



## Getting Started

**Note**

Before using this information, be sure to read the general information under “Notices” on page 399.

**Compilation date: June 27, 2004**

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## How to send your comments

Your feedback is important in helping to provide the most accurate and highest quality information.

- To send comments on articles in the WebSphere Application Server Information Center
  1. Display the article in your Web browser and scroll to the end of the article.
  2. Click on the **Feedback** link at the bottom of the article, and a separate window containing an e-mail form appears.
  3. Fill out the e-mail form as instructed, and click on **Submit feedback** .
- To send comments on PDF books, you can e-mail your comments to: **wasdoc@us.ibm.com** or fax them to 919-254-0206.

Be sure to include the document name and number, the WebSphere Application Server version you are using, and, if applicable, the specific page, table, or figure number on which you are commenting.

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## About this book

This book is organized into sections that describe planning, installing and migrating. The information in this book is also available online, which is the most current version.

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### Planning

Planning is an activity in which you make decisions that affect one or more subsequent activities.

Pre-installation planning helps IT architects and various administrators select and implement multiple node server environments comprised of one or more product installations.

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### Installing

Installing is an activity in which you put software onto machines. Some installation can be performed after the initial product setup, such as installing the complimentary application clients provided with the product.

Installation can be part of setting up a multiple node production environment.

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### Migrating

Migrating is an activity in which you take advantage of existing materials. Migration tasks and tools help you upgrade the product and its prerequisites, reuse existing application components when feasible, and transfer administrative configurations from your past version to a current one.

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### Accessing this information online

This book is compiled from information center articles that are available at Web address: <http://publib.boulder.ibm.com/infocenter/ws51help/index.jsp>. The information center has many intertopic links that this book is not able to replicate in its subset of information. Although some effort was made to remove such links and replace them with links to external information center articles, it is possible that some links were missed. Intertopic links to articles that are not in this PDF and that we did not change to point to the external information center do not function properly. Such links were overlooked during the production of this PDF. We apologize for any inconvenience a broken link causes and ask you to look for the information in the information center.

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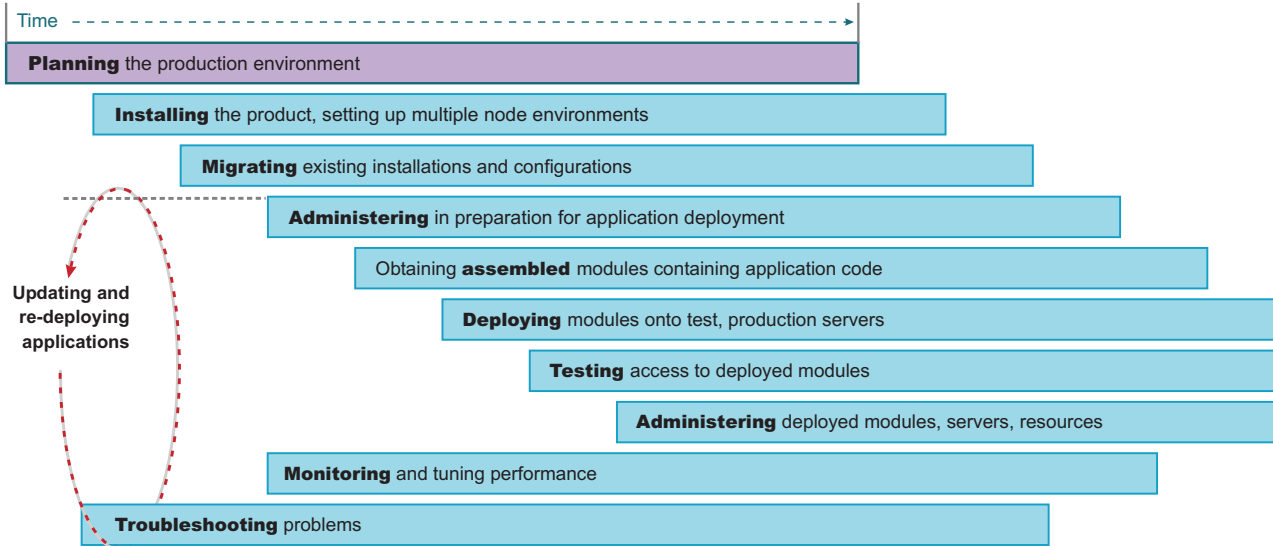
# Chapter 1. Planning

Planning is an activity in which you make decisions that affect one or more subsequent activities.

Pre-installation planning helps IT architects and various administrators select and implement multiple node server environments comprised of one or more product installations.

Note the topic , as it is an essential task in a WebSphere Application Server Network Deployment environment.

## A simple timeline of activities for Planning, Installer and Administrator roles.



Aside from the planning that precedes product installation, application developers and others encounter various decisions that are smaller in scale, but can have ramifications if not well planned. Those are the kind of decisions outlined under Planning.

For example, selecting a session tracking approach can affect application development, assembly, and administration downstream.

Whatever kind of planning you are doing, it is best to review the product documentation of the functional area you are using, to understand the key concepts underlying, as well as the specific product support and limitations in that area.

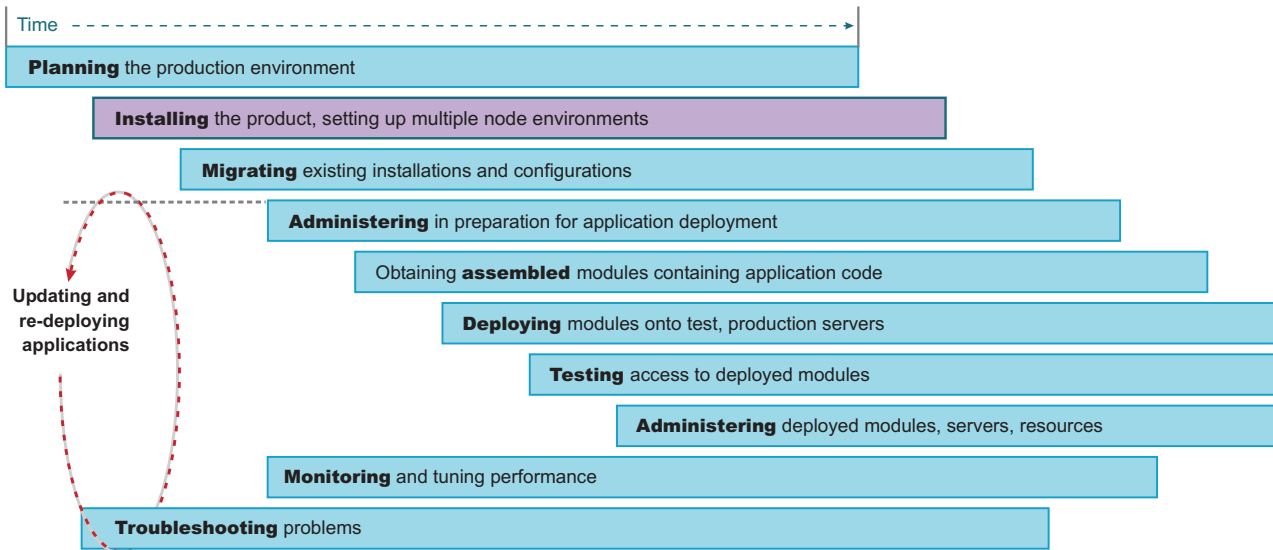


## Chapter 2. Installing

Installing is an activity in which you put software onto machines. Some installation can be performed after the initial product setup, such as installing the complimentary application clients provided with the product.

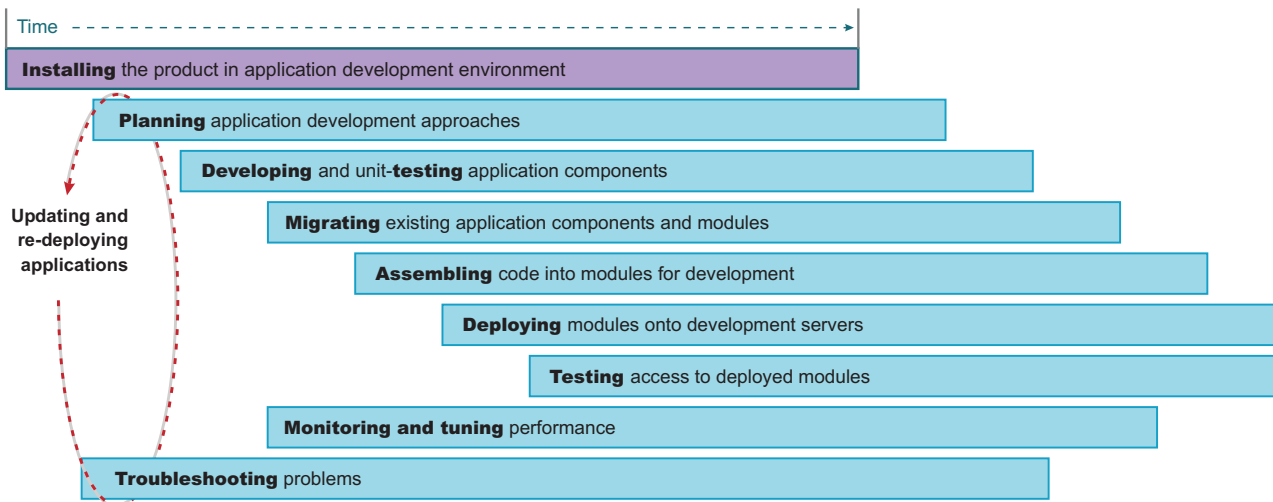
For Version 5.1.1 the Launchpad and the installer wizard use the language setting from the machine locale to determine the language for the interface.

### A simple timeline of activities for **Planning, Installer and Administrator** roles.



Application developers might perform quick, single machine installations to create a realistic server environment for unit-testing code artifacts and applications. This task can require little preparation beyond checking the software and hardware requirements.

### A simple timeline of activities for an **Application Developer** role.





## Chapter 3. Installing WebSphere Application Server products

This topic introduces installing IBM WebSphere Application Server, Version 5.x, including the tasks you need to perform.

To create a complete environment for installation, you must install any prerequisites and prepare the operating platform for installation. During installation, you can optionally migrate the configuration from a previous version of the product. After installation, you can run the installation verification test and bring up your Application Server.

Perform the following tasks to create a running version of the product on your machine.

1. Plan to install an e-business network, as described in “Planning to install an e-business network” on page 10

This task helps you plan to install an e-business network. It also describes interoperability considerations.

2. Install a Web server on a separate, dedicated machine.

If you plan to install the IBM HTTP Server or another Web server on a dedicated machine, install it now. You can also install the IBM HTTP Server using the installation program in the IHS directory on the WebSphere Application Server product CD-ROM. See “Preparing to install and configure a Web server” on page 27 for more information.

3. Install the product, as described in “Installing the product” on page 45.

This task helps you prepare your machine for installation and explains the different types of installation available to you. It includes information on:

- Using the Launchpad
- Deciding whether to migrate applications and the configuration from a previous version
- Deciding whether to coexist with a previous version
- Using the silent installation method

This task describes using the installation wizard. Through the installation wizard, you migrate applications and configurations from a previous version of WebSphere Application Server, coexist with the previous version, choose a full installation type or a custom installation type, and perform some initial configuration.

A full installation requires setting up a user and two operating system groups on Linux and UNIX-based platforms for the embedded messaging server and client feature. If you select the embedded messaging server and client feature in a custom installation, you must also set up the operating system groups.

The wizard lets you install and configure IBM HTTP Server. You can also select Web server plug-ins for IBM HTTP Server and other popular Web servers.

Migrate Enterprise, V5.0.x or Enterprise Edition, V4.x to WebSphere Business Integration Server Foundation, Version 5.1.

Table 1. When to migrate extended applications to Version 5.1

| Migration from             | Migrate to V5.1?                                 |   |                    |
|----------------------------|--|---|--------------------|
|                            | WebSphere Business Integration Server Foundation | WebSphere Application Server  | Network Deployment |
| Enterprise Edition, V4.1.x | Yes  | No. You disable programming model extensions in your migrated applications. |                    |
| Enterprise, V5.0.x         | Yes  |   |                    |

Migrating to base or Network Deployment issues warnings that describe the parts of your configuration that are disabled. The migration tools record these warnings in a log file. If you have

already migrated and disabled the extensions in your applications, you can enable the extensions again by installing Integration Server and selecting the migration option.

There is no Enterprise Edition in Version 3.5.x or Version 4.0.x. If you are migrating from a V3.5.x product or a V4.0.x product, migrate when you install the V5.1 base product or the V5.1 Network Deployment product. After migrating, install the WebSphere Business Integration Server Foundation product.

4. Verify the installation.

- a. Use the First Steps tool to run the Installation Verification Test, as described in “Using the installation verification test” on page 213.

The First Steps tool starts automatically at the end of the installation.

- b. Identify and correct any problems using the troubleshooting procedure, as described in “Troubleshooting the installation” on page 214.

5. Examine the results of migration, or prepare to perform a manual migration, as described in “Migrating and coexisting” on page 326.

This task describes exactly what is migrated during the automatic migration. It also describes how to perform a manual migration using the migration tools.

6. Prepare to migrate from an unsupported operating system, as described in “Migrating from an operating system that is no longer supported” on page 350.

This task describes a basic procedure to follow when migrating from one operating system to another.

7. Configure WebSphere Application Server after migration, as described in “Configuring WebSphere Application Server after migration” on page 388.

This task explains how to check migrated application and configuration information, to understand and configure exactly what you migrated.

- If you migrate from Version 3.5.x, examine the applications that you are moving. Make any necessary changes to the applications that are converted to Java 2 Platform, Enterprise Edition (J2EE) platform applications. The migration tools create the initial J2EE enterprise applications, based on Version 3.5.x configurations.
- If you migrate from Version 4.x, you have little to review. J2EE 1.2 enterprise archive (EAR) files in Version 4 work in Version 5 of WebSphere Application Server, which also supports the J2EE 1.3 specification.

8. Set up V3.5.x and V5 coexistence, as described in “Setting up Version 3.5.x and Version 5 coexistence” on page 367.

This task describes running WebSphere Application Server V3.5.5 and later editions with V5.x, on the same machine.

9. Set up V4.0.x and V5 coexistence, as described in “Setting up Version 4.0.x and Version 5.x coexistence” on page 368.

This task describes running WebSphere Application Server V4.0.2 and later editions with V5.x, on the same machine.

10. Set up V5.x coexistence, as described in “Setting up Version 5 coexistence” on page 370.

This task describes running multiple WebSphere Application Server product installations on the same machine.

11. Manually configure a Web server, for example, to support multiple WebSphere Application Server versions or multiple V5 instances, as described in “Manually configuring supported Web servers” on page 32.

This task describes migrating plug-ins and how to configure a plug-in for V5.x.

12. Automatically restart WebSphere Application Server processes, as described in “Automatically restarting server processes” on page 205.

This task describes how to set up WebSphere Application Server processes for the operating system to monitor and restart.

13. Create multiple Version 5 instances on one machine, as described in “Creating multiple Version 5 configuration instances” on page 220.  
This task describes creating multiple configuration instances from one installation. It also describes creating multiple servers in a coexistence or multiple instance environment, and changing port settings for HTTP transport to avoid conflicts.
14. Apply an interim fix, a cumulative fix, or a fix pack to an existing installation, as described in “Installing interim fixes, cumulative fixes, and fix packs” on page 230.  
This task helps you apply maintenance to WebSphere Application Server products after you download the maintenance from the Support page.
15. Remove an interim fix, a cumulative fix, or a fix pack from an existing installation, as described in “Uninstalling interim fixes, cumulative fixes, and fix packs” on page 263.  
This task helps you remove applied maintenance from WebSphere Application Server products.
16. Tune for performance. For best performance on any platform, see Tuning performance parameter index.

The WebSphere Application Server product is installed.

**Uninstalling and reinstalling:** See “Uninstalling the product” on page 295 for information about uninstalling and reinstalling any WebSphere Application Server product.

**Deploying applications:** Go to Quickly deploying Web components - Try it out! for a description of how to get started deploying applications.

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## WebSphere Application Server packages for Version 5.1

The WebSphere Application Server family of interoperable products provides a next-generation application server on an industry-standard foundation. The IBM WebSphere Application Server family is divided into the following packages for Version 5. Each edition addresses a distinct set of scenarios and needs.

WebSphere Application Server includes:

- **WebSphere Application Server Express** (not pictured below)  
This edition is a lightweight server for static content, servlets, and JavaServer Pages (JSP) files, but does not support enterprise beans.
- **WebSphere Application Server**  
This edition addresses the basic programming and run-time needs of desktop developers and single-server production scenarios. The run-time environment for this edition addresses standards-based programming for Web and component-based programming, as well as Web services. The administration model for this edition presumes a single-server environment with no clustering for failover or workload balancing, and with no centralized administration of multiple server instances. However, you can add a stand-alone node to a centrally administered network (the cell) at any time after installing the following product, Network Deployment that controls the cell.
- **WebSphere Application Server Network Deployment**  
This edition addresses application servers running in multiple-server production scenarios. It provides centralized administration, as well as basic clustering and caching support.
- **WebSphere Business Integration Server Foundation**  
IBM WebSphere Business Integration Server Foundation (previously IBM WebSphere Application Server Enterprise) builds on the industry leading IBM WebSphere Application Server Network Deployment to deliver a next generation composite application platform optimized for building service-oriented applications that extend and integrate your existing IT assets.  
With the Version 5.1 release, IBM WebSphere Application Server Enterprise has been re-branded as WebSphere Business Integration and renamed to IBM WebSphere Business Integration Server Foundation to improve product alignment and positioning as the foundation for higher value IBM WebSphere Business Integration solutions.

The product value proposition and functionality remain unchanged. Future releases of IBM WebSphere Business Integration Server Foundation will focus on enhancing product integration capabilities, including maintaining and enhancing the process choreography and business rule features and adding new integration capabilities and easier-to-use tools.

IBM WebSphere Business Integration Server Foundation will continue to build on the IBM WebSphere Application Server and will maintain its commitment to J2EE and open standards.

**IBM WebSphere Studio Application Developer Integration Edition** Version 5.1 (name unchanged) is a comprehensive Eclipse-based composite application development environment for building service-oriented applications that extend and integrate your existing IT assets.

IBM WebSphere Studio Application Developer Integration Edition V5.1 is optimized for building integrated applications and business processes that deploy to IBM WebSphere Business Integration Server Foundation V5.1. WebSphere Studio Application Developer Integration Edition includes all of the features available in IBM WebSphere Studio Application Developer v5.1.1.

- **WebSphere Application Server for z/OS** (not pictured)

This edition integrates the WebSphere Application Server product and the Network Deployment product into a single package that leverages the unique qualities of service inherent to the z/OS platform. It addresses standards-based programming for Web and component-based programming, as well as Web services, and provides centralized administration of multiple server instances, as well as basic clustering and caching support.

## 5.1 +



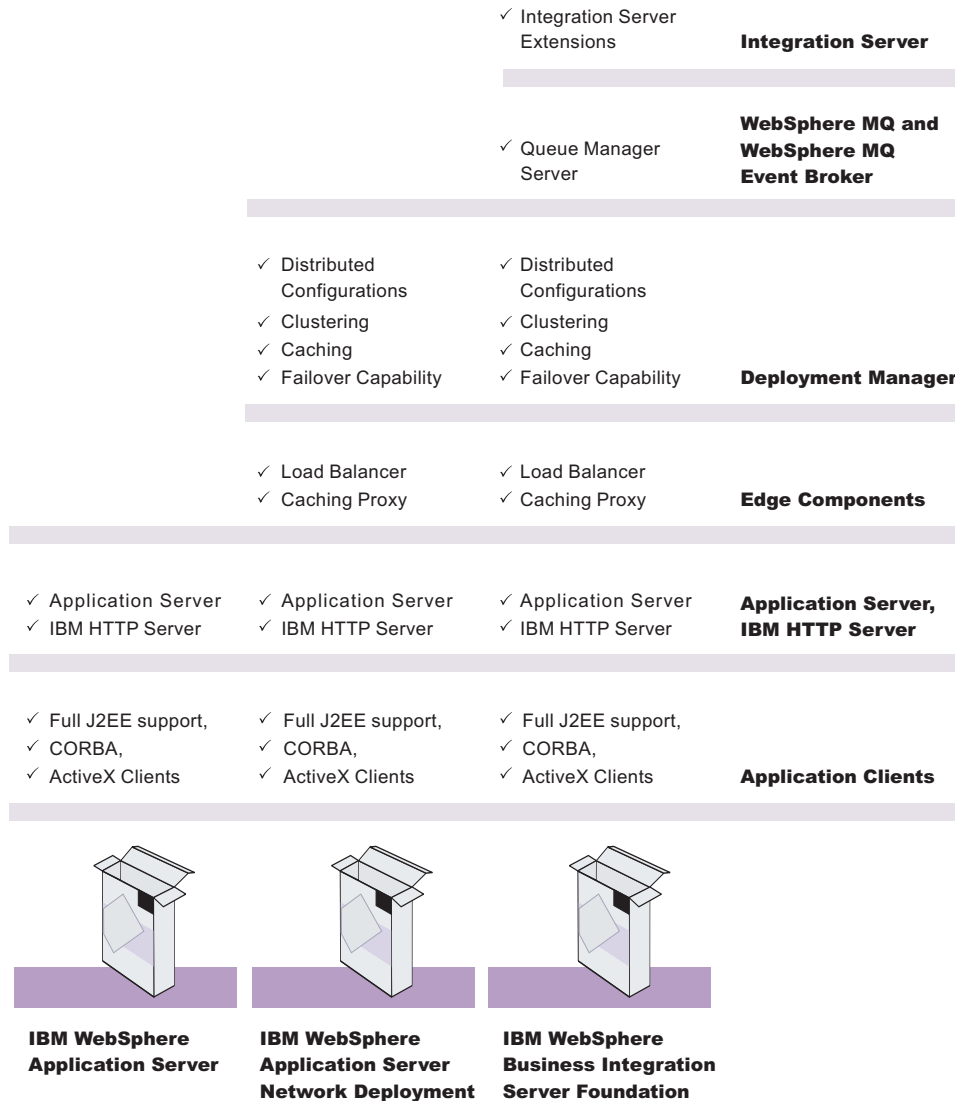


Figure 1. Installation images in WebSphere Application Server packages that are currently available for V5.1. The following packages are available for Version 5.1, which supports the Java 2 SDK 1.4.x specification.

### Description of installation images

The WebSphere software platform for e-business starts with a foundation formed from Web application serving and integration. The WebSphere Application Server family lets you quickly, reliably and flexibly enable your business for the Web. It provides the core software to deploy, integrate and manage your e-business applications. WebSphere Application Server supports custom-built applications, based on integrated WebSphere software platform products, or on other third-party products. Such applications can range from dynamic Web presentations to sophisticated transaction processing systems.

IBM WebSphere Application Server, WebSphere Application Server Network Deployment, and WebSphere Business Integration Server Foundation are interoperable building blocks. The base product CDs are included in the Network Deployment package. The Network Deployment package CDs are included in the Integration Server package.

- The **Application Clients** installation image contains the Java 2 Enterprise Edition (J2EE) Application Clients support, the WebSphere Business Integration Server Foundation client programming model extensions, the CORBA C++ client, the Applet client, and the ActiveX to Enterprise JavaBeans (EJB)

bridge client support. The image also contains the embedded messaging client support for the native Java Message Service (JMS) provider in WebSphere Application Server products.

- The **WebSphere Application Server** product installation image contains the core application server runtime, a native JMS provider (the embedded messaging feature), IBM HTTP Server, IBM Developer Kit, IBM Cloudscape, XML and XSL parsers, the deployment tool, the node agent for communicating to the deployment manager when it is part of a cell, and the external adapter library for proxy caching enablement.

The application assembly tool is no longer a feature of the base WebSphere Application Server product beginning with Version 5.1. The assembly toolkit replaces the application assembly tool. The assembly toolkit is available on the IBM WebSphere Application Server Toolkit CD in the product package. The assembly toolkit consists of the J2EE Perspective of the WebSphere Studio Application Developer product, including code generation capabilities.

- The **Deployment Manager** product installation image contains the deployment manager configured for use in departmental production computing scenarios. It includes the embedded messaging client feature, the Version 2 compliant universal description, discovery, and identification (UDDI) registry feature, and the Web services gateway feature. Although the Network Deployment package includes the base Application Server CD, installing the Network Deployment product does not install the base Application Server product. You must use the base product CD to install the base product.
- The **Edge components** installation image contains IBM HTTP Server, and edge of network support for the Load Balancer (Dispatcher) and Caching Proxy (edge caching), as well as support for network authentication and single sign-on.
- The **WebSphere Business Integration Server Foundation** installation image contains programming model extensions to the core Application Server, such as business rule beans and process choreographer, and deployment manager extensions for administering functions included in the programming model extensions. Integration Server supports an *umbrella installation*, which automatically installs the base product in the same installation procedure.

Although the Integration Server package includes the Network Deployment product CD, installing Integration Server does not install the Network Deployment product. You must use the Network Deployment product CD to install the Network Deployment product.

If you install the Integration Server product on a machine with an installed Network Deployment product, the Integration Server product extends the Network Deployment administrative console.

Although the Integration Server package includes a separate base WebSphere Application Server product CD, installing Integration Server on a clean machine automatically installs the base Application Server product in an umbrella installation.

If you install Integration Server on a machine with an installed base Application Server product, Integration Server extends the base Application Server product, while automatically installing any base product features that Integration Server requires.

- The **WebSphere MQ and WebSphere MQ Event Broker** installation images in Version 5.0 provide the non-embedded full-function WebSphere MQ Queue Manager for reliable, dynamically load balanced asynchronous messaging for more than 35 platforms.

Included with all packages are the Data Direct Technologies JDBC Drivers and the IBM WebSphere Application Server Toolkit (ASTK) compact disks (CDs).

Also included with the Version 5.1 base product and the Network Deployment product are the WebSphere Application Server, Version 5 for iSeries CDs. The Integration Server product for V5.1 is not supported on iSeries servers at this time.

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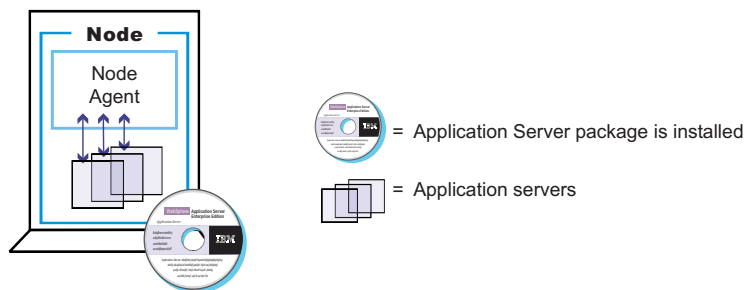
## Planning to install an e-business network

Version 5 of the WebSphere Application Server family provides flexible configurations and deployment options for hosting Java 2 Platform, Enterprise Edition (J2EE) applications. The WebSphere Application Server package provides all required components:

- The WebSphere Application Server

- A Web server
- A J2EE client

### IBM WebSphere Application Server Package



The WebSphere Application Server Network Deployment package includes the core package and provides a smooth transition to deploying and managing applications in a distributed network environment. It includes productivity and scalability enabling components (Edge components). The deployment manager server lets you federate single nodes to its group, which it manages as a single image or *cell*, by using the nodeagent server process on each node. Open the information center for the Network Deployment product to learn how to establish a multimachine environment, and to learn about WebSphere Application Server, Version 5 product scalability.

Tasks in the installation planning process appear below.

1. Plan the general scope of your network.

Review single machine topologies to learn how you can install and use the base WebSphere Application Server product on a single machine. Open the information center for the Network Deployment product to learn how to establish a multimachine environment.

2. Plan for interoperability and coexistence.

Plan to have WebSphere Application Server interoperate with your other e-business systems, including other versions of WebSphere Application Server. *Interoperability* provides a communication mechanism for WebSphere Application Server nodes that are at different versions. *Coexistence* describes multiple versions or instances running on the same machine, at the same time.

Interoperability support enhances migration scenarios with more configuration options. It often is convenient or practical to interoperate during the migration of a configuration from an earlier Application Server version to a later one when some machines are at the earlier version and some machines are at the later version. The mixed environment of machines and application components at different software version levels requires interoperability and coexistence.

It is often impractical, or even physically impossible, to migrate all the machines and applications within an enterprise at the same time. Understanding multiversion interoperability and coexistence is therefore an essential part of a migration between version levels.

a. Plan to run WebSphere Application Server across platforms.

Support of multiple versions is provided on all operating system platforms supported by WebSphere Application Server, Version 5.

b. Plan to run WebSphere Application Server across versions.

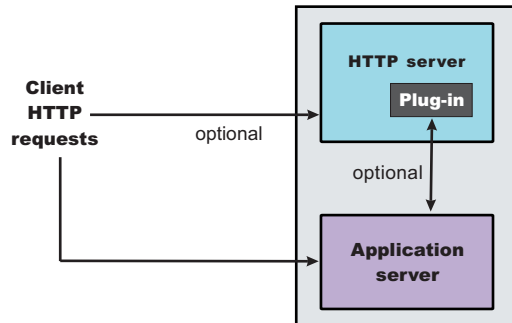
WebSphere Application Server, Version 5 is generally interoperable with WebSphere Application Server Versions 3.5.x and 4.0.x, although each version has specific requirements. However, the ability to run different versions of an Application Server in a configuration does not let you include Version 5 Application Servers in an existing administrative domain, or let you include Version 3.5.x or Version 4.0.x Application Servers in a Version 5 cell.

Reading the information referred to in this topic provides you with a good approach for implementing your WebSphere Application Server environment.

You are now ready for pre-installation planning and installation.

## Single server topology

The following illustrations show examples of single server topologies. Each WebSphere Application Server product can run in a single server environment. The most common topology is a stand-alone base WebSphere Application Server product.



The WebSphere Application Server base product runs on a single machine. You can install the product in a stand-alone configuration or as part of a cell in a multimachine configuration. The stand-alone configuration is typically for developer desktops or stand-alone production computing, which involve a single Application Server instance operating independently of any other applications.

You can install an installation image on any supported machine. You can configure the Application Server with the Administrative Console to host one or more applications.

### Multiple instances on one machine

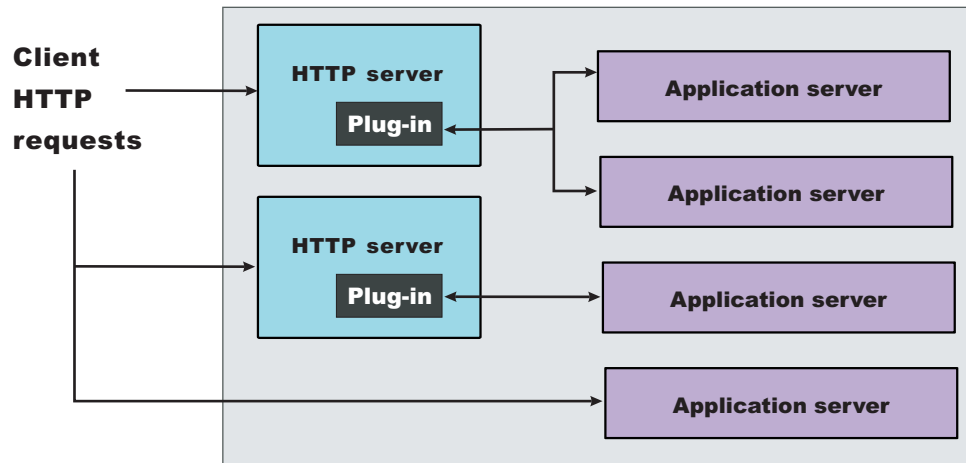
The base WebSphere Application Server product contains three main topologies:

- A single installation, as described previously
- Multiple installations in a coexistence environment
- A single installation with multiple configuration instances

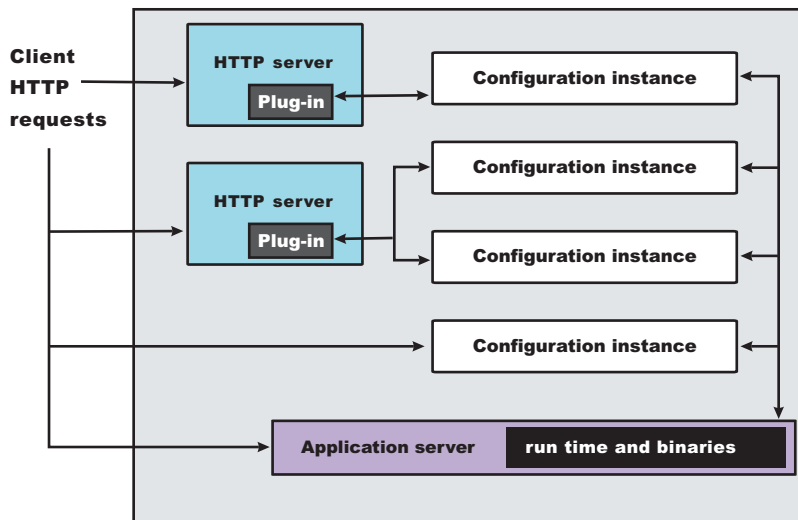
You can install the base WebSphere Application Server product one time as described previously, which creates a default server1 instance.

You can create more servers on a machine using the techniques described in “Creating servers in coexistence or multiple instance environments” on page 229.

You can install the base WebSphere Application Server product multiple times in separate directories. Each resulting installation instance is a fully functional Application Server. The following illustration shows an example of such a configuration.



You can also install the base WebSphere Application Server product one time and use the **wsinstance** command to create multiple configuration instances. Configuration instances are fully functional Application Servers that share the run time and command binaries of the initial product installation. The following illustration shows an example of such a configuration.



### Setting up an environment for the Common Criteria standard

A Common Criteria (CC) evaluated product is a product that has been evaluated in accordance with Common Criteria, an internationally recognized ISO standard (ISO 15408) for the security evaluation of IT products and systems. IBM WebSphere Application Server, Version 5.0 with Fix Pack 2 has been evaluated to CC assurance level EAL3+.

The evaluation was performed on the product with the configuration described in this section. For the product to operate in accordance with the evaluation, with formal assurance, adhere to this configuration. Other configurations do not reduce the security of the system, but such configurations have no formal assurance at this time.

It is assumed that the applications and operating system that the WebSphere Application Server product interfaces, will not compromise the security of the WebSphere Application Server product and where

applicable, that they have been configured in accordance with the manufacturer's installation guides and/or its evaluated configuration. It also is assumed that the developers of the applications will comply with the guidelines described in the following sections of this document: "Web Server Applications" and "Enterprise Beans."

It is assumed that all software and hardware, including network and peripheral devices, have been approved for the transmittal of protected data. Such items are to be physically protected against threats to the confidentiality and integrity of the data.

It is assumed that there are one or more competent individuals that are assigned to manage the WebSphere Application Server product and the security of the information it contains. Such personnel are assumed not to be careless, wilfully negligent or hostile.

### **Required configuration of the WebSphere Application Server product**

In the evaluated configuration, the WebSphere Application Server product must be configured as follows:

- The following product resources must be disabled:
  - WebSphere Relational Resource Adapter
  - Built-in Mail Provider
  - WebSphere embedded messaging feature, which ordinarily provides the Java Messenger Service (JMS) function
- No external resources can be enabled except for an external database resource
- Global security must be enabled
- The CSlv2 protocol must be enabled with basic authentication required
- The user registry must be set to an operating system (OS) registry
- The active authentication mechanism must be set to Simple WebSphere Authentication Mechanism (SWAM)
- The Administrative Service JMX connector must be set to RMI
- Users and group IDs must be mapped to the administration roles
- Users and group IDs must be mapped to the naming roles
- Only the following components can be installed in the WebSphere Application Server product:
  - Product Administrative Console
  - Enterprise applications consisting of Web server applications, enterprise beans, or both
  - Stand-alone Web server application components
  - Stand-alone enterprise beans components
- Users and group IDs must be mapped to the roles used by each Web server application and enterprise bean
- The URLs of the Web server application components must be mapped to (assigned to) the HTTP Transport service of the WebSphere Application Server product.

### **Required configuration of the Product Administrative Console**

In the shipped configuration, the secure and non-secure methods are both configured in `web.xml` files. The `web.xml` files for the secure methods are configured for security, requiring an authentication method of FORM and requiring security constraints to access protected methods. These methods are mapped to a remote HTTPS interface that is implemented by the WebSphere Application Server product.

The `web.xml` files for the non-secure methods are not configured for security. These methods are mapped to a remote HTTP interface that is implemented by the WebSphere Application Server product.

The shipped configuration of the `web.xml` files for the Product Administrative Console cannot be changed. Also, the shipped configuration that maps the URLs to remote HTTPS and HTTP services of the WebSphere Application Server product cannot be changed

## **Software environment of the WebSphere Application Server product**

This section describes the components that are either required or optional in the software environment of the WebSphere Application Server product. The components described in this section are not included in the WebSphere Application Server product. The components that are required or optional in the software environment of the WebSphere Application Server product are described in the following sections. The Product Java 2 SDK and operating system are required. The remaining components are optional.

### **Operating platform configuration components**

Operating platform configuration components include:

- Operating system (required)
- Database provider and database server

### **Description of the required operating system environment**

The operating system is one of the following external products and is required in the evaluated configuration:

- AIX 5.2
- HP-UX 11i
- SuSE Linux Enterprise Server (SLES) 8
- Red Hat Enterprise Linux 2.1
- Solaris Operating Environment 8
- Windows 2000 Professional or Windows 2000 Server

The operating system must reside in the same system unit as the WebSphere Application Server product. The WebSphere Application Server product uses the operating system to provide the following functions:

- An operating system process and JVM for running the WebSphere Application Server product and the local components loaded into the WebSphere Application Server product. (In the evaluated configuration, the Product Administrative Console, Web server applications, and enterprise beans are loaded into the WebSphere Application Server product.)
- A user registry for storing user identities, passwords, and group identities. The location of this user registry is defined by the operating system.
- A file system for storing configuration data and the naming directory.

In the evaluated configuration, the user registry must contain the ID of each user and group that has permission to access a resource protected by the WebSphere Application Server product. The user registry must also contain a password for each user ID.

### **Database resource and database server**

The database resource and server are external software and are optional in the evaluated configuration. The WebSphere Application Server product uses them to handle the back-end processing for the WebSphere Application Server product database service. The evaluated configuration does not have any restrictions as to how to configure these components.

### **Product components**

Product components include:



- WebSphere Software Development Kit, Java Technology Edition (Java 2 SDK)
- Installable Web server applications
- Enterprise beans
- Clients

### **WebSphere Software Development Kit, Java Technology Edition (Java 2 SDK)**

The Java 2 SDK is provided by Product WebSphere Software Development Kit, Java Technology Edition. The WebSphere SDK is included with the product and is required in the evaluated configuration. The WebSphere SDK must reside on the same system unit as the WebSphere Application Server product and must be loaded into the JVM that the WebSphere Application Server product is using.

The WebSphere Application Server product uses the WebSphere SDK to implement the APIs defined in the J2SE V1.3 specification with the exception of the COSNaming API. The WebSphere Application Server product implements the COSNaming API. None of these APIs are security relevant. Therefore, the WebSphere SDK is outside the scope of the evaluation.

### **Installable Web server applications**

An installable Web server application can be any of the following modules: servlets, JSPs, and HTML pages. In the evaluated configuration, each servlet and JSP must be coded as defined in the product documentation with the following exceptions:

- The servlet or JSP cannot call any undocumented interfaces.
- The servlet or JSP cannot use any remote interfaces, such as the interfaces that are available with the Java RMI, JMS, and JavaMail services.
- The servlet or JSP cannot do anything devious that would compromise the WebSphere Application Server product security functions.

In the evaluated configuration, the developer must configure security information in the web.xml file of each Web server application component. The developer must configure this information using standard XML Deployment Tag Descriptors (DTDs), which are defined in Java DTD specifications. The developer can configure the DTDs using a text editor or an application assembly tool, such as the Application Assembly Tool provided by the Product Additional Tools component. If the developer uses an application assembly tool, the developer needs to note that the tool is not included in the WebSphere Application Server product, so the developer is responsible for validating the configured information.

In the web.xml file, the developer must configure the following security information:

- A log-in constraint for the URL of each Web server application. The log-in constraint must use the authentication method deployment descriptor to specify a method of either BASIC or FORM.
- Each role that is used by this Web server application component.
- A security constraint for each sensitive method or HTML page. The security restraint lists each role that has permission to invoke the method or HTML page.

### **Enterprise Java beans**

An enterprise bean is a server module. In the evaluated configuration, each enterprise bean must be coded as defined in the product documentation with the following exceptions:

- The type of the enterprise bean enterprise bean cannot be message-driven. The type must be either entity or session.
- The enterprise bean cannot call any undocumented interfaces.



- The enterprise bean can use only the remote interfaces defined in the Java EJB API. The WebSphere Application Server product implements these remote interfaces. The enterprise bean cannot use any other remote interfaces, such as the remote interfaces that are available with the RMI, JMS, and JavaMail API.
- The enterprise bean cannot do anything devious that would compromise the WebSphere Application Server product security functions.

In the evaluated configuration, the developer must configure security information in the `ejb-jar.xml` file of each enterprise bean component. The developer must configure this information using standard XML Deployment Tag Descriptors (DTDs), which are defined in Java DTD specifications. The developer can configure the DTDs using a text editor or an application assembly tool, such as the Application Assembly Tool provided by the Product Additional Tools component. If the developer uses an application assembly tool, the developer needs to note that the tool is not included in the WebSphere Application Server product, so the developer is responsible for validating the configured information.

In the `ejb-jar.xml` file, the developer must configure the following security information:

- Each role that is used by this enterprise bean component.
- A permission for each sensitive method in the enterprise bean component. The permission lists each role that has permission to invoke the method.

## Clients

Clients are optional in the evaluated configuration. Clients are entities that are remote from the JVM and operating system process that the WebSphere Application Server product is using. Clients are attempting to access the resources of the WebSphere Application Server product. Resources that clients can access are:

- Methods and HTML pages in Web server applications
- Methods in enterprise beans
- Methods in the Product Administrative Console
- Services of the WebSphere Application Server product

The term *remote* has to do with the operating system process and JVM that the clients are using rather than system unit where the clients are located. If a client is located on the same system unit as the WebSphere Application Server product but is using a different operating system process and JVM than the WebSphere Application Server product is using, the client is considered to be remote.

In the evaluated configuration, the only way that clients can request access to any of these resources is to issue requests to remote interfaces that are implemented by the WebSphere Application Server product.

## CC evaluation-compliant installation and configuration

The CC evaluation covers security configuration options listed only in this document. The following installation and configuration requirements apply:

- Verify that you are using systems that do not have previous versions of WebSphere Application Server installed. You cannot migrate a Version 3.5.x system or a Version 4.x system to Version 5 and then install Fix Pack 2 as a basis for an evaluated configuration.
- The `server1` system must be installed on a stand-alone machine. It is not connected to a deployment manager cell. No coexisting Version 5 instances or multiple configuration instances of the Application Server are on the machine.
- The WebSphere Application Server Network Deployment product is not supported in the evaluated configuration.
- The WebSphere Application Server Enterprise product is not supported in the evaluated configuration.

- Only LDAP is supported for access to the directory server. Active Directory or other protocols are not supported.
- LDAP replicas are not supported.
- Hardware encryption devices are not supported.
- Only English language support was evaluated.
- Use easy installation programs, if supported for your particular platform. If easy installation is not supported, verify that you follow native installation instructions and refer to the readme file of the fix pack for any last-minute updates.
- All WebSphere Application Server systems are configured to operate independently and are not connected to each other. Therefore, load balancing and failover configurations of WebSphere Application Server systems are not supported in the evaluated configuration.

## Installing Version 5.0.2 of WebSphere Application Server

The following procedure describes how the CC-compliant installation of the base WebSphere Application Server product. The procedure describes installing the Version 5.0.0 WebSphere Application Server product from the Version 5.0.0 product CD-ROM and then installing Fix Pack 2 for Version 5.0.0 to change the service level to Version 5.0.2.

The following procedure replaces the procedure described elsewhere in the information center. Do not perform both procedures. Follow this procedure to set up a CC-compliant environment.

**Configuration compliance:** If you use any other procedure to install WebSphere Application Server, you change the compliant configuration that was evaluated. It is likely that by following another installation procedure, the system that you install does not meet the evaluated configuration.

## Installing WebSphere Application Server V5.0.0

Use the following procedure to install WebSphere Application Server, Version 5.0.0 on a Windows platform using the English language. You must install the product from the Administrator user ID or from a user ID that belongs to the Administrator user group and has the following advanced user rights:

- Act as part of the operating system
  - Log on as a service
1. Insert the product CD-ROM to autostart the LaunchPad.  
If you have autostart turned off, open a DOS prompt and type the following command:  
`d:\win\launchpad`  
This example assumes that your CD-ROM drive is the D:\ drive.
  2. Click **OK** on the Language selection panel for the LaunchPad.
  3. Click **Install the product** on the LaunchPad.
  4. Click **OK** on the Language selection panel for the Installation wizard.
  5. Click **Next** on the Welcome panel.
  6. Click **I accept the terms in the license agreement** and click **Next** on the License panel.
  7. Select the **Custom** check box on the Installation type panel and click **Next**.
  8. Clear the check box for each of the following features on the Features selection panel:
    - Application Server samples
    - Embedded Messaging and all of its sub-features
  9. Click **Next** on the Features panel.
  10. Change the directory specification to a directory without a space in the name. For example, use the C:\WebSphere\AppServer directory. Click **Next** to accept the directory for installing WebSphere Application Server and the IBM HTTP Server product on the Installation location panel.

11. Accept the default node name and host name of your machine and click **Next** on the Network identification panel.
12. Choose to run WebSphere Application Server (server1) as a Windows service and to run IBM HTTP Server as a Windows service, enter your user ID, enter your password, and click **Next** on the Windows services panel.
13. Click **Next** on the Features summary panel to start the installation.
14. Wait for the Installation progress panel to finish displaying the progress of the selected features.
15. Clear the check box labeled **Register this product now** to bypass product registration and click **Next** on the Registration panel.
16. Verify the installation by selecting the **Verify Installation** option on the First Steps panel that automatically displays at the end of the installation routine.  
 The message window at the bottom of the First Steps panel displays the operating system name, the locale, and the host name. The installation verification test (IVT) displays various messages in the messages window as it verifies the installation.  
 Each verification test displays a line with the word Passed at the end to indicate a successful installation of that component. The next to last line says IVT Verification Successful to indicate success.  
 The last line says Installation Verification is complete to indicate the end of the test.
17. Click **Stop the server** to stop the server1 process, which the IVT started.  
 Wait for the Server Server1 stop completed message to display in the message window of the First Steps panel before continuing.
18. Click **Exit** to close the First Steps panel.
19. Click **Finish** to close the Installation wizard.
20. Click **Exit** to close the LaunchPad.

### Installing Fix Pack 2 for the WebSphere Application Server, Version 5.0.0 product

Stop all installation procedures or uninstall procedures before installing Fix Pack 2. Use the **versionInfo** command in the C:\WebSphere\AppServer\bin directory to display the exact fix and version level of the product. Do not use the **versionInfo** command while installing or uninstalling an interim fix or fix pack.

Before installing or uninstalling fixes and fix packs, stop all Java processes that use the IBM SDK that WebSphere Application Server provides to support the Java 2 SDK on your operating system platform, such as the IBM Developer Kit for Windows, Java Technology Edition. Stop the server1 process, if it is running. Stop all Java processes, if necessary.

If you do install or uninstall an interim fix or fix pack while a WebSphere Application Server-related Java process is running, IBM does not guarantee that the product can continue to run successfully, or without error.

Space requirements vary depending on what you are installing. The size of each download is available on the Support site. For a fix pack, have approximately 400 MB of free space in the /tmp directory and another 400 MB in the file system that hosts the WebSphere Application Server image (typically /opt) on a Linux or UNIX-based platform, or approximately 800 MB of free space on the disk drive where you are installing on a Windows platform.

Verify that the required free space is available before beginning the installation. After unpacking the ZIP file, you can delete the ZIP file to free space if necessary. After installation, the Fix Pack 2 code increases the size of the IBM WebSphere Application Server installation directory and the run-time footprint by a small amount.

Space is required for the C:\WebSphere\AppServer\update directory. The space required is about the same as the size of the fix pack, typically somewhere between 50 MB to 400 MB.

Space is required for backup files in the C:\WebSphere\AppServer\properties\version\backup directory. The space required is about the same as the size of the fix pack, somewhere between 50 MB to 400 MB, varying by product and platform.

### Steps for this task

Perform the following procedure to install Fix Pack 2:

1. Stop each server process on the base WebSphere Application Server node with the **stopServer** command.  
C:\WebSphere\AppServer\bin> stopserver server1
2. Stop all WebSphere Application Server-related Java processes.  
On a Windows platform, use the task manager to stop Java processes. On a Linux or UNIX-based platform, use the **kill** command to stop the Java processes.
3. Create the C:\WebSphere\AppServer\update directory.
4. Download Fix Pack 2 for the WebSphere Application Server, Version 5.0.0 product to the C:\WebSphere\AppServer\update directory and unpack the fix pack into the same directory. Unpacking the fix pack automatically creates the C:\WebSphere\AppServer\update\fixpacks directory.
  - a. Start the <http://www.ibm.com/software/webservers/appserv/was/support/> Web address.
  - b. Click **Version 5.0 Fix Pack 2 (5.0.2)**.
  - c. Select the download package for the base product for the correct operating system. For example, for a Windows 2000 operating system, select the **Windows 2000/NT Base** download package.
  - d. Follow the prompt to download Fix Pack 2, which includes the update installer application.
5. Click the C:\WebSphere\AppServer\update\was50\_fp2\_win.zip file to unzip it.
6. After unzipping the fix pack, click the updateWizard.bat file to launch the Update installation wizard.
7. Click **OK** to select English as the language for the wizard.
8. Verify that the only product that is displayed is the **IBM WebSphere Application Server V5.0.0** product. Verify that this product is highlighted and click **Next** on the Product identification panel.
9. Verify that the **Install fix packs** option is selected and click **Next** on the Fix pack selection panel.
10. Type the C:\WebSphere\AppServer\update\fixpacks directory and click **Next** on the Fix pack location panel.
11. Verify that was50\_fp2\_win is selected and click **Next** on the Fix pack selection panel.
12. Verify that both feature components indicate Not Found and click **Next** on the External components panel.
13. Click **Next** on the Fix packs summary panel.
14. Wait for the Fix pack installation progress panel to finish displaying the progress of the installation.
15. Verify that the following message is displayed:  
The following fix pack was successfully installed:  
was50\_fp2\_win  
The message for installing the fix pack on another operating system indicates the name of the fix pack for that operating system.
16. Click **Finish**.
17. Verify that Fix Pack 2 was installed successfully. From a command prompt, change the directory to C:\WebSphere\AppServer\bin and issue the **versionInfo** command. The report that appears shows that the Version is **5.0.2**.
18. Verify that the update is successful by launching the First Steps tool with the **C:\WebSphere\AppServer\bin\firststeps** command.
19. Verify the installation by selecting the **Verify Installation** option on the First Steps panel.

The message window at the bottom of the First Steps panel displays the operating system name, the locale, and the host name. The installation verification test displays various messages in the messages window as it verifies the installation.

Each verification test displays a line with the word Passed at the end to indicate a successful installation of that component. The next to last line says IVT Verification Successful to indicate success.

The last line says Installation Verification is complete to indicate the end of the test.

20. Click **Stop the server** to stop the server1 process, which the IVT started.

Wait until the Server Server1 stop completed message is displayed in the message window of the First Steps panel before continuing.

21. Click **Exit** to close the First Steps panel.

### Configuring WebSphere Application Server

1. Start the server1 process using the **startserver** command. For example:

```
./startServer.sh server1
```

2. Start the Administrative Console by pointing your browser at the Web address. For example:

```
http://wasccc.ibm.com:9090/admin/
```

The server name in the example is wasccc.ibm.com. You must use your server name to access your Administrative Console.

3. Log in to the Administrative Console.
4. Set up the local operating system user registry:
  - a. Click **Security > User Registries > Local OS**.
  - b. Under the general properties, type the Server Userid and the Server User Password.
  - c. Click **OK**.
  - d. Click **Save**.
  - e. Click **Save**.
5. Set up the authentication protocol:
  - a. Click **Security > Authentication Protocol > CSiv2 Inbound Authentication**.
  - b. Under the general properties, locate Basic Authentication and click **Required**.
  - c. Click **OK**.
  - d. Click **Save**.
  - e. Click **Save**.
6. Set up Global security:
  - a. Click **Security > Global Security**.
  - b. Under the general properties:
    - 1) Select the checkbox for **Enabled**.
    - 2) Select **CSI** as the Active Protocol.
    - 3) Select Simple WebSphere Authentication Mechanism as the Active Authentication Mechanism: **SWAM**.
    - 4) Select **Local OS** or LDAP as the Active User Registry.
  - c. Click **OK**.
  - d. Click **Save**.
  - e. Click **Save**.
7. Restart the server for Global Security changes to take effect:
  - a. Stop the server with the **stopserver** command. For example:

```
./stopServer.sh server1
```

Wait for the server to stop before proceeding.

b. Start the server1 process using the **startserver** command. For example:

```
./startServer.sh server1
```

8. Deploy installable applications and use the Administrative Console to view the security roles used by the application and to assign users, groups, or both users and groups to each role. See the Security section of the information center for more information.

## Example: Choosing a topology for better performance

WebSphere Application Server provides various Workload Management (WLM) topologies. The following case study uses two topologies, Topology A and Topology B to show how the type of topology you choose can affect performance. In the case study, Topology A can improve performance from 10%-20% more than Topology B. You can see performance increase by using the J2EE benchmark Trade, which is included in this release.

Topology A contains a Web server and a WebSphere Application Server plug-in to a cluster of WebSphere Application Servers. Each cluster member contains a Web container and EJB container. Topology B includes a Web server, a plug-in, and one Web container to a cluster of EJB containers. In both topologies, the Object Request Broker pass-by-reference is selected and the backend database is on a dedicated machine.

Topology A has an advantage because the Web container and EJB container are running in a single Java virtual machine (JVM). In Topology B, the Object Request Broker pass-by-reference option is ignored between the Web container cluster member and the EJB container member. In Topology A, the EJB container uses the same thread passed from the Web container. The request does not have to be passed from one thread in one JVM to another thread in another JVM.

Also, if the processor utilization of the cluster member machines is near 100% you can add more members. If the Web server box is not running at capacity and the Web container processing is not heavy, try freeing the processor on the other members by moving to Topology B.

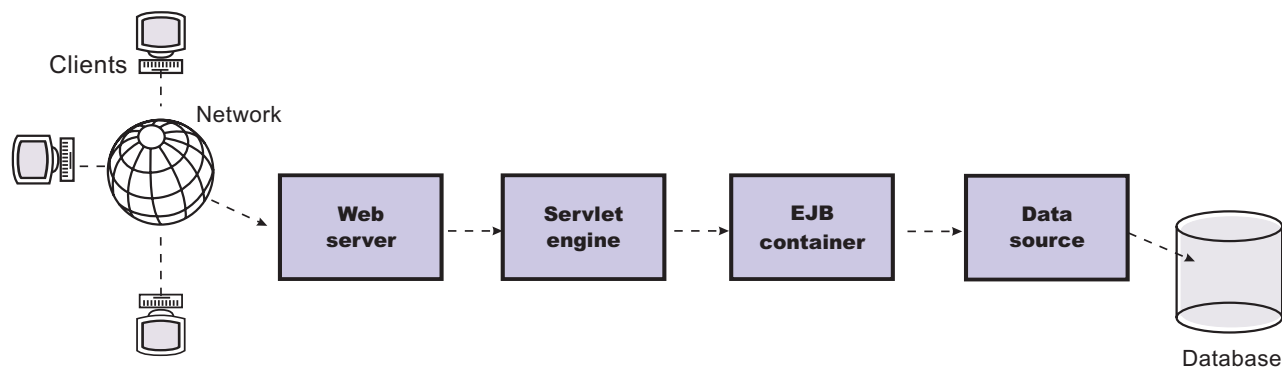
In this test environment, Topology A had the advantage, however, many factors related to the application and environment can influence results.

## Queuing network

WebSphere Application Server contains interrelated components that must be harmoniously tuned to support the custom needs of your end-to-end e-business application. These adjustments help the system achieve maximum throughput while maintaining the overall stability of the system. This group of interconnected components is known as a queuing network. These queues or components include the network, Web server, Web container, EJB container, data source, and possibly a connection manager to a custom back-end system. Each of these resources represents a queue of requests waiting to use that resource. Various queue settings include:

- IBM HTTP Server: **MaxClients** for UNIX and **ThreadsPerChild** for Windows NT and Windows 2000 systems described in Web server tuning parameters.
- Web container: **Maximum size** described in Thread pool settings, **MaxKeepAliveConnections** and **MaxKeepAliveRequests** described in HTTP transport custom properties.
- **Tuning Object Request Brokers** explained in Tuning application servers.
- Data source **connection pooling** is discussed in Connection pooling and **statement cache size** is explained in Data source settings.





**Figure Reference 1: WebSphere queuing network**

Most of the queues that make up the queuing network are closed queues. A closed queue places a limit on the maximum number of requests present in the queue, while an open queue has no limit. A closed queue supports tight management of system resources. For example, the Web container thread pool setting controls the size of the Web container queue. If the average servlet running in a Web container creates 10MB of objects during each request, a value of 100 for thread pools limits the memory consumed by the Web container to 1GB.

In a closed queue, requests can be active or waiting. An active request is doing work or waiting for a response from a downstream queue. For example, an active request in the Web server is doing work, such as retrieving static HTML, or waiting for a request to complete in the Web container. A waiting request is waiting to become active. The request remains in the waiting state until one of the active requests leaves the queue.

All Web servers supported by WebSphere Application Server are closed queues, as are WebSphere Application Server data sources. You can configure Web containers as open or closed queues. In general, it is best to make them closed queues. EJB containers are open queues. If there are no threads available in the pool, a new one is created for the duration of the request.

If enterprise beans are called by servlets, the Web container limits the number of total concurrent requests into an EJB container, because the Web container also has a limit. The Web container limits the number of total concurrent requests only if enterprise beans are called from the servlet thread of execution. Nothing prevents you from creating threads and bombarding the EJB container with requests. Therefore, servlets should not create their own work threads.

## Running WebSphere Application Server across versions

WebSphere Application Server Version 5.1 is generally interoperable with WebSphere Application Server Versions 3.5.x, 4.0.x, and 5.0.x. However, there are specific requirements to address for each version. Make the following changes to support interoperability between versions.

1. Apply required interim fixes.

*Table 2. Interim fixes to apply to Version 3.5.x*

| Interim fix | Version 3.5.3 | Version 3.5.4 | Version 3.5.5 | Version 3.5.6 |
|-------------|---------------|---------------|---------------|---------------|
| PQ51387     | Apply         | Apply         |               |               |
| PQ60074     | Apply         | Apply         | Apply         | Apply         |
| PQ60335     |               |               | Apply         |               |
| PQ63548     | Apply         | Apply         | Apply         | Apply         |

Table 3. Interim fixes to apply to Version 4.0.x

| Interim fix | Version 4.0.1 | Version 4.0.2 | Version 4.0.3 |
|-------------|---------------|---------------|---------------|
| PQ60074     | Apply         | Apply         |               |
| PQ60336     | Apply         | Apply         |               |
| PQ63548     | Apply         | Apply         | Apply         |

Table 4. Interim fixes to apply to Version 5.0.x client

| Interim fix | Version 5.0.0 | Version 5.0.1 | Version 5.0.2 |
|-------------|---------------|---------------|---------------|
| PQ81989     | Apply         | Apply         | Apply         |

All fixes are available on the Support site for WebSphere Application Server products. There is a link to the Support site for WebSphere Application Server products at the bottom of each information center topic. Scroll all the way to the bottom of each page to see the link.

**Interim fix PQ51387**

A naming client fix that supports Version 3.5.x naming client access to the V5.0.x or V5.1.x name server.

**Interim fix PQ60074**

An Object Request Broker (ORB) fix that supports V5.0.x or V5.1.x naming client access to the Version 3.5.x or 4.0.x name server. A down-level client has no problem accessing a V5.0.x or V5.1.x name server, even when using corbaloc.

**Interim fix PQ60335**

An ORB fix to reconcile `java.math.BigDecimal` and other class differences in IBM Software Development Kits 122 and 131.

**Note:** This fix does not apply to IBM Software Development Kits on the Solaris Operating Environment.

**Interim fix PQ60336**

An ORB fix to reconcile `java.math.BigDecimal` and other class differences in IBM Software Development Kits 130 and 131.

**Note:** This fix does not apply to IBM Software Development Kits on Solaris platforms.

**Interim fix PQ63548**

A fix to correct problems that might occur when passing embedded valueTypes between WebSphere Application Server releases.

The best solution is to upgrade all your installations to the latest release and PTF levels, such as Versions 3.5.7 or 4.0.4, which do not require this fix. If this solution is not possible, apply the fix to your version.

Symptoms include `org.omg.CORBA.MARSHAL` exceptions when passing embedded valueTypes across the versions. Sometimes, other symptoms might mask `org.omg.CORBA.MARSHAL` exceptions, which makes them difficult to identify.

If symptoms reoccur in spite of the fix, re-export existing IORs.

**Interim fix PQ81989**

An interim fix to upgrade the Software Development Kit (SDK) used by the Version 5.0.x client. The evolution of a number of core classes causes interoperability errors between a WebSphere Application Server, Version 5.0.x client and a Version 5.1 server.

You might see the following message when running an interoperability scenario between a WebSphere Application Server, Version 5.0.x client and a WebSphere Application Server, Version 5.1 server:

```
java.rmi.MarshalException:
CORBA MARSHAL 0x4942f89a No;
nested exception is: org.omg.CORBA.MARSHAL:
```



```

Unable to read value from underlying bridge :
Invalid start_value valuetag: c
minor code: 4942F89A
completed: No

```

A number of core classes evolved between Software Development Kit (SDK) 1.3.x and SDK 1.4.x. You can experience problems interoperating with WebSphere Application Server, Version 5.1, which is the first WebSphere Application Server release to use SDK 1.4.x.

The recommended response is to upgrade the 5.0.x SDK 1.3.1 to a newer Service Release (SR). The SDK Service Release update is available at: <http://www-1.ibm.com/support/docview.wss?uid=swg24006169>.

## 2. Follow the required guidelines.

Table 5. Guidelines to apply for Version 3.5.x and Version 4.0.x

| Guideline | Version 3.5.x | Version 4.0.x |
|-----------|---------------|---------------|
| 1         | Apply         |               |
| 2         | Apply         | Apply         |
| 3         | Apply         |               |
| 4         | Apply         |               |
| 5         | Apply         | Apply         |
| 6         | Apply         | Apply         |
| 7         | Apply         | Apply         |

### Guideline 1

Use the context of the lowest common denominator when interoperating at the naming level. For example, always use the 3.5.x context `com.ibm.ejs.ns.jndi.CNInitialContextFactory` when a client or server is at 3.5.x. For later versions, use the current `com.ibm.websphere.naming.WsnInitialContextFactory` context.

### Guideline 2

Make required naming changes to support V3.5.x or V4.0.x client access to V5.0.x or V5.1.x enterprise beans. This issue is new, introduced by V5. There are several ways to make it work, such as:

- Updating the `namebindings.xml` file if you do not use the V5.0.x or V5.1.x migration tools, but have installed V3.5.x or V4.0.x applications on V5.0.x or V5.1.x. To allow V3.5.x or V4.0.x client access to the applications, add additional information to the bind information in the V5.0.x or V5.1.x namespace to make the old JNDI names work. Add the information to the `namebindings.xml` configuration file at the cell level using the administrative console.

**Note:** Applications that you migrate to V5.0.x or V5.1.x during installation, or that you migrate using the WASPreUpgrade and WASPostUpgrade migration tools, already have this update.

- Calling V5.0.x or V5.1.x enterprise beans directly using the naming path that includes the server on which the enterprise beans are running, such as `cell/node/server1/some/ejb/name`, for example.
- Using the Version 4.0.x client `java:/comp` location to find V5.0.x or V5.1.x enterprise beans. (You cannot use the command from a V3.5.x client.)

### Guideline 3

Ensure that programs performing a JNDI lookup of the `UserTransaction` interface, use an `InitialContext` that resolves to a local implementation of the interface. Also ensure that such programs use a JNDI location appropriate for the enterprise bean version.

Prior to the EJB 1.1 Specification, the JNDI location of the UserTransaction interface was not specified. Earlier versions up to and including Version 3.5.x do not use the EJB 1.1 Specification. They bind the UserTransaction interface to a JNDI location of `jta/usertransaction`.

Version 4, and later releases, bind the UserTransaction interface at the location defined by the EJB 1.1 Specification, which is `java:comp/UserTransaction`.

Version 5.0.x and Version 5.1.x no longer provide the earlier `jta/usertransaction` binding within Web and EJB containers to applications at a J2EE specification level of 1.3 or later, to enforce use of the newer UserTransaction interface. For example, EJB 2.0 applications can use only the `java:comp/UserTransaction` location.

#### Guideline 4

Be aware of limitations when calling WorkLoad Management (WLM)-enabled enterprise beans.

Some clients cannot call WLM-enabled enterprise beans on remote clusters when there is a local WLM-enabled enterprise bean of the same name. If there is a cluster local to the client with the same enterprise bean as the remote cluster that the client is trying to call, the client ends up talking to the local cluster. The following table lists supported combinations of clients calling WLM-enabled enterprise beans on remote application servers.

| All clients at Version: | Server at Version: | Supported interoperability |
|-------------------------|--------------------|----------------------------|
| 3.5.6                   | 5.0.x, 5.1.x       | Yes                        |
| 4.02, 4.03              | 5.0.x, 5.1.x       | Yes                        |
| 5.0.x, 5.1.x            | 5.0.x, 5.1.x       | Yes                        |
| 5.0.x, 5.1.x            | 3.5.x              | No                         |
| 5.0.x, 5.1.x            | 4.02, 4.03         | Yes                        |

#### Guideline 5

Be aware of administrative console limitations.

You cannot use the administrative interfaces for V5.0.x or V5.1.x to administer a V3.5.x or V4.0.x administrative server. Likewise, you cannot use a Version 3.5.x or Version 4.0.x administrative console to administer a V5.0.x or V5.1.x environment. If you use the administrative console on a remote machine to administer V3.5.x or V4.0.x WebSphere Application Server domains, migrating any of the nodes or domains to V5.0.x or V5.1.x renders the remote administration console ineffective for administering any V5.0.x or V5.1.x environment.

#### Guideline 6

Use Secure Sockets Layer Version 3 (SSL v3) when interoperating with Version 3.5.x for secure connections. You cannot use Common Secure Interoperability Version 2 (CSlv2) for interoperability, because Versions 3.5.x and 4.0.x do not support CSlv2.

#### Guideline 7

The evolution of a number of core classes causes interoperability errors between a V3.5.x or V4.0.x WebSphere Application Server client and a Version 5.1 Application Server.

You might see an error message similar to the following example when running an interoperability scenario between a WebSphere Application Server V3.5.x or V4.0.x client and a Version 5.1 Application Server:

```
java.rmi.MarshalException: CORBA MARSHAL 0 No; nested exception is:
org.omg.CORBA.MARSHAL: Unable to read value from underlying bridge :
Custom marshaling of RMI:java.lang.Throwable:
F8678B4F4D2EB705:D5C635273977B8CB not compatible with local class
(local class not custom marshal capable) minor code : 0
completed: No
```

The exception is provoked by the evolution of the class you are trying to marshal. For example, the `readObject()` and `writeObject()` methods are inconsistent at the sender and the receiver.

The problem is provoked by an enterprise bean `CreateException` exception, as a result of its inheritance from the `Throwable` object, which evolves between Software Development Kit (SDK) 1.3.1 and SDK 1.4.0.

A number of core classes evolve between SDK 1.3.x and SDK 1.4.x. Therefore, you see the problems when you interoperate with WebSphere Application Server, Version 5.1, which is the first release to use SDK 1.4.x.

Migrate WebSphere Application Server, Version 3.5.x to Version 4.0.0 and upgrade to WebSphere Application Server, Version 4.0.7 to solve the problem.

Or upgrade WebSphere Application Server, Version 4.0.x to Version 4.0.7 or later to solve the problem.

This information is dynamic and might be augmented by information in technical articles that are available on the IBM DeveloperWorks WebSphere site. Check the site for the latest information.

---

## Preparing to install and configure a Web server

Install the IBM HTTP Server powered by Apache 1.3 Web server and plug-in, or install a plug-in for a supported Web server to enable the Web server to work with WebSphere Application Server, V5.x.

To use a Web server other than IBM HTTP Server powered by Apache 1.3, install and configure the Web server before installing WebSphere Application Server. To install and configure IBM HTTP Server powered by Apache 2.0, see “Installing IBM HTTP Server powered by Apache 2.0” on page 31.

The WebSphere Application Server installation wizard configures supported Web servers. You can also manually configure supported Web servers for WebSphere Application Server, Version 5, as described in “Manually configuring supported Web servers” on page 32. If you must migrate a Web server that is supporting an earlier version of WebSphere Application Server to supporting Version 5.x, see “Migrating Web server configurations” on page 377.

### 5.1 +

*Table 6. Installation tip*

|                    |  |
|--------------------|--|
| Operating platform | Tip  |
| AIX platforms      | Installing xIC.rte 6.0 run-time code, which is a prerequisite of GSKit7. |

When installing the Web server and the Application Server on the same machine, select the appropriate Web server plug-in for a supported, installed Web server. No further configuration is required for most Web servers. Installing a plug-in on a remote machine can require manual configuration.

*Table 7. Installation tip*

|                    |  |
|--------------------|--|
| Operating platform | Tip in “Platform-specific tips for installing and migrating” on page 146 |
| All platforms      | Installing all Web server plug-ins during the initial installation       |

This topic describes several optional scenarios, including:

- Installing IBM HTTP Server on the same machine as Application Server
- Installing IBM HTTP Server on a remote machine

- Installing IBM HTTP Server without using the Application Server installation wizard
  - Preparing for several IBM HTTP Server instances on the same machine
  - Installing IBM HTTP Server powered by Apache 2.0
  - Installing the plug-in for other supported Web servers
  - Manually configuring the plug-ins for supported Web servers
  - Migrating plug-ins to work with more than one version of Application Server
  - Installing more than one instance of IBM HTTP Server powered by Apache 1.3
  - Allowing Web servers to access the administrative console
1. Optional: Install the IBM HTTP Server feature and its plug-in on the same machine as the Application Server. You can select the IBM HTTP Server powered by Apache 1.3 plug-in and the plug-in for IBM HTTP Server powered by Apache 2.0 during installation of the base WebSphere Application Server product. You can select either plug-in or both plug-ins. The installation wizard configures V1.3 and V2.0 according to which plug-ins you select. You can also manually edit the V2.0 httpd.conf file to enable WebSphere Application Server to work with V2.0 as described in “Installing IBM HTTP Server powered by Apache 2.0” on page 31.
  2. Optional: Install the IBM HTTP Server and its plug-in on a different machine from the WebSphere Application Server.
    - a. Insert the product CD-ROM labeled, **WebSphere Application Server, IBM HTTP Server**, into the machine.
    - b. Select **Install the product** if the LaunchPad starts.
    - c. Accept the product license agreement.
    - d. Select **Custom** installation.
    - e. Clear all options but the IBM HTTP Server and the plug-in for the IBM HTTP Server.
    - f. Complete the installation.
  3. Optional: Install the IBM HTTP Server without the WebSphere Application Server installation wizard. Alternatively, you can install the IBM HTTP Server without using the WebSphere Application Server installation wizard. You do not get the binary plug-in program for using the IBM HTTP Server product with the WebSphere Application Server product. You can copy the binary plug-in from the Application Server machine, as described in the following procedure.
    - a. Verify that IBM Developer Kit, Java Technology Edition Version 1.4.1, is present on your machine. Install the IBM Developer Kit for the Java platform if you plan to use the Key Management (IKEYMAN) utility to create server certificates for Secure Sockets Layer (SSL). This Developer Kit ships on the WebSphere Application Server CD-ROM and is also available from the IBM Web site, <http://www.ibm.com/java/jdk>.
    - b. Insert the product CD-ROM labeled, **WebSphere Application Server, IBM HTTP Server**, into the machine.
    - c. Close the LaunchPad if it starts automatically.
    - d. Change to the IHS directory on the product CD-ROM.
    - e. Click the installation script for your platform, to install the IBM HTTP Server.
      - Windows platforms: InstallIHS.bat
      - UNIX-based operating platforms: InstallIHS.sh
    - f. Manually configure IBM HTTP Server V1.3, as described in “Manually configuring IBM HTTP Server powered by Apache 1.3” on page 36.
    - g. Apply any interim fixes or fix packs to IBM HTTP Server. There are two different sites that you must use to service the IBM HTTP Server feature and WebSphere Application Server products. You cannot install or uninstall interim fixes for the IBM HTTP Server feature with the update installer program for WebSphere Application Server. But you can install fix packs (cumulative service that creates a new modification level) for the IBM HTTP Server using the update installer program for WebSphere Application Server.

The update installer program is also known as the updateInstaller program or the update installation wizard.

See the following tips for more information:

Table 8. Installation tip

| Operating platform | Tip in “Platform-specific tips for installing and migrating” on page 146   |
|--------------------|--|
| All platforms      | <ul style="list-style-type: none"> <li>• Installing interim fixes for the IBM HTTP Server feature and the embedded messaging feature</li> <li>• Uninstalling interim fixes for the IBM HTTP Server feature and the embedded messaging (WebSphere MQ) feature before installing fix pack updates to the features</li> </ul> |

Installing the IBM HTTP Server 1.3.x product either with or without the WebSphere Application Server installation wizard lets you use the WebSphere Application Server update installer program to install future fix packs to IBM HTTP Server.

Installing the IBM HTTP Server 1.3.x product with the WebSphere Application Server installation wizard lets you use the WebSphere Application Server update installer program later to install future fix packs to the IBM HTTP Server feature and the HTTP Server plug-in for WebSphere Application Server feature. See “Installing interim fixes, cumulative fixes, and fix packs” on page 230 for more information.

You must install the binary plug-in module with the installation wizard of the Application Server to use the update installer to service the binary plug-in. When you do not use the installation wizard to install the plug-in, apply future service to the Application Server machine and copy the updated binary plug-in module to the Web server machine.

4. Optional: Prepare for IBM HTTP Server coexistence. IBM HTTP Server, V1.3.2x can coexist with earlier versions.

Beginning with WebSphere Application Server V5.1, you must install IBM HTTP Server V1.3.28 into a new directory structure. You cannot use the same directory structure as IBM HTTP Server V1.3.19 or V1.3.26 to upgrade the earlier version.

When you install IBM HTTP Server into a different directory, V1.3.2x coexists with the previous version. By default, the HTTP administration server and the IBM HTTP Server use the same ports as the previous version. Change these ports on the coexistence panel during the installation of the WebSphere Application Server product, or by editing the Port directive of the `httpd.conf` file in the IBM HTTP Server installation root:

- a. Change the port number assignments for the IBM HTTP Server in its new directory structure. Use the coexistence panel during the installation of WebSphere Application Server. Click **Previous** in the installation wizard to return to the panel where you can set port values, if you have not changed the ports. Or, you can change the port settings after installation, in the `conf\httpd.conf` file in the installation root directory of IBM HTTP Server.

5. Optional: Install IBM HTTP Server powered by Apache 2.0, as described in “Installing IBM HTTP Server powered by Apache 2.0” on page 31.
6. Optional: Install the plug-in for another supported Web server from the product CD-ROM. Select the plug-in for a supported Web server on the feature selection page of the installation wizard. See “Installing WebSphere Application Server plug-ins for supported Web servers” on page 41 for information about installing WebSphere plug-ins for remote Web servers.
7. Optional: Manually configure the plug-in for supported Web servers, as described in “Manually configuring supported Web servers” on page 32.
8. Optional: Migrate plug-ins to work with WebSphere Application Server, Version 5, as described in “Migrating Web server configurations” on page 377. Migrating plug-ins to support multiple versions of WebSphere Application Server is described in “Migrating plug-ins, one machine at a time” on page 380. The topic links to procedures that are specific to Web server products, such as “Migrating IBM HTTP Server to support multiple WebSphere Application Server versions” on page 380.

9. Optional: Install more than one instance of IBM HTTP Server on an operating system image. If you install multiple instances of Application Server, you can also install multiple images of IBM HTTP Server:
  - a. Use the `InstallIHS.sh` or `InstallIHS.bat` script in the IHS directory on the product CD to install a second or later instance of IBM HTTP Server.
  - b. Install the new instance in a new directory.
  - c. Set unique ports for each instance by editing the Port directive in the `conf/httpd.conf` file in the installation root of IBM HTTP Server.
  - d. Apply any service to each instance of IBM HTTP Server. You can use the silent interface of the update installer of WebSphere Application Server:
 

```
updateSilent -ihsOnly -install -ihsInstallDir directory
```
  - e. Copy the current binary plug-in to the IBM HTTP Server machine. Copy the current binary plug-in from the `install_root/bin` directory of the WebSphere Application Server product to the IBM HTTP Server machine and update the `LoadModule ibm_app_server_http_module` directive in the `httpd.conf` file accordingly.
  - f. Copy the `plugin-cfg.xml` file to the IBM HTTP Server machine. Copy the `plugin-cfg.xml` file from the `/config/cells` directory of the installation root of the Application Server, to the IBM HTTP Server machine and update the `WebSpherePluginConfig` directive in the `httpd.conf` file accordingly.
10. Optional: Configure the administrative console for Web server accessibility, as described in “Allowing Web servers to access the administrative console” on page 40. You can change the default virtual hosts configuration to allow Web servers to access the administrative console. As of WebSphere Application Server V5.0.1, an enhancement to the generator of the plug-in configuration omits applications installed on the virtual host *admin\_host*. This change to the `plugin-cfg.xml` file provides enhanced security to the administrative console application.

You can install or migrate a Web server and a plug-in to work with WebSphere Application Server V5, on the same machine with the Application Server, or on a remote machine. You can configure the Application Server to allow Web servers to access the administrative console.

You can get started easily with Secure Sockets Layer (SSL) connections, by making only a few configuration changes, as described in *Configuring IBM HTTP Server for secure sockets layer mutual authentication*. If you run the IBM HTTP Server on a Windows platform, you can configure the Fast Response Cache Accelerator to boost performance. You can also make many other configuration changes with Apache directives. Refer to the information center for IBM HTTP Server at <http://www-3.ibm.com/software/webservers/htpservers/library.html>, for a description of configuring the Web server for SSL, the Fast Response Cache Accelerator, or Apache directives.

Return to Chapter 3, “Installing WebSphere Application Server products,” on page 5 to continue.

## Web server configuration

When you install WebSphere Application Server, you can also install a binary plug-in module for a supported, installed Web server to communicate with the Application Server. When you install a Web server plug-in, the installation wizard configures the supported Web server, if possible.

The installation wizard uses three files to configure a plug-in for the Web server you select:

- The **Web server configuration file** on the Web server, such as the `httpd.conf` file for IBM HTTP Server. The configuration file defines where the Web server can locate the plug-in configuration file and the binary plug-in program.
- The **plug-in configuration file** on the Application Server, `plugin-cfg.xml` that is either on the Application Server in a single machine configuration, or copied, either during installation, or manually to the Web server from the Application Server. Use the administrative console on the Application Server to regenerate the `plugin-cfg.xml` file whenever you change the Application Server configuration. You must then copy the file to the Web server.



- The **binary plug-in program** file, either on the Application Server in a single machine configuration, or copied, either during installation, or manually to the Web server from the Application Server. An example of such a file is the `mod_ibm_app_server_http.dll` file for IBM HTTP Server powered by Apache 1.3 on a Windows platform.

Install a Web server plug-in on the same machine while installing the WebSphere Application Server. Select the plug-in feature. The installation wizard updates the configuration file for the Web server you identify. Install the plug-in on a remote Web server machine by using the WebSphere Application Server installation wizard to install only the plug-in for the Web server. Clear all other features.

WebSphere Application Server provides a unique binary plug-in file for each supported Web server. Plug-in binaries for supported servers are located in the `bin` folder of the installation root. The plug-in configuration file is in the `/config/cells` directory of the installation root.

The binary file reads the `plugin-cfg.xml` configuration file (generated by the Application Server), to retrieve the configuration of the Application Server. An example of a specification in the configuration file is how often the binary file reads the XML configuration file, to determine if there are changes in the file. The XML file also identifies cluster members and applications on the Application Server.

The Web server configuration file is installed as part of the Web server you install. It must have entries to identify the locations of the WebSphere Application Server binary plug-in file and the `plugin-cfg.xml` configuration file, for every Application Server that hosts applications that the Web server accesses. The installation wizard configures the file if you install the plug-in on the Web server machine. You have to remove the old entries manually. You can also add the current entries manually, if necessary.

## Installing IBM HTTP Server powered by Apache 2.0

This topic describes installing and configuring IBM HTTP Server Version 2.0 (2.0.42.1 or later).

If you plan to install and configure IBM HTTP Server Version 2.0, use the installation and configuration instructions in this topic. Select the plug-in for IBM HTTP Server V2.0 when you install the base WebSphere Application Server product. The plug-in modules for IBM HTTP Server V2.0 are `mod_was_ap20_http.so` for Linux and UNIX-based platforms other than HP-UX, `mod_was_ap20_http.s1` for HP-UX platforms, and `mod_was_ap20_http.dll` for Windows platforms.

You must select the IBM HTTP Server V2.0 plug-in during installation of the base IBM WebSphere Application Server, Version 5.1 product. The installer does not install it when you select the plug-in for IBM HTTP Server, Version 1.3.x as it did in previous releases. The installation wizard configures a V1.3.x installation or a V2.0 installation when you select the appropriate plug-in.

IBM HTTP Server V2.0 is available on all supported WebSphere Application Server Version 5 platforms. Based on the Apache V2.0 Web server, this version of IBM HTTP Server includes:

- An Apache V2.0 foundation
- IBM-added InstallShield for MultiPlatforms (ISMP) installation
- Secure Sockets Layer (SSL)
- Lightweight Directory Access Protocol (LDAP)

1. Download IBM HTTP Server V2.0. The IBM HTTP Server V2.0 product is fully supported by IBM when deployed with WebSphere Application Server V5. You can download V2.0 from <http://www-3.ibm.com/software/webservers/httpservers/>.
2. Install IBM HTTP Server V2.0. Go to the directory where you downloaded and unpacked the file and issue this command:

```
java -jar setup.jar
```

To install IBM HTTP Server V2.0 on UNIX-based platforms without using an X-Windows GUI:

- To use all installation defaults instead of dialogs:

```
java -jar setup.jar -silent
```

- To use text-based dialogs:

```
java -jar setup.jar -console
```

Install IBM HTTP Server Version 2.0 before installing IBM WebSphere Application Server, Version 5.1. Select the plug-in for Version 2.0 to have the installer configure IBM HTTP Server Version 2.0 to work with WebSphere Application Server, Version 5.1.

## Manually configuring supported Web servers

This task helps you configure any of the Web servers that WebSphere Application Server supports. Select the link that identifies your Web server:

- Configure Apache HTTP Server 1.3.
- **5.1+** Configure Apache HTTP Server 2.0.
- Configure Domino Web Server Version 5.
- Configure Domino Web Server Version 6.
- Configure IBM HTTP Server 1.3.28
- Configure IBM HTTP Server 2.0.
- Configure Microsoft Internet Information Services (IIS).
- Configure Sun Java System Web Server (formerly Sun ONE Web Server and iPlanet Web server).

You can configure your supported Web servers to work with WebSphere Application Server, Version 5.

### Manually configuring Apache HTTP Server V1.3

This topic describes how to change configuration settings for Apache HTTP Server Version 1.3.

This topic is one of the optional procedures in Manually configuring supported Web servers.

Perform the step that configures the Apache HTTP Server 1.3 Web server that you intend to use, with or without support for extended API (EAPI) on a Linux, UNIX, or Windows platform.

Examples and messages are sometimes shown on more than one line for ease of presentation. Verify that each directive in a Web server configuration file is on one line.

Most Apache Web servers are not compiled with EAPI support. If you see a message similar to one of the following examples when starting the Web server with the `mod_app_server_http.so` plug-in module, use the EAPI version of the module.

#### Linux and UNIX-based platforms:

```
[warn] Loaded DSO /opt/WebSphere/AppServer/bin/mod_app_server_http.so
uses plain Apache 1.3 API, this module might crash under EAPI!
(please recompile it with -D EAPI)
```

The installation root, `/opt/WebSphere/AppServer`, can vary per operating system platform. For example, the AIX installation root is `/usr/WebSphere/AppServer/` for Version 5.

#### Windows platforms:

```
[warn] Loaded DSO C:\WebSphere\AppServer\bin\mod_app_server_http.dll
uses plain Apache 1.3 API, this module might crash under EAPI!
(please recompile it with -D EAPI)
```

Ignore the preceding message on SuSE Linux Enterprise Server 8.0. You must configure the Apache 1.3 `httpd.conf` file to run on SLES 8.0 as described in the first step.



1. Optional: Configure the entries in the `httpd.conf` file of Apache HTTP Server 1.3 without EAPI support to run on a SuSE Linux Enterprise Server 8.0 platform.

You can use the Apache 1.3 Web server that ships with SuSE Linux Enterprise Server (SLES) 8.0 if you comment the PHP directives in the `httpd.conf` file. Also, you must update the version of Apache 1.3 that ships with SLES 8 and comment the PHP directives to use the binary plug-in module that supports EAPI.

2. Optional: Configure the entries in the `httpd.conf` file of Apache HTTP Server 1.3 without EAPI support on other Linux platforms or on a UNIX-based platform.

Use the following examples of the `LoadModule` and `WebSpherePluginConfig` directives as models for configuring your file:

```
LoadModule app_server_http_module/opt/WebSphere/AppServer/bin/mod_app_server_http.so
WebSpherePluginConfig /opt/WebSphere/AppServer/config/cells/plugin-cfg.xml
```

3. Optional: Configure the entries in the `httpd.conf` file of Apache HTTP Server 1.3 without EAPI support on a Windows platform.

Use the following examples of the `LoadModule` and `WebSpherePluginConfig` directives as models for configuring your file:

```
LoadModule ibm_app_server_http_module
    drive:\WebSphere\AppServer\bin\mod_app_server_http.dll
WebSpherePluginConfig
    drive:\WebSphere\AppServer\config\cells\plugin-cfg.xml
```

4. Optional: Configure the entries in the `httpd.conf` file of Apache HTTP Server 1.3 with EAPI support on a Linux or UNIX-based platform.

Use the following examples of the `LoadModule` and `WebSpherePluginConfig` directives as models for configuring your file:

```
LoadModule app_server_http_module/opt/WebSphere/AppServer/bin/mod_app_server_http_eapi.so
WebSpherePluginConfig /opt/WebSphere/AppServer/config/cells/plugin-cfg.xml
```

5. Optional: Set the `LD_LIBRARY_PATH` variable. On some installations of Apache on a Linux machine, it is necessary to manually set the `LD_LIBRARY_PATH` variable to `/usr/lib` before starting Apache with a plug-in configured for Secure Sockets Layer (SSL). For example, in the Korn shell, issue the following command before invoking the command to start Apache:

```
'export $LD_LIBRARY_PATH=/usr/lib:$LD_LIBRARY_PATH'
```

6. Optional: Configure the entries in the `httpd.conf` file of Apache HTTP Server 1.3 with EAPI support on a Windows platform. Use the following examples of the `LoadModule` and `WebSpherePluginConfig` directives as models for configuring your file:

```
LoadModule ibm_app_server_http_module
    drive:\WebSphere\AppServer\bin\mod_app_server_http_eapi.dll
WebSpherePluginConfig
    drive:\WebSphere\AppServer\config\cells\plugin-cfg.xml
```

You can configure the Apache 1.3.x Web server to work with WebSphere Application Server, V5.

## Manually configuring Apache HTTP Server V2.0

This topic describes how to change configuration settings for Apache HTTP Server Version 2.0.

This topic is one of the optional procedures in Manually configuring supported Web servers.

The WebSphere Application Server plug-in for Apache HTTP Server, Version 2.0 has been verified to work with Apache HTTP Server version 2.0.47, the latest version of Apache 2.0 available at the time of testing. The plug-in was tested with the threaded worker MPM on all platforms except Windows. The plug-in was tested with the default threaded MPM on Windows.

The plug-in works with the Apache 2 prefork MPM but works best with the worker MPM. The plug-in maintains connection pools to backend WebSphere Application Servers and employs in-memory caching. These plug-in functions perform most efficiently when Apache 2.0 is configured to use a single child

process with `ThreadsPerChild` equal to `MaxClients`. The plug-in can be used with the `prefork` MPM or the `worker` MPM configured with multiple child processes, but at reduced efficiency.

**Compatibility Statement** The plug-in should work with versions of the Apache HTTP Server that claim full binary compatibility with Apache 2.0.42 and later, and which are built with compilers (and compiler options) that are compatible with those used to build the plug-in.

Perform the optional step that configures the Apache 2.0 that you intend to use on a Linux, UNIX, or Windows platform.

Examples and messages are sometimes shown on more than one line for ease of presentation. Each directive in a Web server configuration file should be on one line.

1. Optional: **HP-UX platforms:** Configure entries in the `httpd.conf` file.

Use the following examples of the `LoadModule` and `WebSpherePluginConfig` directives as models for configuring your file:

```
LoadModule
    was_ap20_module /opt/WebSphere/AppServer/bin/mod_was_ap20_http.s1
WebSpherePluginConfig
    /opt/WebSphere/AppServer/config/cells/plugin-cfg.xml
```

The installation root, `/opt/WebSphere/AppServer`, can vary per operating system platform. For example, the AIX installation root is `/usr/WebSphere/AppServer/` for Version 5.x.

2. Optional: **Linux or UNIX-based platform other than HP-UX:** Configure entries in the `httpd.conf` file.

Use the following examples of the `LoadModule` and `WebSpherePluginConfig` directives as models for configuring your file:

```
LoadModule
    was_ap20_module /opt/WebSphere/AppServer/bin/mod_was_ap20_http.so
WebSpherePluginConfig
    /opt/WebSphere/AppServer/config/cells/plugin-cfg.xml
```

3. Optional: **Windows platforms:** Configure entries in the `httpd.conf` file.

Use the following examples of the `LoadModule` and `WebSpherePluginConfig` directives as models for configuring your file:

```
LoadModule was_ap20_module
    drive:\WebSphere\AppServer\bin\mod_was_ap20_http.dll
WebSpherePluginConfig
    drive:\WebSphere\AppServer\config\cells\plugin-cfg.xml
```

You can configure the Apache 2.0 Web server to work with WebSphere Application Server, V5.x.

## Manually configuring Lotus Domino V5

This task describes how to change configuration settings for Lotus Domino V5.

This topic is one of the optional procedures in Manually configuring supported Web servers.

Follow this procedure to enable the HTTP transport plug-in to work with Lotus Domino Version 5.0.x. The installation wizard does not perform this modification. Perform this manual procedure.

1. Start the Domino server.
2. Access the `/webadmin.nsf` file using your Web browser (for example, `http://hokie2ks.raleigh.ibm.com/webadmin.nsf`). The browser prompts you for a password.
3. Give the short name for the administrator and the administrator password.
4. Click **Configuration** on the left side of the page.
5. Click **Servers** on the top-left center of the page.
6. Click the server that you intend to have work with WebSphere Application Server, Version 5.
7. Click **Edit Server** on the top-left of the center window.

8. Click **Internet Protocols** in the middle of the page.
9. Add the path to the Domino plug-in under **DSAPI Section** in the middle-right of the page. The plug-in is installed in the WebSphere Application Server bin directory. If specifications for filter files for Domino Web Server Application Programming Interface (DSAPI) already exist, use a space to delimit the WebSphere Application Server plug-in file.
10. Click **Save and Close** on the upper-left of the center window.
11. Define the location of the `plugin-cfg.xml` configuration file. **Linux and UNIX-based platform:**  
Set the `WAS_HOME` environment variable to point to the WebSphere Application Server installation root directory.  
**Windows platforms:**  
**5.1+** Add the *Plugin Config* variable to the registry under the path **HKEY\_LOCAL\_MACHINE > SOFTWARE > IBM > WebSphere Application Server > 5.1.0.0**. Set the value for the variable to the location of the `plugin-cfg.xml` file, which is `install_root\config\cells\plugin-cfg.xml`.
12. Restart the Domino server. When the server starts, information similar to the following example appears:  

```
02/12/2001 03:05:09 PM JVM: Java virtual machine initialized
WebSphere Application Server DSAPI filter loaded
02/12/2001 03:05:10 PM HTTP Web Server started
```

You can configure Version 5 of Lotus Domino to work with WebSphere Application Server, V5.

For more information on configuring Lotus Domino to work with WebSphere Application Server, search the Lotus Support Services Web site. Enter the search term WebSphere in the keyword search field.

Related technotes:

- Enabling single sign-on for Domino and WebSphere Application Server
- Extended Search installation: Using horizontal clusters in WebSphere Application Server Version 5.0
- Prompted to authentication again when using single sign-on (SSO) for WebSphere Application Server and Domino
- Some CGI Variables do not work with DSAPI filter, Domino, and WebSphere Application Server
- WebSphere Application Server plug-in can hang when Domino encounters HTTP Error 500
- Must I install WebSphere Application Server Network Deployment before Lotus Workplace Messaging?

## Manually configuring Lotus Domino Version 6

This task describes how to change configuration settings for Lotus Domino V6.

This topic is one of the optional procedures in Manually configuring supported Web servers.

Follow this procedure to enable the HTTP transport plug-in to work with Lotus Domino Version 6.0.2 and later. The installation wizard does not perform this modification. Perform this manual procedure.

1. Start the Domino server.
2. Access the file `/names.nsf` using your Web browser (for example, `http://hokie2ks.raleigh.ibm.com/names.nsf`). The browser prompts you for a password.
3. Give the administrator name and password.
4. Click **Configuration** on the left side of the page.
5. Click **Servers** on the left side of the page.
6. Click **All Server Documents** on the left side of the page.
7. Click the server that you intend to have work with WebSphere Application Server, Version 5.
8. Click **Edit Server** on the top-left of the center window.
9. Click **Internet Protocols** in the middle of the page.

10. Add the path to the Domino plug-in under **DSAPI Section** in the middle-right of the page. The plug-in is installed in the bin directory of the WebSphere Application Server installation root. If specifications for filter files for Domino Server Application Programming Interface (DSAPI) already exist, use a space to delimit the plug-in file for WebSphere Application Server.
11. Click **Save and Close** on the upper-left of the center window.
12. Define the location of the plugin-cfg.xml configuration file. **Linux and UNIX-based platforms:**  
Set the WAS\_HOME environment variable to point to the WebSphere Application Server installation root directory.  
**Windows platforms:**  
**5.1+** Add the *Plugin Config* variable to the registry under the path **HKEY\_LOCAL\_MACHINE > SOFTWARE > IBM > WebSphere Application Server > 5.1.0.0**. Set the value for this variable to the location of the plugin-cfg.xml file, which is *install\_root\config\cells\plugin-cfg.xml*.
13. Restart the Domino server. When the server starts, information similar to the following example appears:  
02/12/2001 03:05:09 PM JVM: Java virtual machine initialized  
WebSphere Application Server DSAPI filter loaded  
02/12/2001 03:05:10 PM HTTP Web Server started

You can configure Version 6 of Lotus Domino to work with WebSphere Application Server, V5.x.

For more information on configuring Lotus Domino to work with WebSphere Application Server, search the Lotus Support Services Web site. Enter the search term WebSphere in the keyword search field.

Related technotes:

- Enabling single sign-on for Domino and WebSphere Application Server
- Extended Search installation: Using horizontal clusters in WebSphere Application Server Version 5.0
- Prompted to authentication again when using single sign-on (SSO) for WebSphere Application Server and Domino
- Some CGI Variables do not work with DSAPI filter, Domino, and WebSphere Application Server
- WebSphere Application Server plug-in can hang when Domino encounters HTTP Error 500
- Must I install WebSphere Application Server Network Deployment before Lotus Workplace Messaging?

### Manually configuring IBM HTTP Server powered by Apache 1.3

This topic describes how to change configuration settings for IBM HTTP Server powered by Apache 1.3.

This topic is one of the optional procedures in Manually configuring supported Web servers.

Perform the optional step that configures the IBM HTTP Server powered by Apache 1.3 that you intend to use, on a Linux, UNIX, or Windows platform.

Examples and messages are sometimes shown on more than one line for ease of presentation. Verify that each directive in a Web server configuration file is on one line.

1. Optional: Configure entries in the httpd.conf file for IBM HTTP Server 1.3.28 on a Linux or UNIX-based platform.

Use the following examples of the LoadModule and WebSpherePluginConfig directives as models for configuring your file:

```
LoadModule
    ibm_app_server_http_module /opt/WebSphere/AppServer/bin/mod_ibm_app_server_http.so
WebSpherePluginConfig
    /opt/WebSphere/AppServer/config/cells/plugin-cfg.xml
```

The installation root can vary for each operating system platform. For example, the AIX installation root is /usr/WebSphere/AppServer/ for Version 5.

2. Optional: Configure entries in the `httpd.conf` file for IBM HTTP Server 1.3.28 on a Windows platform. Use the following examples of the `LoadModule` and `WebSpherePluginConfig` directives as models for configuring your file:

```
LoadModule ibm_app_server_http_module
    drive:\WebSphere\AppServer\bin\mod_ibm_app_server_http.dll
WebSpherePluginConfig
    drive:\WebSphere\AppServer\config\cells\plugin-cfg.xml
```

You can configure the IBM HTTP Server powered by Apache 1.3 to work with WebSphere Application Server, V5.

## Manually configuring IBM HTTP Server powered by Apache 2.0

This topic describes how to change configuration settings for IBM HTTP Server powered by Apache 2.0.

This topic is one of the optional procedures in Manually configuring supported Web servers.

Perform the optional step that configures the IBM HTTP Server powered by Apache 2.0 that you intend to use, on a Linux, UNIX, or Windows platform.

Examples and messages are sometimes shown on more than one line for ease of presentation. Each directive in a Web server configuration file should be on one line.

1. Optional: Configure entries in the `httpd.conf` file for IBM HTTP Server 2.0 on an HP-UX platform. Use the following examples of the `LoadModule` and `WebSpherePluginConfig` directives as models for configuring your file:

```
LoadModule
    was_ap20_module /opt/WebSphere/AppServer/bin/mod_was_ap20_http.sl
WebSpherePluginConfig
    /opt/WebSphere/AppServer/config/cells/plugin-cfg.xml
```

The installation root, `/opt/WebSphere/AppServer`, can vary per operating system platform. For example, the AIX installation root is `/usr/WebSphere/AppServer/` for Version 5.

2. Optional: Configure entries in the `httpd.conf` file for IBM HTTP Server 2.0 on a Linux or UNIX-based platform other than HP-UX. Use the following examples of the `LoadModule` and `WebSpherePluginConfig` directives as models for configuring your file:

```
LoadModule
    was_ap20_module /opt/WebSphere/AppServer/bin/mod_was_ap20_http.so
WebSpherePluginConfig
    /opt/WebSphere/AppServer/config/cells/plugin-cfg.xml
```

The installation root, `/opt/WebSphere/AppServer`, can vary per operating system platform. For example, the AIX installation root is `/usr/WebSphere/AppServer/` for Version 5.

3. Optional: Configure entries in the `httpd.conf` file for IBM HTTP Server 2.0 on a Windows platform. Use the following examples of the `LoadModule` and `WebSpherePluginConfig` directives as models for configuring your file:

```
LoadModule was_ap20_module
    drive:\WebSphere\AppServer\bin\mod_was_ap20_http.dll
WebSpherePluginConfig
    drive:\WebSphere\AppServer\config\cells\plugin-cfg.xml
```

You can configure the IBM HTTP Server powered by Apache 2.0 to work with WebSphere Application Server, Version 5.x.

If the IBM HTTP Server 1.3.2x directive, `LoadModule ibm_app_server_http_module`, is present in an IBM HTTP Server 2.0 `httpd.conf` file, the IBM HTTP Server cannot start. You must comment or delete the directive to start the Version 2 server.

The `mod_was_ap20_http` plug-in module requires the GSKIT SSL encryption library if the plug-in is to be configured to support encrypted connections to back-end WebSphere Application Servers. If you install the plug-in for Apache 2.0 from the WebSphere Application Server installation media (the preferred method), the installation program installs GSKIT along with the plug-in. If you manually copy the plug-in to a new machine, you might not have the required GSKIT libraries for encrypting back-end connections.

## Manually configuring Microsoft Internet Information Services (IIS)

This topic describes manual configuration settings for Internet Information Services (IIS).

This topic is one of the optional procedures in Manually configuring supported Web servers.

Follow this procedure to manually reproduce how the Installation wizard configures the Microsoft Internet Information Services Web server.

### Configuring IIS 5.0

1. Start the IIS application.
2. Create a new virtual directory for the Web site instance that you intend to work with WebSphere Application Server. These instructions assume that you are using the Default Web Site.
  - a. Expand the tree on the left until you see **Default Web Site**. Right-click **Default Web Site** and select **New > Virtual Directory** to create the directory with a default installation.

In the wizard for adding a virtual directory, perform the following steps:

    - 1) Type `sePlugins` in the "Alias to be used to Access Virtual Directory" field.
    - 2) Browse to the WebSphere Application Server `install_root\bin` directory in the "Enter the physical path of the directory containing the content you want to publish" field.
    - 3) Select the **Allow Execute Access** check box in the "What access permissions do you want to set for this directory" field.
    - 4) Click **Finish** to add the `sePlugins` virtual directory to your default Web site.
3. Add the Internet Services Application Programming Interface (ISAPI) filter into the IIS configuration.
  - a. Right-click the host name in the tree on the left and click **Properties**.

In the Properties dialog, perform the following steps:

    - 1) Go to the **Internet Information Services** tab.
    - 2) Click **WWW Service** in the Master properties window.
    - 3) Click **Edit** to open the WWW Service master properties window.
    - 4) Click **ISAPI Filters > Add** to open the Filter properties window.
    - 5) Type `iisWASPlugin` in the "Filter Name" field.
    - 6) Click **Browse** in the Executable field.
    - 7) Browse to the `install_root\bin` directory.
    - 8) Click the `iisWASPlugin_http.dll` file.
    - 9) Click **OK** until all open windows close.
4. Add the `Plugin Config` variable to the registry under the path **HKEY\_LOCAL\_MACHINE > SOFTWARE > IBM > WebSphere Application Server > 5.x.0.0** where x designates the version.

Set the value of the `Plugin Config` variable to the location of the configuration file, which is the `install_root\config\cells\plugin-cfg.xml` directory.

### Configuring IIS 6.0

1. Start the IIS application.
2. Create a new virtual directory for the Web site instance that you intend to work with WebSphere Application Server. These instructions assume that you are using the Default Web Site.
  - a. Expand the tree on the left until you see **Default Web Site**. Right-click **Default Web Site** and select **New > Virtual Directory** to create the directory with a default installation.



- b. In the wizard for adding a virtual directory, perform the following steps:
  - 1) Type `sePlugins` in the "Alias to be used to Access Virtual Directory" field.
  - 2) Browse to the WebSphere Application Server `install_root\bin` directory in the "Enter the physical path of the directory containing the content you want to publish" field.
  - 3) Select the **Allow Execute Access** check box in the "What access permissions do you want to set for this directory" field.
  - 4) Click **Finish** to add the `sePlugins` virtual directory to your default Web site.
3. Add the Internet Services Application Programming Interface (ISAPI) filter into the IIS configuration.
  - a. Right-click **Default Web Site** in the tree on the left and click **Properties**.
  - b. In the Properties dialog, perform the following steps:
    - 1) Go to the **Internet Information Services** tab.
    - 2) Go to the **ISAPI Filters** tab.
    - 3) Click **Add** to open the Filter properties window.
    - 4) Type `iisWASPlugin` in the "Filter Name" field.
    - 5) Click **Browse** in the Executable field.
    - 6) Browse to the `install_root\bin` directory.
    - 7) Click the `iisWASPlugin_http.dll` file.
    - 8) Click **OK** until all open windows close.
4. Add the *Plugin Config* variable to the registry under the path **HKEY\_LOCAL\_MACHINE > SOFTWARE > IBM > WebSphere Application Server > 5.x.0.0** where x designates the version.  
Set the value of the *Plugin Config* variable to the location of the configuration file, which is the `install_root\config\cells\plugin-cfg.xml` directory.
5. Enable the Web server to run WebSphere Application Server extensions:
  - a. Expand the tree on the left until you see **Web service extensions**.
  - b. Click **Web service extensions**.
  - c. Click **All Unknown ISAPI extensions** on the right side of the page.
  - d. Click **Allow**.

You can configure the Internet Information Services (IIS) Web server to work with WebSphere Application Server, Version 5.x.

## Manually configuring the Sun Java System Web Server

This topic describes how to change configuration settings for the Sun Java System Web Server (formerly Sun ONE Web Server and before that, iPlanet Web Server), Version 6.0 and later.

This topic is one of the optional procedures in "Manually configuring supported Web servers" on page 32.

Configure the Sun Java System Web Server, V6.0 and later, on a Linux, UNIX, or Windows platform.

Examples and messages are sometimes shown on more than one line for ease of presentation. Verify that each directive in a Web server configuration file is on one line.

1. Configure entries in the `obj.conf` configuration file and in the `magnus.conf` configuration file for Version 6.0 and later of the Sun Java System Web Server.
  - a. Add one directive to the `obj.conf` file after the "`<object name=default>`" tag:
 

```
Service fn="as_handler"
```
  - b. Add two directives at the end of the `magnus.conf` file:
 

**Linux and UNIX platforms:**

```

Init fn="load-modules"
    funcs="as_init,as_handler,as_term"
    shlib="/opt/WebSphere/AppServer/bin/libns41_http.so"
Init fn="as_init"
    bootstrap.properties="/opt/WebSphere/AppServer/config/cells/plugin-cfg.xml"

```

#### Windows platforms:

```

Init fn="load-modules"
    funcs="as_init,as_handler,as_term"
    shlib="drive:\WebSphere\AppServer\bin\libns41_http.dll"
Init fn="as_init"
    bootstrap.properties="
drive:\WebSphere\AppServer\config\cells\plugin-cfg.xml"

```

2. Set the shared library path on HP-UX machines. On some installations of Sun Java System Web Server on an HP-UX machine, it is necessary to manually set the SHLIB\_PATH variable to /usr/lib before starting Sun Java System Web Server with a plug-in configured for SSL. For example, in the korn shell, issue the following command before invoking the command to start the Sun Java System Web Server:

```
export SHLIB_PATH=/usr/lib:$SHLIB_PATH
```

3. Disable the feature of the Sun Java System Web Server 6.1 that supports servlets and JSPs by default. Disable this feature so that requests can be handled by the WebSphere Application Server plug-in.

Perform the following steps to disable the feature:

- a. Remove or comment out the following two lines from the obj.conf configuration file:

```

NameTrans fn="ntrans-j2ee" name="j2ee"
Error fn="error-j2ee"

```

- b. Remove or comment out the following line from the magnus.conf configuration file:

Linux and UNIX platforms:

```

Init fn="load-modules"
    shlib="C:/Sun/WebServer6.1/bin/https/bin/j2eeplugin.so"
    shlib_flags="(global|now)"

```

Windows platform:

```

Init fn="load-modules"
    shlib="C:\Sun\WebServer6.1\bin\https\bin\j2eeplugin.dll"
    shlib_flags="(global|now)"

```

You can configure the Sun Java System Web Server to work with WebSphere Application Server.

## Allowing Web servers to access the administrative console

This task gives you the option of manually configuring WebSphere Application Server so that Web servers can access the administrative console.

1. Use the administrative console to change the virtual host group admin\_host to include the Web server port (80 by default).
  - a. Click **Environment > Virtual Host > admin\_host > Host Aliases > New**. The default port that appears is 80 unless you specified a different port on the coexistence panel during installation.
  - b. Specify the IP address, or the name of the machine hosting the administrative console application. For example, if you installed the base Application Server or the Deployment Manager on a machine named wastricia.rtp.ibm.com, specify the name in this field.
2. Click **Apply > Save**.
3. Stop and restart the deployment manager machine, or the Application Server machine. For example, to access the administrative console of a deployment manager machine, stop the deployment manager and restart it. To stop the deployment manager, open a command window and navigate to the /bin directory of the installation root. Then issue this command:

```
C:\Program Files\WebSphere\DeploymentManager\bin> stopManager.bat
```



After receiving the following message, you can restart the deployment manager:

```
ADMU4000I: Server dmgr stop completed.
```

To start the deployment manager, issue the following command:

```
C:\Program Files\WebSphere\DeploymentManager\bin> startManager.bat
```

When you receive a message that is similar to the following message, the deployment manager is running:

```
ADMU3000I: Server dmgr open for e-business; process id is 1720
```

4. Edit the `plugin-cfg.xml` file to include the following entries, as described in [Configuring Web server plug-ins](#).

```
<VirtualHostGroup Name="admin_host">
  <VirtualHost Name="*:9090"/>
  <VirtualHost Name="*:80"/>
  <VirtualHost Name="*:9043"/>
</VirtualHostGroup>
...
...
...
<ServerCluster Name="dmgr_DMGRHOSTNAMEManager_Cluster">
  <Server LoadBalanceWeight="1" Name="DMGRHOSTNAMEManager_dmgr">
    <Transport Hostname="DMGRHOSTNAME" Port="9090" Protocol="http"/>
  </Server>

  <PrimaryServers>
    <Server Name="DMGRHOSTNAMEManager_dmgr"/>
  </PrimaryServers>
</ServerCluster>
...
...
...
<UriGroup Name="admin_host_dmgr_DMGRHOSTNAMEManager_Cluster_URIs">
  <Uri AffinityCookie="JSESSIONID"
    AffinityURLIdentifier="jsessionid" Name="/admin/*"/>
</UriGroup>
<Route ServerCluster="dmgr_DMGRHOSTNAMEManager_Cluster"
  UriGroup="admin_host_dmgr_DMGRHOSTNAMEManager_Cluster_URIs" VirtualHostGroup="admin_host"/>
```

Replace `DMGRHOSTNAME` with the host name of your deployment manager. For example, if the host name is `wastricia`:

```
<ServerCluster Name="dmgr_wastriciaManager_Cluster">
```

You can configure your supported Web servers to access the administrative console application of the WebSphere Application Server, V5.0.1 and later.

---

## Installing WebSphere Application Server plug-ins for supported Web servers

After installing the Application Server and a Web server, you can install a WebSphere Application Server plug-in for a supported Web server. The binary plug-in is unique per Web server. The purpose of the binary plug-in is to provide the communication link between the Web server and the Application Server.

To use a Web server other than IBM HTTP Server powered by Apache 1.3, install and configure the Web server before installing WebSphere Application Server. The correct order of installation lets you select and install the plug-in for your supported Web server during the installation of the Application Server.

If the Web server is not already installed, you cannot install the plug-in for it during the installation of the Application Server. You can install the plug-in after you install WebSphere Application Server. This topic describes such a scenario. This topic describes the procedure for installing a plug-in when you are not also installing the Application Server. The primary scenario that this procedure addresses is installing a binary plug-in module on a remote Web server machine.

Suppose that you do not intend to install the Web server and the Application Server on the same machine. You can use the compact disc for the WebSphere Application Server product to install IBM HTTP Server on the remote machine as described in “Preparing to install and configure a Web server” on page 27. Using the WebSphere Application Server installation procedure to install only the HTTP Server on a remote machine also installs the binary plug-in for HTTP Server.

The scenario that this topic addresses is installing the binary plug-in module for a supported Web server that is already installed. Suppose that a supported Web server is installed on a remote machine, and you need the binary plug-in to let the Web server talk to WebSphere Application Server. You can use the product CD for WebSphere Application Server to install the binary plug-in on the remote machine.

This topic describes using the product CD for the IBM WebSphere Application Server product to install only the binary plug-in module and not the Application Server. This topic describes a procedure that does not install the IBM WebSphere Application Server nor the IBM HTTP Server. This procedure only installs binary plug-in modules.

See “Preparing to install and configure a Web server” on page 27 for information about installing Web servers, including the IBM HTTP Server powered by Apache 1.3. and the IBM HTTP Server powered by Apache 2.0.

One advantage of using the product CD for the IBM WebSphere Application Server product to install the binary plug-in module is that you can then use the Update installation wizard (part of the update installer application) to apply fix packs, cumulative fixes, and interim fixes to the binary plug-in modules. This procedure describes such a scenario.

The WebSphere Application Server installation wizard configures supported Web servers when you install the binary plug-in. However, installing a plug-in on a remote machine can require manual configuration. You can manually configure supported Web servers for WebSphere Application Server, Version 5.x, by following the procedure in “Manually configuring supported Web servers” on page 32.

One other topic to be familiar with is the manual propagation of the `plugin-cfg.xml` document from the machine with the Application Server to the remote Web server machine. Do not confuse the document with the binary plug-in module. The editable `plugin-cfg.xml` document describes the Application Server environment to the Web server and directs the Web server to applications and data that the Web server can then retrieve. The document does not enable the Web server to communicate with the Application Server. The binary plug-in module enables communication.

The `plugin-cfg.xml` document changes whenever you regenerate it from the administrative console of the Application Server. Regenerating the file is not necessary unless you change such things as the configuration of deployed applications, virtual host definitions, or HTTP transport definitions on a stand-alone Application Server, or on Application Servers managed by a deployment manager in a Network Deployment environment. After regenerating the `plugin-cfg.xml` file, you must manually copy it to the remote machine hosting the Web server.

A local Web server can simply point to the location of the `plugin-cfg.xml` document in the installation root directory structure of the Application Server. It is not necessary to copy the `plugin-cfg.xml` document when the Web server is locally installed.

Manually propagating or copying the `plugin-cfg.xml` file is a necessary step at these times:

- When you install a Web server on a remote machine
- When you regenerate the `plugin-cfg.xml` document because of changes in the configuration and you are putting the changes into effect on the Web server

Without the binary plug-in module, a Web server cannot communicate with the Application Server. Without the `plugin-cfg.xml` document, a Web server cannot find deployed applications on the Application Server.

Both files are necessary for a Web server to work with an Application Server. Configuration directives in the configuration files of any supported Web server exist to point to each file. The following example shows the configuration directives in the configuration file for the IBM HTTP Server powered by Apache 1.3 on a Linux machine:

```
LoadModule
    ibm_app_server_http_module /opt/WebSphere/AppServer/bin/mod_ibm_app_server_http.so
WebSpherePluginConfig
    /opt/WebSphere/AppServer/config/cells/plugin-cfg.xml
```

In the example, the binary module is the `mod_ibm_app_server_http.so` file. The binary plug-in module and the `plugin-cfg.xml` document are in a standard directory structure created by installing the files on the Web server machine. Installing the WebSphere Application Server binary code is not required. You simply clear the check box for the WebSphere Application Server feature to not install the code. Selecting the check box for the binary plug-ins and the check box for your particular plug-in is all that is necessary to create the directory structure and install the necessary files for the Web server.

Each directive in the example is on two lines. Each directive is on one line in a real `httpd.conf` file, which is the configuration file for IBM HTTP Server. The example directives are split for formatting and clarity purposes.

The following procedure lets you install a WebSphere Application Server plug-in for a supported Web Server on a different machine than the machine where the WebSphere Application Server is installed.

1. Log on as root on a Linux or UNIX platform, or as the administrator on a Windows platform. You cannot install the plug-in feature correctly without the proper authorizations. You are also required to use the update installer program (in a later step) as the root user on a Linux or UNIX platform, or as the administrator on a Windows platform.
2. Insert the product CD-ROM labeled, **WebSphere Application Server, IBM HTTP Server**, into the machine.
3. Mount the CD drive, if necessary.
4. Select **Install the product** if the Launchpad starts.
5. Accept the product license agreement.
6. Select **Custom** installation.
7. Clear the check boxes for all options on the Feature selection panel. This means clear the check box for the Application Server. You are not required to install the Application Server code on the Web server machine.
8. Select the check box for the plug-ins and the particular plug-in for your Web server on the Features selection panel.
9. Complete the installation. You can clear the check box on the Product registration panel. You are not required to register the installation of the Web server plug-ins.

The installation of the binary plug-in module creates a directory structure that includes the following directories:

- `/WebSphere/AppServer/bin` contains the binary plug-in module and other necessary binary files
  - `/WebSphere/AppServer/config` contains configuration files including the `plugin_cfg.xml` document
  - `/WebSphere/AppServer/etc` contains plug-in related files
  - `/WebSphere/AppServer/java` contains the WebSphere SDK
  - `/WebSphere/AppServer/logs` contains log files
10. Create the `/WebSphere/AppServer/update/fixes` directory. You will use the `update/fixes` directory to install service in a later step.
  11. Manually configure the plug-in for supported Web servers, as described in “Manually configuring supported Web servers” on page 32. Examine the configuration files for your Web server to determine

if it is necessary to manually configure the file. Compare the configuration directives in the file to those shown in the document for your Web server. Verify that the necessary configuration directives exist in the file.

12. Copy a current `plugin-cfg.xml` file from the Application Server machine to the location specified in the directive in the Web server configuration file.
13. Download the most current fix pack, the most current cumulative fix, and any recommended interim fixes for the base WebSphere Application Server, Version 5.x product from the WebSphere Application Server Support site at <http://www.ibm.com/software/webservers/appserv/was/support> to the `/WebSphere/AppServer/update` directory. The relationship among interim fixes, cumulative fixes, and fix packs is shown in the Cumulative Fix Strategy for WebSphere Application Server Web page. Identify recommended interim fixes using the Recommended updates for WebSphere Application Server Base and Network Deployment Editions page at the <http://www-1.ibm.com/support/docview.wss?rs=180&context=SSEQTP&uid=swg27004980> IBM Web address. IBM Support offers tutorials on various WebSphere Application Server installation topics. See WebSphere education on demand: Installation best practices tutorials at the <http://www.ibm.com/support/docview.wss?rs=180&context=SSEQTP&q1=educationondemand&uid=swg27004762> IBM Web address for more information. One topic describes updating WebSphere Application Server products using the update installer program.
14. Unjar, untar, or unzip the fix pack, cumulative fix, and the recommended interim fixes that are in the update directory. Unpacking the fix pack or the cumulative fix creates the `update/fixpacks` directory automatically. Unpack interim fixes into the `update/fixes` directory.
15. Download the `updateInstaller.zip` file from the Support site to the `/WebSphere/AppServer/update` directory. The files that comprise the ZIP file are also part of each fix pack and cumulative fix ZIP file package. Therefore, download the latest update installer application after unpacking the cumulative fix or the fix pack to avoid overwriting the file.  
There are separate update installer applications for Version 5.0.x and Version 5.1.x:
  - UpdateInstaller for WebSphere Application Server V5.0 releases:  
<http://www.ibm.com/support/docview.wss?rs=180&context=SSEQTP&uid=swg24001908>
  - UpdateInstaller for WebSphere Application Server V5.1 releases:  
<http://www.ibm.com/support/docview.wss?rs=180&context=SSEQTP&uid=swg24006036>
16. Stop all Java and Web server processes on the machine.
17. Open a command window and use it throughout the rest of the procedure.
18. Source the **setupCmdLine.sh** command on Linux and UNIX platforms or run the command on Windows platforms. Sourcing the command on Linux or UNIX is different than running the command. Sourcing the command sets the `JAVA_HOME` environment for all subsequent operations performed from the command window.  
Use the appropriate command:
  - `./WebSphere/AppServer/bin/setupCmdLine.sh` (Source the command on UNIX platforms. There is a space between the period and the installation root directory.)
  - `source /WebSphere/AppServer/bin/setupCmdLine.sh` (Source the command on Linux platforms.)
  - `WebSphere\AppServer\bin\setupCmdLine.bat` (Windows platforms only)
19. Change directories to the `/WebSphere/AppServer/update` directory. Use the same command window where you sourced the `setupCmdLine.sh` script on a Linux or UNIX platform.
20. Change directories to the `/WebSphere/AppServer/update` directory and issue the **updateWizard.sh** command on Linux and UNIX platforms or the **updateWizard** command on Windows platforms. The command starts the Update installation wizard.
21. Select a fix pack installation to install either a fix pack or a cumulative fix. The update installer installs cumulative fixes as if they were fix packs.  
A panel shows the available fix packs or cumulative fixes that you can install.

22. Select the correct fix pack or cumulative fix to install. The Update installation wizard updates the binary plugin module component, the SDK component, or the GSKit component when there is service in the fix pack or cumulative fix for the component.
23. Use the Update installation wizard again to install any interim fixes you downloaded.
24. Select an interim fix installation. A panel shows the available interim fixes that you can install.
25. Complete the installation and restart your Web server as described in the Web server documentation.

You can use this procedure to install and maintain a WebSphere Application Server binary plugin module on a remote machine. See the following `plugin-cfg.xml` file documentation for more information about regenerating and editing the file:

- Regenerating Web server plug-in configurations
- Manually editing the plug-in configuration
- Situations requiring manual editing of the plug-in configuration

---

## Installing the product

This topic describes how to install WebSphere Application Server products as the root user on a Linux platform or on a UNIX-based platform, or from a user ID that belongs to the administrator group on a Windows platform.

You cannot install the product correctly as a non-root user on a Linux or UNIX-based operating system platform, or from a user ID on a Windows platform that is not part of the administrators group. Some steps of the installation procedure on a Windows platform require the user to belong to the administrator group and have the following advanced user rights, *Act as part of the operating system* and *Log on as a service*. If you back up the product CD-ROM on a Linux or UNIX platform, do so as root. Backup copies made from non-root users do not preserve the correct file attributes and do not work.

IBM Support offers tutorials on various WebSphere Application Server installation topics. See WebSphere education on demand: Installation best practices tutorials for more information. One topic describes installing new or coexisting versions.

**5.1 +** WebSphere Business Integration Server Foundation is the V5.1 level of the Enterprise product. WebSphere Business Integration Server Foundation, Version 5.1 extends the base WebSphere Application Server V5.1 product. After migrating the underlying product to V5.1, do not reinstall the V5.0.x Enterprise product. Version 5.0.x of the Enterprise product does not extend Version 5.1 of the base WebSphere Application Server product.

Read through this topic and its related topics to prepare for installation and to make yourself familiar with installation options, before you start to use the installation tools. Review the prerequisite requirements on the IBM WebSphere Application Server supported hardware, software, and APIs Web site to get started.

### 5.1 +

Table 9. Installation tip

| Operating platform | Tip in “Platform-specific tips for installing and migrating” on page 146 |
|--------------------|--|
| AIX platforms      | Installing the prerequisite xIC.rte 6.0 run-time code.                   |

After verifying prerequisites, read these topics before installing the product:

- Preparing to install and configure a Web server
- Platform-specific tips for installing and migrating
- Tips for installing the embedded messaging feature
- Migrating and coexisting

- Using the Launchpad to start the installation
- Installing silently

If you encounter a problem such as not having enough disk space or temporary space or not having prerequisite packages on your Linux or UNIX-based system, cancel the installation, make the required changes, and restart the installation to pick up the changes that you made.

The installation uses InstallShield for Multiplatforms (ISMP) to perform the installation. You can use the Installation wizard or perform the installation from a command line, using the silent installation method.

The Installation wizard does not support hot keys, such as Alt-Y. You can tab to the Yes key and press **Enter** to select it, for example.

**5.1+** This topic describes installing the base WebSphere Application Server product, using the installation image on the product CD labeled, **Application Server, IBM HTTP Server**. This CD is available in the base WebSphere Application Server product package and the Network Deployment product package, and the WebSphere Business Integration Server Foundation product package. Use this information center topic to install the base WebSphere Application Server installation image, regardless of which package the CD comes from, unless you are performing an *umbrella installation* while installing the Integration Server product. An umbrella installation automatically installs the base product during the installation of the Integration Server product.

Although you can create multiple servers on a base WebSphere Application Server node, the servers all share one set of configuration files. Changes that you make to one server affect the others. There is a possibility that configuration documents might become corrupted. Use configuration instances to create multiple servers, each with its own set of configuration files. Or install the Network Deployment product to create and manage multiple base Application Servers.

Install the base product before installing the Network Deployment product when installing both products on the same machine. The embedded messaging feature that is included in the default installation requires this specific order of installation.

Table 10. Installation tip

| Operating platform | Tip   |
|--------------------|---|
| All platforms      | Installing WebSphere Application Server products in order on the same machine, when installing the embedded messaging component |

Open this topic in the information center for the Network Deployment product to learn how to install the Network Deployment installation image and establish a multimachine environment. The CD-ROM for the Network Deployment installation image is labeled, **Deployment Manager**.

This topic is available in Adobe PDF format, on the product CD-ROMs, and online in an information center that is available from the IBM WebSphere Application Server Web site at <http://publib.boulder.ibm.com/infocenter/ws51help/index.jsp>. When possible, access the most current version of this information by selecting the information center. The information center displays in the language of your machine locale.

The Launchpad tool lets you access the product overview, the `readme.html` file, and installation guides. You also use the Launchpad during the installation procedure to install the product. See “Using the Launchpad to start the installation” on page 189 for more information.

The Installation wizard performs the following actions:

- Automatically checks prerequisites



- Looks for a previous WebSphere Application Server installation, to determine whether to display the Migration panel or the Coexistence panel during the installation
- Installs the IBM HTTP Server and other features, if you select them

Install the base WebSphere Application Server product on your platform. Use one of the following procedures:

- Install WebSphere Application Server on AIX platforms, as described in “Installing the base Application Server on AIX platforms.”
- Install WebSphere Application Server on HP-UX platforms, as described in “Installing the base Application Server on HP-UX platforms” on page 67.
- Install WebSphere Application Server on Linux platforms, as described in “Installing the base Application Server on Linux platforms” on page 88.
- Install WebSphere Application Server on Solaris platforms, as described in “Installing the base Application Server on Solaris platforms” on page 106.
- Install WebSphere Application Server on Windows platforms, as described in “Installing the base Application Server on Windows platforms” on page 125.

The Installation wizard configures the product. It is not necessary to perform further configuration at this time.

You have now successfully installed IBM WebSphere Application Server, Version 5 and the features that you selected.

## Installing the base Application Server on AIX platforms

This topic describes how to install the base WebSphere Application Server product as the root user on an AIX operating system platform.

You cannot install the product correctly as a non-root user. If you back up the product CD-ROM, do so as root. Backup copies made from non-root users do not preserve the correct file attributes and do not work.

If you encounter a problem such as not having enough temporary space or not having the right packages on your system, cancel the installation, make the required changes, and restart the installation.

The installation uses InstallShield for Multiplatforms (ISMP) to perform the installation. You can use the Installation wizard or perform the installation from a command line, using the silent installation method.

### Installation programs in WebSphere Application Server products

#### 5.1 +

| Product  | Link to installation procedure                             | Label on product CD  |
|--|--|--|
| (Base) WebSphere Application Server              | Base product installation (which links to this procedure!) | <b>Application Server, IBM HTTP Server</b>                     |
| Network Deployment                               | Network Deployment installation                            | <b>Deployment Manager</b>                                      |
| WebSphere Business Integration Server Foundation | Integration Server installation                            | <b>Integration Server Disk 1 and Integration Server Disk 2</b> |

Use the Network Deployment installation image to manage a multimachine environment, where you have installed the base product on different machines and want to manage the Application Servers in a group, or *cell*. If you buy the Network Deployment product, you also get the base product in the package.

WebSphere Business Integration Server Foundation is the V5.1 level of the Enterprise product.

WebSphere Business Integration Server Foundation, Version 5.1 extends the base WebSphere Application

Server V5.1 product. After migrating the underlying product to V5.1, do not reinstall the V5.0.x Enterprise product. Version 5.0.x of the Enterprise product does not extend Version 5.1 of the base WebSphere Application Server product nor does it extend the V5.1 Network Deployment product.

**5.1 +** If you buy the WebSphere Business Integration Server Foundation product, you also get the Network Deployment product and the base product in the package.

### Creating multiple Application Servers on a single machine

Although you can create multiple servers on a base WebSphere Application Server node, the servers all share one set of configuration files. Changes that you make to one server affect the others. Configuration documents might become corrupted. The **wsinstance** command can create multiple configuration instances. Each instance is a stand-alone Application Server with its own set of configuration files. Or install the Network Deployment product to create and manage multiple base Application Servers.

### Order of installation

**5.1 +** Install the base product before installing the Network Deployment product when installing both products on the same machine. Install the Network Deployment product before the Integration Server product that extends the Network Deployment product. You can install the Integration Server product before the base product. The Integration Server product can install the base product in what is known as an *umbrella* installation but Integration Server cannot install the Network Deployment product. Some features of the base product cannot be installed by Integration Server.

The embedded messaging feature that is included in the default installation requires that you install base before Network Deployment when installing both on the same machine. Otherwise, the order does not matter. See the following installation tip for more information:

Table 11. Installation tip

| Operating platform | Tip in “Platform-specific tips for installing and migrating” on page 146  |
|--------------------|---|
| All platforms      | Installing WebSphere Application Server products in order on the same machine, when installing the embedded messaging component |

This topic is available in Adobe PDF format on the product CD-ROM and online in an information center. The information center always has the most current information. The information center displays in the language of your machine locale if possible.

The installation guide PDF is updated occasionally. Download a new installation guide at:

**5.1 +** [ftp://ftp.software.ibm.com/software/webserver/appserv/library/wasv51base\\_gs.pdf](ftp://ftp.software.ibm.com/software/webserver/appserv/library/wasv51base_gs.pdf)

The Launchpad tool lets you access the product overview, the `readme.html` file, and the installation guide. See “Using the Launchpad to start the installation” on page 189.

You also use the Launchpad during the installation procedure to install the product. The installation program performs the following actions:

- Checks prerequisites automatically
- Looks for a previous WebSphere Application Server installation, to determine whether to display the Migration panel or the Coexistence panel during the installation
- Installs the IBM HTTP Server and other features, if you select them

A known problem with the Launchpad can prevent it from using Netscape to open the documentation links on some operating system platforms.



If you use the Mozilla browser, some Launchpad links do not work. The Launchpad attempts to call the Netscape browser in the `/usr/bin/netscape` directory. Try a symbolic link to the Mozilla browser to fix the problem as shown in the following example:

```
ln -sf /usr/bin/mozilla /usr/bin/netscape
```

You can also launch the following links directly from your browser:

### Product Overview

<http://www.ibm.com/software/webservers/appserv/>

Your security options might prevent redirection, such as to the <http://www-306.ibm.com/software/info1/websphere/index.jsp?tab=products/appserv> Web site. If so, you can identify the IBM Web site as a trusted site to allow the redirection. For example, on Internet Explorer, add <http://www-306.ibm.com> to the list of Trusted Sites by selecting **Tools > Internet Options > Security (tab) > Trusted Sites**.

### Readme File

[CD-ROM\\_mount\\_point/readme/readme\\_en.html](CD-ROM_mount_point/readme/readme_en.html)

### Installation Guide

[CD-ROM\\_mount\\_point/docs/InstallGuide\\_en.PDF](CD-ROM_mount_point/docs/InstallGuide_en.PDF)

The *Installation Guide* is in Adobe PDF format. Viewing this document requires you to have Adobe Acrobat Reader, which is a free download from the Adobe Acrobat Web site.

After using the Launchpad to view product documentation, perform the following procedure. The procedure includes several preliminary steps before actually launching the installer program.

1. Stop all WebSphere Application Server-related Java processes on the machine where you are installing the product.
2. Stop any Web server process such as the IBM HTTP Server, if you are extending the base product.
3. **5.1+** Install the prerequisite `Java130.rte.lib` version 1.3.0 on AIX Version 5.2 maintenance level 1. You must install `Java130.rte.lib` Version 1.3.0 to verify that the embedded messaging feature installs correctly. To download a copy of Java 1.3.0:
  - a. Go to the <http://www-106.ibm.com/developerworks/java/jdk/aix/index.html> Web page.  
If the link is unavailable, search for IBM Developer Kit for AIX.
  - b. Click **Download and service information** in the Contents box.
  - c. Click **Java 1.3.0** from the **Java Version** column in the table.
  - d. (Optional) Register for a user ID and password.

To correct an existing problem:

- a. Uninstall the following components, if present:
  - WebSphere Application Server
  - WebSphere MQ (MQSeries)
  - WebSphere MQ (MQSeries) classes for Java and WebSphere MQ (MQSeries) for Java Message Service
  - IBM HTTP Server
  - WebSphere Embedded Messaging Publishing and Subscribe Edition
- b. Clean up the system registry and edit the `vpd.properties` file on AIX to remove any entry related to WebSphere Application Server products. Entries related to WebSphere Application Server products begin with:
  - **WSB** for the base WebSphere Application Server
  - **WSC** for the WebSphere Application Server Application Clients
  - **WSE** for the Enterprise product
  - **WSN** for the Network Deployment product
  - **WSM** for the WebSphere MQ product

4. **5.1+** Install the prerequisite xIC.rte 6.0 run-time code on AIX 5.2 maintenance level 1. You must install the xIC.rte 6.0 run-time code, which is a prerequisite of GSKit7. Download the run-time code as a fix from the AIX Support site.
5. Provide adequate disk space.

**5.1+** The base Application Server requires the following disk space:

**450 MB for the /usr/WebSphere/AppServer directory**

The installation root directory includes the base product code.

**150 MB for the /tmp directory**

The temporary directory is the working directory for the installation program.

Verify that you have at least 150 MB of free space to avoid problems.

A message about free space occurs when less than 4 MB of free space remains after starting the installation. The InstallShield for MultiPlatforms (ISMP) program displays a message about using the `-is:tempdir` parameter to identify an alternate temporary space directory.

Ignore any `-is:tempdir` message. The `-is:tempdir` parameter is not supported. Cancel the installation, allocate a total of 100 MB of free space in the `/tmp` directory, and start the installation again.

**20 MB for the /usr/IBMHttpServer directory**

The IBM HTTP Server feature requires this space.

**35 MB for the /usr/IBM/gsk7 directory**

The Tivoli Global Security Kit requires this space.

**655 MB total requirement without the embedded messaging feature**

The total amount of space required includes the `/tmp` space, which is released after installation. Space requirements for the embedded messaging feature are described after the next few steps that describe setting up required users and user groups for the feature.

The Installation wizard displays required space for individual features on the Feature selection panel. The Installation wizard also warns you if you do not have enough space to install the product.

If you plan to migrate applications and the configuration from a previous version, verify that application objects have available disk space. As a rough guideline, plan for space equal to 110 percent of the size of the application objects:

- **For Version 3.5.x:** The size of application Java archive (JAR) files, Web archive (WAR) files, and servlet files
- **For Version 4.0.x:** The size of enterprise archive (EAR) files
- **5.1+ For Version 5.0.x:** The size of EAR files

6. **5.1+** Define the user groups and the user needed for the embedded messaging feature.

A user ID of the name `mqm`, with a primary group of `mqm`, owns the directories and files that contain the resources associated with the embedded messaging feature:

- a. Use the System Management Interface Tool (smit) to create the **mqm** and **mqbrkrs** user groups:
  - 1) Click **Security & Users > Groups > Add a Group**.
  - 2) Set the name field to **mqm** and create the user group.
  - 3) Create the **mqbrkrs** user group in the same way.
- b. Use smit to create the **mqm** user:
  - 1) Click **Security & Users > Users > Add a User**.
  - 2) Set the name field to **mqm** and create the user.
  - 3) Click **Security & Users > Change a Users Password > Passwords** to add a password to the new user ID.
- c. Use smit to add the **mqm** and **root** users to the **mqm** group:
  - 1) Click **Security & Users > Users > Change / Show Characteristics of a User**.
  - 2) Enter **mqm** in the User Name field.

- 3) Add **mqm** to the Group SET field, which is a comma-separated list of the groups to which the user belongs.
- 4) Add **root** to the mqm group and the mqbrkrs group.

The recommended user ID for running the jmsserver process is root. If you do run the jmsserver process under another user ID, add that user ID to the **mqm** and **mqbrkrs** groups. User IDs longer than 12 characters cannot be used for authentication with the embedded WebSphere JMS provider.

The mqm user starts the jmsserver for general JMS support and the WebSphere embedded broker for WebSphere Application Server topic connections.

7. Log out and back in to pick up the secondary user groups, mqm and mqbrkrs, for root. Use **ssh** instead of **telnet** to log in or set up the display environment for a real root login on AIX systems by running the following command after logging on:

```
su -
```

In a normal root login, issue the command **su**. For a real root login, issue the command **su -**.

Display settings for a normal root login are automatic. For a real root login, you must set your display environment properly to successfully view the installation wizard. Otherwise, you see a message about Preparing Java(tm) Virtual Machine..., and seven rows of dots, but no installation GUI and no further messages. Refer to the documentation for your AIX platform to determine proper display settings.

Use the **id -a** command or the **groups** command to see defined groups for root. If mqm and mqbrkrs are not in the list that is returned, you cannot install the embedded messaging feature:

```
[root@wasdoc2 root]# id -a
uid=0(root) gid=0(root)
groups=0(root),1(bin),2(daemon),
3(sys),4(adm),6(disk),10(wheel),500(mqm),501(mqbrkrs)
```

```
[root@wasdoc2 root]# groups
root bin daemon sys adm disk wheel mqm mqbrkrs
```

8. Allocate adequate disk space for the embedded messaging feature if you are planning to install the feature. The installation locations for the embedded messaging feature are fixed as shown in the following table, which lists the locations for the base messaging functions and the messaging broker functions for publish/subscribe messaging.

Table 12. Space requirements for the embedded messaging feature on AIX

| Component                           | Base code | Broker code     | Base data | Broker data |
|-------------------------------------|-----------|-----------------|-----------|-------------|
| <b>Path</b>                         | /usr/mqm  | /usr/opt/ wemps | /var/mqm  | /var/wemps  |
| <b>Server and client subfeature</b> | 40 MB     | 80 MB           | 8 MB      | 5 MB        |
| <b>Client subfeature</b>            | 15 MB     | 15 MB           | 5 MB      | N/A         |

9. Prepare to install the embedded messaging feature with WebSphere MQ. The embedded messaging feature is based on the IBM WebSphere MQ product. The feature and the product each provide a Java message service (JMS) function that supports queues for point-to-point messaging and topics for publish and subscribe messaging.

You can install the embedded messaging feature with or without the WebSphere MQ product on the same machine. To support both the embedded messaging feature and the WebSphere MQ product on the same machine, the WebSphere MQ product must be at a certain fix level and must have several of its features installed.

If you already have WebSphere MQ installed, you can configure it as the JMS provider. Otherwise, you can install the embedded messaging feature during the installation or install the WebSphere MQ product or another JMS provider after you install.

Even though you might decide now to install only the embedded messaging feature, you can install the WebSphere MQ product later and use the IBM WebSphere MQ product as the JMS provider instead.

10. **5.1+** Verify that you have upgraded to WebSphere MQ 5.3 with the CSD04 update to install embedded messaging on a machine where you already have WebSphere MQ installed. Determine if your WebSphere MQ 5.3 installation is at the required level by running the **mqver** utility provided by WebSphere MQ.

The required level as indicated by the mqver command:

```
Name:      WebSphere MQ
Version:   530.4 CSD04
...
```

11. **5.1+** Verify that you have installed the required WebSphere MQ 5.3 features to install embedded messaging on a machine where you already have WebSphere MQ installed. Verify that you have installed the following features:
  - When installing the embedded messaging server and client feature, the required MQ features are *Server* and *Java messaging*.
  - When installing the embedded messaging client feature, the required MQ feature is *Java messaging*.

If you attempt to install the embedded messaging feature when WebSphere MQ is already installed, the level of WebSphere MQ must be Version 5.3 with the required MQ features. Otherwise, the installation of the embedded messaging feature fails with prerequisite check errors.

12. **5.1+** Create and mount a journalized file system called `/var/mqm` for your messaging working data. Use a partitioning strategy with a separate volume for embedded messaging or WebSphere MQ data to isolate system activity from the potentially high volume of messaging work that can build up in the `/var/mqm` directory.
13. **5.1+** Create separate file systems for log data in the `var/mqm/log` directory and error files in the `var/mqm/errors` directory. Store log files on a different physical volume from the embedded messaging queues, which are in the `var/mqm` directory. This ensures data integrity in the case of a hardware failure. If you are creating separate file systems, allow the following minimum free space:

**30 MB** `/var/mqm`

**20 MB** `/var/mqm/log`

**4 MB** `/var/mqm/errors`

The `/var` file system stores all the security logging information for the system and stores the temporary files for e-mail and printing. Therefore, it is critical that you maintain free space in `/var` for these operations. If you do not create a separate file system for messaging data, and `/var` fills up, all security logging stops on the system until free space is available in `/var`. Also, e-mail and printing do not work without some available free space in `/var`.

You have the same options for creating file systems for the embedded messaging feature as you do for WebSphere MQ. For example, if you cannot install the embedded messaging options in the required file system (for example, if it is too small), you can do one of the following *before* installing embedded messaging:

- Create and mount a new file system for the installation directory.
- Create a new directory anywhere on your machine, and create a symbolic link from the required installation directory to the new directory. For example, on AIX:

```
mkdir /bigdisk/mqm
ln -s /bigdisk/mqm /usr/mqm
```

14. **5.1+** Unmount file systems with broken links to avoid `java.lang.NullPointerException` errors. Unmount file systems with broken links before installing.

The installation of the cumulative fix can fail with the following error when broken links exist to file systems:

An error occurred during wizard bean change notification:

```
java.lang.NullPointerException
  at com.ibm.wizard.platform.aix.AixFileUtils.
    getFileSystemData(AixFileUtils.java:388)
  at com.ibm.wizard.platform.aix.AixFileUtils.
    getPartitionDataWithExecs(AixFileUtils.java:172)
  at com.ibm.wizard.platform.aix.AixFileUtils.
    getPartitionData(AixFileUtils.java:104)
  at com.ibm.wizard.platform.aix.AixFileServiceImpl.
    getPartitionNames(AixFileServiceImpl.java:397)
...
```

Use the **df -k** command to check for broken links to file systems. Look for file systems that list blank values in the *1024-blocks size* column. Columns with a value of "-" (dash) are not a problem. The following example shows a problem with the /dev/lv00 file system:

```
> df -k
Filesystem      1024-blocks      Free %Used   Iused %Iused Mounted on
/dev/hd4         1048576      447924   58%    2497    1% /
/dev/hd3         4259840     2835816   34%     484    1% /tmp
/proc            -             -        -        -        - /proc
/dev/lv01        2097152     229276   90%    3982    1% /storage
/dev/lv00
/dev/hd2         2097152     458632   79%   42910    9% /usr
iw031864:/cdrom/db2_v72_eee_aix32_sbcs
```

The /proc file system is not a problem. The iw031864:/cdrom/db2\_v72\_eee\_aix32\_sbcs file system is a definite problem. The /dev/lv00 file system is also a likely problem. Use one of the following commands to solve this problem:

```
> umount /cdrom/db2_v72_eee_aix32_sbcs
> umount /cdrom
```

If the problem continues, unmount any file systems that have blank values, such as the /dev/lv00 file system in the example. If you cannot solve the problem by unmounting file systems with broken links, reboot the machine and begin this procedure again.

15. Verify that prerequisites and corequisites are at the required release levels. Although the Installation wizard checks for prerequisite operating system patches with the prereqChecker application, review the prerequisites on the IBM WebSphere Application Server supported hardware, software, and APIs Web site if you have not already done so. Refer to the documentation for non-IBM prerequisite and corequisite products to learn how to migrate to their supported versions.

Some operating systems that were not supported at the time that this product was shipped on CD-ROM might now be supported. You might receive a message from the prereqChecker program that an operating system is not supported when, in fact, the operating system is supported.

Always consult the IBM WebSphere Application Server supported hardware, software, and APIs Web site to determine whether your operating system is supported when you receive a message from the prereqChecker program. The Web site lists all supported operating systems and the operating system fixes and patches that you must install to have a compliant operating system. After confirming that your operating system is supported and that you have installed all necessary patches, you can click **Next** to continue an installation when you receive an error message from the prereqChecker program.

16. Remove any entries from the /usr/bin/jitk.db file if you have uninstalled WebSphere Application Server Enterprise Edition Version 4.1. Remove any remaining artifacts from an uninstalled Enterprise Edition V4.1 system to prevent the display of the Coexistence panel or the Migration panel during installation.

The Installation wizard might display the Migration panel or the Coexistence panel even though you have uninstalled WebSphere Application Server Version 4.1. You can prevent the Installation wizard from recognizing a previously deleted V4.1 Application Server by removing the following entry from the /usr/bin/jitk.db file:

```
WebSphere Application Server 4.1
```

Remove other Version 4.x entries for WebSphere Application Server products that are no longer on your system.

17. Verify the system **cp** command when using emacs or other freeware.

If you have emacs or other freeware installed on your AIX operating platform, verify that the system **cp** command is being used.

- a. Type `which cp` at the command prompt before running the installation program for the WebSphere Application Server product.
- b. Remove the freeware directory from your PATH if the resulting directory output includes freeware. For example, if the output is similar to this `/opt/freeware/bin/cp` message, remove the directory from the PATH.
- c. Install the WebSphere Application Server product.
- d. Add the freeware directory back to the PATH.

If you install with a **cp** command that is part of a freeware package, the installation might appear to complete successfully, but the Java 2 SDK that the product installs might have missing files in the `install_root/java` directory.

Missing files can destroy required symbolic links. If you remove the freeware **cp** command from the PATH, you can install the Application Server product successfully.

Perform the following step to verify that the Java 2 SDK is working correctly.

18. Verify the Java 2 SDK on the WebSphere Application Server CD. Perform the following steps to verify that the Java 2 SDK on the product CD-ROM is working correctly.
  - a. Change directories to the `/aix/WAS/jdk/java/bin` directory on the product CD-ROM. For example:  

```
cd /mnt/aix/WAS/jdk/java/bin
```
  - b. Verify the Java 2 SDK version. Type the following command:

```
./java -version
```

The command completes successfully with no errors when the Java 2 SDK is intact.

19. Select the Installation wizard method or the silent installation method but do not start the installation yet. The installer program has two interfaces, the Installation wizard and a silent command-line installation.

### Performing the installation with the wizard

You can start the Installation wizard using the Launchpad or directly using the **install** command.

The default installation method is to open a command window and issue the command to start the Launchpad tool. Click the **Install the product** option on the Launchpad. (See “Using the Launchpad to start the installation” on page 189.)

This option launches the Installation wizard, which is an InstallShield for MultiPlatforms (ISMP) application. This action launches the Installation wizard in the language of your machine locale unless no translation exists for your locale, in which case you receive the English version.

A short delay occurs before the ISMP wizard displays. You do not need to click the Install the product option more than once to cause the wizard to display. The delay is particularly noticeable on x-windows platforms.

You can also start the Installation wizard using the `/cdrom/aix/install` command, where `/cdrom` is the mount point for the product CD-ROM and `aix` is the platform directory.

### Performing a silent installation

You can perform a silent installation using the `-options responsefile` parameter with the command method:

```
fully_qualified_CD_pathname/install  
-options fully_qualified_HDD_pathname/responsefile
```

```
# /cdrom/aix/install -options /tmp/my_responsefile
```



Start the silent installation with a fully qualified path to the options response file. Otherwise, the Installation wizard starts.

A silent installation causes the installation program to read your responses from the options response file, instead of from the wizard interface. You must customize the *responsefile* before installing silently. See “Customizing the base options response file” on page 191.

After customizing the file, you can issue the command to silently install. See “Installing silently” on page 190.

After issuing the command, the following text displays:

```
# .....  
.InstallShield Wizard
```

```
Initializing InstallShield Wizard...
```

```
Searching for Java(tm) Virtual Machine...
```

The silent installation runs without displaying status to the window:

- Press **Enter** when the installation is complete to return to the command prompt.
- Press **Enter** at any time to return from a background job to the command prompt.

You can change the `-W launchPRTBean.active` option in the response file to display the Registration panel to indicate the completion of a silent installation on a local system with a graphical user interface.

To determine the status of the silent installation, review the installation logs in the *install\_root/logs* directory or in the */tmp* directory. See “Troubleshooting the installation” on page 214 for more information about log files.

Silent installation is particularly useful if you install the product often.

The rest of this procedure assumes that you are using the Installation wizard. Corresponding entries in the response file exist for every prompt that is described as part of the wizard.

Review the description of the “responsefile” on page 204 for more information. Comments in the file describe how to customize their options.

### Asynchronous and synchronous command lines

After running the **install** command, the command line returns synchronously. A synchronous **install** command returns the command line after the installation is complete.

You can start the installation asynchronously with the installation process and its children processes all running as background processes. Consult your operating system documentation to learn how to issue asynchronous commands. After running the **install** command, the command line returns immediately.

Do not misinterpret an asynchronous command line to mean that the installation has finished when the command prompt returns. Although the command line returns, either the Installation wizard or a silent installation might still be in progress.

### Installing with a network file system mount

If you must use an NFS mount, see the following installation tip:

Table 13. Installation tip

| Operating platform | Tip in “Platform-specific tips for installing and migrating” on page 146 |
|--------------------|--|
| All platforms      | Platform-specific issues when dealing with network file systems          |

20. Insert the product CD labeled, *Application Server, IBM HTTP Server*.
21. Open a shell window to mount the product CD-ROM, as described in “Mounting a CD-ROM drive on AIX” on page 66. Use the same shell window throughout the installation procedure.

22. Start the installation with the `/cdrom/aix/launchpad.sh` command, where `/cdrom` is the mount point for the product CD-ROM and `aix` is the platform directory on the CD-ROM. You can also start the installation directly with the `/cdrom/aix/install` command. The following example shows a fully qualified call to the installer program:

```
fully_qualified_CD_pathname/install
```

```
# /cdrom/aix/install
```

The readme link in the Launchpad is to the `readme.html` file in the CD root directory. The *Getting Started* document that contains installation information is in the `docs` directory on the CD. Download the current version of the *Getting Started* document from:

**5.1+** [ftp://ftp.software.ibm.com/software/webserver/appserv/library/wasv51base\\_gs.pdf](ftp://ftp.software.ibm.com/software/webserver/appserv/library/wasv51base_gs.pdf)

The rest of this procedure assumes that you are using the Installation wizard. Corresponding entries in the response file exist for every prompt that is described as part of the wizard. Review the description of the “responsefile” on page 204 for more information. Comments in the file describe how to customize the options.

23. Click **Next** to continue. The license agreement displays.  
The Installation wizard does not support hot keys, such as **Alt-N**. You can tab to **Next** and press **Enter** to select it, for example.
24. Click the radio button beside the **I accept the terms in the license agreement** message if you agree to the license agreement and click **Next** to continue. After you accept the licensing terms, the Installation wizard checks for prerequisites and for previous versions, with which it can either migrate or coexist.

The prerequisites checker program recognizes the official supported level for AIX 5.2 as ML1 + APAR IY44183. AIX 5.2 ML2 is also supported. If you receive a message from the prerequisites checker program that AIX 5.2 ML2 is an unsupported operating system, ignore the message and continue the installation.

Update your operating system if it is missing required file sets. If you receive a message that a file set is missing, such as file set `X11.fnt.ucs.ttf`, cancel the installation, update the operating system, and restart the installation.

As the base WebSphere Application Server product version changes, its prerequisites and corequisites change. Updating your database, Web server, Software Development Kit (SDK), and other software is probably necessary.

The base WebSphere Application Server product simplifies migrating product prerequisites, by providing the option to install a complimentary Web server and SDK on your supported operating system. You can uninstall back-level prerequisites and let the Installation wizard install current versions.

If the wizard finds a previous version of WebSphere Application Server, it prompts you to migrate applications and the configuration from the previous version, or to coexist with it. If it finds more than one previous version, the Installation wizard lists them for you to select which one to migrate.

**Migrating or coexisting with an existing WebSphere Application Server node that AIX does not recognize.**

In some cases, the InstallShield for MultiPlatforms (ISMP) program might not detect a previously installed version of WebSphere Application Server because of a failure to read the registry keys on AIX. You can force the migration and coexistence panel to display, by starting the installation with an option on the `/cdrom/aix/install` command.

For example, use this command:

```
./install -W previousVersionDetectedBean.previousVersionDetected="true"
```

You can also force the appearance of the coexistence panel to change conflicting port number assignments. For example, force the coexistence panel to appear using this command:

```
./install -W coexistenceOptionsBean.showCoexistence="true"
```

On either panel, identify the location of the existing product instance to cause it to be recognized.



25. Choose whether to install additional features or to install the product again when a previous installation of the same level product exists. You can add features to an unfederated base node or to a deployment manager node at any time, by running the Installation wizard again. Federated nodes must be unfederated before adding features to avoid conflicts while the deployment manager owns the configuration of the base node.

Log off as root and back on again.

This Installation wizard panel appears when the installer program detects a previous installation at the same product level. The panel lets you select whether to add features to the existing installation, or to perform a new installation to another directory. Use a procedure in the following description to install features without causing component regression problems.

When the installer program detects a previous installation at the same product level, a panel appears to let you add features to the existing installation or perform a new installation to another directory.

When adding features, previously installed features are checked and grayed out with the term **(Installed)** at the end of the feature name. The IBM HTTP Server feature is an exception. You can install more than one instance of the IBM HTTP Server product. It is not grayed out or labeled **(Installed)**. You can install the plug-in feature each time you install IBM HTTP Server, too. Select a new directory for each instance of IBM HTTP Server that you install.

Table 14. Installation tip

| Operating platform | Tip in “Platform-specific tips for installing and migrating” on page 146 |
|--------------------|--|
| All platforms      | Installing all Web server plug-ins during the initial installation.      |

If you intend to install additional features, use the following procedure to avoid component regression problems. It is important that you understand that there is no way to add features to a base node without unfederating it from its cell and losing its configuration. The configuration for the base node is restored back to its original configuration, before it was federated and before you changed it with the administrative console of the deployment manager.

Restoring an original configuration means that you lose the configuration for any additional servers that you created on the base node from the deployment manager. (The additional servers will not exist any more.) You will lose any other configuration you performed from the deployment manager administrative console.

Although you can use the **backupConfig** command to save the configuration, you cannot restore it with the **restoreConfig** command because the configuration you restore does not include any features that you add to the base node.

You can use the **backupConfig** command to save the Network Deployment configuration so that you can restore it if necessary. You can also refer to the configuration as you use the administrative console of the deployment manager to reconfigure the base node.

- a. If the node is a base product node in a deployment manager cell, unfederate the node with the **removeNode** command. Removing the base node from the cell also removes the configuration for the base node, which resides at the cell level.
- b. Uninstall any interim fixes, starting with the last one and finishing with the first one.
- c. Uninstall any cumulative fixes you installed, starting with the last one and finishing with the first one.
- d. Uninstall any fix packs you installed, starting with the last one and finishing with the first one.
- e. Log off and back on.
- f. Install new features.
- g. Install the most current fix pack.
- h. Install the most current cumulative fix.
- i. Install any interim fixes to bring the node back to its previous fix level.

- j. If the node was part of a cell, rejoin the node to the cell with the **addNode** command or the deployment manager administrative console. This action synchronizes the master cell configuration with changes you make to the Application Server configuration during the installation of the new features.
  - k. Reconfigure the base node with the Network Deployment administrative console.
26. Choose to migrate applications and the configuration from a previous version, to coexist with another version, or to neither coexist or migrate. Click **Next** to continue. See “Migrating and coexisting” on page 326 for more information.

All WebSphere Application Server products on a single machine share some of the code in the embedded messaging feature, if installed. The required level of the embedded messaging feature for V5.1 (CSD04) is not the same as for V5.0.0 or V5.0.1. The required level of the embedded messaging feature for V5.1 is the same as for V5.0.2.

If you attempt to install V5.0.2 or V5.1 on a machine where a version of the embedded messaging feature is at a release level earlier than CSD04, the installer program displays the message log in a panel. The message that you see is similar to one of the messages in the following example:

```
MQSeries or WebSphere MQ server at an earlier release than required to support
embedded messaging is already installed on the system.
Unsupported earlier maintenance level of MQSeries or WebSphere MQ detected.
Unsupported earlier release of MQSeries client or WebSphere MQ client detected.
Unsupported maintenance level of MQSeries client or WebSphere MQ client detected.
Software conflict with MQSeries JMS SupportPac MA88 detected.
```

To correct the problem, perform one of the following actions:

- Upgrade the full MQSeries or WebSphere MQ product to WebSphere MQ at the latest level that supports embedded messaging (CSD04).
  - 5.1+** See Installing WebSphere embedded messaging as the JMS provider for more information.
- Uninstall the existing MQSeries or WebSphere MQ product if MQSeries or WebSphere MQ is not required on this system and reinstall the WebSphere Application Server product. Select the embedded messaging feature.

The MQSeries JMS SupportPac MA88 problem is slightly different. Uninstall the MQSeries JMS SupportPac MA88 and reinstall the WebSphere Application Server product, selecting the embedded messaging feature. The function provided by SupportPac MA88 is included in the embedded messaging feature.

You can upgrade the WebSphere Application Server product to V5.0.2 before migrating it to V5.1 to avoid any problem with an incorrect level of the embedded messaging feature. See “Upgrading a Version 5.0.0 or Version 5.0.1 product to Version 5.0.2” on page 371.

You can also perform the procedure for migrating V5.0.0 or V5.0.1 with embedded messaging to V5.1. See “Migrating Version 5.0.0 or Version 5.0.1 of WebSphere Application Server with embedded messaging to Version 5.1” on page 347.

To share embedded messaging in a coexistence environment, the node names for each installation must be unique, so that each installation has a message queue manager that is named uniquely. To migrate V5.0.2 to V5.1, the node names must be identical. Therefore, the queue manager names are also identical, if you are migrating from V5.0.2 to V5.1.

To prevent losing the queue manager when you uninstall V5.0.2 (or V5.1), you must create a dummy queue manager before uninstalling one of the WebSphere Application Server versions. A series of migration topics in “Migrating and coexisting” on page 326 describe how to migrate after the installation.

- 5.1+** The first rule of migration is to migrate after you install WebSphere Business Integration Server Foundation, if you are planning to install the Integration Server:

| If you are planning to install these products: |                    | Select the migration option while installing this product: |                    |
|--|--------------------|--|--------------------|
| Base product                                   | Integration Server | Base product   | Integration Server |
| X  |                    | X  |                    |
| X  | X                  |  | X                  |

The exception to the rule is to migrate V3.5.x to V5.1 during the installation of the base product or the Network Deployment product.

**5.1+** Migrating Integration Server also migrates the product that Integration Server extends.

When you perform an umbrella installation of the base WebSphere Application Server product, you can choose to migrate applications and the configuration from a previous version, or to coexist with another version of the base WebSphere Application Server product, or to do neither.

You can also perform a silent migration or configure for coexistence during a silent installation. Refer to “Installing silently” on page 190 for a description of performing a silent installation, including the options that you can specify.

The migration prompt appears only when the Installation wizard detects a previous version. The coexistence prompt appears when the Installation wizard detects any other installation, including another Version 5 installation.

If you choose to coexist, the wizard displays a Port selection panel, where you can specify port assignments that do not conflict with existing ports. For example, you can change the HTTP transport port for coexistence, from 9081 (one more than the default Version 5 port number) to 9085 or higher, to avoid potential conflicts with port numbers that previous versions of WebSphere Application Server commonly use.

Use the **netstat -a** command to display all ports in use.

**5.1+** If you choose neither the migration option nor the coexistence option, you can run Version 5.1.x and the previous version, but not at the same time. Although it is possible that both versions might coexist without port conflicts, you can ensure that both versions run together by selecting the coexistence option and checking for conflicting port assignments.

The Migration panel lists all previous releases that it can identify. If you highlight a release, the text boxes labeled, “select previous version,” show the location of the previous product. Select the product to migrate. If you do not see the previous version that you intend to migrate, click **Select previous version** to enter a location and configuration file name if you are migrating a WebSphere Application Server Advanced Edition Single Server Edition, Version 4.0.x installation.

The field labeled “Configuration file” is valid only for WebSphere Application Server Advanced Edition Single Server Edition, Version 4.0.x. For the other versions of WebSphere Application Server that are supported by migration (Version 3.5 Standard Edition, Version 3.5 Extended Edition, and Version 4.0 Advanced Edition), the `admin.config` file provides the host and port values for the administrative server. If you use a file name other than `admin.config`, issue the commands that call the migration tools instead of migrating while installing. Issuing the commands that call the migration tools is described in “Migrating and coexisting” on page 326.

Migrate V3.5.x to V5.1 during the installation of the base product or the Network Deployment product, before installing the Integration Server product.

You must start the administrative server of some previous versions so that the Installation wizard can export the configuration from the `admin.config` file.

Although you might select migration at this point in the installation process, the actual migration does not begin until after the Version 5 installation is complete. At that time, if the `WASPreUpgrade` tool fails, the Installation wizard does not call the `WASPostUpgrade` tool to complete the migration, but instead displays the `WASPreUpgrade.log` and `WASPostUpgrade.log` log files for you to diagnose the problem. After fixing the problem, such as starting the administrative server of a previous release, you can start the migration again, as described in “Migrating and coexisting” on page 326.

27. Choose a type of installation and click **Next**. If you use the Installation wizard, you can choose a full installation type, which installs all features, or a custom installation type. The custom installation type lets you select which features to install.

**5.1 +** If you are migrating a federated node:

- Migrate the deployment manager node first. The deployment manager must be at the highest release level or fix level within the cell.
- Select the same type of installation that you used to install the earlier release:
  - If you selected a full installation type then, select a full installation type now.
  - If you selected a custom installation type then, select a custom installation type now and select the same features as you did for the V5.0.x release.

Federated nodes have configurations that are controlled by the deployment manager that controls the cell. Migrating installs the same features for the V5.1 node that are in the configuration for the previous release. If you decide that you must add features, see "Migrating federated nodes" in the information center for Network Deployment.

You can improve performance by not installing certain features, as described in the **Performance considerations** section in the next step.

- Choose **full install** to install everything you need to run Web applications on your server, including IBM HTTP Server and the embedded messaging feature. The plug-in for IBM HTTP Server is installed and configured in the full installation. Use this option if you are new to WebSphere Application Server and are unsure of what to install. Choosing this option does install the embedded messaging feature. You must prepare for the embedded messaging feature, as described earlier.
- Choose **Custom install** to select installation features. Choose this option if you already know what to install. Choose this type of installation if you must install and configure the plug-in for a Web server other than IBM HTTP Server. The Installation wizard installs all plug-ins if you select any of them, but it only configures selected plug-ins. Also choose this type of installation if you intend to not install the WebSphere Application Server embedded messaging server because you have already installed the WebSphere MQ Version 5.3 product, or another JMS provider.

If you choose a full installation, you can skip the next step.

After selecting a typical installation, the wizard prompts you to select the directory for the program code. After selecting a custom installation, the wizard displays a list of features.

28. Select features to install and click **Next** to continue when performing a custom installation. This step is available only when you choose the custom installation type. A description of each feature appears at the bottom of the panel when you roll the cursor over the feature.

**5.1 +** Selecting certain features causes the installation of other prerequisite features. The following table shows this feature relationship.

Table 15. Features and feature dependencies

| If you select this feature:              | This feature is also installed: | Feature description   |
|--|---------------------------------|---|
| <b>Application Server</b>                | Admin Scripting                 | These features are the Application Server run time and its Samples. |
| Sub-features: Application Server Samples |                                 |   |
| <b>Administration</b>                    |                                 | Getting started with System Administration                          |
| Sub-features: Admin Scripting            | Application Server              |   |
| Administrative Console                   | Admin Scripting                 |   |

Table 15. Features and feature dependencies (continued)

| If you select this feature:   | This feature is also installed: | Feature description |                       |                 |   |  |  |                 |                         |   |  |   |
|---|---------------------------------|---------------------|-----------------------|-----------------|---|--|--|-----------------|-------------------------|---|--|---|
| <b>Deployment Tools</b>   |                                 |                     |                       |                 |   |  |  |                 |                         |   |  |   |
| Sub-features: <table border="0" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; border-bottom: 1px solid black; text-align: center;">Deploy Tool</td> <td style="width: 50%; border-bottom: 1px solid black; text-align: center;">Application Server</td> </tr> <tr> <td style="border-bottom: 1px solid black; text-align: center;">ANT Utilities</td> <td style="border-bottom: 1px solid black; text-align: center;">Admin Scripting</td> </tr> </table>  | Deploy Tool                     | Application Server  | ANT Utilities         | Admin Scripting |   | <ul style="list-style-type: none"> <li>• Deploying and managing applications</li> <li>• Overview of the ANT Utilities</li> </ul> |  |                 |                         |   |  |   |
| Deploy Tool   | Application Server              |                     |                       |                 |   |  |  |                 |                         |   |  |   |
| ANT Utilities   | Admin Scripting                 |                     |                       |                 |   |  |  |                 |                         |   |  |   |
| <b>Embedded Messaging</b>   |                                 |                     |                       |                 |   |  |  |                 |                         |   |  |   |
| Sub-features: <table border="0" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; border-bottom: 1px solid black; text-align: center;">Server and Client</td> <td style="width: 50%; border-bottom: 1px solid black; text-align: center;">Application Server</td> </tr> <tr> <td style="border-bottom: 1px solid black; text-align: center;">Client Only</td> <td style="border-bottom: 1px solid black;"></td> </tr> <tr> <td style="border-bottom: 1px solid black; text-align: center;">           Message-driven Bean Samples (These samples are the MDBSamples application, which is for the server and not for the client.)         </td> <td style="border-bottom: 1px solid black; text-align: center;">Application Server samples</td> </tr> <tr> <td style="border-bottom: 1px solid black;"></td> <td style="border-bottom: 1px solid black; text-align: center;">Admin Scripting</td> </tr> </table> | Server and Client               | Application Server  | Client Only           |                 | Message-driven Bean Samples (These samples are the MDBSamples application, which is for the server and not for the client.) | Application Server samples   |  | Admin Scripting |                         | <ul style="list-style-type: none"> <li>• Installing and configuring a JMS provider</li> <li>• Message-driven beans samples</li> </ul>   |  |   |
| Server and Client   | Application Server              |                     |                       |                 |   |  |  |                 |                         |   |  |   |
| Client Only   |                                 |                     |                       |                 |   |  |  |                 |                         |   |  |   |
| Message-driven Bean Samples (These samples are the MDBSamples application, which is for the server and not for the client.)   | Application Server samples      |                     |                       |                 |   |  |  |                 |                         |   |  |   |
|   | Admin Scripting                 |                     |                       |                 |   |  |  |                 |                         |   |  |   |
| <p>You can install the MDBSamples application without installing the embedded messaging server and client feature. Perhaps you have already installed the server and client feature. Or perhaps you intend to reconfigure the MDBSamples to use messaging resources that WebSphere MQ software provides.</p>  |                                 |                     |                       |                 |   |  |  |                 |                         |   |  |   |
| <p>In any case, if you install the MDBSamples application and do not have the server and client feature installed, errors occur. The Application Server starts the MDBSamples application at start up. The MDBSamples application cannot start the required messaging resources in the Java Naming and Directory Interface (JNDI).</p>  |                                 |                     |                       |                 |   |  |  |                 |                         |   |  |   |
| <p>Because of the lack of required resources, the message-driven beans fail to start, which causes an exception that the Application Server logs. The Application Server is not affected other than being unable to start the MDBSamples application.</p>   |                                 |                     |                       |                 |   |  |  |                 |                         |   |  |   |
| <b>IBM HTTP Server</b>  |                                 |                     |                       |                 |   |  |  |                 |                         |   |  |   |
| <b>Web Server Plug-ins</b>  |                                 |                     |                       |                 |   |  |  |                 |                         |   |  |   |
| Sub-features: <table border="0" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; border-bottom: 1px solid black; text-align: center;">IBM HTTP Server</td> <td style="width: 50%;"></td> </tr> <tr> <td style="border-bottom: 1px solid black; text-align: center;">Apache Web Server</td> <td></td> </tr> <tr> <td style="border-bottom: 1px solid black; text-align: center;">Microsoft Internet Information Services (IIS)</td> <td></td> </tr> <tr> <td style="border-bottom: 1px solid black; text-align: center;">Sun ONE (formerly known as iPlanet) Web Server</td> <td></td> </tr> <tr> <td style="border-bottom: 1px solid black; text-align: center;">Lotus Domino Web Server</td> <td></td> </tr> </table>  | IBM HTTP Server                 |                     | Apache Web Server     |                 | Microsoft Internet Information Services (IIS)   |  | Sun ONE (formerly known as iPlanet) Web Server |                 | Lotus Domino Web Server |   |  | <p>“Preparing to install and configure a Web server” on page 27</p> |
| IBM HTTP Server   |                                 |                     |                       |                 |   |  |  |                 |                         |   |  |   |
| Apache Web Server   |                                 |                     |                       |                 |   |  |  |                 |                         |   |  |   |
| Microsoft Internet Information Services (IIS)   |                                 |                     |                       |                 |   |  |  |                 |                         |   |  |   |
| Sun ONE (formerly known as iPlanet) Web Server  |                                 |                     |                       |                 |   |  |  |                 |                         |   |  |   |
| Lotus Domino Web Server   |                                 |                     |                       |                 |   |  |  |                 |                         |   |  |   |
| <b>Performance And Analysis Tools</b>   |                                 |                     |                       |                 |   |  |  |                 |                         |   |  |   |
| Sub-features: <table border="0" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; border-bottom: 1px solid black; text-align: center;">Tivoli Performance Viewer</td> <td style="width: 50%;"></td> </tr> <tr> <td style="border-bottom: 1px solid black; text-align: center;">Dynamic Cache Monitor</td> <td></td> </tr> <tr> <td style="border-bottom: 1px solid black; text-align: center;">Performance Servlet</td> <td></td> </tr> <tr> <td style="border-bottom: 1px solid black; text-align: center;">Log Analyzer</td> <td></td> </tr> </table>  | Tivoli Performance Viewer       |                     | Dynamic Cache Monitor |                 | Performance Servlet   |  | Log Analyzer                                   |                 |                         | <ul style="list-style-type: none"> <li>• Tivoli Performance Viewer features</li> <li>• Displaying cache information</li> <li>• Performance Monitoring Infrastructure servlet</li> <li>• Log Analyzer</li> </ul> |  |   |
| Tivoli Performance Viewer   |                                 |                     |                       |                 |   |  |  |                 |                         |   |  |   |
| Dynamic Cache Monitor   |                                 |                     |                       |                 |   |  |  |                 |                         |   |  |   |
| Performance Servlet   |                                 |                     |                       |                 |   |  |  |                 |                         |   |  |   |
| Log Analyzer  |                                 |                     |                       |                 |   |  |  |                 |                         |   |  |   |
| <b>Javadocs</b>   |                                 |                     |                       |                 |   |  |  |                 |                         |   |  |   |
| <p>IBM WebSphere Application Server, Release 5 API Specification in Javadoc format</p>  |                                 |                     |                       |                 |   |  |  |                 |                         |   |  |   |

**Performance considerations**

For better performance in either a development or production environment, do not install the Samples. By omitting the Samples, you can improve Application Server startup time by 60 percent and save 15 percent of disk space. You can save up to 30 percent of process footprint (based on a maximum heap size of 256 MB).

If your applications do not use Java Message Service (JMS) messaging, do not install embedded messaging. This recommendation is especially true if your system has 256 MB or less of physical memory.

Not installing the embedded messaging feature saves about 36 MB of message queuing process memory and can improve application startup time up to 5 percent and save an additional 72 MB of disk space. (This was tested on Windows machines. Results on an AIX platform might differ slightly.)

In addition, if you install the embedded messaging client feature you do not need to install the message-driven Bean Samples. The message-driven Bean Samples are for the embedded messaging server in the server and client feature.

### **Web Server plug-in feature considerations**

Select the IBM HTTP Server feature to install and configure IBM HTTP Server on the same, or on a different machine than the WebSphere Application Server product. You can migrate plug-ins from an earlier version of WebSphere Application Server to access the current WebSphere Application Server product.

Install IBM HTTP Server on a separate machine using the CD-ROM labeled, **Application Server, IBM HTTP Server**. After installing IBM HTTP Server, you can install the plug-in by installing the base WebSphere Application Server product and clearing all features except the plug-in for IBM HTTP server. See *Installing and configuring a Web server*.

The Installation wizard automatically installs and configures IBM HTTP Server and the IBM HTTP Server plug-in on the same machine as the WebSphere Application Server if you choose the full installation. No further configuration is necessary. Installing the IBM HTTP Server product with the WebSphere Application Server product also includes it in the WebSphere Application Server uninstaller program that the Installation wizard creates. Choose the custom type of installation to clear the selection of the IBM HTTP Server feature, if you want to install and uninstall it separately.

You can run the uninstaller program to remove all installed features.

29. Specify a destination directory. Click **Next** to continue.

Specify a target directory for the base WebSphere Application Server product and for the IBM HTTP Server feature, if you are installing the feature. You cannot change the default installation directory for the embedded messaging feature, if you are installing the feature.

Deleting the default target location and leaving an installation directory field empty stops you from continuing the installation process. The Installation wizard does not proceed when you click **Next**. Enter the required target directory to proceed to the next panel. Non-ASCII special characters are not supported in the name of the installation directory. Spaces are also not supported in the name of the installation directory.

The installer program checks for required space at the beginning of the installation. If you must increase the /tmp allocation, stop the installation program, increase the allocation, and restart the installation.

If you have problems accessing the administrative console after installation, check the `installAdminConsole.log` file for a failure indication. Clean up the /tmp space and reinstall the administrative console using the wsadmin scripting facility.

**5.1+** Version 5.1 does not allow you to install the IBM HTTP Server feature in the same directory as an earlier version.

If you select the embedded messaging feature and prerequisites are missing, the Installation wizard displays the `mq_prereq.log` error log and takes you back to the Installation type panel. Choose **Custom** installation and clear the checkbox for the embedded messaging feature. The `mq_prereq.log` file is in the system temp directory.



30. Specify target directories for configuration files for any selected Web server plug-ins. Click **Next** to continue.

If you are installing the IBM HTTP Server, you do not need to specify a location for its plug-in configuration file. The wizard uses the installation path you specified for the Web server to derive the location.

If you have previously installed the IBM HTTP Server product on the same machine as the WebSphere Application Server, and are now installing just the plug-in, enter a configuration file location of *IHS\_DIR/conf/httpd.conf*, where *IHS\_DIR* is the directory where the IBM HTTP Server product is installed.

31. Specify node information and click **Next**.

Specify the node name and host name. Although the wizard inserts the machine name (of the installation platform) as the node name, you can specify any unique name. The node name is an arbitrary WebSphere Application Server-specific name that must be unique within a cell.

The host name is the network name for the physical machine on which the node is installed. The host name must resolve to a physical network node on the server. When multiple network cards exist in the server, the host name or IP address must resolve to one of the network cards. Remote WebSphere Application Server nodes use the host name to connect to and to communicate with this node. Selecting a host name that other machines can reach within your network is extremely important. Do not use the generic localhost identifier for this value.

If you define coexisting nodes on the same computer with unique IP addresses, define each IP address in the */etc/hosts* file or in a domain name server (DNS) look-up table. WebSphere Application Server configuration files do not provide domain name resolution for multiple IP addresses on a machine with a single network address.

The value that you specify for the host name is used as the value of the *hostName* property in WebSphere Application Server configuration documents. Specify the host name value in one of the following formats:

- Fully qualified domain name servers (DNS) host name string, such as *xmachine.manhattan.ibm.com*
- The default short DNS host name string, such as *xmachine*
- Numeric IP address, such as *127.1.255.3*

The fully qualified DNS host name has the advantage of being totally unambiguous and also flexible. You have the flexibility of changing the actual IP address for the host system without having to change the WebSphere Application Server configuration. This value for host name is particularly useful if you plan to change the IP address frequently when using Dynamic Host Configuration Protocol (DHCP) to assign IP addresses. A format disadvantage is being dependent on DNS. If DNS is not available, then connectivity is compromised.

The short host name is also dynamically resolvable. A short name format has the added ability of being redefined in the local hosts file so that the system can run WebSphere Application Server even when disconnected from the network. Define the short name to *127.0.0.1* (local loopback) in the hosts file to run disconnected. A format disadvantage is being dependent on DNS for remote access. If DNS is not available, then connectivity is compromised.

A numeric IP address has the advantage of not requiring name resolution through DNS. A remote node can connect to the node you name with a numeric IP address without DNS being available. A format disadvantage is that the numeric IP address is fixed. You must change the setting of the *hostName* property in WebSphere Application Server configuration documents whenever you change the machine IP address. Therefore, do not use a numeric IP address if you use DHCP, or if you change IP addresses regularly. Another format disadvantage is that you cannot use the node if the host is disconnected from the network.

32. Review the summary information and click **Next** to install the product code or **Back** to change your specifications. When the installation is complete, the wizard displays the *install\_root\logs\mq\_install.log* installation log if you selected the embedded messaging feature and errors occur with its installation.

33. Review the `mq_install.log` installation log if it displays. Click **Next** to continue. The wizard displays the Registration panel.
34. Click **Next** to register the product, or clear the check box and click **Next** to register at a later time. The Registration panel is in English when the machine locale uses a double byte character set (DBCS) language.

You can register the product now by using the link on this panel or later, by using the Web address in the `install_root/prt/readme_prt.txt` file. The Web address in the file is encoded for your locale. A known problem for some locales corrupts the Web address so that it is similar to the following example. (The Web address is all one line in the file. The following example shows the address on two lines for clarity.)

```
http%3A%2F%2Fwww.ibm.com%2Fsoftware%2Fwebprt%2Fregister%2Fprodreg.nsf%
2Fcontact%3F0penForm%26lang%3DENU%26pid%3D45P8842%26q2%3DWindows+2000
```

Use one of the following Web addresses if your `install_root/prt/readme_prt.txt` file is corrupt:

- <http://www.ibm.com/software/webprt/register/prodreg.nsf/contact?OpenForm&>
- <https://www6.software.ibm.com/reg/prt/prt-r>

The Installation wizard starts the First Steps tool. See “firststeps command” on page 210 for more information.

If you are migrating a federated node as you install, close the First Steps tool. Migrated federated nodes have configuration differences that prevent you from using the First Steps tool.

35. Click **Finish** to close the Installation wizard.
36. Verify the success of the installer program by examining the Exit summary panel and the `install_root/logs/log.txt` for installation status. ISMP records a success message in the `install_root/logs/log.txt` file: “INSTFIN: The installation is complete.” The log is the only source of status information for a silent installation.

Look for severe errors that the installer records in the `install_root/logs/log.txt` file in the installation root directory to verify that no file system or other unusual errors occurred during installation.

If the `install_root/logs/log.txt` file does not contain a record of any problems but problems exist, verify or troubleshoot the installation, as described in “Troubleshooting the installation” on page 214 and in Installation component troubleshooting tips.

If problems exist, correct them, uninstall the product, as described in “Uninstalling the product” on page 295, log off as root and back on, and reinstall.

When installing WebSphere Application Server with embedded messaging from the CD-ROM, the following warning messages are issued despite successful installation:

```
MQSERIES.MQM-CL-HPUX: A test command parameter is not valid." and "*"
"hostname:/cdrom/hpux/messaging/images": Cannot open the
logfile on this target or source. Possibly the media is
read-only or there is a permission problem." on mq_install.log.
```

You can ignore the warning messages, because the problem does not affect the successful installation of WebSphere Application Server with embedded messaging.

37. Restrict access to the `/var/mqm/errors` directory and messaging logging files. After installing the embedded messaging feature, you must restrict access to the `/var/mqm` directory and to log files that are needed for embedded messaging, such that only the `mqm` user or members of the `mqm` user group have write access. For detailed information, see Installing WebSphere embedded messaging as the JMS provider and Securing messaging directories and log files.
38. Install the most current fix pack and cumulative fix for the WebSphere Application Server product. See Recommended updates for WebSphere Application Server for information about downloading and installing the upgrades.
39. Install the Network Deployment product to manage multiple base product Application Servers. The WebSphere Application Server, Version 5.x product does not provide centralized management of multiple servers. The WebSphere Application Server Network Deployment, Version 5.x product provides this function.



The deployment manager process (dmgr) in the Network Deployment product manages a cell of Application Servers. You can federate a base Application Server into the cell or unfederate it. While federated, the configuration of the base Application Server is managed from the deployment manager. See the information center for the Network Deployment product to get started installing the product:

#### 5.1+ Network Deployment installation

40. Tune your system for performance. For best performance on any platform, see Tuning performance parameter index.
41. Optional: Create a monitored process for one or more Application Server processes or for the HTTP Server, as described in “Automatically restarting server processes” on page 205.

You can create monitored processes after the installation is complete.

Processes started by a **startServer.sh** command are not running as monitored processes, regardless of how you have configured them. You must start the server process with a shell script based on the example `rc.was` file, to have the server running as a monitored process.

The Installation wizard configures the base product. It is not necessary to perform further configuration at this time.

You have now successfully installed WebSphere Application Server and the features that you selected.

### Uninstalling and reinstalling

See “Uninstalling the product” on page 295 for information about uninstalling any WebSphere Application Server product.

**5.1+** If you uninstalled the V5.1 base product but left the embedded messaging feature installed, and now you want to reinstall the V5.1 product, see “Reinstalling V5.1 after uninstalling and leaving the embedded messaging feature installed” on page 326.

After uninstalling a WebSphere Application Server product, reinstalling into the same directory without first deleting all directory contents results in invalid XML configurations because of the retention of old files. Uninstall manually to delete all of the files so that you can reinstall with a clean system, as described in [Manually uninstalling on AIX platforms](#)

Symptoms that you might experience if you reinstall without uninstalling manually include:

1. The **versionInfo.sh** command states that a product is installed but the product is not installed.
2. Specific directories might be missing in the installation root directory.

If you experience symptoms such as these, uninstall everything manually and reinstall. Reinstallation is successful if you manually uninstall before reinstalling.

After manually uninstalling and before reinstalling with the embedded messaging component, look for the following directory: `/var/mqm/log/WAS_system_name_server_name`. If this directory exists, confirm that the directory is empty and that the user, `mqm`, can open and write to it. If it is not accessible, the embedded messaging installation program throws the following error:

```
AMQ7064: Log path not valid or inaccessible is written in the
        createMQ.system_name_server_name.log file.
```

If this error occurs, the installation of the embedded messaging component fails.

### Miscellaneous tips for AIX platforms

Table 16. Installation and migration tips

| Operating platform           | Tip in “Platform-specific tips for installing and migrating” on page 146  |
|------------------------------|---|
| AIX platforms                | <p>AIX platforms</p> <ul style="list-style-type: none"> <li>• Avoiding a segmentation fault error when installing or uninstalling</li> <li>• Ignoring DBCS messages when you do not require DBCS support. Otherwise, install the necessary patches</li> <li>• Navigating if the scroll bar disappears on the installation feature panel</li> <li>• Avoiding a DSAPI filter-loading error when the Lotus Domino Server starts</li> </ul> |
| All platforms                | All platforms   |
| All Linux and UNIX platforms | All Linux and UNIX-based platforms  |

## Mounting a CD-ROM drive on AIX

This topic describes how to mount a CD-ROM drive as the root user on an AIX operating system platform.

This topic describes a procedure for using SMIT to mount a CD-ROM drive. Before using SMIT to mount a CD-ROM drive, try the following command:

```
# mount -rv cdrfs /dev/cd0 /cdrom
```

The cd0 device is the name assigned to your CD-ROM. Your system might use another device name. You can use `smitty` to see the device name.

The `/cdrom` directory is the mount directory. If a CD-ROM drive has ever been mounted on your system, there is a mount directory created with `smitty`. It might be a different directory than the `/cdrom` directory.

If the command was successful, you can unmount the CD-ROM drive with the following command:

```
# umount /cdrom
```

If you cannot determine the device name and the mount directory, use the procedure in this topic to mount the CD-ROM drive.

This topic describes mounting a local CD-ROM drive. This procedure assumes you are already logged on as root.

1. Insert the CD-ROM labeled, *Integration Server Disk 1 of 2* into the CD-ROM drive.
2. If the `/cdrom` directory does not already exist, enter the following command to create it:
 

```
# mkdir /cdrom
```
3. Start SMIT by entering the following command:
 

```
# smitty
```
4. From the SMIT System Management menu, select **System Storage Management (Physical & Logical Storage)**.
5. Click **File Systems**.
6. Click **Add/Change/Show/Delete File Systems**.
7. Click **CDROM File Systems**.
8. Click **Add a CDROM File System**.
9. Click **List** and select **CD0** as the device name.
10. Enter `/cdrom` in the Mount Point field.
11. Click **OK**. The Output: field contains messages about any errors that can occur at this point in the procedure. If another device is already mounted on the mount point, the process fails.
12. Click **Done**.
13. Click **Cancel** to clear the Add CDROM File System dialog box.
14. Press **F12** to close SMIT or click **Exit > Exit SMIT**.

15. Enter the following command:  

```
# smit mountfs
```

 The Mount a File System dialog box appears.
16. Click **List** and select the **CD0** CD-ROM device.
17. Type **/cdrom** in the DIRECTORY field.
18. Click **List** in the Type of File System field.
19. Click **cdrfs** as the file system type.
20. Click **yes** for the Set the Mount as Read-Only system field.
21. Click **OK**. A successful mount generates no errors in the Output: field.
22. Click **Done**.
23. Click **Cancel** to exit SMIT.

For more detailed instructions, consult your AIX documentation.

## Installing the base Application Server on HP-UX platforms

This topic describes how to install the base WebSphere Application Server product as the root user on an HP-UX operating system platform.

You cannot install the product correctly as a non-root user. If you back up the product CD-ROM, do so as root. Backup copies made from non-root users do not preserve the correct file attributes and do not work.

If you encounter a problem such as not having enough temporary space or not having the right packages on your system, cancel the installation, make the required changes, and restart the installation.

The installation uses InstallShield for Multiplatforms (ISMP) to perform the installation. You can use the Installation wizard or perform the installation from a command line, using the silent installation method.

### Installation programs in WebSphere Application Server products

#### 5.1 +

| Product  | Link to installation procedure                             | Label on product CD  |
|--|--|--|
| (Base) WebSphere Application Server              | Base product installation (which links to this procedure!) | <b>Application Server, IBM HTTP Server</b>                     |
| Network Deployment                               | Network Deployment installation                            | <b>Deployment Manager</b>                                      |
| WebSphere Business Integration Server Foundation | Integration Server installation                            | <b>Integration Server Disk 1 and Integration Server Disk 2</b> |

Use the Network Deployment installation image to manage a multimachine environment, where you have installed the base product on different machines and want to manage the Application Servers in a group, or *cell*. If you buy the Network Deployment product, you also get the base product in the package.

WebSphere Business Integration Server Foundation is the V5.1 level of the Enterprise product. WebSphere Business Integration Server Foundation, Version 5.1 extends the base WebSphere Application Server V5.1 product. After migrating the underlying product to V5.1, do not reinstall the V5.0.x Enterprise product. Version 5.0.x of the Enterprise product does not extend Version 5.1 of the base WebSphere Application Server product nor does it extend the V5.1 Network Deployment product.

**5.1 +** If you buy the WebSphere Business Integration Server Foundation product, you also get the Network Deployment product and the base product in the package.

## Creating multiple Application Servers on a single machine

Although you can create multiple servers on a base WebSphere Application Server node, the servers all share one set of configuration files. Changes that you make to one server affect the others. Configuration documents might become corrupted. The **wsinstance** command can create multiple configuration instances. Each instance is a stand-alone Application Server with its own set of configuration files. Or install the Network Deployment product to create and manage multiple base Application Servers.

### Order of installation

**5.1 +** Install the base product before installing the Network Deployment product when installing both products on the same machine. Install the Network Deployment product before the Integration Server product that extends the Network Deployment product. You can install the Integration Server product before the base product. The Integration Server product can install the base product in what is known as an *umbrella* installation but Integration Server cannot install the Network Deployment product. Some features of the base product cannot be installed by Integration Server.

The embedded messaging feature that is included in the default installation requires that you install base before Network Deployment when installing both on the same machine. Otherwise, the order does not matter. See the following installation tip for more information:

Table 17. Installation tip

| Operating platform | Tip in “Platform-specific tips for installing and migrating” on page 146  |
|--------------------|---|
| All platforms      | Installing WebSphere Application Server products in order on the same machine, when installing the embedded messaging component |

This topic is available in Adobe PDF format on the product CD-ROM and online in an information center. The information center always has the most current information. The information center displays in the language of your machine locale if possible.

**5.1 +** The installation guide PDF is updated occasionally. Download a new installation guide at [ftp://ftp.software.ibm.com/software/websphere/appserv/library/wasv51base\\_gs.pdf](ftp://ftp.software.ibm.com/software/websphere/appserv/library/wasv51base_gs.pdf).

The Launchpad tool lets you access the product overview, the `readme.html` file, and the installation guide. See “Using the Launchpad to start the installation” on page 189.

You also use the Launchpad during the installation procedure to install the product. The installation program performs the following actions:

- Checks prerequisites automatically
- Looks for a previous WebSphere Application Server installation, to determine whether to display the Migration panel or the Coexistence panel during the installation
- Installs the IBM HTTP Server and other features, if you select them

A known problem with the Launchpad can prevent it from using Netscape to open the documentation links on some operating system platforms.

If you use the Mozilla browser, some Launchpad links do not work. The Launchpad attempts to call the Netscape browser in the `/usr/bin/netscape` directory. Try a symbolic link to the Mozilla browser to fix the problem as shown in the following example:

```
ln -sf /usr/bin/mozilla /usr/bin/netscape
```

You can also launch the following links directly from your browser:

## Product Overview

<http://www.ibm.com/software/webservers/appserv/>

Your security options might prevent redirection, such as to the <http://www-306.ibm.com/software/info1/websphere/index.jsp?tab=products/appserv> Web site. If so, you can identify the IBM Web site as a trusted site to allow the redirection. For example, on Internet Explorer, add <http://www-306.ibm.com> to the list of Trusted Sites by selecting **Tools > Internet Options > Security (tab) > Trusted Sites**.

## Readme File

*CD-ROM\_mount\_point/readme/readme\_en.html*

## Installation Guide

*CD-ROM\_mount\_point/docs/InstallGuide\_en.PDF*

The *Installation Guide* is in Adobe PDF format. Viewing this document requires you to have Adobe Acrobat Reader, which is a free download from the Adobe Acrobat Web site.

After using the Launchpad to view product documentation, perform the following procedure. The procedure includes several preliminary steps before actually launching the installer program.

1. Stop all WebSphere Application Server-related Java processes on the machine where you are installing the product.
2. Stop any Web server process, such as the IBM HTTP Server.
3. Provide adequate disk space.

**5.1+** The base Application Server requires the following disk space:

### **550 MB for the /opt/WebSphere/AppServer directory**

The installation root directory includes the base product code.

### **100 MB for the /tmp directory**

The temporary directory is the working directory for the installation program.

Verify that you have at least 100 MB of free space to avoid problems.

A message about free space occurs when less than 4 MB of free space remains after starting the installation. The InstallShield for MultiPlatforms (ISMP) program displays a message about using the `-is:tempdir` parameter to identify an alternate temporary space directory.

Ignore any `-is:tempdir` message. The `-is:tempdir` parameter is not supported. Cancel the installation, allocate a total of 100 MB of free space in the `/tmp` directory, and start the installation again.

### **25 MB for the /opt/IBMHttpServer directory**

The IBM HTTP Server feature requires this space.

### **25 MB for the /opt/IBM/gsk7 directory**

The Tivoli Global Security Kit requires this space.

### **700 MB total requirement without the embedded messaging feature**

The total amount of space required includes the `/tmp` space, which is released after installation. Space requirements for the embedded messaging feature are described after the next few steps that describe setting up required users and user groups for the feature.

The Installation wizard displays required space for individual features on the Feature selection panel. The Installation wizard also warns you if you do not have enough space to install the product.

If you plan to migrate applications and the configuration from a previous version, verify that application objects have available disk space. As a rough guideline, plan for space equal to 110 percent of the size of the application objects:

- **For Version 3.5.x:** The size of application Java archive (JAR) files, Web archive (WAR) files, and servlet files
- **For Version 4.0.x:** The size of enterprise archive (EAR) files

- **5.1+** For Version 5.0.x: The size of EAR files
4. Define the user groups and the user needed for the embedded messaging feature.
    - a. Use the System Administration Manager (SAM) to create the **mqm** and **mqbrkrs** user groups.
    - b. Use SAM to create the **mqm** user.
    - c. Use SAM to add the **mqm** and **root** users to the **mqm** group.
    - d. Use SAM to add **root** to the **mqbrkrs** group.

The recommended user ID for running the JMS server process is root. If you do run the JMS server process under another user ID, add that user ID to the **mqm** and **mqbrkrs** groups. User IDs longer than 12 characters cannot be used for authentication with the embedded WebSphere JMS provider.

The mqm user starts the JMS server for general JMS support and the WebSphere embedded broker for WebSphere Application Server topic connections.

5. Log out and back in to pick up the secondary user groups, mqm and mqbrkrs, for root. Use **ssh** instead of **telnet** to log in or run the following command after logging on:

```
su -
```

Use the **id** command or the **groups** command to see defined groups for root. If mqm and mqbrkrs are not in the list that is returned, you cannot install the embedded messaging feature:

```
[root@was2 root]# id
uid=0(root) gid=0(root)
groups=0(root),1(bin),2(daemon),
3(sys),4(adm),6(disk),10(wheel),500(mqm),501(mqbrkrs)
```

```
[root@was2 root]# groups
root bin daemon sys adm disk wheel mqm mqbrkrs
```

6. Allocate adequate disk space for the embedded messaging feature if you are planning to install the feature. The installation locations for the embedded messaging feature are fixed as shown in the following table, which lists the locations for the base messaging functions and the messaging broker functions for publish/subscribe messaging.

Table 18. Space requirements for the embedded messaging feature on HP-UX

| Component                    | Base code | Broker code | Base data | Broker data |
|------------------------------|-----------|-------------|-----------|-------------|
| Path                         | /opt/mqm  | /opt/wemps  | /var/mqm  | /var/wemps  |
| Server and client subfeature | 40 MB     | 105 MB      | 8 MB      | 5 MB        |
| Client subfeature            | 15 MB     | 15 MB       | 5 MB      | N/A         |

7. Prepare to install the embedded messaging feature with WebSphere MQ. The embedded messaging feature is based on the IBM WebSphere MQ product. The feature and the product each provide a Java message service (JMS) function that supports queues for point-to-point messaging and topics for publish and subscribe messaging.

You can install the embedded messaging feature with or without the WebSphere MQ product on the same machine. To support both the embedded messaging feature and the WebSphere MQ product on the same machine, the WebSphere MQ product must be at a certain fix level and must have several of its features installed.

If you already have WebSphere MQ installed, you can configure it as the JMS provider. Otherwise, you can install the embedded messaging feature during the installation or install the WebSphere MQ product or another JMS provider after you install.

Even though you might decide now to install only the embedded messaging feature, you can install the WebSphere MQ product later and use the IBM WebSphere MQ product as the JMS provider instead.

8. Verify that you have upgraded to WebSphere MQ 5.3 with the CSD04 update to install embedded messaging on a machine where you already have WebSphere MQ installed.



Determine if your WebSphere MQ 5.3 installation is at the required level by running the **mqver** utility provided by WebSphere MQ.

The required level as indicated by the mqver command:

```
Name:      WebSphere MQ
Version:   530.4 CSD04
...
```

9. Verify that you have installed the required WebSphere MQ 5.3 features to install embedded messaging on a machine where you already have WebSphere MQ installed. Verify that you have installed the following features:
  - When installing the embedded messaging server and client feature, the required MQ features are *Server* and *Java messaging*.
  - When installing the embedded messaging client feature, the required MQ feature is *Java messaging*.

If you attempt to install the embedded messaging feature when WebSphere MQ is already installed, the level of WebSphere MQ must be Version 5.3 with the required MQ features. Otherwise, the installation of the embedded messaging feature fails with prerequisite check errors.

10. Create and mount a journalized file system called `/var/mqm` for your messaging working data. Use a partitioning strategy with a separate volume for embedded messaging or WebSphere MQ data to isolate system activity from the potentially high volume of messaging work that can build up in the `/var/mqm` directory.
11. Create separate file systems for log data in the `var/mqm/log` directory and error files in the `var/mqm/errors` directory. Store log files on a different physical volume from the embedded messaging queues, which are in the `var/mqm` directory. This ensures data integrity in the case of a hardware failure. If you are creating separate file systems, allow the following minimum free space:

**30 MB** `/var/mqm`

**20 MB** `/var/mqm/log`

**4 MB** `/var/mqm/errors`

The `/var` file system stores all the security logging information for the system and stores the temporary files for e-mail and printing. Therefore, it is critical that you maintain free space in `/var` for these operations. If you do not create a separate file system for messaging data, and `/var` fills up, all security logging stops on the system until free space is available in `/var`. Also, e-mail and printing do not work without some available free space in `/var`.

You have the same options for creating file systems for the embedded messaging feature as you do for WebSphere MQ. For example, if you cannot install the embedded messaging options in the required file system (for example, if it is too small), you can do one of the following *before* installing the Embedded Messaging options:

- Create and mount a new file system for the installation directory.
- Create a new directory anywhere on your machine, and create a symbolic link from the required installation directory to the new directory. For example:

```
mkdir /bigdisk/mqm
ln -s /bigdisk/mqm /usr/mqm
```

12. Set kernel values to support Application Server. Several HP-UX kernel values are typically too small for the product and the embedded messaging feature. Starting the internal JMS server or client with insufficient kernel resources produces a First Failure Support Technology (FFST) file in the `/var/mqm/errors` directory.

Before installing embedded messaging, review the machine configuration and, if needed, set appropriate HP-UX kernel settings.

Queue managers are generally independent of each other. Therefore system kernel parameters, for example `shmmni`, `semmni`, `semmns`, and `semmnu` need to allow for the number of queue managers in the system.

To set kernel parameters, perform the following steps:

- a. Log into the host machine as root.



- b. Determine the physical memory, which you must know to avoid setting certain kernel parameters above the physical capacity:
  - 1) Start the HP-UX System Administration Manager (SAM) utility.
  - 2) Select **Performance Monitors > System Properties > Memory**.
  - 3) Note the value for Physical Memory and click **OK**.
  - 4) Exit from the SAM utility.
- c. Set the `maxfiles` and `maxfiles_lim` parameters to at least 4096. (The following table recommends 8000 and 8196, respectively. You must first edit the `/usr/conf/master.d/core-hpux` file, to allow the SAM utility to set values greater than 2048:
  - 1) Open the file `/usr/conf/master.d/core-hpux` in a text editor.
  - 2) Change the line, "`*range maxfiles<=2048`" to "`*range maxfiles<=60000`"
  - 3) Change the line, "`*range maxfiles_lim<=2048`" to "`*range maxfiles_lim<=60000`"
  - 4) Save and close the file. Old values might be stored in the `/var/sam/boot.config` file. Force the SAM utility to create a new `boot.config` file:
    - a) Move the existing version of the `/var/sam/boot.config` file to another location, such as the `/tmp` directory.
    - b) Start the SAM utility.
    - c) Select **Kernel Configuration > Configurable Parameters**. When the Kernel Configuration window opens, a new `boot.config` file exists.  
Alternatively, rebuild the `boot.config` file with the following command:  

```
# /usr/sam/sbin/getkinfo -b
```
- d. Set new kernel parameter values:
  - 1) Start the SAM utility.
  - 2) Select **Kernel Configuration > Configurable Parameters**.
  - 3) For each of the parameters in the following table, perform this procedure:
    - a) Highlight the parameter to change.
    - b) Select **Actions > Modify Configurable Parameter**.
    - c) Type the new value in the **Formula/Value** field.
    - d) Click **OK**.

Typical kernel settings for running WebSphere Application Server appear in the following table:

| Parameter                    | Value   |
|------------------------------|---|
| <code>dbc_max_pct</code>     | 25  |
| <code>maxdsiz</code>         | 805306358   |
| <code>maxdsiz</code>         | 2048000000 (when the base and Network Deployment products are on one machine) |
| <code>maxfiles_lim</code>    | 8196 (Change this one before <code>maxfiles</code> .)                         |
| <code>maxfiles</code>        | 8000  |
| <code>maxssiz</code>         | 8388608   |
| <code>maxswapchunks</code>   | 8192  |
| <code>max_thread_proc</code> | 3000  |
| <code>maxuprc</code>         | 512   |
| <code>maxusers</code>        | 512   |
| <code>msgmap</code>          | 2048  |
| <code>msgmax</code>          | 65535   |
| <code>msgmax</code>          | 131070 (when the base and Network Deployment products are on one machine)     |
| <code>msgmnb</code>          | 65535   |
| <code>msgmnb</code>          | 131070 (when the base and Network Deployment products are on one machine)     |

| Parameter | Value                           |
|-----------|---------------------------------|
| msgmni    | 50                              |
| msgseg    | 32767                           |
| msgssz    | 32                              |
| msgtql    | 2046                            |
| nfile     | 58145                           |
| nflocks   | 3000                            |
| ninode    | 60000                           |
| nkthread  | 7219                            |
| nproc     | 4116                            |
| npty      | 2024                            |
| nstrpty   | 1024                            |
| nstrtel   | 60                              |
| sema      | 1 (with embedded messaging)     |
| semaem    | 16384 (with embedded messaging) |
| semmap    | 514                             |
| semni     | 2048                            |
| semmns    | 16384 (with embedded messaging) |
| semmnu    | 1024                            |
| semume    | 200                             |
| semvmx    | 32767 (with embedded messaging) |
| shmmax    | 2147483647                      |
| shmem     | 1 (with embedded messaging)     |
| shmmni    | 1024                            |
| shmseg    | 1024                            |
| STRMSGSZ  | 65535                           |

When WebSphere Application Server and IBM DB2 are on the same machine, some kernel values are higher than those shown in the preceding table.

See the following Web links for more information:

- Recommended HP-UX kernel configuration parameters for DB2 V8
- (V5.0.x only) Recommended HP-UX kernel configuration parameters for DB2 V7

e. Select **Actions > Process New Kernel**.

f. Click **Yes** on the information window to confirm your decision to restart the machine.

Follow on-screen instructions to restart your machine and to enable the new settings.

g. If you plan to redirect displays to non-HP machines, do the following before running the WebSphere Application Server installation wizard:

1) Issue the following command to obtain information on all public locales accessible to your application:

```
# locale -a
```

2) Choose a value for your system from the output that is displayed and set the LANG environment variable to this value. Here is an example command that sets the value of LANG to en\_US.iso88591

```
# export LANG=en_US.iso8859
```

13. Verify that prerequisites and corequisites are at the required release levels. Although the Installation wizard checks for prerequisite operating system patches with the prereqChecker application, review the prerequisites on the IBM WebSphere Application Server supported hardware, software, and APIs Web site if you have not already done so.

Refer to the documentation for non-IBM prerequisite and corequisite products to learn how to migrate to their supported versions.

Some operating systems that were not supported at the time that this product was shipped on CD-ROM might now be supported. You might receive a message from the prereqChecker program that an operating system is not supported when, in fact, the operating system is supported.

Always consult the IBM WebSphere Application Server supported hardware, software, and APIs Web site to determine whether your operating system is supported when you receive a message from the prereqChecker program. The Web site lists all supported operating systems and the operating system fixes and patches that you must install to have a compliant operating system.

After confirming that your operating system is supported and that you have installed all necessary patches, you can click **Next** to continue an installation when you receive an error message from the prereqChecker program.

**Ignoring a prerequisite checker error for a patch when a superset of the patch has been installed.**

If you apply a superset patch that includes a specific patch that the prerequisite checker program requires, you can ignore the message from the installer program and continue the installation.

You can always continue the installation whenever you see an error message about a missing prerequisite. It is your option to ignore the messages and continue the installation. Although the list of prerequisite patches that the installer program checks is extensive, the list does not include all superset patches.

For example, the installer program checks for patch PHCO\_29109. The HP-UX Web site recommends that you install a superset patch, PHCO\_29960, instead of PHCO\_29109.

After installing the patch and rebooting the machine, reinstalling the base WebSphere Application Server results in the same message about the missing PHCO\_29109 prerequisite. You can ignore the error because you know that you have installed a superset patch.

14. Remove any entries from the `/usr/bin/jitk.db` file if you have uninstalled WebSphere Application Server Enterprise Edition Version 4.1. Remove any remaining artifacts from an uninstalled V4.1 system to prevent the display of the Coexistence panel or the Migration panel during installation.

The Installation wizard might display the Migration panel or the Coexistence panel even though you have uninstalled WebSphere Application Server Version 4.1. You can prevent the Installation wizard from recognizing a previously deleted V4.1 Application Server by removing the following entry from the `/usr/bin/jitk.db` file:

```
WebSphere Application Server 4.1
```

Remove other Version 4.x entries for WebSphere Application Server products that are no longer on your system.

15. Verify the system **cp** command when using emacs or other freeware.

If you have emacs or other freeware installed on your HP-UX system, verify that the system **cp** command is being used.

- a. Type `which cp` at the command prompt before running the installation program for the WebSphere Application Server product.
- b. Remove the freeware directory from your PATH if the resulting directory output includes freeware. For example, if the output is similar to this `/opt/freeware/bin/cp` message, remove the directory from the PATH.
- c. Install the WebSphere Application Server product.
- d. Add the freeware directory back to the PATH.

If you install with a **cp** command that is part of a freeware package, the installation might appear to complete successfully, but the Java 2 SDK that the product installs might have missing files in the *install\_root/java* directory.

Missing files can destroy required symbolic links. If you remove the freeware **cp** command from the PATH, you can install the Application Server product successfully.

Perform the following step to verify that the Java 2 SDK is working correctly.

16. Verify the Java 2 SDK on the WebSphere Application Server CD. If you copied the product CD to back it up and are using a backup version, perform the following steps to verify that the Java 2 SDK on the product CD-ROM is working correctly.

- a. Change directories to the */hpux/WAS/jdk/java/bin* directory on the product CD-ROM.

For example:

```
cd /mnt/hpux/WAS/jdk/java/bin
```

- b. Verify the Java 2 SDK version.

Type the following command:

```
./java -version
```

The command completes successfully with no errors when the Java 2 SDK is intact.

17. Select the Installation wizard method or the silent installation method but do not start the installation yet. The installer program has two interfaces, the Installation wizard and a silent command-line installation.

#### **Performing the installation with the wizard**

You can start the Installation wizard using the Launchpad or directly using the **install** command.

The default installation method is to open a command window and issue the command to start the Launchpad tool. Click the **Install the product** option on the Launchpad. (See “Using the Launchpad to start the installation” on page 189.)

This option launches the Installation wizard in the language of your machine locale unless there is no translation for your locale, in which case you receive the English version.

A short delay occurs before the ISMP wizard displays. You do not need to click the Install the product option more than once to cause the wizard to display. The delay is particularly noticeable on x-windows platforms.

You can also start the Installation wizard using the **/cdrom/hpux/install** command, where */cdrom* is the mount point for the product CD-ROM and *hpux* is the platform directory.

#### **Performing a silent installation**

You can perform a silent installation using the **-options responsefile** parameter with the command method:

```
fully_qualified_CD_pathname/install  
-options fully_qualified_hard_disk_drive_path_name/responsefile
```

```
# /cdrom/hpux/install -options /tmp/my_responsefile
```

Start the silent installation with a fully qualified path to the options response file. Otherwise, the Installation wizard starts.

A silent installation causes the installation program to read your responses from the options response file, instead of from the wizard interface. You must customize the *responsefile* before installing silently. See “Customizing the base options response file” on page 191.

After customizing the file, you can issue the command to silently install. See “Installing silently” on page 190.

After issuing the command, the following text displays:

```
# .....  
.InstallShield Wizard
```

Initializing InstallShield Wizard...

Searching for Java(tm) Virtual Machine...

The silent installation runs without displaying status to the window:

- Press **Enter** when the installation is complete to return to the command prompt.
- Press **Enter** at any time to return from a background job to the command prompt.

You can change the `-W launchPRTBean.active` option in the response file to display the Registration panel to indicate the completion of a silent installation on a local system with a graphical user interface.

To determine the status of the silent installation, review the installation logs in the `install_root/logs` directory or in the `/tmp` directory. See “Troubleshooting the installation” on page 214 for more information about log files.

Silent installation is particularly useful if you install the product often.

The rest of this procedure assumes that you are using the Installation wizard. Corresponding entries in the response file exist for every prompt that is described as part of the wizard.

Review the description of the “responsefile” on page 204 for more information. Comments in the file describe how to customize their options.

### Asynchronous and synchronous command lines

After running the **install** command, the command line returns synchronously. A synchronous **install** command returns the command line after the installation is complete.

You can start the installation asynchronously with the installation process and its children processes all running as background processes. Consult your operating system documentation to learn how to issue asynchronous commands. After running the **install** command, the command line returns immediately.

Do not misinterpret an asynchronous command line to mean that the installation has finished when the command prompt returns. Although the command line returns, either the Installation wizard or a silent installation might still be in progress.

### Installing with a network file system mount

If you must use an NFS mount, see the following installation tip:

Table 19. Installation tip

| Operating platform | Tip in “Platform-specific tips for installing and migrating” on page 146 |
|--------------------|--|
| All platforms      | Platform-specific issues when dealing with network file systems          |

18. Insert the product CD-ROM labeled, *Application Server, IBM HTTP Server* into a CD drive.
19. Open a shell window and mount the CD drive, as described in “Mounting a CD drive on HP-UX” on page 86. Use the same shell window throughout the installation procedure.
20. Start the installation with the `/cdrom/hpux/launchpad.sh` command, where `/cdrom` is the mount point for the product CD-ROM and `hpux` is the platform directory on the CD-ROM. You can also start the installation with the `/cdrom/hpux/install` command:

```
# /cdrom/hpux/install
```

The readme link in the Launchpad is to the `readme.html` file in the CD root directory. The *Getting Started* document that contains installation information is in the `docs` directory on the CD.

### 5.1+

Download a new installation guide at

[ftp://ftp.software.ibm.com/software/webserver/appserv/library/wasv51base\\_gs.pdf](ftp://ftp.software.ibm.com/software/webserver/appserv/library/wasv51base_gs.pdf).

The rest of this procedure assumes that you are using the Installation wizard. Corresponding entries in the response file exist for every prompt that is described as part of the wizard. Review the description of the "responsefile" on page 204 for more information. Comments in the file describe how to customize the options.

21. Click **Next** to continue. The license agreement displays.

The Installation wizard does not support hot keys, such as **Alt-N**. You can tab to **Next** and press **Enter** to select it, for example.

22. Click the radio button beside the **I accept the terms in the license agreement** message if you agree to the license agreement and click **Next** to continue. After you accept the licensing terms, the Installation wizard checks for prerequisites and for previous versions, with which it can either migrate or coexist.

As the base WebSphere Application Server product version changes, its prerequisites and corequisites change. Updating your database, Web server, Software Development Kit (SDK), and other software is probably necessary.

The base WebSphere Application Server product simplifies migrating product prerequisites, by providing the option to install a complimentary Web server and SDK on your supported operating system. You can uninstall back-level prerequisites and let the Installation wizard install current versions.

If the wizard finds a previous version of WebSphere Application Server, it prompts you to migrate applications and the configuration from the previous version, or to coexist with it. If it finds more than one previous version, the Installation wizard lists them for you to select which one to migrate.

#### **Migrating or coexisting with an existing WebSphere Application Server node that HP-UX does not recognize.**

In some cases, the InstallShield for MultiPlatforms (ISMP) program does not detect a previously installed version of WebSphere Application Server because of a failure to read the registry keys on HP-UX. You can force the migration and coexistence panel to display, by starting the installation with an option on the `/cdrom/hpux/install` command.

For example, use this command:

```
./install -W previousVersionDetectedBean.previousVersionDetected="true"
```

You can also force the appearance of the coexistence panel to change conflicting port number assignments. For example, force the coexistence panel to appear using this command:

```
./install -W coexistenceOptionsBean.showCoexistence="true"
```

On either panel, identify the location of the existing product instance to cause it to be recognized.

23. Choose whether to install additional features or to install the product again when a previous installation of the same level product exists. You can add features to an unfederated base node or to a deployment manager node at any time, by running the Installation wizard again. Federated nodes must be unfederated before adding features to avoid conflicts while the deployment manager owns the configuration of the base node.

Log off as root and back on again.

This Installation wizard panel appears when the installer program detects a previous installation at the same product level. The panel lets you select whether to add features to the existing installation, or to perform a new installation to another directory. Use a procedure in the following description to install features without causing component regression problems.

When adding features, previously installed features are checked and grayed out with the term **(Installed)** at the end of the feature name. The IBM HTTP Server feature is an exception. You can install more than one instance of the IBM HTTP Server product. It is not grayed out or labeled **(Installed)**. You can install the plug-in feature each time you install IBM HTTP Server, too. Select a new directory for each instance of IBM HTTP Server that you install.



Table 20. Installation tip

| Operating platform | Tip in “Platform-specific tips for installing and migrating” on page 146 |
|--------------------|--|
| All platforms      | Installing all Web server plug-ins during the initial installation.      |

If you intend to install additional features, use the following procedure to avoid component regression problems. It is important that you understand that there is no way to add features to a base node without unfederating it from its cell and losing its configuration. The configuration for the base node is restored back to its original configuration, before it was federated and before you changed it with the administrative console of the deployment manager.

Restoring an original configuration means that you lose the configuration for any additional servers that you created on the base node from the deployment manager. (The additional servers will not exist any more.) You will lose any other configuration you performed from the deployment manager administrative console.

Although you can use the **backupConfig** command to save the configuration, you cannot restore it with the **restoreConfig** command because the configuration you restore does not include any features that you add to the base node.

You can use the **backupConfig** command to save the Network Deployment configuration so that you can restore it if necessary. You can also refer to the configuration as you use the administrative console of the deployment manager to reconfigure the base node.

- a. If the node is a base product node in a deployment manager cell, unfederate the node with the **removeNode** command. Removing the base node from the cell also removes the configuration for the base node, which resides at the cell level.
  - b. Uninstall any interim fixes, starting with the last one and finishing with the first one.
  - c. Uninstall any cumulative fixes you installed, starting with the last one and finishing with the first one.
  - d. Uninstall any fix packs you installed, starting with the last one and finishing with the first one.
  - e. Log off and back on.
  - f. Install new features.
  - g. Install the most current fix pack.
  - h. Install the most current cumulative fix.
  - i. Install any interim fixes to bring the node back to its previous fix level.
  - j. If the node was part of a cell, rejoin the node to the cell with the **addNode** command or the deployment manager administrative console. This action synchronizes the master cell configuration with changes you make to the Application Server configuration during the installation of the new features.
  - k. Reconfigure the base node with the Network Deployment administrative console.
24. Choose to migrate applications and the configuration from a previous version, to coexist with another version, or to neither coexist or migrate. Click **Next** to continue. See “Migrating and coexisting” on page 326 for more information.

All WebSphere Application Server products on a single machine share some of the code in the embedded messaging feature, if installed. The required level of the embedded messaging feature for V5.1 (CSD04) is not the same as for V5.0.0 or V5.0.1. The required level of the embedded messaging feature for V5.1 is the same as for V5.0.2.

If you attempt to install V5.0.2 or V5.1 on a machine where a version of the embedded messaging feature is at a release level earlier than CSD04, the installer program displays the message log in a panel. The message that you see is similar to one of the messages in the following example:

```
MQSeries or WebSphere MQ server at an earlier release than required to support
embedded messaging is already installed on the system.
Unsupported earlier maintenance level of MQSeries or WebSphere MQ detected.
```



Unsupported earlier release of MQSeries client or WebSphere MQ client detected.  
 Unsupported maintenance level of MQSeries client or WebSphere MQ client detected.  
 Software conflict with MQSeries JMS SupportPac MA88 detected.

To correct the problem, perform one of the following actions:

- Upgrade the full MQSeries or WebSphere MQ product to WebSphere MQ at the latest level that supports embedded messaging (CSD04).

**5.1+** See Installing WebSphere embedded messaging as the JMS provider for more information.

- Uninstall the existing MQSeries or WebSphere MQ product if MQSeries or WebSphere MQ is not required on this system and reinstall the WebSphere Application Server product. Select the embedded messaging feature.

The MQSeries JMS SupportPac MA88 problem is slightly different. Uninstall the MQSeries JMS SupportPac MA88 and reinstall the WebSphere Application Server product, selecting the embedded messaging feature. The function provided by SupportPac MA88 is included in the embedded messaging feature.

You can upgrade the WebSphere Application Server product to V5.0.2 before migrating it to V5.1 to avoid any problem with an incorrect level of the embedded messaging feature. See “Upgrading a Version 5.0.0 or Version 5.0.1 product to Version 5.0.2” on page 371.

You can also perform the procedure for migrating V5.0.0 or V5.0.1 with embedded messaging to V5.1. See “Migrating Version 5.0.0 or Version 5.0.1 of WebSphere Application Server with embedded messaging to Version 5.1” on page 347.

To share embedded messaging in a coexistence environment, the node names for each installation must be unique, so that each installation has a message queue manager that is named uniquely. To migrate V5.0.2 to V5.1, the node names must be identical. Therefore, the queue manager names are also identical, if you are migrating from V5.0.2 to V5.1.

To prevent losing the queue manager when you uninstall V5.0.2 (or V5.1), you must create a dummy queue manager before uninstalling one of the WebSphere Application Server versions. A series of migration topics in “Migrating and coexisting” on page 326 describe how to migrate after the installation.

**5.1+** The first rule of migration is to migrate after you install WebSphere Business Integration Server Foundation, if you are planning to install the Integration Server:

| If you are planning to install these products: |                    | Select the migration option while installing this product: |                    |
|--|--------------------|--|--------------------|
| Base product                                   | Integration Server | Base product   | Integration Server |
| X  |                    | X  |                    |
| X  | X                  |  | X                  |

The exception to the rule is to migrate V3.5.x to V5.1 during the installation of the base product or the Network Deployment product.

**5.1+** Migrating Integration Server also migrates the product that Integration Server extends.

When you perform an umbrella installation of the base WebSphere Application Server product, you can choose to migrate applications and the configuration from a previous version, or to coexist with another version of the base WebSphere Application Server product, or to do neither.

You can also perform a silent migration or configure for coexistence during a silent installation. Refer to “Installing silently” on page 190 for a description of performing a silent installation, including the options that you can specify.

The migration prompt appears only when the Installation wizard detects a previous version. The coexistence prompt appears when the Installation wizard detects any other installation, including another Version 5 installation.

If you choose to coexist, the wizard displays a Port selection panel, where you can specify port assignments that do not conflict with existing ports. For example, you can change the HTTP transport port for coexistence, from 9081 (one more than the default Version 5 port number) to 9085 or higher, to avoid potential conflicts with port numbers that previous versions of WebSphere Application Server commonly use.

Use the **netstat -a** command to display all ports in use.

**5.1 +** If you choose neither the migration option nor the coexistence option, you can run Version 5.1.x and the previous version, but not at the same time. Although it is possible that both versions might coexist without port conflicts, you can ensure that both versions run together by selecting the coexistence option and checking for conflicting port assignments.

The Migration panel lists all previous releases that it can identify. If you highlight a release, the text boxes labeled, "select previous version," show the location of the previous product. Select the product to migrate. If you do not see the previous version that you intend to migrate, click **Select previous version** to enter a location and configuration file name if you are migrating a WebSphere Application Server Advanced Edition Single Server Edition, Version 4.0.x installation.

The field labeled "Configuration file" is valid only for WebSphere Application Server Advanced Edition Single Server Edition, Version 4.0.x. For the other versions of WebSphere Application Server that are supported by migration (Version 3.5 Standard Edition, Version 3.5 Extended Edition, and Version 4.0 Advanced Edition), the `admin.config` file provides the host and port values for the administrative server. If you use a file name other than `admin.config`, issue the commands that call the migration tools instead of migrating while installing. Issuing the commands that call the migration tools is described in "Migrating and coexisting" on page 326.

Migrate V3.5.x to V5.1 during the installation of the base product or the Network Deployment product, before installing the Integration Server product.

You must start the administrative server of some previous versions so that the Installation wizard can export the configuration from the `admin.config` file.

Although you might select migration at this point in the installation process, the actual migration does not begin until after the Version 5 installation is complete. At that time, if the `WASPreUpgrade` tool fails, the Installation wizard does not call the `WASPostUpgrade` tool to complete the migration, but instead displays the `WASPreUpgrade.log` and `WASPostUpgrade.log` log files for you to diagnose the problem. After fixing the problem, such as starting the administrative server of a previous release, you can start the migration again, as described in "Migrating and coexisting" on page 326.

25. Choose a type of installation and click **Next**. If you use the Installation wizard, you can choose a full installation type, which installs all features, or a custom installation type. The custom installation type lets you select which features to install.

**5.1 +** If you are migrating a federated node:

- Migrate the deployment manager node first. The deployment manager must be at the highest release level or fix level within the cell.
- Select the same type of installation that you used to install the earlier release:
  - If you selected a full installation type then, select a full installation type now.
  - If you selected a custom installation type then, select a custom installation type now and select the same features as you did for the V5.0.x release.

Federated nodes have configurations that are controlled by the deployment manager that controls the cell. Migrating installs the same features for the V5.1 node that are in the configuration for the previous release. If you decide that you must add features, see "Migrating federated nodes" in the information center for Network Deployment.

You can improve performance by not installing certain features, as described in the **Performance considerations** section in the next step.

- Choose **full install** to install everything you need to run Web applications on your server, including IBM HTTP Server and the embedded messaging feature. The plug-in for IBM HTTP Server is installed and configured in the full installation. Use this option if you are new to WebSphere

Application Server and are unsure of what to install. Choosing this option does install the embedded messaging feature. You must prepare for the embedded messaging feature, as described earlier.

- Choose **Custom install** to select installation features. Choose this option if you already know what to install. Choose this type of installation if you must install and configure the plug-in for a Web server other than IBM HTTP Server. The Installation wizard installs all plug-ins if you select any of them, but it only configures selected plug-ins. Also choose this type of installation if you intend to not install the WebSphere Application Server embedded messaging server because you have already installed the WebSphere MQ Version 5.3 product, or another JMS provider.

If you choose a full installation, you can skip the next step. After selecting a full installation, the wizard prompts you to select the directory for the program code. After selecting a custom installation, the wizard displays the list of features.

26. Select features to install and click **Next** to continue when performing a custom installation. This step is available only when you choose the custom installation type. A description of each feature appears at the bottom of the panel when you roll the cursor over the feature.

**5.1 +** Selecting certain features causes the installation of other prerequisite features. The following table shows this feature relationship.

Table 21. Features and feature dependencies

| If you select this feature:   | This feature is also installed: | Feature description   |
|---|---------------------------------|---|
| <b>Application Server</b>   | Admin Scripting                 | These features are the Application Server run time and its Samples.   |
| Sub-features: Application Server Samples  |                                 |   |
| <b>Administration</b>   |                                 | Getting started with System Administration  |
| Sub-features: Admin Scripting   | Application Server              |   |
|   | Administrative Console          | Admin Scripting   |
| <b>Deployment Tools</b>   | Admin Scripting                 | <ul style="list-style-type: none"> <li>• Deploying and managing applications</li> <li>• Overview of the ANT Utilities</li> </ul>      |
| Sub-features: Deploy Tool   | Application Server              |   |
|   | Admin Scripting                 |   |
|   | ANT Utilities                   |   |
| <b>Embedded Messaging</b>   |                                 | <ul style="list-style-type: none"> <li>• Installing and configuring a JMS provider</li> <li>• Message-driven beans samples</li> </ul> |
| Sub-features: Server and Client   | Application Server              |   |
| Client Only   |                                 |   |
| Message-driven Bean Samples (These samples are the MDBSamples application, which is for the server and not for the client.)   | Application Server samples      |   |
|   | Admin Scripting                 |   |
| <p>You can install the MDBSamples application without installing the embedded messaging server and client feature. Perhaps you have already installed the server and client feature. Or perhaps you intend to reconfigure the MDBSamples to use messaging resources that WebSphere MQ software provides.</p> <p>In any case, if you install the MDBSamples application and do not have the server and client feature installed, errors occur. The Application Server starts the MDBSamples application at start up. The MDBSamples application cannot start the required messaging resources in the Java Naming and Directory Interface (JNDI).</p> <p>Because of the lack of required resources, the message-driven beans fail to start, which causes an exception that the Application Server logs. The Application Server is not affected other than being unable to start the MDBSamples application.</p> |                                 |   |

Table 21. Features and feature dependencies (continued)

| If you select this feature:           | This feature is also installed:  | Feature description   |
|---------------------------------------|--|---|
| <b>IBM HTTP Server</b>                |  |   |
| <b>Web Server Plug-ins</b>            |  |   |
| Sub-features:                         | <div style="border-bottom: 1px solid black; padding-bottom: 2px;">IBM HTTP Server</div> <div style="border-bottom: 1px solid black; padding-bottom: 2px;">Apache Web Server</div> <div style="border-bottom: 1px solid black; padding-bottom: 2px;">Microsoft Internet Information Services (IIS)</div> <div style="border-bottom: 1px solid black; padding-bottom: 2px;">Sun ONE (formerly known as iPlanet) Web Server</div> <div style="padding-bottom: 2px;">Lotus Domino Web Server</div> | “Preparing to install and configure a Web server” on page 27  |
| <b>Performance And Analysis Tools</b> |  |   |
| Sub-features:                         | <div style="border-bottom: 1px solid black; padding-bottom: 2px;">Tivoli Performance Viewer</div> <div style="border-bottom: 1px solid black; padding-bottom: 2px;">Dynamic Cache Monitor</div> <div style="border-bottom: 1px solid black; padding-bottom: 2px;">Performance Servlet</div> <div style="padding-bottom: 2px;">Log Analyzer</div>   | <ul style="list-style-type: none"> <li>• Tivoli Performance Viewer features</li> <li>• Displaying cache information</li> <li>• Performance Monitoring Infrastructure servlet</li> <li>• Log Analyzer</li> </ul> |
| <b>Javadocs</b>                       |  | IBM WebSphere Application Server, Release 5 API Specification in Javadoc format   |

### Performance considerations

For better performance in either a development or production environment, do not install the Samples. By omitting the Samples, you can improve Application Server startup time by 60 percent and save 15 percent of disk space. You can save up to 30 percent of process footprint (based on a maximum heap size of 256 MB).

If your applications do not use Java Message Service (JMS) messaging, do not install embedded messaging. This recommendation is especially true if your system has 256 MB or less of physical memory.

Not installing the embedded messaging feature saves about 36 MB of message queuing process memory and can improve application startup time up to 5 percent and save an additional 72 MB of disk space. (This was tested on Windows machines. Results on the HP-UX platform might differ slightly.)

In addition, if you install the embedded messaging client feature you do not need to install the message-driven Bean Samples. The message-driven Bean Samples are for the embedded messaging server in the server and client feature.

### Web Server plug-in feature considerations

Select the IBM HTTP Server feature to install and configure IBM HTTP Server on the same, or on a different machine than the WebSphere Application Server product. You can migrate plug-ins from an earlier version of WebSphere Application Server to access the current WebSphere Application Server product.

Install IBM HTTP Server on a separate machine using the CD-ROM labeled, **Application Server, IBM HTTP Server**. After installing IBM HTTP Server, you can install the plug-in by installing the base WebSphere Application Server product and clearing all features except the plug-in for IBM HTTP server. See Installing and configuring a Web server.

The Installation wizard automatically installs and configures IBM HTTP Server and the IBM HTTP Server plug-in on the same machine as the WebSphere Application Server if you choose the full installation. No further configuration is necessary. Installing the IBM HTTP Server product with the

WebSphere Application Server product also includes it in the WebSphere Application Server uninstaller program that the Installation wizard creates. Choose the custom type of installation to clear the selection of the IBM HTTP Server feature, if you want to install and uninstall it separately.

You can run the uninstaller program to remove all installed features.

27. Specify a destination directory. Click **Next** to continue.

Specify a target directory for the base WebSphere Application Server product and for the IBM HTTP Server feature, if you are installing the feature. You cannot change the default installation directory for the embedded messaging feature, if you are installing the feature.

Deleting the default target location and leaving an installation directory field empty stops you from continuing the installation process. The Installation wizard does not proceed when you click **Next**. Enter the required target directory to proceed to the next panel. Non-ASCII special characters are not supported in the name of the installation directory. Spaces are also not supported in the name of the installation directory.

The installer program checks for required space at the beginning of the installation. If you must increase the /tmp allocation on a Linux or UNIX-based platform, stop the installation program, increase the allocation, and restart the installation.

If you have problems accessing the administrative console after installation, check the `installAdminConsole.log` file for a failure indication. Clean up the /tmp space and reinstall the administrative console using the `wsadmin` scripting facility.

**5.1 +** Version 5.1 does not allow you to install the IBM HTTP Server feature in the same directory as an earlier version.

If you select the embedded messaging feature and prerequisites are missing, the Installation wizard displays the `mq_prereq.log` error log and takes you back to the Installation type panel. Choose **Custom** installation and clear the checkbox for the embedded messaging feature. The `mq_prereq.log` file is in the system temp directory.

28. Specify target directories for configuration files for any selected Web server plug-ins. Click **Next** to continue.

If you are installing the IBM HTTP Server, you do not need to specify a location for its plug-in configuration file. The wizard uses the installation path you specified for the Web server to derive the location.

If you have previously installed the IBM HTTP Server product on the same machine as the WebSphere Application Server, and are now installing just the plug-in, enter a configuration file location of `IHS_DIR/conf/httpd.conf`, where `IHS_DIR` is the directory where the IBM HTTP Server product is installed.

29. Specify node information and click **Next**. Specify the node name and host name. Although the wizard inserts the machine name (of the installation platform) as the node name, you can specify any unique name. The node name is an arbitrary WebSphere Application Server-specific name that must be unique within a cell.

The host name is the network name for the physical machine on which the node is installed. The host name must resolve to a physical network node on the server. When multiple network cards exist in the server, the host name or IP address must resolve to one of the network cards. Remote WebSphere Application Server nodes use the host name to connect to and to communicate with this node. Selecting a host name that other machines can reach within your network is extremely important. Do not use the generic `localhost` identifier for this value.

If you define coexisting nodes on the same computer with unique IP addresses, define each IP address in the `/etc/hosts` file or in a domain name server (DNS) look-up table. WebSphere Application Server configuration files do not provide domain name resolution for multiple IP addresses on a machine with a single network address.

The value that you specify for the host name is used as the value of the `hostName` property in WebSphere Application Server configuration documents. Specify the host name value in one of the following formats:



- Fully qualified domain name servers (DNS) host name string, such as `xmachine.manhattan.ibm.com`
- The default short DNS host name string, such as `xmachine`
- Numeric IP address, such as `127.1.255.3`

The fully qualified DNS host name has the advantage of being totally unambiguous and also flexible. You have the flexibility of changing the actual IP address for the host system without having to change the WebSphere Application Server configuration. This value for host name is particularly useful if you plan to change the IP address frequently when using Dynamic Host Configuration Protocol (DHCP) to assign IP addresses. A format disadvantage is being dependent on DNS. If DNS is not available, then connectivity is compromised.

The short host name is also dynamically resolvable. A short name format has the added ability of being redefined in the local hosts file so that the system can run WebSphere Application Server even when disconnected from the network. Define the short name to `127.0.0.1` (local loopback) in the hosts file to run disconnected. A format disadvantage is being dependent on DNS for remote access. If DNS is not available, then connectivity is compromised.

A numeric IP address has the advantage of not requiring name resolution through DNS. A remote node can connect to the node you name with a numeric IP address without DNS being available. A format disadvantage is that the numeric IP address is fixed. You must change the setting of the `hostName` property in WebSphere Application Server configuration documents whenever you change the machine IP address. Therefore, do not use a numeric IP address if you use DHCP, or if you change IP addresses regularly. Another format disadvantage is that you cannot use the node if the host is disconnected from the network.

30. Review the summary information and click **Next** to install the product code or **Back** to change your specifications. When the installation is complete, the wizard displays the `install_root/logs/mq_install.log` installation log if you selected the embedded messaging feature and errors occur during its installation.
31. Review the `mq_install.log` installation log if it displays. Click **Next** to continue. The wizard displays the Registration panel.
32. Click **Next** to register the product, or clear the check box and click **Next** to register at a later time. The Registration panel is in English when the machine locale uses a double byte character set (DBCS) language.

You can register the product now by using the link on this panel or later, by using the Web address in the `install_root/prt/readme_prt.txt` file. The Web address in the file is encoded for your locale.

A known problem for some locales corrupts the Web address so that it is similar to the following example. (The Web address is all one line in the file. The following example shows the address on two lines for clarity.)

```
http%3A%2F%2Fwww.ibm.com%2Fsoftware%2Fwebprt%2Fregister%2Fprodreg.nsf%
2Fcontact%3F0penForm%26lang%3DENU%26pid%3D45P8842%26q2%3DWindows+2000
```

Use one of the following Web addresses if your `install_root/prt/readme_prt.txt` file is corrupt:

- <http://www.ibm.com/software/webprt/register/prodreg.nsf/contact?OpenForm&>
- <https://www6.software.ibm.com/reg/prt/prt-r>

The Installation wizard starts the First Steps tool. See “firststeps command” on page 210 for more information.

If you are migrating a federated node as you install, close the First Steps tool. Migrated federated nodes have configuration differences that prevent you from using the First Steps tool.

33. Click **Finish** to close the Installation wizard.
34. Verify the success of the installer program by examining the Exit summary panel and the `install_root/logs/log.txt` for installation status. ISMP records a success message in the `install_root/logs/log.txt` file: “INSTFIN: The installation is complete.” The log is the only source of status information for a silent installation.

Look for severe errors that the installer records in the *install\_root/logs/log.txt* file in the installation root directory to verify that no file system or other unusual errors occurred during installation.

If the *install\_root/logs/log.txt* file does not contain a record of any problems but problems exist, verify or troubleshoot the installation, as described in “Troubleshooting the installation” on page 214 and in Installation component troubleshooting tips.

If problems exist, correct them, uninstall the product, as described in “Uninstalling the product” on page 295, log off as root and back on, and reinstall.

When installing WebSphere Application Server with embedded messaging from the CD-ROM, the following warning messages are issued despite successful installation:

```
MQSERIES.MQM-CL-HPUX: A test command parameter is not valid." and "*  
"hostname:/cdrom/hpux/messaging/images": Cannot open the  
  logfile on this target or source. Possibly the media is  
  read-only or there is a permission problem." on mq_install.log.
```

You can ignore the warning messages, because the problem does not affect the successful installation of WebSphere Application Server with embedded messaging.

35. Restrict access to the */var/mqm/errors* directory and messaging logging files. After installing the embedded messaging feature, you must restrict access to the */var/mqm* directory and to log files that are needed for embedded messaging, such that only the *mqm* user or members of the *mqm* user group have write access. For detailed information, see *Installing WebSphere embedded messaging as the JMS provider* and *Securing messaging directories and log files*.
36. Install the most current fix pack and cumulative fix for the WebSphere Application Server product. See *Recommended updates for WebSphere Application Server* for information about downloading and installing the upgrades.
37. Install the Network Deployment product to manage multiple base product Application Servers.  
The WebSphere Application Server, Version 5.x product does not provide centralized management of multiple servers. The WebSphere Application Server Network Deployment, Version 5.x product provides this function.  
The deployment manager process (*dmgr*) in the Network Deployment product manages a cell of Application Servers. You can federate a base Application Server into the cell or unfederate it. While federated, the configuration of the base Application Server is managed from the deployment manager. See the information center for the Network Deployment product to get started installing the product:  
**5.1 +** Network Deployment installation
38. Tune your system for performance. For best performance on any platform, see *Tuning performance parameter index*.
39. Optional: Create a monitored process for one or more Application Server processes or for the HTTP Server, as described in “Automatically restarting server processes” on page 205.

You can create monitored processes after the installation is complete.

Processes started by a **startServer.sh** command are not running as monitored processes, regardless of how you have configured them. You must start the server process with a shell script based on the example *rc.was* file, to have the server running as a monitored process.

The Installation wizard configures the base product. It is not necessary to perform further configuration at this time.

You have now successfully installed WebSphere Application Server and the features that you selected.

## Uninstalling and reinstalling

See “Uninstalling the product” on page 295 for information about uninstalling any WebSphere Application Server product.



## 5.1+ Reinstalling a V5.1 instance after uninstalling and leaving the embedded messaging feature installed

**5.1+** If you uninstall a V5.1 instance but leave the embedded messaging feature installed because of other WebSphere Application Server instances on the machine, rename the `/opt/WebSphere/AppServer51` directory to cause HP-UX to be unable to locate the previous installation that is still registered. Reinstall into a directory other than the `/opt/WebSphere/AppServer51` directory or the renamed directory. Use a new directory name for reinstalling the V5.1 instance.

**5.1+** If you uninstall all WebSphere Application Server products on the machine and are now reinstalling, follow the procedure in “Manually uninstalling on HP-UX platforms” on page 312 instead.

**5.1+** For example, assume that V5.0.2 exists in `/opt/WebSphere/AppServer502` with the embedded messaging server and client feature. You then install V5.1 to the following directory, `/opt/WebSphere/AppServer51`, but later you uninstall the V5.1 base product with the **uninstall** command and select to leave the embedded messaging feature installed. And now you decide to reinstall the V5.1 base product.

**5.1+** Rename `/opt/WebSphere/AppServer51` to `/opt/WebSphere/AppServer51_bk` before reinstalling V5.1 into the `/opt/WebSphere/AppServer51New` directory.

**5.1+** This step is required before you can reinstall the product onto the same system. Reinstalling into the same directory without first deleting all directory contents results in invalid XML configurations because of the retention of old files. If you want to correct the registry entries and uninstall all WebSphere Application Server products on the machine, uninstall manually to delete all of the files so that you can reinstall with a clean system, as described in “Manually uninstalling on HP-UX platforms” on page 312.

## Miscellaneous tips for HP-UX platforms

Table 22. Installation and migration tips

| Operating platform           | Tip in “Platform-specific tips for installing and migrating” on page 146   |
|------------------------------|--|
| HP-UX platforms              | HP-UX platforms <ul style="list-style-type: none"><li>• Migrating or coexisting with an existing WebSphere Application Server node that HP-UX does not recognize</li><li>• Avoiding using Netscape 4.79 on HP-UX 11 in Japanese, to avoid problems in viewing the administrative console</li><li>• Configuring the <code>converter.properties</code> file to use EUC-JP (Japanese) encoding on HP-UX</li></ul> |
| All platforms                | All platforms  |
| All Linux and UNIX platforms | All Linux and UNIX-based platforms   |

## Mounting a CD drive on HP-UX

This topic describes how to mount a CD drive as the root user on a Linux platform or as the root user on a UNIX-based operating system platform.

Product CDs for WebSphere Application Server products for HP-UX platforms are formatted for the Rock-Ridge file system type, which is an extension to the International Standards Organization ISO-9660 file system type.

HP-UX uses a mechanism called portable file system (PFS) on PA-RISC machines to mount Rock-Ridge CDs. This procedure describes how to use the PFS method.

The following procedure guides you through using the portable file system (PFS) to mount a CD drive.

1. Log on as root.
2. Determine the CD-ROM device name by using the **ioscan** command or **sam**. Run the **/usr/sbin/ioscan -funC disk** command to return a table of disk devices. If you cannot determine the name of the CD-ROM device, run the sam system maintenance interface to find more information about disk devices.
3. Start the pfsd daemon. PFS mounting is not active on HP-UX systems by default. The pfsd daemon must be running to mount a CD-ROM device. To start the daemon, run the following commands:

```
# /usr/sbin/pfs_mountd &  
# /usr/sbin/pfsd &
```

4. Insert the product CD-ROM labeled, *Integration Server Disk 1 of 2* into the CD-ROM.
5. Mount the CD-ROM with the following command:

```
# /usr/sbin/pfs_mount -t rrip -o xlat=unix /dev/dsk/c0t0d0 /cdrom
```

The CD-ROM drive is the **/dev/dsk/c0t0d0** device. The **/cdrom** directory is where the CD-ROM drive mounts. The **rrip** parameter forces the CD-ROM drive to mount in the Rock Ridge Interchange Format. The **xlat=unix** parameter translates file names properly for HP-UX.

6. Use the following procedures if you have a problem with mounting the CD-ROM because it contains files with long names. The **mount** command can fail on any CD-ROM that contains files with long file names. Two methods exist for working around the problem and mounting the product CD-ROM:
  - Edit the **pfs\_fstab** file.
  - Use **pfs\_mount** to read the Rock Ridge system type.

#### Editing the pfs\_fstab file

To avoid the mount problem, perform the following steps:

- a. Log in as a user with root authority.
- b. In the **/etc** directory, add the following line to the **pfs\_fstab** file:

```
/dev/dsk/c0t0d0 mount_point pfs-rrip ro,hard
```

The **mount\_point** variable represents the mount point of the CD-ROM.

- c. Start the pfs daemon by entering the following commands (if they are not already running):

```
/usr/sbin/pfs_mountd &  
/usr/sbin/pfsd 4 &
```

- d. Insert the CD-ROM in the drive and enter the following commands:

```
mkdir /cdrom  
/usr/sbin/pfs_mount /cdrom
```

Where **/cdrom** represents the mount point of the CD-ROM.

#### Using pfs\_mount to read the Rock Ridge system type

- a. The standard HP-UX mount procedure does not read the Rock Ridge file system type correctly. You must mount the CD using the **pfs\_mount** command. Start pfs daemons by entering these commands:

```
pfs_mountd&  
pfsd&
```

- b. Mount the CD as shown in the following example, where **device** represents the raw device (for example, **/dev/rdisk/c0t0d0**), and **mntpnt** represents the mount point (for example, **/cdrom**):

```
pfs_mount -x unix device /mntpnt
```

- c. Add the following line to **/etc/pfs\_exports**, where **remotemnt** represents the mount point, and **server** represents the name of the HP-UX system where you are installing the product:

```
/remotemnt -access=server
```

- d. Enter the following command:

```
pfs_exportfs -a
```

Run the remaining steps in this procedure on the local HP-UX system:

e. Log in as root.

f. Start pfs daemons by entering the following commands:

```
pfs_mountd&  
pfsd&
```

g. Enter the following command, where *remote\_server* represents your remote system, *remotemnt* represents the CD-ROM drive on the remote HP-UX system, and *localmnt* represents the mount point on your local HP-UX system:

```
pfs_mount -x unix remote_server:/remotemnt /localmnt
```

h. Change the directory to the package location, where *localmnt* represents the directory mount point.

```
cd /localmnt/tas
```

After installation, you can unmount the CD-ROM using the following command:

```
/usr/sbin/pfs_umount /cdrom
```

For more detailed instructions, consult your HP-UX documentation.

## Installing the base Application Server on Linux platforms

This topic describes how to install the base WebSphere Application Server product as the root user on a Linux operating system platform.

You cannot install the product correctly as a non-root user. If you back up the product CD-ROM, do so as root. Backup copies made from non-root users do not preserve the correct file attributes and do not work.

If you encounter a problem such as not having enough temporary space or not having the right packages on your system, cancel the installation, make the required changes, and restart the installation.

The installation uses InstallShield for Multiplatforms (ISMP) to perform the installation. You can use the Installation wizard or perform the installation from a command line, using the silent installation method.

### Installation programs in WebSphere Application Server products

#### 5.1 +

| Product  | Link to installation procedure                             | Label on product CD  |
|--|--|--|
| (Base) WebSphere Application Server              | Base product installation (which links to this procedure!) | <b>Application Server, IBM HTTP Server</b>                     |
| Network Deployment                               | Network Deployment installation                            | <b>Deployment Manager</b>                                      |
| WebSphere Business Integration Server Foundation | Integration Server installation                            | <b>Integration Server Disk 1 and Integration Server Disk 2</b> |

Use the Network Deployment installation image to manage a multimachine environment, where you have installed the base product on different machines and want to manage the Application Servers in a group, or *cell*. If you buy the Network Deployment product, you also get the base product in the package.

WebSphere Business Integration Server Foundation is the V5.1 level of the Enterprise product. WebSphere Business Integration Server Foundation, Version 5.1 extends the base WebSphere Application Server V5.1 product. After migrating the underlying product to V5.1, do not reinstall the V5.0.x Enterprise product. Version 5.0.x of the Enterprise product does not extend Version 5.1 of the base WebSphere Application Server product nor does it extend the V5.1 Network Deployment product.

**5.1 +** If you buy the WebSphere Business Integration Server Foundation product, you also get the Network Deployment product and the base product in the package.

### Creating multiple Application Servers on a single machine

Although you can create multiple servers on a base WebSphere Application Server node, the servers all share one set of configuration files. Changes that you make to one server affect the others. Configuration documents might become corrupted. The **winstance** command can create multiple configuration instances. Each instance is a stand-alone Application Server with its own set of configuration files. Or install the Network Deployment product to create and manage multiple base Application Servers.

### Order of installation

**5.1 +** Install the base product before installing the Network Deployment product when installing both products on the same machine. Install the Network Deployment product before the Integration Server product that extends the Network Deployment product. You can install the Integration Server product before the base product. The Integration Server product can install the base product in what is known as an *umbrella* installation but Integration Server cannot install the Network Deployment product. Some features of the base product cannot be installed by Integration Server.

The embedded messaging feature that is included in the default installation requires that you install base before Network Deployment when installing both on the same machine. Otherwise, the order does not matter. See the following installation tip for more information:

*Table 23. Installation tip*

| Operating platform | Tip in “Platform-specific tips for installing and migrating” on page 146  |
|--------------------|---|
| All platforms      | Installing WebSphere Application Server products in order on the same machine, when installing the embedded messaging component |

This topic is available in Adobe PDF format on the product CD-ROM and online in an information center. The information center always has the most current information. The information center displays in the language of your machine locale if possible.

**5.1 +** The installation guide PDF is updated occasionally. Download a new installation guide at [ftp://ftp.software.ibm.com/software/websphere/appserv/library/wasv51base\\_gs.pdf](ftp://ftp.software.ibm.com/software/websphere/appserv/library/wasv51base_gs.pdf).

The Launchpad tool lets you access the product overview, the `readme.html` file, and the installation guide. See “Using the Launchpad to start the installation” on page 189.

You also use the Launchpad during the installation procedure to install the product. The installation program performs the following actions:

- Checks prerequisites automatically
- Looks for a previous WebSphere Application Server installation, to determine whether to display the Migration panel or the Coexistence panel during the installation
- Installs the IBM HTTP Server and other features, if you select them

A known problem with the Launchpad can prevent it from using Netscape to open the documentation links on some operating system platforms.

If you use the Mozilla browser, some Launchpad links do not work. The Launchpad attempts to call the Netscape browser in the `/usr/bin/netscape` directory. Try a symbolic link to the Mozilla browser to fix the problem as shown in the following example:

```
ln -sf /usr/bin/mozilla /usr/bin/netscape
```

You can also launch the following links directly from your browser:

### Product Overview

<http://www.ibm.com/software/webservers/appserv/>

Your security options might prevent redirection, such as to the <http://www-306.ibm.com/software/info1/websphere/index.jsp?tab=products/appserv> Web site. If so, you can identify the IBM Web site as a trusted site to allow the redirection. For example, on Internet Explorer, add <http://www-306.ibm.com> to the list of Trusted Sites by selecting **Tools > Internet Options > Security (tab) > Trusted Sites**.

### Readme File

[CD-ROM\\_mount\\_point/readme/readme\\_en.html](CD-ROM_mount_point/readme/readme_en.html)

### Installation Guide

[CD-ROM\\_mount\\_point/docs/InstallGuide\\_en.PDF](CD-ROM_mount_point/docs/InstallGuide_en.PDF)

The *Installation Guide* is in Adobe PDF format. Viewing this document requires you to have Adobe Acrobat Reader, which is a free download from the Adobe Acrobat Web site.

After using the Launchpad to view product documentation, perform the following procedure. The procedure includes several preliminary steps before actually launching the installer program.

1. Stop all WebSphere Application Server-related Java processes on the machine where you are installing the product.
2. Stop any Web server process such as the IBM HTTP Server, if you are extending the base product.
3. Provide adequate disk space.

**5.1+** The base Application Server requires the following disk space:

#### **550 MB for the /opt/WebSphere/AppServer directory**

The installation root directory includes the base product code.

#### **100 MB for the /tmp directory**

The temporary directory is the working directory for the installation program.

Verify that you have at least 100 MB of free space to avoid problems.

A message about free space occurs when less than 4 MB of free space remains after starting the installation. The InstallShield for MultiPlatforms (ISMP) program displays a message about using the `-is:tempdir` parameter to identify an alternate temporary space directory.

Ignore any `-is:tempdir` message. The `-is:tempdir` parameter is not supported. Cancel the installation, allocate a total of 100 MB of free space in the `/tmp` directory, and start the installation again.

#### **25 MB for the /opt/IBMhttpServer directory**

The IBM HTTP Server feature requires this space.

#### **25 MB for the /opt/IBM/gsk7 directory**

The Tivoli Global Security Kit requires this space.

#### **700 MB total requirement without the embedded messaging feature**

The total amount of space required includes the `/tmp` space, which is released after installation. Space requirements for the embedded messaging feature are described after the next few steps that describe setting up required users and user groups for the feature.

The Installation wizard displays required space for individual features on the Feature selection panel. The Installation wizard also warns you if you do not have enough space to install the product.

If you plan to migrate applications and the configuration from a previous version, verify that application objects have available disk space. As a rough guideline, plan for space equal to 110 percent of the size of the application objects:

- **For Version 3.5.x:** The size of application Java archive (JAR) files, Web archive (WAR) files, and servlet files
  - **For Version 4.0.x:** The size of enterprise archive (EAR) files
  - **5.1+ For Version 5.0.x:** The size of EAR files
4. Define the user groups and the user needed for the embedded messaging feature.
    - a. If you have not already done so, create the mqm and mqbrkrs user groups.
    - b. Create the mqm user.
    - c. Add the **mqm** and **root** users to the **mqm** group.
    - d. Add the user **root** to the **mqbrkrs** group.

The recommended user ID for running the JMS server process is root. If you do run the JMS server process under another user ID, add that user ID to the **mqm** and **mqbrkrs** groups. User IDs longer than 12 characters cannot be used for authentication with the embedded WebSphere JMS provider.

The mqm user starts the JMS server for general JMS support and the WebSphere embedded broker for WebSphere Application Server topic connections.

5. Log out and back in to pick up the secondary user groups, mqm and mqbrkrs, for root. Use the **ssh** command instead of the **telnet** command to log in. Or run the following command after logging on:

```
su -
```

Use the **id -a** command or the **groups** command to see defined groups for root. If mqm and mqbrkrs are not in the list that is returned, you cannot install the embedded messaging feature:

```
[root@wasdoc2 root]# id -a
uid=0(root) gid=0(root)
groups=0(root),1(bin),2(daemon),
3(sys),4(adm),6(disk),10(wheel),500(mqm),501(mqbrkrs)
```

```
[root@wasdoc2 root]# groups
root bin daemon sys adm disk wheel mqm mqbrkrs
```

6. Allocate adequate disk space for the embedded messaging feature if you are planning to install the feature. The installation locations for the embedded messaging feature are fixed as shown in the following table, which lists the locations for the base messaging functions and the messaging broker functions for publish/subscribe messaging.

Table 24. Space requirements for the embedded messaging feature on Linux

| Component                           | Base code | Broker code | Base data | Broker data |
|-------------------------------------|-----------|-------------|-----------|-------------|
| <b>Path</b>                         | /opt/mqm  | /opt/wemps  | /var/mqm  | /var/wemps  |
| <b>Server and client subfeature</b> | 40 MB     | 100 MB      | 8 MB      | 5 MB        |
| <b>Client subfeature</b>            | 15 MB     | 15 MB       | 5 MB      | N/A         |

7. Prepare to install the embedded messaging feature with WebSphere MQ. The embedded messaging feature is based on the IBM WebSphere MQ product. The feature and the product each provide a Java message service (JMS) function that supports queues for point-to-point messaging and topics for publish and subscribe messaging.

You can install the embedded messaging feature with or without the WebSphere MQ product on the same machine. To support both the embedded messaging feature and the WebSphere MQ product on the same machine, the WebSphere MQ product must be at a certain fix level and must have several of its features installed.

If you already have WebSphere MQ installed, you can configure it as the JMS provider. Otherwise, you can install the embedded messaging feature during the installation or install the WebSphere MQ product or another JMS provider after you install.

Even though you might decide now to install only the embedded messaging feature, you can install the WebSphere MQ product later and use the IBM WebSphere MQ product as the JMS provider instead.



8. Verify that you have upgraded to WebSphere MQ 5.3 with the CSD04 update to install embedded messaging on a machine where you already have WebSphere MQ installed.  
Determine if your WebSphere MQ 5.3 installation is at the required level by running the **mqver** utility provided by WebSphere MQ.

The required level as indicated by the mqver command:

```
Name:      WebSphere MQ
Version:   530.4 CSD04
...
```

9. Verify that you have installed the required WebSphere MQ 5.3 features to install embedded messaging on a machine where you already have WebSphere MQ installed. Verify that you have installed the following features:
  - When installing the embedded messaging server and client feature, the required MQ features are *Server* and *Java messaging*.
  - When installing the embedded messaging client feature, the required MQ feature is *Java messaging*.

If you attempt to install the embedded messaging feature when WebSphere MQ is already installed, the level of WebSphere MQ must be Version 5.3 with the required MQ features. Otherwise, the installation of the embedded messaging feature fails with prerequisite check errors.

10. Create and mount a journalized file system called `/var/mqm` for your messaging working data. Use a partitioning strategy with a separate volume for embedded messaging or WebSphere MQ data to isolate system activity from the potentially high volume of messaging work that can build up in the `/var/mqm` directory.
11. Create separate file systems for log data in the `var/mqm/log` directory and error files in the `var/mqm/errors` directory. Store log files on a different physical volume from the embedded messaging queues, which are in the `var/mqm` directory. This ensures data integrity in the case of a hardware failure. If you are creating separate file systems, allow the following minimum free space:

**30 MB** `/var/mqm`

**20 MB** `/var/mqm/log`

**4 MB** `/var/mqm/errors`

The `/var` file system stores all the security logging information for the system and stores the temporary files for e-mail and printing. Therefore, it is critical that you maintain free space in `/var` for these operations. If you do not create a separate file system for messaging data, and `/var` fills up, all security logging stops on the system until free space is available in `/var`. Also, e-mail and printing do not work without some available free space in `/var`.

You have the same options for creating file systems for the embedded messaging feature as you do for WebSphere MQ. For example, if you cannot install the embedded messaging options in the required file system (for example, if it is too small), you can do one of the following *before* installing the Embedded Messaging options:

- Create and mount a new file system for the installation directory.
- Create a new directory anywhere on your machine, and create a symbolic link from the required installation directory to the new directory. For example:

```
mkdir /bigdisk/mqm
ln -s /bigdisk/mqm /usr/mqm
```

12. Verify that prerequisites and corequisites are at the required release levels. Although the Installation wizard checks for prerequisite operating system patches with the `prereqChecker` application, review the prerequisites on the IBM WebSphere Application Server supported hardware, software, and APIs Web site if you have not already done so.

Refer to the documentation for non-IBM prerequisite and corequisite products to learn how to migrate to their supported versions.

Some operating systems that were not supported at the time that this product was shipped on CD-ROM might now be supported. You might receive a message from the `prereqChecker` program that an operating system is not supported when, in fact, the operating system is supported.



Always consult the IBM WebSphere Application Server supported hardware, software, and APIs Web site to determine whether your operating system is supported when you receive a message from the prereqChecker program. The Web site lists all supported operating systems and the operating system fixes and patches that you must install to have a compliant operating system.

After confirming that your operating system is supported and that you have installed all necessary patches, you can click **Next** to continue an installation when you receive an error message from the prereqChecker program.

13. Provide necessary prerequisites for Red Hat Enterprise Linux V3.0. A known limitation exists in the prerequisites checker program when examining prerequisite packages on Linux systems.

You must install the following packages on Red Hat Enterprise Linux V3.0 for xSeries platforms:

- compat-gcc-7.3-2.96.122
- compat-libstdc++-7.3-2.96.122
- compat-libstdc++-devel-7.3-2.96.122
- compat-glibc-7.x-2.2.4.32.5
- compat-gcc-c++-7.3-2.96.122
- compat-db-4.0.14-5
- rpm-build-4.2.1-4.2

The following package is required for Red Hat Enterprise Linux V3.0 for pSeries platforms:  
rpm-build-4.2.1-4.2.

You must install the following packages on Red Hat Enterprise Linux V3.0 for S/390 (z/VM and VM/ESA) platforms:

- compat-db-4.0.14-5
- compat-pwdb-0.62-3
- compat-libstdc++-7.2-2.95.3.77
- rpm-build-4.2.1-4.2

You can install a later release of any of these packages.

14. Upgrade Red Hat Enterprise Linux V3.0 to service level 1 (update 1).

Upgrade RHEL 3.0 to service level 1 by downloading and installing the service updates from Red Hat.

If you do not upgrade to service level 1, certain national language issues in the released version of GLIBC included in Red Hat Enterprise Linux V3 might cause Java virtual machine (JVM) failures due to segmentation faults. These failures can occur during installation when the locale is set to anything other than an English locale.

The prerequisites checker program for the base V5.1.0.0 product does not recognize Red Hat Enterprise Linux 3.0 as a supported operating system. If you receive a message from the prerequisites checker program that RHEL 3.0 is an unsupported operating system, ignore the message and continue the installation if you installed all prerequisite packages from the previous step and downloaded and installed the service level 1 update.

Also, do not install, log off, and log back on when you are installing from the operator console attached to the machine. This can produce segmentation faults that cause the installation to fail, as described in Troubleshooting the installation.

15. Prepare the SuSE Linux Enterprise Server 8.0 - Powered by UnitedLinux 1.0 operating platform for WebSphere Application Server installation.

- a. Install SP2 for the United Linux 1.0 operating platform to let you use the LaunchPad.

It is your responsibility to install this service pack. The prereqChecker function of the installer cannot detect service pack versions definitively on United Linux. Kernel unames and versions between 8.0 and 8.0.2 are identical. No signature RPM denotes a service pack install.

- b. Use the IBM Developer Kit that WebSphere Application Server provides to support the Java 2 SDK on the SuSE Linux Enterprise System (SLES) 8.0 operating system to avoid potential

problems when uninstalling an interim fix or a fix pack. To use the IBM Developer Kit, remove the `java2-jre-1.3.1-524` and `java2-1.3.1-524` RPMs from the machine before installing WebSphere Application Server.

16. Correct font problems on SuSE Linux Enterprise Server 8.0 in Simplified Chinese and Traditional Chinese locales.

On the Linux for Power platform that SuSE Linux Enterprise Server 8.0 provides, a missing package causes a font problem. The `ttf-hanyi` package is not installed during the normal product installation of the SuSE 8.0 operating system. The missing package causes the Installation wizard for WebSphere Application Server products to display garbled characters in the Simplified Chinese locale and in the Traditional Chinese locale.

Copy the `ttf-hanyi-2021016-0.noarch.rpm` package on the SuSE 8.0 for i386 CD to the Power PC system. Install the package on the Power PC machine and reboot the machine to solve the problem.

17. Remove any entries from the `/usr/bin/jitk.db` file if you have uninstalled WebSphere Application Server Enterprise Edition Version 4.1. Remove any remaining artifacts from an uninstalled V4.1 system to prevent the display of the Coexistence panel or the Migration panel during installation. The Installation wizard might display the Migration panel or the Coexistence panel even though you have uninstalled WebSphere Application Server Version 4.1. You can prevent the Installation wizard from recognizing a previously deleted V4.1 Application Server by removing the following entry from the `/usr/bin/jitk.db` file:

```
WebSphere Application Server 4.1
```

Remove other Version 4.x entries for WebSphere Application Server products that are no longer on your system.

18. Verify the system `cp` command when using emacs or other freeware.

If you have emacs or other freeware installed on your Linux operating platform, verify that the system `cp` command is being used.

- a. Type `which cp` at the command prompt before running the installation program for the WebSphere Application Server product.
- b. Remove the freeware directory from your `PATH` if the resulting directory output includes freeware. For example, if the output is similar to this `/opt/freeware/bin/cp` message, remove the directory from the `PATH`.
- c. Install the WebSphere Application Server product.
- d. Add the freeware directory back to the `PATH`.

If you install with a `cp` command that is part of a freeware package, the installation might appear to complete successfully, but the Java 2 SDK that the product installs might have missing files in the `install_root/java` directory.

Missing files can destroy required symbolic links. If you remove the freeware `cp` command from the `PATH`, you can install the Application Server product successfully.

Perform the following step to verify that the Java 2 SDK is working correctly.

19. Verify the Java 2 SDK on the WebSphere Application Server CD. If you copied the product CD to back it up and are using a backup version, perform the following steps to verify that the Java 2 SDK on the product CD-ROM is working correctly.
  - a. Change directories to the `/sun/WAS/jdk/java/bin` directory on the product CD-ROM. For example:

```
cd /mnt/linuxi386/WAS/jdk/java/bin
```
  - b. Verify the Java 2 SDK version. Type the following command:

```
./java -version
```

The command completes successfully with no errors when the Java 2 SDK is intact.

20. Select the Installation wizard method or the silent installation method but do not start the installation yet. The installer program has two interfaces, the Installation wizard and a silent command-line installation.

### Performing the installation with the wizard

You can start the Installation wizard using the Launchpad or directly using the **install** command.

The default installation method is to open a command window and issue the command to start the Launchpad tool. Click the **Install the product** option on the Launchpad. (See “Using the Launchpad to start the installation” on page 189.)

This option launches the Installation wizard in the language of your machine locale unless there is no translation for your locale, in which case you receive the English version.

A short delay occurs before the ISMP wizard displays. You do not need to click the Install the product option more than once to cause the wizard to display. The delay is particularly noticeable on x-windows platforms.

You can also start the Installation wizard using the `/mnt/cdrom/linuxi386/install` command, where `/mnt/cdrom` is the mount point for the product CD-ROM and `linuxi386` is the platform directory.

### Performing a silent installation

You can perform a silent installation using the `-options responsefile` parameter with the command method:

```
fully_qualified_CD_pathname/install
  -options fully_qualified_hard_disk_drive_path_name/responsefile
```

```
# /mnt/cdrom/linuxi386/install -options /tmp/my_responsefile
```

Start the silent installation with a fully qualified path to the options response file. Otherwise, the Installation wizard starts.

A silent installation causes the installation program to read your responses from the options response file, instead of from the wizard interface. You must customize the *responsefile* before installing silently. See “Customizing the base options response file” on page 191.

After customizing the file, you can issue the command to silently install. See “Installing silently” on page 190.

After issuing the command, the following text displays:

```
# .....
.InstallShield Wizard
```

```
Initializing InstallShield Wizard...
```

```
Searching for Java(tm) Virtual Machine...
```

The silent installation runs without displaying status to the window:

- Press **Enter** when the installation is complete to return to the command prompt.
- Press **Enter** at any time to return from a background job to the command prompt.

You can change the `-W launchPRTBean.active` option in the response file to display the Registration panel to indicate the completion of a silent installation on a local system with a graphical user interface.

To determine the status of the silent installation, review the installation logs in the `install_root/logs` directory or in the `/tmp` directory. See “Troubleshooting the installation” on page 214 for more information about log files.

Silent installation is particularly useful if you install the product often.

The rest of this procedure assumes that you are using the Installation wizard. Corresponding entries in the response file exist for every prompt that is described as part of the wizard.

Review the description of the “responsefile” on page 204 for more information. Comments in the file describe how to customize their options.

### Asynchronous and synchronous command lines

After running the **install** command, the command line returns synchronously. A synchronous **install** command returns the command line after the installation is complete.

You can start the installation asynchronously with the installation process and its children processes all running as background processes. Consult your operating system documentation to learn how to issue asynchronous commands. After running the **install** command, the command line returns immediately.

Do not misinterpret an asynchronous command line to mean that the installation has finished when the command prompt returns. Although the command line returns, either the Installation wizard or a silent installation might still be in progress.

### Installing with a network file system mount

If you must use an NFS mount, see the following installation tip:

Table 25. Installation tip

| Operating platform | Tip in “Platform-specific tips for installing and migrating” on page 146 |
|--------------------|--|
| All platforms      | Platform-specific issues when dealing with network file systems          |

21. Insert the product CD labeled, *Application Server, IBM HTTP Server*. Most Linux systems are configured to automatically mount CD-ROM drives.

22. Open a shell window and mount the CD-ROM drive if necessary. Mount the CD drive with the following command:

```
mount /mnt/cdrom
```

If a file explorer window opens, close it.

Use the same shell window throughout the installation procedure. Verify that you are in a read/write directory and not the CD-ROM directory or another read-only directory before you start the installation.

23. Start the installation with the **/mnt/cdrom/linuxi386/launchpad.sh** command, where `mnt/cdrom` is the mount point for the product CD-ROM and `linuxi386` is the platform directory for the xSeries CD-ROM. You can also start the installation directly using the **/mnt/cdrom/linuxi386/install** command. The following examples show how to issue the command:

#### Syntax:

```
fully_qualified_CD_pathname/install
```

#### Examples:

```
# /mnt/cdrom/linuxi386/install (For xSeries platforms and clones)
# /mnt/cdrom/linuxs390/install (For Linux guests on S/390 VM platforms)
# /mnt/cdrom/linuxppc/install (For POWERPC platforms)
```

The readme link in the Launchpad is to the `readme.html` file in the CD root directory. The *Getting Started* document that contains installation information is in the `docs` directory on the CD.

Download the current version of the *Getting Started* document from:

**5.1 +** [ftp://ftp.software.ibm.com/software/webserver/appserv/library/wasv51base\\_gs.pdf](ftp://ftp.software.ibm.com/software/webserver/appserv/library/wasv51base_gs.pdf)

The rest of this procedure assumes that you are using the Installation wizard. Corresponding entries in the response file exist for every prompt that is described as part of the wizard. Review the description of the “responsefile” on page 204 for more information. Comments in the file describe how to customize the options.

24. Click **Next** to continue. The license agreement displays.

The Installation wizard does not support hot keys, such as **Alt-N**. You can tab to **Next** and press **Enter** to select it, for example.

25. Click the radio button beside the **I accept the terms in the license agreement** message if you agree to the license agreement and click **Next** to continue. After you accept the licensing terms, the Installation wizard checks for prerequisites and for previous versions, with which it can either migrate or coexist.

As the base WebSphere Application Server product version changes, its prerequisites and corequisites change. Updating your database, Web server, Software Development Kit (SDK), and other software is probably necessary.

The base WebSphere Application Server product simplifies migrating product prerequisites, by providing the option to install a complimentary Web server and SDK on your supported operating system. You can uninstall back-level prerequisites and let the Installation wizard install current versions.

If the wizard finds a previous version of WebSphere Application Server, it prompts you to migrate applications and the configuration from the previous version, or to coexist with it. If it finds more than one previous version, the Installation wizard lists them for you to select which one to migrate.

**Migrating or coexisting with an existing WebSphere Application Server node that Linux does not recognize.**

In some cases, the InstallShield for MultiPlatforms (ISMP) program might not detect a previously installed version of WebSphere Application Server because of a failure to read the registry keys on Linux. You can force the migration and coexistence panel to display, by starting the installation with an option on the `/cdrom/cdrom0/linuxi386/install` command.

For example, use this command:

```
./install -W previousVersionDetectedBean.previousVersionDetected="true"
```

You can also force the appearance of the coexistence panel to change conflicting port number assignments. For example, force the coexistence panel to appear using this command:

```
./install -W coexistenceOptionsBean.showCoexistence="true"
```

On either panel, identify the location of the existing product instance to cause it to be recognized.

- 26. Choose whether to install additional features or to install the product again when a previous installation of the same level product exists. You can add features to an unfederated base node or to a deployment manager node at any time, by running the Installation wizard again. Federated nodes must be unfederated before adding features to avoid conflicts while the deployment manager owns the configuration of the base node.

Log off as root and back on again.

This Installation wizard panel appears when the installer program detects a previous installation at the same product level. The panel lets you select whether to add features to the existing installation, or to perform a new installation to another directory. Use a procedure in the following description to install features without causing component regression problems.

When the installer program detects a previous installation at the same product level, a panel appears to let you add features to the existing installation or perform a new installation to another directory.

When adding features, previously installed features are checked and grayed out with the term **(Installed)** at the end of the feature name. The IBM HTTP Server feature is an exception. You can install more than one instance of the IBM HTTP Server product. It is not grayed out or labeled **(Installed)**. You can install the plug-in feature each time you install IBM HTTP Server, too. Select a new directory for each instance of IBM HTTP Server that you install.

*Table 26. Installation tip*

| Operating platform | Tip in “Platform-specific tips for installing and migrating” on page 146 |
|--------------------|--|
| All platforms      | Installing all Web server plug-ins during the initial installation.      |

If you intend to install additional features, use the following procedure to avoid component regression problems. It is important that you understand that there is no way to add features to a base node without unfederating it from its cell and losing its configuration. The configuration for the base node is restored back to its original configuration, before it was federated and before you changed it with the administrative console of the deployment manager.

Restoring an original configuration means that you lose the configuration for any additional servers that you created on the base node from the deployment manager. (The additional servers will not exist any more.) You will lose any other configuration you performed from the deployment manager administrative console.

Although you can use the **backupConfig** command to save the configuration, you cannot restore it with the **restoreConfig** command because the configuration you restore does not include any features that you add to the base node.

You can use the **backupConfig** command to save the Network Deployment configuration so that you can restore it if necessary. You can also refer to the configuration as you use the administrative console of the deployment manager to reconfigure the base node.

- a. If the node is a base product node in a deployment manager cell, unfederate the node with the **removeNode** command. Removing the base node from the cell also removes the configuration for the base node, which resides at the cell level.
  - b. Uninstall any interim fixes, starting with the last one and finishing with the first one.
  - c. Uninstall any cumulative fixes you installed, starting with the last one and finishing with the first one.
  - d. Uninstall any fix packs you installed, starting with the last one and finishing with the first one.
  - e. Log off and back on.
  - f. Install new features.
  - g. Install the most current fix pack.
  - h. Install the most current cumulative fix.
  - i. Install any interim fixes to bring the node back to its previous fix level.
  - j. If the node was part of a cell, rejoin the node to the cell with the **addNode** command or the deployment manager administrative console. This action synchronizes the master cell configuration with changes you make to the Application Server configuration during the installation of the new features.
  - k. Reconfigure the base node with the Network Deployment administrative console.
27. Choose to migrate applications and the configuration from a previous version, to coexist with another version, or to neither coexist or migrate. Click **Next** to continue. See “Migrating and coexisting” on page 326 for more information.

All WebSphere Application Server products on a single machine share some of the code in the embedded messaging feature, if installed. The required level of the embedded messaging feature for V5.1 (CSD04) is not the same as for V5.0.0 or V5.0.1. The required level of the embedded messaging feature for V5.1 is the same as for V5.0.2.

If you attempt to install V5.0.2 or V5.1 on a machine where a version of the embedded messaging feature is at a release level earlier than CSD04, the installer program displays the message log in a panel. The message that you see is similar to one of the messages in the following example:

```
MQSeries or WebSphere MQ server at an earlier release than required to support
embedded messaging is already installed on the system.
Unsupported earlier maintenance level of MQSeries or WebSphere MQ detected.
Unsupported earlier release of MQSeries client or WebSphere MQ client detected.
Unsupported maintenance level of MQSeries client or WebSphere MQ client detected.
Software conflict with MQSeries JMS SupportPac MA88 detected.
```

**5.1 +** To correct the problem, perform one of the following actions:

- Upgrade the full MQSeries or WebSphere MQ product to WebSphere MQ at the latest level that supports embedded messaging (CSD04).

**5.1 +** See Installing WebSphere embedded messaging as the JMS provider for more information.

- Uninstall the existing MQSeries or WebSphere MQ product if MQSeries or WebSphere MQ is not required on this system and reinstall the WebSphere Application Server product. Select the embedded messaging feature.

The MQSeries JMS SupportPac MA88 problem is slightly different. Uninstall the MQSeries JMS SupportPac MA88 and reinstall the WebSphere Application Server product, selecting the embedded messaging feature. The function provided by SupportPac MA88 is included in the embedded messaging feature.



You can upgrade the WebSphere Application Server product to V5.0.2 before migrating it to V5.1 to avoid any problem with an incorrect level of the embedded messaging feature. See “Upgrading a Version 5.0.0 or Version 5.0.1 product to Version 5.0.2” on page 371.

You can also perform the procedure for migrating V5.0.0 or V5.0.1 with embedded messaging to V5.1. See “Migrating Version 5.0.0 or Version 5.0.1 of WebSphere Application Server with embedded messaging to Version 5.1” on page 347.

To share embedded messaging in a coexistence environment, the node names for each installation must be unique, so that each installation has a message queue manager that is named uniquely. To migrate V5.0.2 to V5.1, the node names must be identical. Therefore, the queue manager names are also identical, if you are migrating from V5.0.2 to V5.1.

To prevent losing the queue manager when you uninstall V5.0.2 (or V5.1), you must create a dummy queue manager before uninstalling one of the WebSphere Application Server versions. A series of migration topics in “Migrating and coexisting” on page 326 describe how to migrate after the installation.

**5.1+** The first rule of migration is to migrate after you install WebSphere Business Integration Server Foundation, if you are planning to install the Integration Server:

| If you are planning to install these products: |                    | Select the migration option while installing this product: |                    |
|--|--------------------|--|--------------------|
| Base product                                   | Integration Server | Base product   | Integration Server |
| X  |                    | X  |                    |
| X  | X                  |  | X                  |

The exception to the rule is to migrate V3.5.x to V5.1 during the installation of the base product or the Network Deployment product.

**5.1+** Migrating Integration Server also migrates the product that Integration Server extends.

When you perform an umbrella installation of the base WebSphere Application Server product, you can choose to migrate applications and the configuration from a previous version, or to coexist with another version of the base WebSphere Application Server product, or to do neither.

You can also perform a silent migration or configure for coexistence during a silent installation. Refer to “Installing silently” on page 190 for a description of performing a silent installation, including the options that you can specify.

The migration prompt appears only when the Installation wizard detects a previous version. The coexistence prompt appears when the Installation wizard detects any other installation, including another Version 5 installation.

If you choose to coexist, the wizard displays a Port selection panel, where you can specify port assignments that do not conflict with existing ports. For example, you can change the HTTP transport port for coexistence, from 9081 (one more than the default Version 5 port number) to 9085 or higher, to avoid potential conflicts with port numbers that previous versions of WebSphere Application Server commonly use.

Use the **netstat -a** command to display all ports in use.

**5.1+** If you choose neither the migration option nor the coexistence option, you can run Version 5.1.x and the previous version, but not at the same time. Although it is possible that both versions might coexist without port conflicts, you can ensure that both versions run together by selecting the coexistence option and checking for conflicting port assignments.

The Migration panel lists all previous releases that it can identify. If you highlight a release, the text boxes labeled, “select previous version,” show the location of the previous product. Select the product to migrate. If you do not see the previous version that you intend to migrate, click **Select previous version** to enter a location and configuration file name if you are migrating a WebSphere Application Server Advanced Edition Single Server Edition, Version 4.0.x installation.

The field labeled "Configuration file" is valid only for WebSphere Application Server Advanced Edition Single Server Edition, Version 4.0.x. For the other versions of WebSphere Application Server that are supported by migration (Version 3.5 Standard Edition, Version 3.5 Extended Edition, and Version 4.0 Advanced Edition), the `admin.config` file provides the host and port values for the administrative server. If you use a file name other than `admin.config`, issue the commands that call the migration tools instead of migrating while installing. Issuing the commands that call the migration tools is described in "Migrating and coexisting" on page 326.

Migrate V3.5.x to V5.1 during the installation of the base product or the Network Deployment product, before installing the Integration Server product.

You must start the administrative server of some previous versions so that the Installation wizard can export the configuration from the `admin.config` file.

Although you might select migration at this point in the installation process, the actual migration does not begin until after the Version 5 installation is complete. At that time, if the `WASPreUpgrade` tool fails, the Installation wizard does not call the `WASPostUpgrade` tool to complete the migration, but instead displays the `WASPreUpgrade.log` and `WASPostUpgrade.log` log files for you to diagnose the problem. After fixing the problem, such as starting the administrative server of a previous release, you can start the migration again, as described in "Migrating and coexisting" on page 326.

28. Choose a type of installation and click **Next**. If you use the Installation wizard, you can choose a full installation type, which installs all features, or a custom installation type. The custom installation type lets you select which features to install.

**5.1 +** If you are migrating a federated node:

- Migrate the deployment manager node first. The deployment manager must be at the highest release level or fix level within the cell.
- Select the same type of installation that you used to install the earlier release:
  - If you selected a full installation type then, select a full installation type now.
  - If you selected a custom installation type then, select a custom installation type now and select the same features as you did for the V5.0.x release.

Federated nodes have configurations that are controlled by the deployment manager that controls the cell. Migrating installs the same features for the V5.1 node that are in the configuration for the previous release. If you decide that you must add features, see "Migrating federated nodes" in the information center for Network Deployment.

You can improve performance by not installing certain features, as described in the **Performance considerations** section in the next step.

- Choose **full install** to install everything you need to run Web applications on your server, including IBM HTTP Server and the embedded messaging feature. The plug-in for IBM HTTP Server is installed and configured in the full installation. Use this option if you are new to WebSphere Application Server and are unsure of what to install. Choosing this option does install the embedded messaging feature. You must prepare for the embedded messaging feature, as described earlier.
- Choose **Custom install** to select installation features. Choose this option if you already know what to install. Choose this type of installation if you must install and configure the plug-in for a Web server other than IBM HTTP Server. The Installation wizard installs all plug-ins if you select any of them, but it only configures selected plug-ins. Also choose this type of installation if you intend to not install the WebSphere Application Server embedded messaging server because you have already installed the WebSphere MQ Version 5.3 product, or another JMS provider.

If you choose a full installation, you can skip the next step.

After selecting a typical installation, the wizard prompts you to select the directory for the program code. After selecting a custom installation, the wizard displays a list of features.

29. Select features to install and click **Next** to continue when performing a custom installation. This step is available only when you choose the custom installation type. A description of each feature appears at the bottom of the panel when you roll the cursor over the feature.

**5.1+** Selecting certain features causes the installation of other prerequisite features. The following table shows this feature relationship.

Table 27. Features and feature dependencies

| If you select this feature:   | This feature is also installed:  | Feature description   |
|---|--|---|
| <p><b>Application Server</b></p> <p>Sub-features: Application Server Samples</p>  | Admin Scripting  | These features are the Application Server run time and its Samples.   |
| <b>Administration</b>   |  |   |
| <p>Sub-features: Admin Scripting</p> <p style="padding-left: 100px;">Administrative Console</p>   | <p>Application Server</p> <p>Admin Scripting</p>                                   | Getting started with System Administration  |
| <b>Deployment Tools</b>   |  |   |
| <p>Sub-features: Deploy Tool</p> <p style="padding-left: 100px;">ANT Utilities</p>  | <p>Admin Scripting</p> <p>Application Server</p> <p>Admin Scripting</p>            | <ul style="list-style-type: none"> <li>• Deploying and managing applications</li> <li>• Overview of the ANT Utilities</li> </ul>      |
| <b>Embedded Messaging</b>   |  |   |
| <p>Sub-features: Server and Client</p> <p style="padding-left: 100px;">Client Only</p> <p style="padding-left: 100px;">Message-driven Bean Samples (These samples are the MDBSamples application, which is for the server and not for the client.)</p>  | <p>Application Server</p> <p>Application Server samples</p> <p>Admin Scripting</p> | <ul style="list-style-type: none"> <li>• Installing and configuring a JMS provider</li> <li>• Message-driven beans samples</li> </ul> |
| <p>You can install the MDBSamples application without installing the embedded messaging server and client feature. Perhaps you have already installed the server and client feature. Or perhaps you intend to reconfigure the MDBSamples to use messaging resources that WebSphere MQ software provides.</p> <p>In any case, if you install the MDBSamples application and do not have the server and client feature installed, errors occur. The Application Server starts the MDBSamples application at start up. The MDBSamples application cannot start the required messaging resources in the Java Naming and Directory Interface (JNDI).</p> <p>Because of the lack of required resources, the message-driven beans fail to start, which causes an exception that the Application Server logs. The Application Server is not affected other than being unable to start the MDBSamples application.</p> |  |   |
| <b>IBM HTTP Server</b>  |  |   |
| <b>Web Server Plug-ins</b>  |  |   |
| <p>Sub-features: IBM HTTP Server</p> <p style="padding-left: 100px;">Apache Web Server</p> <p style="padding-left: 100px;">Microsoft Internet Information Services (IIS)</p> <p style="padding-left: 100px;">Sun ONE (formerly known as iPlanet) Web Server</p> <p style="padding-left: 100px;">Lotus Domino Web Server</p>   |  | <p>“Preparing to install and configure a Web server” on page 27</p>   |

Table 27. Features and feature dependencies (continued)

| If you select this feature:           | This feature is also installed:  | Feature description   |                       |                     |              |   |
|---------------------------------------|--|---|-----------------------|---------------------|--------------|---|
| <b>Performance And Analysis Tools</b> |  |   |                       |                     |              |   |
| Sub-features:                         | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="text-align: center;">Tivoli Performance Viewer</td></tr> <tr><td style="text-align: center;">Dynamic Cache Monitor</td></tr> <tr><td style="text-align: center;">Performance Servlet</td></tr> <tr><td style="text-align: center;">Log Analyzer</td></tr> </table> | Tivoli Performance Viewer   | Dynamic Cache Monitor | Performance Servlet | Log Analyzer | <ul style="list-style-type: none"> <li>• Tivoli Performance Viewer features</li> <li>• Displaying cache information</li> <li>• Performance Monitoring Infrastructure servlet</li> <li>• Log Analyzer</li> </ul> |
| Tivoli Performance Viewer             |  |   |                       |                     |              |   |
| Dynamic Cache Monitor                 |  |   |                       |                     |              |   |
| Performance Servlet                   |  |   |                       |                     |              |   |
| Log Analyzer                          |  |   |                       |                     |              |   |
| <b>Javadocs</b>                       |  | IBM WebSphere Application Server, Release 5 API Specification in Javadoc format |                       |                     |              |   |

### Performance considerations

For better performance in either a development or production environment, do not install the Samples. By omitting the Samples, you can improve Application Server startup time by 60 percent and save 15 percent of disk space. You can save up to 30 percent of process footprint (based on a maximum heap size of 256 MB).

If your applications do not use Java Message Service (JMS) messaging, do not install embedded messaging. This recommendation is especially true if your system has 256 MB or less of physical memory.

Not installing the embedded messaging feature saves about 36 MB of message queuing process memory and can improve application startup time up to 5 percent and save an additional 72 MB of disk space. (This was tested on Windows machines. Results on a Linux platform might differ slightly.)

In addition, if you install the embedded messaging client feature you do not need to install the message-driven Bean Samples. The message-driven Bean Samples are for the embedded messaging server in the server and client feature.

### Web Server plug-in feature considerations

Select the IBM HTTP Server feature to install and configure IBM HTTP Server on the same, or on a different machine than the WebSphere Application Server product. You can migrate plug-ins from an earlier version of WebSphere Application Server to access the current WebSphere Application Server product.

Install IBM HTTP Server on a separate machine using the CD-ROM labeled, **Application Server, IBM HTTP Server**. After installing IBM HTTP Server, you can install the plug-in by installing the base WebSphere Application Server product and clearing all features except the plug-in for IBM HTTP server. See "Preparing to install and configure a Web server" on page 27.

The Installation wizard automatically installs and configures IBM HTTP Server and the IBM HTTP Server plug-in on the same machine as the WebSphere Application Server if you choose the full installation. No further configuration is necessary. Installing the IBM HTTP Server product with the WebSphere Application Server product also includes it in the WebSphere Application Server uninstaller program that the Installation wizard creates. Choose the custom type of installation to clear the selection of the IBM HTTP Server feature, if you want to install and uninstall it separately.

You can run the uninstaller program to remove all installed features.

30. Specify a destination directory. Click **Next** to continue.

Specify a target directory for the base WebSphere Application Server product and for the IBM HTTP Server feature, if you are installing the feature. You cannot change the default installation directory for the embedded messaging feature, if you are installing the feature.

Deleting the default target location and leaving an installation directory field empty stops you from continuing the installation process. The Installation wizard does not proceed when you click **Next**.

Enter the required target directory to proceed to the next panel. Non-ASCII special characters are not supported in the name of the installation directory. Spaces are also not supported in the name of the installation directory.

The installer program checks for required space at the beginning of the installation. If you must increase the /tmp allocation on a Linux or UNIX-based platform, stop the installation program, increase the allocation, and restart the installation.

If you have problems accessing the administrative console after installation, check the `installAdminConsole.log` file for a failure indication. Clean up the /tmp space and reinstall the administrative console using the `wsadmin` scripting facility.

**5.1 +** Version 5.1 does not allow you to install the IBM HTTP Server feature in the same directory as an earlier version.

If you select the embedded messaging feature and prerequisites are missing, the Installation wizard displays the `mq_prereq.log` error log and takes you back to the Installation type panel. Choose **Custom** installation and clear the checkbox for the embedded messaging feature. The `mq_prereq.log` file is in the system temp directory.

31. Specify target directories for configuration files for any selected Web server plug-ins. Click **Next** to continue.

If you are installing the IBM HTTP Server, you do not need to specify a location for its plug-in configuration file. The wizard uses the installation path you specified for the Web server to derive the location.

If you have previously installed the IBM HTTP Server product on the same machine as the WebSphere Application Server, and are now installing just the plug-in, enter a configuration file location of `IHS_DIR/conf/httpd.conf`, where `IHS_DIR` is the directory where the IBM HTTP Server product is installed.

32. Specify node information and click **Next**.

Specify the node name and host name. Although the wizard inserts the machine name (of the installation platform) as the node name, you can specify any unique name. The node name is an arbitrary WebSphere Application Server-specific name that must be unique within a cell.

The host name is the network name for the physical machine on which the node is installed. The host name must resolve to a physical network node on the server. When multiple network cards exist in the server, the host name or IP address must resolve to one of the network cards. Remote WebSphere Application Server nodes use the host name to connect to and to communicate with this node. Selecting a host name that other machines can reach within your network is extremely important. Do not use the generic `localhost` identifier for this value.

If you define coexisting nodes on the same computer with unique IP addresses, define each IP address in the `/etc/hosts` file or in a domain name server (DNS) look-up table. WebSphere Application Server configuration files do not provide domain name resolution for multiple IP addresses on a machine with a single network address.

The value that you specify for the host name is used as the value of the `hostName` property in WebSphere Application Server configuration documents. Specify the host name value in one of the following formats:

- Fully qualified domain name servers (DNS) host name string, such as `xmachine.manhattan.ibm.com`
- The default short DNS host name string, such as `xmachine`
- Numeric IP address, such as `127.1.255.3`

The fully qualified DNS host name has the advantage of being totally unambiguous and also flexible. You have the flexibility of changing the actual IP address for the host system without having to change the WebSphere Application Server configuration. This value for host name is particularly useful if you plan to change the IP address frequently when using Dynamic Host Configuration Protocol (DHCP) to assign IP addresses. A format disadvantage is being dependent on DNS. If DNS is not available, then connectivity is compromised.



The short host name is also dynamically resolvable. A short name format has the added ability of being redefined in the local hosts file so that the system can run WebSphere Application Server even when disconnected from the network. Define the short name to 127.0.0.1 (local loopback) in the hosts file to run disconnected. A format disadvantage is being dependent on DNS for remote access. If DNS is not available, then connectivity is compromised.

A numeric IP address has the advantage of not requiring name resolution through DNS. A remote node can connect to the node you name with a numeric IP address without DNS being available. A format disadvantage is that the numeric IP address is fixed. You must change the setting of the `hostName` property in WebSphere Application Server configuration documents whenever you change the machine IP address. Therefore, do not use a numeric IP address if you use DHCP, or if you change IP addresses regularly. Another format disadvantage is that you cannot use the node if the host is disconnected from the network.

33. Review the summary information and click **Next** to install the product code or **Back** to change your specifications. When the installation is complete, the wizard displays the `install_root\logs\mq_install.log` installation log if you selected the embedded messaging feature and errors occur with its installation.
34. Review the `mq_install.log` installation log if it displays. Click **Next** to continue. The wizard displays the Registration panel.
35. Click **Next** to register the product, or clear the check box and click **Next** to register at a later time. The Registration panel is in English when the machine locale uses a double byte character set (DBCS) language.

You can register the product now by using the link on this panel or later, by using the Web address in the `install_root/prt/readme_prt.txt` file. The Web address in the file is encoded for your locale. A known problem for some locales corrupts the Web address so that it is similar to the following example. (The Web address is all one line in the file. The following example shows the address on two lines for clarity.)

```
http%3A%2F%2Fwww.ibm.com%2Fsoftware%2Fwebprt%2Fregister%2Fprodreg.nsf%  
2Fcontact%3F0penForm%261ang%3DENU%26pid%3D45P8842%26q2%3DWindows+2000
```

Use one of the following Web addresses if your `install_root/prt/readme_prt.txt` file is corrupt:

- <http://www.ibm.com/software/webprt/register/prodreg.nsf/contact?OpenForm&>
- <https://www6.software.ibm.com/reg/prt/prt-r>

The Installation wizard starts the First Steps tool. See “firststeps command” on page 210 for more information.

If you are migrating a federated node as you install, close the First Steps tool. Migrated federated nodes have configuration differences that prevent you from using the First Steps tool.

36. Click **Finish** to close the Installation wizard.
37. Verify the success of the installer program by examining the Exit summary panel and the `install_root/logs/log.txt` for installation status. ISMP records a success message in the `install_root/logs/log.txt` file: “INSTFIN: The installation is complete.” The log is the only source of status information for a silent installation.

Look for severe errors that the installer records in the `install_root/logs/log.txt` file in the installation root directory to verify that no file system or other unusual errors occurred during installation.

If the `install_root/logs/log.txt` file does not contain a record of any problems but problems exist, verify or troubleshoot the installation, as described in “Troubleshooting the installation” on page 214 and in Installation component troubleshooting tips.

If problems exist, correct them, uninstall the product, as described in “Uninstalling the product” on page 295, log off as root and back on, and reinstall.

When installing WebSphere Application Server with embedded messaging from the CD-ROM, the following warning messages are issued despite successful installation:



```
MQSERIES.MQM-CL-HPUX: A test command parameter is not valid." and "*  
"hostname:/cdrom/hpux/messaging/images": Cannot open the  
logfile on this target or source. Possibly the media is  
read-only or there is a permission problem." on mq_install.log.
```

You can ignore the warning messages, because the problem does not affect the successful installation of WebSphere Application Server with embedded messaging.

38. Restrict access to the `/var/mqm/errors` directory and messaging logging files. After installing the embedded messaging feature, you must restrict access to the `/var/mqm` directory and to log files that are needed for embedded messaging, such that only the `mqm` user or members of the `mqm` user group have write access. For detailed information, see *Installing WebSphere embedded messaging as the JMS provider* and *Securing messaging directories and log files*.
39. Install the most current fix pack and cumulative fix for the WebSphere Application Server product. See *Recommended updates for WebSphere Application Server* for information about downloading and installing the upgrades.
40. Install the Network Deployment product to manage multiple base product Application Servers. The WebSphere Application Server, Version 5.x product does not provide centralized management of multiple servers. The WebSphere Application Server Network Deployment, Version 5.x product provides this function. The deployment manager process (`dmgr`) in the Network Deployment product manages a cell of Application Servers. You can federate a base Application Server into the cell or unfederate it. While federated, the configuration of the base Application Server is managed from the deployment manager. See the information center for the Network Deployment product to get started installing the product:

#### **5.1 +** Network Deployment installation

41. Tune your system for performance. For best performance on any platform, see *Tuning performance parameter index*.
42. Optional: Create a monitored process for one or more Application Server processes or for the HTTP Server, as described in “Automatically restarting server processes” on page 205. You can create monitored processes after the installation is complete. Processes started by a `startServer.sh` command are not running as monitored processes, regardless of how you have configured them. You must start the server process with a shell script based on the example `rc.was` file, to have the server running as a monitored process.

The Installation wizard configures the base product. It is not necessary to perform further configuration at this time.

You have now successfully installed WebSphere Application Server and the features that you selected.

## **Uninstalling and reinstalling**

See “Uninstalling the product” on page 295 for information about uninstalling any WebSphere Application Server product.

**5.1 +** If you uninstalled the V5.1 base product but left the embedded messaging feature installed, and now you want to reinstall the V5.1 product, see “Reinstalling V5.1 after uninstalling and leaving the embedded messaging feature installed” on page 326.

After uninstalling a WebSphere Application Server product, reinstalling into the same directory without first deleting all directory contents results in invalid XML configurations because of the retention of old files. Uninstall manually to delete all of the files so that you can reinstall with a clean system, as described in “Manually uninstalling on Linux platforms” on page 314

Symptoms that you might experience if you reinstall without uninstalling manually include:

1. The **versionInfo.sh** command states that a product is installed but the product is not installed.
2. Specific directories might be missing in the installation root directory.

If you experience symptoms such as these, uninstall everything manually and reinstall. Reinstallation is successful if you manually uninstall before reinstalling.

## Miscellaneous tips for Linux platforms

Table 28. Installation and migration tips

| Operating platform           | Tip in “Platform-specific tips for installing and migrating” on page 146   |
|------------------------------|--|
| Linux platforms              | Linux platforms <ul style="list-style-type: none"> <li>• <b>5.1+</b> Ignoring YAST2 dependency conflicts for embedded messaging packages</li> <li>• Avoiding utility hangs and accessing the deployment manager</li> <li>• Accessing First Steps items on Linux for S/390 systems</li> </ul> |
| All platforms                | All platforms  |
| All Linux and UNIX platforms | All Linux and UNIX-based platforms   |

## Installing the base Application Server on Solaris platforms

This topic describes how to install the base WebSphere Application Server product as the root user on the Solaris operating environment.

You cannot install the product correctly as a non-root user. If you back up the product CD-ROM, do so as root. Backup copies made from non-root users do not preserve the correct file attributes and do not work.

If you encounter a problem such as not having enough temporary space or not having the right packages on your system, cancel the installation, make the required changes, and restart the installation.

The installation uses InstallShield for Multiplatforms (ISMP) to perform the installation. You can use the Installation wizard or perform the installation from a command line, using the silent installation method.

## Installation programs in WebSphere Application Server products

### 5.1+

| Product  | Link to installation procedure                             | Label on product CD  |
|--|--|--|
| (Base) WebSphere Application Server              | Base product installation (which links to this procedure!) | <b>Application Server, IBM HTTP Server</b>                     |
| Network Deployment                               | Network Deployment installation                            | <b>Deployment Manager</b>                                      |
| WebSphere Business Integration Server Foundation | Integration Server installation                            | <b>Integration Server Disk 1 and Integration Server Disk 2</b> |

Use the Network Deployment installation image to manage a multimachine environment, where you have installed the base product on different machines and want to manage the Application Servers in a group, or *cell*. If you buy the Network Deployment product, you also get the base product in the package.

WebSphere Business Integration Server Foundation is the V5.1 level of the Enterprise product. WebSphere Business Integration Server Foundation, Version 5.1 extends the base WebSphere Application Server V5.1 product. After migrating the underlying product to V5.1, do not reinstall the V5.0.x Enterprise product. Version 5.0.x of the Enterprise product does not extend Version 5.1 of the base WebSphere Application Server product nor does it extend the V5.1 Network Deployment product.

**5.1 +** If you buy the WebSphere Business Integration Server Foundation product, you also get the Network Deployment product and the base product in the package.

### Creating multiple Application Servers on a single machine

Although you can create multiple servers on a base WebSphere Application Server node, the servers all share one set of configuration files. Changes that you make to one server affect the others. Configuration documents might become corrupted. The **winstance** command can create multiple configuration instances. Each instance is a stand-alone Application Server with its own set of configuration files. Or install the Network Deployment product to create and manage multiple base Application Servers.

### Order of installation

**5.1 +** Install the base product before installing the Network Deployment product when installing both products on the same machine. Install the Network Deployment product before the Integration Server product that extends the Network Deployment product. You can install the Integration Server product before the base product. The Integration Server product can install the base product in what is known as an *umbrella* installation but Integration Server cannot install the Network Deployment product. Some features of the base product cannot be installed by Integration Server.

The embedded messaging feature that is included in the default installation requires that you install base before Network Deployment when installing both on the same machine. Otherwise, the order does not matter. See the following installation tip for more information:

*Table 29. Installation tip*

| Operating platform | Tip in “Platform-specific tips for installing and migrating” on page 146  |
|--------------------|---|
| All platforms      | Installing WebSphere Application Server products in order on the same machine, when installing the embedded messaging component |

This topic is available in Adobe PDF format on the product CD-ROM and online in an information center. The information center always has the most current information. The information center displays in the language of your machine locale if possible.

**5.1 +** The installation guide PDF is updated occasionally. Download a new installation guide at [ftp://ftp.software.ibm.com/software/webserver/appserv/library/wasv51base\\_gs.pdf](ftp://ftp.software.ibm.com/software/webserver/appserv/library/wasv51base_gs.pdf).

The Launchpad tool lets you access the product overview, the `readme.html` file, and the installation guide. See “Using the Launchpad to start the installation” on page 189.

You also use the Launchpad during the installation procedure to install the product. The installation program performs the following actions:

- Checks prerequisites automatically
- Looks for a previous WebSphere Application Server installation, to determine whether to display the Migration panel or the Coexistence panel during the installation
- Installs the IBM HTTP Server and other features, if you select them

A known problem with the Launchpad can prevent it from using Netscape to open the documentation links on some operating system platforms.

If you use the Mozilla browser, some Launchpad links do not work. The Launchpad attempts to call the Netscape browser in the `/usr/bin/netscape` directory. Try a symbolic link to the Mozilla browser to fix the problem as shown in the following example:

```
ln -sf /usr/bin/mozilla /usr/bin/netscape
```

You can also launch the following links directly from your browser:

### Product Overview

<http://www.ibm.com/software/webservers/appserv/>

Your security options might prevent redirection, such as to the <http://www-306.ibm.com/software/info1/websphere/index.jsp?tab=products/appserv> Web site. If so, you can identify the IBM Web site as a trusted site to allow the redirection. For example, on Internet Explorer, add <http://www-306.ibm.com> to the list of Trusted Sites by selecting **Tools > Internet Options > Security (tab) > Trusted Sites**.

### Readme File

[CD-ROM\\_mount\\_point/readme/readme\\_en.html](CD-ROM_mount_point/readme/readme_en.html)

### Installation Guide

[CD-ROM\\_mount\\_point/docs/InstallGuide\\_en.PDF](CD-ROM_mount_point/docs/InstallGuide_en.PDF)

The *Installation Guide* is in Adobe PDF format. Viewing this document requires you to have Adobe Acrobat Reader, which is a free download from the Adobe Acrobat Web site.

After using the Launchpad to view product documentation, perform the following procedure. The procedure includes several preliminary steps before actually launching the installer program.

1. Stop all WebSphere Application Server-related Java processes on the machine where you are installing the product.
2. Stop any Web server process such as the IBM HTTP Server, if you are extending the base product.
3. Provide adequate disk space.

**5.1+** The base Application Server requires the following disk space:

#### **550 MB for the /opt/WebSphere/AppServer directory**

The installation root directory includes the base product code.

#### **100 MB for the /tmp directory**

The temporary directory is the working directory for the installation program.

Verify that you have at least 100 MB of free space to avoid problems.

A message about free space occurs when less than 4 MB of free space remains after starting the installation. The InstallShield for MultiPlatforms (ISMP) program displays a message about using the `-is:tempdir` parameter to identify an alternate temporary space directory.

Ignore any `-is:tempdir` message. The `-is:tempdir` parameter is not supported. Cancel the installation, allocate a total of 100 MB of free space in the `/tmp` directory, and start the installation again.

#### **25 MB for the /opt/IBMhttpServer directory**

The IBM HTTP Server feature requires this space.

#### **25 MB for the /opt/IBM/gsk7 directory**

The Tivoli Global Security Kit requires this space.

#### **700 MB total requirement without the embedded messaging feature**

The total amount of space required includes the `/tmp` space, which is released after installation. Space requirements for the embedded messaging feature are described after the next few steps that describe setting up required users and user groups for the feature.

The Installation wizard displays required space for individual features on the Feature selection panel. The Installation wizard also warns you if you do not have enough space to install the product.

If you plan to migrate applications and the configuration from a previous version, verify that application objects have available disk space. As a rough guideline, plan for space equal to 110 percent of the size of the application objects:

- **For Version 3.5.x:** The size of application Java archive (JAR) files, Web archive (WAR) files, and servlet files
  - **For Version 4.0.x:** The size of enterprise archive (EAR) files
  - **5.1+ For Version 5.0.x:** The size of EAR files
4. Define the user groups and the user needed for the embedded messaging feature.
    - a. If you have not already done so, create the mqm and mqbrkrs user groups.
    - b. Create the mqm user.
    - c. Add the **mqm** and **root** users to the **mqm** group.
    - d. Add the user **root** to the **mqbrkrs** group.

The recommended user ID for running the JMS server process is root. If you do run the JMS server process under another user ID, add that user ID to the **mqm** and **mqbrkrs** groups. User IDs longer than 12 characters cannot be used for authentication with the embedded WebSphere JMS provider.

The mqm user starts the JMS server for general JMS support and the WebSphere embedded broker for WebSphere Application Server topic connections.

5. Log out and back in to pick up the secondary user groups, mqm and mqbrkrs, for root. Use the **ssh** command instead of the **telnet** command to log in. Or run the following command after logging on:

```
su -
```

Use the **id -a** command or the **groups** command to see defined groups for root. If mqm and mqbrkrs are not in the list that is returned, you cannot install the embedded messaging feature:

```
[root@wasdoc2 root]# id -a
uid=0(root) gid=0(root)
  groups=0(root),1(bin),2(daemon),
    3(sys),4(adm),6(disk),10(wheel),500(mqm),501(mqbrkrs)
```

```
[root@wasdoc2 root]# groups
root bin daemon sys adm disk wheel mqm mqbrkrs
```

6. Allocate adequate disk space for the embedded messaging feature if you are planning to install the feature. The installation locations for the embedded messaging feature are fixed as shown in the following table, which lists the locations for the base messaging functions and the messaging broker functions for publish/subscribe messaging.

Table 30. Space requirements for the embedded messaging feature on Solaris

| Component                           | Base code | Broker code | Base data | Broker data |
|-------------------------------------|-----------|-------------|-----------|-------------|
| <b>Path</b>                         | /opt/mqm  | /opt/wemps  | /var/mqm  | /var/wemps  |
| <b>Server and client subfeature</b> | 40 MB     | 70 MB       | 20 MB     | 5 MB        |
| <b>Client subfeature</b>            | 15 MB     | 15 MB       | 15 MB     | N/A         |

7. Prepare to install the embedded messaging feature with WebSphere MQ. The embedded messaging feature is based on the IBM WebSphere MQ product. The feature and the product each provide a Java message service (JMS) function that supports queues for point-to-point messaging and topics for publish and subscribe messaging.

You can install the embedded messaging feature with or without the WebSphere MQ product on the same machine. To support both the embedded messaging feature and the WebSphere MQ product on the same machine, the WebSphere MQ product must be at a certain fix level and must have several of its features installed.

If you already have WebSphere MQ installed, you can configure it as the JMS provider. Otherwise, you can install the embedded messaging feature during the installation or install the WebSphere MQ product or another JMS provider after you install.

Even though you might decide now to install only the embedded messaging feature, you can install the WebSphere MQ product later and use the IBM WebSphere MQ product as the JMS provider instead.

- Verify that you have upgraded to WebSphere MQ 5.3 with the CSD04 update to install embedded messaging on a machine where you already have WebSphere MQ installed.  
Determine if your WebSphere MQ 5.3 installation is at the required level by running the **mqver** utility provided by WebSphere MQ.

The required level as indicated by the mqver command:

```
Name:      WebSphere MQ
Version:   530.4 CSD04
...
```

- Verify that you have installed the required WebSphere MQ 5.3 features to install embedded messaging on a machine where you already have WebSphere MQ installed. Verify that you have installed the following features:
  - When installing the embedded messaging server and client feature, the required MQ features are *Server* and *Java messaging*.
  - When installing the embedded messaging client feature, the required MQ feature is *Java messaging*.

If you attempt to install the embedded messaging feature when WebSphere MQ is already installed, the level of WebSphere MQ must be Version 5.3 with the required MQ features. Otherwise, the installation of the embedded messaging feature fails with prerequisite check errors.

- Create and mount a journalized file system called `/var/mqm` for your messaging working data. Use a partitioning strategy with a separate volume for embedded messaging or WebSphere MQ data to isolate system activity from the potentially high volume of messaging work that can build up in the `/var/mqm` directory.
- Create separate file systems for log data in the `var/mqm/log` directory and error files in the `var/mqm/errors` directory. Store log files on a different physical volume from the embedded messaging queues, which are in the `var/mqm` directory. This ensures data integrity in the case of a hardware failure. If you are creating separate file systems, allow the following minimum free space:

**30 MB** `/var/mqm`

**20 MB** `/var/mqm/log`

**4 MB** `/var/mqm/errors`

The `/var` file system stores all the security logging information for the system and stores the temporary files for e-mail and printing. Therefore, it is critical that you maintain free space in `/var` for these operations. If you do not create a separate file system for messaging data, and `/var` fills up, all security logging stops on the system until free space is available in `/var`. Also, e-mail and printing do not work without some available free space in `/var`.

You have the same options for creating file systems for the embedded messaging feature as you do for WebSphere MQ. For example, if you cannot install the embedded messaging options in the required file system (for example, if it is too small), you can do one of the following *before* installing the Embedded Messaging options:

- Create and mount a new file system for the installation directory.
- Create a new directory anywhere on your machine, and create a symbolic link from the required installation directory to the new directory. For example:

```
mkdir /bigdisk/mqm
ln -s /bigdisk/mqm /usr/mqm
```

- Set kernel values to support Application Server. Several Solaris kernel values are typically too small for the embedded messaging options. Starting the internal JMS server or client with insufficient kernel resources produces a First Failure Support Technology (FFST) file in the `/var/mqm/errors` directory. Before installing embedded messaging, review the machine configuration:

```
sysdef -i
```

The kernel values are set in the `/etc/system` file, as shown in the following example.

```
set shmsys:shminfo_shmmax = 4294967295
set shmsys:shminfo_shmseg = 1024
set shmsys:shminfo_shmmni = 1024
```



```

set semsys:seminfo_semaem = 16384
set semsys:seminfo_semmni = 1024
set semsys:seminfo_semmap = 1026
set semsys:seminfo_semmns = 16384
set semsys:seminfo_semmsl = 100
set semsys:seminfo_semopm = 100
set semsys:seminfo_semmnu = 2048
set semsys:seminfo_semume = 256
set msgsys:msginfo_msgmap = 1026
set msgsys:msginfo_msgmax = 65535
set rlim_fd_cur=1024

```

You can change kernel values by editing the `/etc/system` file then rebooting the operating system. For more information about setting up the Solaris system, see the Solaris System Administration documentation. For example, the *Solaris Tunable Parameters Reference Manual*.

Queue managers are generally independent of each other. Therefore system kernel parameters, for example `shmmni`, `semmni`, `semmns`, and `semmnu` need to allow for the number of queue managers in the system.

13. Verify that prerequisites and corequisites are at the required release levels. Although the Installation wizard checks for prerequisite operating system patches with the `prereqChecker` application, review the prerequisites on the IBM WebSphere Application Server supported hardware, software, and APIs Web site if you have not already done so.

Refer to the documentation for non-IBM prerequisite and corequisite products to learn how to migrate to their supported versions.

Some operating systems that were not supported at the time that this product was shipped on CD-ROM might now be supported. You might receive a message from the `prereqChecker` program that an operating system is not supported when, in fact, the operating system is supported.

Always consult the IBM WebSphere Application Server supported hardware, software, and APIs Web site to determine whether your operating system is supported when you receive a message from the `prereqChecker` program. The Web site lists all supported operating systems and the operating system fixes and patches that you must install to have a compliant operating system.

After confirming that your operating system is supported and that you have installed all necessary patches, you can click **Next** to continue an installation when you receive an error message from the `prereqChecker` program.

14. Remove any entries from the `/usr/bin/jitk.db` file if you have uninstalled WebSphere Application Server Enterprise Edition Version 4.1. Remove any remaining artifacts from an uninstalled V4.1 system to prevent the display of the Coexistence panel or the Migration panel during installation.

The Installation wizard might display the Migration panel or the Coexistence panel even though you have uninstalled WebSphere Application Server Version 4.1. You can prevent the Installation wizard from recognizing a previously deleted V4.1 Application Server by removing the following entry from the `/usr/bin/jitk.db` file:

```
WebSphere Application Server 4.1
```

Remove other Version 4.x entries for WebSphere Application Server products that are no longer on your system.

15. Verify the system `cp` command when using emacs or other freeware.

If you have emacs or other freeware installed on your Solaris operating platform, verify that the system `cp` command is being used.

- a. Type `which cp` at the command prompt before running the installation program for the WebSphere Application Server product.
- b. Remove the freeware directory from your `PATH` if the resulting directory output includes freeware. For example, if the output is similar to this `/opt/freeware/bin/cp` message, remove the directory from the `PATH`.
- c. Install the WebSphere Application Server product.
- d. Add the freeware directory back to the `PATH`.

If you install with a **cp** command that is part of a freeware package, the installation might appear to complete successfully, but the Java 2 SDK that the product installs might have missing files in the *install\_root/java* directory.

Missing files can destroy required symbolic links. If you remove the freeware **cp** command from the PATH, you can install the Application Server product successfully.

Perform the following step to verify that the Java 2 SDK is working correctly.

16. Verify the Java 2 SDK on the WebSphere Application Server CD. If you copied the product CD to back it up and are using a backup version, perform the following steps to verify that the Java 2 SDK on the product CD-ROM is working correctly.
  - a. Change directories to the `/sun/WAS/jdk/java/bin` directory on the product CD-ROM. For example:

```
cd /mnt/sun/WAS/jdk/java/bin
```
  - b. Verify the Java 2 SDK version. Type the following command:

```
./java -version
```

The command completes successfully with no errors when the Java 2 SDK is intact.
17. Select the Installation wizard method or the silent installation method but do not start the installation yet. The installer program has two interfaces, the Installation wizard and a silent command-line installation.

#### Performing the installation with the wizard

You can start the Installation wizard using the Launchpad or directly using the **install** command.

The default installation method is to open a command window and issue the command to start the Launchpad tool. Click the **Install the product** option on the Launchpad. (See “Using the Launchpad to start the installation” on page 189.)

This option launches the Installation wizard in the language of your machine locale unless there is no translation for your locale, in which case you receive the English version.

A short delay occurs before the ISMP wizard displays. You do not need to click the Install the product option more than once to cause the wizard to display. The delay is particularly noticeable on x-windows platforms.

You can also start the Installation wizard using the `/cdrom/cdrom0/sun/install` command, where `/cdrom/cdrom0` is the mount point for the product CD-ROM and `sun` is the platform directory.

#### Performing a silent installation

You can perform a silent installation using the `-options responsefile` parameter with the command method:

```
fully_qualified_CD_pathname/install  
-options fully_qualified_hard_disk_drive_path_name/responsefile
```

```
# /cdrom/sun/install -options /tmp/my_responsefile
```

Start the silent installation with a fully qualified path to the options response file. Otherwise, the Installation wizard starts.

A silent installation causes the installation program to read your responses from the options response file, instead of from the wizard interface. You must customize the *responsefile* before installing silently. See “Customizing the base options response file” on page 191.

After customizing the file, you can issue the command to silently install. See “Installing silently” on page 190.

After issuing the command, the following text displays:

```
# .....  
.InstallShield Wizard
```

```
Initializing InstallShield Wizard...
```

```
Searching for Java(tm) Virtual Machine...
```

The silent installation runs without displaying status to the window:

- Press **Enter** when the installation is complete to return to the command prompt.
- Press **Enter** at any time to return from a background job to the command prompt.

You can change the `-W launchPRTBean.active` option in the response file to display the Registration panel to indicate the completion of a silent installation on a local system with a graphical user interface.

To determine the status of the silent installation, review the installation logs in the `install_root/logs` directory or in the `/tmp` directory. See “Troubleshooting the installation” on page 214 for more information about log files.

Silent installation is particularly useful if you install the product often.

The rest of this procedure assumes that you are using the Installation wizard. Corresponding entries in the response file exist for every prompt that is described as part of the wizard.

Review the description of the “responsefile” on page 204 for more information. Comments in the file describe how to customize their options.

### Asynchronous and synchronous command lines

After running the `install` command, the command line returns synchronously. A synchronous `install` command returns the command line after the installation is complete.

You can start the installation asynchronously with the installation process and its children processes all running as background processes. Consult your operating system documentation to learn how to issue asynchronous commands. After running the `install` command, the command line returns immediately.

Do not misinterpret an asynchronous command line to mean that the installation has finished when the command prompt returns. Although the command line returns, either the Installation wizard or a silent installation might still be in progress.

### Installing with a network file system mount

If you must use an NFS mount, see the following installation tip:

Table 31. Installation tip

| Operating platform | Tip in “Platform-specific tips for installing and migrating” on page 146 |
|--------------------|--|
| All platforms      | Platform-specific issues when dealing with network file systems          |

18. Insert the product CD labeled, *Application Server, IBM HTTP Server* into a CD-ROM drive to automatically mount the drive. If the Solaris machine is configured to auto mount CDs, Solaris automatically mounts the product CD.
19. Start the installation with the `/cdrom/cdrom0/sun/launchpad.sh` command, where `/cdrom/cdrom0` is the mount point for the product CD-ROM and `sun` is the platform directory on the CD. You can also start the installation with the `/cdrom/cdrom0/sun/install` command:

```
# /cdrom/cdrom0/sun/install
```

The readme link in the Launchpad is to the `readme.html` file in the CD root directory. The *Getting Started* document that contains installation information is in the `docs` directory on the CD.

#### 5.1+

Download a new installation guide at

[ftp://ftp.software.ibm.com/software/webserver/appserv/library/wasv51base\\_gs.pdf](ftp://ftp.software.ibm.com/software/webserver/appserv/library/wasv51base_gs.pdf).

The rest of this procedure assumes that you are using the Installation wizard. Corresponding entries in the response file exist for every prompt that is described as part of the wizard. Review the description of the “responsefile” on page 204 for more information. Comments in the file describe how to customize the options.

20. Click **Next** to continue. The license agreement displays.  
The Installation wizard does not support hot keys, such as **Alt-N**. You can tab to **Next** and press **Enter** to select it, for example.

21. Click the radio button beside the **I accept the terms in the license agreement** message if you agree to the license agreement and click **Next** to continue. After you accept the licensing terms, the Installation wizard checks for prerequisites and for previous versions, with which it can either migrate or coexist.

As the base WebSphere Application Server product version changes, its prerequisites and corequisites change. Updating your database, Web server, Software Development Kit (SDK), and other software is probably necessary.

The base WebSphere Application Server product simplifies migrating product prerequisites, by providing the option to install a complimentary Web server and SDK on your supported operating system. You can uninstall back-level prerequisites and let the Installation wizard install current versions.

If the wizard finds a previous version of WebSphere Application Server, it prompts you to migrate applications and the configuration from the previous version, or to coexist with it. If it finds more than one previous version, the Installation wizard lists them for you to select which one to migrate.

**Migrating or coexisting with an existing WebSphere Application Server node that Solaris does not recognize.**

In some cases, the InstallShield for MultiPlatforms (ISMP) program might not detect a previously installed version of WebSphere Application Server because of a failure to read the registry keys on Solaris. You can force the migration and coexistence panel to display, by starting the installation with an option on the `/cdrom/cdrom0/sun/install` command.

For example, use this command:

```
./install -W previousVersionDetectedBean.previousVersionDetected="true"
```

You can also force the appearance of the coexistence panel to change conflicting port number assignments. For example, force the coexistence panel to appear using this command:

```
./install -W coexistenceOptionsBean.showCoexistence="true"
```

On either panel, identify the location of the existing product instance to cause it to be recognized.

22. Choose whether to install additional features or to install the product again when a previous installation of the same level product exists. You can add features to an unfederated base node or to a deployment manager node at any time, by running the Installation wizard again. Federated nodes must be unfederated before adding features to avoid conflicts while the deployment manager owns the configuration of the base node.

Log off as root and back on again.

This Installation wizard panel appears when the installer program detects a previous installation at the same product level. The panel lets you select whether to add features to the existing installation, or to perform a new installation to another directory. Use a procedure in the following description to install features without causing component regression problems.

When the installer program detects a previous installation at the same product level, a panel appears to let you add features to the existing installation or perform a new installation to another directory.

When adding features, previously installed features are checked and grayed out with the term **(Installed)** at the end of the feature name. The IBM HTTP Server feature is an exception. You can install more than one instance of the IBM HTTP Server product. It is not grayed out or labeled **(Installed)**. You can install the plug-in feature each time you install IBM HTTP Server, too. Select a new directory for each instance of IBM HTTP Server that you install.

*Table 32. Installation tip*

| Operating platform | Tip in “Platform-specific tips for installing and migrating” on page 146 |
|--------------------|--|
| All platforms      | Installing all Web server plug-ins during the initial installation.      |

If you intend to install additional features, use the following procedure to avoid component regression problems. It is important that you understand that there is no way to add features to a base node

without unfederating it from its cell and losing its configuration. The configuration for the base node is restored back to its original configuration, before it was federated and before you changed it with the administrative console of the deployment manager.

Restoring an original configuration means that you lose the configuration for any additional servers that you created on the base node from the deployment manager. (The additional servers will not exist any more.) You will lose any other configuration you performed from the deployment manager administrative console.

Although you can use the **backupConfig** command to save the configuration, you cannot restore it with the **restoreConfig** command because the configuration you restore does not include any features that you add to the base node.

You can use the **backupConfig** command to save the Network Deployment configuration so that you can restore it if necessary. You can also refer to the configuration as you use the administrative console of the deployment manager to reconfigure the base node.

- a. If the node is a base product node in a deployment manager cell, unfederate the node with the **removeNode** command. Removing the base node from the cell also removes the configuration for the base node, which resides at the cell level.
  - b. Uninstall any interim fixes, starting with the last one and finishing with the first one.
  - c. Uninstall any cumulative fixes you installed, starting with the last one and finishing with the first one.
  - d. Uninstall any fix packs you installed, starting with the last one and finishing with the first one.
  - e. Log off and back on.
  - f. Install new features.
  - g. Install the most current fix pack.
  - h. Install the most current cumulative fix.
  - i. Install any interim fixes to bring the node back to its previous fix level.
  - j. If the node was part of a cell, rejoin the node to the cell with the **addNode** command or the deployment manager administrative console. This action synchronizes the master cell configuration with changes you make to the Application Server configuration during the installation of the new features.
  - k. Reconfigure the base node with the Network Deployment administrative console.
23. Choose to migrate applications and the configuration from a previous version, to coexist with another version, or to neither coexist or migrate. Click **Next** to continue. See “Migrating and coexisting” on page 326 for more information.

All WebSphere Application Server products on a single machine share some of the code in the embedded messaging feature, if installed. The required level of the embedded messaging feature for V5.1 (CSD04) is not the same as for V5.0.0 or V5.0.1. The required level of the embedded messaging feature for V5.1 is the same as for V5.0.2.

If you attempt to install V5.0.2 or V5.1 on a machine where a version of the embedded messaging feature is at a release level earlier than CSD04, the installer program displays the message log in a panel. The message that you see is similar to one of the messages in the following example:

```
MQSeries or WebSphere MQ server at an earlier release than required to support
embedded messaging is already installed on the system.
Unsupported earlier maintenance level of MQSeries or WebSphere MQ detected.
Unsupported earlier release of MQSeries client or WebSphere MQ client detected.
Unsupported maintenance level of MQSeries client or WebSphere MQ client detected.
Software conflict with MQSeries JMS SupportPac MA88 detected.
```

**5.1 +** To correct the problem, perform one of the following actions:

- Upgrade the full MQSeries or WebSphere MQ product to WebSphere MQ at the latest level that supports embedded messaging (CSD04).

**5.1 +** See Installing WebSphere embedded messaging as the JMS provider for more information.

- Uninstall the existing MQSeries or WebSphere MQ product if MQSeries or WebSphere MQ is not required on this system and reinstall the WebSphere Application Server product. Select the embedded messaging feature.

The MQSeries JMS SupportPac MA88 problem is slightly different. Uninstall the MQSeries JMS SupportPac MA88 and reinstall the WebSphere Application Server product, selecting the embedded messaging feature. The function provided by SupportPac MA88 is included in the embedded messaging feature.

You can upgrade the WebSphere Application Server product to V5.0.2 before migrating it to V5.1 to avoid any problem with an incorrect level of the embedded messaging feature. See “Upgrading a Version 5.0.0 or Version 5.0.1 product to Version 5.0.2” on page 371.

You can also perform the procedure for migrating V5.0.0 or V5.0.1 with embedded messaging to V5.1. See “Migrating Version 5.0.0 or Version 5.0.1 of WebSphere Application Server with embedded messaging to Version 5.1” on page 347.

To share embedded messaging in a coexistence environment, the node names for each installation must be unique, so that each installation has a message queue manager that is named uniquely. To migrate V5.0.2 to V5.1, the node names must be identical. Therefore, the queue manager names are also identical, if you are migrating from V5.0.2 to V5.1.

To prevent losing the queue manager when you uninstall V5.0.2 (or V5.1), you must create a dummy queue manager before uninstalling one of the WebSphere Application Server versions. A series of migration topics in “Migrating and coexisting” on page 326 describe how to migrate after the installation.

**5.1+** The first rule of migration is to migrate after you install WebSphere Business Integration Server Foundation, if you are planning to install the Integration Server:

| If you are planning to install these products: |                    | Select the migration option while installing this product: |                    |
|--|--------------------|--|--------------------|
| Base product                                   | Integration Server | Base product   | Integration Server |
| X  |                    | X  |                    |
| X  | X                  |  | X                  |

The exception to the rule is to migrate V3.5.x to V5.1 during the installation of the base product or the Network Deployment product.

**5.1+** Migrating Integration Server also migrates the product that Integration Server extends.

When you perform an umbrella installation of the base WebSphere Application Server product, you can choose to migrate applications and the configuration from a previous version, or to coexist with another version of the base WebSphere Application Server product, or to do neither.

You can also perform a silent migration or configure for coexistence during a silent installation. Refer to “Installing silently” on page 190 for a description of performing a silent installation, including the options that you can specify.

The migration prompt appears only when the Installation wizard detects a previous version. The coexistence prompt appears when the Installation wizard detects any other installation, including another Version 5 installation.

If you choose to coexist, the wizard displays a Port selection panel, where you can specify port assignments that do not conflict with existing ports. For example, you can change the HTTP transport port for coexistence, from 9081 (one more than the default Version 5 port number) to 9085 or higher, to avoid potential conflicts with port numbers that previous versions of WebSphere Application Server commonly use.

Use the **netstat -a** command to display all ports in use.

**5.1+** If you choose neither the migration option nor the coexistence option, you can run Version 5.1.x and the previous version, but not at the same time. Although it is possible that both versions



might coexist without port conflicts, you can ensure that both versions run together by selecting the coexistence option and checking for conflicting port assignments.

The Migration panel lists all previous releases that it can identify. If you highlight a release, the text boxes labeled, "select previous version," show the location of the previous product. Select the product to migrate. If you do not see the previous version that you intend to migrate, click **Select previous version** to enter a location and configuration file name if you are migrating a WebSphere Application Server Advanced Edition Single Server Edition, Version 4.0.x installation.

The field labeled "Configuration file" is valid only for WebSphere Application Server Advanced Edition Single Server Edition, Version 4.0.x. For the other versions of WebSphere Application Server that are supported by migration (Version 3.5 Standard Edition, Version 3.5 Extended Edition, and Version 4.0 Advanced Edition), the `admin.config` file provides the host and port values for the administrative server. If you use a file name other than `admin.config`, issue the commands that call the migration tools instead of migrating while installing. Issuing the commands that call the migration tools is described in "Migrating and coexisting" on page 326.

Migrate V3.5.x to V5.1 during the installation of the base product or the Network Deployment product, before installing the Integration Server product.

You must start the administrative server of some previous versions so that the Installation wizard can export the configuration from the `admin.config` file.

Although you might select migration at this point in the installation process, the actual migration does not begin until after the Version 5 installation is complete. At that time, if the `WASPreUpgrade` tool fails, the Installation wizard does not call the `WASPostUpgrade` tool to complete the migration, but instead displays the `WASPreUpgrade.log` and `WASPostUpgrade.log` log files for you to diagnose the problem. After fixing the problem, such as starting the administrative server of a previous release, you can start the migration again, as described in "Migrating and coexisting" on page 326.

24. Choose a type of installation and click **Next**. If you use the Installation wizard, you can choose a full installation type, which installs all features, or a custom installation type. The custom installation type lets you select which features to install.

**5.1 +** If you are migrating a federated node:

- Migrate the deployment manager node first. The deployment manager must be at the highest release level or fix level within the cell.
- Select the same type of installation that you used to install the earlier release:
  - If you selected a full installation type then, select a full installation type now.
  - If you selected a custom installation type then, select a custom installation type now and select the same features as you did for the V5.0.x release.

Federated nodes have configurations that are controlled by the deployment manager that controls the cell. Migrating installs the same features for the V5.1 node that are in the configuration for the previous release. If you decide that you must add features, see "Migrating federated nodes" in the information center for Network Deployment.

You can improve performance by not installing certain features, as described in the **Performance considerations** section in the next step.

- Choose **full install** to install everything you need to run Web applications on your server, including IBM HTTP Server and the embedded messaging feature. The plug-in for IBM HTTP Server is installed and configured in the full installation. Use this option if you are new to WebSphere Application Server and are unsure of what to install. Choosing this option does install the embedded messaging feature. You must prepare for the embedded messaging feature, as described earlier.
- Choose **Custom install** to select installation features. Choose this option if you already know what to install. Choose this type of installation if you must install and configure the plug-in for a Web server other than IBM HTTP Server. The Installation wizard installs all plug-ins if you select any of them, but it only configures selected plug-ins. Also choose this type of installation if you intend to not install the WebSphere Application Server embedded messaging server because you have already installed the WebSphere MQ Version 5.3 product, or another JMS provider.

If you choose a full installation, you can skip the next step. After selecting a full installation, the wizard prompts you to select the directory for the program code. After selecting a custom installation, the wizard displays the list of features.

25. Select features to install and click **Next** to continue when performing a custom installation. This step is available only when you choose the custom installation type. A description of each feature appears at the bottom of the panel when you roll the cursor over the feature.

**5.1+** Selecting certain features causes the installation of other prerequisite features. The following table shows this feature relationship.

Table 33. Features and feature dependencies

| If you select this feature:   | This feature is also installed: | Feature description   |
|---|---------------------------------|---|
| <b>Application Server</b>   | Admin Scripting                 | These features are the Application Server run time and its Samples.   |
| Sub-features:                      Application Server Samples   |                                 |   |
| <b>Administration</b>   |                                 | Getting started with System Administration  |
| Sub-features:                      Admin Scripting  | Application Server              |   |
| Administrative Console  | Admin Scripting                 |   |
| <b>Deployment Tools</b>   | Admin Scripting                 | <ul style="list-style-type: none"> <li>• Deploying and managing applications</li> <li>• Overview of the ANT Utilities</li> </ul>      |
| Sub-features:                      Deploy Tool  | Application Server              |   |
| ANT Utilities   | Admin Scripting                 |   |
| <b>Embedded Messaging</b>   |                                 | <ul style="list-style-type: none"> <li>• Installing and configuring a JMS provider</li> <li>• Message-driven beans samples</li> </ul> |
| Sub-features:                      Server and Client  | Application Server              |   |
| Client Only   |                                 |   |
| Message-driven Bean Samples (These samples are the MDBSamples application, which is for the server and not for the client.)   | Application Server samples      |   |
|   | Admin Scripting                 |   |
| <p>You can install the MDBSamples application without installing the embedded messaging server and client feature. Perhaps you have already installed the server and client feature. Or perhaps you intend to reconfigure the MDBSamples to use messaging resources that WebSphere MQ software provides.</p> <p>In any case, if you install the MDBSamples application and do not have the server and client feature installed, errors occur. The Application Server starts the MDBSamples application at start up. The MDBSamples application cannot start the required messaging resources in the Java Naming and Directory Interface (JNDI).</p> <p>Because of the lack of required resources, the message-driven beans fail to start, which causes an exception that the Application Server logs. The Application Server is not affected other than being unable to start the MDBSamples application.</p> |                                 |   |

Table 33. Features and feature dependencies (continued)

| If you select this feature:           | This feature is also installed:  | Feature description   |
|---------------------------------------|--|---|
| <b>IBM HTTP Server</b>                |  |   |
| <b>Web Server Plug-ins</b>            |  |   |
| Sub-features:                         | <ul style="list-style-type: none"> <li>IBM HTTP Server</li> <hr/> <li>Apache Web Server</li> <hr/> <li>Microsoft Internet Information Services (IIS)</li> <hr/> <li>Sun ONE (formerly known as iPlanet) Web Server</li> <hr/> <li>Lotus Domino Web Server</li> </ul> | <p>“Preparing to install and configure a Web server” on page 27</p>   |
| <b>Performance And Analysis Tools</b> |  |   |
| Sub-features:                         | <ul style="list-style-type: none"> <li>Tivoli Performance Viewer</li> <hr/> <li>Dynamic Cache Monitor</li> <hr/> <li>Performance Servlet</li> <hr/> <li>Log Analyzer</li> </ul>  | <ul style="list-style-type: none"> <li>• Tivoli Performance Viewer features</li> <li>• Displaying cache information</li> <li>• Performance Monitoring Infrastructure servlet</li> <li>• Log Analyzer</li> </ul> |
| <b>Javadocs</b>                       |  |   |
|                                       |  | <p>IBM WebSphere Application Server, Release 5 API Specification in Javadoc format</p>  |

### Performance considerations

For better performance in either a development or production environment, do not install the Samples. By omitting the Samples, you can improve Application Server startup time by 60 percent and save 15 percent of disk space. You can save up to 30 percent of process footprint (based on a maximum heap size of 256 MB).

If your applications do not use Java Message Service (JMS) messaging, do not install embedded messaging. This recommendation is especially true if your system has 256 MB or less of physical memory.

Not installing the embedded messaging feature saves about 36 MB of message queuing process memory and can improve application startup time up to 5 percent and save an additional 72 MB of disk space. (This was tested on Windows machines. Results on a Solaris platform might differ slightly.)

In addition, if you install the embedded messaging client feature you do not need to install the message-driven Bean Samples. The message-driven Bean Samples are for the embedded messaging server in the server and client feature.

### Web Server plug-in feature considerations

Select the IBM HTTP Server feature to install and configure IBM HTTP Server on the same, or on a different machine than the WebSphere Application Server product. You can migrate plug-ins from an earlier version of WebSphere Application Server to access the current WebSphere Application Server product.

Install IBM HTTP Server on a separate machine using the CD-ROM labeled, **Application Server, IBM HTTP Server**. After installing IBM HTTP Server, you can install the plug-in by installing the base WebSphere Application Server product and clearing all features except the plug-in for IBM HTTP server. See Installing and configuring a Web server.

The Installation wizard automatically installs and configures IBM HTTP Server and the IBM HTTP Server plug-in on the same machine as the WebSphere Application Server if you choose the full installation. No further configuration is necessary. Installing the IBM HTTP Server product with the

WebSphere Application Server product also includes it in the WebSphere Application Server uninstaller program that the Installation wizard creates. Choose the custom type of installation to clear the selection of the IBM HTTP Server feature, if you want to install and uninstall it separately.

You can run the uninstaller program to remove all installed features.

26. Specify a destination directory. Click **Next** to continue.

Specify a target directory for the base WebSphere Application Server product and for the IBM HTTP Server feature, if you are installing the feature. You cannot change the default installation directory for the embedded messaging feature, if you are installing the feature.

Deleting the default target location and leaving an installation directory field empty stops you from continuing the installation process. The Installation wizard does not proceed when you click **Next**. Enter the required target directory to proceed to the next panel. Non-ASCII special characters are not supported in the name of the installation directory. Spaces are also not supported in the name of the installation directory.

The installer program checks for required space at the beginning of the installation. If you must increase the /tmp allocation, stop the installation program, increase the allocation, and restart the installation.

If you have problems accessing the administrative console after installation, check the `installAdminConsole.log` file for a failure indication. Clean up the /tmp space and reinstall the administrative console using the `wsadmin` scripting facility.

**5.1 +** Version 5.1 does not allow you to install the IBM HTTP Server feature in the same directory as an earlier version.

If you select the embedded messaging feature and prerequisites are missing, the Installation wizard displays the `mq_prereq.log` error log and takes you back to the Installation type panel. Choose **Custom** installation and clear the checkbox for the embedded messaging feature. The `mq_prereq.log` file is in the system temp directory.

27. Specify target directories for configuration files for any selected Web server plug-ins. Click **Next** to continue.

If you are installing the IBM HTTP Server, you do not need to specify a location for its plug-in configuration file. The wizard uses the installation path you specified for the Web server to derive the location.

If you have previously installed the IBM HTTP Server product on the same machine as the WebSphere Application Server, and are now installing just the plug-in, enter a configuration file location of `IHS_DIR/conf/httpd.conf`, where `IHS_DIR` is the directory where the IBM HTTP Server product is installed.

28. Specify node information and click **Next**.

Specify the node name and host name. Although the wizard inserts the machine name (of the installation platform) as the node name, you can specify any unique name. The node name is an arbitrary WebSphere Application Server-specific name that must be unique within a cell.

The host name is the network name for the physical machine on which the node is installed. The host name must resolve to a physical network node on the server. When multiple network cards exist in the server, the host name or IP address must resolve to one of the network cards. Remote WebSphere Application Server nodes use the host name to connect to and to communicate with this node. Selecting a host name that other machines can reach within your network is extremely important. Do not use the generic `localhost` identifier for this value.

If you define coexisting nodes on the same computer with unique IP addresses, define each IP address in the `/etc/hosts` file or in a domain name server (DNS) look-up table. WebSphere Application Server configuration files do not provide domain name resolution for multiple IP addresses on a machine with a single network address.

The value that you specify for the host name is used as the value of the `hostName` property in WebSphere Application Server configuration documents. Specify the host name value in one of the following formats:

- Fully qualified domain name servers (DNS) host name string, such as `xmachine.manhattan.ibm.com`
- The default short DNS host name string, such as `xmachine`
- Numeric IP address, such as `127.1.255.3`

The fully qualified DNS host name has the advantage of being totally unambiguous and also flexible. You have the flexibility of changing the actual IP address for the host system without having to change the WebSphere Application Server configuration. This value for host name is particularly useful if you plan to change the IP address frequently when using Dynamic Host Configuration Protocol (DHCP) to assign IP addresses. A format disadvantage is being dependent on DNS. If DNS is not available, then connectivity is compromised.

The short host name is also dynamically resolvable. A short name format has the added ability of being redefined in the local hosts file so that the system can run WebSphere Application Server even when disconnected from the network. Define the short name to `127.0.0.1` (local loopback) in the hosts file to run disconnected. A format disadvantage is being dependent on DNS for remote access. If DNS is not available, then connectivity is compromised.

A numeric IP address has the advantage of not requiring name resolution through DNS. A remote node can connect to the node you name with a numeric IP address without DNS being available. A format disadvantage is that the numeric IP address is fixed. You must change the setting of the `hostName` property in WebSphere Application Server configuration documents whenever you change the machine IP address. Therefore, do not use a numeric IP address if you use DHCP, or if you change IP addresses regularly. Another format disadvantage is that you cannot use the node if the host is disconnected from the network.

29. Review the summary information and click **Next** to install the product code or **Back** to change your specifications. When the installation is complete, the wizard displays the `install_root\logs\mq_install.log` installation log if you selected the embedded messaging feature and errors occur with its installation.
30. Review the `mq_install.log` installation log if it displays. Click **Next** to continue. The wizard displays the Registration panel.
31. Click **Next** to register the product, or clear the check box and click **Next** to register at a later time. The Registration panel is in English when the machine locale uses a double byte character set (DBCS) language.

You can register the product now by using the link on this panel or later, by using the Web address in the `install_root/prt/readme_prt.txt` file. The Web address in the file is encoded for your locale. A known problem for some locales corrupts the Web address so that it is similar to the following example. (The Web address is all one line in the file. The following example shows the address on two lines for clarity.)

```
http%3A%2F%2Fwww.ibm.com%2Fsoftware%2Fwebprt%2Fregister%2Fprodreg.nsf%
2Fcontact%3F0penForm%26lang%3DENU%26pid%3D45P8842%26q2%3DWindows+2000
```

Use one of the following Web addresses if your `install_root/prt/readme_prt.txt` file is corrupt:

- <http://www.ibm.com/software/webprt/register/prodreg.nsf/contact?OpenForm&>
- <https://www6.software.ibm.com/reg/prt/prt-r>

The Installation wizard starts the First Steps tool. See “firststeps command” on page 210 for more information.

If you are migrating a federated node as you install, close the First Steps tool. Migrated federated nodes have configuration differences that prevent you from using the First Steps tool.

32. Verify the success of the installer program by examining the Exit summary panel and the `install_root/logs/log.txt` for installation status. ISMP records a success message in the `install_root/logs/log.txt` file: “INSTFIN: The installation is complete.” The log is the only source of status information for a silent installation.

Look for severe errors that the installer records in the `install_root/logs/log.txt` file in the installation root directory to verify that no file system or other unusual errors occurred during installation.

If the `install_root/logs/log.txt` file does not contain a record of any problems but problems exist, verify or troubleshoot the installation, as described in “Troubleshooting the installation” on page 214 and in Installation component troubleshooting tips.

If problems exist, correct them, uninstall the product, as described in “Uninstalling the product” on page 295, log off as root and back on, and reinstall.

When installing WebSphere Application Server with embedded messaging from the CD-ROM, the following warning messages are issued despite successful installation:

```
MQSERIES.MQM-CL-HPUX: A test command parameter is not valid." and "*
"hostname:/cdrom/hpux/messaging/images": Cannot open the
  logfile on this target or source. Possibly the media is
  read-only or there is a permission problem." on mq_install.log.
```

You can ignore the warning messages, because the problem does not affect the successful installation of WebSphere Application Server with embedded messaging.

33. Click **Finish** to close the Installation wizard.
34. Close the terminal window that remains open after the installation finishes. When installing WebSphere Application Server from the product CD onto a Solaris system, the ISMP installation wizard launches a terminal window, which remains open after the installation is complete. This window contains the following text:

```
InstallShield Wizard
Initializing InstallShield Wizard...

Searching for Java(tm) Virtual Machine...
.....
```

Close the window after the installation completes.
35. Restrict access to the `/var/mqm/errors` directory and messaging logging files. After installing the embedded messaging feature, you must restrict access to the `/var/mqm` directory and to log files that are needed for embedded messaging, such that only the `mqm` user or members of the `mqm` user group have write access. For detailed information, see *Installing WebSphere embedded messaging as the JMS provider and Securing messaging directories and log files*.
36. Install the most current fix pack and cumulative fix for the WebSphere Application Server product. See *Recommended updates for WebSphere Application Server* for information about downloading and installing the upgrades.
37. Install the Network Deployment product to manage multiple base product Application Servers. The WebSphere Application Server, Version 5.x product does not provide centralized management of multiple servers. The WebSphere Application Server Network Deployment, Version 5.x product provides this function. The deployment manager process (`dmgr`) in the Network Deployment product manages a cell of Application Servers. You can federate a base Application Server into the cell or unfederate it. While federated, the configuration of the base Application Server is managed from the deployment manager. See the information center for the Network Deployment product to get started installing the product:  
**5.1+** Network Deployment installation
38. Tune your system for performance. For best performance on any platform, see *Tuning performance parameter index*.
39. Optional: Create a monitored process for one or more Application Server processes or for the HTTP Server, as described in “Automatically restarting server processes” on page 205. You can create monitored processes after the installation is complete. Processes started by a **startServer.sh** command are not running as monitored processes, regardless of how you have configured them. You must start the server process with a shell script based on the example `rc.was` file, to have the server running as a monitored process.



The Installation wizard configures the base product. It is not necessary to perform further configuration at this time.

You have now successfully installed WebSphere Application Server and the features that you selected.

## Uninstalling and reinstalling

See “Uninstalling the product” on page 295 for information about uninstalling any WebSphere Application Server product.

### 5.1+ Reinstalling a V5.1 instance on a Solaris platform after uninstalling and leaving the embedded messaging feature installed

**5.1+** If you uninstall a V5.1 instance but leave the embedded messaging feature because of other WebSphere Application Server instances, clean up the `/var/sadm/pkg` directory before reinstalling V5.1.

**5.1+** If you uninstall all WebSphere Application Server products on the machine and are now reinstalling, follow the procedure in “Manually uninstalling on Solaris platforms” on page 318 instead of the following procedure.

**5.1+** You must perform this procedure before you can reinstall the product into the same installation root directory on Solaris platforms. Otherwise you must reinstall the product into another directory and you might have a problem reinstalling the embedded messaging feature.

**5.1+** Assume that V5.0.2 exists in `/opt/WebSphere/AppServer50` with the embedded messaging server and client feature. You then install V5.1 to the following directory, `/opt/WebSphere/AppServer51`, but later you uninstall V5.1 and leave the embedded messaging feature installed. And now you decide to reinstall V5.1.

1. Make the `/var/backupForWAS51Reinstall` backup directory.
2. Change directories to `/var/sadm/pkg`, and type `ls -lt | grep WSBAA51` to find packages that contain the base WebSphere Application Server.
3. If the `WSBAA51` directory exists, change directories to the `WSBAA51` directory and read the `pkginfo` file in the `/var/sadm/pkg/WSBAA51` directory.

Find the installation location for V5.1. If the location is the same installation location as the V5.1 product you uninstalled, move the `/var/sadm/pkg/WSBAA51` folder to `/var/backupForWAS51Reinstall`.

The following example shows how to display the `pkginfo` file:

```
# pwd
/var/sadm/pkg/WSBAA51
# ls -lt
total 6
-rw-r--r--  1 root    other      591 Oct 27 15:46 pkginfo
drwxr-xr-x  2 root    other      512 Oct 27 15:46 install
drwxr-xr-x  2 root    other      512 Oct 27 15:46 save
# cat pkginfo
# VPD created by InstallShield MultiPlatform Edition
# Mon Oct 27 15:46:34 EST 2003
ARCH=sparc
BASEDIR=/opt/WebSphere/AppServer51
CATEGORY=application
CLASSES=none
DESC=
ISJE_INSTALL_STATUS=3
ISJE_IS_ACTIVE=true
ISJE_IS_PUBLICLY_SHAREABLE=false
ISJE_NAME=IBM WebSphere Application Server
```

```

ISJE_PARENTS=WSBAA51:5.1.0.0.DSP=:1
ISJE_PRODUCT_NUMBER=5.1.0.0
ISJE_REQUIRED_COUNT=0
ISJE_SOURCES=
ISJE_UID=WSBAA51
ISJE_UNINSTALLER="uninst" "uninstall.jar" "uninstall.dat" ""
ISJE_VPD_VERSION=4.5
ISJE_WEB=
NAME=WebSphere Application Server
PKG=WSBAA51
PKGINST=WSBAA51
VENDOR=
VERSION=5.1.0.0.DSP=

```

When two instances of V5.1 WebSphere Application Server exist, for example, with one installed and one uninstalled, two files exist in the /var/sadm/pkg directory. One is the /var/sadm/pkg/WSBAA51 file; the other is the /var/sadm/pkg/WSBAA51.2 file. For example:

```

# ls -lt | grep WSBAA
drwxr-xr-x  4 root    other      512 Oct 27 18:52 WSBAA51.2
drwxr-xr-x  4 root    other      512 Oct 27 15:46 WSBAA51
drwxr-xr-x  3 root    other      512 Oct 21 13:32 WSBAA

```

4. Verify that you are moving the correct file to the backup directory.

You can do this by examining the pkginfo files. Do not touch entries for other WebSphere Application Server products that might be present on the platform, such as WS entries for existing WebSphere Application Server V5.0.x.

5. Run the **ls -lt | grep WSBM** command to get all of the embedded messaging packages.

For example:

```

#
# ls -lt | grep WSBM
drwxr-xr-x  4 root    other      512 Oct 27 18:52 WSBMQ1AA.2
drwxr-xr-x  4 root    other      512 Oct 27 18:52 WSBMQ2AA.2
drwxr-xr-x  4 root    other      512 Oct 27 18:52 WSBMS4AA.2
drwxr-xr-x  4 root    other      512 Oct 27 18:52 WSBMS6AA.2
drwxr-xr-x  4 root    other      512 Oct 27 18:52 WSBMQAA.2
drwxr-xr-x  4 root    other      512 Oct 27 15:46 WSBMS4AA
drwxr-xr-x  4 root    other      512 Oct 27 15:46 WSBMS6AA
drwxr-xr-x  4 root    other      512 Oct 27 15:46 WSBMQ1AA
drwxr-xr-x  4 root    other      512 Oct 27 15:46 WSBMQ2AA
drwxr-xr-x  4 root    other      512 Oct 27 15:46 WSBMQ3AA
drwxr-xr-x  4 root    other      512 Oct 27 15:46 WSBMQAA
drwxr-xr-x  4 root    other      512 Oct 27 15:46 WSBMSAA

```

6. Identify entries that are related to the V5.1 product that you uninstalled.

Examine the pkginfo file for each entry. In the previous example, ".2" entries relate to the product you uninstalled, which was originally in the /opt/WebSphere/AppServer51 directory. Use a command to move all the ".2" entries into the backup directory. For example, run the following command from the /var/sadm/pkg/ directory:

```
mv WSBM*.2 /var/backupForWAS51Reinstall
```

For V5.1 of Network Deployment, all related embedded messaging entries start with WSNM. Run the following command to show the Network Deployment entries:

```
ls -lt | grep WSNM
```

For V5.1 of WebSphere Business Integration Server Foundation, all related embedded messaging entries are related to the base product or to the Network Deployment product. No embedded messaging entries start with WSEM.

7. Rename /opt/WebSphere/AppServer51 to /opt/WebSphere/AppServer51\_bk before reinstalling V5.1.

## Miscellaneous tips for Solaris platforms

Table 34. Installation and migration tips

| Operating platform           | Tip in “Platform-specific tips for installing and migrating” on page 146   |
|------------------------------|--|
| Solaris platforms            | Solaris operating environment <ul style="list-style-type: none"> <li>• Using the <b>unzip</b> function, not the <b>jar</b> command, to decompress downloaded files</li> <li>• Configuring the converter.properties file to use EUC-JP (Japanese) encoding</li> <li>• Configuring the Domino Server plug-in</li> <li>• Avoiding problems starting application servers in zh_TW.EUC locale on Solaris</li> </ul> |
| All platforms                | All platforms  |
| All Linux and UNIX platforms | All Linux and UNIX-based platforms   |

## Installing the base Application Server on Windows platforms

This topic describes how to install the base WebSphere Application Server product from a user ID that belongs to the administrator group.

You cannot install the product correctly from a user ID that does not belong to the administrator group. Some steps of the installation procedure require the administrator group ID to have the following advanced user rights, *Act as part of the operating system* and *Log on as a service*.

If you encounter a problem such as not having enough space or not having the right prerequisite updates on your system, cancel the installation, make the required changes, and restart the installation.

The installation uses InstallShield for Multiplatforms (ISMP) to perform the installation. You can use the Installation wizard or perform the installation from a command line, using the silent installation method.

### Installation programs in WebSphere Application Server products

#### 5.1 +

| Product  | Link to installation procedure                             | Label on product CD  |
|--|--|--|
| (Base) WebSphere Application Server              | Base product installation (which links to this procedure!) | <b>Application Server, IBM HTTP Server</b>                     |
| Network Deployment                               | Network Deployment installation                            | <b>Deployment Manager</b>                                      |
| WebSphere Business Integration Server Foundation | Integration Server installation                            | <b>Integration Server Disk 1 and Integration Server Disk 2</b> |

Use the Network Deployment installation image to manage a multimachine environment, where you have installed the base product on different machines and want to manage the Application Servers in a group, or *cell*. If you buy the Network Deployment product, you also get the base product in the package.

WebSphere Business Integration Server Foundation is the V5.1 level of the Enterprise product. WebSphere Business Integration Server Foundation, Version 5.1 extends the base WebSphere Application Server V5.1 product. After migrating the underlying product to V5.1, do not reinstall the V5.0.x Enterprise product. Version 5.0.x of the Enterprise product does not extend Version 5.1 of the base WebSphere Application Server product nor does it extend the V5.1 Network Deployment product.

**5.1 +** If you buy the WebSphere Business Integration Server Foundation product, you also get the Network Deployment product and the base product in the package.

### Creating multiple Application Servers on a single machine

Although you can create multiple servers on a base WebSphere Application Server node, the servers all share one set of configuration files. Changes that you make to one server affect the others. Configuration documents might become corrupted. The **wsinstance** command can create multiple configuration instances. Each instance is a stand-alone Application Server with its own set of configuration files. Or install the Network Deployment product to create and manage multiple base Application Servers.

## Order of installation

**5.1 +** Install the base product before installing the Network Deployment product when installing both products on the same machine. Install the Network Deployment product before the Integration Server product that extends the Network Deployment product. You can install the Integration Server product before the base product. The Integration Server product can install the base product in what is known as an *umbrella* installation but Integration Server cannot install the Network Deployment product. Some features of the base product cannot be installed by Integration Server.

The embedded messaging feature that is included in the default installation requires that you install base before Network Deployment when installing both on the same machine. Otherwise, the order does not matter. See the following installation tip for more information:

Table 35. Installation tip

| Operating platform | Tip in “Platform-specific tips for installing and migrating” on page 146  |
|--------------------|---|
| All platforms      | Installing WebSphere Application Server products in order on the same machine, when installing the embedded messaging component |

This topic is available in Adobe PDF format on the product CD-ROM and online in an information center. The information center always has the most current information. The information center displays in the language of your machine locale if possible.

The installation guide PDF is updated occasionally. Download a new installation guide from:

**5.1 +** [ftp://ftp.software.ibm.com/software/webserver/appserv/library/wasv51base\\_gs.pdf](ftp://ftp.software.ibm.com/software/webserver/appserv/library/wasv51base_gs.pdf)

The Launchpad tool lets you access the product overview, the `readme.html` file, and the installation guide. See “Using the Launchpad to start the installation” on page 189.

You also use the Launchpad during the installation procedure to install the product. The installation program performs the following actions:

- Checks prerequisites automatically
- Looks for a previous WebSphere Application Server installation, to determine whether to display the Migration panel or the Coexistence panel during the installation
- Installs the IBM HTTP Server and other features, if you select them

After using the Launchpad to view product documentation, perform the following procedure. The procedure includes several preliminary steps before actually launching the installer program.

1. Stop all WebSphere Application Server-related Java processes on the machine where you are installing the product.
2. Stop any Web server process such as the IBM HTTP Server, if you are extending the base product.
3. **5.1 +** Stop all instances of the `process_spawner.exe` program on a Windows system before installing.
4. Provide adequate disk space.

**5.1 +** The base Application Server requires the following disk space:

**520 MB for the C:\Program Files\WebSphere\AppServer directory**

The installation root directory includes the base product code.

**100 MB for the C:\temp directory**

The temporary directory is the working directory for the installation program.

Verify that you have at least 100 MB of free space to avoid problems.

A message about free space occurs when less than 4 MB of free space remains on the disk that contains the system temp directory after starting the installation.

**20 MB for the C:\Program Files\IBMHttpServer directory**

The IBM HTTP Server feature requires this space.

**20 MB for the C:\Program Files\IBM\gsK7 directory**

The Tivoli Global Security Kit requires this space.

**660 MB total requirement without the embedded messaging feature**

Space requirements for the embedded messaging feature are described in the next step.

The Installation wizard displays required space for individual features on the Feature selection panel. The Installation wizard also warns you if you do not have enough space to install the product and the cumulative fixes.

If you plan to migrate applications and the configuration from a previous version, verify that application objects have available disk space. As a rough guideline, plan for space equal to 110 percent of the size of the application objects:

- **For Version 3.5.x:** The size of application Java archive (JAR) files, Web archive (WAR) files, and servlet files
- **For Version 4.0.x:** The size of enterprise archive (EAR) files
- **5.1+ For Version 5.0.x:** The size of EAR files

5. Allocate adequate disk space for the embedded messaging feature if you are planning to install the feature. You can specify the file system into which the embedded messaging feature is installed. The following table shows default locations and free space requirements for the base messaging functions and the messaging broker functions for publish/subscribe messaging.

Table 36. Space requirements for the embedded messaging feature on Windows platforms

| Component                 | Base messaging                    | Messaging broker                        |
|---------------------------|-----------------------------------|---|
| Installation directory    | C:\Program Files\IBM\WebSphere MQ | C:\Program Files\IBM\WebSphere MQ\WEMPS |
| Server and client feature | 70 MB                             | 45 MB                                   |
| Client feature            | 15 MB                             | N/A                                     |

If you are using the Installation wizard to install IBM WebSphere Application Server, you can specify an installation location for the embedded messaging feature during either a Full or Custom installation. You can also specify an installation location for the embedded messaging feature when installing silently.

6. Prepare to install the embedded messaging feature with WebSphere MQ. The embedded messaging feature is based on the IBM WebSphere MQ product. The feature and the product each provide a Java message service (JMS) function that supports queues for point-to-point messaging and topics for publish and subscribe messaging.

You can install the embedded messaging feature with or without the WebSphere MQ product on the same machine. To support both the embedded messaging feature and the WebSphere MQ product on the same machine, the WebSphere MQ product must be at a certain fix level and must have several of its features installed.

If you already have WebSphere MQ installed, you can configure it as the JMS provider. Otherwise, you can install the embedded messaging feature during the installation or install the WebSphere MQ product or another JMS provider after you install.

Even though you might decide now to install only the embedded messaging feature, you can install the WebSphere MQ product later and use the IBM WebSphere MQ product as the JMS provider instead.

7. Verify that you have upgraded to WebSphere MQ 5.3 with the CSD04 update to install embedded messaging on a machine where you already have WebSphere MQ installed.

Determine if your WebSphere MQ 5.3 installation is at the required level by running the **mqver** utility provided by WebSphere MQ.

The required level as indicated by the mqver command:

```
Name:      WebSphere MQ
Version:   530.4 CSD04
...
```

8. Verify that you have installed the required WebSphere MQ 5.3 features to install embedded messaging on a machine where you already have WebSphere MQ installed. Verify that you have installed the following features:
  - When installing the embedded messaging server and client feature, the required MQ features are *Server* and *Java messaging*.
  - When installing the embedded messaging client feature, the required MQ feature is *Java messaging*.

If you attempt to install the embedded messaging feature when WebSphere MQ is already installed, the level of WebSphere MQ must be Version 5.3 with the required MQ features. Otherwise, the installation of the embedded messaging feature fails with prerequisite check errors.

9. Verify that prerequisites and corequisites are at the required release levels. Although the Installation wizard checks for prerequisite operating system patches with the prereqChecker application, review the prerequisites on the IBM WebSphere Application Server supported hardware, software, and APIs Web site if you have not already done so.

Refer to the documentation for non-IBM prerequisite and corequisite products to learn how to migrate to their supported versions.

Some operating systems that were not supported at the time that this product was shipped on CD-ROM might now be supported. You might receive a message from the prereqChecker program that an operating system is not supported when, in fact, the operating system is supported.

Always consult the IBM WebSphere Application Server supported hardware, software, and APIs Web site to determine whether your operating system is supported when you receive a message from the prereqChecker program. The Web site lists all supported operating systems and the operating system fixes and patches that you must install to have a compliant operating system.

After confirming that your operating system is supported and that you have installed all necessary patches, you can click **Next** to continue an installation when you receive an error message from the prereqChecker program.

10. Install the required msvcp60.dll file for Windows 2000 Server platforms. The embedded messaging feature requires a DLL file on Windows 2000 Server platforms. The DLL file is already installed on Windows 2000 Advanced Server and other Windows platforms that are supported. If you see a message similar to the following example, download the msvcp60.dll file:

```
wempsdeletebroker.exe - Unable To Locate DLL
The dynamic link library MSVCP60.dll could
not be found in the specified path...
```

The prereq checker in the installer program does not check for this DLL file on the Windows 2000 Server platform. If you select the Windows 2000 Support Tools during Windows 2000 Server installation, the installation program for Windows 2000 Server installs the DLL file in the C:\Program Files\Support Tools directory. The DLL file is installed during the installation of Windows 2000 Advanced Server in the C:\WINNT\system32 directory.

You can download the DLL file from the Microsoft Web site.

11. Lower the Internet Explorer security level from high to medium to view the Product overviews option from the Launchpad on Windows 2003 machines.



You might see a blank page when trying to view Product overviews from the Launchpad on Windows 2003 machines. Internet Explorer is set with high security level on the internet zone. Use the following procedure to lower the internet zone security level to medium:

- a. Right-click the Internet Explorer icon on the desktop.
  - b. Click **Properties > Security > Internet Zone**.
  - c. In the **Security level for this zone** area, move the slider from **High** to **Medium**.
  - d. Click **OK** to save the change.
12. Verify the Java 2 SDK on the product CD. Perform the following steps to verify that the Java 2 SDK on the product CD-ROM is working correctly.
- a. Change directories to the `\win\WAS\jdk\java\bin` directory on the product CD-ROM. Type the following command:  

```
cd CD_Drive_D:\win\WAS\jdk\java\bin
```
  - b. Verify the Java 2 SDK version. Type the following command:  

```
.\java -version
```

The command completes successfully with no errors when the Java 2 SDK is intact.
13. Select the Installation wizard method or the silent installation method but do not start the installation yet. The installer program has two interfaces, the Installation wizard and a silent command-line installation.

#### Performing the installation with the wizard

You can start the Installation wizard using the Launchpad or directly using the **install** command.

The default installation method is to open a command window and issue the command to start the Launchpad tool. Click the **Install the product** option on the Launchpad. (See “Using the Launchpad to start the installation” on page 189.)

This option launches the Installation wizard in the language of your machine locale unless there is no translation for your locale, in which case you receive the English version. A short delay occurs before the ISMP wizard displays. You do not need to click the Install the product option more than once to cause the wizard to display.

You can also start the Installation wizard using the **C:\> D:\win\install.bat** command, where the D: drive is your CD-ROM drive and win is the platform directory.

The following example shows a fully qualified call to the installer program:

```
> fully_qualified_CD_pathname\install.bat
```

```
C:\> D:\win\install
```

#### Performing a silent installation

You can also perform a silent installation using the `-options C:\fully_qualified_path\responsefile` parameter with the command method:

```
C:\> fully_qualified_CD_pathname\install  
-options fully_qualified_HDD_pathname\responsefile
```

```
C:\> D:\win\install -options C:\temp\my_responsefile
```

Start the silent installation with a fully qualified path to the options response file. Otherwise, the Installation wizard starts.

A silent installation causes the installation program to read your responses from the options response file, instead of from the wizard interface. You must customize the *responsefile* before installing silently. See “Customizing the base options response file” on page 191.

After customizing the file, you can issue the command to silently install. See “Installing silently” on page 190.

After issuing the command, the following text displays:

```
# .....  
.InstallShield Wizard
```

Initializing InstallShield Wizard...

Searching for Java(tm) Virtual Machine...

The silent installation runs without displaying status to the window:

- Press **Enter** when the installation is complete to return to the command prompt.
- Press **Enter** at any time to return from a background job to the command prompt.

You can change the `-W launchPRTBean.active` option in the response file to display the Registration panel to indicate the completion of a silent installation on a local system with a graphical user interface.

To determine the status of the silent installation, review the installation logs in the `install_root\logs` directory or in the system `%TEMP%` directory. See “Troubleshooting the installation” on page 214 for more information about log files.

Silent installation is particularly useful if you install the product often.

The rest of this procedure assumes that you are using the Installation wizard. Corresponding entries in the response file exist for every prompt that is described as part of the wizard.

Review the description of the “responsefile” on page 204 for more information. Comments in the file describe how to customize their options.

### Installing with a network file system mount

If you must use an NFS mount, see the following installation tip:

Table 37. Installation tip

| Operating platform | Tip in “Platform-specific tips for installing and migrating” on page 146 |
|--------------------|--|
| All platforms      | Platform-specific issues when dealing with network file systems          |

14. Insert the product CD-ROM labeled, *Application Server, IBM HTTP Server* into the CD-ROM drive.
15. Open a DOS window. Use the same DOS window throughout the installation procedure.
16. Start the installation with the `D:\win\launchpad.bat` command, where the D: drive is your CD-ROM drive and win is the platform directory on the CD-ROM. You can also start the installation using the `D:\win\install.bat` command:

```
C:\> D:\win\install
```

The readme link in the Launchpad is to the `readme.html` file in the CD root directory. The *Getting Started* document that contains installation information is in the `docs` directory on the CD.

Download the current version of the *Getting Started* document from:

**5.1+** [ftp://ftp.software.ibm.com/software/webserver/appserv/library/wasv51base\\_gs.pdf](ftp://ftp.software.ibm.com/software/webserver/appserv/library/wasv51base_gs.pdf)

The rest of this procedure assumes that you are using the Installation wizard. Corresponding entries in the response file exist for every prompt that is described as part of the wizard. Review the description of the “responsefile” on page 204 for more information. Comments in the file describe how to customize the options.

17. Click **Next** to continue. The license agreement displays.  
The Installation wizard does not support hot keys, such as **Alt-N**. You can tab to **Next** and press **Enter** to select it, for example.
18. Click the radio button beside the **I accept the terms in the license agreement** message if you agree to the license agreement and click **Next** to continue. After you accept the licensing terms, the Installation wizard checks for prerequisites and for previous versions, with which it can either migrate or coexist.

As the base WebSphere Application Server product version changes, its prerequisites and corequisites change. Updating your database, Web server, Software Development Kit (SDK), and other software is probably necessary.

The base WebSphere Application Server product simplifies migrating product prerequisites, by providing the option to install a complimentary Web server and SDK on your supported operating system. You can uninstall back-level prerequisites and let the Installation wizard install current versions.

If the wizard finds a previous version of WebSphere Application Server, it prompts you to migrate applications and the configuration from the previous version, or to coexist with it. If it finds more than one previous version, the Installation wizard lists them for you to select which one to migrate.

**Migrating or coexisting with an existing WebSphere Application Server node that Windows does not recognize.**

In some cases, the InstallShield for MultiPlatforms (ISMP) program might not detect a previously installed version of WebSphere Application Server because of a failure to read the registry keys on the Windows operating system. You can force the migration and coexistence panel to display, by starting the installation with an option on the **install** command.

For example, use this command:

```
install -W previousVersionDetectedBean.previousVersionDetected="true"
```

You can also force the appearance of the coexistence panel to change conflicting port number assignments. For example, force the coexistence panel to appear using this command:

```
install -W coexistenceOptionsBean.showCoexistence="true"
```

On either panel, identify the location of the existing product instance to cause it to be recognized.

19. Choose whether to install additional features or to install the product again when a previous installation of the same level product exists. You can add features to an unfederated base node or to a deployment manager node at any time, by running the Installation wizard again. Federated nodes must be unfederated before adding features to avoid conflicts while the deployment manager owns the configuration of the base node.

Log off as root and back on again.

This Installation wizard panel appears when the installer program detects a previous installation at the same product level. The panel lets you select whether to add features to the existing installation, or to perform a new installation to another directory. Use a procedure in the following description to install features without causing component regression problems.

When the installer program detects a previous installation at the same product level, a panel appears to let you add features to the existing installation or perform a new installation to another directory.

When adding features, previously installed features are checked and grayed out with the term **(Installed)** at the end of the feature name. The IBM HTTP Server feature is an exception. You can install more than one instance of the IBM HTTP Server product. It is not grayed out or labeled **(Installed)**. You can install the plug-in feature each time you install IBM HTTP Server, too. Select a new directory for each instance of IBM HTTP Server that you install.

*Table 38. Installation tip*

| Operating platform | Tip in “Platform-specific tips for installing and migrating” on page 146 |
|--------------------|--|
| All platforms      | Installing all Web server plug-ins during the initial installation.      |

If you intend to install additional features, use the following procedure to avoid component regression problems. It is important that you understand that there is no way to add features to a base node without unfederating it from its cell and losing its configuration. The configuration for the base node is restored back to its original configuration, before it was federated and before you changed it with the administrative console of the deployment manager.

Restoring an original configuration means that you lose the configuration for any additional servers that you created on the base node from the deployment manager. (The additional servers will not exist any more.) You will lose any other configuration you performed from the deployment manager administrative console.

Although you can use the **backupConfig** command to save the configuration, you cannot restore it with the **restoreConfig** command because the configuration you restore does not include any features that you add to the base node.

You can use the **backupConfig** command to save the Network Deployment configuration so that you can restore it if necessary. You can also refer to the configuration as you use the administrative console of the deployment manager to reconfigure the base node.

- a. If the node is a base product node in a deployment manager cell, unfederate the node with the **removeNode** command. Removing the base node from the cell also removes the configuration for the base node, which resides at the cell level.
  - b. Uninstall any interim fixes, starting with the last one and finishing with the first one.
  - c. Uninstall any cumulative fixes you installed, starting with the last one and finishing with the first one.
  - d. Uninstall any fix packs you installed, starting with the last one and finishing with the first one.
  - e. Log off and back on.
  - f. Install new features.
  - g. Install the most current fix pack.
  - h. Install the most current cumulative fix.
  - i. Install any interim fixes to bring the node back to its previous fix level.
  - j. If the node was part of a cell, rejoin the node to the cell with the **addNode** command or the deployment manager administrative console. This action synchronizes the master cell configuration with changes you make to the Application Server configuration during the installation of the new features.
  - k. Reconfigure the base node with the Network Deployment administrative console.
20. Choose to migrate applications and the configuration from a previous version, to coexist with another version, or to neither coexist or migrate. Click **Next** to continue. See “Migrating and coexisting” on page 326 for more information.

All WebSphere Application Server products on a single machine share some of the code in the embedded messaging feature, if installed. The required level of the embedded messaging feature for V5.1 (CSD04) is not the same as for V5.0.0 or V5.0.1. The required level of the embedded messaging feature for V5.1 is the same as for V5.0.2.

If you attempt to install V5.0.2 or V5.1 on a machine where a version of the embedded messaging feature is at a release level earlier than CSD04, the installer program displays the message log in a panel. The message that you see is similar to one of the messages in the following example:

```
MQSeries or WebSphere MQ server at an earlier release than required to support
embedded messaging is already installed on the system.
Unsupported earlier maintenance level of MQSeries or WebSphere MQ detected.
Unsupported earlier release of MQSeries client or WebSphere MQ client detected.
Unsupported maintenance level of MQSeries client or WebSphere MQ client detected.
Software conflict with MQSeries JMS SupportPac MA88 detected.
```

To correct the problem, perform one of the following actions:

- Upgrade the full MQSeries or WebSphere MQ product to WebSphere MQ at the latest level that supports embedded messaging (CSD04).  
**5.1 +** See Installing WebSphere embedded messaging as the JMS provider for more information.
- Uninstall the existing MQSeries or WebSphere MQ product if MQSeries or WebSphere MQ is not required on this system and reinstall the WebSphere Application Server product. Select the embedded messaging feature.

The MQSeries JMS SupportPac MA88 problem is slightly different. Uninstall the MQSeries JMS SupportPac MA88 and reinstall the WebSphere Application Server product, selecting the embedded messaging feature. The function provided by SupportPac MA88 is included in the embedded messaging feature.

You can upgrade the WebSphere Application Server product to V5.0.2 before migrating it to V5.1 to avoid any problem with an incorrect level of the embedded messaging feature. See “Upgrading a Version 5.0.0 or Version 5.0.1 product to Version 5.0.2” on page 371.

You can also perform the procedure for migrating V5.0.0 or V5.0.1 with embedded messaging to V5.1. See “Migrating Version 5.0.0 or Version 5.0.1 of WebSphere Application Server with embedded messaging to Version 5.1” on page 347.

To share embedded messaging in a coexistence environment, the node names for each installation must be unique, so that each installation has a message queue manager that is named uniquely. To migrate V5.0.2 to V5.1, the node names must be identical. Therefore, the queue manager names are also identical, if you are migrating from V5.0.2 to V5.1.

To prevent losing the queue manager when you uninstall V5.0.2 (or V5.1), you must create a dummy queue manager before uninstalling one of the WebSphere Application Server versions. A series of migration topics in “Migrating and coexisting” on page 326 describe how to migrate after the installation.

**5.1+** The first rule of migration is to migrate after you install WebSphere Business Integration Server Foundation, if you are planning to install the Integration Server:

| If you are planning to install these products: |                    | Select the migration option while installing this product: |                    |
|--|--------------------|--|--------------------|
| Base product                                   | Integration Server | Base product   | Integration Server |
| X  |                    | X  |                    |
| X  | X                  |  | X                  |

The exception to the rule is to migrate V3.5.x to V5.1 during the installation of the base product or the Network Deployment product.

**5.1+** Migrating Integration Server also migrates the product that Integration Server extends.

When you perform an umbrella installation of the base WebSphere Application Server product, you can choose to migrate applications and the configuration from a previous version, or to coexist with another version of the base WebSphere Application Server product, or to do neither.

You can also perform a silent migration or configure for coexistence during a silent installation. Refer to “Installing silently” on page 190 for a description of performing a silent installation, including the options that you can specify.

The migration prompt appears only when the Installation wizard detects a previous version. The coexistence prompt appears when the Installation wizard detects any other installation, including another Version 5 installation.

If you choose to coexist, the wizard displays a Port selection panel, where you can specify port assignments that do not conflict with existing ports. For example, you can change the HTTP transport port for coexistence, from 9081 (one more than the default Version 5 port number) to 9085 or higher, to avoid potential conflicts with port numbers that previous versions of WebSphere Application Server commonly use.

Use the **netstat -a** command to display all ports in use.

**5.1+** If you choose neither the migration option nor the coexistence option, you can run Version 5.1.x and the previous version, but not at the same time. Although it is possible that both versions might coexist without port conflicts, you can ensure that both versions run together by selecting the coexistence option and checking for conflicting port assignments.

The Migration panel lists all previous releases that it can identify. If you highlight a release, the text boxes labeled, “select previous version,” show the location of the previous product. Select the product to migrate. If you do not see the previous version that you intend to migrate, click **Select previous version** to enter a location and configuration file name if you are migrating a WebSphere Application Server Advanced Edition Single Server Edition, Version 4.0.x installation.



The field labeled "Configuration file" is valid only for WebSphere Application Server Advanced Edition Single Server Edition, Version 4.0.x. For the other versions of WebSphere Application Server that are supported by migration (Version 3.5 Standard Edition, Version 3.5 Extended Edition, and Version 4.0 Advanced Edition), the `admin.config` file provides the host and port values for the administrative server. If you use a file name other than `admin.config`, issue the commands that call the migration tools instead of migrating while installing. Issuing the commands that call the migration tools is described in "Migrating and coexisting" on page 326.

Migrate V3.5.x to V5.1 during the installation of the base product or the Network Deployment product, before installing the Integration Server product.

You must start the administrative server of some previous versions so that the Installation wizard can export the configuration from the `admin.config` file.

Although you might select migration at this point in the installation process, the actual migration does not begin until after the Version 5 installation is complete. At that time, if the `WASPreUpgrade` tool fails, the Installation wizard does not call the `WASPostUpgrade` tool to complete the migration, but instead displays the `WASPreUpgrade.log` and `WASPostUpgrade.log` log files for you to diagnose the problem. After fixing the problem, such as starting the administrative server of a previous release, you can start the migration again, as described in "Migrating and coexisting" on page 326.

21. Choose a type of installation and click **Next**. If you use the Installation wizard, you can choose a full installation type, which installs all features, or a custom installation type. The custom installation type lets you select which features to install.

**5.1 +** If you are migrating a federated node:

- Migrate the deployment manager node first. The deployment manager must be at the highest release level or fix level within the cell.
- Select the same type of installation that you used to install the earlier release:
  - If you selected a full installation type then, select a full installation type now.
  - If you selected a custom installation type then, select a custom installation type now and select the same features as you did for the V5.0.x release.

Federated nodes have configurations that are controlled by the deployment manager that controls the cell. Migrating installs the same features for the V5.1 node that are in the configuration for the previous release. If you decide that you must add features, see "Migrating federated nodes" in the information center for Network Deployment.

You can improve performance by not installing certain features, as described in the **Performance considerations** section in the next step.

- Choose **full install** to install everything you need to run Web applications on your server, including IBM HTTP Server and the embedded messaging feature. The plug-in for IBM HTTP Server is installed and configured in the full installation. Use this option if you are new to WebSphere Application Server and are unsure of what to install. Choosing this option does install the embedded messaging feature. You must prepare for the embedded messaging feature, as described earlier.
- Choose **Custom install** to select installation features. Choose this option if you already know what to install. Choose this type of installation if you must install and configure the plug-in for a Web server other than IBM HTTP Server. The Installation wizard installs all plug-ins if you select any of them, but it only configures selected plug-ins. Also choose this type of installation if you intend to not install the WebSphere Application Server embedded messaging server because you have already installed the WebSphere MQ Version 5.3 product, or another JMS provider.

If you choose a full installation, you can skip the next step.

After selecting a typical installation, the wizard prompts you to select the directory for the program code. After selecting a custom installation, the wizard displays a list of features.

22. Select features to install and click **Next** to continue when performing a custom installation. This step is available only when you choose the custom installation type. A description of each feature appears at the bottom of the panel when you roll the cursor over the feature.



**5.1+** Selecting certain features causes the installation of other prerequisite features. The following table shows this feature relationship.

Table 39. Features and feature dependencies

| If you select this feature:  | This feature is also installed:                                     | Feature description   |
|--|---|---|
| <b>Application Server</b><br>Sub-features: Application Server Samples  | Admin Scripting   | These features are the Application Server run time and its Samples.   |
| <b>Administration</b>  |   |   |
| Sub-features: Admin Scripting<br>Administrative Console  | Application Server<br>Admin Scripting                               | Getting started with System Administration  |
| <b>Deployment Tools</b>  |   |   |
| Sub-features: Deploy Tool<br>ANT Utilities   | Admin Scripting<br>Application Server<br>Admin Scripting            | <ul style="list-style-type: none"> <li>• Deploying and managing applications</li> <li>• Overview of the ANT Utilities</li> </ul>      |
| <b>Embedded Messaging</b>  |   |   |
| Sub-features: Server and Client<br>Client Only<br>Message-driven Bean Samples (These samples are the MDBSamples application, which is for the server and not for the client.)  | Application Server<br>Application Server samples<br>Admin Scripting | <ul style="list-style-type: none"> <li>• Installing and configuring a JMS provider</li> <li>• Message-driven beans samples</li> </ul> |
| <p>You can install the MDBSamples application without installing the embedded messaging server and client feature. Perhaps you have already installed the server and client feature. Or perhaps you intend to reconfigure the MDBSamples to use messaging resources that WebSphere MQ software provides.</p>                           |   |   |
| <p>In any case, if you install the MDBSamples application and do not have the server and client feature installed, errors occur. The Application Server starts the MDBSamples application at start up. The MDBSamples application cannot start the required messaging resources in the Java Naming and Directory Interface (JNDI).</p> |   |   |
| <p>Because of the lack of required resources, the message-driven beans fail to start, which causes an exception that the Application Server logs. The Application Server is not affected other than being unable to start the MDBSamples application.</p>  |   |   |
| <b>IBM HTTP Server</b>   |   |   |
| <b>Web Server Plug-ins</b>   |   |   |
| Sub-features: IBM HTTP Server<br>Apache Web Server<br>Microsoft Internet Information Services (IIS)<br>Sun ONE (formerly known as iPlanet) Web Server<br>Lotus Domino Web Server   |   | “Preparing to install and configure a Web server” on page 27  |

Table 39. Features and feature dependencies (continued)

| If you select this feature:           | This feature is also installed: | Feature description   |
|---------------------------------------|---------------------------------|---|
| <b>Performance And Analysis Tools</b> |                                 | <ul style="list-style-type: none"> <li>• Tivoli Performance Viewer features</li> <li>• Displaying cache information</li> <li>• Performance Monitoring Infrastructure servlet</li> <li>• Log Analyzer</li> </ul> |
| Sub-features:                         | Tivoli Performance Viewer       |   |
|                                       | Dynamic Cache Monitor           |   |
|                                       | Performance Servlet             |   |
|                                       | Log Analyzer                    | IBM WebSphere Application Server, Release 5 API Specification in Javadoc format   |
| <b>Javadocs</b>                       |                                 |   |

### Performance considerations

For better performance in either a development or production environment, do not install the Samples. By omitting the Samples, you can improve Application Server startup time by 60 percent and save 15 percent of disk space. You can save up to 30 percent of process footprint (based on a maximum heap size of 256 MB).

If your applications do not use Java Message Service (JMS) messaging, do not install embedded messaging. This recommendation is especially true if your system has 256 MB or less of physical memory.

Not installing the embedded messaging feature saves about 36 MB of message queuing process memory and can improve application startup time up to 5 percent and save an additional 72 MB of disk space. (This was tested on Windows machines.)

In addition, if you install the embedded messaging client feature you do not need to install the message-driven Bean Samples. The message-driven Bean Samples are for the embedded messaging server in the server and client feature.

### Web Server plug-in feature considerations

Select the IBM HTTP Server feature to install and configure IBM HTTP Server on the same, or on a different machine than the WebSphere Application Server product. You can migrate plug-ins from an earlier version of WebSphere Application Server to access the current WebSphere Application Server product.

Install IBM HTTP Server on a separate machine using the CD-ROM labeled, **Application Server, IBM HTTP Server**. After installing IBM HTTP Server, you can install the plug-in by installing the base WebSphere Application Server product and clearing all features except the plug-in for IBM HTTP server. See "Preparing to install and configure a Web server" on page 27.

The Installation wizard automatically installs and configures IBM HTTP Server and the IBM HTTP Server plug-in on the same machine as the WebSphere Application Server if you choose the full installation. No further configuration is necessary. Installing the IBM HTTP Server product with the WebSphere Application Server product also includes it in the WebSphere Application Server uninstaller program that the Installation wizard creates. Choose the custom type of installation to clear the selection of the IBM HTTP Server feature, if you want to install and uninstall it separately.

You can run the uninstaller program to remove all installed features.

23. Specify a destination directory. Click **Next** to continue.

Specify a target directory for the base WebSphere Application Server product and for the IBM HTTP Server feature, if you are installing the feature. You cannot change the default installation directory for the embedded messaging feature, if you are installing the feature.

Deleting the default target location and leaving an installation directory field empty stops you from continuing the installation process. The Installation wizard does not proceed when you click **Next**.

Enter the required target directory to proceed to the next panel. Non-ASCII special characters are not supported in the name of the installation directory. Spaces are also not supported in the name of the installation directory.

The installer program checks for required space at the beginning of the installation. If you do not have enough space, stop the installation program, free space by deleting unused files and emptying the recycle bin, and restart the installation.

If you have problems accessing the administrative console after installation, check the `installAdminConsole.log` file for a failure indication. Clean up the system `%TEMP%` directory and reinstall the administrative console using the `wsadmin` scripting facility.

**5.1 +** Version 5.1 does not allow you to install the IBM HTTP Server feature in the same directory as an earlier version.

If you select the embedded messaging feature and prerequisites are missing, the Installation wizard displays the `mq_prereq.log` error log and takes you back to the Installation type panel. Choose **Custom** installation and clear the checkbox for the embedded messaging feature. The `mq_prereq.log` file is in the system temp directory.

24. Specify target directories for configuration files for any selected Web server plug-ins. Click **Next** to continue.

If you are installing the IBM HTTP Server, you do not need to specify a location for its plug-in configuration file. The wizard uses the installation path you specified for the Web server to derive the location.

If you have previously installed the IBM HTTP Server product on the same machine as the WebSphere Application Server, and are now installing just the plug-in, enter a configuration file location of `IHS_DIR\conf\httpd.conf`, where `IHS_DIR` is the directory where the IBM HTTP Server product is installed.

25. Specify node information and click **Next**.

Specify the node name and host name. Although the wizard inserts the machine name (of the installation platform) as the node name, you can specify any unique name. The node name is an arbitrary WebSphere Application Server-specific name that must be unique within a cell.

The host name is the network name for the physical machine on which the node is installed. The host name must resolve to a physical network node on the server. When multiple network cards exist in the server, the host name or IP address must resolve to one of the network cards. Remote WebSphere Application Server nodes use the host name to connect to and to communicate with this node. Selecting a host name that other machines can reach within your network is extremely important. Do not use the generic `localhost` identifier for this value.

If you define coexisting nodes on the same computer with unique IP addresses, define each IP address in a domain name server (DNS) look-up table. WebSphere Application Server configuration files do not provide domain name resolution for multiple IP addresses on a machine with a single network address.

The value that you specify for the host name is used as the value of the `hostName` property in WebSphere Application Server configuration documents. Specify the host name value in one of the following formats:

- Fully qualified domain name servers (DNS) host name string, such as `xmachine.manhattan.ibm.com`
- The default short DNS host name string, such as `xmachine`
- Numeric IP address, such as `127.1.255.3`

The fully qualified DNS host name has the advantage of being totally unambiguous and also flexible. You have the flexibility of changing the actual IP address for the host system without having to change the WebSphere Application Server configuration. This value for host name is particularly useful if you plan to change the IP address frequently when using Dynamic Host Configuration Protocol (DHCP) to assign IP addresses. A format disadvantage is being dependent on DNS. If DNS is not available, then connectivity is compromised.

The short host name is also dynamically resolvable. A short name format has the added ability of being redefined in the local hosts file so that the system can run WebSphere Application Server even when disconnected from the network. Define the short name to 127.0.0.1 (local loopback) in the hosts file to run disconnected. A format disadvantage is being dependent on DNS for remote access. If DNS is not available, then connectivity is compromised.

A numeric IP address has the advantage of not requiring name resolution through DNS. A remote node can connect to the node you name with a numeric IP address without DNS being available. A format disadvantage is that the numeric IP address is fixed. You must change the setting of the `hostName` property in WebSphere Application Server configuration documents whenever you change the machine IP address. Therefore, do not use a numeric IP address if you use DHCP, or if you change IP addresses regularly. Another format disadvantage is that you cannot use the node if the host is disconnected from the network.

26. Create one or more Windows services and click **Next**. Run WebSphere Application Server and IBM HTTP Server as Windows services by selecting the check boxes. Selecting a check box on this panel configures a manually started service.

Processes started by a **startServer** command are not running as monitored processes, regardless of how you have configured them. For example, you can configure a base Application Server as a WebSphere Application Server Windows service. However, if you start the Application Server instance using the **startServer** command, Windows does not monitor or restart the Application Server because it was not started as a Windows service.

To perform this installation task, the user ID must not have spaces in its name. The ID must also belong to the administrator group and must have the advanced user rights *Act as part of the operating system* and *Log on as a service*. The Installation wizard grants the user ID the advanced user rights if it does not already have them, if the user ID belongs to the administrator group.

You can also create other Windows services after the installation is complete, to start other server processes. See “Automatically restarting server processes” on page 205 for more information.

27. Review the summary information and click **Next** to install the product code or **Back** to change your specifications. When the installation is complete, the wizard displays the `install_root\logs\mq_install.log` installation log if you selected the embedded messaging feature and errors occur with its installation.
28. Review the `mq_install.log` installation log if it displays. Click **Next** to continue. The wizard displays the Registration panel.
29. Click **Next** to register the product, or clear the check box and click **Next** to register at a later time. The Registration panel is in English when the machine locale uses a double byte character set (DBCS) language.

You can register the product now by using the link on this panel or later, by using the Web address in the `install_root\prt\readme_prt.txt` file. The Web address in the file is encoded for your locale. A known problem for some locales corrupts the Web address so that it is similar to the following example. (The Web address is all one line in the file. The following example shows the address on two lines for clarity.)

```
http%3A%2F%2Fwww.ibm.com%2Fsoftware%2Fwebprt%2Fregister%2Fprodreg.nsf%  
2Fcontact%3F0penForm%26lang%3DENU%26pid%3D45P8842%26q2%3DWindows+2000
```

Use one of the following Web addresses if your `install_root\prt\readme_prt.txt` file is corrupt:

- <http://www.ibm.com/software/webprt/register/prodreg.nsf/contact?OpenForm&>
- <https://www6.software.ibm.com/reg/prt/prt-r>

The Installation wizard starts the First Steps tool. See “firststeps command” on page 210 for more information.

If you are migrating a federated node as you install, close the First Steps tool. Migrated federated nodes have configuration differences that prevent you from using the First Steps tool.

30. Verify the success of the installer program by examining the Exit summary panel and the *install\_root\logs\log.txt* for installation status. ISMP records a success message in the *install\_root\logs\log.txt* file: "INSTFIN: The installation is complete." The log is the only source of status information for a silent installation.

Look for severe errors that the installer records in the *install\_root\logs\log.txt* file in the installation root directory to verify that no file system or other unusual errors occurred during installation.

If the *install\_root\logs\log.txt* file does not contain a record of any problems but problems exist, verify or troubleshoot the installation, as described in "Troubleshooting the installation" on page 214 and in Installation component troubleshooting tips.

Examine the Start menu entry for **Programs > IBM WebSphere > Application Server 5.1 > WAS Help**. The WAS Help entry is new for Version 5.1.1. For example, the following graphic shows the Start menu for an English locale:

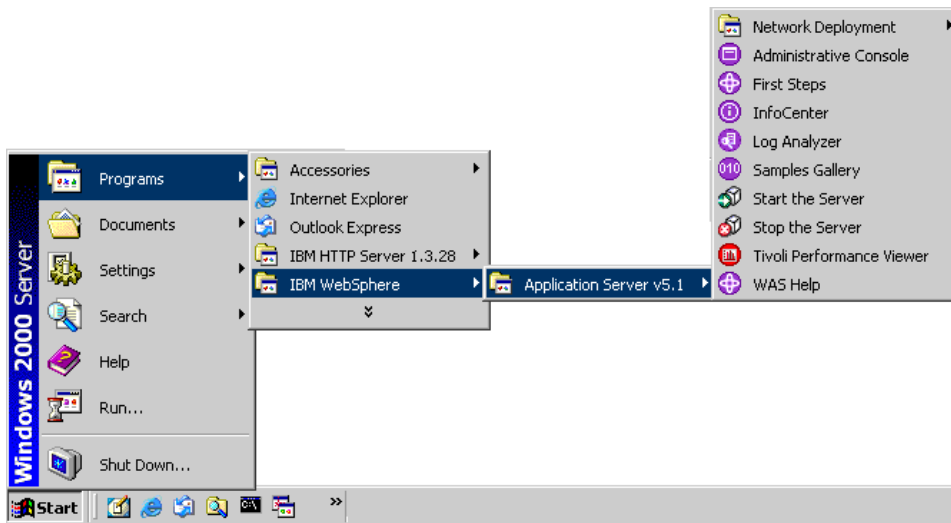


Figure 2. Start menu options for Version 5.1.1

If problems exist, correct them, uninstall the product, as described in "Uninstalling the product" on page 295, reboot the operating system, and reinstall.

31. Click **Finish** to close the Installation wizard.
32. Install the most current fix pack and cumulative fix for the WebSphere Application Server product. See Recommended updates for WebSphere Application Server for information about downloading and installing the upgrades.
33. Install the Network Deployment product to manage multiple base product Application Servers. The WebSphere Application Server, Version 5.x product does not provide centralized management of multiple servers. The WebSphere Application Server Network Deployment, Version 5.x product provides this function. The deployment manager process (dmgr) in the Network Deployment product manages a cell of Application Servers. You can federate a base Application Server into the cell or unfederate it. While federated, the configuration of the base Application Server is managed from the deployment manager. See the information center for the Network Deployment product to get started installing the product:

#### **5.1+** Network Deployment installation

34. Tune your system for performance. For best performance on any platform, see Tuning performance parameter index.

The Installation wizard configures the base product. It is not necessary to perform further configuration at this time.

You have now successfully installed WebSphere Application Server and the features that you selected.

## Uninstalling and reinstalling

See “Uninstalling the product” on page 295 for information about uninstalling any WebSphere Application Server product.

**5.1 +** If you uninstalled the base V5.1 product but left the embedded messaging feature installed, and now you want to reinstall the V5.1 product, see “Reinstalling V5.1 after uninstalling and leaving the embedded messaging feature installed” on page 326.

After uninstalling a WebSphere Application Server product, reinstalling into the same directory without first deleting all directory contents results in invalid XML configurations because of the retention of old files. Uninstall manually to delete all of the files so that you can reinstall with a clean system, as described in “Manually uninstalling on Windows platforms” on page 322

**5.1 +** Symptoms that you might experience if you reinstall without uninstalling manually include:

1. The **versionInfo** command states that the base product is installed when it is not installed.
2. Specific directories might be missing in the installation root directory.

If you experience symptoms such as these, uninstall everything manually and reinstall. The installation is successful if you manually uninstall before reinstalling.

## Miscellaneous tips for Windows platforms

Table 40. Installation and migration tips

| Operating platform | Tip in “Platform-specific tips for installing and migrating” on page 146   |
|--------------------|--|
| Windows platforms  | Windows platforms <ul style="list-style-type: none"><li>• Viewing accurate migration messages</li><li>• Decompressing a WebSphere Application Server elmage that you download</li><li>• Editing or removing the vpd.properties file</li><li>• Preparing for Adaptive Fast Path Architecture (AFPA) driver availability when migrating from IBM HTTP Server Version 1.3.19.x, or earlier</li><li>• Avoiding a user ID with spaces when installing the WebSphere Application Server as a Windows service</li><li>• Changing the display settings from high-contrast black to high-contrast white to view panels with hypertext links</li></ul> |
| All platforms      | All platforms  |

## Installing additional features on a base Application Server

This topic describes how to install additional features to an existing base WebSphere Application Server product.

If you encounter a problem such as not having enough temporary space or not having the right packages on your system, cancel the installation, make the required changes, and restart the installation.

The installation of new features uses the InstallShield for Multiplatforms (ISMP) wizard to perform the installation. You can use the Installation wizard or perform the installation from a command line, using the silent installation method.

## Installation programs in WebSphere Application Server products



## 5.1 +

| Product  | Link to installation procedure                             | Label on product CD  |
|--|--|--|
| (Base) WebSphere Application Server              | Base product installation (which links to this procedure!) | <b>Application Server, IBM HTTP Server</b>                     |
| Network Deployment                               | Network Deployment installation                            | <b>Deployment Manager</b>                                      |
| WebSphere Business Integration Server Foundation | Integration Server installation                            | <b>Integration Server Disk 1 and Integration Server Disk 2</b> |

You can add features to an unfederated base node or to a deployment manager node at any time, by running the Installation wizard again. Use the following procedure to avoid component regression problems when installing additional features.

If the node is a base product node in a deployment manager cell, it is important that you understand that there is no way to add features to a base node without unfederating it from its cell and losing its configuration. The configuration for the base node is restored back to its original configuration, before it was federated and before you changed it with the administrative console of the deployment manager.

If the node is a base product node in a deployment manager cell, restoring an original configuration means that you lose the configuration for any additional servers that you created on the base node from the deployment manager. (The additional servers will not exist any more.) You will lose any other configuration you performed from the deployment manager administrative console.

1. Log on as the root user on a Linux or UNIX system or as a user in the administrator group on a Windows system.

You cannot install features correctly as a non-root user on a Linux or UNIX system, or as a non-administrator on a Windows system.

2. Use the **backupConfig** command to save the configuration.

The **backupConfig** command works well in an unfederated environment, to save the configuration of the base node. Issue the command from the *install\_root/bin* directory of the base node.

Although you can use the **backupConfig** command to save the configuration on a federated node, you cannot restore it with the **restoreConfig** command because the configuration you restore does not include any features that you add to the base node.

You can use the **backupConfig** command to save the Network Deployment configuration when adding features to a federated node. Then you can restore it if necessary. You can also refer to the configuration as you use the administrative console of the deployment manager to reconfigure the base node. Issue the command from the *install\_root/bin* directory of the deployment manager node.

For example, use the following command on a Linux system:

```
#!/backupConfig.sh /tmp/my_backup_2004-06-03.zip -user user_ID -password password
```

See **backupconfig** command for more information.

3. If the node is a base product node in a deployment manager cell, unfederate the node with the **removeNode** command. Removing the base node from the cell also removes the configuration for the base node, which resides at the cell level. Issue the **removeNode** command from the *install\_root/bin* directory of the base Application Server. For example, on a Linux server, issue the following command:

```
#!/removeNode.sh -user user_ID -password password
```

See **removeNode** command for more information.

4. Uninstall any interim fixes, starting with the last one and finishing with the first one. See “Uninstalling interim fixes, cumulative fixes, and fix packs” on page 263 for more information about how to remove an interim fix, a cumulative fix, or a fix pack.

5. Uninstall any cumulative fixes you installed, starting with the last one and finishing with the first one.
6. Uninstall any fix packs you installed, starting with the last one and finishing with the first one.
7. Log off and back on or reboot a Windows system.
8. Insert the product CD labeled, *Application Server, IBM HTTP Server*. Windows systems and most Linux systems are configured to automatically mount CD-ROM drives.
9. Open a shell window and mount the CD-ROM drive if necessary.
10. Start the installation with the `./launchpad.sh` command or the `launchpad` command on a Windows system. See the platform-specific installation instructions if you need more information about restarting the installation from the product CD-ROM, such as instructions for mounting the CD drive. The rest of this procedure assumes that you are using the Installation wizard. Corresponding entries in the response file exist for every prompt that is described as part of the wizard. Comments in the response file describe how to customize the options.  
Review the description of the “responsefile” on page 204 for more information.
11. Click **Next** to continue. The license agreement displays.  
The Installation wizard does not support hot keys, such as **Alt-N**. You can tab to **Next** and press **Enter** to select it, for example.
12. Click the radio button beside the **I accept the terms in the license agreement** message if you agree to the license agreement and click **Next** to continue. After you accept the licensing terms, the Installation wizard checks for prerequisites and for previous versions, with which it can either migrate or coexist.  
If the wizard finds a previous version of WebSphere Application Server, it prompts you to migrate applications and the configuration from the previous version, or to coexist with it. If it finds more than one previous version, the Installation wizard lists them for you to select which one to migrate.
13. Choose to install additional features. The Installation wizard panel that appears when the installer program detects a previous installation at the same product level has an option for installing additional features. Select the check box labeled, Add features to the existing copy. Select the check box labeled, Add features to the existing copy.  
If you did not unfederate a managed node, you see a message that the installation wizard is unable to add components to a federated node. Exit the installation, start from the beginning of this procedure, and unfederate the node this time.
14. Skip the coexistence panel that lets you select new ports, if it appears.
15. Select features to install and click **Next** to continue when performing a custom installation. A description of each feature appears at the bottom of the panel when you roll the cursor over the feature.  
Previously installed features are checked and grayed out with the term **(Installed)** at the end of the feature name. The IBM HTTP Server feature is an exception. You can install more than one instance of the IBM HTTP Server product. It is not grayed out or labeled **(Installed)**. You can install the plug-in feature each time you install IBM HTTP Server, too. Select a new directory for each instance of IBM HTTP Server that you install.

**5.1 +** Selecting certain features causes the installation of other prerequisite features. The following table shows this feature relationship.

Table 41. Features and feature dependencies

| If you select this feature:                                   | This feature is also installed: | Feature description   |
|---|---------------------------------|---|
| <b>Application Server</b>                                     | Admin Scripting                 | These features are the Application Server run time and its Samples. |
| Sub-features:                      Application Server Samples |                                 |   |

Table 41. Features and feature dependencies (continued)

| If you select this feature:   | This feature is also installed:   | Feature description       |                    |                        |   |  |   |  |                 |   |
|---|---|---------------------------|--------------------|------------------------|---|--|---|--|-----------------|---|
| <b>Administration</b>   |   |                           |                    |                        |   |  |   |  |                 |   |
| Sub-features:   | <table border="0"> <tr> <td style="border-bottom: 1px solid black;">Admin Scripting</td> <td rowspan="2" style="border-left: 1px solid black; border-right: 1px solid black; vertical-align: middle;">Application Server</td> </tr> <tr> <td>Administrative Console</td> </tr> <tr> <td></td> <td style="border-left: 1px solid black; border-right: 1px solid black;">Admin Scripting</td> </tr> </table>  | Admin Scripting           | Application Server | Administrative Console |   | Admin Scripting                                | Getting started with System Administration  |  |                 |   |
| Admin Scripting   | Application Server  |                           |                    |                        |   |  |   |  |                 |   |
| Administrative Console  |   |                           |                    |                        |   |  |   |  |                 |   |
|   | Admin Scripting   |                           |                    |                        |   |  |   |  |                 |   |
| <b>Deployment Tools</b>   |   |                           |                    |                        |   |  |   |  |                 |   |
| Sub-features:   | <table border="0"> <tr> <td style="border-bottom: 1px solid black;">Deploy Tool</td> <td rowspan="2" style="border-left: 1px solid black; border-right: 1px solid black; vertical-align: middle;">Application Server</td> </tr> <tr> <td>ANT Utilities</td> </tr> <tr> <td></td> <td style="border-left: 1px solid black; border-right: 1px solid black;">Admin Scripting</td> </tr> </table>   | Deploy Tool               | Application Server | ANT Utilities          |   | Admin Scripting                                | <ul style="list-style-type: none"> <li>• Deploying and managing applications</li> <li>• Overview of the ANT Utilities</li> </ul>  |  |                 |   |
| Deploy Tool   | Application Server  |                           |                    |                        |   |  |   |  |                 |   |
| ANT Utilities   |   |                           |                    |                        |   |  |   |  |                 |   |
|   | Admin Scripting   |                           |                    |                        |   |  |   |  |                 |   |
| <b>Embedded Messaging</b>   |   |                           |                    |                        |   |  |   |  |                 |   |
| Sub-features:   | <table border="0"> <tr> <td style="border-bottom: 1px solid black;">Server and Client</td> <td rowspan="2" style="border-left: 1px solid black; border-right: 1px solid black; vertical-align: middle;">Application Server</td> </tr> <tr> <td>Client Only</td> </tr> <tr> <td style="border-bottom: 1px solid black;">Message-driven Bean Samples (These samples are the MDBSamples application, which is for the server and not for the client.)</td> <td rowspan="2" style="border-left: 1px solid black; border-right: 1px solid black; vertical-align: middle;">Application Server samples</td> </tr> <tr> <td></td> </tr> <tr> <td></td> <td style="border-left: 1px solid black; border-right: 1px solid black;">Admin Scripting</td> </tr> </table> | Server and Client         | Application Server | Client Only            | Message-driven Bean Samples (These samples are the MDBSamples application, which is for the server and not for the client.) | Application Server samples                     |   |  | Admin Scripting | <ul style="list-style-type: none"> <li>• Installing and configuring a JMS provider</li> <li>• Message-driven beans samples</li> </ul> |
| Server and Client   | Application Server  |                           |                    |                        |   |  |   |  |                 |   |
| Client Only   |   |                           |                    |                        |   |  |   |  |                 |   |
| Message-driven Bean Samples (These samples are the MDBSamples application, which is for the server and not for the client.)   | Application Server samples  |                           |                    |                        |   |  |   |  |                 |   |
|   |   |                           |                    |                        |   |  |   |  |                 |   |
|   | Admin Scripting   |                           |                    |                        |   |  |   |  |                 |   |
| <p>You can install the MDBSamples application without installing the embedded messaging server and client feature. Perhaps you have already installed the server and client feature. Or perhaps you intend to reconfigure the MDBSamples to use messaging resources that WebSphere MQ software provides.</p> <p>In any case, if you install the MDBSamples application and do not have the server and client feature installed, errors occur. The Application Server starts the MDBSamples application at start up. The MDBSamples application cannot start the required messaging resources in the Java Naming and Directory Interface (JNDI).</p> <p>Because of the lack of required resources, the message-driven beans fail to start, which causes an exception that the Application Server logs. The Application Server is not affected other than being unable to start the MDBSamples application.</p> |   |                           |                    |                        |   |  |   |  |                 |   |
| <b>IBM HTTP Server</b>  |   |                           |                    |                        |   |  |   |  |                 |   |
| <b>Web Server Plug-ins</b>  |   |                           |                    |                        |   |  |   |  |                 |   |
| Sub-features:   | <table border="0"> <tr> <td style="border-bottom: 1px solid black;">IBM HTTP Server</td> <td rowspan="5" style="border-left: 1px solid black; border-right: 1px solid black; vertical-align: middle;"></td> </tr> <tr> <td style="border-bottom: 1px solid black;">Apache Web Server</td> </tr> <tr> <td style="border-bottom: 1px solid black;">Microsoft Internet Information Services (IIS)</td> </tr> <tr> <td style="border-bottom: 1px solid black;">Sun ONE (formerly known as iPlanet) Web Server</td> </tr> <tr> <td>Lotus Domino Web Server</td> </tr> </table>   | IBM HTTP Server           |                    | Apache Web Server      | Microsoft Internet Information Services (IIS)   | Sun ONE (formerly known as iPlanet) Web Server | Lotus Domino Web Server   | “Preparing to install and configure a Web server” on page 27 |                 |   |
| IBM HTTP Server   |   |                           |                    |                        |   |  |   |  |                 |   |
| Apache Web Server   |   |                           |                    |                        |   |  |   |  |                 |   |
| Microsoft Internet Information Services (IIS)   |   |                           |                    |                        |   |  |   |  |                 |   |
| Sun ONE (formerly known as iPlanet) Web Server  |   |                           |                    |                        |   |  |   |  |                 |   |
| Lotus Domino Web Server   |   |                           |                    |                        |   |  |   |  |                 |   |
| <b>Performance And Analysis Tools</b>   |   |                           |                    |                        |   |  |   |  |                 |   |
| Sub-features:   | <table border="0"> <tr> <td style="border-bottom: 1px solid black;">Tivoli Performance Viewer</td> <td rowspan="4" style="border-left: 1px solid black; border-right: 1px solid black; vertical-align: middle;"></td> </tr> <tr> <td style="border-bottom: 1px solid black;">Dynamic Cache Monitor</td> </tr> <tr> <td style="border-bottom: 1px solid black;">Performance Servlet</td> </tr> <tr> <td>Log Analyzer</td> </tr> </table>   | Tivoli Performance Viewer |                    | Dynamic Cache Monitor  | Performance Servlet   | Log Analyzer                                   | <ul style="list-style-type: none"> <li>• Tivoli Performance Viewer features</li> <li>• Displaying cache information</li> <li>• Performance Monitoring Infrastructure servlet</li> <li>• Log Analyzer</li> </ul> |  |                 |   |
| Tivoli Performance Viewer   |   |                           |                    |                        |   |  |   |  |                 |   |
| Dynamic Cache Monitor   |   |                           |                    |                        |   |  |   |  |                 |   |
| Performance Servlet   |   |                           |                    |                        |   |  |   |  |                 |   |
| Log Analyzer  |   |                           |                    |                        |   |  |   |  |                 |   |

Table 41. Features and feature dependencies (continued)

| If you select this feature: | This feature is also installed: | Feature description   |
|-----------------------------|---------------------------------|---|
| <b>Javadocs</b>             |                                 | IBM WebSphere Application Server, Release 5 API Specification in Javadoc format |

### Performance considerations

For better performance in either a development or production environment, do not install the Samples. By omitting the Samples, you can improve Application Server startup time by 60 percent and save 15 percent of disk space. You can save up to 30 percent of process footprint (based on a maximum heap size of 256 MB).

If your applications do not use Java Message Service (JMS) messaging, do not install embedded messaging. This recommendation is especially true if your system has 256 MB or less of physical memory.

Not installing the embedded messaging feature saves about 36 MB of message queuing process memory and can improve application startup time up to 5 percent and save an additional 72 MB of disk space. (This was tested on Windows machines. Results on a Linux platform might differ slightly.)

In addition, if you install the embedded messaging client feature you do not need to install the message-driven Bean Samples. The message-driven Bean Samples are for the embedded messaging server in the server and client feature.

### Web Server plug-in feature considerations

Select the IBM HTTP Server feature to install and configure IBM HTTP Server on the same, or on a different machine than the WebSphere Application Server product. You can migrate plug-ins from an earlier version of WebSphere Application Server to access the current WebSphere Application Server product.

Install IBM HTTP Server on a separate machine using the CD-ROM labeled, **Application Server, IBM HTTP Server**. After installing IBM HTTP Server, you can install the plug-in by installing the base WebSphere Application Server product and clearing all features except the plug-in for IBM HTTP server.

See “Preparing to install and configure a Web server” on page 27.

The Installation wizard automatically installs and configures IBM HTTP Server and the IBM HTTP Server plug-in on the same machine as the WebSphere Application Server if you choose the full installation. No further configuration is necessary. Installing the IBM HTTP Server product with the WebSphere Application Server product also includes it in the WebSphere Application Server uninstaller program that the Installation wizard creates. Choose the custom type of installation to clear the selection of the IBM HTTP Server feature, if you want to install and uninstall it separately.

You can run the uninstaller program to remove all installed features.

16. Specify a destination directory for the IBM HTTP Server feature, if selected. Click **Next** to continue. The destination directory for the base product is grayed out. You cannot change it.

Specify a target directory for the IBM HTTP Server feature, if you are installing the feature. You cannot change the default installation directory for the embedded messaging feature, if you are installing the feature.

Deleting the default target location and leaving an installation directory field empty stops you from continuing the installation process. The Installation wizard does not proceed when you click **Next**. Enter the required target directory to proceed to the next panel. Non-ASCII special characters are not supported in the name of the installation directory. Spaces are also not supported in the name of the installation directory.

If you have problems accessing the administrative console after installation, check the `installAdminConsole.log` file for a failure indication. Clean up the `/tmp` space and reinstall the administrative console using the `wsadmin` scripting facility.

**5.1+** Version 5.1.x does not allow you to install the IBM HTTP Server feature in the same directory as an earlier version.

If you select the embedded messaging feature and prerequisites are missing, the Installation wizard displays the `mq_prereq.log` error log and takes you back to the Installation type panel. Choose **Custom** installation and clear the checkbox for the embedded messaging feature. The `mq_prereq.log` file is in the system temp directory.

17. Specify target directories for configuration files for any selected Web server plug-ins. Click **Next** to continue.

If you are installing the IBM HTTP Server, you do not need to specify a location for its plug-in configuration file. The wizard uses the installation path you specified for the Web server to derive the location.

If you have previously installed the IBM HTTP Server product on the same machine as the WebSphere Application Server, and are now installing just the plug-in, enter a configuration file location of `IHS_DIR/conf/httpd.conf`, where `IHS_DIR` is the directory where the IBM HTTP Server product is installed.

18. Review the features summary information and click **Next** to install the product code for the additional features or click **Back** to change your specifications. When the installation is complete, the wizard displays the `install_root\logs\mq_install.log` installation log if you selected the embedded messaging feature and errors occur with its installation.
19. Review the `mq_install.log` installation log if it displays. Click **Next** to continue. The wizard displays the Registration panel.
20. Click **Next** to register the product, or clear the check box and click **Next** to register at a later time. The Registration panel is in English when the machine locale uses a double byte character set (DBCS) language.

You can register the product now by using the link on this panel or later, by using the Web address in the `install_root/prt/readme_prt.txt` file. The Web address in the file is encoded for your locale. A known problem for some locales corrupts the Web address so that it is similar to the following example. (The Web address is all one line in the file. The following example shows the address on two lines for clarity.)

```
http%3A%2F%2Fwww.ibm.com%2Fsoftware%2Fwebprt%2Fregister%2Fprodreg.nsf%  
2Fcontact%3F0penForm%26lang%3DENU%26pid%3D45P8842%26q2%3DWindows+2000
```

Use one of the following Web addresses if your `install_root/prt/readme_prt.txt` file is corrupt:

- <http://www.ibm.com/software/webprt/register/prodreg.nsf/contact?OpenForm&>
- <https://www6.software.ibm.com/reg/prt/prt-r>

The Installation wizard starts the First Steps tool. See “firststeps command” on page 210 for more information.

21. Click **Finish** to close the Installation wizard.
22. Verify the success of the installer program by examining the Exit summary panel and the `install_root/logs/log.txt` for installation status. ISMP records a success message in the `install_root/logs/log.txt` file: “INSTFIN: The installation is complete.” The log is the only source of status information for a silent installation.

Look for severe errors that the installer records in the `install_root/logs/log.txt` file in the installation root directory to verify that no file system or other unusual errors occurred during installation.

If the `install_root/logs/log.txt` file does not contain a record of any problems but problems exist, verify or troubleshoot the installation, as described in “Troubleshooting the installation” on page 214 and in Installation component troubleshooting tips.

If problems exist, correct them, uninstall the product, as described in “Uninstalling the product” on page 295, log off as root and back on, and reinstall.

When installing WebSphere Application Server with embedded messaging from the CD-ROM, the following warning messages are issued on some platforms despite a successful installation:

```
MQSERIES.MQM-CL-HPUX: A test command parameter is not valid." and "*  
"hostname:/cdrom/hpux/messaging/images": Cannot open the  
logfile on this target or source. Possibly the media is  
read-only or there is a permission problem." on mq_install.log.
```

You can ignore the warning messages, because the problem does not affect the successful installation of WebSphere Application Server with embedded messaging.

23. Install the most current fix pack for the WebSphere Application Server product. See Recommended updates for WebSphere Application Server for information about downloading and installing the upgrades. See “Installing interim fixes, cumulative fixes, and fix packs” on page 230 for information about using the update installer program.
24. Install the most current cumulative fix for the WebSphere Application Server product.
25. Install any interim fixes to bring the node back to its previous fix level.
26. If the node was part of a cell, rejoin the node to the cell with the **addNode** command or the deployment manager administrative console. This action synchronizes the master cell configuration with changes you make to the Application Server configuration during the installation of the new features.
27. Reconfigure the base node with the Network Deployment administrative console.

You have now successfully installed additional features for the WebSphere Application Server product.

## Platform-specific tips for installing and migrating

This topic is a collection of platform-specific tips that can help you install and migrate the base WebSphere Application Server product.

If you encounter a problem such as not having enough disk space or temporary space or not having the right packages on your Linux or UNIX-based system, cancel the installation, make the required changes, and restart the installation.

For information related to installing the embedded messaging feature, refer to Tips for installing the embedded messaging feature.

The following sections contain applicable tips:

- All platforms
- All Linux and UNIX-based platforms
- AIX platforms
- HP-UX platforms
- Linux platforms
- Solaris Operating Environment
- Windows platforms

### All platforms

#### Summary of tips that apply to all platforms

- Running servers in different code pages within a single cell is not supported
- Updating all of the cluster members to the same service level
- Avoiding non-ASCII special characters or double-byte character set (DBCS) characters in the name of the installation directory
- Verifying the SDK that WebSphere Application Server products install
- **5.1+** Avoiding the use of a V5.0.x deployment manager after migrating to V5.1
- **5.1+** Migrating from embedded messaging to WebSphere MQ requires setting the MQ\_INSTALL\_ROOT variable to the location of the installation root of WebSphere MQ
- **5.1+** Ignoring the Registration panel when installing only IBM HTTP Server



- Installing WebSphere Application Server products in order on the same machine, when installing the embedded messaging component
- **5.1+** Recovering from configuration errors when the deployment manager was not running during migration.
- **5.1+** Installing all of the Web server plug-ins during the initial installation
- Recovering from an InvalidExecutableException error while starting the jmsserver process
- 150Restarting the server after a configuration change
- 150Updating ports for coexistence requires a WebSphere Application Server installation
- Manually uninstalling all of the beta products before installing WebSphere Application Server
- Installing from a directory with a name beginning with the word `disk` fails
- Accessing migration tools in the migration subdirectory on the WebSphere Application Server product CD-ROM
- Avoiding license files with bad characters in certain languages
- Updating the XMLConfig utility on WebSphere Version 4.0 Advanced Edition before migration
- Planning to not use the `launchClient` command on the WebSphere Application Server Network Deployment product
- Installing interim fixes for the IBM HTTP Server feature and the embedded messaging feature
- Uninstalling interim fixes for the IBM HTTP Server feature and the embedded messaging (WebSphere MQ) feature before installing fix pack updates to the features
- Applying interim fixes and fix packs to the embedded messaging feature
- Installing the WebSphere Application Server product on top of WebSphere MQ
- Editing the port number when choosing the coexistence option during installation
- Avoiding using the installation verification test on node names that contain double-byte characters
- Avoiding the use of hot keys in the Installation wizard
- Downloading a refreshed PDF from the WebSphere Application Server Library page, or refer to the information in the information center
- Logging in appropriately to pick up secondary user groups for root
- Retaining the embedded messaging feature when uninstalling an instance that does not have the feature installed
- Installing WebSphere Application Server 5.1 Cumulative Fix 3
- Verifying that no files exist in the `install_root/classes` directory during installation
- Platform-specific issues when dealing with network file systems
- Avoiding the underscore (`_`) character in machine names
- Avoiding the installation of the server and client feature or the client feature more than once
- Locating more information about the embedded messaging feature or WebSphere MQ
- Installing the embedded messaging server feature if WebSphere MQ Version 5.3 is already installed
- Logging off and back on, or rebooting a Windows machine, after uninstalling the embedded messaging feature
- Planning to not use terminal services with the embedded messaging feature
- Avoiding a coexistence problem between embedded messaging, IBM WebSphere Studio Application Developer Integration Edition, and IBM WebSphere Application Server
- Using a version of Internet Explorer other than Version 6.0 to view the IBM HTTP Administration server
- Avoiding a core that is caused by an incompatibility between functions in various C or C++ run-time libraries
- Hiding one copy of the OpenSSL module so that the Apache Web server can start
- Defining the name of the WebSEAL HTTP server in lower case
- Bringing up the IKEYMAN administrative console with the Conversational Monitoring System option for IBM HTTP server 1.3.28 and IBM HTTP Server 2.0.47
- Enabling cryptographic hardware
- Using the WebSphere MQ client instead of the embedded messaging client feature

#### Tips that apply to all platforms

- **Running servers in different code pages within a single cell is not supported.**

Both the IBM WebSphere Application Server Network Deployment node and the IBM WebSphere Application Server nodes must be on the same code page.

- **Updating all of the cluster members to the same service level**

Apply the same interim fixes and fix packs to all of the WebSphere Application Server nodes in a cluster. When all of the cluster members are not at the same service level, the following exception can occur:

```
DRSCacheApp    E DRSW0008E:  
Exception is: com.ibm.disthub.impl.jms.JMSWrappedException:  
{-1361012295|unknown|java.io.OptionalDataException|}
```

This error can cause memory replication to not function properly.

- **Avoiding special non-ASCII characters or double byte character set (DBCS) characters in the name of the installation directory.**

Do not use non-ASCII special characters or double-byte characters in the directory name. This problem is a known limitation.

- **Verifying the Java 2 SDK that WebSphere Application Server products install.**

Verify that the CD-ROM that you are using is a good copy, by verifying the Java 2 SDK on the CD-ROM.

To verify that the Java 2 SDK on the product CD-ROM is working correctly:

1. Change directories to the /WAS/jdk/java/bin directory in the operating system root directory on the product CD-ROM.

For example, on an IBM AIX platform:

```
cd /mnt/aix/WAS/jdk/java/bin
```

On a Windows platform, type the following command:

```
cd CD-ROMDrive:\win\WAS\jdk\java\bin
```

2. Verify the Java 2 SDK version.

On a Linux or UNIX-based platform, type the following command:

```
./java -version
```

On a Windows platform, type the following command:

```
.\java -version
```

The command completes successfully with no errors when the Java 2 SDK is intact.

- **5.1+ Avoiding the use of a V5.0.x deployment manager after migrating to V5.1.**

After a deployment manager configuration has been migrated to Version 5.1.x, avoid using the Version 5.0.x deployment manager node. Using the V5.0.x node results in an inconsistent configuration and creates an unsupported environment. Use the Version 5.1.x deployment manager node to manage all of the federated nodes in that cell.

If you inadvertently start the Version 5.0.x deployment manager node, the deployment manager attempts to manage the same cell as the Version 5.1.x deployment manager, but with an older version of the configuration. Any changes made through the Version 5.1.x deployment manager can disappear after the nodes synchronize with the Version 5.0.x deployment manager. This problem can cause major disruptions to the operation of your cell.

It is advisable to disable the Version 5.0.x deployment manager node. Be sure to perform a backup of the configuration using the **backupConfig** command before proceeding. You can disable the Version 5.0.x deployment manager node in a number of ways. The recommended approach is renaming the config directory to something else.

- **5.1+ Migrating from embedded messaging to WebSphere MQ requires setting the MQ\_INSTALL\_ROOT variable to the location of the installation root of WebSphere MQ.**

When installing V5.1.x with the WebSphere MQ product as the JMS provider, you must use the administrative console to set the *MQ\_INSTALL\_ROOT* variable to the proper path. The installation program does not set the path when you use the WebSphere MQ product. Although WebSphere MQ is

a supported JMS provider, migrating from V5.0.x with embedded messaging does not reset the variable, which still points to the installation root of the V5.0.x embedded messaging code.

Use the administrative console to set the MQ\_INSTALL\_ROOT to the installation root of the WebSphere MQ product.

1. Click **Environment > Manage WebSphere Variables > MQ\_INSTALL\_ROOT**.
2. Type the fully qualified file path for the installation root of the WebSphere MQ product in the Value field.
3. Click **Apply > Save > Save** to apply and save your changes.

- **5.1+** Ignoring the Registration panel when installing only IBM HTTP Server.

If you install IBM HTTP Server on another machine by installing WebSphere Application Server, Version 5.1 and clearing all of the features but the one for IBM HTTP Server and its plug-in, the installer program displays the Registration panel. Select the check box to clear it and click **Next** to avoid registration, which is not required when installing only the Web server. If you do attempt to register the feature when you have not installed WebSphere Application Server, Version 5.1, you can ignore the following error:

```
java.io.FileNotFoundException:  
  C:\Program Files\WebSphere\AppServer\prt\PRT_Welcome.html  
  (the system cannot found the path specified)
```

- **Installing WebSphere Application Server products in order on the same machine, when installing the embedded messaging component.**

When installing the embedded messaging feature of the WebSphere Application Server product and the Network Deployment product on the same machine, install the WebSphere Application Server product first. Then install the Network Deployment product. Otherwise, embedded messaging installation can fail, or can install with errors.

- **5.1+** Recovering from configuration errors when the deployment manager was not running during migration.

During migration of federated nodes, the V5.1 deployment manager must be running for the migration tools to:

- Update the configuration for each federated node
- Request full synchronization

If the V5.1 deployment manager is not running, failures can occur. You can correct the failures by starting the V5.1 deployment manager, running the **updateVariables.jacl** command in the */migration-specific-backup/variables\_files* directory that the migration tools create, and performing a full synchronization for the cell.

Use the following procedure to correct the problem:

1. Start the deployment manager with the **startManager** command.
2. Update the *variables.xml* files:

```
>cd /websphere/appserver/bin  
>wsadmin -f /.../websphereBackup/variables_files/updateVariables.jacl
```
3. Use the administrative console or the scripting facilities of the deployment manager to perform a full synchronization for the node.

For example, you can use the **syncNode** command to synchronize the node.

- **Installing all of the Web server plug-ins during the initial installation.**

**5.1+** You must select all of the plug-ins that you require during the initial installation of the WebSphere Application Server product to automatically control the configuration of the Web servers. If the installer program configures the Web servers, the uninstaller program can remove the configuration from each Web server when you uninstall WebSphere Application Server. If you install the product again to add features, any Web server plug-ins that you select get configured but the uninstaller program is already configured. The uninstaller program does not remove the configuration from each additional Web server whose plug-in that you selected during the second installation.

**5.1+** Install a new instance of the WebSphere Application Server to create an uninstaller program that can remove the configuration from all of the Web servers whose plug-ins that you select. Or you can remove the configuration manually.

- **Recovering from an InvalidExecutableException error while starting the jmsserver process**

You might get an exception while starting the jmsserver process when you install Network Deployment first and then install the base WebSphere Application Server product and its embedded messaging feature on the same node. The error message is recorded in the *install\_root/logs/jmsserver/SystemOut.log* file:

```
[9/5/02 14:35:37:818 EDT] 36349b90 JMSService
E MSGS0001E: Starting the Server failed with exception: com.ibm.ws.process.exception.
InvalidExecutableException: Error creating new process.
   002: No such file or directory
```

In addition, although the *mq\_install.log* file might appear to contain no errors, the *createMQ.nodeName\_jmsserver.log* file can contain I/O exceptions. These exceptions result from a corrupted installation of the embedded messaging feature caused by installing the Network Deployment product before the base WebSphere Application Server product. The workaround is to uninstall both products, reinstall the base WebSphere Application Server product, and then reinstall the Network Deployment product.

- **Restarting the server after a configuration change.**

If you make any changes to the configuration, restart the server as noted in the messages section of the administrative console.

- **Updating ports for coexistence requires installing WebSphere Application Server.**

Port updates for coexistence require the installation of WebSphere Application Server. This requirement affects port updates for IBM HTTP Server coexistence. Port updates do not occur if only the IBM HTTP Server is installed. In this case, manually update the *httpd.conf* file. Verify that the ports that you use are available. For example, use the **netstat -a** command to see ports that are being used.

- **Manually uninstalling all of the beta products before installing WebSphere Application Server.**

You might experience problems if portions of the beta product remain.

To make sure that you get a clean uninstall, follow these steps:

1. Uninstall the beta version of WebSphere Application Server.

Refer to Uninstalling WebSphere Application Server for more information.

2. Confirm that WebSphere MQ and WebSphere embedded messaging Publish and Subscribe (WEMPS) are uninstalled.

If not, uninstall them by using the Windows Add/Remove programs tool or Smitty/installp, whichever is appropriate. Refer to Uninstalling WebSphere Application Server for more information about manually uninstalling on specific platforms.

3. Remove all of the directory trees from the earlier installations of WebSphere Application Server products.

If the stand-alone WebSphere MQ Version 5.3 is installed, remove the WEMPS directory only. Do not uninstall or remove other WebSphere MQ Version 5.3 items.

- **Installing from a directory with a name beginning with the word disk fails.**

Installing WebSphere Application Server Version 5 from a folder that begins with the word *disk* results in an error. Provide another name for the folder.

- **Accessing migration tools in the migration subdirectory on the WebSphere Application Server product CD-ROM.**

**5.1+** A migration subdirectory on the installation image on the CD-ROM contains the WASPreUpgrade migration tool. The WASPreUpgrade migration tool is intended for scenarios where you might save the currently installed configuration before installing the Version 5.1 product. One example of this situation is where you must upgrade the operating system as part of the Version 5.1 installation. You can migrate

the earlier version, copy the migrated files in the backup directory to another system, update the operating system, restore the migrated files in their backup directory, install Version 5.1, and complete the migration.

**5.1+** You can also use the migration directory on the CD-ROM to back up a Version 5.1 configuration in the event of an operating system upgrade. After the upgrade, you can restore the Version 5.1 configuration using the WASPostUpgrade tool.

- **Avoiding license files with bad characters in certain languages.**

Use the graphical installation interface to avoid this problem.

- **Updating the XMLConfig utility on WebSphere Application Server Advanced Edition, Version 4.0 before migration.**

The migration tools use the XMLConfig utility to export the configuration of V4.0 Advanced Edition. You can install any of the following fixes:

- PQ52555 - XMLConfig does not export clone property configuration
- PQ55064 - XMLConfig does not export Enter JavaBeans (EJB) to data source level mappings
- PQ58038 - Performing an XMLConfig export produces an extra CRLF
- PQ62103 - XMLConfig full export fails with a NullPointerException error in a multinode environment
- PQ62471 - Security AdminRoles are not getting exported during the XML export
- PQ63815 - The "=" symbol is not a valid character for the value string in the XMLConfig file

- **5.1+ Planning to not use the launchClient command on the WebSphere Application Server Network Deployment product.**

The **launchClient** command works on a base WebSphere Application Server node and on a WebSphere Business Integration Server Foundation node, where the Integration Server product extends the base product. The WebSphere Application Server client program does not work on a Network Deployment node.

- **Installing interim fixes for the IBM HTTP Server feature and the embedded messaging feature.**

Three different sites contain service for WebSphere Application Server products and features:

- Download interim fixes for the IBM HTTP Server feature from the IBM Support site for IBM HTTP Server. The readme file that is bundled with the interim fix describes how to install the interim fix. You do not use the update installer program for the WebSphere Application Server (also known as the updateInstaller program or the Update Installation wizard) to install interim fixes for the IBM HTTP Server feature.
- Download interim fixes for the embedded messaging feature from the WebSphere MQ Service download site. Download the readme file for a description of how to install the interim fix. You do not use the update installer for the WebSphere Application Server to install interim fixes for the embedded messaging feature.
- Download any interim fixes, cumulative fixes, and fix packs for the WebSphere Application Server family of products from the IBM Support site for WebSphere Application Server. Cumulative fixes and fix packs do include service for the IBM HTTP Server feature and for the embedded messaging feature. Interim fixes for a WebSphere Application Server product do not include service for the IBM HTTP Server feature or the embedded messaging feature. The readme file that is bundled with the WebSphere Application Server interim fix, the cumulative fix, or the fix pack describes how to use the update installer program for WebSphere Application Server products to install the interim fix, the cumulative fix, or the fix pack.

Installing a cumulative fix or a fix pack removes all of the interim fixes for serviceable components, except for interim fixes for the IBM HTTP Server feature or the embedded messaging feature. You must remove those manually as described in the following tip.

- **Uninstalling interim fixes for the IBM HTTP Server feature and the embedded messaging (WebSphere MQ) feature before installing cumulative fixes and fix packs to the features**

If you have installed interim fixes for the IBM HTTP Server feature from the IBM Support site for IBM HTTP Server, or if you have installed interim fixes for the embedded messaging feature from the WebSphere MQ Service download site, the update installer program cannot uninstall interim fixes for



these feature components before installing a cumulative fix or a fix pack that might include service for the features. The update installer program does uninstall interim fixes for all of the other components. If the interim fixes for the IBM HTTP Server feature and the embedded messaging feature are not uninstalled for some reason, installing a cumulative fix or a fix pack to the IBM HTTP Server feature or to the embedded messaging feature might fail, or the updated features might fail when you begin using them.

If you reinstall all of the interim fixes for either feature that are more current than the cumulative fix or the fix pack, there is no problem.

You can also choose to have the update installer skip applying cumulative fix or fix pack updates to IBM HTTP Server or embedded messaging if you do not require the updates. You can skip these updates and still apply updates to the rest of the product.

- **Applying interim fixes and fix packs to the embedded messaging feature.**

The IBM WebSphere MQ product can coexist with the embedded messaging feature, if they are at compatible service levels. Always apply any outstanding corrective service to the stand-alone WebSphere MQ product, before installing an interim fix (from the WebSphere MQ Support site) or installing a cumulative fix or a fix pack (from the WebSphere Application Server Support site) that might include a service update for the embedded messaging feature.

In each of the following cases, use the readme file associated with the interim fix or with the cumulative fix or the fix pack to install the service. Do not use the update installer program (also known as the updateInstaller program or the Update installation wizard) to install interim fixes for the embedded messaging feature. Download interim fixes for the embedded messaging feature from the WebSphere MQ Service download site.

For example:

- If you have the embedded messaging server and client feature and do not have WebSphere MQ, do not attempt to apply a corrective service diskette (CSD) for WebSphere MQ. Instead, go to the WebSphere MQ Service download site and download the *WebSphere Embedded Messaging interim fixes for WebSphere Application Server V5.1*.

Upgrading the embedded messaging CSD level by applying a WebSphere MQ CSD is supported only for customers with a full WebSphere MQ license.

- If you have the embedded messaging client feature and a stand-alone WebSphere MQ product, apply any outstanding corrective service to the WebSphere MQ product before installing the interim fix (from the WebSphere MQ Support site) for the embedded messaging client feature or installing a fix pack (from the WebSphere Application Server Support site) for the product that includes service for the embedded messaging client feature.
- If you have the embedded messaging client feature and the stand-alone WebSphere MQ product is already at the latest corrective service level, install the interim fix (from the WebSphere MQ Support site) for the embedded messaging client feature or install a fix pack (from the WebSphere Application Server Support site) for the product that includes service for the embedded messaging client feature.

- **Installing the WebSphere Application Server product on top of WebSphere MQ.**

When planning to install a WebSphere Application Server, Version 5 release on a machine that already has a copy of WebSphere MQ V5.3 installed on it, you are recommended to complete the following steps:

1. Ensure that all the WebSphere MQ features required by the WebSphere Application Server embedded messaging are installed:
  - on UNIX:
    - for WebSphere Application Server Network Deployment or Client: Java Messaging
    - for WebSphere Application Server (base): Runtime, Base (or SDK), Server, Client, Java Messaging and All Message Catalogs
  - on Windows:
    - for WebSphere Application Server ND or Client: Java Messaging
    - for WebSphere Application Server (base): Server and Java Messaging
2. Ensure that WebSphere MQ v5.3 is upgraded to the appropriate prerequisite CSD level:



- CSD1 for WebSphere Application Server V5.0
- CSD3 for WebSphere Application Server V5.0.1
- CSD4 for WebSphere Application Server V5.0.2 and later, including V5.1

3. Install the WebSphere Application Server V5 GM release.

4. Install any appropriate WebSphere Application Server fix packs.

After the initial installation of WebSphere MQ and WebSphere Application Server, you should service WebSphere MQ independently of the WebSphere Application Server fix packs. For example, download and apply the WebSphere MQ V5.3 CSD4 before upgrading your WebSphere Application Server to V5.0.2 or before installing V5.1. This approach helps to avoid failures in uninstalling WebSphere Application Server fix packs.

- **Editing port numbers that First Steps uses after selecting the coexistence option during installation.**

Change First Steps port numbers for Samples and the administrative console to match the port numbers in a coexistence scenario.

If you choose the coexistence option during installation, edit the Samples address to make it comply with the new port value for the HTTP transport port. Manually edit the port number when First Steps attempts to open the page. Change the port to match the coexistence port number for the HTTP transport port. The following example shows how to change the address to the default coexistence port number for the HTTP transport port:

```
http://localhost:9085/WSsamples
```

Edit the administrative console address when First Steps attempts to open the administrative console Web address. Change the port to match the coexistence port number for the administrative console port. The following example shows how to change the address to the default coexistence port number for the administrative console port:

```
http://localhost:9091/admin
```

- **Avoiding using the installation verification test on node names that contain double-byte characters.**

The installation verification test is not supported on node names that contain double-byte characters. See “Troubleshooting the installation” on page 214 for more information.

- **Avoiding the use of hot keys while using the Installation wizard.**

The Installation wizard does not support hot keys.

Hot keys do not work for any languages on any operating system platforms. For example, on the **Cancel Confirmation** panel, you cannot type **Alt - Y** or **Alt - N** to say Yes or No to cancel the installation.

- **Downloading a refreshed PDF from the WebSphere Application Server Library page, or refer to the information in the information center.**

The Getting Started PDF on the product CD-ROM is back level. The information in the information center is more current. This is particularly true for the information related to migrating or uninstalling a migrated or coexisting node that uses the embedded messaging feature.

Download a refreshed PDF from the WebSphere Application Server Library page, or refer to the information in the information center before migrating, uninstalling a node after migration, or uninstalling a coexisting node that has the embedded messaging feature installed.

- **Logging in appropriately to pick up secondary user groups for root**

When the root user on all platforms (except Windows platforms) does not belong to the mqbrkrs and mqm user groups, errors occur when installing the embedded messaging feature.

On many systems, such as SuSe Linux, if you telnet and issue the **id** command or the **groups** command, you cannot see the groups mqm or mqbrkrs even though they might exist. Solve this problem in one of two ways:

- Use the **ssh** command to log in
- Issue the **su -** command

After using one of the commands, verify the required groups with the **id** command or the **groups** command.

In a normal root login, issue the **su** command. For a real root login, issue the **su -** command.

Display settings for a normal root login are automatic. For a real root login, you must set your display environment properly to successfully view the GUI installation wizard. Otherwise, you see a message about Preparing Java(tm) Virtual Machine... and seven rows of dots, but no installation GUI and no further messages. Refer to the documentation for your platform to determine proper display settings.

See “Troubleshooting the installation” on page 214 for a description of the error messages that you might receive if you have not picked up the required secondary groups for root.

- **Retaining the embedded messaging feature when uninstalling an instance that does not have the feature installed.**

The wizard prompts you to uninstall the embedded messaging feature, if the feature is installed. To obey licensing rules, always remove the embedded messaging feature unless other product instances share the code.

This panel can appear whenever the embedded messaging feature is installed on the node and not just when you are uninstalling an instance that has the feature installed. For example, assume that you install the embedded messaging feature when you install the base product. Assume that you install a second instance of the base product, but do not install the embedded messaging feature with the product. If you uninstall the second instance, the Installation wizard displays the prompt to uninstall the embedded messaging feature.

- **Installing WebSphere Application Server 5.1 Cumulative Fix 3.**

This collection of fixes for Version 5.1 updates the WebSphere Application Server base product or the Network Deployment product to Version 5.1.0.3. Cumulative Fix 3 includes all of the interim fixes in Cumulative Fix 2. Cumulative Fix 3 is available at the <http://www-1.ibm.com/support/docview.wss?uid=swg24006675> Web address.

Always install the latest cumulative fixes as they are released. See Cumulative Fix Strategy for WebSphere Application Server V5.0 and V5.1 for more information.

- **Verifying that no files exist in the `install_root/classes` directory during installation.**

The `install_root/classes` directory is reserved for testing and debugging fixes when customers call IBM Support. Having files in the directory during installation can cause various problems depending on the fix left in the directory. Verify that no files exist in the `install_root/classes` directory.

When IBM Support queues work for you and provides you test or debug fixes, you put the fixes in the `install_root/classes` directory. By default, the `install_root/classes` directory is picked up first in the WebSphere Application Server class path to let it override other classes.

This directory lets you verify or debug a fix. After accepting the test fix or finishing with the debugging of the debug fix, delete the fix from the `install_root/classes` directory to return the system to a working state. If you do not remove such fixes from the `install_root/classes` directory, you can experience errors.

- **Platform-specific issues when dealing with network file systems.**

The installation CDs are platform specific. Each CD label identifies the platform for which it is designed to be used. The CDs for a particular platform should only be inserted and run from a CD drive that is mounted on the platform that is identified on the CD.

#### **Installing with a network file system mount:**

When installing from a drive mounted on a network file system (NFS), use NFS client and server platforms with identical versions of the operating system and a well-tuned NFS, if possible. For example, if installing on an xSeries (i386) RHEL3 machine, the recommended NFS server is also an xSeries (i386) RHEL3 machine.

If you are forced to use a cross-platform NFS mount, such as when installing from CD on a Linux for S/390 system, mount the drive with the `-o tcp` option if the option is available. For example:

```
mount -o tcp mycdrom.hostname:/media/cdrom /mnt
```

Refer to the man pages for the **mount** command to see if the **tcp** option is available. Using a CD drive or a disk drive mounted with the default mount option (**udp**) is known to cause errors on some versions of Linux. Red Hat Enterprise Linux 3.0 UL1 on zLinux platforms is particularly sensitive to this problem, but the recommendation applies to all Linux platforms.

If you must copy CD images for one platform to an NFS disk on another operating system platform, use a command that preserves symbolic links. For example, on an AIX platform use the **cp -hrp** command to copy data from an HP-UX disk and preserve the symbolic links. Without the **-h** option, the **cp** command on an AIX platform attempts to resolve symbolic links when copying an HP-UX disc instead of preserving the links.

Even with the **-h** option, the **cp** command on a Solaris platform does not preserve symbolic links when copying an HP-UX disc. On a Solaris platform, use the **tar -cvf** command to copy data from an HP-UX disk and preserve the symbolic links.

Consult the man page for the copy command on the NFS system to understand how the platform supports copying symbolic links.

Because many NFS incompatibilities can exist among various platforms, do not use a drive mounted on a network file system to install from one operating system platform to another without first verifying that the NFS configuration is robust. For example, if your mounted CD is **/mnt**, issue the following command on a Linux for S/390 system to see if you have an NFS problem:

```
unzip -l /mnt/linuxs390/WAS/setup.jar
```

The proper output from the command lists all the files in the **setup.jar** file without error. If you encounter problems in running the command, verify that your **/etc/exports** file includes the **no\_root\_squash** option.

See <http://www.redhat.com/docs/manuals/enterprise/RHEL-3-Manual/sysadmin-guide/s1-nfs-mount.html> for more information about the **-o tcp** option.

See Troubleshooting the installation for more information about possible symptoms when installing with a faulty NFS mount. Contact your system administrator for help if you continue to have NFS problems.

- **Avoiding the underscore ( \_ ) character in machine names.**

Internet standards dictate that domain names conform to the host name requirements described in Internet Official Protocol Standards RFC 952 and RFC 1123. Domain names must contain only letters (upper or lower case) and digits. Domain names can also contain dash characters ( **-** ) as long as the dashes are not on the ends of the name. Underscore characters ( **\_** ) are not supported in the host name.

If you have installed WebSphere Application Server on a machine with an underscore character in the machine name, access the machine with its IP address or the **localhost** designator until you rename the machine.

- **Locating more information about the embedded messaging feature or WebSphere MQ.**

For more information about the actions to take before installing the embedded messaging feature, refer to Installing WebSphere embedded messaging as the JMS provider. For more information about installing JMS providers, refer to Installing and configuring a JMS provider.

For information about installing the WebSphere MQ Version 5.3 product, or migrating to WebSphere MQ Version 5.3 from an earlier release, refer to the appropriate WebSphere MQ *Quick Beginnings* book:

- *WebSphere MQ for Windows, V5.3 Quick Beginnings*, GC34-6073
- *WebSphere MQ for AIX, V5.3 Quick Beginnings*, GC34-6076
- *WebSphere MQ for Solaris, V5.3 Quick Beginnings*, GC34-6075
- *WebSphere MQ for Linux for iSeries and Linux for zSeries, V5.3 Quick Beginnings*, GC34-6078

These books are available at the WebSphere MQ messaging platform-specific books Web page.

- **Installing the embedded messaging server feature if WebSphere MQ Version 5.3 is already installed.**

You have a choice if WebSphere MQ Version 5.3 is already installed:

- You can install only the embedded messaging client feature on a machine that already has WebSphere MQ Version 5.3.

To use WebSphere MQ Version 5.3 as the JMS provider, install the IBM WebSphere Application Server product with only the embedded messaging client feature. Installing and using the WebSphere Application Server embedded messaging client feature is recommended with either the server feature or the full WebSphere MQ Version 5.3 product.

WebSphere Application Server messaging applications can use the WebSphere MQ Version 5.3 product as the JMS provider. Using the client feature, however, requires that you install the WebSphere MQ Version 5.3 Java messaging feature.

- You can install the embedded messaging server and client features on a machine that already has WebSphere MQ Version 5.3.

To install the embedded messaging server feature when WebSphere MQ Version 5.3 is already installed, upgrade WebSphere MQ Version 5.3:

- **5.1+** Apply the CSD04 update to the original WebSphere MQ Version 5.3 release if you are running V5.0.2 or V5.1 of WebSphere Application Server.
- Install the WebSphere MQ Version 5.3 features, server and Java messaging, which the WebSphere Application Server embedded messaging server feature requires.

If you install WebSphere MQ Version 5.3 without the required features, the installation of either embedded messaging feature of IBM WebSphere Application Server is unsuccessful because of prerequisite check errors. The Enterprise package includes installation images of the WebSphere MQ Version 5.3 product and the WebSphere MQ Event Broker product, with restricted licensing. You can use the products to install the required WebSphere MQ Version 5.3 features or to install the refresh release of WebSphere MQ Version 5.3 for use with the Enterprise product.

- **Logging off and back on, or rebooting a Windows machine, after uninstalling the embedded messaging feature.**

If you uninstall the embedded messaging feature, log off and back on, or reboot a Windows machine before reinstalling.

- **Planning to not use terminal services with the embedded messaging feature.**

Terminal services is not supported as a valid installation scenario when installing WebSphere Application Server and the embedded messaging feature.

- **Avoiding a coexistence problem between embedded messaging, IBM WebSphere Studio Application Developer Integration Edition, and IBM WebSphere Application Server.**

The IBM WebSphere Studio Application Developer Integration Edition and IBM WebSphere Application Server both include an option to install embedded messaging. The embedded messaging option in these two products is incompatible.

To avoid this problem, do not install embedded messaging for both products on the same machine.

- **Using a version of Internet Explorer other than Version 6.0 to view the IBM HTTP Administration server.**

Forms Proxy Settings and Proxy Cache do not behave correctly When using Internet Explorer Version 6.0 to view the IBM HTTP Administration server, the Forms Proxy Settings and Proxy Cache do not behave correctly. If you select the radio buttons that display editable fields, the fields do not display.

To work around this problem, use another version of the browser.

- **Avoiding a core that is caused by an incompatibility between functions in various C or C++ run-time libraries.**

Depending on the order that the libraries are loaded, a core can occur or IBM HTTP Server fails to initialize. This problem is seen on various Red Hat Intel versions, and SuSE SLES and Red Hat on S/390 platforms.

The GSKit libraries used by the IKEYMAN utility and the IBM HTTP Server SSL module require the C++ library `libstdc++-libc6.1-1.so.2` file on the Intel platform and the `libstdc++-libc6.1-2.so.3` file on the OS/390 platform. If the libraries do not exist, the IKEYMAN utility might provide only limited functionality and the IBM HTTP Server SSL fails to initialize. If another version of this library, or another library with a common function, loaded first, it might result in the use of an incompatible library routine.

If you encounter this problem, set the environment variable `LD_PRELOAD` to the following values before starting IBM HTTP Server or IKEYMAN:

- Intel: export `LD_PRELOAD=/usr/lib/libstdc++-libc6.1-1.so.2`
- OS/390: export `LD_PRELOAD=/usr/lib/libstdc++-libc6.1-2.so.3`

This change forces the library to load first when the application starts.

- **Hiding one copy of the OpenSSL module so that the Apache Web server can start.**

Apache Web server fails to start when using the `mod_ssl` plug-in module and issuing the following command:

```
apachectl startssl
```

A problem exists with a single process that has two copies of the OpenSSL modules.

Hide the Global Security Kit (GSKit) copy of the OpenSSL modules by renaming the `opt/ibm/gsk7/icc` directory to `opt/ibm/gsk7/icc_save`.

- **Defining the name of the WebSEAL HTTP server in lower case.**

When defining your WebSEAL HTTP Server in the administrative console, you must define the name of the WebSEAL HTTP Server all in lower case.

To define the name of the WebSEAL server name, click **LTPA > Trust Association > Interceptors > com.ibm.ws.security.web.WebSealTrustAssociationInterceptor > Custom Properties > com.ibm.websphere.security.webseal.hostnames**.

- **Bringing up the IKEYMAN administrative console with the Conversational Monitoring System option for IBM HTTP server 1.3.28 and IBM HTTP Server 2.0.47**

- You cannot bring up IKEYMAN.
- IKEYMAN does not have the Conversational Monitoring System (CMS) database option to choose from when creating a key database for IBM HTTP Server.

IKEYMAN is changed in Global Security Kit (GSKit) 7 to integrate IKEYMAN for Java Secure Socket Extension (JSSE) that is Java-based and GSKit that is C++-based. IKEYMAN is a tool used to manage digital certificates. You can now use the same IKEYMAN for WebSphere Application Server and IBM HTTP Server. For example, creating a Java Key Store (JKS) or a CMS key database from the same panel within IKEYMAN.

A key database enables a client application to connect to those servers that have digital certificates signed by those certificate authorities (CAs). You must perform extra steps to use the same IKEYMAN with the CMS option in addition to the JKS option. The CMS option is needed when you set up IBM HTTP Server for Secure Sockets Layer (SSL) transactions.

Set the `JAVA_HOME` variable to the location of the IBM Software Development Kit on the machine. If you are using WebSphere Application Server, set the `JAVA_HOME` variable to the Java Runtime Environment (JRE) that is shipped with WebSphere Application Server.

For example:

- On the Linux platform: Export the `JAVA_HOME=/opt/WebSphere/AppServer/java` variable.
- On the UNIX platform: Run the `<IHS install root>/bin/ikeyman`, or `<WAS_HOME>/bin/ikeyman.sh` command, from a command prompt to bring up the IKEYMAN administrative console.
- On the Windows platform: To bring up IKEYMAN, click **Start > Programs > IBM HTTP Server 1.3.28 (or IBM HTTP Server 2.0.47) > Start Key Management Utility**, or run `<WAS_HOME>/bin/ikeyman.bat` at a command prompt.

If you cannot bring up IKEYMAN after the previous steps, perform the following steps:

1. Set the `JAVA_HOME` variable to the home of the IBM Software Development Kit for the Java platform located on your machine. If you are using WebSphere Application Server, you should set the `JAVA_HOME` variable to the JRE that is shipped with WebSphere Application Server.
2. If you are not using the JRE that comes with WebSphere Application Server, and the `gskikm.jar` file exists in your `JAVA_HOME` directory, rename and move the `$JAVA_HOME/jre/lib/ext/gskikm.jar` file to a directory that is not visible to the IBM Software Development Kit class path, external directory, and the bootstrap class path. For example, on the Linux platform: `mv $JAVA_HOME/jre/lib/ext/gskikm.jar/gskfiles/gskikm.jar.org`.



3. Ensure that the `java.security` file has the following providers:

You can find the `java.security` file in the security directory path. For example, the full path to the file on the Windows platform is `C:\Program Files\IBM\Java141\jre\lib\security\java.security`.

```
security.provider.2=com.ibm.crypto.provider.IBMJCE
security.provider.3=com.ibm.spi.IBMCMSProvider
```

If you try to use cryptographic hardware with IBM HTTP Server, ensure that the file contains the following lines in the order that is shown here:

```
security.provider.1=com.ibm.spi.IBMCMSProvider
security.provider.2=com.ibm.crypto.provider.IBMJCE
security.provider.3=com.ibm.jsse.IBMJSSEProvider
security.provider.4=com.ibm.crypto.pkcs11.provider.IBMPKCS11
```

If you are not using an IBM Software Development Kit or if the IBM Software Development Kit files in the `lib\ext` directory are older than the ones that come with the GSKit, you have to copy all the Java archive (JAR) files from the `ibm\gsk7\classes\jre\lib\ext` directory to the `Java141\jre\lib\ext` directory.

– On the UNIX platform:

To bring up IKEYMAN, run the `<IHS install root>/bin/ikeyman`, or `<WAS_HOME>/bin/ikeyman.sh` command, from a command prompt.

– On the Windows platform:

To bring up IKEYMAN, click **Start > Programs > IBM HTTP Server 1.3.28** (or **IBM HTTP Server 2.0.47**) > **Start Key Management Utility**, or run `WAS_HOME/bin/ikeyman.bat` at a command prompt.

- **Enabling cryptographic hardware**

The cryptographic token is no longer a separate item on the IKEYMAN GUI menu. It is treated as one of the key store types. You can specify the PKCS11 module name by specifying the property of `DEFAULT_CRYPTOGRAPHIC_MODULE` in the `ikmuser.properties` file as before. However, IKEYMAN no longer tries to load the dynamic link lists (DLL) or Library (LIB) at startup time to decide whether to support the cryptographic token. The value of the `DEFAULT_CRYPTOGRAPHIC_MODULE` property is used only for the default value shown on the GUI.

When you open the Cryptographic Token, IKEYMAN first retrieves the value of the `DEFAULT_CRYPTOGRAPHIC_MODULE` property in the `ikmuser.properties` file and pre-fill the value in the **File Name** and **Location** fields in the **Key Database File > Open dialog box of IKEYMAN** GUI. You can modify the value in the **File Name** and **Location** fields or click the **Browse** button.

Once the specified DLL or LIB is loaded successfully, you can use IKEYMAN. After opening a cryptographic token successfully, IKEYMAN displays the certificates stored in the cryptographic token.

- **Using the WebSphere MQ client instead of the embedded messaging client feature.**

Use the client from the full WebSphere MQ installation and do not use the embedded messaging client feature. It is not necessary to install the embedded messaging client feature. Both clients are the same, except that the embedded messaging client has a licensing restriction that prohibits it from communicating with queue managers outside of the WebSphere Application Server environment.

## All Linux and UNIX-based platforms

### Summary of tips that apply to all Linux and UNIX-based platforms

- Preparing a Linux or UNIX operating platform for the embedded messaging feature
- Installing to fixed locations on Linux and UNIX-based operating systems
- Defining the prerequisite Linux or UNIX operating system groups, `mqm` and `mqbrkrs`
- Creating and mounting the required journalized file system, `/var/mqm`, before installing WebSphere Application Server
- Restricting access to the `var/mqm/errors` directory and to the messaging logging files
- Verifying the system `cp` command when using emacs or other freeware
- Ignoring the desktop icon messages from InstallShield for Multiplatforms (ISMP) during installation
- Avoiding setting WebSphere Application Server environment variables in the user profile or in the system profile



- Avoiding spaces in the name of the installation directory on Linux and UNIX platforms
- Moving all of the core dump files from the `var/sadm/pkg` directory
- Starting the `jmsserver` process before running some Samples on UNIX platforms
- Using an option on the **install** or **uninstall** commands to identify a temporary directory other than the default `/tmp` directory
- Adding additional name space bindings with a new console user
- Migrating when the SDK that ships with the product is not available
- A delay occurs before the Installation wizard displays its first panel
- Manually entering Launchpad Web addresses to launch the links directly from your browser
- Using the `tcp` option to mount CD drives or disk drives in a network file system mount if the option is available
- Preserving symbolic links when copying product CDs to network file server disks

### Tips that apply to all Linux and UNIX-based platforms

- **Preparing a Linux or UNIX operating platform for the embedded messaging feature.**

Perform this step only if you are installing the Java Message Service (JMS) provider for WebSphere Application Server on a Linux or UNIX-based operating system. You must install the embedded messaging feature to use the JMS provider that WebSphere Application Server provides.

If you are installing the embedded messaging feature, you must create two operating system groups as described in Installing WebSphere embedded messaging as the JMS provider.

The Solaris Operating Environment and HP-UX also require that you increase kernel settings as described in Installing WebSphere embedded messaging as the JMS provider.

For an index of platform-specific information about using the embedded messaging feature, see “Tips for installing the embedded messaging feature” on page 187.

- **Installing to fixed locations on Linux and UNIX-based operating systems**

On Linux and UNIX-based operating systems, the embedded messaging feature installs to fixed locations that you cannot override. The default locations are:

- Linux platforms: `/var/mqm`, `/var/wemps`, `/opt/mqm`, `/opt/wemps`
- AIX platforms: `/usr/opt/mqm`, `/usr/opt/wemps`, `/var/mqm`
- Solaris platforms: `/var/mqm`, `/var/wemps`, and `/usr`

The Installing WebSphere embedded messaging as the JMS provider topic describes directory locations in detail.

- **Defining the prerequisite Linux or UNIX operating system groups, `mqm` and `mqbrkrs`**

Before you install the embedded messaging component on UNIX or Linux platforms, you must define the operating system groups `mqm` and `mqbrkrs`, and the user IDs needed for WebSphere embedded messaging. For detailed information, see Installing WebSphere embedded messaging as the JMS provider.

- **Creating and mounting the required journalized file system, `/var/mqm`, before installing WebSphere Application Server**

On UNIX platforms, use a partition strategy with a separate volume for the messaging data. A separate partition prevents other system activity from being affected when a large amount of messaging work builds up in the `/var/mqm` directory.

The `/var` file system is used to store all of the security logging information for the system, and is used to store the temporary files for e-mail and printing. Therefore, it is critical that you maintain free space in the `/var` directory for these operations. If you do not create a separate file system for messaging data, and the `/var` directory fills up, all of the security logging, e-mail, and printing is stopped on the system until some free space is available in the `/var` directory.

- **Restricting access to the `/var/mqm/errors` directory and messaging logging files**

After installing WebSphere embedded messaging, you must restrict access to the `/var/mqm` directories and to the log files needed for WebSphere embedded messaging, such that only the `mqm` user ID or members of the `mqm` user group have write access. For detailed information, see Installing WebSphere embedded messaging as the JMS provider and Securing messaging directories and log files.

- **Verifying the system cp command when using emacs or other freeware.**

If you have emacs or other freeware installed on your Linux or UNIX-based system, verify that the system **cp** command is being used.

1. Type `which cp` at the command prompt before running the installation program for a WebSphere Application Server product.
2. Remove the freeware directory from your PATH if the resulting directory output includes freeware. For example if the output shows `/opt/freeware/bin/cp`, remove the directory from the PATH.
3. Install the WebSphere Application Server product.
4. Add the freeware directory back to the PATH.

If you install with a **cp** command that is part of a freeware package, the installation completes but the Java 2 SDK that the WebSphere Application Server product installs, which is `install_root/java`, can have missing files. Some required symbolic links can be destroyed. If you remove the freeware **cp** command from the PATH, you can install the WebSphere Application Server product successfully.

To verify that the Java 2 SDK that WebSphere Application Server installs is working correctly:

1. Go to `install_root/java/bin`.
2. Type `./java -version`.

The command completes successfully with no errors when the Java 2 SDK is intact.

- **Ignoring the desktop icon messages from InstallShield for Multiplatforms (ISMP) during installation.**

You can ignore any messages in the `log.txt` file about not being able to create a desktop icon on Linux and UNIX-based platforms.

For instance, ignore messages that are similar to the following messages when installing the base WebSphere Application Server product:

```
Setup.product.install,
  com.installshield.product.actions.DesktopIcon,
  msg1, Unable to find platform specific desktop icon information.
  Could not create desktop icon "Start the Server"
Setup.product.install,
  com.installshield.product.actions.DesktopIcon,
  msg1, Unable to find platform specific desktop icon information.
  Could not create desktop icon "Stop the Server"
Setup.product.install,
  com.installshield.product.actions.DesktopIcon,
  msg1, Unable to find platform specific desktop icon information.
  Could not create desktop icon "Samples Gallery"
Setup.product.install,
  com.installshield.product.actions.DesktopIcon,
  msg1, Unable to find platform specific desktop icon information.
  Could not create desktop icon "information center"
Setup.product.install,
  com.installshield.product.actions.DesktopIcon,
  msg1, Unable to find platform specific desktop icon information.
  Could not create desktop icon "First Steps"
Setup.product.install,
  com.installshield.product.actions.DesktopIcon,
  msg1, Unable to find platform specific desktop icon information.
  Could not create desktop icon "Administrative Console"
Setup.product.install,
  com.installshield.product.actions.DesktopIcon,
  msg1, Unable to find platform specific desktop icon information.
  Could not create desktop icon "Tivoli Performance Viewer"
Setup.product.install,
  com.installshield.product.actions.DesktopIcon,
  msg1, Unable to find platform specific desktop icon information.
  Could not create desktop icon "Log Analyzer"
```

- **Avoiding setting WebSphere Application Server environment variables in the user or system profile.**

WebSphere Application Server products use environment variables to control many dynamic settings, such as the path to the product in the \$WAS\_HOME variable, the path to the /logs directory in \$LOG\_ROOT, or the path to the IBM Development Kit in \$JAVA\_HOME. Avoid setting these variables in the system profile or in user profiles. You might have a setting in a profile that overrides the proper setting. If you reset variables that the products use to function, you can produce unpredictable results, or even failure. To view WebSphere Application Server environment variables, open the administrative console and click **Environment > Manage WebSphere Variables**. Scroll down to see the variables. You can also click **Next** and **Previous** to see other pages of variables. Click a variable to see more information, including its description. Other variable settings are described on other administrative console pages.

- **Avoiding spaces in the name of the installation directory on Linux and UNIX platforms.**

Do not use spaces in the installation directory name. Spaces in directory names are not supported on Linux and UNIX.

- **Moving all of the core dump files from the var/sadm/pkg directory.**

The InstallShield for MultiPlatforms (ISMP) Installation wizard iterates through all of the directories in the /var/sadm/pkg directory, assuming that each entry that the wizard finds is a directory. The wizard tries to open the pkginfo file within the directory. The ISMP wizard fails when it cannot find an entry under the core file. Remove the core file from the directory to avoid the problem.

- **Starting the JMS server before running some Samples on UNIX platforms.**

To run Samples that use JMS APIs, you must manually start the JMS server (jmsserver) before running the samples on UNIX platforms.

To start the jmsserver process, complete the following steps:

1. Open the administrative console: `http://localhost:9090/admin`.
2. Click **Servers > Application Servers > server1 > Server Components > JMS Servers**.
3. Change the Initial State from **STOP** to **START**.
4. Save the configuration and log out of the administrative console.
5. Stop and restart the Application Server from the command line. For example,

```
stopServer.sh server1 followed by startServer.sh server1
```

- **Using an option on the install or uninstall command to identify a temporary directory other than the default /tmp directory.**

If the tmp disk does not have a large enough allocation, this message appears:

```
Error writing file = There may not be enough temporary disk space.  
Try using -is:tempdir to use a temporary directory on a partition with more disk space.
```

Use the `-is:tempdir` installation option to specify a different temporary disk to use. For example, the following command uses the /swap file system as a temporary disk during installation:

```
./install -is:tempdir /swap
```

Some space in the /tmp directory is required for a copy of the native install launcher program, the Java virtual machine (JVM), and some utility programs. ISMP uses the location you specify with the `-is:tempdir` parameter for its temporary work area.

- **Adding additional name space bindings with a new console user.**

On UNIX platforms, when you click **Name Space Bindings**, you receive an Error 500 message on the browser. When you click **Show Details**, a NullPointerException displays. This only occurs with the administrative ID that was configured as the server ID.

To solve the problem, add a different user to **System Management > Console Users** and login with that user to add additional name space bindings.

- **Migrating when the Java 2 SDK that ships with the product is not available.**

If you upgrade the Java 2 SDK that ships with the WebSphere Application Server product, and you intend to use the migration tools to migrate the configuration of a Version 4.0.x installation to Version 5.0.x, you can work around any Java wrapper errors that you might receive.

For example, if you upgrade to Java 2 SDK 1.3.1\_08 and attempt to migrate V4.0.4 to V5.0.2, you receive a Java wrapper not found error when you issue the following command, which is shown on more than one line for clarity:

```
./WASPreUpgrade.sh
/tmp/WAS40Backup
/opt/WebSphere/AppServer
wassun3
-traceString " *=all=enabled"
-traceFile /tmp/PreUpgradeTrace.log
```

The error that you receive is about a Java wrapper not found. Create a soft link to get around the problem:

1. `cd install_root/java/bin/aparc/native_threads`
2. `ln -s java .java_wrapper`

When you call the `.java_wrapper`, the Java 2 SDK assumes that the Java code is called and the migration can continue.

- **A delay occurs before the Installation wizard displays its first panel.**

The default installation method is to open a command window to a read/write directory, issue the fully qualified command to start the Launchpad tool, and click the **Install the product** option. This option launches the Installation wizard, which is an InstallShield for MultiPlatforms (ISMP) application. This action launches the Installation wizard in the language of your machine locale unless no translation exists for your locale, in which case you receive the English version. A short delay occurs before the ISMP wizard displays.

You do not need to click the *Install the product* option more than once to cause the wizard to display the first panel. The delay is particularly noticeable on x-windows platforms.

- **Manually entering Launchpad Web addresses to launch the links directly from your browser.**

A known problem with the Launchpad can prevent it from using Netscape to open the documentation links on some operating system platforms.

If you use the Mozilla browser, some Launchpad links do not work. The Launchpad attempts to call the Netscape browser in the `/usr/bin/netscape` directory. Try a symbolic link to the Mozilla browser to fix the problem as shown in the following example:

```
ln -sf /usr/bin/mozilla /usr/bin/netscape
```

You can also launch the following links directly from your browser:

#### **Product Overview**

<http://www.ibm.com/software/webservers/appserv/>

Your security options might prevent redirection, such as to the <http://www-306.ibm.com/software/info1/websphere/index.jsp?tab=products/appserv> Web site. If so, you can identify the IBM Web site as a trusted site to allow the redirection. For example, on Internet Explorer, add <http://www-306.ibm.com> to the list of Trusted Sites by selecting **Tools > Internet Options > Security (tab) > Trusted Sites**.

#### **Readme File**

`CD-ROM_mount_point/readme/readme_en.html`

#### **Installation Guide**

`CD-ROM_mount_point/docs/InstallGuide_en.PDF`

The *Installation Guide* is in Adobe PDF format. Viewing this document requires you to have Adobe Acrobat Reader, which is a free download from the Adobe Acrobat Web site.

**5.1 +** Download a new installation guide at  
[ftp://ftp.software.ibm.com/software/webserver/appserv/library/wasv51base\\_gs.pdf](ftp://ftp.software.ibm.com/software/webserver/appserv/library/wasv51base_gs.pdf).

See “Using the Launchpad to start the installation” on page 189 for more information about the Launchpad program.

- **Using the tcp option to mount CD drives or disk drives in a network file system mount if the option is available.**

Refer to the man pages for the **mount** command to check if the tcp option is available. Using a CD drive or a disk drive mounted with the default mount option (udp) is known to cause errors on some versions of Linux.

Red Hat Enterprise Linux 3.0 UL1 on zLinux platforms is particularly sensitive to this problem, but the recommendation applies to all Linux platforms. Installing with product CDs that are physically located on an NFS server can fail. Symptoms that occur when installing with disk 1 on an NFS server include:

- An indication that the `/tmp/_wbi_/jdk/java/bin/java` file does not exist after issuing the **launchpad.s** command or the **install** command and the installation fails.
- An indication of copy errors in the `/tmp/wbisf_launcher.log` file:
 

```
cp: cannot stat `/mnt/linuxs390/WAS/jdk/java/jre/lib/images':
  No such file or directory
cp: cannot stat `/mnt/linuxs390/WAS/jdk/java/jre/lib/security':
  No such file or directory
cp: cannot stat `/mnt/linuxs390/WAS/jdk/java/lib':
  No such file or directory
```
- An indication of stale NFS file handle errors when trying to list the files under the NFS-mounted file system:
 

```
#ls /mnt/linuxs390/WAS/jdk/java/jre/lib
ls.: :stale NFS file handle
```
- An indication of server-not-responding errors in the `/var/log/messages` file on the NFS client:
 

```
Mar 15 16:29:59 aushat178 kernel:
  nfs: server svtnx4 not responding, still trying
```

Symptoms that occur when installing with disk 2 on the NSF server include:

- After clicking **Next** on the Prompt for disk 2 panel, the Installation wizard fails while copying the update installer application with an error that is similar to the following example:
 

```
Copying cumulative fix and update installer application failed.
Cumulative fix or interim fixes cannot be applied.
This installation is terminating.
```
- After the failure of the installation of the cumulative fix, there are missing directories in the `install_root/WAS_update` directory. You can verify missing directories by comparing the directory structure to the directory structure on disk 2.

Before installing with an NFS-mounted CD or hard disk, verify that the NFS is working correctly. For example, if your mounted CD is `/mnt`, issue the following command on zLinux to see if you have an NFS problem:

```
unzip -l /mnt/linuxs390/WAS/setup.jar
```

The proper output from the command lists all the files in the `setup.jar` file without error. If you encounter problems in running the command, verify that your `/etc/exports` file includes the `no_root_squash` option. Also mount the NFS drive with the `-o tcp` option. For example:

```
mount -o tcp mycdrom.hostname:/media/cdrom /mnt
```

See <http://www.redhat.com/docs/manuals/enterprise/RHEL-3-Manual/sysadmin-guide/s1-nfs-mount.html> for more information about the `-o tcp` option.

Contact your system administrator for help if you continue to have NFS problems.

- **Preserving symbolic links when copying product CDs to network file server disks**

When copying a CD for one operating system platform to a network file system (NFS) disk on another type of operating system using the **cp** command, you can encounter errors such as those in the following example:

```
a file is bad
no such file or directory exists
libCSup.2 cannot be accessed
```

The copy error occur when incorrectly copying symbolic link files.

An example of such an error occurs when copying an HP-UX CD image onto an AIX platform with the **cp -frp** command. The default **cp** command behavior on an AIX platform is to resolve the symbolic links by copying the files to which the symbolic links point. Errors occur when a symbolic link resolves to a platform-specific library or file that is not present on the NFS operating system. Use options on the copy command of the NFS system to copy symbolic links instead of resolving them. For example, the **-h** option on the **cp** command of the AIX platform copies symbolic links from the HP-UX CD to the NFS disk on the AIX platform.

Even with the **-h** option, the **cp** command on a Solaris platform does not preserve symbolic links when copying an HP-UX disk. On a Solaris platform, use the **tar -cvf** command to copy data from an HP-UX disk and preserve the symbolic links:

1. Insert disk 2 for HP-UX platforms into the drive on the Solaris system.
2. Close the file explorer window if one opens.
3. Open a command window.
4. Change directories:  

```
CD /cdrom/cdrom0
```
5. Issue the following command:  

```
tar cvf * /workarea/filename.tar
```
6. Change directories:  

```
CD /workarea
```
7. Issue the following command:  

```
tar -xvf filename.tar
```

Consult the man page for the copy command on the NFS system to understand how the platform supports copying symbolic links.

## AIX platforms

### Summary of tips that apply to AIX platforms

- Providing adequate disk space for installation
- **5.1+** Unmounting file systems with broken links to avoid java.lang.NullPointerException errors
- **5.1+** Installing the prerequisite xIC.rte 6.0 run-time code on AIX 5.1 or AIX 5.2
- Installing the prerequisite Java130.rte.lib Version 1.3.0 on AIX Version 4.3.3 or AIX Version 5
- Correcting directory permissions on AIX platforms before reinstalling WebSphere Application Server with the embedded messaging feature
- A core dump might occur when running WebSphere Application Server with DB2 V7.2 FP8 client in AIX 5.2
- Avoiding a segmentation fault problem when installing or uninstalling
- Avoiding a null pointer exception during the interactive installation of the IBM HTTP Server product on AIX platforms.
- Ignoring DBCS messages when you do not require DBCS support. Otherwise, install the necessary patches.
- Using UNIX line-end characters (0x0D0A) to terminate each line of the options response file for silent installation
- Navigating if the scroll bar disappears on the Feature panel of the Installation wizard
- Ignoring error messages that appear in the log.txt installation log
- Avoiding a potential port conflict between the administrative console and the WebSM system management console on AIX 5.1, with maintenance level 2.
- Canceling the installation and updating your operating system before restarting the installation, if you install on an AIX machine and receive a message that a fileset is missing, such as the X11.fnt.ucs.ttf fileset
- Setting up the display environment for a real root login on AIX systems
- Avoiding a DSAPI filter-loading error when the Lotus Domino Server starts



- Avoiding a null pointer exception during the interactive installation of the IBM HTTP Server on AIX platforms
- Starting IBM HTTP Server 2.0.47 on AIX 5.2 systems
- Using the AIX 5.1 and AIX 5.2 Fast Response Cache Accelerator feature with IBM HTTP Server 2.0.47

### Tips that apply to AIX platforms

- **Providing adequate disk space for AIX platforms.**

Space requirements for the embedded messaging feature are described in the Installing WebSphere embedded messaging as the JMS provider topic.

Table 42. Installed sizes of installation directories for AIX platforms

|  | Base product                     | Network Deployment                           | IBM HTTP Server          | Embedded messaging           | Tivoli Global Security Kit | Temp space |
|--|----------------------------------|--|--------------------------|------------------------------|----------------------------|------------|
| <b>Installation directory</b>              | /usr/<br>WebSphere/<br>AppServer | /usr/<br>WebSphere/<br>Deployment<br>Manager | /usr/ IBM<br>Http Server | /usr/ mqm and<br>/opt/ wemps | /usr/ ibm/<br>gsk7         | /tmp       |
| <b>Minimum free space for installation</b> | 450 MB                           | 370 MB                                       | 20 MB                    | 17 MB; 40 MB<br>on base      | 32.5 MB on<br>base         | 150 MB     |

- **Unmounting file systems with broken links to avoid java.lang.NullPointerException errors.**

Unmount file systems with broken links before installing on an AIX system. The installation of the cumulative fix pack can fail with the following error when broken links to file systems occur:

An error occurred during wizard bean change notification:

```
java.lang.NullPointerException
  at com.ibm.wizard.platform.aix.AixFileUtils.
    getFileSystemData(AixFileUtils.java:388)
  at com.ibm.wizard.platform.aix.AixFileUtils.
    getPartitionDataWithExecs(AixFileUtils.java:172)
  at com.ibm.wizard.platform.aix.AixFileUtils.
    getPartitionData(AixFileUtils.java:104)
  at com.ibm.wizard.platform.aix.AixFileServiceImpl.
    getPartitionNames(AixFileServiceImpl.java:397)
...

```

Use the **df -k** command to check for broken links to file systems. Look for file systems that list blank values in the *1024-blocks size* column. Columns with a value of "-" (dash) are not a problem. A problem with the /dev/lv00 file system is illustrated in the following example:

```
> df -k
Filesystem      1024-blocks      Free %Used    Iused %Iused Mounted on
/dev/hd4         1048576         447924   58%     2497    1% /
/dev/hd3         4259840         2835816  34%      484    1% /tmp
/proc            -                -        -        -      - /proc
/dev/lv01        2097152         229276   90%     3982    1% /storage
/dev/lv00
/dev/hd2         2097152         458632   79%     42910   9% /usr
iw031864:/cdrom/db2_v72_eee_aix32_sbcs

```

The /proc file system is not a problem. The iw031864:/cdrom/db2\_v72\_eee\_aix32\_sbcs file system is a definite problem. The /dev/lv00 file system is also a likely problem. Use one of the following commands to solve this problem:

```
> umount /cdrom/db2_v72_eee_aix32_sbcs
> umount /cdrom

```

Start the installation again. If the problem continues, unmount any file systems that have blank values, such as the /dev/lv00 file system in the example. If you cannot solve the problem by unmounting file systems with broken links, reboot the machine and start the installation again.

- **5.1+** **Installing xIC.rte 6.0 run-time code, which is a prerequisite of GSKit7 on AIX 5.1 or AIX 5.2.**

You must install the x1C.rte 6.0 run-time code, which is a prerequisite of GSKit7. Download the run-time code as a fix from the AIX Support site.

- **Installing the prerequisite Java130.rte.lib Version 1.3.0 on AIX Version 4.3.3 or AIX Version 5.**

On AIX Version 4.3.3 (not supported by WebSphere Application Server V5.1) and AIX Version 5, you must install Java130.rte.lib Version 1.3.0 to verify that the embedded messaging feature installs correctly. To download a copy of Java 1.3.0:

1. Go to [www.ibm.com/java](http://www.ibm.com/java): Java Technology Zone.
2. Go to the bottom of the page: **Most popular links**.
3. Click **IBM Developer Kit for AIX**.
4. Click **Download**.
5. Click **Java 1.3.0** from the **Java Version** column in the table.
6. (Optional) Register for a user ID and password.

To correct an existing problem:

1. Uninstall the following components, if present:
  - WebSphere Application Server
  - WebSphere MQ (MQSeries)
  - WebSphere MQ (MQSeries) Java classes and classes for WebSphere MQ for the Java Message Service
  - IBM HTTP Server
  - WebSphere Embedded Messaging Publishing and Subscribe Edition
2. Edit the `vpd.properties` file and remove any entry related to WebSphere Application Server. WebSphere Application Server-related entries begin with:
  - **WSB** for the base WebSphere Application Server, V5.0.x product
  - **WSBAA51** for the base WebSphere Application Server, V5.1 product
  - **WSC** for the WebSphere Application Server Application Clients
  - **WSE** for the Enterprise product, V5.0.x
  - **WSN** for the Network Deployment product, V5.0.x
  - **WSNAA51** for the Network Deployment product, V5.1
  - **WSM** for the WebSphere MQ product
3. Reinstall the WebSphere Application Server product.

- **Correcting directory permissions on AIX platforms before reinstalling WebSphere Application Server with the embedded messaging feature**

After manually uninstalling the WebSphere Application Server product and before reinstalling the product with the embedded messaging component, look for the following directory: `/var/mqm/log/WAS_system_name_server_name`. If this directory exists, confirm that the directory is empty and that the user, `mqm`, can open and write to it. If it is not accessible, the embedded messaging installation program throws the following error:

```
AMQ7064: Log path not valid or inaccessible is written in the
         createMQ.system_name_server_name.log file.
```

If this error occurs, the installation of the embedded messaging component fails.

- **Avoiding a segmentation fault problem when installing or uninstalling.**

If a core dump causes the desktop to disappear while installing or uninstalling the product and leaves only the log in prompt, run the DBX utility on the resulting core file.

If you see the following output, apply the AIX PTF fix for PMR:82869,004 to solve the problem:

```
dbx /usr/bin/X11/X core
Type 'help' for help.
reading symbolic information ...warning: no source compiled with -g
```

```
[using memory image in core]
```

```
Segmentation fault in . at 0x10040aac
0x10040aac (???) 931d0000      stw   r24,0x0(r29)
(dbx) where
SetFontPathElements(??, ??, ??, ??) at 0x10040aac
```

```
SetFontPath(??, ??, ??, ??) at 0x10042e58
SetFontPath(??, ??, ??, ??) at 0x10042e80
ProcSetFontPath(??) at 0x10015ce4
DeleteClientFromAnySelections(??) at 0x1001e8a8
```

- **Avoiding a null pointer exception during the interactive installation of the IBM HTTP Server product on AIX platforms.**

When installing IBM HTTP Server using the wizard on an AIX platform, you might receive a null pointer Java error on the installation panels when the installer begins to copy files to your machine. This error is caused by an unstable AIX ODM registry.

To work around this problem:

1. Exit the installer.
2. Issue the following command to see if any remaining registry entries for IBM HTTP Server are present:

```
lslpp -l|grep IHS
```

3. If registry entries for IBM HTTP Server remain, install IBM HTTP Server silently by running the following command:

```
java -jar setup.jar -silent -P ihs.installLocation=the desired installation location
```

**Note:** To remove the installation silently, use the `-silent` parameter on the `uninstall` command. For example, run this command from the IBM HTTP Server installation root:

```
java -jar _uninst/uninstall.jar -silent
```

- **Ignoring DBCS messages or installing necessary patches when you do not require DBCS support.**

While installing any WebSphere Application Server product, you might see the following messages on AIX 5.1 and AIX 4.3.3 (not supported by WebSphere Application Server V5.1) until you install the missing filesets.

Operating system patches of particular concern:

```
Fileset X11.fnt.ucs.ttf_KR was not found on the system.
v5.1.0.0 - Font required for Korean character display
```

```
Fileset X11.fnt.ucs.ttf_TW was not found on the system.
v5.1.0.0 - Font required for Taiwanese character display
```

```
Fileset X11.fnt.ucs.ttf_CN was not found on the system.
v5.1.0.0 - Font required for Chinese character display
```

- **Using UNIX line-end characters (0x0D0A) to terminate each line of the options response file for silent installation.**

During a silent installation on AIX machines, the response file passed to the installer program must not contain ASCII line-end characters (0x0D0A). The response file must contain UNIX line-end characters only. When the options response file contains ASCII line-end characters, the `install` command is unsuccessful and does not log or display an error. To verify the cause of failure, use the Java argument `-Dis.debug=1` on the `install` command. The debug information describes a service exception about invalid characters in the options response file.

- **Navigating if the scroll bar disappears on the Feature panel of the Installation wizard.**

If the scroll bar disappears, use the up and down arrow keys to navigate the features in the Feature panel. Use the tab key to move the focus to the navigation. You can also use the mouse.

- **Ignoring the following error messages that appear in the log.txt installation log.**

You can ignore the following error messages that might appear during installation of the base product in an umbrella installation:

```
WASBase, com.ibm.wizard.platform.aix.AixProductServiceImpl,
    wrn, - WARNING:
Got invalid size of 0 for file:
/usr/WebSphere/AppServer/
```

```

config/cells/
BaseApplicationServerCell/
nodes/
DefaultNode/
spi.policy:
WASBase, com.ibm.wizard.platform.aix.AixRegistryServiceImpl,
wrn, AixRegistryServiceImpl:
Error attempting to modify AIX VPD.

```

- **Avoiding a potential port conflict between the administrative console and the WebSM system management console on AIX 5.1, with maintenance level 2.**

The AIX WebSM system management server listens on port 9090 by default. If you suspect that you have a port conflict, verify it by shutting down WebSphere Application Server. Then issue this command:

```
netstat -an |grep 9090
```

If you get a match, another process is already listening on port 9090. If you want the WebSM server and WebSphere Application Server to coexist, change the WebSphere Application Server administrative console port when installing WebSphere Application Server, or after installation. Although not recommended, you can also disable the WebSM server. To disable the WebSM server, issue this command:

```
/usr/websm/bin/wmsmserver -disable
```

The command permanently disables WebSM server startup.

- **Canceling the installation and updating your operating system before restarting the installation, if you install on an AIX machine and receive a message that a fileset is missing, such as the X11.fnt.ucs.ttf fileset.**

Update your operating system if it is missing required filesets. If you receive a message that a fileset is missing, such as the X11.fnt.ucs.ttf fileset, cancel the installation, update the operating system, and restart the installation.

- **Setting up the display environment for a real root login on AIX systems.**

In a normal root login, issue the command `su`. For a real root login, issue the command `su -`.

Display settings for a normal root login are automatic. For a real root login, you must set your display environment properly to successfully view the Installation wizard. Otherwise, you see a message about Preparing Java(tm) Virtual Machine..., and seven rows of dots, but no Installation wizard and no further messages. Refer to the documentation for your AIX platform to determine proper display settings.

- **Avoiding a DSAPI filter-loading error when the Lotus Domino Server starts.**

On a UNIX-based operating system, if you start the Lotus Domino Web server from a non-root user, you are likely to generate a DSAPI filter-loading error:

```
Error loading DSAPI filter.
```

```
Filter not loaded: /usr/WebSphere/AppServer/bin/libdomino5_http.a
```

Manually change the WebSphere Application Server bin directory permissions from 750 to 755 to run Lotus Domino Server as a non-root user and not generate the error. This change does, however, pose a security risk.

You must also change permissions on the WebSphere Application Server logs directory to 777 to let Lotus Domino Server write to the log.

If the Lotus Domino Server is started as root, the problem does not occur.

- **Avoiding a null pointer exception during the interactive installation of the IBM HTTP Server on AIX platforms.**

A null pointer exception is thrown during the interactive installation of IBM HTTP Server on AIX systems. When installing IBM HTTP Server as a standalone installation through the administrative console on the AIX platform, you can receive a null pointer Java error on the installation panels, when the installer begins to copy files to your machine.

This situation is caused by an unstable AIX Object Data Manager (ODM) registry.

To work around this problem:

1. Exit the installer.
2. Issue the `lslpp -l |grep IHS` command to check if there are remaining IBM HTTP Server registry entries that cannot exist.
3. If there are remaining IBM HTTP Server registry entries, do a silent installation of IBM HTTP Server by running the following command:

```
java -jar setup.jar -silent -P ihs.installLocation=<the desired install location>
```

**Note:** To remove the installation silently, add the `-silent` parameter to the regular **uninstall** command from the IBM HTTP Server installation location, for example:

```
java -jar _uninst/uninstall.jar -silent
```

- **Starting IBM HTTP Server 2.0.47 on AIX 5.2 systems.**

A potential IBM HTTP Server 2.0.47 startup failure exists on AIX 5.2 systems when a non-default AIX resolver configuration is used (for example, in `/etc/netsvc.conf`), and the IBM HTTP Server configuration file (for example, `httpd.conf`), uses `Listen` directives that do not specify an Internet Protocol address. The following example shows error messages issued by IBM HTTP Server:

```
[crit] (78) A remote host did not respond within the timeout period.:
      alloc_listener: failed to set up sockaddr for ::
Syntax error on line 130 of /usr/IBMIHS/conf/httpd.conf
Listen setup failed.
```

This error is caused by a defect in the AIX resolver library.

The defect is fixed by APAR IY40908 for AIX 5.2. The fix is shipped with AIX52B Gold and later.

Alternatively, you can take one of the following actions to solve the problem:

- Use the IPv4-specific `Listen` directive in the IBM HTTP Server configuration file, for example, `"Listen 0.0.0.0:80"`
- Do not override the default AIX resolver configuration.
- Change the following line in the `/etc/netsvc.conf` file from:

```
hosts = local = auth , bind
to
hosts = local = auth , bind , local
```

- **Using the AIX 5.1 and 5.2 Fast Response Cache Accelerator feature with IBM HTTP Server 2.0.47.**

IBM HTTP Server 2.0.47 supports the AIX 5.1 and 5.2 Fast Response Cache Architecture (FRCA) feature through the `mod_afpa_cache.so` plug-in module. However, you must install the interim fix IY49388 for AIX 5.2. IBM HTTP Server 1.3.28 does not support the AIX FRCA feature.

## HP-UX platforms

### Summary of tips that apply to HP-UX platforms

- Providing adequate disk space for installation
- Installing required patches for correct character display of the installation panel on Asian language platforms
- Ignoring a prerequisite checker error for a patch when a superset of the patch has been installed.
- **5.1+** Uninstalling a V5.1 instance on HP-UX platforms before reinstalling the instance
- Mounting the product CD-ROM
- Configuring HP-UX kernel settings before installing WebSphere Application Server
- Migrating or coexisting with an existing WebSphere Application Server node that HP-UX does not recognize
- Avoiding using Netscape 4.79 on HP-UX 11 in Japanese, to avoid problems in viewing the administrative console
- Configuring the `converter.properties` file to use EUC-JP (Japanese) encoding on HP-UX

- Using certificate revocation lists (CRLs) with IBM HTTP Server on HP-UX and Linux for S/390 platforms is not supported at this time
- Ignoring certain error messages when installing WebSphere Application Server with embedded messaging from the CD-ROM

### Tips that apply to HP-UX platforms

- **Providing adequate disk space for HP-UX platforms.**

Table 43. Installed sizes of installation directories for HP-UX platforms

|  | Base product                     | Network Deployment                           | IBM HTTP Server          | Tivoli Global Security Kit | Temp space      |
|--|----------------------------------|--|--------------------------|----------------------------|-----------------|
| <b>Installation directory</b>              | /opt/<br>WebSphere/<br>AppServer | /opt/<br>WebSphere/<br>Deployment<br>Manager | /opt/ IBM Http<br>Server | /opt/ ibm/ gsk7            | /tmp            |
| <b>Minimum free space for installation</b> | 539 MB                           | 539 MB                                       | 18.6 MB                  | 15.9 MB                    | At least 100 MB |

Space requirements for the embedded messaging feature are described in the Installing WebSphere embedded messaging as the JMS provider topic.

- **Installing required patches for correct character display of the installation panel on Asian language platforms.**

The installation panel displays garbled characters on Asian language platforms, including Korean, traditional Chinese, Japanese, and simplified Chinese, for the HP-UX 11i operating system.

Verify that the following patches are installed on your HP-UX 11i machine:

| Name  | Description   |
|---|---|
| B6848BA                                       | Ximian GNOME 1.4 GTK+ Libraries for HP-UX 11.00 and 11i     |
| BUNDLE11i                                     | Required Patch Bundle for HP-UX 11i, February 2001 or later |
| PHSS_26974 (for 11.0) or PHSS_26973 (for 11i) | Korean TrueType fonts                                       |
| PHSS_24937 (for 11.0) or PHSS_26977 (for 11i) | Traditional Chinese TrueType fonts                          |
| PHSS_26972(for 11.0) or PHSS_26971 (for 11i)  | Japanese TrueType fonts                                     |
| PHSS_26976(for 11.0) or PHSS_24975 (for 11i)  | Simplified Chinese TrueType fonts                           |
| PHSS_25091(for 11.0) or PHSS_25092 (for 11i)  | Common TrueType fonts                                       |

You can find these patches at the following URL:

<http://www.hp.com/products1/unix/java/infolibrary/patches.html#1>.

- **Ignoring a prerequisite checker error for a patch when a superset of the patch has been installed.**

If you apply a superset patch that includes a specific patch that the prerequisite checker program requires, you can ignore the message from the installer program and continue the installation. You can always continue the installation whenever you see an error message about a missing prerequisite. You can ignore the messages and continue the installation. Although the list of prerequisite patches that the installer program checks is extensive, the list does not include all of the superset patches.

For example, the installer program checks for patch PHCO\_29109. The HP-UX Web site recommends that you install a superset patch, PHCO\_29960, instead of PHCO\_29109. After installing the patch and



rebooting the machine, reinstalling the base WebSphere Application Server results in the same message about the missing PHCO\_29109 prerequisite. You can ignore the error because you know that you have installed a supersets patch.

- **5.1+ Uninstalling a V5.1 instance on HP-UX platforms before reinstalling the instance.**

If you uninstall a V5.1 instance, but leave the embedded messaging feature installed because of other WebSphere Application Server instances on the machine, rename the /opt/WebSphere/AppServer51 directory so that HP-UX cannot locate the earlier installation that is still registered. Reinstall into a directory other than the /opt/WebSphere/AppServer51 directory or the renamed directory. Use a new directory name for reinstalling the V5.1 instance.

If you uninstall every WebSphere Application Server product on the machine and are now reinstalling, follow the procedure in “Manually uninstalling on HP-UX platforms” on page 312 instead.

For example, assume that V5.0.2 exists in the /opt/WebSphere/AppServer502 directory with the embedded messaging server and client feature. You then install V5.1 to the /opt/WebSphere/AppServer51 directory, but later you uninstall the product with the **uninstall** command and select to leave the embedded messaging feature installed. And now you decide to reinstall V5.1.

Rename the /opt/WebSphere/AppServer51 directory to the /opt/WebSphere/AppServer51\_bk directory before reinstalling V5.1 into the /opt/WebSphere/AppServer51New directory.

This step is required before you can reinstall the product onto the same system. To correct the registry entries and uninstall all of the WebSphere Application Server products on the machine, follow the procedure in “Manually uninstalling on HP-UX platforms” on page 312 instead.

- **Configuring HP-UX kernel settings before installing.**

To set kernel parameters, perform the following steps:

1. Log into the host machine with superuser (root) privileges.
2. Determine the physical memory to avoid setting certain kernel parameters above the physical capacity:
  - a. Start the HP-UX System Administration Manager (SAM) utility.
  - b. Click **Performance Monitors > System Properties > Memory**.
  - c. Note the value for Physical Memory and click **OK**.
  - d. Exit from the SAM utility.
3. Set the maxfiles and maxfiles\_lim parameters to at least 4096. (The following table recommends 8000 and 8196, respectively. You must first edit the /usr/conf/master.d/core-hpux file, to allow the SAM utility to set values greater than 2048:
  - a. Open the file /usr/conf/master.d/core-hpux in a text editor.
  - b. Change the line, \*range maxfiles<=2048 to \*range maxfiles<=60000
  - c. Change the line, \*range maxfiles\_lim<=2048 to \*range maxfiles\_lim<=60000
  - d. Save and close the file. Old values might be stored in the /var/sam/boot.config file. Force the SAM utility to create a new boot.config file:
    - 1) Move the existing version of the /var/sam/boot.config file to another location, such as the /tmp directory.
    - 2) Start the SAM utility.
    - 3) Click **Kernel Configuration > Configurable Parameters**. When the Kernel Configuration window opens, a new boot.config file exists.  
Alternatively, rebuild the boot.config file with the following command:

```
# /usr/sam/lbin/getkinfo -b
```
4. Set new kernel parameter values:
  - a. Start the SAM utility.
  - b. Click **Kernel Configuration > Configurable Parameters**.
  - c. For each of the parameters in the following table, perform this procedure:
    - 1) Highlight the parameter to change.
    - 2) Click **Actions > Modify Configurable Parameter**.
    - 3) Type the new value in the **Formula/Value** field.
    - 4) Click **OK**.

Some kernel values for WebSphere Application Server with the embedded messaging feature are higher than those shown in the following table. See the Installing WebSphere embedded messaging as the JMS provider topic for more information.

Some kernel values for WebSphere Application Server IBM DB2 on the same machine, are higher than those shown in the following table.

- Recommended HP-UX kernel configuration parameters for DB2 Version 8
- Recommended HP-UX kernel configuration parameters for DB2 V7

Typical kernel settings for running WebSphere Application Server appear in the following table:

| Parameter       | Value   |
|-----------------|---|
| dbc_max_pct     | 25  |
| maxdsiz         | 805306358   |
| maxdsiz         | 2048000000 (when the base and Network Deployment products are on one machine) |
| maxfiles_lim    | 8196 (Change this setting before changing the maxfiles setting.)              |
| maxfiles        | 8000  |
| maxssiz         | 8388608   |
| maxswapchunks   | 8192  |
| max_thread_proc | 3000  |
| maxuprc         | 512   |
| maxusers        | 512   |
| msgmap          | 2048  |
| msgmax          | 65535   |
| msgmax          | 131070 (when the base and Network Deployment products are on one machine)     |
| msgmnb          | 65535   |
| msgmnb          | 131070 (when the base and Network Deployment products are on one machine)     |
| msgmni          | 50  |
| msgseg          | 32767   |
| msgssz          | 32  |
| msgtql          | 2046  |
| nfile           | 58145   |
| nflocks         | 3000  |
| ninode          | 60000   |
| nkthread        | 7219  |
| nproc           | 4116  |
| npty            | 2024  |
| nstrpty         | 1024  |
| nstrtel         | 60  |
| sema            | 1 (with embedded messaging)   |
| semaem          | 16384 (with embedded messaging)   |
| semmap          | 514   |
| semmni          | 2048  |
| semmns          | 16384 (with embedded messaging)   |

| Parameter | Value                           |
|-----------|---------------------------------|
| semmnu    | 1024                            |
| semume    | 200                             |
| semvmx    | 32767 (with embedded messaging) |
| shmmax    | 2147483647                      |
| shmem     | 1 (with embedded messaging)     |
| shmmni    | 1024                            |
| shmseg    | 1024                            |
| STRMSGSZ  | 65535                           |

5. click **Actions > Process New Kernel**.

6. Click **Yes** on the information window to confirm your decision to restart the machine.

Follow on-screen instructions to restart your machine and to enable the new settings.

7. If you plan to redirect displays to non-HP machines, do the following steps before running the WebSphere Application Server Installation wizard:

a. Issue the following command to obtain information on all of the public locales accessible to your application:

```
# locale -a
```

b. Choose a value for your system from the output that is displayed and set the LANG environment variable to this value. Here is an example command that sets the value of LANG to en\_US.iso88591

```
# export LANG=en_US.iso8859
```

- **Migrating or coexisting with an existing WebSphere Application Server node that HP-UX does not recognize.**

In some cases, the InstallShield for MultiPlatforms (ISMP) program does not detect a previously installed version of WebSphere Application Serve because of a failure to read the registry keys on HP-UX.

You can force the Migration panel or the Coexistence panel to display, by starting the installation with an option on the **Install.exe** or **install** command. For example, use this command:

```
./install -W previousVersionDetectedBean.previousVersionDetected="true"
```

You can also force the display of the Coexistence panel to change conflicting port number assignments. For example, force the Coexistence panel to display using this command:

```
./install -W coexistenceOptionsBean.showCoexistence="true"
```

On either panel, identify the location of the existing product instance that is not being recognized.

- **Avoiding using Netscape 4.79 on HP-UX 11 in Japanese, to avoid problems in viewing the administrative console.**

It is possible that you cannot view the menu or areas of the console that scroll. Only certain portions of the administrative console are visible. You cannot scale the administrative console.

The workaround for the problem is to use another supported browser or another browser and operating system platform. You can also open the menu frame in a separate window, to avoid the problem.

- **Configuring the converter.properties file to use EUC-JP (Japanese) encoding on HP-UX.**

The *install\_root/java/jre/lib/i18n.jar* file on HP-UX platforms does not have the coverters for Cp33722C, but does have the converter for Cp33722. To use EUC-JP encoding on HP-UX platforms, change the EUC-JP=Cp33722C entry in the *converter.properties* file to EUC-JP=Cp33722 or EUC-JP=EUC\_JP.

- **Using certificate revocation lists (CRLs) with IBM HTTP Server on HP-UX and Linux for S/390 platforms is not supported at this time.**

Certificate revocation lists are not supported for IBM HTTP Server on HP-UX and Linux for S/390 platforms.

- **Ignoring certain error messages when installing WebSphere Application Server with embedded messaging from the CD-ROM.**

The following warning messages are issued despite successful installation. You might see the following messages in the `mq_install.log` file when installing WebSphere Application Server with embedded messaging from the CD-ROM:

```
MQSERIES.MQM-CL-HPUX: A test command parameter is not valid." and "*
"hostname:/cdrom/hpux/messaging/images": Cannot open the
  logfile on this target or source. Possibly the media is
  read-only or there is a permission problem."
```

You can ignore the warning messages. The problem does not affect the successful installation of WebSphere Application Server with embedded messaging.

## Linux platforms

### Summary of tips that apply to Linux platforms

- Providing adequate disk space for installation
- **5.1 +** Providing prerequisites for Red Hat Enterprise Linux V3.0
- **5.1 +** Upgrading Red Hat Enterprise Linux V3.0 to service level 1 (update 1)
- Preparing Linux for S/390 for better performance
- Changing the locale encoding to English to install WebSphere Application Server on SuSE SLES 8.0 for PowerPC platforms
- Japanese not recommended on Red Hat Enterprise Linux (RHEL) Advanced Server Version 2.1
- **5.1 +** Ignoring YAST2 dependency conflicts for embedded messaging packages
- Preparing the SuSE Linux Enterprise Server 8.0 - Powered by UnitedLinux 1.0 platform for WebSphere Application Server installation
- Configuring Apache 1.3 to run on SuSE Linux Enterprise Server 8.0
- Correct font problems on SuSE Linux Enterprise Server 8.0 in Simplified Chinese and Traditional Chinese locales
- Avoiding the certificate revocation list (CRL) function, which is not supported for IBM HTTP Server on Linux for S/390
- Using the `ikeycmd` command line interface for `ikeyman` from IBM HTTP Server on Linux for S/390
- Avoiding utility hangs
- Using the GNOME desktop on Red Hat Linux Advanced Server V2.1 in the Korean locale
- Upgrading Red Hat Enterprise Linux V3.0 to service level 1 (update 1)
- Changing the Chinese locale on a Red Hat Enterprise Linux 3.0 platform from `zh_CN.gb18030` to `zh_CN.gbk`
- Accessing First Steps items on Linux for S/390 systems
- Using certificate revocation lists (CRLs) with IBM HTTP Server HP-UX and Linux for S/390 platforms is not supported at this time
- Editing the `keyman` script to bring up `IKEYMAN` for IBM HTTP Server 1.3.28 shipped with WebSphere Application Server
- Ignoring messages from the prerequisites checker when your operating system is at the level specified by the WebSphere Application Server supported hardware, software, and APIs Web site
- Using the LinuxThreads threading mode instead of the Native POSIX Threading Library (NPTL)
- Avoiding an error that occurs when starting the Launchpad program for WebSphere Application Server clients, Version 5.1 using the `Konqueror` file in the K Desktop Environment on SuSE Linux Enterprise Server (SLES)
- Avoiding a segmentation fault on RHEL V3.0 Update 1

### Tips that apply to Linux platforms

- **Providing adequate disk space on Linux platforms.**

Table 44. Installed sizes of installation directories for Linux platforms

|  | Base product               | Network Deployment                  | IBM HTTP Server      | Embedded messaging        | Tivoli Global Security Kit | Temp space      |
|--|----------------------------|-------------------------------------|----------------------|---------------------------|----------------------------|-----------------|
| <b>Installation directory</b>                                | /opt/ WebSphere/ AppServer | /opt/ WebSphere/ Deployment Manager | /opt/ IBM Http Sever | /opt/ wemps and /opt/ mqm | /opt/ ibm/ gsk7            | /tmp            |
| <b>Minimum free space for Linux for xSeries installation</b> | 470 MB                     | 390 MB                              | 20.4 MB on base      | 6 MB; 60 MB on base       | 11.8 MB                    | At least 150 MB |
| <b>Minimum free space for Linux for S/390 installation</b>   | 470 MB                     | 390 MB                              | 20.4 MB on base      | 6 MB; 60 MB on base       | 13.2 MB                    | At least 150 MB |

Space requirements for the embedded messaging feature are described in Installing WebSphere embedded messaging as the JMS provider.

- **5.1+ Providing prerequisites for Red Hat Enterprise Linux V3.0**

A known limitation in the prerequisites checker program prevents correctly examining prerequisite packages on Linux platforms. If you plan to install WebSphere Application Server Version 5.1.x products on a Red Hat Enterprise Linux 3.0 system, install the following prerequisite packages on the RHEL 3.0 system.

You must install the following packages on Red Hat Enterprise Linux V3.0 for xSeries platforms:

- compat-gcc-7.3-2.96.122
- compat-libstdc++-7.3-2.96.122
- compat-libstdc++-devel-7.3-2.96.122
- compat-glibc-7.x-2.2.4.32.5
- compat-gcc-c++-7.3-2.96.122
- compat-db-4.0.14-5
- rpm-build-4.2.1-4.2

The following package is required for Red Hat Enterprise Linux V3.0 for pSeries platforms:  
rpm-build-4.2.1-4.2.

You must install the following packages on Red Hat Enterprise Linux V3.0 for S/390 (z/OS and S/390 in 31-bit mode) platforms:

- compat-db-4.0.14-5
- compat-pwdb-0.62-3
- compat-libstdc++-7.2-2.95.3.77
- rpm-build-4.2.1-4.2

You can install a later release of any of these packages.

- **5.1+ Upgrading Red Hat Enterprise Linux V3.0 to service level 1 (update 1).**

Upgrade RHEL 3.0 to service level 1 by downloading and installing the service updates from Red Hat.

If you do not upgrade to service level 1, certain national language issues in the released version of GLIBC included in Red Hat Enterprise Linux V3 might cause Java virtual machine (JVM) failures due to segmentation faults. These failures can occur during installation when the locale is set to anything other than an English locale.

The prerequisites checker program for the base V5.1.0.0 product does not recognize Red Hat Enterprise Linux 3.0 as a supported operating system. If you receive a message from the prerequisites

checker program that RHEL 3.0 is an unsupported operating system, ignore the message and continue the installation if you installed all prerequisite packages from the previous step and downloaded and installed the service level 1 update.

- **Preparing Linux for S/390 for better performance**

Linux for S/390 (which refers to the Linux distributions available from Linux distributors that run on IBM eServer zSeries and S/390 systems in 31-bit mode) provides a configuration technique that affects the installation and run time performance of WebSphere Application Server. The technique configures the environment where the Linux image runs to use swap space efficiently. Some performance guidelines recommend running Linux with the VM/ESA or z/VM swap turned off because of VM/ESA or z/VM virtualization of hardware. Virtualization can produce double-swapping situations where VM/ESA or z/VM swaps storage and Linux also swaps storage, which degrades performance.

Excessive swapping affects the performance of WebSphere Application Server, which might require 200 MB when all of the Sample applications are loaded. On a system without swap space configured for use, and with a relatively small amount of memory (such as 256 MB), WebSphere Application Server might encounter problems obtaining enough free memory to work properly, particularly when competing for resources against other applications and products that run in the Linux environment.

The solution is to disable swapping in Linux, but to enable swapping in VM/ESA or z/VM. You can increase performance by letting VM/ESA or z/VM handle the swapping. Double or triple the specification for physical memory for the Linux image. For example, if the physical memory allocation as seen by the Linux image is 256 MB, disable swap in Linux, enable swap in VM/ESA or z/VM, and increase the physical memory specification as seen by Linux to 512 MB or 768 MB. This amount of memory handles any large spikes in application memory usage that might occur.

You can fine tune the amount of physical memory to allocate to each Linux guest operating system. Size the JVM heap size for the application running in the Application Server, add 90 MB to that amount for the Application Server, 20 MB for Linux, and another 10-20% to handle peak usage. This measurement provides better memory management from a VM/ESA or z/VM perspective.

Avoid socket timeout exceptions (SocketTimeoutExceptions) when running WebSphere Business Integration Server Foundation on a Network Deployment node on a Linux for S/390 guest operating system on z/VM or VM/ESA. The exceptions are an indicator that too many processes are running and that the Linux system is being overloaded. If the deployment manager is under a heavy load, 1 GB of memory is required. In addition, move all base nodes to other Linux for S/390 guests to allow the deployment manager to run by itself on the Linux for S/390 system.

See the Linux on IBM eserver zSeries and S/390: ISP/ASP Solutions IBM Redbook and the Performance Analysis for Java Web sites book for more information.

- **Changing the locale encoding to English to install WebSphere Application Server on SuSE 8.0 SLES for PowerPC platforms.**

The WebSphere Application Server installation program is corrupted when you start the installation on SuSE Linux Enterprise Server (SLES) 8.0 for a PowerPC platform in a double-byte character set (DBCS) language. The double-byte character set languages display the characters incorrectly. The single-byte character set (SBCS) languages display the characters correctly.

The reason for this problem is either missing fonts on the system, incorrectly called fonts, or incorrectly displayed fonts.

Change the locale encoding to English to properly install WebSphere Application Server on SuSE SLES 8.0 for PowerPC platforms. To change the locale, open a terminal or window and complete the following steps:

1. Type `export LC_ALL=C` and press **Enter**.
2. Type `export LANG=C` and press **Enter**.
3. To verify that the locale is properly set to English, type `locale` to see that all variables are set to C.

- **Japanese not recommended on Red Hat Enterprise Linux (RHEL) Advanced Server Version 2.1.**

The Red Hat Advanced Server Version 2.1 GUI language selection menu displays two selections for Japanese:

- Japanese (eucJP)



– Japanese (SJIS)

Click **Japanese (eucJP)** to install and run the IBM WebSphere Application Server in a Japanese environment. Do not use Japanese (SJIS).

See the Red Hat Japanese Web site at <http://www.jp.redhat.com/support/7.2/sla/rh72faq.html> for more information.

- **5.1+ Ignoring YAST2 dependency conflicts for embedded messaging packages**

The YAST2 utility on SuSE Linux Enterprise Server 8.0 has a known problem reporting dependency conflicts. If you use the utility, you can ignore the Dependency conflict panel that reports conflicting packages for the embedded messaging feature. Two examples from such a report might appear like this:

```
MQSeriesClient
MQSeriesClient-U486878
```

```
MQSeriesJava
MQSeriesJava-U486878
```

Many packages, such as the embedded messaging packages in the WebSphere Application Server products, specify a conflict to control incompatible package levels. In this case, the conflict identifies a WebSphere MQ-related package level that is less than 5.3.0. YAST2 seems to be misinterpreting the specification and flagging a conflict for WebSphere MQ packages that are less than *or equal to* 5.3.0.

- **Preparing the SuSE Linux Enterprise Server 8.0 - Powered by UnitedLinux 1.0 operating platform for WebSphere Application Server installation.**

1. Install SP2 for the UnitedLinux 1.0 operating platform to let you use the WebSphere Application Server LaunchPad.

It is your responsibility to install this service pack. No definitive way is available for the `prereqChecker` function of the installer to detect service pack versions on UnitedLinux. Kernel `uname`/versions between 8.0 and 8.0.2 are identical. `signature RPM` exists for denoting a service pack installation.

2. Use the IBM Developer Kit that WebSphere Application Server provides to support the Java 2 SDK on the SuSE SLES 8.0 operating system to avoid potential problems when uninstalling an interim fix or a fix pack. To use the IBM Developer Kit, remove the `java2-jre-1.3.1-524` and `java2-1.3.1-524` RPMs from the machine before installing WebSphere Application Server.

- **Configuring Apache 1.3 to run on SuSE Linux Enterprise Server 8.0.**

Using the following directive in an otherwise unmodified `httpd.conf` file can result in an error:

```
LoadModule app_server_http_module /opt/WebSphere/AppServer/bin/mod_app_server_http.so
```

The error is indicated by a message similar to the following example:

```
[warn] Loaded DSO /opt/WebSphere/AppServer/bin/mod_app_server_http.so uses
plain Apache 1.3 API, this module might crash under EAPI!
(please recompile it with -DEAPI)
[notice] Apache/1.3.26 (Linux/SuSE) mod_python/2.7.8 Python/2.2.1
PHP/4.2.2 mod_perl/1.27 configured -- resuming normal operations
[notice] suEXEC mechanism enabled (wrapper: /usr/sbin/suexec)
[notice] Accept mutex: sysvsem (Default: sysvsem)
[notice] child pid 3383 exit signal Segmentation fault (11)
```

1. Edit the `/etc/sysconfig/apache` file and change the value of the following parameters from **yes** to **no** to remove PHP and Python from the Web server:

- `HTTPD_SEC_MOD_PYTHON`
- `HTTPD_SEC_MOD_PHP`

2. Run the `SuSEconfig` utility to enable your changes.

Do not attempt to use the EAPI module with the version of Apache 1.3 that ships with SuSE Linux Enterprise Server 8.0. An error in this version of Apache prevents using the EAPI module. Obtain an updated version of Apache 1.3 from SuSE, or download an updated version of Apache 1.3 from another source to use the EAPI plug-in module.

Edit the `/etc/sysconfig/apache` file if you download a new version, remove PHP and Python from the Web server, and run the SuSEconfig utility.

- **Correct font problems on SuSE Linux Enterprise Server 8.0 in Simplified Chinese and Traditional Chinese locales.**

On the Linux for Power platform that SuSE Linux Enterprise Server 8.0 provides, there is a font problem caused by a missing package. There is no `ttf-hanyi` package installed during the normal product installation of the SuSE 8.0 operating system. This causes the Installation wizard for WebSphere Application Server products to display garbled characters on the Simplified Chinese locale and the Traditional Chinese locale.

Copy the `ttf-hanyi-2021016-0.noarch.rpm` package on the SuSE 8.0 for i386 CD-ROM to the Power PC system. Install the package on the Power PC machine and reboot the machine to solve the problem.

- **Avoiding the certificate revocation list (CRL) function, which is not supported for IBM HTTP Server on Linux for S/390.**

Do not use the certificate revocation list (CRL) function on Linux for S/390 at this time.

- **Using the `ikeycmd` command line interface for `ikeyman` from IBM HTTP Server on Linux for S/390.**

You might see a Java core dump after running an `ikeyman` command function, such as creating the stash file. This error occurs on both RedHat and SuSE releases as the result of a conflict in library routines caused by the default loading sequence.

To work around this problem, set the `LD_PRELOAD` environment variable before running the following command:

```
LD_PRELOAD=/usr/lib/libstdc++-libc6.1-2.so.3
```

This command loads the library first when the application is started. Setting this environment variable is also necessary to support Secure Sockets Layer (SSL) on Linux for S/390.

- **Migrating from WebSphere Application Server, Version 3.5 on Linux platforms.**

The error can occur when the migration tools cannot find the `JAVA_HOME`. The **WASPreUpgrade** command reports the error while backing up the WebSphere Application Server V3.5 environment. The error appears in the `WASPreUpgrade` log as:

```
MIGR0257E:Environment variable JAVA_HOME was not set is generated
```

To work around the problem:

1. Create a directory link to one of the following directories:

- `$WAS_HOME/IBMJavaLink`
- `/opt/IBMJava2-122`
- `$WAS_HOME/IBMJava2-122`

`WAS_HOME` is the WebSphere Application Server 3.5 `WAS_HOME`.

2. Run the **WASPreUpgrade** command again, followed by the **WASPostUpgrade** command, to migrate the environment correctly to WebSphere Application Server, Version 5.

- **Avoiding utility hangs.**

The default Red Hat installation creates an association between the host name of the machine and the loopback address, 127.0.0.1. In addition, the `/etc/nsswitch.conf` file is set up to use the `/etc/hosts` file before trying to look up the server using a name server (DNS). This loopback processing can hang utilities that start and stop a server, such as `startServer.sh` and others, even though the server might successfully start or stop.

Ensure that the host name is defined properly. The default configuration has `localhost` defined in the `/etc/hosts` file. The default `/etc/nsswitch.conf` file looks only at the host file and not the DNS server.

To correct this problem, remove the 127.0.0.1 mapping to `localhost` in the `/etc/hosts` file or edit the name service configuration (`/etc/nsswitch.conf`) file to resolve the proper host name by using the name server.

For example, remove the 127.0.0.1 mapping from the `/etc/hosts` file, which might look like this example:

|              |                     |          |
|--------------|---------------------|----------|
| # IP Address | name of machine     |          |
| n.n.n.n      | hostname.domain.com | hostname |
| 127.0.0.1    | localhost           |          |

Otherwise, change the `etc/nsswitch.conf` file to search DNS before searching the hosts file.

For example, `hosts : dns files`

- **Using the GNOME desktop on Red Hat Linux Advanced Server V2.1 for i386 Update3 in the Korean locale.**

You cannot start the deployment manager on a Network Deployment system when Korean characters are in the cell name. This is true in the Korean locale when running the KDE desktop on a Red Hat Linux Advanced Server V2.1 for i386 Update3 system.

This problem is caused by the default system desktop being set to "KDE", which means that file `/etc/sysconfig/desktop` has the value `desktop="KDE"`.

Run the following command on your RedHat 2.1 system to change the default system desktop to GNOME:

```
#echo "DESKTOP=\"GNOME\"" >/etc/sysconfig/desktop
```

Restart your system to solve the problem.

- **Upgrading Red Hat Enterprise Linux V3.0 to service level 1 (update 1).**

Upgrade RHEL 3.0 to service level 1 by downloading and installing the service updates from Red Hat.

If you do not upgrade to service level 1, certain national language issues in the released version of GLIBC included in Red Hat Enterprise Linux V3 might cause Java virtual machine (JVM) failures due to segmentation faults. These failures can occur during installation when the locale is set to anything other than an English locale.

- **Changing the Chinese locale on a Red Hat Enterprise Linux 3.0 platform from zh\_CN.gb18030 to zh\_CN.gbk.**

A known problem with RHEL V3 before installing service level 1 (update 1) is that one of the Chinese locales and its codepage, `zh_CN.gb18030`, causes the Installation wizard to render several input fields uneditable. Change the locale and its codepage to `zh_CN.gbk` to allow the Installation wizard to work correctly.

- **Accessing First Steps items on Linux for S/390 systems.**

When you select the following features from the First Steps panel, the Web browser window does not open:

- WebSphere information center
- Register the Product
- Samples Gallery
- Administrative Console

To access these features:

1. Open a Web browser window on another machine.
2. Type the browser Web address that displays in the First Steps status window into the address field of the Web browser.
3. Press **Enter** to open the page in the Web browser.

- **Editing the keyman script to bring up IKEYMAN for IBM HTTP Server 1.3.28 shipped with WebSphere Application Server**

Editing the `keyman` script to bring up IKEYMAN for the IBM HTTP Server 1.3.28 shipped with WebSphere Application Server

You cannot bring up IKEYMAN by typing the `keyman` script under the `IHS_HOME/bin` directory for IBM HTTP Server 1.3.28 shipped with WebSphere Application Server, Version 5.1 on the Linux PowerPC 64 bit platform. The following error is thrown:

```
Line 139: /usr/local/ibm/gsk7_gcc295/bin/gsk7ibm_gcc295: No such file or directory
```

To work around this problem, perform the following steps:

1. Use WebSphere Application Server IKEYMAN to create the CMS keystore. You can invoke the WebSphere Application Server IKEYMAN from the `WAS_HOME/bin` directory.

2. Edit the IBM HTTP Server `keyman` script: remove 2 references of "gcc295" from next to the last line.

- **Ignoring messages from the prerequisites checker when your operating system is at the level specified by the WebSphere Application Server supported hardware, software, and APIs Web site.**

The installation prerequisites checker checks for prerequisites that might have changed since the release of the product CD.

The prerequisites checker for the installation program is fixed at the time the product CDs are created. It is possible that more operating system patches are required since the time the product CDs were created. It is also possible that new versions of operating systems are supported even though the prerequisites checker identifies the new operating system level as unsupported.

Always consult the IBM WebSphere Application Server supported hardware, software, and APIs Web site to determine whether your operating system is supported when you receive a message from the prerequisites checker program during installation.

The Web site lists all supported operating systems and the operating system fixes and patches that you must install to have a compliant operating system. After confirming that your operating system is supported and that you have installed all the necessary patches, you can click **Next** to continue an installation when you receive an error message from the `prereqChecker` program.

- **Using the LinuxThreads threading mode instead of the Native POSIX Threading Library (NPTL).**

WebSphere Application Server, Version 5.1.0 products run under the LinuxThreads threading mode because of program dependencies on specific behavior within the LinuxThreads mode. The WAS 5.1.0 run time automatically sets up LinuxThreads mode for you. Do not try to force the NPTL mode because errors are thrown by the run time when the WebSphere embedded messaging broker and queue servers are started.

If you set `LD_ASSUME_KERNEL=2.4.19` or `LD_ASSUME_KERNEL=2.2.5` to switch to LinuxThreads outside the context of WebSphere Application Server, it is recommended that you also set the `RPM_FORCE_NPTL=1` environment variable.

Unusual behavior occurs with Red Hat Package Manager (RPM) when running under LinuxThreads on Red Hat Enterprise Linux, Version 3.0. Corruption of the RPM database can occur. Setting the environment variable forces the RPM program to always run under NPTL threading and protects the RPM database from corruption.

Set the value in the environment using the following command:

```
export RPM_FORCE_NPTL=1
```

- **Avoiding an error that occurs when starting the Launchpad program for WebSphere Application Server clients, Version 5.1 using the Konqueror file in the K Desktop Environment on SuSE Linux Enterprise Server (SLES).**

When starting the Launchpad program for WebSphere Application Server clients, Version 5.1 using the Konqueror file manager in the K Desktop Environment (KDE) on Linux systems, a "Couldn't find the program `launchpad.sh`" error occurs.

Because the `launchpad.sh` command uses a relative path to locate the Java program, you should run the `launchpad.sh` command from the directory where the `launchpad.sh` command is located for the client program. When using the Konqueror file manager to issue the `launchpad.sh` command, the current directory is your home directory. Therefore, the `launchpad.sh` command cannot work.

Do not use the Konqueror file manager to issue the `launchpad.sh` command for the client. Open a Konsole session in the KDE, change the current directory to where the `launchpad.sh` command is located, and run the `launchpad.sh` command.

- **Avoiding a segmentation fault on RHEL V3.0 Update 1.**

An "A suitable JVM could not be found" message is displayed when installing WebSphere Business Integration Server Foundation on Red Hat Enterprise Linux 3 U1.

When installing from an operator console attached to the server (not telnet), the "A suitable JVM could not be found" message displays and the installation fails with a segmentation fault.

You might have previously installed, logged off, logged back on, and are running the installation again on the operator console attached to the server.

This is a known limitation of Red Hat Enterprise Linux V3.0 that causes a segmentation fault when calling the JVM.

Test if the JVM is failing by running the following command:

```
/mnt/cdrom/platform/linuxi386/jdk/java/jre/bin/java -version
```

If you receive a "Segmentation Fault" message, reboot your machine or press **Ctrl-X** to reinstall. Rebooting the machine resolves the problem.

## Solaris Operating Environment

### Summary of tips that apply to Solaris platforms

- Providing adequate space for Solaris platforms
- **5.1+** Uninstalling a V5.1 instance on a Solaris platform before reinstalling the instance
- Using the **unzip** function, not the **jar** command, to decompress downloaded files
- Closing the terminal window that remains open after the installation finishes
- Configuring the `converter.properties` file to use EUC-JP (Japanese) encoding
- Configuring the Domino Server plug-in
- Avoiding problems starting application servers in zh\_TW.EUC locale on Solaris
- Using the correct mount point for the product CD

### Tips that apply to Solaris platforms

- **Providing adequate disk space for Solaris platforms.**

Table 45. Installed sizes of installation directories for Solaris platforms

|  | Base product                     | Network Deployment                           | IBM HTTP Server          | Embedded messaging            | Tivoli Global Security Kit                 | Temp space         |
|--|----------------------------------|--|--------------------------|-------------------------------|--|--------------------|
| <b>Installation directory</b>              | /opt/<br>WebSphere/<br>AppServer | /opt/<br>WebSphere/<br>Deployment<br>Manager | /opt/ IBM<br>Http Server | /var/ mqm<br>and /opt/<br>mqm | /opt/ ibm/<br>gsk7                         | /tmp               |
| <b>Minimum free space for installation</b> | 530 MB                           | 460 MB                                       | 20 MB                    | 4 MB; 40 MB<br>on base        | 23.1 MB<br>(GSKit 7); 23.1<br>MB (GSKit 5) | At least 150<br>MB |

Space requirements for the embedded messaging feature are described in Installing WebSphere embedded messaging as the JMS provider.

- **5.1+ Uninstalling a V5.1 instance on a Solaris platform before reinstalling the instance.**

If you uninstall a V5.1 instance but leave the embedded messaging feature because of other WebSphere Application Server instances, clean up the `/var/sadm/pkg` directory before reinstalling V5.1.

If you uninstall all of the WebSphere Application Server products on the machine and are now reinstalling, follow the procedure in "Manually uninstalling on Solaris platforms" on page 318 instead of this procedure.

You must perform this procedure before you can reinstall the product into the same installation root directory on Solaris platforms. Otherwise, you must reinstall the product into another directory and you might have a problem reinstalling the embedded messaging feature.

Assume that V5.0.x exists in `/opt/WebSphere/AppServer50` with the embedded messaging server and client feature. You then install V5.1 to the following directory, `/opt/WebSphere/AppServer51`, but later you uninstall the product and leave the embedded messaging feature installed. And now you decide to reinstall V5.1.

1. Make the `/var/backupForWAS51Reinstall` backup directory.

2. Change directories to `/var/sadm/pkg`, and type `ls -lt | grep WSBA51` to find packages that contain the base WebSphere Application Server.
3. If the `WSBA51` directory exists, change directories to the `WSBA51` directory and read the `pkginfo` file in the `/var/sadm/pkg/WSBA51` directory.

Find the installation location for V5.1. If the location is the same installation location as the V5.1 product that you uninstalled, move the `/var/sadm/pkg/WSBA51` folder to the `/var/backupForWAS51Reinstall` directory.

The following example shows how to display the `pkginfo` file:

```
# pwd
/var/sadm/pkg/WSBA51
# ls -lt
total 6
-rw-r--r--  1 root    other      591 Oct 27 15:46 pkginfo
drwxr-xr-x  2 root    other      512 Oct 27 15:46 install
drwxr-xr-x  2 root    other      512 Oct 27 15:46 save
# cat pkginfo
# VPD created by InstallShield MultiPlatform Edition
# Mon Oct 27 15:46:34 EST 2003
ARCH=sparc
BASEDIR=/opt/WebSphere/AppServer51
CATEGORY=application
CLASSES=none
DESC=
ISJE_INSTALL_STATUS=3
ISJE_IS_ACTIVE=true
ISJE_IS_PUBLICLY_SHAREABLE=false
ISJE_NAME=IBM WebSphere Application Server
ISJE_PARENTS=WSBA51:5.1.0.0.DSP=:1
ISJE_PRODUCT_NUMBER=5.1.0.0
ISJE_REQUIRED_COUNT=0
ISJE_SOURCES=
ISJE_UID=WSBA51
ISJE_UNINSTALLER="_uninst" "uninstall.jar" "uninstall.dat" ""
ISJE_VPD_VERSION=4.5
ISJE_WEB=
NAME=WebSphere Application Server
PKG=WSBA51
PKGINST=WSBA51
VENDOR=
VERSION=5.1.0.0.DSP=
```

When two instances of V5.1 WebSphere Application Server exist, such as with one instance installed and one instance uninstalled, for example, two files exist in the `/var/sadm/pkg` directory. One is the `/var/sadm/pkg/WSBA51` file, the other is the `/var/sadm/pkg/WSBA51.2` file. For example:

```
# ls -lt | grep WSBA51
drwxr-xr-x  4 root    other      512 Oct 27 18:52 WSBA51.2
drwxr-xr-x  4 root    other      512 Oct 27 15:46 WSBA51
drwxr-xr-x  3 root    other      512 Oct 21 13:32 WSBA51
```

4. Verify that you are moving the correct file to the backup directory.  
Examine the `pkginfo` files. Do not touch entries for other WebSphere Application Server products that might be present on the platform, such as `WS` entries for existing WebSphere Application Server V5.0.x.
5. Run the `ls -lt | grep WSBM` command to get all of the embedded messaging packages.

For example:

```
#
# ls -lt | grep WSBM
drwxr-xr-x  4 root    other      512 Oct 27 18:52 WSBMQ1AA.2
drwxr-xr-x  4 root    other      512 Oct 27 18:52 WSBMQ2AA.2
drwxr-xr-x  4 root    other      512 Oct 27 18:52 WSBMS4AA.2
drwxr-xr-x  4 root    other      512 Oct 27 18:52 WSBMS6AA.2
drwxr-xr-x  4 root    other      512 Oct 27 18:52 WSBMQAA.2
```



```

drwxr-xr-x  4 root    other    512 Oct 27 15:46 WSBMS4AA
drwxr-xr-x  4 root    other    512 Oct 27 15:46 WSBMS6AA
drwxr-xr-x  4 root    other    512 Oct 27 15:46 WSBMQ1AA
drwxr-xr-x  4 root    other    512 Oct 27 15:46 WSBMQ2AA
drwxr-xr-x  4 root    other    512 Oct 27 15:46 WSBMQ3AA
drwxr-xr-x  4 root    other    512 Oct 27 15:46 WSBMQAA
drwxr-xr-x  4 root    other    512 Oct 27 15:46 WSBMSAA

```

- Identify entries that are related to the V5.1 product that you uninstalled.

Examine the `pkginfo` file for each entry. In the previous example, ".2" entries relate to the product that you uninstalled, which was originally in the `/opt/WebSphere/AppServer51` directory. Use a `mv` command to move all of the ".2" entries into the backup directory. For example, run the following command from the `/var/sadm/pkg/` directory:

```
mv WSBM*.2 /var/backupForWAS51Reinstall
```

For V5.1 of Network Deployment, all of the related embedded messaging entries start with `WSNM`. Run the following command to show the Network Deployment entries:

```
ls -lt | grep WSNM
```

- Rename `/opt/WebSphere/AppServer51` to `/opt/WebSphere/AppServer51_bk` before reinstalling V5.1.

- Using the `unzip` function, not the `jar` command, to uncompress downloaded files.**

To uncompress downloaded installation files for the Solaris operating system, use the **`unzip`** function and not the **`jar`** command. Using the **`jar`** function sets file permissions incorrectly, which causes the installation to fail.

- Closing the terminal window that remains open after the installation finishes.**

When installing WebSphere Application Server from the product CD onto a Solaris system, the ISMP Installation wizard launches a terminal window, which remains open after the installation is complete. This window contains the following text:

```

InstallShield Wizard
Initializing InstallShield Wizard...

Searching for Java(tm) Virtual Machine...
.....

```

Close the window after the installation completes.

- Configuring the `converter.properties` file to use EUC-JP (Japanese) encoding.**

The `install_root/java/jre/lib/i18n.jar` file on Solaris platforms does not have the converters for Cp33722C, but does have the converter for Cp33722. To use EUC-JP encoding on Solaris platforms, change the `EUC-JP=Cp33722C` entry in the `converter.properties` file to `EUC-JP=Cp33722` or `EUC-JP=EUC_JP`.

- Configuring the Domino Server plug-in.**

During installation, a `dsapi_stderr.txt` file is created in the `logs` directory and you can get the following error messages:

```

lotus.notes.NotesException: Could not load dll for system name SUNOS
    at lotus.notes.NotesThread.load(NotesThread.java:210)
    at lotus.notes.NotesThread.<clinit>(NotesThread.java:24)
java.lang.UnsatisfiedLinkError: NnotesInitThread
    at lotus.notes.NotesThread.NnotesInitThread(Native Method)
    at lotus.notes.NotesThread.initThread(NotesThread.java:99)
    at lotus.notes.NotesThread.run(NotesThread.java:133)

```

You can configure the IBM WebSphere Application Server or Domino Server plug-in manually using the Domino Server Web administration tool. The workarounds include:

- Start the Domino Server.
- Enter the Web address for the Domino Server Web Administration site using a browser. For example, `http://hostname/names.nsf`. Enter the administrator user name and password.
- Double-click **Server-Servers**.
- Double-click **WebServer** to configure.

5. Double-click **Edit Server**.
  6. Double-click **Internet Protocol**.
  7. Add the IBM WebSphere Application Server DSAPI plug-in to the **DSAPI** field. For example, `/opt/WebSphere/AppServer/bin/libdomino5_http.so`  
If DSAPI filter files are already specified, use a space to delimit the WebSphere Application Server plug-in file.
  8. Double-click **Save and Close**.
  9. Restart the Domino Server.
- **Avoiding problems starting application servers in the zh\_TW.EUC locale on Solaris platforms.**  
If you use the embedded JMS provider in WebSphere Application Server products or WebSphere MQ as the JMS provider on Solaris, do not set the LANG and LC\_ALL variables to zh\_TW.EUC (Traditional Chinese locale) to avoid problems when starting application servers. Set the LANG and LC\_ALL variables to zh\_TW instead of zh\_TW.EUC.
  - **Using the correct mount point for the product CD.**  
If the Solaris Volume Manager (vold) is running, Solaris automatically mounts the product CD as the `/cdrom/was_wbisf_sun_cd1` device.  
Do not run the **launchpad.sh** command or the **install** command from the automatically generated mount point. For example, do not run the `/cdrom/was_wbisf_sun_cd1/sun/install` command.
    1. Close the File explorer window that Solaris automatically opens so that you can define a correct mount point.
    2. Open a shell window and use the window throughout the installation.
    3. Verify that you are in a read/write directory and not the CD-ROM directory or another read-only directory before you start the installation.
    4. Start the installation using the mount point specification in the following command:  

```
# /cdrom/cdrom0/sun/launchpad.sh
```

## Windows platforms

### Summary of tips that apply to Windows platforms

- Providing adequate space for installation
- Providing the required `msvc60.dll` file for Windows 2000 Server
- Planning for the default installation path
- Viewing accurate migration messages
- Decompressing a WebSphere Application Server image that you download
- Editing or removing the `vpd.properties` file
- Preparing for Adaptive Fast Path Architecture (AFPA) driver availability when migrating from IBM HTTP Server Version 1.3.19.x, or earlier
- Rebooting the machine after uninstalling the embedded messaging feature
- Ignoring an incorrect `ImagePath` entry in the registry after changing the document root
- Avoiding a user ID with spaces when installing the WebSphere Application Server as a Windows service
- Changing the display settings from high-contrast black to high-contrast white to view panels with hypertext links
- Avoiding using the default service names created by the installer because they are common
- Uninstalling WebSphere Embedded Messaging Publish and Subscribe Edition on Windows 2003 Server
- Lowering the Internet Explorer security level from High to Medium to view the Product overviews from the Launchpad on Windows 2003 machines
- Expecting a delay before the Installation wizard displays its first panel

### Tips that apply to Windows platforms

- **Providing adequate disk space for installation.**

Table 46. Installed sizes of installation directories for Windows platforms

|                                       | Base product                         | Network Deployment product                    | IBM HTTP Server                  | Embedded messaging                 | Tivoli Global Security Kit | Temp space      |
|---------------------------------------|--------------------------------------|---|----------------------------------|------------------------------------|----------------------------|-----------------|
| <b>Installation directory</b>         | C:\Program Files\WebSphere\AppServer | C:\Program Files\WebSphere\Deployment Manager | C:\Program Files\IBM Http Server | C:\Program Files\ IBM\WebSphere MQ | C:\Program Files\ IBM\gsK7 | C:\temp         |
| <b>Minimum space for installation</b> | 422 MB                               | 360 MB  | 20 MB                            | 4 MB; 40 MB on base                | 16.8 MB                    | At least 150 MB |

Space requirements for the embedded messaging feature are described in the Installing WebSphere embedded messaging as the JMS provider topic.

- **Providing the required `msvcp60.dll` file for Windows 2000 Server platforms.**

The embedded messaging feature requires a DLL file on Windows 2000 Server platforms. The DLL file is already installed on Windows 2000 Advanced Server and other Windows platforms that are supported. If you see a message similar to the following example, download the `msvcp60.dll` file:

```
wempsdeletebroker.exe - Unable To Locate DLL
The dynamic link library MSVCP60.dll could
not be found in the specified path...
```

The prereq checker in the installer program does not check for this DLL file on the Windows 2000 Server platform. If you select the Windows 2000 Support Tools during Windows 2000 Server installation, the installation program for Windows 2000 Server installs the DLL file in the `C:\Program Files\Support Tools` directory. The DLL file is installed during the installation of Windows 2000 Advanced Server in the `C:\WINNT\system32` directory.

You can download the DLL file from the Microsoft Web site.

- **Planning for the default installation path**

On Windows platforms, the default installation path is `drive:\Program Files\IBM\WebSphere MQ\`. You can specify a different directory during installation. On Linux and UNIX-based platforms, the path is fixed.

- **Viewing accurate migration messages.**

When migration is running during installation, the information displayed in the pre-migration and post-migration processing might display corrupted national characters. Use the PreUpgrade and PostUpgrade logs in the `backup/logs` directory, where `backup` is the backup directory specified during installation.

- **Decompressing a WebSphere Application Server image that you download.**

If you are using the downloadable archive file to install the WebSphere Application Server product, the PKWARE `pkunzip` utility might not decompress the download image correctly. Use another utility (such as WinZip) to unzip the image.

- **Editing or removing the `vpd.properties` file.**

Installing WebSphere Application Server on some international computers might result in an installation failure or in font problems. Use the following procedure to work around this problem:

1. Locate the `vpd.properties` file in the operating system installation directory.  
For example, `C:\WINDOWS` or `C:\WINNT` on a Windows system.
2. Remove all of the lines containing one of these strings:
  - WSE
  - WSN
  - WSB
  - WSM

Do not delete or rename the `vpd.properties` file because the InstallShield for MultiPlatforms (ISMP) program uses it for other products that it installs. If you are sure that no other entries exist in the file, you can delete the file.

- **Preparing for Adaptive Fast Path Architecture (AFPA) driver availability when migrating from IBM HTTP Server Version 1.3.19.x, or earlier.**

The AFPA driver controls the fast response cache accelerator function, which is also known as the *cache accelerator*. The version of IBM HTTP Server installed with WebSphere Application Server shares the AFPA driver with any coexisting IBM HTTP Server. Uninstalling a coexisting Version 1.3.19.x (or earlier) IBM HTTP Server also uninstalls the common AFPA driver.

When configured to use an AFPA driver that is no longer present, the cache accelerator does not provide a response improvement. IBM HTTP Server generates errors as it starts. For example:

```
[error] (9) Bad file descriptor: Afpa Device Driver open failed.
```

You can either restore the driver or disable the cache accelerator configuration. Restore the driver by reinstalling the later version of IBM HTTP Server after you uninstall the earlier version. To verify that the AFPA driver is installed and working, see if it is listed in device manager under Non-Plug and Play Drivers. Select the Show hidden devices option in the device manager view on Windows 2000 or later platforms.

You can disable AFPA by commenting out the following directives in the `httpd.conf` configuration file:

```
AfpaEnable  
AfpaCache on  
AfpaLogFile "C:\Program Files\IBM HTTP Server\log\afpalog" V-ECLF
```

- **Rebooting the machine after uninstalling the embedded messaging feature.**

If you uninstall the embedded messaging feature on a Windows machine, you must reboot the machine before reinstalling.

- **Avoiding a user ID with spaces when installing the WebSphere Application Server as a Windows service.**

When installing the WebSphere Application Server as a Windows service, do not use a user ID that contains spaces. A user ID with spaces cannot be validated. The user is not allowed to proceed with the installation. To work around this problem, install with a user ID that does not contain spaces, or do not choose to install services.

- **Changing the display settings from high-contrast black to high-contrast white to view panels with hypertext links.**

For Installation wizard panels that contain hypertext links, a display setting of "high-contrast black" causes some of the text to display in the same color (black) as the background color. This makes the text impossible to display. Change your settings to "high-contrast white" to see all of the text in every Installation wizard panel.

- **Avoiding using the default service names created by the installer because they are common**

Unable to use the default service names created by the installer because they are common

In a same version coexistence scenario for IBM HTTP Server Version 1.3.28 or Version 2.0.47 on a Windows platform, you are unable to use the default service names created by the installer because they are common.

To work around this problem, perform the following steps:

1. Install the first copy of IBM HTTP Server, either by itself or with IBM WebSphere Application Server.
2. Customize the service names for the first install by running the following commands from the first install location:

```
apache -k install -n "IHS 1.3.28(1)"  
apache -k install -f conf\admin.conf -n "IHS 1.3.28 Administration (1)"
```

3. Edit the `AdminAlias` directive in the `<installLocation 1>\conf\admin.conf` file to point to the new service name, for example "IHS 1.3.28(1)".
4. Remove the default service names installed by the first installation by running:

```
apache -k uninstall -n "IBM HTTP Server 1.3.28"  
apache -k uninstall -n "IBM HTTP Administration 1.3.28"
```

5. Install the second copy of IBM HTTP Server, either by itself or with IBM WebSphere Application Server. The default service names correspond to the second installation.

The custom service names previously mentioned must be unique on your system and are not required to be those exact strings.

- **Uninstalling WebSphere Embedded Messaging Publish and Subscribe Edition on Windows 2003 Server.**

After using the Add or Remove Programs utility on Windows 2003 Server to uninstall WebSphere Application Server, the entry for WebSphere Embedded Messaging Publish and Subscribe Edition persists. Using the Add or Remove Programs utility to remove WebSphere Embedded Messaging Publish and Subscribe Edition generates a Fatal Error during installation message.

As a work around, manually remove the WEMPS entry in the Windows 2003 Server registry. See "Manually uninstalling on Windows platforms" on page 322 for more information about manually uninstalling messaging components.

- **Lowering the Internet Explorer security level from High to Medium to view the Product overviews from the Launchpad on Windows 2003 machines.**

You might see a blank page when trying to view Product overviews from the WebSphere Launchpad on Windows 2003 machines. The default security level setting for the Internet Zone on Internet Explorer is High. Use the following techniques to lower the Internet zone security level to Medium:

1. Right-click the Internet Explorer icon on the desktop.
2. Click **Properties > Security > Internet Zone**.
3. In the **Security level for this zone** area, move the slider from **High** to **Medium**.
4. Click **OK** to save the change.

- **Expecting a delay before the Installation wizard displays its first panel**

The default installation method is to open a command window to a read/write directory, issue the fully qualified command to start the Launchpad tool, and click the **Install the product** option. This option launches the Installation wizard, which is an InstallShield for MultiPlatforms (ISMP) application. This action launches the Installation wizard in the language of your machine locale unless no translation exists for your locale, in which case you receive the English version. A short delay occurs before the ISMP wizard displays.

You do not need to click the Install the product option more than once to cause the wizard to display.

## Tips for installing the embedded messaging feature

When installing IBM WebSphere Application Server, you can install the embedded messaging feature (which is selected by default) to use as the Java Message Service (JMS) provider. To install the embedded messaging feature successfully, you must complete several other actions first as described in the installation procedure. You must consider whether you also want to use WebSphere MQ on the same host. On Linux and UNIX-based platforms, you must define the groups and the user required to support the embedded messaging feature.

You can either complete the required actions before installing the WebSphere Application Server product, or deselect the embedded messaging feature, which installs the WebSphere Application Server product without embedded messaging.

If you already have WebSphere MQ installed, you can configure it as the JMS provider. Otherwise, you can install the embedded messaging feature, the WebSphere MQ product, or another JMS provider later, after you install the WebSphere Application Server product.

The WebSphere Application Server embedded messaging feature provides a JMS provider that supports both queues (for point-to-point messaging) and topics (for publish and subscribe messaging). You can

install the WebSphere Application Server with the embedded messaging feature on the same host with the WebSphere MQ product. To support this combination, several WebSphere MQ product features must be at a certain level.

After installing the WebSphere Application Server product with the embedded messaging feature, you can install the WebSphere MQ product and use it as the JMS provider instead.

This topic provides an index to tips for installing and migrating the embedded messaging feature that are described in “Platform-specific tips for installing and migrating” on page 146.

### Tips for all platforms

- **5.1+** Migrating from embedded messaging to WebSphere MQ requires setting the MQ\_INSTALL\_ROOT variable to the location of the installation root of WebSphere MQ
- Installing WebSphere Application Server products in order on the same machine, when installing the embedded messaging component
- Recovering from an InvalidExecutableException while starting jmsserver
- Applying fixes and fix packs to the embedded messaging feature
- Providing adequate space for installation
- Avoiding the installation of the server and client feature or the client feature more than once
- Installing the embedded messaging server feature if WebSphere MQ Version 5.3 is already installed
- Logging off and back on, or rebooting a Windows machine, after uninstalling the embedded messaging feature
- Planning not to use terminal services with the embedded messaging feature
- Avoiding a coexistence problem between embedded messaging, IBM WebSphere Studio Application Developer Integration Edition, and IBM WebSphere Application Server
- Locating more information about the embedded messaging feature or WebSphere MQ

### Tips for all Linux and UNIX platforms

- Preparing a Linux or UNIX operating platform for the embedded messaging feature
- Defining the prerequisite Linux or UNIX operating system groups, mqm and mqbrkrs
- Installing to fixed locations on UNIX-based operating systems
- Creating and mounting the required journalized file system, /var/mqm, before installing WebSphere Application Server
- Restricting access to the /var/mqm/errors directory and messaging logging files

### Tips for AIX platforms

- Installing the prerequisite Java130.rte.lib Version 1.3.0 on AIX Version 4.3.3 or AIX Version 5
- Correcting directory permissions on AIX platforms before reinstalling WebSphere Application Server with the embedded messaging feature

### Tips for Linux platforms

- **5.1+** Ignoring YAST2 dependency conflicts for embedded messaging packages

### Tips for Windows platforms

- Providing the required msvc60.d11 file for Windows 2000 Server
- Planning for the default installation path



## Using the Launchpad to start the installation

Use the Launchpad to access a product overview, to access the readme file, to access the installation guide, and to install the product.

### 1. Start the Launchpad.

The Launchpad program is in the *operating\_system\_platform* directory on the product CD.

You can start the Launchpad manually using a fully qualified command instead of changing directories to the CD-ROM and running the command locally from the platform directory:

- Mount the CD-ROM drive on Linux or UNIX-based platforms, if necessary. This procedure varies per platform. Consult the installation procedure for your platform for instructions on mounting CD-ROM drives. Open a shell window and issue a fully qualified **launchpad.sh** command to start the Launchpad. On Windows platforms, issue a fully qualified **launchpad.bat** command to start the Launchpad. Issue a fully qualified **LaunchPad.sh** command to start the Launchpad for the **Application Clients** CD-ROM.

The Launchpad opens in the language of the machine locale setting. The appearance of the Launchpad is the same for the base product and the Network Deployment product. You can access the Installation Guide to see which product it describes installing if you lose track of the product to which the panel applies.

2. Use the Launchpad to access the product overview, the readme file, and installation guides.
3. Click **Install the product** to launch the installation wizard.

You can use the Launchpad to start the installation and to access information through a browser.

If you use the Mozilla browser on a Linux or UNIX system and you do not have the Netscape browser, some links might not work because the Launchpad attempts to call the Netscape browser in the `/usr/bin/netscape` directory. Try a symbolic link to the Mozilla browser to fix the problem as shown in the following example:

```
ln -sf /usr/bin/mozilla /usr/bin/netscape
```

If you still cannot use the Launchpad panel, you can launch the following links directly from your browser:

### Button Link

#### Product Overview

<http://www.ibm.com/software/webservers/appserv/>

It is possible that your security options might prevent redirection, such as to the <http://www-306.ibm.com/software/info1/websphere/index.jsp?tab=products/appserv> Web site. If so, you can identify the IBM Web site as a trusted site to allow the redirection. For example, on Internet Explorer, add <http://www-306.ibm.com> to the list of Trusted Sites by selecting **Tools > Internet Options > Security (tab) > Trusted Sites**.

#### Readme File

*CD-ROM mount point/readme/readme\_en.html*

#### Installation Guide

*CD-ROM\_mount\_point/docs/InstallGuide\_en.PDF*

The *Installation Guide* is in Adobe PDF format. Viewing this document requires you to have Adobe Acrobat Reader, which is a free download from the Adobe Acrobat Web site.

**5.1 +** Download a new installation guide at [ftp://ftp.software.ibm.com/software/webserver/appserv/library/wasv51base\\_gs.pdf](ftp://ftp.software.ibm.com/software/webserver/appserv/library/wasv51base_gs.pdf).

#### Install the product

*CDROM\_mount\_point/platform\_directory/install* on Linux and UNIX-based platforms.

*CDROM\_drive:\platform\_directory\Install.exe* on Windows platforms.

## Installing silently

This topic describes how to perform a silent installation of the product as the root user on a Linux or UNIX-based operating system, or from a user ID that belongs to the Administrator group on a Windows platform.

Use this procedure to perform a silent installation of the WebSphere Application Server product.

A silent installation uses the installation program to install the product. However, instead of displaying a wizard interface, the silent installation causes the installation program to read all of your responses from a file that you must customize.

1. Verify that the user ID has sufficient authority to perform the task.

Install silently as root on a Linux or UNIX-based platform, or as a user that belongs to the administrator group on a Windows platform. Some steps for installing silently on a Windows platform require the administrator group user to have the following advanced user rights:

- *Act as part of the operating system*
- *Log on as a service*

The installation wizard grants your Windows user ID the advanced user rights, if the user ID belongs to the administrator group. The silent installation does not grant these rights. If you create a new user ID on a Windows platform to perform the silent installation, you must restart the system to activate the proper authorizations for the user ID, before you can perform a successful silent installation.

Table 47. Installation tip

| Operating platform | Tip  |
|--------------------|--|
| Windows platforms  | A Windows user ID with spaces cannot be validated for installing services. |

If you attempt a silent installation of services or the embedded messaging feature without the required authorizations, the installation might fail while attempting to write to a log.txt file that it has not opened yet. Or, you might see messages in the log.txt file that are similar to the following messages:

```
(Jan 30, 2003 12:04:32 PM), Setup.product.install,
com.ibm.ws.install.conditions.PCWebSphereCheckCondition, msg1,
higherVersionFoundPasses: false
(Jan 30, 2003 12:04:32 PM), Setup.product.install,
com.ibm.ws.install.conditions.PCWebSphereCheckCondition, msg1,
defaultEvalResult: false
(Jan 30, 2003 12:04:32 PM), Setup.product.install,
com.ibm.ws.install.conditions.PCWebSphereCheckCondition, msg1,
checkOnlyCurrentVersion: true
(Jan 30, 2003 12:04:34 PM), Setup.product.install,
com.ibm.ws.install.conditions.PCWebSphereCheckCondition, msg1,
higherVersionFoundPasses: false
(Jan 30, 2003 12:04:34 PM), Setup.product.install,
com.ibm.ws.install.conditions.PCWebSphereCheckCondition, msg1,
defaultEvalResult: false
(Jan 30, 2003 12:04:34 PM), Setup.product.install,
com.ibm.ws.install.conditions.PCWebSphereCheckCondition, msg1,
checkOnlyCurrentVersion: false
(Jan 30, 2003 12:04:41 PM), Setup.product.install,
com.ibm.ws.install.actions.LogMessageAction, msg1, INST0058E:
The install failed or did not complete due to one or more errors.
```

2. Copy the response file as myoptionsfile to your disk drive and customize it.

The name of the original file is responsefile.

3. Issue one of these commands to use your custom response file:

### Windows platforms

```
"fully_qualified_CD_drive_D:\win\install"
-options"fully_qualified_disk_drive_C:_WAS\myoptionsfile
```

The log.txt file is in the *install\_root*\logs directory.

## Linux and UNIX-based platforms

```
fully_qualified_mnt_cdrom/install -options  
fully_qualified_disk_drive_/tmp/WAS/myoptionsfile
```

The `log.txt` file is in the `install_root/logs` directory.

You can find the sample options response file in the `operating-system platform` directory on the product CD.

4. Reboot your machine in response to the prompt that might appear on Windows platforms.

If you install the embedded messaging feature, `-P mqSeriesBean.active="true"`, certain conditions, such as a locked file, might require you to reboot. You have the option of rebooting immediately, after which the installation program resumes the installation at the point it left off. You can also defer rebooting to a convenient time, such as after the overall installation is complete.

5. Customize the port setting for the administrative console in the Start menu on a Windows platform when coexistence is present.

The silent installation might not update the port setting for the administrative console in the Start menu. An incorrect port causes the Start menu to fail when opening the administrative console.

- a. From your desktop Start menu, right-click **Start** and click **Explore**.
- b. Double-click the **Programs** folder.
- c. Double-click **IBM WebSphere Application Server, Version 5**.
- d. Right-click **Administrative Console**, and then click **Properties**.
- e. Modify the port number that appears in the **Target** field to match the port number you specified for the administrative console port in the silent options response file. The default

You can install silently using the response file. To determine if the silent installation is successful, examine the `log.txt` file for a line similar to this:

```
MessageAction, msg1, The WebSphere 5.1 install is complete.
```

This is an indicator that you have successfully installed the product.

## Customizing the base options response file

This topic describes how to customize the response file for silently installing the base WebSphere Application Server product from a command line without the Installation wizard. Install as the root user on a Linux or UNIX-based platform, or as a user that belongs to the administrator group on a Windows platform. Some steps of the silent installation procedure on a Windows platform require that the administrator group user to have the advanced user rights *Act as part of the operating system* and *Log on as a service*.

Before using the `Install.exe -options myoptionsfile` command, for example, to invoke a silent installation, you must customize the response file to add your selections.

Customize the options response file precisely to let the installation program read the option values it contains. The options response file is for silent installation only. The file does not affect the default values that appear in the Installation wizard.

The options response file has comments that describe each field. Read the explanation to an entry to further understand the purpose of the setting, and what it accomplishes during installation.

1. Locate the sample options response file. The file is named `responsefile` in the `operating-system platform` directory on the product CD-ROM.
2. Copy the file to preserve it in its original form. For example, copy it as `myoptionsfile` on your disk drive.
3. Edit the copy in your flat file editor of choice, on the target operating system. Read the directions within the response file to choose appropriate values.

**Note:** To prepare the file for a silent installation on AIX, use UNIX line-end characters (0x0D0A) to terminate each line of the options response file as described in the *Platform-specific tips for installing and migrating* topic.

Here is an example of an edited entry for a feature (mqSeriesBean) and its sub-features (mqSeriesServerBean and mqSeriesClientBean). These entries install both the server and the client. The server option installs both subfeatures in this case as you can see from the comments in the file. These options settings do not install the Samples. If you set the client option to true, this is an error. If you have errors in the response file, the installation program logs the errors in log.txt and exits without installing anything.

```
# *****
# Install Embedded Messaging
# *****

-P mqSeriesBean.active="true"

# *****
# The next three features are for Embedded Messaging. In order to install
# any of the following three subfeatures, the property to install Embedded
# Messaging denoted above must be set to "true."
#
# IMPORTANT NOTE: If you do not want to install Embedded Messaging, please
# ensure all of the following options are set to "false" as well as the above
# option.
# *****

# *****
# Install Embedded Messaging Server and Client
#
# You may only install the Embedded Messaging Server and Client or the Embedded
# Messaging client below. If you set the Server and Client to "true," please
# ensure that the Client only option below is set to "false." The same applies
# if you set the Client only option to "true," please ensure the server and client
# option is set to "false."
# *****

-P mqSeriesServerBean.active="true"

# *****
# Embedded Messaging Server and Client install location
#
# If you choose to install Embedded Messaging Server and Client above, please
# specify an install location below for Windows platforms only.
# The directory may not be configured by the user for UNIX platforms
# as it is predetermined.
# *****

-P mqSeriesServerBean.installLocation="C:\Program Files\IBM\WebSphere MQ"

# *****
# Install Embedded Messaging Client only
# *****

-P mqSeriesClientBean.active="false"

# *****
# Embedded Messaging Client Only install location
#
# If you choose to install Embedded Messaging Client only above, please
# specify an install location below for Windows platforms only.
# The directory may not be configured by the user for UNIX platforms
# as it is predetermined.
# *****

-P mqSeriesClientBean.installLocation="C:\Program Files\IBM\WebSphere MQ"
```

```
# *****
# Install Message-driven beans Samples
# *****
```

```
-P mqSeriesSamplesBean.active="true"
```

4. Make the first non-commented option `-silent` to have a silent install. The options response file is for silent installation only. The file does not affect the default values that appear in the Installation wizard. If you do not specify `-silent`, the file is ignored.
5. Include custom option responses that reflect parameters for your system. Read the directions within the response file to choose appropriate values.
6. Save the file.

You can customize the response file to prepare for running a silent installation.

Edit the version of the file that ships with the WebSphere Application Server product. The following example shows the V5.1.0 version of the file. Some of the longer lines are split for clarity in the example. In the real file, leave each assignment statement on one line.

```
# *****
#
# Response file for WebSphere Application Server 5.1 Install
#
# Please follow the comments to use the response file and
# understand the various options. You must carefully complete
# or change the various values. If the values are not completed
# properly, the install may be unsuccessful.
#
# NOTE: This file is for silent install only.
#
#
# IMPORTANT: ALL VALUES MUST BE ENCLOSED IN DOUBLE QUOTES ( " " ).
#
# *****
#
# *****
# This value is required.
# PLEASE DO NOT REMOVE THIS VALUE.
# *****

-W setupTypes.selectedSetupTypeId="custom"

# *****
# Below is the beginning of the response file that needs to be
# filled in by the user.
# *****

# *****
# The below value specifies silent install. This value
# indicates that the install will be silent.
# *****

-silent

# *****
# WebSphere Application Server Install Location
#
# Please specify the destination directory for the WebSphere Application
# Server installation. You will need to change this for UNIX
# platforms. As an example for AIX, the value may be
# "/usr/WebSphere/AppServer"
# *****
```

```

-P wasBean.installLocation="C:\Program Files\WebSphere\AppServer"

# *****
# IBM HTTP Server Install Location
#
# Please specify the destination directory for the IBM HTTP Server
# installation. This value will need to be completed if you
# choose to install IBM HTTP Server. If you choose to not install IBM
# HTTP Server, then this value is not required. You will need to change
# the default value below for UNIX platforms. As an example for AIX, the
# value may be "/usr/IBMHTTPServer"
# *****

-P ihsFeatureBean.installLocation="C:\Program Files\IBMHTTPServer"

# *****
# Below are the features that you may choose to install.
# Set the following values to "true" or "false," depending upon whether
# you want to install the following features or not.
#
# NOTE: The default settings for features in this response file
#       detail the defaults for a typical installation.
# *****

# *****
# Install Server
# *****

-P serverBean.active="true"

# *****
#
# Begin Features for Administration
#
# *****

# *****
# Install Administration
# *****

-P adminBean.active="true"

# *****
# The next 2 features are part of Administration. In order for any of these
# features to be installed, the property to install Administration denoted
# above must be set to "true."
# *****

# *****
# Install Admin Scripting
# *****

-P adminScriptingFeatureBean.active="true"

# *****
# Install Administrative Console
# *****

-P adminConsoleFeatureBean.active="true"

# *****
#
# End Features for Administration

```



```

#
# *****

# *****
#
# Begin Features for Application Assembly and Deployment Tools
#
# *****

# *****
# Install Application Assembly and Deployment Tools
# *****

-P applicationAndAssemblyToolsBean.active="true"

# *****
# The next 3 features are part of Application Assembly and Deployment
# Tools. In order for any of these features to be installed,
# the property to install Application And Assembly Tools denoted
# above must be set to "true."
# *****

# *****
# Install Deploy Tool
# *****

-P deployToolBean.active="true"

# *****
# Install Ant Utilities
# *****

-P antUtilityBean.active="true"

# *****
#
# End Features for Application Assembly and Deployment Tools
#
# *****

# *****
#
# Begin Features for Embedded Messaging
#
# *****

# *****
# Install Embedded Messaging
# *****

-P mqSeriesBean.active="true"

# *****
# The next three features are for Embedded Messaging. In order to install
# any of the following three subfeatures, the property to install Embedded
# Messaging denoted above must be set to "true."
#
# IMPORTANT NOTE: If you do not want to install Embedded Messaging, please
# ensure all of the following options are set to "false" as well as the above
# option.
# *****

# *****
# Install Embedded Messaging Server and Client

```

```

#
# You may only install the Embedded Messaging Server and Client or the Embedded
# Messaging client below. If you set the Server and Client to "true," please
# ensure that the Client only option below is set to "false." The same applies
# if you set the Client only option to "true," please ensure the server and client
# option is set to "false."
# *****

-P mqSeriesServerBean.active="true"

# *****
# Embedded Messaging Server and Client install location
#
# If you choose to install Embedded Messaging Server and Client above, please
# specify an install location below for Windows platforms only.
# The directory may not be configured by the user for UNIX platforms
# as it is predetermined.
# *****

-P mqSeriesServerBean.installLocation="C:\Program Files\IBM\WebSphere MQ"

# *****
# Install Embedded Messaging Client only
# *****

-P mqSeriesClientBean.active="false"

# *****
# Embedded Messaging Client Only install location
#
# If you choose to install Embedded Messaging Client only above, please
# specify an install location below for Windows platforms only.
# The directory may not be configured by the user for UNIX platforms
# as it is predetermined.
# *****

-P mqSeriesClientBean.installLocation="C:\Program Files\IBM\WebSphere MQ"

# *****
# Install Message-driven beans Samples
# *****

-P mqSeriesSamplesBean.active="true"

# *****
#
# End Features for Embedded Messaging
#
# *****

# *****
# Install IHS WebServer 1.3.28
# *****

-P ihsFeatureBean.active="true"

# *****
#
# Begin Features for Web Server Plugins
#
# *****

# *****
# Install Web Server Plugins
# *****

```

```

-P pluginBean.active="true"

# *****
# The next 5 features are part of Web Server Plugins.
# In order for any of these features to be installed,
# the property to install Web Server Plugins denoted
# above must be set to "true."
# *****

# *****
# Install IBM HTTP Server v1.3 Plugin
# *****

-P ihsPluginBean.active="true"

# *****
# Install IBM HTTP Server v2.0 Plugin
# *****

-P ihs20PluginBean.active="false"

# *****
# Install Apache Web Server v1.3 Plugin
# *****

-P apachePluginBean.active="false"

# *****
# Install Apache Web Server v2.0 Plugin
# *****

-P apache20PluginBean.active="false"

# *****
# Install Microsoft Internet Information Services (IIS) Plugin
# *****

-P iisPluginBean.active="false"

# *****
# Install iPlanet Web Server Plugin
# *****

-P iplanet60PluginBean.active="false"

# *****
# Install Domino Web Server Plugin
# *****

-P dominoPluginBean.active="false"

# *****
#
# End Features for Web Server Plugins
#
# *****

# *****
# Install Samples
# *****

-P samplesBean.active="true"

# *****

```

```

#
# Begin Features for Performance and Analysis Tools
#
# *****

# *****
# Install Performance And Analysis Tools
# *****

-P performanceAndAnalysisToolsBean.active="true"

# *****
# The next 3 features are part of Performance And Analysis
# Tools. In order for any of these features to be installed,
# the property to install Performance And Analysis Tools denoted
# above must be set to "true."
# *****

# *****
# Install Tivoli Performance Viewer
# *****

-P tivoliPerfBean.active="true"

# *****
# Install Dynamic Cache Monitor
# *****

-P DCMBean.active="true"

# *****
# Install Performance Servlet
# *****

-P performanceServletBean.active="true"

# *****
# Install Log Analyzer
# *****

-P logAnalyzerBean.active="true"

# *****
#
# End Features for Performance and Analysis Tools
#
# *****

# *****
# Install Javadocs
# *****

-P javadocBean.active="true"

# *****
# Please enter a node name and hostname for this installation.
# The node name is used for administration, and must be unique
# within its group of nodes (cell). The hostname is the DNS name
# or IP address for this computer. You must replace the
# "DefaultNode" with the node name that you want the default node
# to be and "127.0.0.1" to a resolveable hostname or IP address
# for your machine.

# Warning:

```

```

# 1. If you are migrating now or plan to do so after
# installation, enter the same node name as the previous version.
# 2. If you are performing coexistence, enter a unique node name.
# *****

-W nodeNameBean.nodeName="DefaultNode"
-W nodeNameBean.hostName="127.0.0.1"

# *****
# Begin Installing Services
#
# The following are to install Services for IHS and Websphere
# Application Server on Windows. Using Services, you can start and
# stop services, and configure startup and recovery actions.
# You can ignore these or comment them out for other Operating Systems.
# *****

-W serviceSettingsWizardBean.active="true"

# *****
# The next 2 options are part of Installing Services.
# In order for any of these to be set to "true,"
# the property to install Services denoted above must be set
# to "true."
# *****

# *****
# Install the IHS service
# *****

-W serviceSettingsWizardBean.ihsChoice="true"

# *****
# Install the WebSphere Application Server service
# *****

-W serviceSettingsWizardBean.wasChoice="true"

# *****
# If you chose to install a service above, then you must
# specify the User Name and Password which are required to
# install the Services. The current user must be admin or must
# have admin authority to install a Service. Also the username
# which is given here must have "Log On as a Service " authority
# for the service to run properly.
# *****

# *****
# Replace YOUR_USER_NAME with your username.
# *****

-W serviceSettingsWizardBean.userName="YOUR_USER_NAME"

# *****
# Replace YOUR_PASSWORD with your valid password.
# *****

-W serviceSettingsWizardBean.password="YOUR_PASSWORD"

# *****
#
# End Installing Services
#
# *****

```

```

# *****
# Set any or all of the following to false if the launcher
# icon is not to be installed. These settings will only affect
# an install in which the corresponding product component
# is also selected for install.
# *****

-P StartServerIconBean.active="true"
-P StopServerIconBean.active="true"
-P AdminConsolIconBean.active="true"
-P SamplesGalleryIconBean.active="true"
-P TivoliPerfIconBean.active="true"
-P infoCenterIconBean.active="true"
-P firstStepsIconBean.active="true"
-P logAnalyzerIconBean.active="true"

# *****
# Change the path to the prerequisite checker configuration
# file only if a new file has been provided. This can be a
# relative path or an absolute path. Make sure both the
# prereqChecker.xml and prereqChecker.dtd files are present at the provided path.
# *****

-W osLevelCheckActionBean.configFilePath="waspc/prereqChecker.xml"

# *****
# Begin Plugin Config File Location
#
# If you chose to install plugins above, then you will
# need to specify the fully qualified path, including
# the config file name, for the plugins you selected. If you want to
# install the plugin, you must specify this path, otherwise the
# installer will fail to install the plugins properly. Also, the
# value must be included in double quotes.
# *****

# *****
# IBM HTTP Server Plugin v1.3 Config File Location
# *****

-W defaultIHSConfigFileLocationBean.value=
  "C:\Program Files\IBMHTTPServer\conf\httpd.conf"

# *****
# IBM HTTP Server Plugin v2.0Config File Location
# *****

-W defaultIHS20ConfigFileLocationBean.value=

# *****
# Apache Web Server v1.3 Config File Location
# *****

-W defaultApacheConfigFileLocationBean.value=

# *****
# Apache Web Server v2.0 Config File Location
# *****

-W defaultApache20ConfigFileLocationBean.value=

# *****
# iPlanet Web Server Config File Location
# *****

```



```

-W defaultIPlanetConfigFileLocationBean.value=

# *****
# Begin Domino Web Server Plugin Config File Locations
#
# The Notes.jar and names.nsf locations are required
# for the Domino Plugin. Please be sure to enter values in
# double quotes for both of these files.
# *****

# *****
# Domino Notes.jar File Location
# *****

-W dominoPanelBean.notesJarFile=

# *****
# Domino names.nsf File Location
# *****

-W dominoPanelBean.namesFile=

# *****
# End Domino Web Server Plugin Config File Locations
# *****

# *****
#
# End Plugin Config File Location
#
# *****

# *****
# Product Registration Tool
#
# To launch the Product Registration Tool, please
# change the value to "true." This is only for
# GUI install.
# *****

-W launchPRTBean.active="false"

# *****
# Install Default App
#
# Please specify if you would like to install the
# Default App by setting the value to "true" or "false."
# *****

-W installSampleAppSequenceBean.active="true"

# *****
# First Steps
#
# If you would the First Steps to display at the end
# of the installation, please change the value to "true."
# *****

-W firstStepsSequenceBean.active="false"

# *****
# Installation Verification Tool (IVT)
#

```

```

# Please specify if you would like to run the Installation
# Verification Tool by setting the value to "true" or "false."
# *****

-W installIIVTAppSequenceBean.active="true"

# *****
# **      Support for Silent Coexistence
# **
# ** NOTE:
# ** 1. You must uncomment and modify the properties in
# ** this section for silent coexistence to work properly.
# ** 2. You can not perform migration and coexistence at
# ** the same time.
# *****

# *****
# Tell the installer that you want to perform coexistence
# *****

#-W coexistenceOptionsBean.doCoexistence="true"

# *****
# Set this property if you want to modify the default IHS
# and IHS Admin ports
# *****

#-W coexistencePanelBean.useIhs="true"

# *****
# The new value for the Bootstrap Port
# *****

#-W coexistencePanelBean.bootstrapPort="2810"

# *****
# The new values for the IHS and IHS Admin ports
# NOTE: These values are only used if
# coexistencePanelBean.useIhs is set to "true"
# *****

#-W coexistencePanelBean.ihsPort="81"
#-W coexistencePanelBean.ihsAdminPort="8009"

# *****
# The new values for the HTTP and HTTPs transports.
# *****

#-W coexistencePanelBean.httpTransportPort="9086"
#-W coexistencePanelBean.httpsTransportPort="9044"

# *****
# The new values for the admin console an secure admin
# console ports.
# *****

#-W coexistencePanelBean.adminConsolePort="9091"
#-W coexistencePanelBean.secureAdminConsolePort="9444"

# *****
# The new values for the csivServerAuthListener and
# the csivMultiAuthListener ports.
# NOTE: You can usually leave these set to 0
# *****

#-W coexistencePanelBean.csivServerAuthListenerAddr="0"
#-W coexistencePanelBean.csivMultiAuthListenerAddr="0"

```

```

# *****
# The new value for the sasSSLServerAuth port.
# *****

#-W coexistencePanelBean.sasSSLServerAuthAddr="0"

# *****
# The new values for the JMS Server Direct Address,
# JMS Server Security, and JMS Server QueuedAddress ports
# *****

#-W coexistencePanelBean.jmsServerDirectAddress="5569"
#-W coexistencePanelBean.jmsServerSecurityPort="5567"
#-W coexistencePanelBean.jmsServerQueuedAddress="5568"

# *****
# The new value for the soap connector address port
# *****

#-W coexistencePanelBean.soapConnectorAddress="8881"

# *****
# **          Support for Silent Migration
# **
# ** NOTE:
# ** 1. You must uncomment and modify EVERY property
# ** in this section for silent migration to work properly.
# ** 2. You can not perform migration and coexistence at
# ** the same time.
# **
# *****

# *****
# The installer must be informed that you wish to operate on
# a previous version, so you must tell it that one is present
# by uncommenting the next line.
# *****

# -W previousVersionDetectedBean.previousVersionDetected="true"

# *****
# Direct the installer to operate on a specific previous version by
# uncommenting the next line and entering one of these values:
#
# Value          Edition
# *****
# AE             WAS Advanced Edition (V3.x, V4.0.x)
# advanced      AE
# AEs           WAS Advanced Single Server Edition (V4.0.x)
# standard      WAS Standard Edition (V3.x)
#
# Note:
# For migration from WAS V5.0.x, this field is not used. So simply
# set previousVersionPanelBean.selectedVersionEdition to "NONE".
# *****

# -W previousVersionPanelBean.selectedVersionEdition="AEs"

# *****
# Specify the location where the previous version is installed.
# *****

# -W previousVersionPanelBean.selectedVersionInstallLocation=
  "/opt/WebSphere/AppServer"

```

```

# *****
# Specify the path to the configuration file for the
# previous version. Configuration filenames are:
#
# Value          previousVersionPanelBean.selectedVersionEdition
# *****
# admin.config   AE
# admin.config   advanced
# server-cfg     AEs
# server-cfg     standard
#
# Note:
# For migration from WAS V5.0.x, this field is not used. So simply
# set previousVersionPanelBean.selectedVersionConfigFile to "NONE".
# *****

# -W previousVersionPanelBean.selectedVersionConfigFile=
#    "/opt/WebSphere/AppServer/config/server-cfg.xml"

# *****
# Specify the version number of the previous version:
# 5.0.2,5.0.1,5.0.0,4.0,4.0.1,3.5, etc...
# *****

# -W previousVersionPanelBean.previousVersionSelected="4.0"

# *****
# Uncomment the below line to indicate that you wish to
# migrate the previous version.
# *****

# -W previousVersionPanelBean.migrationSelected="true"

# *****
# Specify the directory where migration will backup
# information about the previous version.
# *****

# -W migrationInformationPanelBean.migrationBackupDir=
#    "/tmp/migrationbackup"

# *****
# Specify the directory where migration logs will be stored.
# *****

# -W migrationInformationPanelBean.migrationLogfileDir=
#    "/tmp/migrationlogs"

```

## responsefile

This topic describes the response file for installing the WebSphere Application Server product, so that the root user on a Linux or UNIX-based platform, or a user that belongs to the Administrator group on a Windows platform, can install the product without the installation wizard. Some steps of the silent installation procedure on a Windows platform require the user to belong to the Administrator group and have the advanced user rights *Act as part of the operating system* and *Log on as a service*.

Silent installation is an installation method that reads all choices from the options response file, responsefile, which you must tailor before performing a silent installation. This file does not affect the installation wizard in any way.

### Location

The sample options response file, responsefile, is on the product CD in the *operating-system platform* directory.

## Usage notes

- The file is not a read-only file.
- Edit this file directly with your flat file editor of choice, such as WordPad on a Windows platform.
- The file is not updated by any product components.
- The file must exist to perform a silent installation. The installation program reads this file to determine installation option values when you install silently.
- Save the file in a location you can identify when you specify the fully qualified path as part of the installation command.
- If you are installing on a Windows platform, your user ID must belong to the Administrator group and have the advanced rights previously described. If you select either of the following options when your user ID does not comply, the installation fails:

```
# Install the IHS service
# *****
-W serviceSettingsWizardBean.ihsChoice="true"
# *****
# Install the WebSphere Application Server service
# *****
-W serviceSettingsWizardBean.wasChoice="true"
# *****
```

## Automatically restarting server processes

There are several server processes related to WebSphere Application Server products that the operating system can monitor and automatically restart when the server processes stop abnormally. This task describes how to set up monitored processes.

To set up this function on a Linux and UNIX-based operating system, you must have root authority to edit the `inittab`.

On a Windows operating system, you must belong to the Administrator group and have the user rights *Act as part of the operating system* and *Log on as a service* to define Windows services. The installation wizard grants you the user rights, if your user ID is part of the Administrator group. It displays a message that states that although the advanced user rights are now effective, they do not display as effective until the next time you log on.

You can also add the user rights manually if you are performing a silent installation on a Windows platform. For example, to grant the user rights to your administrator group user ID on a Windows 2000 Server platform:

1. Click **Administrative Tools** in the Control Panel.
2. Click **Local Security Policy**.
3. Click **Local Policies**.
4. Click **User Rights Assignments**.
5. Right click **Act as part of the operating system**.
6. Click **Security**.
7. Click **Add**.
8. Click your user ID.
9. Click **Add**.
10. Click **OK**.
11. Click **OK**.
12. Right click **Log on as a service**.
13. Click **Security**.
14. Click **Add**.
15. Click **OK**.

16. Click **OK**.
17. Reboot your machine to make the settings effective.

Consult your operating system help for more information.

There are several environments where you might use this function of automatically restarting servers. You can restart the server1 process in a stand-alone WebSphere Application Server environment, for example. Here is a list of processes you might consider restarting:

- The server1 process on a stand-alone Application Server
- The IBM HTTP Server process
- The IBM HTTP Administration process
- The "WebSphere Embedded Messaging Publish And SubscribeWAS\_*node\_name*\_jmsserver" process, if the Application Server node has the embedded messaging feature
- The "WebSphere Embedded Messaging Publish And SubscribeWAS\_*node\_name*\_server1" process, if the Application Server node has the embedded messaging feature

You can create Windows services during installation, using the installation wizard. The wizard lets you create services for these servers:

- The server1 process in a stand-alone base product environment, defined as a manually started (versus automatic) service
- The IBM HTTP Server process and the IBM HTTP Administration process, defined as automatically started services when you choose to install the IBM HTTP Server feature during the base product installation

You must manually create a shell script that automatically starts any of the processes previously mentioned, on a Linux and UNIX-based operating system. Each Windows service or UNIX shell script controls a single process, such as a stand-alone WebSphere Application Server instance. Multiple stand-alone Application Server processes require multiple Windows service or UNIX scripts, which you can define.

If you do not install the WebSphere Application Server base product or Network Deployment as a Windows service during installation, you can use the **WASService** command in the *install\_root/bin* directory to do so at a later time. You can use the tool to add any WebSphere Application Server process as a Windows service. The operating system can then monitor each server process, and restart the server if it stops.

1. **Use the installation wizard** to set up a Windows service to automatically monitor and restart processes related to the WebSphere Application Server product.

- Perform the following procedure from the installation wizard for the base WebSphere Application Server product, to select services that the installation wizard can set up:

a. Click **Run WebSphere Application Server as a service**.

If you select this option, the installation wizard creates the following service during the installation:

**IBM WebSphere Application Server V5 - server1**

The IBM WebSphere Application Server V5 - server1 service controls the **server1** process in a stand-alone environment.

After you complete and verify the installation, use the Windows NT Services Control panel, or the Windows 2000 (or later) Services panel to change the **IBM WebSphere Application Server V5 - server1** service to an automatic startup type.

- 1) Right click **IBM WebSphere Application Server V5 - server1** and click **Properties**.
- 2) Click **Automatic** from the **Startup type** list box and click **OK**.

**5.1 +** WebSphere Application Server Version 5.1 does not support Windows NT.

b. Click **Run IBM HTTP Server as a service**.

Select this option on the machine where you are installing the IBM HTTP Server.



If you select this option, the installation wizard creates the following services during the installation:

- **IBM HTTP Server 1.3.2x** (1.3.26 or 1.3.28 for V5.1)
- **IBM HTTP Administration 1.3.2x** (1.3.26 or 1.3.28 for V5.1)

The installation wizard defines the startup type of these services as **automatic**. It is not necessary that you do so.

- c. Enter your user ID and password and click **Next**.

In a coexistence environment, you can change the default service names to make them unique. In a same version coexistence scenario for IBM HTTP Server 1.3.2x.x or 2.0.x on a Windows platform, you cannot use the default service names created by the installer because they are common.

To work around this problem:

- a. Install the first copy of IBM HTTP Server, either by itself or with WebSphere Application Server and select to install the services.
- b. Customize the service names for the first install by running the following commands from the first install location:

```
apache -k install -n "IHS 1.3.26(1)"
apache -k install -f conf\admin.conf -n "IHS 1.3.26 Administration (1)"
```

If you are installing IBM HTTP Server 1.3.28, use these commands:

```
apache -k install -n "IHS 1.3.28(1)"
apache -k install -f conf\admin.conf -n "IHS 1.3.28 Administration (1)"
```

- c. Edit the AdminAlias directive in the *installLocation 1\conf\admin.conf* file to point to the new service name, such as **IHS 1.3.26(1)**.
- d. Remove the default service names installed by the first install by running the following commands:

```
apache -k uninstall -n "IBM HTTP Server 1.3.26"
apache -k uninstall -n "IBM HTTP Administration 1.3.26"
```

- e. Install the second copy of IBM HTTP Server, either by itself or with WebSphere Application Server. The default service names will now correspond to the second install.

Customized service names must be unique on your system.

2. **After installing**, use the WASService.exe utility in the *install\_root\bin* directory to manually define a Windows service for another installation or configuration instance of the base WebSphere Application Server product.

You can use the **net start** and **net stop** commands to control the IBM HTTP Server services on a Windows system. For more information about these commands, see the Windows help file. Access these commands from the Start menu, clicking **Start > Programs > IBM HTTP Server**.

**5.1 +** You can also use the **Start the Server** and **Stop the Server** commands to control the IBM WebSphere Application Server on a Windows system. Access these commands from the Start menu, clicking **Start > Programs > IBM WebSphere > Application Server V5.1**.

Processes started by a **startServer** or **startNode** or **startManager** command are not running as monitored processes, regardless of how you have configured them.

For example, you can configure a base Application Server as a WebSphere Application Server monitored process. However, if you start the Application Server instance using the **startServer** command, the operating system does not monitor or restart the Application Server because the operating system did not start the process as a monitored process.

## WASService command

The **WASService** command line tool lets you add any WebSphere Application Server process as a Windows service.

WebSphere Application Server processes that you could add as Windows services include:

- Any base Application Server, such as the default server1 process
- The jmsserver process that exists on a base Application Server node when you have installed the embedded messaging server feature and the node is part of a deployment manager cell
- The nodeagent process on a base Application Server node that is part of a deployment manager cell
- The deployment manager process, dmgr, on the Network Deployment node

If the installation wizard creates a Windows service during installation, the uninstaller program removes the Windows service. If you use the WASService command to create a service yourself, it is your responsibility to remove the service when it is no longer valid. The uninstaller program does not remove Windows services that you create with the **WASService** command.

### User ID prerequisites

You must run the WASService.exe command from a user ID that belongs to the administrator group. The user ID must also have the following advanced user rights:

- Act as part of the operating system
- Log on a service

### Location of command file

The WASService.exe command file is located in the *install\_root*\bin directory.

### WASService.exe command syntax for starting an existing service

The command syntax is as follows:

```
WASService.exe [-start] service_name
```

### WASService.exe command syntax for creating a service

The command syntax is as follows:

```
WASService.exe -add service_name
                -serverName Server
                [-wasHome install_root]
                [-configRoot configuration_repository_directory]
                [-startArgs additional_start_arguments]
                [-stopArgs additional_stop_arguments]
                [-userid execution_id -password password]
                [-logFile service_log_file]
                [-logRoot server_log_directory]
                [-userScript path\setupCmdLine.bat]
                [-restart true | -restart false]
```

### WASService.exe command syntax for deleting a service

The command syntax is as follows:

```
WASService.exe -remove service_name
```

### WASService.exe command syntax for stopping a running service

The command syntax is as follows:

```
WASService.exe -stop service_name
```

### WASService.exe command syntax for retrieving service status

The command syntax is as follows:

```
WASService.exe -status service_name
```

## Parameters

Supported arguments include:

- add** *service\_name*  
Creates a service named *service\_name*.
- configRoot** *configuration\_repository\_directory*  
Optional parameter that identifies the configuration directory of the installation root directory of a WebSphere Application Server product.
- logFile** *service\_log\_file*  
Optional parameter that identifies a log file that the **WASService** command uses to record its activity.
- logRoot** *server\_log\_directory*  
Optional parameter that identifies a wsinstance server log directory that the **WASService** command uses to determine if the server is running.
- remove** *service\_name*  
Deletes the specified service.
- restart true | false**  
Restarts the existing service automatically if the service fails when set to true.
- server** *Server\_name*  
Identifies the server that the service controls.
- start** *service\_name*  
Starts the existing service. The **-start** parameter is the default parameter; you can omit the **-start** parameter and still start the service.
- startArgs** *additional\_start\_arguments*  
Optional parameter that identifies additional parameters.
- status** *service\_name*  
Returns the current status of the service, which includes whether the service is running or stopped.
- stop** *service\_name*  
Stops the specified service.
- stopArgs** *additional\_stop\_arguments*  
Optional parameter that identifies additional parameters.
- userid** *execution\_ID* **-password** *password*  
Optional parameters that identify a privileged user ID and password.
- userScript** *path\setupCmdLine.bat*  
Optional parameter that identifies the **setupCmdLine.bat** command file that the **WASService** command uses to understand wsinstance nodes.
- wasHome** *install\_root*  
Optional parameter that identifies the installation root directory of the WebSphere Application Server product.

## Creating a deployment manager service

This example creates a service called *IBMWAS5Service - dmgr* that starts the dmgr process:

```
WASService -add dmgr
  -servername dmgr
  -wasHome "D:\Program Files\WebSphere\DeploymentManager"
  -logfile "D:\Program Files\WebSphere\DeploymentManager\logs\dmgr\startServer.log"
  -logRoot "D:\Program Files\WebSphere\DeploymentManager\logs\dmgr"
  -restart true
```

## Creating a node agent service

This example creates a service called *IBMWAS5Service - nodeagent* that starts the nodeagent process:

```
WASService -add nodeagent
            -servername nodeagent
            -wasHome "D:\Program Files\WebSphere\AppServer"
            -logfile "D:\Program Files\WebSphere\AppServer\logs\nodeagent\startServer.log"
            -logRoot "D:\Program Files\WebSphere\AppServer\logs\nodeagent"
            -restart true
```

## Creating an Application Server service

This example creates a service called *IBMWAS5Service - server2* that starts an Application Server process:

```
WASService -add server2
            -servername server2
            -wasHome "D:\Program Files\WebSphere\AppServer"
            -logfile "D:\Program Files\WebSphere\AppServer\logs\server2\startServer.log"
            -logRoot "D:\Program Files\WebSphere\AppServer\logs\server2"
            -restart true
```

## Example of successful result

```
C:\install_root\bin> WASService -add testserver1 -serverName server1
```

```
Adding Service: testserver1
Config Root: C:\WebSphere\AppServer\config
Server Name: server1
Was Home: C:\WebSphere\AppServer\
Start Args:
Restart: 1
IBM WebSphere Application Server V5 - testserver1 service successfully added.
```

## Example result when the user ID does not have the proper authorization

```
WASService -add "NodeAgent" -serverName nodeAgent -username websphereadm -password pass1
```

```
Adding Service: NodeAgent
Config Root: C:\WebSphere\AppServer\config
Server Name: nodeAgent
Was Home: C:\WebSphere\AppServer\
Start Args: -username websphereadm -password pass1
Restart: 1
Failed to add service: 1057
```

To correct this problem, grant the user ID the proper authorization and advanced user rights.

---

## firststeps command

The **firststeps** command starts the First Steps tool.

First Steps is a post-installation ease-of-use tool for directing WebSphere Application Server elements from one place. Options dynamically appear on the First Steps panel, depending on features you install. With all options present, you can use First Steps to start or stop the Application Server, verify the installation, access the information center, access the administrative console, access the Samples Gallery, or launch the product registration.

First Steps starts automatically at the end of the installation. If it is not running, start First Steps from the command line:

## Location of the command file

- 5.1 +** Beginning with V5.1, the location of the `firststeps.sh` or `firststeps.bat` script is:
- On Linux and UNIX-based server platforms: `install_root/firststeps/firststeps.sh`
  - On Windows platforms: `install_root\firststeps\firststeps.bat`

## Parameters

No parameters are associated with this command.

## Syntax for the `firststeps` command on a Linux or UNIX-based platform

The command syntax is as follows:

```
./firststeps.sh
```

## Syntax for the `firststeps` command on a Windows platform

The command syntax is as follows:

```
firststeps.bat
```

## Usage tips

If this is the first time you have used the First Steps panel since installing the product, click **Verify installation** to make sure that all is well with your installation. The verification process starts the server for you. Do not select the **Start the server** option at the same time that the installation verification test (IVT) is running. There is a known problem if you select the **Start the server** option at the same time that the IVT is running.

After selecting the **Start the server** option, an output screen displays with status messages. The success message informs you that the server is open for business. Then the menu item changes to **Stop the server**.

Do not select any other options from the First Steps panel after selecting the **Start the server** option. There is a known problem that prevents the proper operation of the installation verification test when you select the **Verify Installation** option after selecting the **Start the server** option. Stop the server before verifying the installation.

The installation verification test is not supported on node names that contain double-byte characters. See “Troubleshooting the installation” on page 214 for more information.

The Web administrative console is a configuration editor that runs in a Web browser. The administrative console lets you work with Application Server configuration files encoded in XML. Changes made using the administrative console take effect the next time you start the Application Server. To launch the administrative console, click **Administrative console**. You can also point your browser to `http://your_host_name:9090/admin` to start the administrative console. Substitute your own host name in the address. As the administrative console opens, it prompts you for a login name. This is not a security item, but merely a tag that allows you to identify configuration changes you make during the session.

From the First Steps menu, click on **Samples gallery** to explore the sample applications. Alternatively you can point your browser directly to `http://DNS_host_name:9090/WSsamples`. This command is case sensitive. Substitute your own host name in the address.

**5.1 +** If the Mozilla browser is your default browser, some of the links on the First Steps panel do not work. If you cannot use the First Steps panel, launch the links directly from your browser.

You can also try a symbolic link to the Mozilla browser to fix the problem as shown in the following example:

```
ln -sf /usr/bin/mozilla /usr/bin/netscape
```

**5.1+** Links on the First Steps panel for the base WebSphere Application Server product:

## Button Link

### Product Overview

<http://www.ibm.com/software/webservers/appserv/>

It is possible that your security options might prevent redirection, such as to the <http://www-306.ibm.com/software/info1/websphere/index.jsp?tab=products/appserv> Web site. If so, you can identify the IBM Web site as a trusted site to allow the redirection. For example, on Internet Explorer, add <http://www-306.ibm.com> to the list of Trusted Sites by selecting **Tools > Internet Options > Security (tab) > Trusted Sites**.

### WebSphere information center

<http://publib.boulder.ibm.com/infocenter/ws51help/index.jsp>

### Samples Gallery

<http://localhost:9080/WSsamples>

Use the HTTP transport port if you changed the port setting during installation.

If you do not install Samples this option does not appear on the First Steps panel.

There is a known problem with this option if you do not install Samples during the initial installation of the base product. If you install Samples later in an incremental installation, such as when installing Samples during the installation of WebSphere Business Integration Server Foundation, the option is not added to the panel. If you install Samples in an incremental installation, use the link in this description to access the Samples.

Change the First Steps port number for the Samples option to match the port number in a coexistence scenario. See “Default coexistence settings for port numbers” on page 373.

If you choose the coexistence option during installation, edit the Samples address to make it comply with the new port value for the HTTP transport port. Manually edit the port number when First Steps attempts to open the page. Change the port to match the coexistence port number for the HTTP transport port. The following example shows how to change the address to the default coexistence port number for the HTTP transport port:

```
http://localhost:9085/WSsamples
```

### Administrative Console

<http://localhost:9090/admin>

Change the First Steps port number for the administrative console option to match the port number in a coexistence scenario. See “Default coexistence settings for port numbers” on page 373.

Edit the administrative console address when First Steps attempts to open the administrative console Web address. Change the port to match the coexistence port number for the administrative console port. The following example shows how to change the address to the default coexistence port number for the administrative console port:

```
http://localhost:9091/admin
```

## Viewing the registration page in other languages

The **Register the product** entry on the First Steps menu displays the default welcome page in English.

### Register the product

```
install_root/prt/PRT>Welcome.html
```



To view other language versions of the page, browse the PRT directory to select a version. Use the last three letters before the .html extension of the file name to identify the language. For example, the following versions are included:

- German: PRT\_Welcome\_deu.html
- Spanish: PRT\_Welcome\_esp.html
- French: PRT\_Welcome\_fra.html
- Italian: PRT\_Welcome\_ita.html
- Portuguese: PRT\_Welcome\_ptb.html

---

## Using the installation verification test

After installing the product, you are ready to use the installation verification test (IVT).

After installing the base product during an umbrella installation, you are ready to use the installation verification test (IVT).

The IVT program scans product log files for errors and verifies core functionality of the product installation.

1. If you started the administrative server of a previous WebSphere Application Server product from V3.5.x and later, or V4.0.x or later, to let the installation wizard export its configuration and applications to Version 5, stop the server before running the IVT. Otherwise, the Version 5 server might not start due to port conflicts between the two servers.
2. Select **Verify Installation** from the First Steps panel and observe the results in the First Steps status window. A log file for the installation is created and stored in the logs directory with the name of `ivt.log`. Do not select any other options from the First Steps panel after selecting **Verify Installation** and while the IVT is running. There is a known problem if you select the **Start the server** option at the same time that the IVT is running.
3. If the First Steps tool is not running, start it from the `/bin/firststeps` directory.
  - On Linux and UNIX-based server platforms: `install_root/firststeps/firststeps.sh`
  - On Windows platforms: `install_root\firststeps\firststeps.bat`

You can also run First Steps from the Start Menu on Windows platforms.

4. You can also start the IVT tool from the `/bin` directory.
  - On Linux and UNIX-based platforms: `./ivt.sh`
  - On Windows platforms: `ivt`

The IVT program starts the server automatically if the server is not running. Once the server initializes, the IVT runs a series of verification tests and reports pass or fail status in a console window. It also logs results to the `install_root/logs/ivt.log` file. As the IVT verifies your system, it reports any errors it detects.

### ivt command

The `ivt` command starts the installation verification test (IVT) program.

The IVT program starts the Application Server process automatically if the process is not already running. Once the process initializes, the IVT runs a series of verification tests and reports pass or fail status in a console window.

The IVT program scans product log files for errors and verifies core functionality of the product installation.

You can start the IVT program from the command line or from the First Steps menu.

The installation verification test is not supported on node names that contain double-byte characters.

## Location of the command file

The command file is a script. On Linux and UNIX platforms, the command file is named `ivt.sh` in the `install_root/bin` directory. On Windows platforms, the command file is named `ivt.bat` in the `install_root\bin` directory.

## Parameters

No parameters are associated with this command.

## Syntax for the `ivt` command on a Linux or UNIX-based platform

The command syntax is:

```
ivt.sh
```

Issue the command from the `install_root/bin` directory.

## Syntax for the `ivt` command on a Windows platform

The command syntax is:

```
ivt.bat
```

Issue the command from the `install_root\bin` directory.

## Logging

The `ivt` command logs results to the `install_root/logs/ivt.log` file.

---

## Troubleshooting the installation

If you did not receive the *Successful installation* message or the *INSTFIN: The installation is complete.* line in the installation log, use this information to troubleshoot the installation.

1. Install the base product first before installing the Network Deployment product when installing both products on the same machine. Install the base product before installing the Network Deployment product when installing both products on the same machine. The embedded messaging feature is included in the default installation.

Table 48. Installation tip

| Operating platform | Tip   |
|--------------------|---|
| All platforms      | Installing WebSphere Application Server products in order on the same machine, when installing the embedded messaging component |

2. To manage multiple base product Application Servers, install the Network Deployment product. The WebSphere Application Server, Version 5.x product does not provide centralized management of multiple servers. The WebSphere Application Server Network Deployment, Version 5.x product provides this function.  
The deployment manager process (`dmgr`) in the Network Deployment product manages a cell of Application Servers. You can federate a base Application Server into the cell or unfederate it. While federated, the configuration of the base Application Server is managed from the deployment manager.
3. Use the First Steps tool to run the installation verification test (IVT). Select **Verify installation**. Check the `install_root\logs\ivt.log` file for a summary of test results. Correct any errors and retry. The installation wizard automatically starts the First Steps tool at the end of installation.
4. Check the installation log files for errors after installing:

During installation, a single entry in the `install_root/logs/log.txt` file points to the temporary log file, either `%TEMP%\log.txt` on Windows platforms, or `/tmp/log.txt` on Linux and UNIX-based platforms. The installation program copies the file from the temporary directory to the `install_dir/logs/log.txt` location at the end of the installation. In cases where the installation fails and the `install_dir/logs/log.txt` has only this one entry to the temporary directory, open the `logs.txt` file in the temporary directory for clues to the installation failure. Uninstalling creates the `install_root/logs/uninstlog.txt` file.

The following table shows the installation log locations when installing the application clients for Version 5.1. The location is fixed and might not agree with the installation root location if you specified a location during installation.

Table 49. Installation log locations when installing the WebSphere Application Server Application Clients

| Windows system log path name                                     | Linux and UNIX-based operating system log path name  |
|--|--|
| C:\Program Files\WebSphere\AppClient\logs\WAS.Client.install.log | /opt/WebSphere/AppClient/logs/WAS.Client.install.log |

Table 50. Installation log locations when installing WebSphere Application Server

| Component  | Installation log path name                   |  |
|--|--|--|
|  | Windows system temp directory                | Linux and UNIX-based operating system: /tmp/                     |
| Embedded messaging feature (based on WebSphere MQ) prerequisites error log |  | mq_prereq.log  |
| Component  | Windows platforms: <i>install_root\logs\</i> | Linux and UNIX-based operating system: <i>install_root/logs/</i> |
| WebSphere Application Server   | log.txt<br>uninstlog.txt                     |  |
| IBM HTTP Server  |  | ihs_log.txt  |
| Embedded messaging feature (based on WebSphere MQ) installation log        |  | mq_install.log   |
| Embedded messaging feature (based on WebSphere MQ) configuration log       |  | createMQ.node.server1.log  |
| Default application  |  | installDefaultApplication.log                                    |
| Samples Gallery  |  | installSamples.log   |
| Administrative console   |  | installAdminConsole.log  |
| Migration tools  |  | WASPostUpgrade.log   |

**5.1+** If the installation program cannot locate the `WAS_update` directory from disk 2, the installation program fails immediately. The immediate failure leaves the `WAS.WBISF.install.log` file only in the `/tmp` directory (or in the system `%TEMP%` directory on Windows platforms). Normally, the installation program creates installation logs in the `install_root/logs` directory. In some instances, such as the one where the `WAS_update` directory does not exist, the installation program fails before it can copy the log files from the system temporary directory to the `/logs` directory. If you cannot find the installation log files in the `install_root/logs` directory, look in the system temporary directory.

- See if there are files in the `install_root/classes` directory. When IBM Support queues work for you and provides you test or debugging fixes, you are supposed to place the fixes in the `install_root/classes` directory. By default, the `install_root/classes` directory is picked up first in the WebSphere Application Server class path to let it override other classes.

This directory lets you verify or debug a fix. After accepting the test fix or finishing with the debugging of the debug fix, you are supposed to delete the fix from the *install\_root/classes* directory to return the system to a working state. If you do not remove such fixes from the *install\_root/classes* directory, you can experience errors.

6. Turn on tracing if the installation logs do not contain enough information to determine the cause of the problem.

- Report the `stdout` and `stderr` logs to the console window, by adding the `-is:javaconsole` parameter to the **install** command:

- **5.1+** On Linux and UNIX-based platforms:

```
install -is:javaconsole
```

or capture the stream to a file with the following commands:

```
install -is:javaconsole > captureFileName.txt 2>&1
```

- On Windows platforms:

```
Install.exe -is:javaconsole
```

or capture the stream to a file with the following commands:

```
Install.exe -is:javaconsole > drive:\captureFileName.txt
```

- Capture additional information to a log of your choice with the `-is:log filename` option.
- Turn on additional installation logging by passing the `-W Setup.product.install.logAllEvents="true"` parameter to the **install** command:

- **5.1+** On Linux and UNIX-based platforms:

```
install -W Setup.product.install.logAllEvents="true"
```

- On Windows platforms:

```
Install.exe -W Setup.product.install.logAllEvents="true"
```

If you install on an AIX 5.1 system, with maintenance level 2, it is possible that the Web-based system manager, a standard component of AIX systems, already uses port 9090. When starting the server you get information that port 9090 is already in use. To resolve the conflicting port use, change the port assignment for the `HTTP_TRANSPORT_ADMIN` port in the `server.xml` file. The file path is:

```
usr/websphere/appserver/config/cells  
/cell/nodes/node/servers/server1/server.xml
```

7. Use the First Steps tool or the command line method to start the Application Server. **To start the server from the command line:**

- On Linux and UNIX-based platforms: `install_root/bin/startServer.sh server1`
- On Windows platforms: `install_root\bin\startServer server1`

If you enable security, specify the `-user` and the `-password` parameters of the command.

8. Verify whether the server starts and loads properly, by looking for a running Java process and the *Open for e-business* message in the `SystemOut.log` and `SystemErr.log` files. If no Java process exists or if the message does not appear, examine the same logs for any miscellaneous errors. Correct any errors and retry. You can find the `SystemOut.log` and `SystemErr.log` files in the *install\_root/logs/server1* (Linux and UNIX-based platforms) or *install\_root\logs\server1* (Windows platforms) directory.
9. Refer to the plug-in configuration documentation, if you have installed plug-ins and the Web server does not come up properly.
10. Start the Snoop servlet.
  - a. Start the Application Server.
  - b. Start the IBM HTTP Server or the Web server that you are using. Use a command window to change the directory to the IBM HTTP Server installed image, or to the installed image of your Web server. Issue the appropriate command to start the Web server, such as these commands for IBM HTTP Server:

**To start the IBM HTTP Server from the command line:** Access the **apache** and **apachectl** commands in the *IBMHttpServer/bin* directory.

- On Linux and UNIX-based platforms: `./apachectl start`
  - On Windows platforms: `apache`
- c. Point your browser to `http://localhost:9090/snoop` to test the internal HTTP transport provided by the Application Server. Point your browser to `http://localhost/snoop` to test the Web server plug-in.
  - d. Verify that Snoop is running. Either Web address should display the Snoop Servlet - Request/Client Information page.
11. Start the WebSphere Application Server administrative console.
- a. Start the Application Server.
  - b. Point your browser to `http://localhost:9090/admin`.
  - c. Type any ID and click **OK** at the administrative console window.
- The server starts. The administrative console starts. You can access the administrative console through the browser. The administrative console accepts your login.
12. Resolve any IP address caching problems.

By default, the Java 2 SDK caches the IP address for the domain name service (DNS) naming lookup. After resolving the host name successfully, the IP address stays in the cache. By default, the cache entry remains forever. This default IP caching mechanism can cause problems, as described in the following problem scenarios.

#### **Problem scenario 1**

Suppose the Application Server at `host1.ibm.com` has an initial IP address of `1.2.3.4`. When a client at `host2.ibm.com` conducts a DNS lookup of `host1.ibm.com`, the client stores the `1.2.3.4` address in the cache. Subsequent DNS name lookups return the cached value, `1.2.3.4`. The cached value is not a problem until the `host1.ibm.com` IP address changes, to `5.6.7.8`, for example. The client at `host2.ibm.com` does not retrieve the current IP address, but always retrieves the previous address from the cache. If this scenario occurs, the client cannot reach `host1.ibm.com` unless you stop and restart the client process.

#### **Problem scenario 2**

Suppose the Application Server at `host1.ibm.com` has an initial IP address of `1.2.4.5`. Although the IP address of the application server does not change, a network outage can record an exception code as the IP address in the cache, where it remains until the client is restarted on a working network. For example, if the client at `host2.ibm.com` disconnects from the network because of an unplugged cable, the disconnected lookup of the Application Server at `host1.ibm.com` fails. The failure causes the IBM Developer Kit to put the special exception code entry into the IP address cache. Subsequent DNS name lookups return the exception code, which is `java.net.UnknownHostException`.

#### **Using the IP address cache setting**

You can always stop and restart a deployment manager process to refresh its IP address cache. However, this process might be expensive or inappropriate.

The `networkaddress.cache.ttl` (public, JDK1.4) and `sun.net.inetaddr.ttl` (private, JDK1.3) parameters control IP caching. The value is an integer that specifies the number of seconds to cache IP addresses. The default value, `-1`, specifies to cache forever. A value of `0` specifies to never cache.

Using a zero value is not recommended for normal operation. If you do not anticipate network outages or changes in IP addresses, use the cache forever setting. The never caching setting introduces the potential for DNS spoofing attacks.

#### **For more information about the Java 2 SDK**

The Java 2 SDK, Standard Edition 1.4 Web site at <http://java.sun.com/j2se/1.4/docs/guide/net/properties.html> describes the private `sun.net.inetaddr.ttl` property, which works in both Java 2 SDK, Standard Edition 1.3 (WebSphere Application Server V5.0.0, V5.0.1, and V5.0.2) and Java 2 SDK, Standard Edition 1.4 (WebSphere Application Server

V5.1). The *Networking* section of the Java 2 SDK, Standard Edition 1.4 Web site at <http://java.sun.com/j2se/1.4.1/jcp/beta/> describes a change in the behavior of the `java.net.URLConnection` class.

13. Avoid segmentation faults when installing on Red Hat Enterprise Linux 3.0 U1.

If you are installing from an operator console attached to the RHEL 3 U1 machine and you receive a message that is similar to the following message, you might be experiencing a known limitation of RHEL 3 U1:

```
A suitable JVM could not be found
```

Red Hat Enterprise Linux 3.0 causes a segmentation fault when calling the JVM. The problem occurs when you run the installation program, log off of the root user, log back on to root, and run the installation again on the operator console that is attached to the machine (not a telnet session).

The installation fails with a segmentation fault.

This is a known limitation of Red Hat Enterprise Linux V3.0 that causes a segmentation fault when calling the JVM.

Test the JVM to see if it is failing by running the following command:

```
/mnt/cdrom/platform/linuxi386/jdk/java/jre/bin/java -version
```

If you receive a "segmentation fault" message, reboot your machine or press Ctrl-x to reinstall. Rebooting the machine or pressing Ctrl-x resolves the problem.

14. Preserve symbolic links when copying product CDs to network file server (NFS) disks. When copying a CD for one operating system platform to a network file system (NFS) disk on another type of operating system using the `cp` command, you can encounter errors such as those in the following example:

```
a file is bad
no such file or directory exists
libcSup.2 cannot be accessed
```

The copy error occur when incorrectly copying symbolic link files.

An example of such an error occurs when copying an HP-UX CD image onto an AIX platform with the **cp -frp** command. The default `cp` command behavior on AIX is to resolve the symbolic links by copying the files to which the symbolic links point. Errors occur when a symbolic link resolves to a platform-specific library or file that is not present on the NFS operating system.

Use options on the copy command of the NFS system to copy symbolic links instead of resolving them. For example, the `-h` option on the `cp` command of the AIX platform copies symbolic links from the HP-UX CD to the NFS disk on the AIX platform.

Even with the `-h` option, the **cp** command on a Solaris platform does not preserve symbolic links when copying an HP-UX disk. On a Solaris platform, use the **tar -cvf** command to copy data from an HP-UX disk and preserve the symbolic links:

- a. Insert disk 2 for HP-UX platforms into the drive on the Solaris system.
- b. Close the file explorer window if one opens.
- c. Open a command window.
- d. Change directories:

```
CD /cdrom/cdrom0
```
- e. Issue the following command:

```
tar cvf * /workarea/filename.tar
```
- f. Change directories:

```
CD /workarea
```
- g. Issue the following command:

```
tar -xvf filename.tar
```

Consult the man page for the copy command on the NFS system to understand how the platform supports copying symbolic links.

15. Pick up secondary user groups for root before installing the embedded messaging feature.



On many systems, such as SuSe Linux, if you telnet and issue the **id** command or the **groups** command, you cannot see the groups **mqm** or **mqbrkrs** even though they might exist. Solve this problem in one of two ways:

- Use the **ssh** command to log in
- Issue the **su -** command

After using one of the commands, verify the required groups with the **id** command or the **groups** command.

In a normal root login, issue the **su** command. For a real root login, issue the **su -** command.

Display settings for a normal root login are automatic. For a real root login, you must set your display environment properly to successfully view the GUI installation wizard. Otherwise, you see a message about Preparing Java(tm) Virtual Machine... and seven rows of dots, but no installation GUI and no further messages. Refer to the documentation for your platform to determine proper display settings.

If you see the following messages in the SystemOut.log file, you have not picked up the required secondary groups for root:

```
[date time CDT] 60cf2faf JMSRegistrati
  A MSGS0601I: WebSphere Embedded Messaging has not been installed
[date time CDT] 60cf2faf JMSEmbeddedPr A MSGS0050I:
  Starting the Queue Manager
[date time CDT] 60cf2faf JMSEmbeddedPr E MSGS0058E:
  Unable to start the JMS Server as WebSphere Embedded Messaging has not been installed
[date time CDT] 60cf2faf JMSService    E MSGS0001E:
  Starting the JMS Server failed with exception:
  java.lang.Exception: MSGS0058E:
    Unable to start the JMS Server as
      WebSphere Embedded Messaging has not been installed
```

Also, the following associated messages are added to the `mq_install.log` file:

```
wmsetup: date time Checking if user "root" is in group "mqm"
wmsetup: date time
wmsetup: date time ERROR: Group "mqm" exists, id "root" is
  defined to the group but does not
wmsetup: date time have the group in its current set of effective groups.
wmsetup: date time Current group membership is :
wmsetup: date time uid=0(root) gid=0(system) groups=2(bin)
wmsetup: date time You may need to login.
wmsetup: date time
wmsetup: date time ... RC 4 from Check_root
wmsetup: date time ERROR: User "root" not in group "mqm"
wmsetup: date time Check_root mqbrkrs
wmsetup: date time Checking for group "mqbrkrs" ...
wmsetup: date time lsgroup returned "mqbrkrs id=203
  admin=false users=root adms=root registry=files " RC=0
wmsetup: date time Checking if user "root" is in group "mqbrkrs"
wmsetup: date time
wmsetup: date time ERROR: Group "mqbrkrs" exists, id "root" is
  defined to the group but does not
wmsetup: date time have the group in its current set of effective groups.
wmsetup: date time Current group membership is :
wmsetup: date time uid=0(root) gid=0(system) groups=2(bin)
wmsetup: date time You may need to login.
wmsetup: date time
wmsetup: date time ... RC 4 from Check_root
wmsetup: date time ERROR: User "root" not in group "mqbrkrs"
```

16. Do not use the installation verification test (IVT) from the First Steps program or by running the **ivt.sh** command (or the **ivt.bat** command on a Windows platform) if the node name contains double-byte characters. The installation verification test is not supported on node names that contain double-byte characters. You can receive an error that is similar to the following example:

```
java.lang.reflect.InvocationTargetException
  at sun.reflect.NativeMethodAccessorImpl.invoke0(Native Method)
  at sun.reflect.NativeMethodAccessorImpl.invoke(NativeMethodAccessorImpl.java:79)
```

```
at sun.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorImpl.java:41)
at java.lang.reflect.Method.invoke(Method.java:386)
at com.ibm.ws.bootstrap.WSLauncher.main(WSLauncher.java:94)Caused
  by: java.lang.NumberFormatException: For input string: ""
at java.lang.NumberFormatException.forInputString(NumberFormatException.java:62)
at java.lang.Integer.parseInt(Integer.java:469)
at java.lang.Integer.parseInt(Integer.java:498)
at com.ibm.websphere.ivt.client.ivtClient.main(Unknown Source)
...

```

17. Starting the Launchpad program for WebSphere Application Server clients, Version 5.1 using the Konqueror file in the K Desktop Environment on SuSE Linux Enterprise Server (SLES) causes an error.

When starting the Launchpad program for WebSphere Application Server clients, Version 5.1 using the Konqueror file manager in the K Desktop Environment (KDE) on Linux systems, a "Couldn't find the program launchpad.sh" error occurs.

Because the **launchpad.sh** command uses a relative path to locate the Java program, you should run the **launchpad.sh** command from the directory where the **launchpad.sh** command is located for the client program. When using the Konqueror file manager to issue the **launchpad.sh** command, the current directory is your home directory. Therefore, the **launchpad.sh** command cannot work.

You can troubleshoot the installation.

The Troubleshooting or problem determination contains more detailed debugging and reporting instructions. See Installation component troubleshooting tips for more information about troubleshooting the installation.

For current information available from IBM Support on known problems and their resolution, see the IBM Support page.

IBM Support has documents that can save you time gathering information needed to resolve this problem. Before opening a PMR, see the IBM Support page.

---

## Creating multiple Version 5 configuration instances

*Multiple configuration instances*, as it applies to WebSphere Application Server products, is the ability to install the base WebSphere Application Server product once, and to use the **wsinstance** command to create multiple instances of the initial installation, all running on the same machine at the same time.

In contrast to multiple configuration instances is *coexistence*, which refers to multiple *installations* of WebSphere Application Server, running on the same machine at the same time. Both coexistence and multiple configuration instances of the base WebSphere Application Server product imply various combinations of Web server interaction.

You can find a description of coexistence in "Migrating and coexisting" on page 326.

You can install the base WebSphere Application Server product one time and use the **wsinstance** tool in the `install_root\bin\wsinstance` folder to create multiple configuration instances. Each WebSphere Application Server configuration instance is a stand-alone instance with a unique name, and its own set of configuration files and user data folders. Configuration folders include `config`, `etc` and `properties`. User data folders include `installedApps`, `installableApps`, `temp`, `logs`, `tranlog` and `wstemp`. Each instance has the administrative console application to manage the configuration instance. The configuration instance shares all run-time scripts, libraries, the Software Development Kit, and other files with the initial Application Server.

You can configure and operate each configuration instance independently of other instances.

These limitations apply to multiple configuration instances:

- You cannot use the **Uninstall.exe** or **uninstall** command to remove a configuration instance. You must remove configuration instances with the **-delete** option of the **wsinstance** command, before uninstalling the installation instance.
- You cannot migrate the configuration and applications from an earlier release to a Version 5 configuration instance.

Reasons to use configuration instances include:

- You install the product only once.
- You can have stand-alone environments without the space or procedural constraints of multiple, full product installations. (Configuration instances use a minimal amount of space.)
- You can have a centralized development environment that is easy to maintain, where multiple developers and testers share one machine.
- You can create identical environments, where everyone is developing, testing, or performing in an identical workspace.

Use the following procedure to create and configure multiple V5 instances:

1. Install the base WebSphere Application Server product.
2. Back up the *install\_root/bin/wsinstance/configdefaults* directory. In certain situations, it might become necessary to restore the following files from the backup to the *install\_root/bin/wsinstance/configdefaults* directory:

- *./security.xml*
- *./nodes/\$NODE\_NAME/resources.xml*
- *./nodes/\$NODE\_NAME/serverindex.xml*
- *./nodes/\$NODE\_NAME/servers/\$SERVER\_NAME/resources.xml*

See the description of a possible error that can occur for more information.

3. Use the **wsinstance** command in the *WAS\_HOME/bin/wsinstance* folder, to create a configuration instance of the server you installed in step 1. Refer to the description of the **wsinstance** command to learn more about the command, and to see examples of use.

You must specify a unique directory path and a unique node name for each configuration instance.

You must also specify unique port numbers for each configuration instance. For example, on a Windows platform, specify ports beginning at 20002, for node shasti, in configuration instance\_root G:\shasti\WebSphere, on the planetjava machine, by issuing this command:

```
wsinstance.bat -name shasti
                -path G:\shasti\WebSphere
                -host planetjava
                -startingPort 20002
                -create
```

This command creates a separate set of configuration and other data files.

4. Source the **setupCmdLine.sh** (or run the **setupCmdLine.bat**) script in the *bin* directory of the *instance\_root* folder to set the WebSphere Application Server environment to the configuration instance.

Or you can set **WAS\_USER\_SCRIPT** to *instance\_root/bin/setupCmdLine.bat*, which has the same effect as sourcing the *setupCmdLine.sh* script or running the *setupCmdLine.bat* script.

On Linux and UNIX-based platforms, *sourcing* the script to the parent shell allows child processes to inherit the exported variables. Source the command by using the following format:

```
# ./setupCmdLine.sh (there is a space between the period and the slash)
```

The format varies per platform:

- *install\_root/bin/setupCmdLine.sh* (source the command on UNIX platforms - There is a space between the period and the installation root directory.)
- `source install_root/bin/setupCmdLine.sh` (source the command on Linux platforms )
- *install\_root\bin\setupCmdLine.bat* (Windows platforms only)

Or, you can set `WAS_USER_SCRIPT` to `instance_root/bin/setupCmdLine.sh`, which has the same effect as sourcing the **setupCmdLine** command. For example:

```
# export WAS_USER_SCRIPT=/opt/inst1/bin/setupCmdLine.sh
```

After completing this step, you can start the application server configuration instance with the **startManager** or **startServer** command.

If you are using the embedded messaging feature, and you are logging on as a non-root user on a UNIX-based or Linux platform, you must add the `mqm` user and the `root` user to the `mqm` and `mqbrkr` operating system groups, as described in the Installing WebSphere embedded messaging as the JMS provider topic.

You must download and apply any interim fixes for the embedded messaging feature to each configuration instance:

- Download interim fixes for the embedded messaging feature from the WebSphere MQ Service download site. The readme file that is bundled with the interim fix describes how to install the interim fix.
- Download any fix packs for the product from the IBM Support site for WebSphere Application Server. The readme file that is bundled with the fix pack describes how to use the update installer (also known as the `updateInstaller` program or the update installation wizard) for WebSphere Application Server products to install the fix pack. Installing a fix pack removes all interim fixes. You might have to reinstall interim fixes that are not in the fix pack to bring the embedded messaging feature back to the fix level you require.

#### 5. Associate a Web server with a configuration instance.

If you create multiple configuration instances of the base WebSphere Application Server product, you can configure each instance to either share a Web server with other configuration instances, or to use a separate Web server.

- **Share the Web server**

- a. Generate a `plugin-cfg.xml` configuration file for each application server configuration instance that is to share a Web server.
- b. Manually merge all `plugin-cfg.xml` configuration files into one file of the same name, `plugin-cfg.xml`. Put the file in the default folder for the first configuration instance, such as:

```
instance_root/WebSphere/AppServer/config/cells/plugin-cfg.xml
```

If you use the same server name in multiple instances, (for example, suppose there are two `server1` entries), the merged file has duplicate entries that you must address. All requests for either `server1` instance are routed to the last one in the merged list.

To correct the problem, change duplicate server name entries to make them unique in the `PrimaryServers` stanza:

```
<PrimaryServers>
  <Server Name="server1"/>
  <Server Name="server1a"/>
</PrimaryServers>
```

Change each duplicate name in the merged file to match its unique name in the `PrimaryServers` stanza.

Three tips to follow when merging the files are:

- There should be only one instance of the tags `Config` and `Log`.
  - The properties `"keyring"` and `"stashfile"` should use the same location for all application servers in the merged file.
  - Combine all other tags from both files, so long as the tags do not have duplicate names.
- c. Edit the Web server configuration file on the Web server, as described in the *Configuring Web server plug-ins* topic, to point to the `plugin-cfg.xml` file.

Repeat this process to add or remove a configuration instance from the configuration that shares the Web server, or when you regenerate a plug-in configuration file for any configuration instance in the group.

- **Use a separate Web server**

This configuration is simple. Each application server configuration instance uses a different Web server.

- a. Use the Web server documentation to create a new Web server instance for each configuration instance.

For example, to install multiple images of the IBM HTTP Server:

- 1) Use the **InstallIHS** command script in the IHS directory on the product CD to install IBM HTTP Server for a second or later instance.
- 2) Install the multiple installation instance to a new directory.
- 3) Set a unique port for each multiple instance by editing the "port" directive in the `conf/httpd.conf` file in the IBM HTTP Server installation root.
- 4) Download and apply any interim fixes to each multiple instance of the IBM HTTP Server from the IBM Support site for IBM HTTP Server. The readme file that is bundled with the interim fix describes how to install the interim fix.
- 5) Download any fix packs for the product from the IBM Support site for WebSphere Application Server. The readme file that is bundled with the fix pack describes how to use the update installer for WebSphere Application Server products to install the fix pack to each multiple instance of the IBM HTTP Server using the silent interface of the WebSphere Application Server update installer:

```
updateSilent -ihsOnly -install -ihsInstallDir directory
```

Installing a fix pack removes all interim fixes except those installed for the IBM HTTP Server feature (or the embedded messaging feature). The fix pack includes all interim fix changes up to the point of the fix pack. You might have to reinstall interim fixes that are more current than the fix pack to bring the HTTP Server back to the fix level you require.

- 6) Copy the current binary plug-in from the `install_root\bin` directory of the WebSphere Application Server product, to the HTTP Server machine and update the `LoadModule` directive in the `httpd.conf` file accordingly.
  - 7) Copy the `plugin-cfg.xml` file from the `install_root\config\cells` directory of the WebSphere Application Server product, to the HTTP Server machine and update the `WebSpherePluginConfig` directive in the `httpd.conf` file accordingly.
- b. Modify the Web server configuration file, such as the `httpd.conf` file for IBM HTTP Server, to point to the configuration instance.
    - 1) Specify the location of the WebSphere Application Server plug-in binary program. For example, when you install a plug-in feature, the installation wizard installs the plug-in binary program in the `install_root/bin` folder.
    - 2) Specify the location of the `plugin-cfg.xml` file of the configuration instance. This file is located in the `config/cells` or `config\cells` folder of the configuration instance root location.
6. Create additional servers in a multiple instance or coexistence environment.
  7. Change port assignments in configuration files if you have a node that you cannot start because of port conflicts.

Refer to the description of the `wsinstance` command to learn more about the command, and to see examples of use.

## **wsinstance command**

The **wsinstance** command creates multiple configuration instances of one initial installation of the product.

### **Overview**

The `wsinstance` script is based on the base product ANT Utilities feature, which is required.

Each WebSphere Application Server configuration instance is a stand-alone instance with a unique name and its own set of configuration files and user data folders. Configuration folders include `config`, etc and

properties. User data folders include `installedApps`, `installableApps`, `temp`, `logs`, `tranlog` and `wstemp`. Each configuration instance also has the administrative console application to manage the configuration instance. Each configuration instance shares all run-time scripts, libraries, the Software Development Kit, and other files with the initial Application Server.

## Location of command file

The command file is located in the `install_root/bin/wsinstance` directory. The command file is a script named `wsinstance.sh` for Linux and UNIX-based platforms or `wsinstance.bat` for Windows platforms.

## wsinstance.sh command syntax for Linux and UNIX-based platforms

The command syntax is as follows:

```
wsinstance.sh -name instanceName
              -path instanceLocation
              -host hostName
              [-startingPort startingPort]
              [-readOnly]
              -create|-delete
              [-debug]
```

## wsinstance.sh command syntax for Windows platforms

```
wsinstance.bat -name instanceName
               -path instanceLocation
               -host hostName
               [-startingPort startingPort]
               [-readOnly]
               -create|-delete
               [ -debug]
```

## Parameters

Supported arguments include:

### -create|-delete

A required parameter that specifies whether to create or delete the configuration instance.

### -debug

An optional parameter that turns on the debug function of the Ant utility, which the `wsinstance` tool uses.

### -host *hostname*

A required parameter that specifies the host name where you are creating the configuration instance. This should match the host name you specified during installation of the initial product.

### -name *instanceName*

A required parameter that specifies the name of the new configuration instance. Use a unique value. The **wsinstance** command uses this name to construct the node name, which is `instanceName_hostname` for the new configuration instance of an Application Server. It is important to have a unique name for each configuration instance, to provide a unique combination of host name and instance name, which together form the `WAS_NODE` name for the configuration instance.

**5.1 +** The embedded messaging feature requires unique node names. The `wsinstance` tool cannot prevent reusing node names for configuration instances created from read-only partitions. Embedded messaging is not supported when you reuse a node name for a configuration instance. So use a unique name.

### -path *instanceLocation*

A required parameter that specifies the file path of the instance. All required folders for the instance are in this directory, which is unique to the configuration instance.



### **-readOnly**

An optional parameter. The `wsinstance` tool can detect whether you are creating an instance from the base WebSphere Application Server in a read-only partition.

The `wsinstance` tool registers a new `wsinstance` in the `properties/wsinstance.properties` file of the original installation, if write access to the original product is available. If the original installation is in a read-only partition or if you use the `-readOnly` option, the `wsinstance` tool does not register the `wsinstance` within the `properties/wsinstance.properties` file of the original installation.

Creating configuration instances from an original installation in a read-only partition has service implications. There is no mechanism in the original installation to identify and update a configuration instance that you create from a read-only partition. Normally, the registration file in the original installation provides the mechanism for updating configuration instances. When you apply a fix pack or an interim fix to the original installation, the update installer also updates the registered configuration instances. However, there is no registration entry for a configuration instance created from a read-only partition, where no entry is made in the registration file.

When you install a fix pack or interim fix to the original installation, you must use the `wsinstance` tool to delete the configuration instance and recreate it. A configuration instance must be at the same fix level as the product from which you create it. Otherwise, the configuration instance is unsupported.

### **-startingPort** *startingPort*

An optional parameter that specifies the starting port number for generating all ports for the configuration instance. If not specified, the `wsinstance` tool uses default ports, or custom-defined ports from a file that you can create.

## **Example of creating an instance on a Linux or UNIX-based platform**

To create a configuration instance for user `shasti`:

```
wsinstance.sh -name shasti
               -path ~/shasti/WebSphere
               -host planetaix
               -create
```

On a base WebSphere Application Server product installation, the command creates an Application Server configuration instance named `shasti` in location `~/shasti/WebSphere` with a node name of `shasti_planetaix`. If user `shasti` is to use the embedded messaging feature, you must add the user (`shasti`) to the `mqm` and `mqbrkrs` operating system groups, as described in *Installing WebSphere embedded messaging as the JMS provider*. This is true for any non-root user on a Linux or UNIX-based platform.

## **Example of creating an instance on a Windows platform**

To create a configuration instance for user `shasti`:

```
wsinstance.bat -name shasti
                -path G:\shasti\WebSphere
                -host planetnt
                -create
```

On a base WebSphere Application Server product installation, the command creates an Application Server configuration instance named `shasti` in location `G:\shasti\WebSphere` with a node name of `shasti_planetnt`.

## **Example of a creating an instance in a multiuser environment on a Linux or UNIX platform**

Follow these steps to create a configuration instance for user `shasti` in a multiuser environment:

1. Create the configuration instance:

```
winstance.sh -name shasti
             -path ~/shasti/WebSphere
             -host myhost
             -startingPort 12000
             -create
```

2. Change the owner of the folder:

```
chown -R shasti ~/shasti/WebSphere
```

3. As a convenience, add a call to script ~/shasti/WebSphere/bin/setupCmdLine.sh in the profile of user shasti to set the environment when user shasti logs in.

4. Give these folder permissions to user shasti:

```
install_root/bin          --- rx (read and execute)
install_root/java         --- rx
install_root/properties  ----r (read)
install_root/deploytool  ----r
install_root/config      ----r
install_root/lib         ----r
install_root/classes     ----r
install_root/null       ----r
install_root/samples     ----r
install_root/Web        ----r
```

### Example of deleting a configuration instance

The following command is on more than one line for formatting purposes. Enter the command on one line to delete the configuration instance named shasti:

```
winstance.sh -name shasti
             -host planetaix
             -delete
```

### Using predefined port numbers

When you use the winstance tool without the -startingPort parameter, the tool attempts to examine a file named with the convention *instanceName\_portdef.props* in the /bin/winstance directory of the installation root directory of the original product. You can create the file by copying the portdef.props template file and customizing the port numbers.

### Example of using default port assignments

When a port definition file is not present, the winstance tool generates a *hostname\_instanceName\_portdef.props* file in the /bin/winstance directory of the installation root directory of the original product, using the portdef.props template file.

**5.1 +** When using the winstance tool from a read-only partition, the tool cannot create the *hostname\_instanceName\_portdef.props* file in a directory of the original product. Therefore, the tool creates the file in the installation root directory of the new instance.

The winstance tool adds one (1) to the default port numbers for the base WebSphere Application Server product. If you create two configuration instances using default port assignments, both instances have the same, conflicting port numbers until you change them.

### Incrementing default port numbers from a starting point

The winstance tool can assign port numbers based on a starting port value that you give on the command line, using the -startingPort parameter. The tool assigns port numbers sequentially from the starting port number value as it creates an *hostname\_instanceName\_portdef.props* file in the winstance subdirectory of the bin directory in the *install\_root* folder.

**5.1 +** In the case of creating an instance from a read-only partition, the resulting `hostname_instanceName_portdef.props` file is in the installation root of the new instance.

For example, a `hostname_instanceName_portdef.props` file created with `-startingPort 20002` would appear similar to this:

```
HTTPS_TRANSPORT_ADMIN=20002
CSIV2_SSL_SERVERAUTH_LISTENER_ADDRESS=20004
HTTP_TRANSPORT_ADMIN=20003
HTTP_TRANSPORT=20005
HTTPS_TRANSPORT=20006
INTERNAL_JMS_SERVER=20007
BOOTSTRAP_ADDRESS=20008
SAS_SSL_SERVERAUTH_LISTENER_ADDRESS=20009
DRS_CLIENT_ADDRESS=20011
SOAP_CONNECTOR_ADDRESS=20010
CSIV2_SSL_MUTUALAUTH_LISTENER_ADDRESS=20012
JMSSERVER_QUEUED_ADDRESS=20013
JMSSERVER_DIRECT_ADDRESS=20014
```

The order of port assignments can be arbitrary. Predicting assignments is not possible.

### Example of startingPort parameter use

The following example of using the `wsinstance` tool creates the `shasti_portdef.props` file with the content shown in the previous example:

```
wsinstance.bat -name shasti
               -path G:\shasti\WebSphere
               -host planetnt
               -startingPort 20002
               -create
```

### Setting up and using the configuration instance environment

Most tasks that you perform in a configuration instance are done from one shell or command window after you run the `setupCmdLine.sh` or `setupCmdLine.bat` script in the `/bin` directory of the configuration instance. Such a scenario might be:

1. Create the configuration instance using the `/bin/wsinstance/wsinstance.sh` (or `wsinstance.bat`) script from the original installation.
2. In that command window or in another, change directories to the `/bin` directory of the new configuration instance.
3. Establish a temporary override for the normal WebSphere Application Server environment by running the `setupCmdLine.sh` or `setupCmdLine.bat` script:

```
setupCmdLine.sh
```

4. In the same window, start `server1` by changing directories to the `install_root/bin` directory of the original installation and issuing the command. There is no such command in the `/bin` directory of the configuration instance:

```
startServer.sh server1
```

This works because running the `setupCmdLine` script from the configuration instance reconfigures the WebSphere Application Server environment. Reconfiguring the environment lets you issue commands from the `/bin` directory of the original installation as if you were issuing them from the configuration instance. The configuration instance creates a virtual installation that includes the original installation `/bin` directory. The virtual environment lasts until you close the Linux or UNIX shell or the command window in a Windows environment.

Even after you close the shell or command window, the server you started is still running in a spawned process that retains the environment settings.

5. See how the environment has changed. Display all the environment variables. You can see one that points to the `setupCmdLine.sh` or `setupCmdLine.bat` file in the configuration instance. The name of the environment variable is `WAS_USER_SCRIPT`. For example, in a Linux bash shell or in the command window on a Windows platform, type:

```
set
```

6. Notice the changes in the environment. Display all the ports for the machine to see the ports that you set for the configuration instance. For example, in a Linux bash shell or in the command window on a Windows platform, type:

```
netstat -a
```

7. Open a browser window and point it at the port where you defined `HTTP_TRANSPORT_ADMIN` in the `hostname_instanceName_portdef.props` file in the installation root of the new instance. For example, suppose the setting is `HTTP_TRANSPORT_ADMIN=20003`. Open the administrative console for `server1` by pointing your browser at:

```
http://hostname_orIP_address:20003/admin/
```

By setting the `WAS_USER_SCRIPT` environment variable to point to itself, the `setupCmdLine` script of the configuration instance overrides the `setupCmdLine` script of the original installation and redirects scripts in the `install_root/bin` directory of the original installation to work on configuration instance objects.

### Backing up required files before installing additional features or before installing the V5.0.x Enterprise product

Creating a new WebSphere Application Server V5.x instance using the `wsinstance` utility can fail with an "adminconsole" already exists error after adding features or installing the V5.0.x Enterprise product. The new instance cannot be administered until the `adminconsole.ear` is successfully deployed, but the `adminconsole.ear` cannot be deployed on the new instance. The text of the problem is similar to the following example:

```
WASX7022E: Problem running command
"$AdminApp install adminconsole.ear
  {-node CELL_INSTANCE
   -configroot /WAS_HOME/config
   -copy.sessionmgr.servername server1
   -appname adminconsole}"
-- exception information: com.ibm.ws.scripting.ScriptingException:

WASX7279E: An application with name "adminconsole" already exists.
Select a different name.
```

The new instance of the Application Server might start successfully. However, the administrative console cannot start because of an error in the `wsinstance` template files caused by installing additional base features, additional Network Deployment features, or by installing Enterprise.

Use the following procedure to work around the problem:

1. Back up the `install_root/bin/wsinstance/configdefaults` directory.
2. Use the installation program to add the new features or to install Enterprise.
3. Delete the following directories and their contents:
  - `install_root/bin/wsinstance/configdefaults/backup`
  - `install_root/bin/wsinstance/configdefaults/temp`
  - `install_root/bin/wsinstance/configdefaults/$CELL_NAME/applications`
4. Restore the following files from the backup you made to their original locations in the `install_root/bin/wsinstance/configdefaults` directory:
  - `./security.xml`
  - `./nodes/$NODE_NAME/resources.xml`
  - `./nodes/$NODE_NAME/serverindex.xml`

- `./nodes/$NODE_NAME/servers/$SERVER_NAME/resources.xml`

Do not restore the entire backup you made. Restore only the files mentioned in this step.

`$CELL_NAME` refers to the name of the cell defined during the initial product installation.

`$NODE_NAME` refers to the name chosen for the node.

`$SERVER_NAME` refers to each of the servers present. Perform the procedure on each server.

See the technote [Creating a new V5 instance using the wsinstance command fails with "adminconsole" already exists error](#) for more information.

### Correcting a WASX7022E error

If you did not back up the wsinstance template files before installing additional features or before installing the V5.0.x Enterprise product, you can recover from the resulting WASX7022E error described in the preceding section with the following procedure.

1. Uninstall the product and the Enterprise product (if necessary).
2. Reinstall the product, selecting all features that you intend to use.
3. Back up the `install_root/bin/wsinstance/configdefaults` directory.
4. Install the Enterprise product if necessary.
5. Delete the following directories and their contents:
  - `install_root/bin/wsinstance/configdefaults/backup`
  - `install_root/bin/wsinstance/configdefaults/temp`
  - `install_root/bin/wsinstance/configdefaults/$CELL_NAME/applications`
6. Restore the following files from the backup you made to their original locations in the `install_root/bin/wsinstance/configdefaults` directory:
  - `./security.xml`
  - `./nodes/$NODE_NAME/resources.xml`
  - `./nodes/$NODE_NAME/serverindex.xml`
  - `./nodes/$NODE_NAME/servers/$SERVER_NAME/resources.xml`

Do not restore the entire backup you made. Restore only the files mentioned in this step.

**If you cannot afford to reinstall the product on this system:** Do not use the wsinstance utility on this system. The corrupt templates will not affect functionality of the product other than the wsinstance utility.

## Creating servers in coexistence or multiple instance environments

WebSphere Application Server lets you create multiple servers based on an existing template, or using an existing server as a template. You can generate unique ports for the new server during its creation. Always select the unique port option when creating servers in a coexistence environment of multiple versions, installations or configuration instances, due to the likelihood of conflicting port assignments. Verify port assignments for the newly created server and change them if necessary.

1. Create a server (MyServer, for example) using either the administrative console or wsadmin scripts.
2. Log on to the administrative console.
3. Go to **Servers > Application Servers > MyServer > End Points**.
4. Go into each end point and change the port numbers.
5. Change the HTTP Transport ports.
  - a. Go to **Servers > application servers > MyServer > Web Container > HTTP Transports**.
  - b. Change the HTTP transport port numbers.

- c. Make a record of the new port numbers.
6. Add new port numbers in the Virtual Hosts configuration.
7. Change the JMS server ports, if you create servers from an application server template that has the embedded messaging feature.
  - a. Go to **Servers > application servers > MyServer > Server Components > JMS Servers > Security Port Endpoint**.
  - b. Change the port numbers.

## Changing HTTP transport ports

This topic describes how to change HTTP transports manually by editing configuration files. Use this procedure when a conflicting HTTP transport setting is preventing an application server instance from starting.

Edit the configuration files to resolve conflicting port assignments, as described below.

1. Look for symptoms of port number conflicts.
2. Edit an application server configuration.
  - a. Open the `server.xml` configuration file for the `server1` application server.  
The file path for the `server1` configuration, with a node name of **mynode**, is:  
`install_root/config/cells/mynode/nodes/mynode/servers/server1`
  - b. Look for transports `xmi:type="applicationserver.webcontainer:HTTPTransport"`.  
The administrative console application uses transport ports 9090 and 9043. The Sample applications use transport ports 9080 and 9443. Change the port numbers and save the file. Make a record of the new port numbers.
  - c. Open the `virtualhosts.xml` file in the `install_root/config/cells/mynode` folder.  
This file contains alias entries for transport ports defined in the `server.xml` file.
  - d. Look for aliases `xmi:id` to change port number assignments for any ports you changed.

---

## Installing interim fixes, cumulative fixes, and fix packs

This topic describes how to use the update installer program to install interim fixes, cumulative fixes, and fix packs. The update installer program is also known as the `updateInstaller` program or the Update installation wizard.

IBM Support offers tutorials on various WebSphere Application Server installation topics. See WebSphere education on demand: Installation best practices tutorials for more information. One topic describes updating WebSphere Application Server products using the update installer program.

You cannot install product updates correctly without the proper authorizations. Use the update installer program as the root user on a Linux or UNIX platform, or as the administrator on a Windows platform.

Three different sites contain service for WebSphere Application Server products and features:

- Download interim fixes for the IBM HTTP Server from the IBM Support site for IBM HTTP Server. The readme file that is bundled with the interim fix describes how to install the interim fix. You do not use the update installer program for the WebSphere Application Server (also known as the `updateInstaller` program or the Update Installation wizard) to install interim fixes for the IBM HTTP Server feature.
- Download interim fixes for the embedded messaging feature from the WebSphere MQ Service download site. Download the readme file for a description of how to install the interim fix. You do not use the update installer for the WebSphere Application Server to install interim fixes for the embedded messaging feature.



- Download any interim fixes, cumulative fixes, and fix packs for the WebSphere Application Server family of products from the IBM Support site for WebSphere Application Server. Cumulative fixes and fix packs do include service for the IBM HTTP Server powered by Apache 1.3 feature and for the embedded messaging feature. Interim fixes for a WebSphere Application Server product do not include service for the IBM HTTP Server feature or the embedded messaging feature. The readme file that is bundled with the WebSphere Application Server interim fix, the cumulative fix, or the fix pack describes how to use the update installer program for WebSphere Application Server products to install the interim fix, the cumulative fix, or the fix pack.

**Important:** Cumulative fixes and fix packs do not include service for the IBM HTTP Server powered by Apache 2.0. If you installed IBM HTTP Server powered by Apache 2.0, skip applying service to the IBM HTTP Server during the installation of a cumulative fix or a fix pack. Do not update the 2.0 level IBM HTTP Server with service for the 1.3 level IBM HTTP Server.

Installing a cumulative fix or a fix pack removes all of the interim fixes for serviceable components, except for interim fixes for the IBM HTTP Server feature or the embedded messaging feature. You must remove those manually as described in the following tip.

You must use the update installer program to install cumulative fixes and fix packs for the two features. The relationship among interim fixes, cumulative fixes, and fix packs is shown in the Cumulative Fix Strategy for WebSphere Application Server V5.0 and V5.1 Web page.

Fix packs are also known as *fixpacks*, *FixPaks* and *program temporary fixes*, or PTFs.

There are two interfaces to the update installer application, a wizard with a graphical interface, and a command-line, silent interface:

- The wizard interface is the **updateWizard** command. See “updateWizard command” on page 254 for more information.
- The silent, command-line interface is the **updateSilent** command. See “updateSilent command” on page 242 for more information.

Both the **updateSilent** command and the **updateWizard** command call the update installer program to install and uninstall interim fixes, cumulative fixes, and fix packs for WebSphere Application Server products.

The update installer application can also uninstall interim fixes, cumulative fixes, and fix packs. See “Uninstalling interim fixes, cumulative fixes, and fix packs” on page 263 for more information.

The following descriptions contain reference information about installing interim fixes, cumulative fixes, and fix packs on WebSphere Application Server products:

#### Installation roots

The variable *install\_root* represents the root directory for WebSphere Application Server. By default, this varies per product and operating system:

- Base WebSphere Application Server product:
  - AIX platforms: /usr/WebSphere/AppServer
  - Linux platforms: /opt/WebSphere/AppServer
  - HP-UX and Solaris platforms: /opt/WebSphere/AppServer
  - Windows platforms: *drive*\Program Files\WebSphere\AppServer
- Network Deployment product:
  - AIX platforms: /usr/WebSphere/DeploymentManager
  - Linux platforms: /opt/WebSphere/DeploymentManager
  - HP-UX and Solaris platforms: /opt/WebSphere/DeploymentManager
  - Windows platforms: *drive*\Program Files\WebSphere\DeploymentManager
- **5.1+** WebSphere Business Integration Server Foundation product that extends the base product:
  - AIX platforms: /usr/WebSphere/AppServer

- Linux platforms: `/opt/WebSphere/AppServer`
- HP-UX and Solaris platforms: `/opt/WebSphere/AppServer`
- Windows platforms: `drive\Program Files\WebSphere\AppServer`
- **5.1+** WebSphere Business Integration Server Foundation product that extends the Network Deployment product
  - AIX platforms: `/usr/WebSphere/DeploymentManager`
  - Linux platforms: `/opt/WebSphere/DeploymentManager`
  - HP-UX and Solaris platforms: `/opt/WebSphere/DeploymentManager`
  - Windows platforms: `drive\Program Files\WebSphere\DeploymentManager`

### Space requirements

Space requirements vary depending on what you are installing. The size of each download is available on the Support site. After unpacking the ZIP file you download, delete the ZIP file to free space.

For a fix pack, have approximately 400 MB of free space in the `/tmp` directory and another 400 MB in the file system that hosts the WebSphere Application Server image, which is typically `/opt` for a Linux platform and for all UNIX platforms except for AIX, which is typically `/usr`, or approximately 800 MB of free space on the disk drive where you are installing on a Windows platform.

Interim fixes require much less space to install.

Additional space is required for backup files in the `install_root/properties/version/backup` directory. When installing a fix pack the space required is typically about the same as the size of the fix pack, that is, between 50 MB and 300 MB, depending on the particular fix pack.

The update installer program checks for required space before it installs an interim fix, a cumulative fix, or a fix pack. Fixes require much less space to install than do cumulative fixes or fix packs. The space requirement varies per cumulative fix. For example, Cumulative Fix 3 for Version 5.1 (5.1.0.3) requires 248 MB in the `/tmp` directory and another 248 MB in the partition that contains the installation root directory. That is a total of 496 MB.

The system temporary directory is determined by the JVM and by the operating system. It is possible for the system temporary directory and the installation root directory to be on the same partition.

Older versions of the update installer, including the version current at the time that Cumulative Fix 3 was released, check for the total space requirement but report each requirement separately. Unfortunately, the messages are misleading. If you have 300 MB of free space on a partition but both the `/tmp` directory and the installation root are on the partition, you do not have enough space for both.

In this example, you have 300 MB when you need 496 MB in the partition. Each space checking message states that you do not have enough space and that 248 MB is required. 300 MB is more than 248 MB so the message is misleading. The message should state that you need 496 MB in the partition, 248 MB of which is for the `/tmp` directory. The second message should state that you need 496 MB in the partition, 248 MB of which is for the installation root requirement.

### Command name

`updateSilent.sh`, `updateSilent.bat`, `updateWizard.sh`, and `updateWizard.bat`, command-line interfaces to the `installer.jar` file.

### Prerequisite environment setting

The `JAVA_HOME` environment setting must point to the IBM SDK for WebSphere Application Server products. Source the appropriate command:

- `. install_root/bin/setupCmdLine.sh` (Source the command on UNIX platforms. There is a space between the period and the installation root directory.)
- `source install_root/bin/setupCmdLine.sh` (Source the command on Linux platforms.)
- `install_root\bin\setupCmdLine.bat` (Windows platforms only)

### Download from

Download the `updateInstaller.zip` file from the WebSphere Application Server Support page.

The files that comprise the ZIP file are also part of each fix pack ZIP file package. Fix packs are named according to the Application Server product, the fix pack sequence, and the operating system platform.

Interim fixes are named according to the tracking number used for the defect that the interim fix solves. For example, PQ81989 is an interim fix. See 1.3.1 Java SDK, Java Tech Edition for WebSphere Application Server V5 for an example of a download page for an interim fix.

Cumulative fixes use a naming scheme that identifies the product, the cumulative fix number, and the operating system. The following example shows names for Cumulative Fix 3 for V5.1:

Table 51. Cumulative Fix 3 names for WebSphere Application Server, Version 5.1

| Operating system platform | Cumulative Fix 3 ZIP file | Cumulative Fix 3 ID | Default repository in installation root directory |
|---------------------------|---------------------------|---------------------|---|
| AIX                       | was510_cf3_aix.zip        | was510_cf3_aix      |   |
| Linux                     | was510_cf3_linux.zip      | was510_cf3_linux    |   |
| Linux for S/390           | was510_cf3_linux390.zip   | was510_cf3_linux390 | ../update/ fixpacks                               |
| Solaris                   | was510_cf3_solaris.zip    | was510_cf3_solaris  |   |
| HP-UX                     | was510_cf3_hpux.zip       | was510_cf3_hpux     |   |
| Windows                   | was510_cf3_win.zip        | was510_cf3_win      | ..\update\ fixpacks                               |

Table 52. Cumulative Fix 3 names for WebSphere Application Server Network Deployment, Version 5.1

| Operating system platform | Cumulative Fix 3 ZIP file  | Cumulative Fix 3 ID    | Default repository in installation root directory |
|---------------------------|----------------------------|------------------------|---|
| AIX                       | was510_nd_cf3_aix.zip      | was510_nd_cf3_fp2_aix  | ../update/fixpacks                                |
| Linux                     | was510_nd_cf3_linux.zip    | was510_nd_cf3_linux    |   |
| Linux for S/390           | was510_nd_cf3_linux390.zip | was510_nd_cf3_linux390 |   |
| Solaris                   | was510_nd_cf3_solaris.zip  | was510_nd_cf3_solaris  |   |
| HP-UX                     | was510_nd_cf3_hpux.zip     | was510_nd_cf3_hpux     |   |
| Windows platforms         | was510_nd_cf3_win.zip      | was510_nd_cf3_win      | ..\update\ fixpacks                               |

See WebSphere Application Server 5.1 Cumulative Fix 3 for an example of a download page for a cumulative fix.

Fix packs use a naming scheme that identifies the product, the fix pack sequence number, and the operating system.

**5.1 +** The names of the cumulative fixes that the WebSphere Business Integration Server Foundation product installs for the base product and for the Network Deployment products are shown in the following table:

Table 53. Cumulative Fix 2 names for WebSphere Application Server, Version 5.1

| Operating system platform | Cumulative Fix 2 ZIP file | Cumulative Fix 2 ID | Default repository in installation root directory |
|---------------------------|---------------------------|---------------------|---|
| AIX                       | was510_cf2_aix.zip        | was510_cf2_aix      |   |
| Linux                     | was510_cf2_linux.zip      | was510_cf2_linux    |   |
| Linux for S/390           | was510_cf2_linux390.zip   | was510_cf2_linux390 | ../update/ fixpacks                               |
| Solaris                   | was510_cf2_solaris.zip    | was510_cf2_solaris  |   |
| HP-UX                     | was510_cf2_hpux.zip       | was510_cf2_hpux     |   |
| Windows                   | was510_cf2_win.zip        | was510_cf2_win      | ..\update\ fixpacks                               |

Table 54. Cumulative Fix 2 names for WebSphere Application Server Network Deployment, Version 5.1

| Operating system platform | Cumulative Fix 2 ZIP file | Cumulative Fix 2 ID   | Default repository in installation root directory |
|---------------------------|---------------------------|-----------------------|---|
| AIX                       | was51_nd_cf2_aix.zip      | was51_nd_cf2_fp2_aix  |   |
| Linux                     | was51_nd_cf2_linux.zip    | was51_nd_cf2_linux    |   |
| Linux for S/390           | was51_nd_cf2_linux390.zip | was51_nd_cf2_linux390 | ../update/fixpacks                                |
| Solaris                   | was51_nd_cf2_solaris.zip  | was51_nd_cf2_solaris  |   |
| HP-UX                     | was51_nd_cf2_hpux.zip     | was51_nd_cf2_hpux     |   |
| Windows platforms         | was51_nd_cf2_win.zip      | was51_nd_cf2_win      | ..\update\ fixpacks                               |

The latest available fix pack is Fix Pack 1 for the WebSphere Application Server V5.1.0 family of products:

Table 55. Fix Pack 1 names for WebSphere Application Server, Version 5.1.0

| Operating system platform | Fix Pack 1 ZIP file    | Fix Pack 1 ID      | Default repository in installation root directory |
|---------------------------|------------------------|--------------------|---|
| AIX                       | was51_fp1_aix.zip      | was51_fp1_aix      |   |
| Linux                     | was51_fp1_linux.zip    | was51_fp1_linux    |   |
| Linux for S/390           | was51_fp1_linux390.zip | was51_fp1_linux390 | ../update/ fixpacks                               |
| Solaris                   | was51_fp1_solaris.zip  | was51_fp1_solaris  |   |
| HP-UX                     | was51_fp1_hpux.zip     | was51_fp1_hpux     |   |
| Windows                   | was51_fp1_win.zip      | was51_fp1_win      | ..\update\ fixpacks                               |

Table 56. Fix Pack 1 names for WebSphere Application Server Network Deployment, Version 5.1.0

| Operating system platform | Fix Pack 1 ZIP file       | Fix Pack 1 ID         | Default repository in installation root directory |
|---------------------------|---------------------------|-----------------------|---|
| AIX                       | was51_nd_fp1_aix.zip      | was51_nd_fp1_aix      |   |
| Linux                     | was51_nd_fp1_linux.zip    | was51_nd_fp1_linux    |   |
| Linux for S/390           | was51_nd_fp1_linux390.zip | was51_nd_fp1_linux390 | ../update/fixpacks                                |
| Solaris                   | was51_nd_fp1_solaris.zip  | was51_nd_fp1_solaris  |   |
| HP-UX                     | was51_nd_fp1_hpux.zip     | was51_nd_fp1_hpux     |   |
| Windows platforms         | was51_nd_fp1_win.zip      | was51_nd_fp1_win      | ..\update\ fixpacks                               |

Table 57. Fix Pack 1 names for WebSphere Business Integration Server Foundation, Version 5.1.0

| Operating system platform | Fix Pack 1 ZIP file      | Fix Pack 1 ID   | Default repository in installation root directory |
|---------------------------|--------------------------|---|---|
| AIX                       | wbisf51_fp1_aix.zip      | wbisf51_fp1_aix (to extend the base product)<br>wbisf51_nd_fp1_aix (to extend the Network Deployment product) |   |
| Linux                     | wbisf51_fp1_linux.zip    | wbisf51_fp1_linux (base)<br>wbisf51_nd_fp1_linux (Network Deployment)   |   |
| Linux for S/390           | wbisf51_fp1_linux390.zip | wbisf51_fp1_linux390 (base)<br>wbisf51_nd_fp1_linux390 (Network Deployment)                                   | ../update/ fixpacks                               |
| Solaris                   | wbisf51_fp1_solaris.zip  | wbisf51_fp1_solaris (base)<br>wbisf51_nd_fp1_solaris (Network Deployment)                                     |   |
| HP-UX                     | wbisf51_fp1_hpux.zip     | wbisf51_fp1_hpux<br>wbisf51_nd_fp1_hpux (Network Deployment)  |   |
| Windows platforms         | wbisf51_fp1_win.zip      | wbisf51_fp1_win (base)<br>wbisf51_nd_fp1_win (Network Deployment)   | ..\update\ fixpacks                               |

Table 58. Fix Pack 1 names for WebSphere Application Server Express, Version 5.1.0

| Operating system platform | Fix Pack 1 ZIP file            | Fix Pack 1 ID              | Default repository in installation root directory |
|---------------------------|--------------------------------|----------------------------|---|
| AIX                       | was51_express_fp1_aix.zip      | was51_express_fp1_aix      |   |
| Linux                     | was51_express_fp1_linux.zip    | was51_express_fp1_linux    |   |
| Linux for S/390           | was51_express_fp1_linux390.zip | was51_express_fp1_linux390 | ../update/ fixpacks                               |
| Solaris                   | was51_express_fp1_solaris.zip  | was51_express_fp1_solaris  |   |
| HP-UX                     | was51_express_fp1_hpux.zip     | was51_express_fp1_hpux     |   |
| Windows platforms         | was51_express_fp1_win.zip      | was51_express_fp1_win      | ..\update\ fixpacks                               |

Table 59. Fix Pack 1 names for WebSphere Application Server, Version 5.1.0 Application Clients

| Operating system platform | Fix Pack 1 ZIP file           | Fix Pack 1 ID             | Default repository in installation root directory |
|---------------------------|-------------------------------|---------------------------|---|
| AIX                       | was51_client_fp1_aix.zip      | was51_client_fp1_aix      |   |
| Linux                     | was51_client_fp1_linux.zip    | was51_client_fp1_linux    |   |
| Linux for S/390           | was51_client_fp1_linux390.zip | was51_client_fp1_linux390 | ../update/fixpacks                                |
| Solaris                   | was51_client_fp1_solaris.zip  | was51_client_fp1_solaris  |   |
| HP-UX                     | was51_client_fp1_hpux.zip     | was51_client_fp1_hpux     |   |
| Windows platforms         | was51_client_fp1_win.zip      | was51_client_fp1_win      | ..\update\fixpacks                                |

### Download to

Choose a directory for unpacking the update installer program or fix pack zip file that does not

have a space in its name. For example, do not use the default installation root on a Windows platform because it is within the Program Files directory. On a Linux or UNIX-based platform, you can use the installation root directory.

Create the *install\_root*/update directory or the *no\_spaces\_path*\update directory on Windows platforms. Unpacking a fix pack creates the *../update/fixpacks* directory. Create another directory, *../update/fixes*, for a repository of fixes you download. If you create the default subdirectories, you can accept default interim fix and fix pack file locations when using the **updateWizard** interface. Otherwise, you must browse to locate the fixes or fix packs you are installing or uninstalling.

#### **Location of extfile.jar**

WebSphere Application Server product *install\_root*/update/lib (or *no\_spaces\_path*\update\lib for Windows platforms)

#### **Location of installer.jar, updateSilent.sh/bat, and updateWizard.sh/bat**

WebSphere Application Server product *install\_root*/update (or *no\_spaces\_path*\update for Windows platforms)

#### **Location of readme files**

WebSphere Application Server product *install\_root*/update/docs (or *no\_spaces\_path*\update\docs for Windows platforms)

#### **Location of interim fix Java archive (JAR) files**

*install\_root*/update/fixes (or *no\_spaces\_path*\update\fixes)

#### **Location of cumulative fix and fix pack JAR files**

*install\_root*/update/fixpacks (or *no\_spaces\_path*\update\fixpacks)

This directory is automatically created by unpacking the fix pack in the *../update* directory.

### **Files in updateInstaller.zip**

Always use the **updateSilent** (or **updateWizard**) command file from the updateInstaller.zip or fix pack you download, to use the most recent version. A newer version can manage previously downloaded fixes and fix packs. Files in the updateInstaller.zip package (or the fix pack ZIP package) include:

- extfile.jar
- installer.jar
- readme\_updateinstaller.txt
- readme\_updateinstaller.html
- readme\_updateinstaller.pdf
- updateSilent.sh (or updateSilent.bat)
- updateWizard.sh (or updateWizard.bat)

In addition to the listed files, the cumulative fix pack zip file or the fix pack zip file also has a JAR file, such as the was510\_nd\_cf3\_win.jar file. Each JAR file includes a cumulative fix or a fix pack.

### **Location of log and backup files**

The update installer program records processing results in log files in the *install\_root*/logs/update directory. Backup files created during the installation of fixes and fix packs are in the *install\_root*/properties/version/backup directory. The files are required to uninstall an interim fix or fix pack.

### **Syntax and panel examples**

#### **Using the updateWizard interface to work with interim fixes**

See “updateWizard examples for interim fixes” on page 256 for more information.

#### **Using the updateWizard interface to work with cumulative fixes and fix packs**

See “updateWizard examples for cumulative fixes and fix packs” on page 260 for more information.

#### **Using the updateSilent interface to work with interim fixes**

See “updateSilent examples for interim fixes” on page 243 for more information.

#### **Using the updateSilent interface to work with cumulative fixes and fix packs**

See “updateSilent examples for cumulative fixes and fix packs” on page 249 for more information.



## Overview of the installation procedure

To install an interim fix, create an update/fixes directory on your disk drive, download the interim fix and the update installer from the Support Web site, and use the update installer to install the interim fix.

To install a cumulative fix or fix pack, create the update directory on your disk drive if it does not already exist, download and unzip the cumulative fix or the fix pack from the Support Web site, and use the update installer to install the cumulative fix or fix pack. The ZIP file for the cumulative fix or the fix pack includes the following files:

- The update installer application
- The two interface programs (updateSilent and updateWizard)
- A readme file for the cumulative fix or fix pack
- A readme file for the update installer
- The cumulative fix or fix pack file

## Special rules for applying fixes within a cell

One requirement governs applying an interim fix or fix pack to a cell, to ensure the continued, smooth interaction of the various WebSphere Application Server nodes:

**Requirement 1:** *The Network Deployment product must be at the highest fix level within the cell.*

For example, you cannot use the **addNode** command to add a V5.1 base WebSphere Application Server node to a V5.0.2 deployment manager cell.

There is no limitation on the fix level of a base Application Server V5 node within its cell, if the fix level of the base node is the same as or lower than that of the deployment manager. There is also no limit on the number of different V5.x fix levels that can coexist or interoperate within a cell, so long as the fix level for each base node is the same as or lower than that of the deployment manager. Version 5.0.x base nodes can comprise V5.1 deployment manager cells.

## Viewing the fix level of the node

You can use the “versionInfo command” on page 290 in the *install\_root/bin* directory to display the exact fix and version level of the product. However, do not use the **versionInfo** command while installing an interim fix or fix pack.

You can also use the silent update installer application to:

- View interim fix information. See Viewing information about interim fixes.
- View cumulative fix or fix pack information. See Viewing information about cumulative fixes and fix packs.

## Updating cluster members

Refer to the following tip for information about updating cluster members:

Table 60. Installation tip

| Operating platform | Tip  |
|--------------------|--|
| All platforms      | Updating all cluster members to the same fix level |

**Do not launch multiple copies of the update installer program at one time** The update installer program cannot be launched concurrently with itself. Performing more than one update at the same time can lead to a failed or faulty installation.

See “Uninstalling interim fixes, cumulative fixes, and fix packs” on page 263 for a description of how to remove an interim fix or fix pack from an entire cell, or from any part of the cell.

Installing a fix pack or cumulative fix uninstalls all interim fixes that were installed with the update installer. Interim fixes for the IBM HTTP Server feature and the embedded messaging feature cannot be removed. Some of the interim fixes that are uninstalled might have been released after the release of the cumulative fix or the fix pack. Reinstall such interim fixes to bring your system back to the previous interim fix level.

This procedure describes a scenario for updating an entire cell to the same fix pack level. According to the requirements, apply a fix pack to the deployment manager node first. You can then apply the fix pack to zero, one, or more of the base nodes. If you update a base node in a cluster, install the interim fix, cumulative fix pack, or fix pack to each node in the cluster.

### Recovering from a failed installation of a fix pack, cumulative fix, or interim fix

Uninstall the fix pack, the cumulative fix, or the interim fix and reinstall it to recover from a failed installation. The installation can fail if you run out of disk space or if you have a process running and the update installer cannot update the locked files.

1. Use the Windows Services panel to stop all services for WebSphere Application Server processes. This includes services for the deployment manager (dmgr) server, Application Servers (such as server1), and WebSphere MQ queue managers.
2. Stop all Java processes that use the IBM Software Developer Kit (SDK) that WebSphere Application Server provides. Before installing or uninstalling interim fixes, cumulative fixes, and fix packs on a machine, stop all Java processes on the machine that use the IBM SDK, Java Technology Edition that WebSphere Application Server provides.

WebSphere Application Server processes include:

- Application Server processes
- All servers, such as the IBMHttpServer process, that belong to serviceable features. Features with servers include the IBM HTTP Server and the embedded messaging feature.
- The nodeagent process on a base node when the node is federated into a deployment manager cell
- The dmgr process for the deployment manager server
- The jmsserver on a base node when the node is part of a cell and the embedded messaging server and client feature is installed

Stop all Java processes, if necessary, with the **killall -9 java** command or by using the task manager on a Windows platform. If you do install or uninstall an interim fix, a cumulative fix, or a fix pack while a WebSphere Application Server-related Java process runs, IBM does not guarantee that the product can continue to run successfully, or without error.

3. Stop all WebSphere MQ processes on a Windows platform.
  - a. Stop the WebSphere MQ queue manager process.

```
endmqm queue_manager_ID
```
  - b. Stop all WebSphere MQ network activity:

```
net stop "IBM MQSeries"
```
  - c. Remove the WebSphere MQ tray icon if it is present on a Windows system. On a Windows platform, remove the WebSphere MQ tray icon if it is present. The WebSphere MQ tray icon in the lower right corner indicates that a WebSphere MQ process (**amqmtbrn.exe**) is running. Right click the tray icon and click **Hide** to remove it.
  - d. Reboot to free locked GSKit-related files. If the fix that you are installing contains service for the GSKit component, it is possible that the operating system might have locked the file. You can manually stop any Windows services as described in the first step and reboot to free all files.
4. Stop all WebSphere MQ processes on a Linux or a UNIX platform.
  - a. Type **dspmqr** to show the state of any queue managers.
  - b. Type **endmqm -i** for each running queue manager.
  - c. Type **\$ ipcs -a** to check for any IPCs.
  - d. Type **\$ ipcrm -[qms] [ID]** to delete the IPCs.
  - e. Type **ps -eaf | grep mqm** or **ps -eaf | grep ^MQ\*** to search for mqm processes.
  - f. Type **kill -9 amq\_pid\_1 amq\_pid\_2 ... amq\_pid\_n** to stop any MQ processes that are running.
5. Verify that the required free space is available before beginning the installation. The space required for unpacking the ZIP file is about the same as the size of the fix pack. After unpacking the ZIP file, you

can delete the ZIP file if necessary. After it is installed, the fix pack code generally increases the installation and run-time footprints by only a small amount.

6. Install the interim fix, the cumulative fix, or the fix pack on a base node, as described in “Using the update installer to update a base node.”

You can successfully install interim fixes, cumulative fixes, and fix packs on WebSphere Application Server nodes.

## Using the update installer to update a base node

This topic describes how to use the update installer program to install interim fixes, cumulative fixes, and fix packs on a base WebSphere Application Server node.

If you have not already done so, read “Installing interim fixes, cumulative fixes, and fix packs” on page 230 for an overview of installing service to WebSphere Application Server products. You must update the deployment manager node before updating managed base nodes, which are base nodes that you have federated into a deployment manager cell.

If you extended the Application Server node by installing the WebSphere Business Integration Server Foundation product, see Using the update installer application to update an extended node.

Install the interim fix, the cumulative fix, or the fix pack on each base node to which you intend to apply the fix using the following procedure for each node.

1. Install the interim fix, the cumulative fix, or the fix pack on the deployment manager node first if the base node is part of a cell, as described in Using the update installer application to update a deployment manager node. The deployment manager node must have the highest fix level within the cell.
2. Stop the nodeagent process on a managed base node with the **stopNode** command if the node is part of a cell and if you have not already done so. Issue the **stopNode** command from the *install\_root/bin* directory of each managed node. For example, issue the following command on a Linux platform:

```
# ./stopNode.sh -user name -password password
```

See stopNode command for more information about the command.

3. Stop each server process on the base WebSphere Application Server node with the **stopServer** command. Issue the **stopServer** command from the *install\_root/bin* directory of each managed node. For example, issue the following command on a Linux platform:

```
# ./stopServer.sh server1 -user name -password password
```

See stopServer command for more information about the command.

Stop all WebSphere Application Server-related Java processes. On a Windows platform, you can use the task manager to stop Java processes. On a Linux or UNIX-based platform, use the **kill** command or the **killall java -9** command to stop Java processes.

Use the Windows Services panel to stop any Windows service for the nodeagent, and for any other WebSphere Application Server related services, including Application Server processes, the jmsserver process, IBM HTTP Server and WebSphere MQ queue managers.

4. Create the *install\_root/update* directory on the Application Server node, if the directory does not already exist. Later, you will also launch the update installer from this directory. Launching the update installer is not supported from a read-only directory, or from a directory with spaces in its name.

For example, create the */opt/WebSphere/AppServer/update* directory on a Linux platform.

On a Windows platform, create the update directory in a path where none of the directory names

includes a space in their names. For example, do not create the *C:\Program*

*Files\WebSphere\AppServer\update* directory because the *Program Files* directory has a space in its name.

You can install a fix from the C:\WebSphere\update directory, for example, to the Application Server product in the default installation root directory, C:\Program Files\WebSphere\AppServer. The target directory can have a space; the source directory cannot.

5. Create the update/fixes repository if you are installing an interim fix. It is not necessary to create the fixpacks repository directory. Unpacking a cumulative fix or a fix pack creates the fixpacks directory if the directory does not already exist.
6. Download the interim fix, the cumulative fix, or the fix pack. Download an interim fix from the Support page to the update/fixes directory. Download a fix pack to the update directory.
7. Unpack the interim fix, the cumulative fix, or the fix pack. Unpacking a cumulative fix or a fix pack automatically creates the fixpacks directory.

Table 61. Installation tip

| Operating platform | Tip in “Platform-specific tips for installing and migrating” on page 146                                      |
|--------------------|---|
| Windows platforms  | Use another unzip product such as WINZIP, instead of the PKWARE pkunzip utility to unzip the product archive. |

8. Download the ZIP file for the current update installer and extract the update installer application to the update directory. You can use the update installer application that is packaged as part of a fix pack. Or, you can download the current version of the file even though you might have an update installer from the fix pack or from a previous fix installation. The Support page links to the current installer for the version of the product that you are updating.

9. Verify that the unpacked files are owned by root on a Linux or UNIX-based platform.

- a. List the contents of the download directory. For example:

```
# ls -al
```

```
drwxr-xr-x 6 root bin 512 Jul 21 08:50 was51fp1_linux
```

The directory list in the preceding example shows a Fix Pack 1 file for V5.1 that is not owned by root.

- b. Change the ownership of any files not owned by root. You can change the ownership of all files in the download directory.

For example:

```
# chmod -R root:root *
```

10. Set up the Java environment for the update installer.

#### Setting the JAVA\_HOME environment variable

**Important:** If the update installer can set the Java environment, this step is unnecessary. Otherwise, this is a required step.

It is possible that the update installer cannot set the JAVA\_HOME environment variable. If you receive a message that the update installer cannot set JAVA\_HOME, or if you have set the JAVA\_HOME variable to point to a non-WebSphere Application Server SDK, you must set the JAVA\_HOME variable to a correct value.

Set the environment variable yourself when there is a problem, or source the appropriate command script from the **bin** directory of the product installation root so that the variable points to an IBM SDK for a WebSphere Application Server product.

If you use the same command window that you use to issue the **stopNode** command or the **stopServer** command, you have already sourced the setupCmdLine script and set the JAVA\_HOME environment variable.

Otherwise, use the following procedure to update the JAVA\_HOME variable:

- a. Open a command-line window.

- b. Change directories to the bin directory of the installation root.
- c. Issue the command to set JAVA\_HOME. Issue the appropriate command:
  - `. install_root/bin/setupCmdLine.sh` (source the command on UNIX platforms - There is a space between the period and the installation root directory.)
  - `source install_root/bin/setupCmdLine.sh` (source the command on Linux platforms )
  - `install_root\bin\setupCmdLine.bat` (Windows platforms only)

11. Install the interim fix, cumulative fix, or fix pack on the base node.

Use the **updateWizard** command or the **updateSilent** command to install the interim fix, cumulative fix, or fix pack on the Application Server node. The choice is whether to use a wizard. For more information about using either command, see the following articles:

- “updateWizard command” on page 254
- “updateSilent command” on page 242

For example, assume that you are installing Fix Pack 1 on Version 5.1.0.0. To install the was51\_nd\_fp1\_win fix pack, use this **updateSilent** command:

```
C:\WebSphere\AppServer\update> updateSilent
-fixpack
-installDir "C:\Program Files\WebSphere\AppServer"
-skipIHS
-skipMQ
-fixpackDir "C:\WebSphere\AppServer\update\fixpacks"
-install
-fixpackID was51_fp1_win
```

This example skips applying any service that might be in the fix pack for the IBM HTTP Server feature or the embedded messaging feature.

The command is shown on more than one line for clarity.

12. Restart the node agent of the base node with the **startNode** command if the node is federated. Restart the node agent on each managed node to let the node agent continue to communicate with the updated deployment manager node.

Issue the **startNode** command from the `install_root/bin` directory of each base node. For example, issue the following command on a Linux platform:

```
# ./startNode.sh
```

See `startNode` command for more information about the command.

13. Restart each server on the base node with the **startServer** command. Issue the **startServer** command from the `install_root/bin` directory of each managed node. For example, issue the following command on a Linux platform:

```
# ./startServer.sh server1
```

See `removeNode` command for more information about the command.

14. Verify that the Application Server node is fully functional and that it has the interim fix, the cumulative fix, or the fix pack applied. There are several ways to verify the successful application of an interim fix, a cumulative fix, or a fix pack:

- Does the fix show up in the wizard panel that lists the appropriate type of installed fix?
  - Installed interim fixes. See Uninstallable fix selection panel .
  - Installed cumulative fixes or fix packs. See Installing and Uninstalling panel.

If you see the interim fix, the cumulative fix, or the fix pack in one of the panels, the fix is installed.

- Does the fix show up in the wizard panel that the appropriate type of installable (not yet installed) fix ?
  - Installable interim fixes. See Installable fix selection panel .
  - Installable cumulative fixes or fix packs. See Installable fix selection panel .

If you see the interim fix, the cumulative fix, or the fix pack in one of the panels, the fix is not installed.

- Does one of the following files exist in the `install_root/properties/version/version` directory?

- [interim\_fix\_ID].efix
- [cumulative\_fix\_ID].ptf
- [fix\_pack\_ID].ptf

Or, does one of the following files exist in the *install\_root/properties/version/history* directory?

- [interim\_fix\_ID].efixApplied
- [interim\_fix\_ID].efixDriver
- [cumulative\_fix\_ID].ptf
- [cumulative\_fix\_ID].ptf
- [fix\_pack\_ID].ptfApplied
- [fix\_pack\_ID].ptfDriver

These types of files indicate the installation of a fix. See Product information files for more information.

- Do the reports that describe the product version and its history show that the interim fix, the cumulative fix, or the fix pack is installed or that it has been removed?

See Reports for more information about the reports.

- Do the **updateSilent** command options for viewing information about interim fixes show that the interim fix is installed or removed?

See Viewing information about interim fixes for more information.

- Do the **updateSilent** command options for viewing information about cumulative fixes and fix packs show that the cumulative fix or the fix pack is installed or removed?

See Viewing information about cumulative fixes and fix packs for more information.

You can successfully install interim fixes, cumulative fixes, and fix packs on a base node.

## updateSilent command

The **updateSilent** command is the silent, command-line interface to the update installer program of the IBM WebSphere Application Server. You can also use a wizard interface to the update installer program, the **updateWizard** command. The update installer program is also known as the updateInstaller program or the Update installation wizard.

The update installer program installs interim fixes, cumulative fixes, and fix packs to WebSphere Application Server products.

The relationship among interim fixes, cumulative fixes, and fix packs is shown in the Cumulative Fix Strategy for WebSphere Application Server V5.0 and V5.1 Web page.

### Overview

Both the **updateSilent** command and the “updateWizard command” on page 254 call the update installer program to install and uninstall interim fixes, cumulative fixes, and fix packs for WebSphere Application Server products. This topic describes the silent interface to the update installer program and its command-line parameters.

**Stop all Java processes on the machine that use the IBM Software Developer Kit (SDK) that WebSphere Application Server provides:** Before installing or uninstalling interim fixes, cumulative fixes, and fix packs on a machine, stop all Java processes on the machine that use the IBM SDK, Java Technology Edition that WebSphere Application Server provides. WebSphere Application Server processes include:

- Application Server processes
- All servers, such as the IBMHttpServer process, that belong to serviceable features. Features with servers include the IBM HTTP Server and the embedded messaging feature.



- The nodeagent process on a base node when the node is federated into a deployment manager cell
- The dmgr process for the deployment manager server
- The jmsserver on a base node when the node is part of a cell and the embedded messaging server and client feature is installed

Stop all Java processes, if necessary. If you do install or uninstall an interim fix, a cumulative fix, or a fix pack while a WebSphere Application Server-related Java process runs, IBM does not guarantee that the product can continue to run successfully, or without error.

**Remove the WebSphere MQ tray icon if present** On a Windows platform, remove the WebSphere MQ tray icon if it is present. The WebSphere MQ tray icon in the lower right corner indicates that a WebSphere MQ process (**amqmtbrn.exe**) is running. Right click the tray icon and click **Hide** to remove it.

**Do not launch multiple copies of the update installer program at one time** The update installer program cannot be launched concurrently with itself. Performing more than one update at the same time can lead to a failed or faulty installation.

The following descriptions contain reference information about the command. See “Installing interim fixes, cumulative fixes, and fix packs” on page 230 for more information about using the command.

**Command name**

updateSilent.sh and updateSilent.bat, command-line interface to the installer.jar file.

**Related command**

updateWizard.sh and updateWizard.bat, graphical interface to the installer.jar file.

**Syntax and panel examples**

**Using the updateSilent interface to work with interim fixes**

See “updateSilent examples for interim fixes” for more information.

**Using the updateSilent interface to work with cumulative fixes and fix packs**

See “updateSilent examples for cumulative fixes and fix packs” on page 249 for more information.

**updateSilent examples for interim fixes**

The **updateSilent** command is the silent, command-line interface for the update installer program. This topic describes using the wizard to work with interim fixes.

The update installer program installs interim fixes, cumulative fixes, and fix packs to WebSphere Application Server products.

Three different Web sites contain interim fixes for WebSphere Application Server products and features. Three sites exist because two of the features of the base product have their own service and support sites.

You cannot install or uninstall interim fixes for either of the two features using the update installer program for WebSphere Application Server. See the following tips for more information:

*Table 62. Installation tip*

| Operating platform | Tip in “Platform-specific tips for installing and migrating” on page 146   |
|--------------------|--|
| All platforms      | <ul style="list-style-type: none"> <li>• Installing interim fixes for the IBM HTTP Server feature and the embedded messaging feature</li> <li>• Uninstalling interim fixes for the IBM HTTP Server feature and the embedded messaging (WebSphere MQ) feature before installing cumulative fixes and fix packs to the features</li> </ul> |

You must use the update installer program to install cumulative fixes and fix packs for the two features. See “updateSilent examples for cumulative fixes and fix packs” on page 249 for more information about using the update installer program to install cumulative fixes and fix packs.

## Syntax examples

The updateSilent interface actually provides two functions. Depending upon the parameters you choose, the command performs the following functions:

- Installs and uninstalls interim fixes, cumulative fixes, and fix packs
- Provides information about the update state of fixes and fix packs that you install or uninstall

The following examples describe various usage syntaxes. In each syntax example, optional parameters are enclosed by brackets ([ ]). Values that you must supply appear in *italicized font*. Choices are denoted by the pipe symbol (|).

## Help

```
updateSilent -help | -? | -usage
```

```
updateSilent /help | /? | -usage (Windows platforms)
```

## Syntax for using a properties file to supply values

```
updateSilent myProps.properties
```

## Syntax for processing interim fixes

```
updateSilent -installDir "fully qualified product install_root"  
-fix  
-fixDir "fully qualified interim fix repository root,  
          usually install_root/update/fixes"  
-install | -uninstall | -uninstallAll  
-fixes space-delimited list of fixes  
-fixJars space-delimited list of interim fix JAR files  
[-fixDetails]  
[-prereqOverride]
```

## Syntax for viewing installed interim fixes

```
updateSilent  
-fix  
-installDir "fully qualified product install_root"
```

## Syntax for viewing available interim fixes

```
updateSilent  
-fix  
-installDir "fully qualified product install_root"  
-fixDir "fully qualified interim fix repository root,  
          usually install_root/update/fixes"
```

## Parameters

Use the following parameters for the **updateSilent** command:

**-?** Shows command usage.

**/?** Shows command usage on Windows platforms only.

### **-fix**

Interim fix only: Identifies the update as an interim fix update.

**-fixDetails**

Interim fix only: Displays interim fix detail information.

**-fixDir**

Interim fix only: Specifies the fully qualified directory where you download fixes. This directory is usually the *install\_root/update/fixes* directory.

**-fixes**

Interim fix only: Specifies a list of space-delimited fixes to install or uninstall. Specify either the *fixJars* parameter or this parameter.

**-fixJars**

Interim fix only: Specifies a list of space-delimited interim fix JAR files to install or uninstall. Each JAR file has one or more fixes. Specify either the *fixes* parameter or this parameter.

**-help**

Shows command usage.

**/help**

Shows command usage on Windows platforms only.

**-install**

Installs the update type.

**-installDir**

Specifies the fully qualified installation root of the WebSphere Application Server product.

**-prereqOverride**

Interim fix only: Overrides any installation and uninstallation prerequisite checking. The update installer program does not log missing prerequisites.

**<propertyFile>.properties**

Specifies an externally supplied parameters file.

You can supply parameters in an external *.properties* file, rather than directly on the command line. There are some differences in the formats of parameters:

- You must include all parameters.
- Parameters are [name]=[value] pairs.
- Lists of parameter values are comma-delimited instead of space-delimited.
- There are two slashes before directory names.

You can use the *.properties* file as a template.

For example, a *sample.properties* file for installing two fixes might look like this:

```
#Sample.properties
#Sample parameters file to install fixes with details and prerequisite override
fix=true
install=true
installDir=C:\\WebSphere\\AppServer
fixDir=C:\\WebSphere\\AppServer\\update\\fixes
fixes=Fix1,Fix2
fixDetails=true
prereqOverride=true
```

**-uninstall**

Uninstalls the identified interim fix, cumulative fix, or fix pack. You must uninstall all interim fixes, cumulative fixes, and fix packs before uninstalling a WebSphere Application Server product. However, if you are manually uninstalling all WebSphere Application Server products from the machine, it is not necessary to uninstall all interim fixes, cumulative fixes or fix packs. See “Uninstalling manually” on page 312 for more information.

**-uninstallAll**

Uninstalls all applied interim fixes. This parameter does not uninstall fix packs.

If you installed interim fixes from the WebSphere MQ Web site, you must use the uninstaller from WebSphere MQ to uninstall interim fixes for the embedded messaging feature. For more information about managing interim fixes for the embedded messaging feature, see the WebSphere MQ Service download site.

If you installed interim fixes from the IBM HTTP Server Web site, you must use the uninstaller from IBM HTTP Server to uninstall interim fixes for the IBM HTTP Server feature. For more information about managing interim fixes for IBM HTTP Server, see the IBM Support site for IBM HTTP Server.

#### **-usage**

Shows command usage.

### **Examples overview**

The following examples assume that:

- The installation root is the C:\WebSphere\AppServer directory.
- The location of the IBM HTTP Server feature is the C:\Program Files\IBMHttpServer directory.
- The interim fix repository is the C:\WebSphere\AppServer\update\fixes directory.
- The cumulative fix and fix pack repository is the C:\WebSphere\AppServer\update\fixpacks directory.

Examples in this section include:

- “Getting help for the command”
- “Using a parameter properties file”
- “Installing interim fixes”
- “Uninstalling interim fixes” on page 247
- “Viewing information about interim fixes” on page 248

Most of the examples are split into more than one line, for ease of publication.

### **Getting help for the command**

To get help for the **updateSilent** command:

```
C:\WebSphere\AppServer\update> updateSilent -help
```

### **Using a parameter properties file**

To use the `myProps.properties` file to supply parameter values for the **updateSilent** command:

```
C:\WebSphere\AppServer\update> updateSilent myProps.properties
```

### **Installing interim fixes**

To install a collection of interim fixes:

```
C:\WebSphere\AppServer\update> updateSilent
  -fix
  -installDir "C:\WebSphere\AppServer"
  -fixDir "C:\WebSphere\AppServer\update\fixes"
  -install
  -fixes Fix1 Fix2
```

It is not possible to install interim fixes for these features:

- IBM HTTP Server feature
- Embedded messaging feature

For more information about managing interim fixes for IBM HTTP Server, see the IBM Support site for IBM HTTP Server. For more information about managing interim fixes for the embedded messaging feature, see the WebSphere MQ Service download site.

To install a collection of interim fixes, and display interim fix details:

```
C:\WebSphere\AppServer\update> updateSilent
-fix
-installDir "C:\WebSphere\AppServer"
-fixDir "C:\WebSphere\AppServer\update\fixes"
-install
-fixes Fix1 Fix2
-fixDetails
```

To install a collection of interim fixes, and override prerequisite checking:

```
C:\WebSphere\AppServer\update> updateSilent
-fix
-installDir "C:\WebSphere\AppServer"
-fixDir "C:\WebSphere\AppServer\update\fixes"
-install
-fixes Fix1 Fix2
-prereqOverride
```

To install interim fixes from a Java archive (JAR) file:

```
C:\WebSphere\AppServer\update> updateSilent
-fix
-installDir "C:\WebSphere\AppServer"
-fixDir "C:\WebSphere\AppServer\update\fixes"
-install
-fixJar Fix1
```

To install interim fixes from a Java archive (JAR) file, and display interim fix details:

```
C:\WebSphere\AppServer\update> updateSilent
-fix
-installDir "C:\WebSphere\AppServer"
-fixDir "C:\WebSphere\AppServer\update\fixes"
-install
-fixJar Fix1
-fixDetails
```

To install interim fixes from a Java archive (JAR) file:

```
C:\WebSphere\AppServer\update> updateSilent
-fix
-installDir "C:\WebSphere\AppServer"
-fixDir "C:\WebSphere\AppServer\update\fixes"
-install
-fixJar Fix1
-fixDetails
```

## Uninstalling interim fixes

To uninstall a collection of interim fixes:

```
C:\WebSphere\AppServer\update> updateSilent
-fix
-installDir "C:\WebSphere\AppServer"
-fixDir "C:\WebSphere\AppServer\update\fixes"
-uninstall
-fixes Fix1 Fix2
```

It is not possible to uninstall interim fixes for these features:

- IBM HTTP Server feature
- Embedded messaging feature

For more information about managing interim fixes for IBM HTTP Server, see the IBM Support site for IBM HTTP Server. For more information about managing interim fixes for the embedded messaging feature, see the WebSphere MQ Service download site.

To uninstall a collection of interim fixes, and display details:

```
C:\WebSphere\AppServer\update> updateSilent
-fix
-installDir "C:\WebSphere\AppServer"
-fixDir "C:\WebSphere\AppServer\update\fixes"
-uninstall
-fixes Fix1 Fix2
-fixDetails
```

To uninstall a collection of interim fixes, and override prerequisite checking:

```
C:\WebSphere\AppServer\update> updateSilent
-fix
-installDir "C:\WebSphere\AppServer"
-fixDir "C:\WebSphere\AppServer\update\fixes"
-uninstall
-fixes Fix1 Fix2
-prereqOverride
```

To uninstall interim fixes in a Java archive (JAR) file:

```
C:\WebSphere\AppServer\update> updateSilent
-fix
-installDir "C:\WebSphere\AppServer"
-fixDir "C:\WebSphere\AppServer\update\fixes"
-uninstall
-fixJar Fix1
```

To uninstall interim fixes in a Java archive (JAR) file, and display details:

```
C:\WebSphere\AppServer\update> updateSilent
-fix
-installDir "C:\WebSphere\AppServer"
-fixDir "C:\WebSphere\AppServer\update\fixes"
-uninstall
-fixJar Fix1
-fixDetails
```

To uninstall interim fixes in a Java archive (JAR) file:

```
C:\WebSphere\AppServer\update> updateSilent
-fix
-installDir "C:\WebSphere\AppServer"
-fixDir "C:\WebSphere\AppServer\update\fixes"
-uninstall
-fixJar Fix1
-fixDetails
```

## Viewing information about interim fixes

To view a list of installed interim fixes:

```
C:\WebSphere\AppServer\update> updateSilent
-fix
-installDir "C:\WebSphere\AppServer"
```

To view a list of interim fixes that are available in the repository:

```
C:\WebSphere\AppServer\update> updateSilent
-fix
-installDir "C:\WebSphere\AppServer"
-fixDir "C:\WebSphere\AppServer\update\fixes"
```



It is not possible to view information about interim fixes for the IBM HTTP Server feature or the embedded messaging feature. For more information about managing interim fixes for IBM HTTP Server, see the IBM Support site for IBM HTTP Server. For more information about managing interim fixes for the embedded messaging feature, see the WebSphere MQ Service download site.

### updateSilent examples for cumulative fixes and fix packs

The **updateSilent** command is the silent, command-line interface for the update installer program. This topic describes using the wizard to work with cumulative fixes and fix packs.

The update installer program installs interim fixes, cumulative fixes, and fix packs to WebSphere Application Server products. See “updateWizard examples for interim fixes” on page 256 for information about using the update silent interface to work with interim fixes.

The relationship among interim fixes, cumulative fixes, and fix packs is shown in the Cumulative Fix Strategy for WebSphere Application Server V5.0 and V5.1 Web page.

### Syntax examples

The updateSilent interface actually provides two functions. Depending upon the parameters you choose, the command performs the following functions:

- Installs and uninstalls interim fixes, cumulative fixes, and fix packs
- Provides information about the update state of interim fixes, cumulative fixes, and fix packs that you install or uninstall

The following examples describe various usage syntaxes. In each syntax example, optional parameters are enclosed by brackets ([ ]). Values that you must supply appear in *italicized font*. Choices are denoted by the pipe symbol (|).

### Help

```
updateSilent -help | -? | -usage
```

```
updateSilent /help | /? | -usage (Windows platforms)
```

### Syntax for using a properties file to supply values

```
updateSilent myProps.properties
```

### Syntax for processing cumulative fixes and fix packs

```
updateSilent -installDir "fully qualified product install_root"  
-fixpack  
-fixpackDir "fully qualified FixPack repository root,  
              usually install_root/update/fixpacks"  
-install | -uninstall  
-fixPackID fix pack ID  
[-skipIHS | [-ihsOnly] -ihsInstallDir fully qualified IBM HTTP Server root]  
[-skipMQ | -mqInstallDir embedded messaging feature root]  
[-includeOptional space-delimited list of components]  
[-fixpackDetails]
```

All other valid arguments are ignored, such as the `prereqOverride` argument, which is for interim fix processing only.

You do not need to supply the `-mqInstallDir` argument for AIX, Linux, and UNIX-based platforms. The install location is fixed on those operating platforms. Use the argument on Windows platforms. The default location on Windows platforms is the `C:\Program Files\IBM\WebSphere MQ` directory.

## Syntax for viewing installed cumulative fixes and fix packs

```
updateSilent -fixpack
  -installDir "fully qualified product install_root"
```

## Syntax for viewing available cumulative fixes and fix packs

```
updateSilent -fixpack
  -installDir "fully qualified product install_root"
  -fixpackDir "fully qualified fix pack repository root,
              usually install_root/update/fixpacks"
```

## Parameters

Use the following parameters for the **updateSilent** command:

**-?** Shows command usage.

**/?** Shows command usage on Windows platforms only.

### **-fixpack**

Fix pack only: Identifies the update as a fix pack update.

### **-fixpackDetails**

Fix pack only: Displays fix pack detail information.

### **-fixpackDir**

Fix pack only: Specifies the fully qualified directory where you download and unpack fix packs. By default, this directory is the *install\_root/update/fixpacks* directory.

### **-fixpackID**

Fix pack only: Specifies the ID of a fix pack to install or uninstall. The value you specify does not include the *.jar* extension. The value is not the fully qualified package file name, but is the name of the individual fix pack within the JAR file.

The current Application Server strategy for fix pack JAR files uses one JAR file per fix pack. The fix pack ID is the name of the JAR file before the *.jar* extension.

**5.1 +** For example:

- **Fix pack ID:** was51\_fp1\_linux
- **Fix pack JAR file name:** was51\_fp1\_linux.jar
- **Fix pack ZIP file name:** was51\_fp1\_linux.zip

### **-help**

Shows command usage.

### **/help**

Shows command usage on Windows platforms only.

### **-ihsInstallDir**

Fix pack only: Specifies the fully qualified path of the IBM HTTP Server product, and applies any service for the IBM HTTP Server product that might exist in the fix pack.

**Important:** Cumulative fixes and fix packs do not include service for the IBM HTTP Server powered by Apache 2.0. If you installed IBM HTTP Server powered by Apache 2.0, skip applying service to the IBM HTTP Server during the installation of a cumulative fix or a fix pack. Do not update the 2.0 level IBM HTTP Server with service for the 1.3 level IBM HTTP Server.

### **-ihsOnly**

Fix pack only: Skips the installation of all service but that for the IBM HTTP Server product, and applies any service for the IBM HTTP Server product that might exist in the fix pack. Requires the *-ihsInstallDir* parameter.

**Important:** Cumulative fixes and fix packs do not include service for the IBM HTTP Server powered by Apache 2.0. If you installed IBM HTTP Server powered by Apache 2.0, skip applying service to the

IBM HTTP Server during the installation of a cumulative fix or a fix pack. Do not update the 2.0 level IBM HTTP Server with service for the 1.3 level IBM HTTP Server.

**-includeOptional**

Fix pack only: Specifies a space-delimited list of features. The installer program applies any service for the components, if present in the fix pack. Otherwise, the installer program does not apply the service.

**-install**

Installs the update type.

**-installDir**

Specifies the fully qualified installation root of the WebSphere Application Server product.

**-mqInstallDir**

Fix pack only: Specifies the fully qualified installation root of the embedded messaging feature, which is based on WebSphere MQ technology.

**<propertyFile>.properties**

Specifies an externally supplied parameters file.

You can supply parameters in an external .properties file, rather than directly on the command line. There are some differences in the formats of parameters:

- You must include all parameters.
- Parameters are [name]=[value] pairs.
- Lists of parameter values are comma-delimited instead of space-delimited.
- There are two slashes before directory names.

A sample.properties file for installing a fix pack might look like the following example:

**-skipIHS**

Fix pack only: Skips any optional service for the IBM HTTP Server product that might exist in the fix pack.

If you installed the IBM HTTP Server product as a feature, use the update installer program to update it with service in an interim fix or fix pack. Otherwise, you must download an updated IBM HTTP Server product from <http://www.ibm.com/software/webervers/httpservers/> and install it into the same directory as your existing version, to update the existing installation. You can also uninstall the current version and install the downloaded version, to avoid any issues with migration.

You must update your configuration, as described in “Manually configuring supported Web servers” on page 32 if you reinstall.

**Important:** Cumulative fixes and fix packs do not include service for the IBM HTTP Server powered by Apache 2.0. If you installed IBM HTTP Server powered by Apache 2.0, skip applying service to the IBM HTTP Server during the installation of a cumulative fix or a fix pack. Do not update the 2.0 level IBM HTTP Server with service for the 1.3 level IBM HTTP Server.

**-skipMQ**

Fix pack only: Specifies no application of any optional service for the embedded messaging feature (which is based on the IBM WebSphere MQ product) that might exist in the fix pack.

Always apply any outstanding corrective service to the stand-alone IBM WebSphere MQ product if you have it, before using the WebSphere Application Server update installer program to update the embedded messaging feature with service in an interim fix or fix pack. You can skip the installation of service to the embedded messaging feature if you must install corrective service to the stand-alone IBM WebSphere MQ product.

**-uninstall**

Specifies to uninstall the identified interim fix, cumulative fix, or fix pack. You must uninstall all interim fixes, cumulative fixes, and fix packs before uninstalling a WebSphere Application Server product. However, if you are manually uninstalling all WebSphere Application Server products from the

machine, it is not necessary to uninstall all interim fixes, cumulative fixes or fix packs. See “Uninstalling manually” on page 312 for more information.

#### **-usage**

Shows command usage.

#### **Examples overview**

The following examples assume that:

- The installation root is the C:\WebSphere\AppServer directory.
- The location of the IBM HTTP Server feature is the C:\Program Files\IBMHttpServer directory.
- The interim fix repository is the C:\WebSphere\AppServer\update\fixes directory.
- The cumulative fix and fix pack repository is the C:\WebSphere\AppServer\update\fixpacks directory.

Examples in this section include:

- “Getting help for the command”
- “Using a parameter properties file”
- “Installing cumulative fixes and fix packs”
- “Uninstalling cumulative fixes and fix packs” on page 254
- “Viewing information about cumulative fixes and fix packs” on page 254

Most of the examples are split into more than one line, for ease of publication.

#### **Getting help for the command**

To get help for the **updateSilent** command:

```
C:\WebSphere\AppServer\update> updateSilent -help
```

#### **Using a parameter properties file**

To use the myProps.properties file to supply parameter values for the **updateSilent** command:

```
C:\WebSphere\AppServer\update> updateSilent myProps.properties
```

#### **Installing cumulative fixes and fix packs**

To install a fix pack:

```
C:\WebSphere\AppServer\update> updateSilent
-fixpack
-installDir "C:\WebSphere\AppServer"
-ihsInstallDir "C:\Program Files\IBMHttpServer"
-fixpackDir "C:\WebSphere\AppServer\update\fixpacks"
-install
-fixpackID was510_cf2_win
```

To install a fix pack, and display fix pack details:

```
C:\WebSphere\AppServer\update> updateSilent
-fixpack
-installDir "C:\WebSphere\AppServer"
-ihsInstallDir "C:\IBMHttpServer"
-fixpackDir "C:\WebSphere\AppServer\update\fixpacks"
-install
-fixpackID was510_cf2_win
-fixpackDetails
```

To perform a partial installation of a fix pack, by choosing to skip the installation of optional service to the WebSphere Application Server embedded messaging feature, which is based on WebSphere MQ:

```
C:\WebSphere\AppServer\update> updateSilent
-fixpack
-installDir "C:\WebSphere\AppServer"
-fixpackDir "C:\WebSphere\AppServer\update\fixpacks"
-ihsInstallDir "C:\Program Files\IBMHttpServer"
-install
-fixpackID was510_cf2_win
-skipMQ
```

The fix pack status shows partial installation.

### About installation status

An interim fix or a fix pack is a collection of updates to one or more product components. Depending on installed product components and on update installer program selections you make, the update installer program applies either a full or partial set of interim fix or fix pack updates to product components.

**Installed status** implies that the interim fix or fix pack has no more updates to product components that you can install.

**Partially installed status** implies that you have updated one or more product components, but the interim fix or fix pack has at least one more update you can apply to an installed product component. (There might be other updates to product components you never installed. These updates do not count in the status determination.)

**Uninstalled status** implies that you have not updated a single product component.

**Examples of partially installed states:** Several scenarios can lead to a partial installation of an interim fix or fix pack:

- Installation fails, leaving some component updates applied and some unapplied. This is a partial installation accompanied by error messages that describe the problem.
- You select to skip certain optional component updates, such as might be present in a fix pack for these features: IBM HTTP Server or embedded messaging. This is a partial installation.
- You trigger a dynamic change in interim fix or fix pack status because:
  1. You apply all changes in an interim fix or fix pack that results in an installed status.
  2. You reinstall the WebSphere Application Server product to select an additional, optional feature.
  3. The interim fix or fix pack contains an update to a product component you just installed.

The status changes dynamically from installed to partially installed.

### How to distinguish between a normal partially installed state and an installation failure

A partially installed state implies that some components on the system are at the level of the fix pack being applied. However, there might be some scenarios where the update installer program can report a partially installed state even if no components are at the newer level. A partially installed state does not imply a failed install. However, a failed install does result in a partially installed state.

**5.1 +** To check for a failed install, open the master log file and search for errors. The update installer program outputs the name of the master log file at the start of the installation process. The file name matches this pattern: *install\_root/logs/update/time-stamp\_was51\_fpnumber\_platform\_selective-install.log*

To perform a partial installation of a fix pack by choosing to skip the installation of optional service to the IBM HTTP Server feature:

```
C:\WebSphere\AppServer\update> updateSilent
-fixpack
-installDir "C:\WebSphere\AppServer"
-fixpackDir "C:\WebSphere\AppServer\update\fixpacks"
```

```
-mqInstallDir "C:\WebSphere MQ"  
-install  
-fixpackID was510_cf2_win  
-skipIHS
```

The fix pack status shows partial installation.

To perform a partial installation of a fix pack, by choosing to skip the installation of optional service to both the embedded messaging feature and the IBM HTTP Server feature:

```
C:\WebSphere\AppServer\update> updateSilent  
-fixpack  
-installDir "C:\WebSphere\AppServer"  
-fixpackDir "C:\WebSphere\AppServer\update\fixpacks"  
-install  
-fixpackID was510_cf2_win  
-skipIHS  
-skipMQ
```

The fix pack status shows partial installation.

## Uninstalling cumulative fixes and fix packs

To uninstall a fix pack:

```
C:\WebSphere\AppServer\update> updateSilent  
-fixpack  
-installDir "C:\WebSphere\AppServer"  
-uninstall  
-fixpackID was510_cf2_win
```

To uninstall a fix pack, and display fix pack details:

```
C:\WebSphere\AppServer\update> updateSilent  
-fixpack  
-installDir "C:\WebSphere\AppServer"  
-uninstall  
-fixpackID was510_cf2_win  
-fixpackDetails
```

## Viewing information about cumulative fixes and fix packs

To view a list of installed fix packs:

```
C:\WebSphere\AppServer\update> updateSilent  
-fixpack  
-installDir "C:\WebSphere\AppServer"
```

To view a list of fix packs available in the repository for the base WebSphere Application Server product:

```
C:\WebSphere\AppServer\update> updateSilent  
-fixpack  
-installDir "C:\WebSphere\AppServer"  
-fixpackDir "C:\WebSphere\AppServer\update\fixpacks"
```

## updateWizard command

The **updateWizard** command is the wizard interface to the IBM WebSphere Application Server update installer program. You can also use a silent, command-line interface to the update installer program, the **updateSilent** command. The update installer program is also known as the updateInstaller program or the Update installation wizard.

The update installer program installs interim fixes, cumulatives fixes, and fix packs to WebSphere Application Server products.



The relationship among interim fixes, cumulative fixes, and fix packs is shown in the Cumulative Fix Strategy for WebSphere Application Server V5.0 and V5.1 Web page.

## Overview

Both the **updateWizard** command and the “updateSilent command” on page 242 command call the update installer program to install and uninstall interim fixes, cumulative fixes, and fix packs for WebSphere Application Server products. This topic describes the wizard interface to the update installer command, and gives some information about its panels and fields.

**Stop all Java processes on the machine that use the IBM Software Developer Kit (SDK) that WebSphere Application Server provides:** Before installing or uninstalling interim fixes, cumulative fixes, and fix packs on a machine, stop all Java processes on the machine that use the IBM SDK, Java Technology Edition that WebSphere Application Server provides. WebSphere Application Server processes include:

- Application Server processes
- All servers, such as the IBMHttpServer process, that belong to serviceable features. Features with servers include the IBM HTTP Server and the embedded messaging feature.
- The nodeagent process on a base node when the node is federated into a deployment manager cell
- The dmgr process for the deployment manager server
- The jmsserver on a base node when the node is part of a cell and the embedded messaging server and client feature is installed

Stop all Java processes, if necessary. If you do install or uninstall an interim fix, a cumulative fix, or a fix pack while a WebSphere Application Server-related Java process runs, IBM does not guarantee that the product can continue to run successfully, or without error.

**Remove the WebSphere MQ tray icon if present** On a Windows platform, remove the WebSphere MQ tray icon if it is present. The WebSphere MQ tray icon in the lower right corner indicates that a WebSphere MQ process (**amqmtbrn.exe**) is running. Right click the tray icon and click **Hide** to remove it.

**Do not launch multiple copies of the update installer program at one time** The update installer program cannot be launched concurrently with itself. Performing more than one update at the same time can lead to a failed or faulty installation.

The following descriptions contain reference information about the command. See “Installing interim fixes, cumulative fixes, and fix packs” on page 230 for more information about using the command.

### Command name

updateWizard.sh and updateWizard.bat, graphical interface to the installer.jar file.

### Related command

updateSilent.sh and updateSilent.bat, command-line interface to the installer.jar file.

See “updateSilent command” on page 242.

### Location of the command

See “Installing interim fixes, cumulative fixes, and fix packs” on page 230 for a list of product installation roots, fix pack space requirements and names, and other information that also applies when using the **updateWizard** command interface.

### Syntax and panel examples

#### Using the updateWizard interface to work with interim fixes

See “updateWizard examples for interim fixes” on page 256 for more information.

#### Using the updateWizard interface to work with cumulative fixes and fix packs

See “updateWizard examples for cumulative fixes and fix packs” on page 260 for more information.

## updateWizard examples for interim fixes

The **updateWizard** command starts the Update installer wizard. This topic describes using the wizard to work with interim fixes.

The update installer program installs interim fixes, cumulative fixes, and fix packs to WebSphere Application Server products.

### Installing interim fixes for features that are products

Three different Web sites contain interim fixes for WebSphere Application Server products and features. Three sites exist because two of the features of the base product have their own service and support sites.

You cannot install or uninstall interim fixes for either of the two features using the update installer program for WebSphere Application Server. See the following tips for more information:

Table 63. Installation tip

| Operating platform | Tip in “Platform-specific tips for installing and migrating” on page 146  |
|--------------------|---|
| All platforms      | <ul style="list-style-type: none"><li>• Installing interim fixes for the IBM HTTP Server feature and the embedded messaging feature</li><li>• Uninstalling interim fixes for the IBM HTTP Server feature and the embedded messaging (WebSphere MQ) feature before installing cumulative fixes and fix packs to the features</li></ul> |

You must use the update installer program to install cumulative fixes and fix packs for the two features. See “updateWizard examples for cumulative fixes and fix packs” on page 260 for information about using the update installer program to install cumulative fixes and fix packs.

### Parameters

Apply zero, one, or more of these optional parameters in any order, by issuing the **updateWizard** command from the command line.

#### **-dpInstall**

Lets you install an interim fix when there are prerequisite check errors.

The default behavior of the update installer application prevents further action if prerequisites are missing.

#### **-dpUninstall**

Lets you uninstall an interim fix when there are prerequisite check errors.

#### **-fixOnly**

Installs or uninstalls only interim fixes. To install and uninstall interim fixes, the **updateWizard** command does not require a local copy of the IBM Developer Kit or the Java Runtime Environment (JRE) in a client environment. This option bypasses making a local copy of the IBM Developer Kit or the JRE.

The default action for the update installer program enables both installing and uninstalling interim fixes, cumulative fixes, and fix packs. The wizard installs a temporary version of one of the IBM products that WebSphere Application Server uses to support the Java 2 SDK on your operating system platform, such as the IBM Developer Kit for AIX, Java Technology Edition.

The **updateWizard** command copies the IBM Developer Kit from the JAVA\_HOME directory to the directory where you are running the **updateWizard** command (usually *install\_root/update*). If the IBM Developer Kit is already in the directory (for example, if you used the **updateWizard** command before), the **updateWizard** command does not make a new copy. The copy of the IBM Developer Kit remains in the directory until you remove it. The IBM Developer Kit requires approximately 43 MB of free space.

If you install on a client platform, where there is a JRE instead of the IBM Developer Kit, the **updateWizard** command copies the JRE to the *install\_root*/update directory. The JRE requires about 18 MB of free space.

#### **-usage**

Displays a list of parameters and how to use them in the correct command syntax.

#### **Syntax for starting the wizard**

The **updateWizard** command (*install\_root*/update/updateWizard.sh and *install\_root*\update\updateWizard.bat) launches the wizard interface to the update installer application.

*install\_root*/update/updateWizard.sh (Linux and UNIX-based platforms)

*install\_root*\update\updateWizard.bat (Windows platforms)

#### **Syntax for displaying usage information**

This command displays command syntax:

```
updateWizard -usage
```

#### **Syntax for bypassing the local copy of the IBM Developer Kit**

The following command bypasses making a local copy of the IBM Developer Kit. Installing and uninstalling interim fixes does not require the local copy.

```
updateWizard -fixOnly
```

#### **Disabling prerequisite checking**

Disabling prerequisite checking is recommended only as directed by IBM Support personnel. Disabling prerequisite checking can leave the installation in a non-valid state.

To disable prerequisite checking when installing interim fixes:

```
updateWizard -fixOnly -dpInstall
```

To disable prerequisite checking when uninstalling interim fixes:

```
updateWizard -fixOnly -dpUninstall
```

#### **Panel descriptions**

Panels in the wizard let you select installable interim fixes, view installed interim fixes, and view prerequisite interim fixes:

- **General**
  - Welcome panel
  - Product selection panel
  - Menu panel
- **Installing and uninstalling interim fixes**
  - Fix repository specifier panel
  - Installable interim fix selection panel
  - Uninstallable interim fix selection panel
  - Prerequisite check panel
  - Pre-installing and pre-uninstalling summary panels
  - Installing and uninstalling
  - Post installing and post uninstalling summary panels

## Welcome panel

Use this panel to view a welcome message that contains a brief summary of the update wizard interface, or to link to the WebSphere Application Server Support page. (This link is not available on some UNIX-based platforms.) You can also view relevant legal notices.

## Product selection panel

Use this panel to select an installed WebSphere Application Server product. If the wizard cannot detect an installed product, specify the product location in the **directory input** field. After selecting a product, its directory location appears in the **input field** for verification purposes. To make corrections or enter another product location, click **Specify product location**.

## Menu panel

Use this panel to install or uninstall interim fixes, or to install or uninstall cumulative fixes and fix packs. If you started the wizard in `-fixOnly` mode, cumulative fix and fix pack options are disabled.

## Fix repository specifier panel

Use this panel to provide the interim fix repository location in a directory input field. Specify the directory location of the downloaded interim fix JAR files. The default location for the repository is the `install_root/update/fixes` directory.

## Installable fix selection panel

Use this panel to select one or more installable fixes for installing. Installed fixes do not appear in the list. Only uninstalled fixes or partially-installed fixes appear. The list includes interim fix ID name, build date, and the current applied state (uninstalled or partially-installed). Click **Details** for detailed information about selected fixes. The window that appears contains build version information, a long description, and a list of installation prerequisites.

## About installation status

An interim fix, a cumulative fix, or a fix pack is a collection of updates to one or more product components. Depending on installed product components and on update installer program selections you make, the update installer program applies either a full or partial set of interim fix, cumulative fix, or fix pack updates to product components.

**Installed status** implies that the interim fix, cumulative fix, or fix pack has no more updates to product components that you can install.

**Partially installed status** implies that you have updated one or more product components, but the interim fix, cumulative fix, or fix pack has at least one more update that you can apply to an installed product component. (Updates to product components that you never installed do not count in the status determination.)

**Uninstalled status** implies that you have not updated a single product component.

**Examples of partially installed states:** Several scenarios can lead to a partial installation of an interim fix, a cumulative fix, or a fix pack:

- Installation fails, leaving some component updates applied and some unapplied. This is a partial installation accompanied by error messages that describe the problem.
- You skip optional component updates for the IBM HTTP Server or embedded messaging feature. This is a partial installation.
- You trigger a dynamic change in interim fix, cumulative fix, or fix pack status because:

1. You apply all changes in an interim fix, a cumulative fix, or a fix pack that results in an installed status.
2. You reinstall the WebSphere Application Server product to select an additional, optional feature.
3. The interim fix, cumulative fix, or fix pack contains an update to a product component you just installed.

The status changes dynamically from installed to partially installed.

### How to distinguish between a normal partially installed state and an installation failure

A partially installed state implies that some components on the system are at the level of the cumulative fix or fix pack being applied. However, there might be some scenarios where the update installer program can report a partially installed state even if no components are at the newer level. A partially installed state does not imply a failed install. However, a failed install does result in a partially installed state.

To check for a failed install, open the master log file and search for errors. The update installer program outputs the name of the master log file at the start of the installation process. The file name matches this pattern: `install_root/logs/update/time-stamp_was50_fpnumber_platform_selective-install.log`

### Uninstallable fix selection panel

Use this panel to select one or more installed interim fixes for uninstalling. Available fixes do not appear in the list. Only installed fixes appear. The list includes interim fix ID name, build date, and the current applied state (installed). Click **Details** to obtain more detailed information about a selected fix. The window that appears contains build version information, a long description, and a list of installation prerequisites.

You must uninstall all interim fixes before uninstalling the base WebSphere Application Server product, the Network Deployment product, or the product.

### Prerequisite check panel

Use this panel to view prerequisite information when a selected interim fix has prerequisite fixes that are not installed. You cannot click **Next** until you correct the problem. The `-dpInstall` and the `-dpUninstall` parameters can override this lock, to let you continue installing or uninstalling even though a prerequisite checking failure occurs.

### Pre-installing and Pre-uninstalling summary panels

**Pre-installing summary panel** Use this panel to display a summary of interim fixes that are selected for installation, the WebSphere Application Server product each interim fix is for, and the directory where each interim fix is located.

**Pre-uninstalling Summary panel** Use this panel to display a summary of interim fixes that are selected for uninstalling, and the WebSphere Application Server product to which each interim fix is currently applied.

### Installing and Uninstalling panel

**Installation action** Use this panel to view the progress of installing selected interim fixes. Click **cancel** to revert the installation. Once cancelled, a message confirms that installed fixes are being rolled back. A similar progress panel then appears, to monitor the progress of rolling back the installation of selected fixes.

**Uninstalling action** Use this panel to view the progress of uninstalling selected interim fixes.

## Post installation summary and Post uninstalling summary panels

**Post installation summary panel** Use this panel to view the results of the installation. Depending on the result, this panel can display a success message, a failure message, or a canceled message. When the success message appears, the installation process is complete. Click **Finish** to exit the panel. You can go back and install additional fixes, which takes you to the **Menu** panel.

**Post uninstalling summary panel** Use this panel to view the results of the uninstall procedure. Depending on the result, this panel can display a success message, a failure message, or a canceled message. When the success message appears, the uninstall process is complete. Click **Finish** to exit the panel. You can go back and uninstall additional fixes, which takes you to the **Menu** panel.

## updateWizard examples for cumulative fixes and fix packs

The **updateWizard** command starts the Update installer wizard. This topic describes using the wizard to work with cumulative fixes and fix packs.

The update installer program installs interim fixes, cumulative fixes, and fix packs to WebSphere Application Server products. See “updateWizard examples for interim fixes” on page 256 for information about using the Update installer wizard to install interim fixes.

The relationship among interim fixes, cumulative fixes, and fix packs is shown in the Cumulative Fix Strategy for WebSphere Application Server V5.0 and V5.1 Web page.

## Syntax for starting the wizard

The **updateWizard** command (*install\_root*/update/updateWizard.sh and *install\_root*\update\updateWizard.bat) launches the wizard interface to the update installer application.

`install_root/update/updateWizard.sh` (Linux and UNIX-based platforms)

`install_root\update\updateWizard.bat` (Windows platforms)

## Syntax for displaying usage information

This command displays command syntax:

```
updateWizard -usage
```

## Panel descriptions

Panels in the wizard let you select installable interim fixes, cumulative fixes, and fix packs, view installed interim fixes, cumulative fixes, and fix packs, and view prerequisite fixes:

- **General**
  - Welcome panel
  - Product selection panel
  - Menu panel
- **Installing and uninstalling cumulative fixes and fix packs**
  - Cumulative fix and fix pack repository specifier panel
  - Cumulative fix and fix pack selection panel
  - Cumulative fix and fix pack features selection panel
  - Pre-installing and pre-uninstalling summary panels
  - Installing and uninstalling
  - Post installing and post uninstalling summary panel



## Welcome panel

Use this panel to view a welcome message that contains a brief summary of the update wizard interface, or to link to the WebSphere Application Server Support page. (This link is not available on some UNIX-based platforms.) You can also view relevant legal notices.

## Product selection panel

Use this panel to select an installed WebSphere Application Server product. If the wizard cannot detect an installed product, specify the product location in the **directory input** field. After selecting a product, its directory location appears in the **input field** for verification purposes. To make corrections or enter another product location, click **Specify product location**.

## Menu panel

Use this panel to install or uninstall cumulative fixes and fix packs.

## Cumulative fix and fix pack repository specifier panel

Use this panel to provide the cumulative fix and fix pack repository location in a directory input field. The location should point to the directory where you unpacked downloaded fix pack JAR files. The default location for the repository is the `install_root/update/fixpacks` directory.

## Cumulative fix and fix pack selection panel

Use this panel to select from a list of installable cumulative fixes and fix packs. The panel displays fix packs by ID name, with a radio button next to each for selecting a single cumulative fix or fix pack. Also displayed is the build date and current applied state (uninstalled or partially-installed) for each cumulative fix or fix pack. A cumulative fix or fix pack on this panel can be in a partially installed state. No installed cumulative fixes or fix packs appear in the list. Click **Details** for more information about a selected cumulative fix or fix pack. The window that appears contains build version information, a long description, installation prerequisites, and a list of included fixes.

## About installation status

An interim fix, a cumulative fix, or a fix pack is a collection of updates to one or more product components. Depending on installed product components and on update installer program selections you make, the update installer program applies either a full or partial set of interim fix, cumulative fix, or fix pack updates to product components.

**Installed status** implies that the interim fix, cumulative fix, or fix pack has no more updates to product components that you can install.

**Partially installed status** implies that you have updated one or more product components, but the interim fix, cumulative fix, or fix pack has at least one more update that you can apply to an installed product component. (Updates to product components that you never installed do not count in the status determination.)

**Uninstalled status** implies that you have not updated a single product component.

**Examples of partially installed states:** Several scenarios can lead to a partial installation of an interim fix, a cumulative fix, or a fix pack:

- Installation fails, leaving some component updates applied and some unapplied. This is a partial installation accompanied by error messages that describe the problem.
- You skip optional component updates for the IBM HTTP Server or embedded messaging feature. This is a partial installation.

- You trigger a dynamic change in interim fix, cumulative fix, or fix pack status because:
  1. You apply all changes in an interim fix, a cumulative fix, or a fix pack that results in an installed status.
  2. You reinstall the WebSphere Application Server product to select an additional, optional feature.
  3. The interim fix, cumulative fix, or fix pack contains an update to a product component you just installed.

The status changes dynamically from installed to partially installed.

### How to distinguish between a normal partially installed state and an installation failure

A partially installed state implies that some components on the system are at the level of the cumulative fix or fix pack being applied because the cumulative fix or fix pack updated them. However, there might be some scenarios where the update installer program can report a partially installed state even if no components are at the level of the cumulative fix or fix pack. A partially installed state does not imply a failed install. However, a failed install does result in a partially installed state.

To check for a failed install, open the master log file and search for errors. The update installer program outputs the name of the master log file at the start of the installation process. The file name matches this pattern: `install_root/logs/update/time-stamp_was50_fpnumber_platform_selective-install.log`

### Cumulative fix or fix pack features selection panel

Use this panel to view a list of WebSphere Application Server features with optionally installable service in the selected cumulative fix or fix pack. Features that can appear include the IBM HTTP Server feature and the embedded messaging feature, which is based on IBM WebSphere MQ technology. If a feature has required service, the feature appears in the list but is grayed out. If you do not install optional service for an installed feature, the cumulative fix or fix pack installs successfully as a **partially installed fix pack**, because there is service that you did not install.

**Important:** Cumulative fixes and fix packs do not include service for the IBM HTTP Server powered by Apache 2.0. If you installed IBM HTTP Server powered by Apache 2.0, skip applying service to the IBM HTTP Server during the installation of a cumulative fix or a fix pack. Do not update the 2.0 level IBM HTTP Server with service for the 1.3 level IBM HTTP Server.

If you installed the IBM HTTP Server powered by Apache 1.3 product as a feature, use the update installer program to update it with service in a cumulative fix or a fix pack. You can install interim fixes from the IBM Support site for IBM HTTP Server. Otherwise, you must download an updated IBM HTTP Server product from <http://www-3.ibm.com/software/webservers/httpservers/> and install it into the same directory as your existing version to update the existing installation. You can also uninstall the current version and install the downloaded version, to avoid any issues with migration.

You must update your configuration if you reinstall.

Always apply any outstanding corrective service to the stand-alone IBM WebSphere MQ product if you have it, before using the WebSphere Application Server update installer program to update the embedded messaging feature with service in an interim fix, a cumulative fix, or a fix pack. Do not select the installation of service to the embedded messaging feature if you must install corrective service to the stand-alone IBM WebSphere MQ product.

### Pre-installing summary and Pre-uninstalling summary panels

**Pre-installing summary panel** Use this panel to display a summary of the cumulative fix or fix pack selected for installation, the WebSphere Application Server product that is the target for the cumulative fix or fix pack, and the directory where the cumulative fix or fix pack is located.

**Pre-uninstalling summary panel** Use this panel to display a summary of the cumulative fix or fix pack that you are uninstalling, the WebSphere Application Server product to which the cumulative fix or fix pack was applied, and the directory where the cumulative fix or fix pack is located.

### Installing and Uninstalling panel

**Installing action** Use this panel to view the progress of installing the selected cumulative fix or fix pack. Click **cancel** to revert the installation. Once cancelled, a message confirms that the cumulative fix or fix pack is being rolled back. A similar progress panel then appears, to monitor the progress of rolling back the installation of the selected cumulative fix or fix pack.

**Uninstalling action** Use this panel to view the progress of uninstalling the selected cumulative fix or fix pack. There is no way to cancel the uninstall action.

You must uninstall all cumulative fix or fix pack before uninstalling the base WebSphere Application Server product, the Network Deployment product, or the WebSphere Business Integration Server Foundation product.

### Post installation summary and Post uninstalling summary panels

**Post installation summary panel** Use this panel to view the results of the installation. Depending on the result, this panel can display a success message, a failure message, or a canceled message. When the success message appears, the installation process is complete. Click **Finish** to exit the panel. You can go back and install another cumulative fix or fix pack, which takes you to the **Menu** panel.

**Post uninstalling summary panel** Use this panel to view the results of the uninstall action. Depending on the result, this panel can display a success message, a failure message, or a canceled message. When the success message appears, the uninstall process is complete. Click **Finish** to exit the panel. You can go back and uninstall another cumulative fix or fix pack. Going back takes you to the **Menu** panel.

## Uninstalling interim fixes, cumulative fixes, and fix packs

This topic describes the proper procedure for using the update installer application to uninstall an interim fix, a cumulative fix, or a fix pack. The update installer program is also known as the updateInstaller program or the Update installation wizard.

You cannot uninstall product updates correctly without the proper authorizations. Use the update installer program as the root user on a Linux or UNIX platform, or as the administrator on a Windows platform.

Fix packs are also known as *fixpacks*, *FixPaks* and *program temporary fixes*, or PTFs.

Removing an interim fix, a cumulative fix, or a fix pack requires setting the JAVA\_HOME environment variable for the update installer. The update installer performs the task by running the **setupCmdLine** or **setupClient** command script. It is possible that the update installer cannot set the JAVA\_HOME environment variable. If the update installer throws an error because it cannot set the Java environment, set the JAVA\_HOME variable yourself. Then use the update installer to remove an interim fix, a cumulative fix, or a fix pack using either its wizard interface, the **updateWizard** command or its silent, command-line interface, the **updateSilent** command.

The update installer application can also install interim fixes, cumulative fixes, and fix packs.

### Installation roots

The variable *install\_root* represents the root directory for WebSphere Application Server. By default, this varies per product and operating system:

- Base WebSphere Application Server product:
  - AIX platforms: /usr/IBM/WebSphere/AppServer
  - Linux platforms: /opt/IBM/WebSphere/AppServer

- HP-UX and Solaris platforms: `/opt/IBM/WebSphere/AppServer`
- Windows platforms: `drive\Program Files\WebSphere\AppServer`
- Network Deployment product:
  - AIX platforms: `/usr/WebSphere/DeploymentManager`
  - Linux platforms: `/opt/WebSphere/DeploymentManager`
  - HP-UX and Solaris platforms: `/opt/WebSphere/DeploymentManager`
  - Windows platforms: `drive\Program Files\WebSphere\DeploymentManager`
- **5.1+** WebSphere Business Integration Server Foundation product that extends the base product:
  - AIX platforms: `/usr/WebSphere/AppServer`
  - Linux platforms: `/opt/WebSphere/AppServer`
  - HP-UX and Solaris platforms: `/opt/WebSphere/AppServer`
  - Windows platforms: `drive\Program Files\WebSphere\AppServer`
- **5.1+** WebSphere Business Integration Server Foundation product that extends the Network Deployment product
  - AIX platforms: `/usr/WebSphere/DeploymentManager`
  - Linux platforms: `/opt/WebSphere/DeploymentManager`
  - HP-UX and Solaris platforms: `/opt/WebSphere/DeploymentManager`
  - Windows platforms: `drive\Program Files\WebSphere\DeploymentManager`

### Command name

`updateSilent.sh`, `updateSilent.bat`, `updateWizard.sh`, and `updateWizard.bat`, command-line interfaces to the `installer.jar` file.

### Prerequisite environment setting

The `JAVA_HOME` environment setting must point to the IBM SDK for WebSphere Application Server products. Source the appropriate command:

- `. install_root/bin/setupCmdLine.sh` (Source the command on UNIX platforms. There is a space between the period and the installation root directory.)
- `source install_root/bin/setupCmdLine.sh` (Source the command on Linux platforms.)
- `install_root\bin\setupCmdLine.bat` (Windows platforms only)

### Location of log and backup files

The update installer program records processing results in log files in the `install_root/logs/update` directory. Backup files created during the installation of fixes and fix packs are in the `install_root/properties/version/backup` directory. The files are required to uninstall an interim fix or fix pack.

### Syntax and panel examples

#### Using the `updateWizard` interface to remove interim fixes

See “`updateWizard` examples for interim fixes” on page 256 for more information.

#### Using the `updateWizard` interface to remove cumulative fixes and fix packs

See “`updateWizard` examples for cumulative fixes and fix packs” on page 260 for more information.

#### Using the `updateSilent` interface to remove interim fixes

See “`updateSilent` examples for interim fixes” on page 243 for more information.

#### Using the `updateSilent` interface to remove cumulative fixes and fix packs

See “`updateSilent` examples for cumulative fixes and fix packs” on page 249 for more information.

### Overview of the removal procedure

Use the update installer to uninstall a cumulative fix or a fix pack.

Use the update installer to uninstall an interim fix that you installed with the update installer.

If you have installed interim fixes for the IBM HTTP Server feature from the IBM Support site for IBM HTTP Server, or if you have installed interim fixes for the embedded messaging feature from the WebSphere MQ Service download site, the update installer program cannot uninstall interim fixes for these feature components before installing a cumulative fix or a fix pack that might include service for the features. The update installer program does uninstall interim fixes for all of the other components. If the interim fixes for the IBM HTTP Server feature and the embedded messaging feature are not uninstalled for some reason, installing a cumulative fix or a fix pack to the IBM HTTP Server feature or to the embedded messaging feature might fail, or the updated features might fail when you begin using them.

If you reinstall all of the interim fixes for either feature that are more current than the cumulative fix or the fix pack, there is no problem.

You can also choose to have the update installer skip applying cumulative fix or fix pack updates to IBM HTTP Server or embedded messaging if you do not require the updates. You can skip these updates and still apply updates to the rest of the product.

### Special rules for removing fixes within a cell

One requirement governs applying an interim fix or fix pack to a cell, to ensure the continued, smooth interaction of the various WebSphere Application Server nodes:

**Requirement 1:** *The Network Deployment product must be at the highest fix level within the cell.*

For example, you cannot use the **addNode** command to add a V5.1 base WebSphere Application Server node to a V5.0.2 deployment manager cell.

There is no limitation on the fix level of a base Application Server V5 node within its cell, if the fix level of the base node is the same as or lower than that of the deployment manager. There is also no limit on the number of different V5.x fix levels that can coexist or interoperate within a cell, so long as the fix level for each base node is the same as or lower than that of the deployment manager. Version 5.0.x base nodes can comprise V5.1 deployment manager cells.

### Viewing the fix level of the node

You can use the “versionInfo command” on page 290 in the *install\_root/bin* directory to display the exact fix and version level of the product. However, do not use the **versionInfo** command while installing an interim fix or fix pack.

You can also use the silent update installer application to:

- View interim fix information. See “Viewing information about interim fixes” on page 248.
- View cumulative fix or fix pack information. See “Viewing information about cumulative fixes and fix packs” on page 254.

### Updating cluster members

Refer to the following tip for information about updating cluster members:

Table 64. Installation tip

| Operating platform | Tip  |
|--------------------|--|
| All platforms      | Updating all cluster members to the same service level |

Although the tip is about installing interim fixes and fix packs, the same principle applies to uninstalling interim fixes and fix packs. All clusters must be at the same service level.

### Avoiding application errors after uninstalling an interim fix, a cumulative fix, or a fix pack

Generally speaking, if an application uses functions that are provided by a particular fix and you remove the fix, the application can throw an error. If you remove a fix, retest your applications to verify that there are no errors. Redeploy any applications that throw an error because of the missing fix.

For example, suppose that you install Fix Pack 1 on Version 5.1.0 of the base Application Server product. You then use Web services to create a stock quote service, StockQuote. The wsdl2java

utility when run in the deployer role creates a ServiceLocator class in the emitted code that extends the AgnosticService class. The AgnosticService class is new as of V5.1.1.

If you uninstall the fix pack, the application is using a new Web services class that V5.1.0 does not support. The application throws the following error:

```
java.lang.NoClassDefFoundError:  
  Error while defining class:  
    com.ibm.ws.wsfvt.test.stockquote.StockQuoteServiceLocator  
  This error indicates that the class:  
    com.ibm.ws.webservices.multiprotocol.AgnosticService  
  could not be located while defining the class:  
    com.ibm.ws.wsfvt.test.stockquote.StockQuoteServiceLocator
```

Redeploy the application on the V5.1.0 Application Server to emit code that does not use the new V5.1.1 Web services class.

Always uninstall the highest level interim fix, cumulative fix, or fix pack before uninstalling other interim fixes or fix packs.

1. Stop all Java processes that use the IBM Software Developer Kit (SDK) that WebSphere Application Server provides. Before installing or uninstalling interim fixes, cumulative fixes, and fix packs on a machine, stop all Java processes on the machine that use the IBM SDK, Java Technology Edition that WebSphere Application Server provides.

WebSphere Application Server processes include:

- Application Server processes
- All servers, such as the IBMHttpServer process, that belong to serviceable features. Features with servers include the IBM HTTP Server and the embedded messaging feature.
- The nodeagent process on a base node when the node is federated into a deployment manager cell
- The dmgr process for the deployment manager server
- The jmsserver on a base node when the node is part of a cell and the embedded messaging server and client feature is installed

Stop all Java processes, if necessary, with the **killall -9 java** command or by using the task manager on a Windows platform. If you do install or uninstall an interim fix, a cumulative fix, or a fix pack while a WebSphere Application Server-related Java process runs, IBM does not guarantee that the product can continue to run successfully, or without error.

2. Remove the WebSphere MQ tray icon if it is present on a Windows system. On a Windows platform, remove the WebSphere MQ tray icon if it is present. The WebSphere MQ tray icon in the lower right corner indicates that a WebSphere MQ process (**amqmtbrn.exe**) is running. Right click the tray icon and click **Hide** to remove it.
3. Remove the interim fix, the cumulative fix, or the fix pack on a base node, as described in “Removing a fix from a base node.”

You can successfully remove interim fixes and fix packs from WebSphere Application Server products.

## Removing a fix from a base node

This topic describes the proper procedure for using the update installer application to uninstall an interim fix, a cumulative fix, or a fix pack from an Application Server node. The update installer program is also known as the updateInstaller program or the Update installation wizard.

The update installer program removes interim fixes, cumulative fixes, and fix packs from WebSphere Application Server products, including base Application Server nodes.

**5.1+** See these information center topics:

- If the base Application Server node is extended by the WebSphere Business Integration Server Foundation product, see Removing a fix from an extended node before you use this topic.



- If the base WebSphere Application Server node is within a cell, see Removing a fix from a Network Deployment node before you use this topic.

This procedure describes a scenario for updating a base node by removing an interim fix, a cumulative fix, or a fix pack. See “Installing interim fixes, cumulative fixes, and fix packs” on page 230 to install an interim fix, a cumulative fix, or a fix pack.

Always uninstall the highest level interim fix, cumulative fix, or fix pack before uninstalling other interim fixes or fix packs.

1. Stop each server on the base node with the **stopServer** command.
2. Set up and configure your WebSphere Application Server environment. Set the JAVA\_HOME environment variable for the update installer. If the update installer can set the Java environment, this step is unnecessary. Otherwise, this is a required step.

The location of the update, fixes, and fixpacks directories is arbitrary. You can create the directories anywhere so long as you do not use a directory name with a space in the name.

The update installer can fail to set the JAVA\_HOME environment variable. If you receive a message that the update installer cannot set JAVA\_HOME or if you have previously set JAVA\_HOME to a Java 2 SDK that is not the one that IBM ships with WebSphere Application Server, set the environment variable yourself or source the appropriate command script from the **bin** directory of the product installation root:

- a. Open a command-line window.
  - b. Change directories to the bin directory of the installation root.
  - c. Run the appropriate command:
    - # ./setupCmdLine.sh (Source the command on UNIX platforms. There is a space between the period and the slash.)
    - # source setupCmdLine.sh (Source the command on Linux platforms.)
    - > setupCmdLine.bat (Windows platforms)
    - # ./setupClient.sh (Source the command for the Application Server client. There is a space between the period and the slash.)
    - # source setupClient.sh (Source the command on Linux platforms.)
    - > setupClient.bat (Windows platforms)
3. Use the appropriate command to remove the interim fix, cumulative fix, or fix pack from the base node. Depending on the interface you use to the update installer:
    - Refer to “updateWizard command” on page 254 for usage information.
    - Refer to the **updateSilent** command description of the proper syntax for uninstalling the interim fix, cumulative fix, or fix pack:
      - “Uninstalling interim fixes” on page 247
      - “Uninstalling cumulative fixes and fix packs” on page 254

**5.1 +** For example, to uninstall the was51\_fp1\_win fix pack, use this **updateSilent** command:

```
C:\WebSphere\AppServer\update> updateSilent -fixpack
  -installDir "C:\Program Files\WebSphere\AppServer"
  -skipIHS
  -fixpackDir "C:\WebSphere\AppServer\update\fixpacks"
  -uninstall
  -fixpackID was51_fp1_win
```

The command is shown here on more than one line, for clarity.

4. Restart each server on the node with the **startServer** command.
5. Verify that the node is online and functioning correctly. There are several ways to verify the successful removal of an interim fix, a cumulative fix, or a fix pack:
  - Does the fix show up in the wizard panel that lists the appropriate type of installed fix?
    - Installed interim fixes. See “Uninstallable fix selection panel ” on page 259.
    - Installed cumulative fixes or fix packs. See “Installing and Uninstalling panel” on page 263.

If you see the interim fix, the cumulative fix, or the fix pack in one of the panels, the fix is installed.

- Does the fix show up in the wizard panel that the appropriate type of installable (not yet installed) fix ?
  - Installable interim fixes. See “Installable fix selection panel ” on page 258.
  - Installable cumulative fixes or fix packs. See “Cumulative fix and fix pack selection panel” on page 261.

If you see the interim fix, the cumulative fix, or the fix pack in one of the panels, the fix is not installed.

- Does one of the following files exist in the *install\_root/properties/version/version* directory?
  - [interim\_fix\_ID].efix
  - [cumulative\_fix\_ID].ptf
  - [fix\_pack\_ID].ptf

Or, does one of the following files exist in the *install\_root/properties/version/history* directory?

- [interim\_fix\_ID].efixApplied
- [interim\_fix\_ID].efixDriver
- [cumulative\_fix\_ID].ptf
- [cumulative\_fix\_ID].ptf
- [fix\_pack\_ID].ptfApplied
- [fix\_pack\_ID].ptfDriver

These types of files indicate the installation of a fix. See “Product information files” on page 269 for more information.

- Do the reports that describe the product version and its history show that the interim fix, the cumulative fix, or the fix pack is installed or that it has been removed?  
See “Reports” on page 270 for more information about the reports.
- Do the **updateSilent** command options for viewing information about interim fixes show that the interim fix is installed or removed?  
See “Viewing information about interim fixes” on page 248 for more information.
- Do the **updateSilent** command options for viewing information about cumulative fixes and fix packs show that the cumulative fix or the fix pack is installed or removed?  
See “Viewing information about cumulative fixes and fix packs” on page 254 for more information.

6. Uninstall the base product manually if you cannot successfully uninstall the interim fix, cumulative fix, or fix pack.

The following platform-specific procedures for uninstalling each describe a manual process that guides you through removing every trace of the products and features you might have installed, including directories that might have changed data.

Before you begin one of the procedures, back up the *config* and *properties* directories in the installation root. Backing up the directories lets you refer to the changed data when you reinstall.

- *ae/tins\_uninstallUnix.dita*
- “Manually uninstalling on Linux platforms” on page 314
- “Manually uninstalling on HP-UX platforms” on page 312
- “Manually uninstalling on Solaris platforms” on page 318
- “Manually uninstalling on Windows platforms” on page 322

You can successfully remove interim fixes, cumulative fixes, and fix packs from a base WebSphere Application Server node.

## Product version and history information

The WebSphere Application Server product contains structural differences from previous versions. The */properties/version* directory in the *install\_root* contains important data about the product and its installed components, such as the build version and build date. This information is included in

[product].product and [component].component files. The /properties/version/history directory in the install\_root contains a collection of records for installed interim fixes and fix packs. This information is included in [interim fixID].efixApplied, [interim fixID].efixDriver, [fix packID].ptfApplied, and [fix packID].ptfDriver files. A driver file has useful information about the entire contents of an interim fix or fix pack. The applied file has relevant information about the interim fixes or fix packs that are currently applied. Event.history files are also present. They contain a detailed log about updates you have applied, either successfully or unsuccessfully. Time-stamped, detailed logs record each update process in the /properties/version/log directory of the install\_root.

This topic describes the XML data files that store product information for Version 5 WebSphere Application Server products. By default, the document type declarations (DTDs) for these files are in the properties/version/dtd folder of the install\_root, or the server root directory. See the Storage locations section for more information.

This topic includes these sections:

- A list of product information files and file locations
- A list of reports for displaying version and history information
- A description of logs and component backups
- A list of properties you can use to change storage locations
- A description of how the update service makes operational use of the product information
- A data dictionary that describes data in the files

## Product information files

### XML files in the in the /properties/version directory that store version information: platform.websphere

One file whose existence indicates that a WebSphere Application Server product is installed. An example of the file follows:

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE websphere PUBLIC "websphereId" "websphere.dtd">
<websphere name="IBM WebSphere Application Server" version="5.0"/>
```

The following XML files in the /properties/version directory represent installed items and installation events.

#### *product-id.product*

One file whose existence indicates the particular WebSphere Application Server product that is installed. Data in the file indicates the version, build date, and build level. For example, the file might be the ND.product file, which indicates that the installed product is WebSphere Application Server Network Deployment. An example of the file follows:

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE product PUBLIC "productId" "product.dtd">
<product name="IBM WebSphere Application Server for Network Deployment">
  <id>ND</id>
  <version>5.0.0</version>
  <build-info date="10/5/02" level="s0239.28"/>
</product>
```

#### *component-name.component*

Any number of component files that each indicate the presence of an installed component, which is part of the product. Data in the file indicates the component build date, build version, component name, and product version. For example, the file might be the activity.component file, which indicates that the **activity** component is installed. The activity component is part of the Network Deployment product. An example of the file follows:

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE component PUBLIC "componentId" "component.dtd">
<component build-date="10/5/02" build-version="s0239.28"
  name="activity" spec-version="5.0"/>
```

***extension.id.extension***

Any number of extension files that each indicate the presence of an extension that you install as a user extension, as part of a service engagement, or as installed by a third party product. The *<extension.id>.extension* files are not created, logged, or removed by WebSphere Application Server products.

***fix-id.efix***

Any number of interim fix files that each indicate the presence of an installed fix.

***ptf-id.ptf***

Any number of files, that each indicate the presence of an installed fix pack.

**XML files in the /properties/version/history directory that store version history information files: event.history**

One file that lists update events that have occurred. An update event is an operation that installs or uninstalls an interim fix or a fix pack. The file is sorted by the date and time of the events that are listed.

The following XML files in the /properties/version/history directory describe fixes and fix packs that are currently installed. These XML files are related to installation items by the primary ID information, which is shown in the following examples as italicized text.

***fix-id.efixDriver***

Interim fix-driver defining information

***fix-id.efixApplied***

Interim fix installation details

***ptf-id.ptfDriver***

Fix pack-driver defining information

***ptf-id.ptfApplied***

Fix pack installation details

**Reports**

You can view product information by examining files in the `properties/version` directory, including the `properties/version/history` directory.

WebSphere Application Server provides the ability to generate two types of reports about the data in the files, **Version** reports and **History** reports. The following report-generation scripts are available in the `install_root/bin` directory.

**Product version reports**

The following report generation scripts extract data from XML data files in the `properties/version` folder:

- `versionInfo` script  
Lets you use parameters to create a version report on Linux and UNIX-based platforms, or on Windows platforms.
- `genVersionReport` script  
Generates the `versionReport.html` report file in the `bin` directory on Linux and UNIX-based platforms, or on Windows platforms. The report includes the list of components, fixes, and fix packs.

**Product history reports**

The following report generation scripts extract data from XML data files in the `properties/version/history` folder.

**`historyInfo.bat`**

Lets you use parameters to create a history report of installed and uninstalled fixes and fix packs, on Windows platforms. You can also specify a component name to create a report that shows the history for that component.

**Parameters:****-format**

text | html

Selects the format of the report. The default is TEXT.

**-file** *fileName*

Specifies the output file name. The report goes to standard output (stdout) by default.

**-updateID** *ID*

Specifies the ID of an interim fix or fix pack update. When specified, the product history report displays events for only the specified update. When not specified, the report displays events for all updates.

**-component** *componentName*

Specifies the name of a component. When specified, the product history report displays events for only the named component. When not specified, the report displays events for all components.

**historyInfo.sh**

Lets you use parameters to create a history report on UNIX-based platforms. Parameters are the same as for the Windows version.

**genHistoryReport.bat**Generates the `historyReport.html` report file in the `bin` directory on Windows platforms. The report includes all updates and components.**genHistoryReport.sh**Generates the `historyReport.html` report file in the `bin` directory on UNIX-based platforms. The report includes all updates and components.**Logs and component backups**

WebSphere Application Server products use two other directories when performing update operations, for logging and backups:

***install\_root/properties/version/log***

Product updates log directory prior to Fix Pack 2.

WebSphere Application Server products store log files to document component, interim fix and fix pack operations and updates.

***install\_root/logs/update***

Product updates log directory beginning with Fix Pack 2.

Beginning with the version of the updateInstaller program that is bundled with Fix Pack 2, log files are in the `install_root/logs/update` directory.***install\_root/properties/version/backup***

Product updates backup directory

WebSphere Application Server products back up components before applying interim fixes and fix packs. If you uninstall an interim fix or fix pack, WebSphere Application Server products restore the backed-up component JAR file.

**File naming convention****Time stamp**

YYYYMMDD\_HHMMSS

For example: 20020924\_211832 is 24-Sep-2002, 9:18:32 pm, GMT. All time stamps are in GMT.

**ID** Interim fix ID or fix pack ID

For example: apar6789c is an interim fix ID; PTF\_1 is a fix pack ID.

**Operation**

install | uninstall

**Interim fix log file names***timeStamp\_fixId\_operation.log*

For example, prior to Fix Pack

2: `properties/version/log/20020924_211832_apar6789c_install.log` and  
`properties/version/log/20020924_211912_apar6789c_uninstall.log`

At Fix Pack 2 or later, the updateInstaller creates these logs:

`install_root/logs/update/20020924_211832_apar6789c_install.log` and  
`install_root/logs/update/20020924_211912_apar6789c_uninstall.log`

#### **Interim fix component log file names**

`timeStamp_fixId_componentName_operation.log`

For example, prior to Fix Pack 2:

`properties/version/log/20020924_211832_apar6789c_ras_install.log` and  
`properties/version/log/20020924_211912_apar6789c_ras_uninstall.log`

At Fix Pack 2 or later, the updateInstaller creates these logs:

`install_root/logs/update/20020924_211832_apar6789c_ras_install.log` and  
`install_root/logs/update/20020924_211912_apar6789c_ras_uninstall.log`

#### **Fix pack log file names**

`timeStamp_ptfId_operation.log`

For example, prior to Fix Pack 2:

`properties/version/log/20030324_211832_was50_fp1_install.log` and  
`properties/version/log/20030325_211912_was50_fp1_uninstall.log`

At Fix Pack 2 or later, the updateInstaller creates these logs:

`install_root/logs/update/20030324_211832_was50_fp2_install.log` and  
`install_root/logs/update/20030325_211912_was50_fp2_uninstall.log`

#### **Fix pack component log file names**

`timeStamp_ptfId_componentName_operation.log`

For example, prior to Fix Pack 2:

`properties/version/log/20030324_211832_was50_fp1_ras_install.log` and  
`properties/version/log/20030325_211912_was50_fp1_ras_uninstall.log`

At Fix Pack 2 or later, the updateInstaller creates these logs:

`install_root/logs/update/20030324_211832_was50_fp2_ras_install.log` and  
`install_root/logs/update/20030325_211912_was50_fp2_ras_uninstall.log`

#### **Backup JAR file names**

`timeStamp_ptfId_componentName_undo.jar` or `timeStamp_fixId_componentName_undo.jar`

For example: `20020924_211832_apar6789c_ras_undo.jar` Do not delete a backup JAR file. You cannot remove a component update if the corresponding backup JAR file is not present.

Update processing might also use a temporary directory, if necessary. A Java property specifies this directory as described in the next section.

### **Storage locations**

Product information files are located relative to the WebSphere Application Server product `install_root`, or the server root directory.

Default file paths are:

#### **Version directory**

`install_root/properties/version` or `server_root/properties/version`

#### **History directory**

`install_root/properties/version/history`

#### **Updates log directory**

Prior to Fix Pack 2: `install_root/properties/version/log`



The version of the updateInstaller that is bundled with Fix Pack 2 and later fix packs, stores log files in the *install\_root/logs/update* directory.

**Updates backup directory**

*install\_root/properties/version/backup*

**DTD directory**

*install\_root/properties/version/dtd*

**Temporary directory**

Specified by the `java.io.tmpdir` Java system property

**Operational description**

WebSphere Application Server products update the product version history information while performing events that install or uninstall fixes or fix packs. Events that might occur include:

- A WebSphere Application Server product adds an interim fix file (with an extension of `.efix`) to the version directory to indicate that an interim fix is currently installed.
- A WebSphere Application Server product removes an interim fix file from the version directory when it uninstalls the corresponding fix.
- A WebSphere Application Server product adds an interim fix driver file (with an extension of `.efixDriver`) to the history directory when an interim fix is installed. An interim fix driver file contains defining information for a fix.
- A WebSphere Application Server product removes an interim fix driver file when it removes the corresponding fix.
- A WebSphere Application Server product adds an interim fix application file (with an extension of `.efixApplied`) to the history directory when it installs an interim fix. An interim fix application file contains information that identifies component updates that have been applied for a fix. The application file also provides links to component log and backup files.
- A WebSphere Application Server product removes an interim fix application file when it removes the corresponding fix.
- A WebSphere Application Server product adds a fix pack, with an extension of `.ptf`, to the version directory to indicate that a fix pack is currently installed.
- A WebSphere Application Server product removes a fix pack file from the version directory when it uninstalls the corresponding fix pack.
- A WebSphere Application Server product adds a fix pack driver file (with an extension of `.ptfDriver`) to the history directory when it installs a fix pack. A fix pack driver file contains defining information for a fix pack.
- A WebSphere Application Server product adds a fix pack application file (with an extension of `.ptfApplied`) to the history directory when it installs a fix pack. A fix pack application file contains information that identifies component updates that have been applied for a fix pack. The application file also provides links to component log and backup files.
- A WebSphere Application Server product makes entries in the history file, `event.history`, when it installs or uninstalls an update.
- A WebSphere Application Server product stores a parent event for each interim fix that it installs or uninstalls.
- A WebSphere Application Server product stores a parent event for each fix pack that it installs or uninstalls.
- A WebSphere Application Server product stores child component events for each component update that it installs or uninstalls, beneath the corresponding interim fix or fix pack parent event.
- A WebSphere Application Server product stores one log file in the `logs/update` directory as it installs or uninstalls one interim fix or fix pack.
- A WebSphere Application Server product stores one log file in the `logs/update` directory as it installs or uninstalls an interim fix or fix pack, in response to each component update that occurs.
- A WebSphere Application Server product stores a component backup file in the backup directory for each component update that it installs.
- A WebSphere Application Server product removes a component backup file from the backup directory for each component update that it uninstalls.

## Data dictionary

### Type Family: websphere product family

#### File Types:

websphere

#### File Type:

websphere

#### Elements:

|         |        |          |
|---------|--------|----------|
| name    | string | required |
| version | string | required |

#### Persistence:

*versionDir/platform.websphere*

#### Type Detail:

The websphere file denotes the presence of WebSphere family products.

#### Element Detail:

|                   |                                       |
|-------------------|---------------------------------------|
| websphere.name    | The WebSphere product family name.    |
| websphere.version | The WebSphere product family version. |

Type Family: product

File Types: product  
component  
extension

File Type: product

Persistence: *versionDir/id.product*

|           |            |         |          |
|-----------|------------|---------|----------|
| Elements: | id         | string  | required |
|           | name       | string  | required |
|           | version    | string  | required |
|           | build-info | complex | required |

#### Type Detail:

A product file is placed to denote the presence of a specific WebSphere family product.  
The product ID is embedded in the product file name.

#### Element Detail:

|                    |  |
|--------------------|--|
| product.id         | The id of the product.                                   |
| product.name       | The name of the product.                                 |
| product.version    | The version of the product.                              |
| product.build-info | An element containing build information for the product. |

Element Type: build-info

|           |       |        |          |
|-----------|-------|--------|----------|
| Elements: | date  | date   | required |
|           | level | string | required |

#### Type Detail:

A build-info instance details the build of a specific installed WebSphere family product.

Element Detail:

build-info.date           The date on which the product was build.  
build-info.level         The level code of the product's build.

File Type:                component

Persistence:             *versionDir/name.component*

|           |               |        |          |
|-----------|---------------|--------|----------|
| Elements: | name          | string | required |
|           | spec-version  | string | required |
|           | build-version | string | required |
|           | build-date    | date   | required |

File Detail:

A component file denotes the presence of a specific component.  
The component name is embedded in the component file name.

Element Detail:

component.name           The name of the component.  
component.spec-version   The specification version of the component.  
component.build-version   The build level of the component.  
component.build-date     The build date of the component.

File Type:                extension

Persistence:             *versionDir/id.extension*

|           |      |        |          |
|-----------|------|--------|----------|
| Elements: | id   | string | required |
|           | name | string | required |

File Detail:

An extension file denotes the presence of a specific extension. The extension's id is embedded in the extension file name.

The elements of an extension file are minimally specified. The listed elements are required. Additional elements may be present as determined by the actual installed extension.

Element Detail:

extension.id             The id of the extension.  
extension.name           The name of the extension.

Type Family:             update

File Types:              efix  
                          ptf  
                          efix-applied  
                          ptf-applied

File Type:                efix

Persistence:             *versionDir/id.efix*

|           |                   |         |          |
|-----------|-------------------|---------|----------|
| Elements: | id                | string  | required |
|           | apar-number       | string  | optional |
|           | pmr-number        | string  | optional |
|           | short-description | string  | required |
|           | long-description  | string  | required |
|           | is-temporary      | boolean | required |
|           | build-version     | string  | required |
|           | build-date        | date    | required |

|                  |         |                      |
|------------------|---------|----------------------|
| component-update | complex | min=1, max=unbounded |
| platform-prereq  | complex | min=0, max=unbounded |
| product-prereq   | complex | min=0, max=unbounded |
| efix-prereq      | complex | min=0, max=unbounded |
| custom-property  | complex | min=0, max=unbounded |

#### Type Detail:

An efix file denotes the presence of some portion of a specific fix. The ID of the interim fix is embedded in the file name.

An efix file contains all interim fix data, such as description, a listing of component updates, and prerequisite information.

Almost always, when installing a fix, all of the potential component updates within the interim fix are required to be installed.

A separate application file must be examined to determine the components which have been updated for a particular fix.

A list of custom properties may be provided. These are provided for future use.

#### Element Detail:

|                        |  |
|------------------------|--|
| efix.id                | The id of the fix.   |
| efix.short-description | A short description of the fix.  |
| efix.long-description  | A long description of the fix.   |
| efix.is-trial          | A flag indicating whether or not an interim fix is considered a trial fix. Generally, a trial interim fix will be followed up with a more permanent fix. |
| efix.expiration-date   | A date on which the interim fix is obsolete.   |
| efix.build-version     | The build version of the fix. This is distinct from the build version of component updates contained within the fix.                                     |
| efix-build-date        | The build date of the fix. This is distinct from the build version of the component updates contained within the fix.                                    |
| efix.apar-info         | A list of APAR's which are associated with the fix.  |
| efix.component-update  | A list of updates for components. For a fix, these are usually all required, and are all patch updates. At least one component update must be present.   |
| efix.efix-prereq       | A list of prerequisite fixes for the fix. Note that prerequisite fixes may be negative (see below). This list may be (and is often) empty.               |
| efix.plaform-prereq    | A list of platforms on which the interim fix may be installed. This list may be empty, in which case the interim fix may be installed on all platforms.  |
| efix.product-prereq    | A list of products on which the interim fix may be installed. This list may be empty, in which case the interim fix may be installed on all products.    |
| efix.custom-property   | A list of properties, provided for future use.   |

File Type: ptf

Persistence: *versionDir/id.ptf*

|           |                   |         |                      |
|-----------|-------------------|---------|----------------------|
| Elements: | id                | string  | required             |
|           | short-description | string  | required             |
|           | long-description  | string  | required             |
|           | build-version     | string  | required             |
|           | build-date        | date    | required             |
|           | component-update  | complex | min=1, max=unbounded |
|           | product-update    | complex | min=0, max=unbounded |
|           | platform-prereq   | complex | min=0, max=unbounded |
|           | product-prereq    | complex | min=0, max=unbounded |
|           | included-efix     | complex | min=0, max=unbounded |
|           | custom-property   | complex | min=0, max=unbounded |

#### Type Detail:

A ptf file denotes the presence of some portion of a specific fix pack. The id of the fix pack is embedded in the fix pack file name.

A ptf file contains all fix pack data, such as description, a listing of component updates, and prerequisite information.

Usually, when installing a fix pack, you can omit certain potential component updates, but only when the corresponding component is not installed.

You must examine a separate application file, to determine which components a particular fix pack has updated.

A fix pack can include updates for a number of fixes.

A list of custom properties might be provided. These are for future use.

#### Element Detail:

|                       |   |
|-----------------------|---|
| ptf.id                | The ID of the fix pack.   |
| ptf.short-description | A short description of the fix pack.  |
| ptf.long-description  | A long description of the fix pack.   |
| ptf.build-version     | The build version of the fix pack.<br>This is distinct from the build version of component updates contained within the fix pack.                           |
| ptf-build-date        | The build date of the fix pack. This is distinct from the build version of the component updates contained within the fix pack.                             |
| ptf.component-update  | A list of updates for components. For a fix pack, these are usually all required, and are all patch updates. At least one component update must be present. |
| ptf.plaform-prereq    | A list of platforms on which you can install the fix pack. This list might be empty. If so, you can install the fix pack on all platforms.                  |
| ptf.product-prereq    | A list of products on which you can install the fix pack. This list might be empty. If so, you can install the fix pack on all products.                    |
| ptf.included-efix     | A list of fixes which are included (fixed) by the fix pack.   |
| ptf.custom-property   | A list of properties, provided for future use.  |

Element Type: component-update

|           |                     |         |                           |
|-----------|---------------------|---------|---------------------------|
| Elements: | component-name      | string  | required                  |
|           | update-type         | enum    | required [enumUpdateType] |
|           | is-required         | boolean | required                  |
|           | is-recommended      | boolean | required                  |
|           | is-optional         | boolean | required                  |
|           | is-external         | boolean | required                  |
|           | root-property-file  | anyURL  | optional                  |
|           | root-property-name  | string  | optional                  |
|           | root-property-value | anyURL  | optional                  |
|           | is-custom           | boolean | required                  |
|           | primary-content     | string  | required                  |
|           | component-prereq    | complex | min=0, max=unbounded      |
|           | final-version       | complex | optional                  |
|           | custom-property     | complex | min=0, max=unbounded      |

#### Type Detail:

A component update represents a potential component update which is packaged in an update (an interim fix or a fix pack).

An component update may be required, in which case the parent update may not be installed unless the component update can be installed. (A component update can be installed if the corresponding component is installed.)

A component update may be a custom update, in which case the content which was provided must be an executable file. Otherwise, the content which is provided must be an update JAR file.

A component update has a type. A final version may be required according to the update type.

#### Element Detail:

|                                      |   |
|--------------------------------------|---|
| component-update.component-name      | The name the component which is to be updated.  |
| component-update.update-type         | The type of the component update, one of 'add', 'replace', 'remove', or 'patch'. Final version information must be provided when the update type is 'add' or 'replace'. |
| component-update.is-required         | A flag which, when true, specifies that the parent update may not be applied unless this component update is applied.   |
| component-update.is-recommended      | A flag which, when true, specifies that this component update, although optional, should be installed.  |
| component-update.is-optional         | A flag which, when true, specifies that this update may be omitted even if its corresponding component is installed.  |
| component-update.is-external         | A flag which, when true, specifies that this component update may live outside of the usual install root.   |
| component-update.root-property-file  | For a component with an external root, this properties file provides the root value.  |
| component-update.root-property-name  | For a component with an external root, this named property provides the root value.   |
| component-update.root-property-value | For a component with an external root, this value   |



provides the default root value.

- component-update.is-custom A flag which, when true, specifies that the update is a custom update. When true, the content must be an executable program. When false, the content must be an update JAR.
- component-update.primary-content The name of the content which is provided for the update. This will be an entry which is packaged in the 'components' directory of the update.
- component-update.component-prereq A list of component versions, one of which must be present for this update to be installed. When this list is empty, any component version is allowed.
- component-update.final-version Final version information for the component. A final version is required when the update operation is 'add' or 'replace'.
- component-update.custom-property A list of properties, provided for future use.

Element Type:     apar-info

|           |                   |        |          |
|-----------|-------------------|--------|----------|
| Elements: | number            | string | required |
|           | date              | date   | required |
|           | short-description | string | required |
|           | long-description  | string | optional |

Type Detail:

An apar-info object provides information about an APAR which is associated with a fix, usually indicating that the interim fix provides an interim fix for the APAR.

Element Detail:

- apar-info.number            The number of the associated APAR.
- apar-info.date              The date of the APAR.
- apar-info.short-description A short description of the APAR.
- apar-info.long-description An optional long description of the APAR.

Element Type:     efix-prereq

|           |               |         |          |
|-----------|---------------|---------|----------|
| Elements: | efix-id       | string  | required |
|           | is-negative   | boolean | required |
|           | install-index | int     | optional |

Type Detail:

An efix-prereq instance denotes an interim fix that must be present (or, if negative, must be absent) for the parent interim fix to be installed.

efix-prereq instances can specify a cycle, in which case the prerequisite specification is treated as a corequisite specification.

The following chart summarizes the interpretation of prerequisite information for two fixes:

|       |       |  |
|-------|-------|--|
| fix1  | fix2  |  |
| -     | -     | Install the fixes without regard to each other.    |
| fix2  | -     | fix1 must be installed after fix2 is installed.    |
| -     | fix1  | fix2 must be installed after fix1 is installed.    |
| fix2  | fix1  | fix1 and fix2 must be installed together.          |
| !fix2 | -     | fix1 may not be installed after fix2 is installed. |
| -     | !fix1 | fix2 may not be installed after fix1 is installed. |
| !fix2 | !fix1 | fix1 and fix2 may not ever be installed together.  |
| !fix2 | fix1  | This is an erroneous specification.                |
| fix2  | !fix1 | This is an erroneous specification.                |

The installation index element provides ordering information for corequisite fixes that must be installed in a particular order.

Element Detail:

|                          |   |
|--------------------------|---|
| fix-prereq.efix-id       | The id of the prerequisite fix.   |
| fix-prereq.is-negative   | A flag which indicates if the prerequisite interim fix is required or prohibited. If false, you must install the interim fix before installing the parent fix. If true, you must not install the interim fix before you install the parent fix. |
| fix-prereq.install-index | An optional index number which is used to order corequisite fixes.  |

Element Type: product-update

|           |               |        |          |
|-----------|---------------|--------|----------|
| Elements: | product-id    | string | required |
|           | product-name  | string | required |
|           | build-version | string | required |
|           | build-date    | date   | required |
|           | build-level   | string | required |

Type Detail:

A product update specifies a replacement to a product file.

The product update information matches the information in product files.

Multiple product updates may be present, in which case each matching product is updated.

Element Detail:

|                              |  |
|------------------------------|--|
| product-update.product-id    | The id of the product that is updated. |
| product-update.product-name  | The name of the product.               |
| product-update.build-version | The build version of the product.      |
| product-update.build-date    | The build date of the product.         |
| product-update.build-level   | The build level of the product.        |

Element Type: component-prereq

|           |                |        |          |
|-----------|----------------|--------|----------|
| Elements: | component-name | string | required |
|           | spec-version   | string | required |
|           | build-version  | string | required |
|           | build-date     | date   | required |

Element Type: platform-prereq

|           |              |        |          |
|-----------|--------------|--------|----------|
| Elements: | architecture | string | required |
|-----------|--------------|--------|----------|

|             |        |          |
|-------------|--------|----------|
| os-platform | string | optional |
| os-version  | string | optional |

Type Detail:

A platform prerequisite instance denotes a platform which must be present for an update to be installed. The element values are according to the values supplied for the matching java properties.

Note that when multiple platform prerequisites are specified, these prerequisites have an OR relationship: At least one of the platform prerequisites must be satisfied.

Element Detail:

|                              |  |
|------------------------------|--|
| platform-prereq.architecture | The name of an architecture which must be present.   |
| platform-prereq.os-platform  | The name of an operating system which must be present. This element is optional. When absent, the architecture is checked, but the os-platform and os-version are not.   |
| platform-prereq.os-version   | The version of a the operating system which must be present. This element is optional. When absent, the architecture and os-platform are checked, but os-version is not. (When os-platform is absent, os-version should not be set.) |

Element Type: product-prereq

|           |               |        |          |
|-----------|---------------|--------|----------|
| Elements: | product-id    | string | required |
|           | build-version | string | optional |
|           | build-date    | date   | optional |
|           | build-level   | string | optional |

Type Detail:

A product prerequisite specifies that a particular product must be present for an update to be installed.

Note that when multiple product prerequisites are specified, these prerequisites have an OR relationship: At least one of the product prerequisites must be satisfied.

Note that all of the elements are required. When multiple products having the same id are supported by an update, multiple product prerequisites must be specified.

Element Detail:

|                              |  |
|------------------------------|--|
| product-prereq.product-id    | The id of the product which must be present.         |
| product-prereq.build-version | The version of the product which must be present.    |
| product-prereq.build-date    | The build date of the product which must be present. |
| product-prereq.build-level   | The level date of the product which must be present. |

Element Type: component-prereq

|           |                |        |          |
|-----------|----------------|--------|----------|
| Elements: | component-name | string | required |
|           | spec-version   | string | required |
|           | build-version  | string | required |
|           | build-date     | date   | required |

Type Detail:

A version prerequisite specifies that a particular component version must be present for an update to be installed.

Note that when multiple version prerequisites are specified, these prerequisites have an OR relationship: At least one of the version prerequisites must be satisfied.

Element Detail:

- version-prereq.component-name The name of the component which must be present.
- version-prereq.spec-version The specification version of the component which must be present.
- version-prereq.build-version The version of the component which must be present.
- version-prereq.build-date The build date of the component which must be present.

Element Type: included-efix

Elements: efix-id string required

Type Detail:

An included-efix identifies an interim fix by ID and indicates that the fix is included in the fix pack.

Element Detail:

included-efix.efix-id The ID of the interim fix that the fix pack includes.

Element Type: custom-property

Elements: property-name string required  
 property-type string optional  
 property-value string optional

Type Detail:

A custom property encodes a key-value pair, with an optional type element. Custom properties are provided for future use.

Element Detail:

- custom-property.property-name The name of the custom property.
- custom-property.property-type An optional type of the custom property. The semantics of this type are defined by user of the property value.
- custom-property.property-value The value of the custom property.

File Type: efix-applied

Persistence: versionDir/id.efixApplied

Elements: efix-id string required  
 component-applied complex min=0, max=unbounded

Type Detail:

An efix-applied collection specifies what components have been updated for the interim fix as specified by the efix-id.

Element Detail:

efix-applied.efix-id            The id of the interim fix for which applieds are recorded.

efix-applied.component-applied    The list of recorded applications.

File Type:            ptf-applied

Persistence:        *versionDir/id.ptfApplied*

|           |                   |         |                      |
|-----------|-------------------|---------|----------------------|
| Elements: | ptf-id            | string  | required             |
|           | component-applied | complex | min=0, max=unbounded |

Type Detail:

A ptf-applied collection specified what components have been updated for the fix pack as specified by the fix pack ID.

Element Detail:

ptf-applied.efix-id            The ID of the fix pack for which applieds are recorded.

ptf-applied.component-applied    The list of recorded applications.

Element Type:        component-applied

|           |                     |         |                           |
|-----------|---------------------|---------|---------------------------|
| Elements: | component-name      | string  | required                  |
|           | update-type         | enum    | required [enumUpdateType] |
|           | is-required         | boolean | required                  |
|           | is-optional         | boolean | required                  |
|           | is-external         | boolean | required                  |
|           | root-property-file  | anyURL  | optional                  |
|           | root-property-name  | string  | optional                  |
|           | root-property-value | string  | optional                  |
|           | is-custom           | boolean | required                  |
|           | log-name            | anyURL  | required                  |
|           | backup-name         | anyURL  | required                  |
|           | time-stamp          | date    | required                  |
|           | initial-version     | complex | optional                  |
|           | final-version       | complex | optional                  |

Type Detail:

An applied instance is present to indicate the application of an update for a particular interim fix or fix pack to a particular component. (The particular interim fix or fix pack is as specified by the applied's parent.) An applied provides sufficient information to undo itself.

The elements of an applied are copies of values from update events.

Element Detail:

component-applied.component-name    The name of the component which was updated.

component-applied.update-type        The type of the component update.

component-applied.is-required        A true value specifies that the parent update requires this component update.

component-applied.is-optional        A flag which, when true, specifies that the parent update does not require this component update, even if the component is installed.

|                                       |  |
|---------------------------------------|--|
| component-applied.is-external         | A flag which, when true, specifies that this component update was applied to a location different than the usual <code>install_root</code> .                                       |
| component-applied.root-property-file  | For an update against a component having an external root, this properties file provides the root value.   |
| component-applied.root-property-name  | For an update against a component having an external root, this named property provides the root value.  |
| component-applied.root-property-value | For an update against a component having an external root, this is a record of the actual external root.   |
| component-applied.is-custom           | A flag which, when true, specifies that the application was a custom update. When true, an executable program was applied. When false, the contents of an update JAR were applied. |
| component-applied.log-name            | The name of the log file that was generated by this application.   |
| component-applied.backup-name         | The name of the backup file which was generated by this application.   |
| component-applied.time-stamp          | The time of this application (the ending time of the corresponding update event).  |
| component-applied.initial-version     | The version of the component before the application. This version will be null if the application was an add.  |
| component-applied.final-version       | The version of the component after application. This will be null if the update was a removal.   |

Element Type:    initial-version

|           |                |        |          |
|-----------|----------------|--------|----------|
| Elements: | component-name | string | required |
|           | spec-version   | string | required |
|           | build-version  | string | required |
|           | build-date     | string | required |

Type Detail:

A `initial-version` instance is used to describe a component level as the initial version of a component.

Element Detail:

|                                |   |
|--------------------------------|---|
| initial-version.component-name | The name of the component.  |
| initial-version.spec-version   | The new specification version for the component following the update. |
| initial-version.build-version  | The new build version for the component.                              |
| initial-version.build-date     | The new build date for the component.                                 |

Element Type:    final-version

|           |                |        |          |
|-----------|----------------|--------|----------|
| Elements: | component-name | string | required |
|           | spec-version   | string | required |
|           | build-version  | string | required |



build-date string required

Type Detail:

A final-version instance is used to supply a component level for a component which has been added or replaced.

Element Detail:

final-version.component-name The name of the new component.  
final-version.spec-version The new specification version for the component following the update.  
final-version.build-version The new build version for the component.  
final-version.build-date The new build date for the component.

Enum Type: enumUpdateType

Values: 0 add  
1 replace  
2 remove  
3 patch

Type Detail:

An update type instance specifies the type of an update. An 'add' update adds a component into an installation. A 'replace' update replaces a particular version of a component with a different version of that component. A 'remove' update removes a component. A 'patch' update performs a limited update to a component, in particular, without changing the version of the component.

When adding a component, that component may not already be present.  
When replacing or removing a component, that component must be present.  
When patching a component, that component must be present.

When replacing or removing a component, or when patching a component, usually, at least one version prerequisite will be specified for the component update.

Value Detail:

enumUpdateType.add Specifies that an update adds a component.  
enumUpdateType.replace Specifies that an update replaces a component.  
enumUpdateType.remove Specifies that an update removes a component.  
enumUpdateType.patch Specifies that an update modifies a component, but does not change its version.

Type Family: history

File Type: event-history

Persistence: *historyDir/event.history*

Elements: update-event complex min=0, max=unbounded

Type Detail:

One event history is provided for a websphere product family installation. This event history contains history of update events, corresponding with the actual update events for that product family.

#### Element Detail:

event-history.update-event The list of update events for the websphere product family. The top level events are fix and fix pack events, each containing one or more component events.

Element Type: update-event

|           |                     |          |          |                   |
|-----------|---------------------|----------|----------|-------------------|
| Elements: | event-type          | enum     | required | [enumEventType]   |
|           | parent-id           | string   | required |                   |
|           | id                  | string   | required |                   |
|           | update-type         | enum     | required | [enumUpdateType]  |
|           | is-required         | boolean  | required |                   |
|           | is-optional         | boolean  | required |                   |
|           | is-external         | boolean  | required |                   |
|           | root-property-file  | anyURL   | optional |                   |
|           | root-property-name  | string   | optional |                   |
|           | root-property-value | string   | optional |                   |
|           | is-custom           | boolean  | required |                   |
|           | primary-content     | anyURI   | required |                   |
|           | event-action        | enum     | required | [enumEventAction] |
|           | log-name            | anyURI   | required |                   |
|           | backup-name         | anyURI   | required |                   |
|           | start-time-stamp    | dateTime | required |                   |
|           | end-time-stamp      | dateTime | optional |                   |
|           | status              | enum     | optional | [enumEventResult] |
|           | status-message      | string   | optional |                   |
|           | initial-version     | complex  | optional |                   |
|           | final-version       | complex  | optional |                   |
|           | update-event        | complex  | optional |                   |

#### Type Detail:

An update event denotes a single update action, applying to either a fix, a fix pack, or to a component, according to the set event type.

Interim fix (efix) and fix pack (ptf) type events each have a collection of component events.

Currently, component events have no child events.

#### Element Detail:

|                          |  |
|--------------------------|--|
| update-event.event-type  | The type of this event, either an interim fix or fix pack (ptf) type event, or a component type event.         |
| update-event.parent-id   | This element is present only for component events. The ID of the parent interim fix or fix pack of this event. |
| update-event.id          | The ID of the fix, fix pack, or component that was updated, interpreted according to the type of the event.    |
| update-event.update-type | The type of update for component events.   |
| update-event.is-required | A flag which, when true, specifies that this component update is required.                                     |

|                                  |  |
|----------------------------------|--|
| update-event.is-optional         | A flag which, when true, specifies that this component update is optional, even if the component is installed.   |
| update-event.is-external         | A flag which, when true, specifies that this update used an external root.   |
| update-event.root-property-file  | For an update of an external component, this properties file contains the external root value.   |
| update-event.root-property-name  | For an update of an external component, the property having this name specifies the external root value.   |
| update-event.root-property-value | For an update of an external component, the root value.  |
| update-event.is-custom           | A flag that, when true, specifies that the application was a custom update. When true, an executable program was applied. When false, the contents of an update JAR file were applied.   |
| update-event.primary-content     | The URL of the primary content for the update.   |
| update-event.event-action        | The type of action for this event.   |
| update-event.log-name            | The name of the log file that was generated for this event.  |
| update-event.backup-name         | The name of the backup file that was generated for this event.   |
| update-event.start-time-stamp    | The XML timestamp of the starting time of the event. This timestamp follows the XML timestamp format, meaning that time zone information is included.  |
| update-event.end-time-stamp      | The XML timestamp of the ending time of the event. This timestamp follows the XML timestamp format, meaning that time zone information is included. When absent, the update operation corresponding to the parent event failed with a non-recoverable exception. |
| update-event.status              | The result of the update.  |
| update-event.status-message      | Message text provided in addition to the basic status code. Exception text is provided through the status-message when an update fails.  |
| update-event.initial-version     | This element is not used unless the update is a component type update. The initial version of the component which was updated. This element is absent when the update is an add type update.   |
| update-event.final-version       | This element is not used unless the update is a component type update. The final version of the component which was updated. This element is absent when the update is a remove type update.   |
| update-event.update-event        | A collection of child events. This collection is used for interim fix and fix pack type events. This collection is empty for component type events.  |

Element Type:    initial-version

Elements:        spec-version           string       required

|               |        |          |
|---------------|--------|----------|
| build-version | string | required |
| build-date    | string | required |

Type Detail:

A initial-version instance is used to describe a component level as the initial version of a component.

Element Detail:

|                               |   |
|-------------------------------|---|
| initial-version.spec-version  | The new specification version for the component following the update. |
| initial-version.build-version | The new build version for the component.                              |
| initial-version.build-date    | The new build date for the component.                                 |

Element Type: final-version

|           |               |        |          |
|-----------|---------------|--------|----------|
| Elements: | spec-version  | string | required |
|           | build-version | string | required |
|           | build-date    | string | required |

Type Detail:

A final-version instance is used to supply a component level for a component which has been added or replaced.

Element Detail:

|                             |   |
|-----------------------------|---|
| final-version.spec-version  | The new specification version for the component following the update. |
| final-version.build-version | The new build version for the component.                              |
| final-version.build-date    | The new build date for the component.                                 |

Enum Type: enumEventType

Values:

- 0 Interim fix (efix)
- 1 Fix pack (ptf)
- 2 Component

Type Detail:

An event type instance specifies the type of an update event, which is either an interim fix (efix) event, a fix pack (ptf) event or a component event. The interpretation of particular event elements depends on the set event type.

Value Detail:

|                         |   |
|-------------------------|---|
| enumEventType.efix      | Specifies that an event is for an interim fix update. |
| enumEventType.ptf       | Specifies that an event is for a fix pack update.     |
| enumEventType.component | Specifies that an event is for a component update.    |

Enum Type: enumEventAction

Values:

- 0 Install
- 1 Uninstall
- 2 Selective install
- 3 Selective uninstall

Type Detail:

An event action instance specified the operation performed by an update, which

can be an install or uninstall operation, and which may be a selective operation. Component operations are always either install or uninstall type operations, only interim fix and fix pack operations may be selective operations.

A selective operation is an installation which is applied to a preset list of components. In particular, potential component updates may be skipped, and component updates which were already applied may be reapplied.

A selective uninstall operation is used to back out an update which was cancelled by the user.

Value Detail:

|  |  |
|--|--|
| <code>enumEventAction.install</code>             | Specifies that an event is an install operation.   |
| <code>enumEventAction.uninstall</code>           | Specifies that an event is an uninstall operation.   |
| <code>enumEventAction.selective-install</code>   | Specifies that an event is an install operation with a preset list of components that are updated.   |
| <code>enumEventAction.selective-uninstall</code> | Specifies that an event is an uninstall operation with a preset list of components that are updated. |

Enum Type: `enumUpdateType`

Values:

- 0 Add
- 1 Replace
- 2 Remove
- 3 Patch

Type Detail:

An update type instance specifies the type of a component update.

An 'add' update adds a component into an installation.

A 'replace' update replaces a particular version of a component with a different version of that component.

A 'remove' update removes a component.

A 'patch' update performs a limited update to a component, in particular, without changing the version of the component.

To add a new component, the component must not exist.

To replace or remove a component, the component must exist.

To patch a component, the component must exist.

When replacing or removing a component, or when patching a component, usually, at least one version prerequisite is specified for the component update.

Value Detail:

|                                     |   |
|-------------------------------------|---|
| <code>enumUpdateType.add</code>     | Specifies that an update adds a component.                                      |
| <code>enumUpdateType.replace</code> | Specifies that an update replaces a component.                                  |
| <code>enumUpdateType.remove</code>  | Specifies that an update removes a component.                                   |
| <code>enumUpdateType.patch</code>   | Specifies that an update modifies a component, but does not change its version. |

Enum Type: `enumEventResult`

Values:

- 0 Succeeded
- 1 Failed

## 2 Cancelled

### Type Detail:

An event result instance denotes a particular result for an update event. The result indicates success, failure, or cancellation.

### Value Detail:

`enumEventResult.succeeded` Specifies that the operation was successful.

`enumEventResult.failed` Specifies that the operation failed.

`enumEventResult.cancelled` Specifies that the operation was cancelled.

## versionInfo command

The **versionInfo** command generates reports from data it extracts from XML files in the `properties/version` folder.

### Product version and history information

The `/properties/version` directory in the installation root contains important data about the product and its installed components, such as the build version and build date. This information is included in *product.product* and *component.component* files. The `/properties/version/history` directory in the installation root contains a collection of records for installed interim fixes and fix packs. This information is included in *interim fixID.efixApplied*, *interim fixID.efixDriver*, *fix packID.ptfApplied*, and *fix packID.ptfDriver* files. A driver file has useful information about the entire contents of an interim fix or fix pack. The applied file has relevant information about the interim fixes or fix packs that are currently applied. `Event.history` files are also present. They contain a detailed log about updates you have applied, either successfully or unsuccessfully. Time-stamped, detailed logs record each update process in the `/properties/version/log` directory of the installation root.

You can view product information by examining files in the `properties/version` directory, including the `properties/version/history` directory. WebSphere Application Server also provides the ability to generate two types of reports about the data in the files, **Version** reports and **History** reports.

**Restriction:** There is one restriction. Do not use the `versionInfo.sh` or `versionInfo.bat` script while installing or uninstalling the product, or while installing or uninstalling an interim fix or fix pack.

### Product version reports

The following report generation scripts extract data from XML data files in the `properties/version` folder:

- `versionInfo` script  
Lets you use parameters to create a version report on Linux and UNIX-based platforms, or on Windows platforms.
- `genVersionReport` script  
Generates the `versionReport.html` report file in the `bin` directory on Linux and UNIX-based platforms, or on Windows platforms. The report includes the list of components, fixes, and fix packs.

### Location of the command file

The command file is a script. On Linux and UNIX platforms, the command file is named `versionInfo.sh` in the `install_root/bin` directory. On Windows platforms, the command file is named `versionInfo.bat` in the `install_root\bin` directory.



## Syntax for the versionInfo command on a Linux or UNIX-based platform

The command syntax is:

```
versionInfo.sh [ -format text | html]
               [ -file output file]
               [ -long ]
               [ -efixes ]
               [ -efixDetail ]
               [ -ptfs ]
               [ -ptfDetail ]
               [ -components ]
               [ -componentDetail ]
```

```
versionInfo.sh [ -help | -? | /help | /? | -usage ]
```

Issue the command from the *install\_root/bin* directory.

## Syntax for the versionInfo command on a Windows platform

The command syntax is:

```
versionInfo [ -format text | html]
            [ -file output file]
            [ -long ]
            [ -efixes ]
            [ -efixDetail ]
            [ -ptfs ]
            [ -ptfDetail ]
            [ -components ]
            [ -componentDetail ]
```

```
versionInfo [ -help | -? | /help | /? | -usage ]
```

Issue the command from the *install\_root\bin* directory.

### Parameters

#### **-? or /? (Windows only)**

Displays command syntax.

#### **-components**

Adds a list of installed components to the report.

#### **-componentDetail**

Adds details about installed components to the report.

#### **-efixes**

Adds a list of applied interim fixes to the report.

#### **-efixDetail**

Adds details about applied interim fixes to the report.

#### **-file *fileName***

Specifies the output file name. The report goes to standard output (stdout) by default.

#### **-format text | html**

Selects the format of the report. The default is "text".

#### **-help or /help (Windows only)**

Displays command syntax.

#### **-long**

Creates the long version of the report.

**-ptfDetail**

Adds details about applied fix packs to the report.

**-ptfs**

Adds a list of applied fix packs to the report.

**-usage**

Displays command syntax.

**Logging**

As the tool runs, it creates reports instead of log entries. Reports appear on the console unless directed to a file with the *-file filename* parameter. There is no default file name. You must specify a file name to generate a file.

When issued on a Windows platform, from the bin directory of the Network Deployment product that has no interim fixes or fix packs applied, the versionInfo.bat script displays the following information:

```
D:\Program Files\WebSphere\DeploymentManager\bin>versionInfo
WVER0010I: Copyright (c) IBM Corporation 2002; All rights reserved.
WVER0011I: WebSphere Application Server Release 5.0
WVER0012I: VersionInfo reporter version 1.14, dated 5/9/03
```

```
-----
IBM WebSphere Application Server Product Installation Status Report
-----
```

Report at date and time 2003-10-05T11:01:45-04:00

**Installation**

```
-----
Product Directory  D:\Program Files\WebSphere\DeploymentManager
Version Directory  ${product.dir}\properties\version
DTD Directory      ${version.dir}\dtd
Log Directory      D:\Program Files\WebSphere\DeploymentManager\logs\update
Backup Directory   ${version.dir}\backup
TMP Directory      D:\DOCUME~1\ADMINI~1\LOCALS~1\Temp
```

**Installation Platform**

```
-----
Name           IBM WebSphere Application Server
Version        5.1
```

**Technology List**

```
-----
ND             installed
```

**Installed Product**

```
-----
Name           IBM WebSphere Application Server Network Deployment
Version        5.1.0
ID             ND
Build Level    b0334.18
Build Date     8/30/03
```

```
-----
End Installation Status Report
-----
```

## genVersionReport command

The **genVersionReport** command generates the `versionReport.html` report file in the `bin` directory on Linux and UNIX platforms, or on Windows platforms. The report includes the list of components, fixes, and fix packs.

### Product version and history information

The `/properties/version` directory in the installation root contains important data about the product and its installed components, such as the build version and build date. This information is included in `[product].product` and `[component].component` files. The `/properties/version/history` directory in the installation root contains a collection of records for installed interim fixes and fix packs. This information is included in `[interim fixID].efixApplied`, `[interim fixID].efixDriver`, `[fix packID].ptfApplied`, and `[fix packID].ptfDriver` files. A driver file has useful information about the entire contents of an interim fix or fix pack. The applied file has relevant information about the interim fixes or fix packs that are currently applied. `Event.history` files are also present. They contain a detailed log about updates you have applied, either successfully or unsuccessfully. Time-stamped, detailed logs record each update process in the `/properties/version/log` directory of the installation root.

You can view product information by examining files in the `properties/version` directory, including the `properties/version/history` directory. WebSphere Application Server also provides the ability to generate two types of reports about the data in the files, **Version** reports and **History** reports.

### Product version reports

The following report generation scripts extract data from XML data files in the `properties/version` folder:

- `versionInfo` script  
Lets you use parameters to create a version report on Linux and UNIX-based platforms, or on Windows platforms.
- `genVersionReport` script  
Generates the `versionReport.html` report file in the `bin` directory on Linux and UNIX-based platforms, or on Windows platforms. The report includes the list of components, fixes, and fix packs.

### Location of the command file

The command file is a script. On Linux and UNIX platforms, the command file is named `genVersionReport.sh` in the `install_root/bin` directory. On Windows platforms, the command file is named `genVersionReport.bat` in the `install_root\bin` directory.

### Syntax for the versionInfo command on a Linux or UNIX-based platform

The command syntax is:

```
genVersionReport.sh
```

Issue the command from the `install_root/bin` directory.

### Syntax for the versionInfo command on a Windows platform

The command syntax is:

```
genVersionReport.bat
```

Issue the command from the `install_root\bin` directory.

## Logging

As the tool runs, it creates the `versionReport.html` report file instead of log entries.

## Creating the report

This example shows how to issue the command on a Windows platform, from the `bin` directory of the Network Deployment product:

```
D:\Program Files\WebSphere\DeploymentManager\bin>genVersionReport
WVER0010I: Copyright (c) IBM Corporation 2002; All rights reserved.
WVER0011I: WebSphere Application Server Release 5.0
WVER0012I: VersionInfo reporter version 1.14, dated 5/9/03
```

When the Network Deployment product has no interim fixes or fix packs applied, the `genVersionReport.bat` script creates the following information in the `versionReport.html` report file, which is edited to show only the first few components:

IBM WebSphere Application Server Product Installation Status Report

-----

Report at date and time 2003-10-05T11:58:40-04:00

### Installation

Product Directory D:\Program Files\WebSphere\DeploymentManager  
Version Directory \${product.dir}\properties\version  
DTD Directory \${version.dir}\dtd  
Log Directory D:\Program Files\WebSphere\DeploymentManager\logs\update  
Backup Directory \${version.dir}\backup  
TMP Directory D:\DOCUME~1\ADMINI~1\LOCALS~1\Temp

### Installation Platform

Name IBM WebSphere Application Server  
Version 5.1

### Technology List

ND installed

### Installed Product

Name IBM WebSphere Application Server for Network Deployment  
Version 5.1.0  
ID ND  
Build Level b0334.18  
Build Date 8/30/03

### Installed Component

Component Name activity  
Spec Version 5.0  
Build Version b0334.18  
Build Date 8/30/03

### Installed Component

Component Name activity.impl  
Spec Version 5.0  
Build Version b0334.18  
Build Date 8/30/03

### Installed Component

Component Name activity.session

-----  
End Installation Status Report

---

## Uninstalling the product

This task describes how to uninstall WebSphere Application Server from the root user on a Linux platform or a UNIX-based platform, or from a user ID that belongs to the administrator group on a Windows platform.

IBM Support offers tutorials on various WebSphere Application Server installation topics. See WebSphere education on demand: Installation best practices tutorials for more information. One topic describes uninstalling WebSphere Application Server products.

Several factors affect the procedure for uninstalling WebSphere Application Server products:

- Security
- Migrating
- Coexisting
- Using the embedded messaging feature
- Being part of a deployment manager cell

WebSphere Application Server provides an uninstaller program, which you can call with the “uninstall command” on page 297.

Before issuing the command, locate your particular scenario for uninstalling and follow the recommended procedure. The potential exists for losing the embedded messaging feature code for WebSphere Application Server products that remain on the machine unless you follow the particular procedure. Another possible consequence of not following the correct procedure for uninstalling is losing the configuration of a federated node after migration.

The uninstaller program removes registry entries, uninstalls the product, and removes all related features and products, such as plug-ins. However, the uninstaller program does not remove some files. The uninstaller program does not delete any configuration files that are changed as the result of selecting installation options, or running Samples, for example. The uninstaller program does not delete log files.

**Uninstalling IBM HTTP Server** If you installed the IBM HTTP Server feature using the WebSphere Application Server installation wizard, the uninstaller program includes code that uninstalls the IBM HTTP Server. You must use the WebSphere Application Server uninstaller program to uninstall IBM HTTP Server in this case. The uninstaller programs interact to produce these results:

- If you uninstall HTTP Server using the HTTP Server uninstaller program, you cannot reinstall HTTP Server using the WebSphere Application Server installer program. Use the HTTP Server installer program to reinstall the product.
- If you uninstall the HTTP Server using the WebSphere Application Server uninstaller program, you can reinstall HTTP Server using the WebSphere Application Server installer program.

### Uninstalling products in the proper sequence

Uninstall WebSphere Application Server products in the following sequence when you are uninstalling more than one product:

1. **5.1+** WebSphere Business Integration Server Foundation on Network Deployment and Network Deployment
2. **5.1+** WebSphere Business Integration Server Foundation on a base node and the base product
3. WebSphere Application Server Network Deployment
4. WebSphere Application Server (base product)

If you do have the Network Deployment product installed, open the information center for Network Deployment to find recommended procedures for uninstalling federated base product nodes.

**Planning for time to uninstall** The time required to uninstall a product depends on the number of configured servers. The uninstaller program attempts to stop all running servers. As a result, the time required to uninstall is directly proportional to the number of defined servers. The uninstaller program attempts to contact each configured server and waits for a timeout before assuming that a server is not running. Therefore, uninstalling many servers can take several minutes. The uninstaller program can run slightly faster if all servers are running, which avoids waiting for a timeout condition.

### Examining logs from the uninstalling operation

**5.1+** Examine the `install_root/logs/WAS.WBISF.uninst.log` file to verify that no file system or other unusual errors occurred. Also examine the `install_root/logs/uninstlog.txt` file if you uninstall the base product or Network Deployment while you are uninstalling Integration Server.

Examine the `install_root/logs/uninstlog.txt` file to verify that no file system or other unusual errors occurred.

1. Close all Web browser processes. Before uninstalling, verify that you have no open Web browsers that are accessing the administrative console. Otherwise, the potential for locked file errors exists.
2. Stop the IBM HTTP Server and any related Java processes. Stop these processes only if the processes are running on the same machine.
3. Disable WebSphere Application Server security. If security is on and Application Servers are running, the uninstaller program cannot detect the status of the Application Servers because security is on. The uninstall procedure fails because it cannot stop the Applications Server processes.

Another scenario involving security is when a federated Application Server is stopped. The uninstall procedure fails because the uninstaller program cannot remove the node from the cell when security is enabled.

4. Stop all Java processes that are related to WebSphere Application Server products on the machine.
  - a. Stop any embedded messaging feature services, such as WebSphere embedded messaging publish and subscribe, or WebSphere MQ queue managers, and any related Java processes. Stop these processes only if the processes are running on the same machine.
  - b. Stop any Java processes related to WebSphere Application Server processes with the **stopServer** command. Stop all server processes for WebSphere Application Server that are running on the machine. For example, use the following command from the `/opt/WebSphere/AppServer/bin` directory on a Linux machine to stop the server1 process:

```
./stopServer.sh server1
```

If you have another installation instance of WebSphere Application Server, V5.0.x or V5.1, stop all servers that are running on the other instances too.

If servers are running and security is enabled, the uninstaller program cannot shut down the servers and the uninstall procedure fails. Manually stop all servers before uninstalling.

- c. Use the “wsinstance command” on page 223 to delete any configuration instances of the product that you are uninstalling. The following example command is on more than one line for formatting purposes. Enter the command on one line to delete the configuration instance named `shast1` from a Linux machine:



```
./wsinstance.sh -name shasti -host planetlinux -delete
```

5. Uninstall the product. Select your uninstalling scenario from the following list of options:
  - Uninstall a base WebSphere Application Server node when neither migration nor coexistence are involved.
  - Uninstall a base WebSphere Application Server node while migrating or after migrating.
  - Uninstall base WebSphere Application Server in a coexistence scenario.
6. Optional: Uninstall manually before reinstalling. The uninstaller program leaves some log and configuration files that were changed during installation. You can manually uninstall the product to remove all artifacts of the product instance from the platform. This step is required before you can reinstall the product into the same installation root directory. Follow the reinstallation scenario for V5.1 if you left the embedded messaging feature installed and now you want to reinstall the V5.1 product. Follow the other procedure when you did not leave the embedded messaging feature installed, or when you are removing all product artifacts from V5.1 or V5.0.x.
  - Uninstall manually after uninstalling V5.1:
    - Uninstall manually on all platforms but Solaris and HP-UX before reinstalling.
    - Uninstall manually on Solaris platforms before reinstalling.
    - Uninstall manually on HP-UX platforms before reinstalling.
  - Uninstall manually after uninstalling V5.0.x, or when you are removing all product artifacts from V5.1.

You can uninstall the product.

## uninstall command

The **uninstall** command uninstalls the product. Uninstalling the product also selects the feature uninstaller programs, such as the uninstaller program for the IBM HTTP Server if you installed IBM HTTP Server as a feature of the base product. The uninstaller wizard prompts you to uninstall the embedded messaging feature because other product instances might share the feature. Options on the silent parameter of the uninstaller program control the removal of an existing embedded messaging feature when you uninstall silently.

### Before you begin uninstalling the product

If servers are running and security is enabled, the uninstaller program cannot shut down the servers and the uninstall procedure fails. Manually stop all servers before uninstalling the product.

### Overview of uninstalling the product

The uninstaller wizard displays a panel when it begins. Click **Next** to begin uninstalling the product when the embedded messaging feature is not installed, or to display a panel with a prompt for uninstalling the embedded messaging feature, if the feature is installed.

If the embedded messaging feature is installed, click the check box to clear the selection and leave the embedded messaging feature installed. You can do this legally only when there is another instance of a WebSphere Application Server product on the machine that also uses the embedded messaging feature and shares the embedded messaging code. Another example of properly retaining the embedded messaging code occurs when migrating to a new version or release of a WebSphere Application Server product that also uses the embedded messaging code.

Leave the check box selected to uninstall the embedded messaging feature.

Click **Next** to begin uninstalling the product.

## Location of the command file **5.1+**

The command file is located in the `_uninst` directory in the installation root directory.

The command file is named `uninstall` for Linux and UNIX-based platforms and `Uninstall.exe` on Windows platforms.

## Command syntax **5.1+**

Command parameters are described at the end of this topic. This section describes the recommended command syntax, which starts the uninstaller wizard.

### Command syntax for uninstalling the base WebSphere Application Server

- On Linux and UNIX-based platforms, issue the **uninstall** command:

```
WAS_install_root/_uninst/uninstall
```

- On Windows platforms, run the uninstaller program in the installation root of the product that you intend to uninstall. Issue a fully qualified command or change directories to the `install_root\_uninst` directory and issue the **uninstall** command. For example, if the installation root is `C:\WebSphere\AppServer`, issue one of the following commands:

```
"C:\WebSphere\AppServer\_uninst\uninstall"  
"C:\WebSphere\AppServer\_uninst\Uninstall.exe"  
C:\WebSphere\AppServer\_uninst> uninstall  
C:\WebSphere\AppServer\_uninst> Uninstall.exe
```

### Uninstalling the base product or Network Deployment when uninstalling Integration Server

You can uninstall the base product or the Network Deployment product when you uninstall the WebSphere Business Integration Server Foundation product, depending on which product the Integration Server is extending. A panel appears that prompts you to uninstall the extended product. If you select to uninstall the product, the uninstaller program removes the product along with the Integration Server. If you select to leave the extended product, the uninstaller program does not remove the product as it uninstalls the Integration Server.

### Logging the results of the uninstall procedure

On Linux and UNIX-based platforms, the return code from the uninstaller program is "1" to indicate success; any other response code indicates failure. There is no return code on Windows platforms.

Examine the `install_root/logs/uninstlog.txt` file to verify that there were no file system or other unusual errors while uninstalling. If there are problems, correct them, and see "Uninstalling manually" on page 312 before reinstalling the product.

After uninstalling a WebSphere Application Server product, delete the installation root directory before reinstalling into the same directory. Deleting the old directory avoids invalid XML configurations that result from retaining old files. To delete all files so that you can reinstall with a clean system, see "Uninstalling manually" on page 312.

### Command syntax for using the `-silent` parameter

If you remove the embedded messaging feature when uninstalling V5.1, any instance of WebSphere Application Server, Version 5.0 on your system cannot properly use the embedded messaging function. If you do not remove the embedded messaging feature, you are responsible for verifying that you are (and that you remain) properly licensed to use the embedded messaging feature on this system.

If WebSphere Application Server, Version 5.0 is not installed on this system and you remove WebSphere Application Server, Version 5.1, you may not have any such right to use the embedded messaging feature. By using the silent uninstall method, you indicate your acknowledgment of this condition and your agreement to comply with the relevant licensing terms as they apply to your use of the embedded messaging feature.

Please refer to the license information documents for WebSphere Application Server, Version 5.1 and WebSphere Application Server, Version 5.0 for further details.

Uninstall silently using one of the commands in the following series of tables. Uninstalling silently does not display the uninstaller program wizard.

**Use the following commands on a base WebSphere Application Server node:**

*Table 65. Uninstalling WebSphere Application Server silently on Linux and UNIX*

| Command<br>(from the <i>install_root/_uninst/</i> directory)                         | Effect on the embedded messaging feature |
|--|--|
| <code>uninstall -silent</code>   | Retains the feature                      |
| <code>uninstall -silent -W MQUninstallSelectionSequence.active= "false"</code>       | Uninstalls the feature                   |
| <code>uninstall -silent -W MQUninstallSelectionSequence.active= "true"</code>        | Retains the feature                      |
| <code>uninstall -silent -W MQUninstallSelectionPanel.uninstallClient= "false"</code> | Retains the client                       |
| <code>uninstall -silent -W MQUninstallSelectionPanel.uninstallClient= "true"</code>  | Uninstalls the client                    |
| <code>uninstall -silent -W MQUninstallSelectionPanel.uninstallServer= "false"</code> | Retains the server and client            |
| <code>uninstall -silent -W MQUninstallSelectionPanel.uninstallServer= "true"</code>  | Uninstalls the server and client         |

*Table 66. Uninstalling WebSphere Application Server silently on Windows platforms*

| Command<br>(from the <i>install_root\_uninst</i> directory)                              | Effect on the embedded messaging feature |
|--|--|
| <code>Uninstall.exe -silent</code>   | Retains the feature                      |
| <code>Uninstall.exe -silent -W MQUninstallSelectionSequence.active= "false"</code>       | Uninstalls the feature                   |
| <code>Uninstall.exe -silent -W MQUninstallSelectionSequence.active= "true"</code>        | Retains the feature                      |
| <code>Uninstall.exe -silent -W MQUninstallSelectionPanel.uninstallClient= "false"</code> | Retains the client                       |
| <code>Uninstall.exe -silent -W MQUninstallSelectionPanel.uninstallClient= "true"</code>  | Uninstalls the client                    |
| <code>Uninstall.exe -silent -W MQUninstallSelectionPanel.uninstallServer= "false"</code> | Retains the server and client            |
| <code>Uninstall.exe -silent -W MQUninstallSelectionPanel.uninstallServer= "true"</code>  | Uninstalls the server and client         |

## vpd.properties file

The installer program for any WebSphere Application Server product uses the Install Shield for Multiplatforms (ISMP) program to install code. ISMP uses the `vpd.properties` file to track WebSphere products that it installs on all platforms but Solaris and HP-UX. The `vpd.properties` file lists program components that are currently installed. The file helps ISMP and the installer programs of WebSphere Application Server products to recognize previous installations of WebSphere Application Server products and to control options for new installations.

## Situations that require you to edit the vpd.properties file

Certain situations require you to edit the vpd.properties file before reinstalling a WebSphere Application Server product. The uninstaller programs for WebSphere Application Server products edit the vpd.properties while uninstalling a product, to remove entries for the product and any of its features that might have entries in the file.

It is necessary to remove product entries in the vpd.properties file before you can reinstall the product. Some situations that occur require manually removing entries from the vpd.properties file before you can reinstall a product. These situations include:

- Removing entries for the embedded messaging feature when the feature was left intact but the product was uninstalled
- Bypassing the uninstaller program to uninstall a product manually
- Manually uninstalling a product when the uninstaller program is not present or is not working

If the vpd.properties file has entries for a product you uninstalled, you must edit the file and remove the entries. If you do not edit the vpd.properties file to remove entries for a product or features of a product, you cannot reinstall the product into the same directory structure. If product entries in the vpd.properties file are present, the installer program reads the vpd.properties file, determines that the product is already installed, and displays the panel that prompts you to install additional features into the existing instance or to install a new instance. Unfortunately, the existing instance might not be a valid installation. The installer program does not verify the products that it finds listed in the vpd.properties file.

## Location of the vpd.properties file

The location of the vpd.properties file varies per operating platform:

- AIX platforms: The root directory or the usr/lib/objrepos directory
- Linux platforms: The root directory
- Windows platforms: installation directory of the operating system, such as the C:\WINNT directory or the C:\windows directory.

## Example of the vpd.properties file

The following example shows the first ten entries for the vpd.properties file for Version 5.0.2 of the base product on a Windows platform. The example shows the entire first line but breaks the line for formatting purposes. The example truncates the rest of the lines in the file. The identifier for the first component is highlighted. The installation location of the first component is also highlighted.

```
WSBACAA|5|0|0|0| |1=Admin Console|Admin Console|
    $L(com.ibm.ws.install.resourcebundle.
    WSResourceBundle,Features.admin.console.description)| | |
D:\WebSphere\AppServer50|0|2|
WSBSRAA|5|0|0|0| |0|0|2|ref_759810|
WSBASAA|5|0|0|0| |0|0|2|ref_58595|1|
WSBADAA|5|0|0|0| |1|0|false| |true|3|
WSBACAA|5|0|0|0| |1
WSBAC2AA|5|0|0|0| |1=adminConsoleRegKeyComponent|admin
WSBSR4AA|5|0|0|0| |1=serverConfigWithoutSamplesCompon
WSBMSAA|5|0|0|0| |1=mqSeriesServer|MQSeries Server|$L(
WSBC05AA|5|0|0|0| |1=IsmpLauncherComponent|IsmpLaunche
WSBASAA|5|0|0|0| |1=Admin Scripting|Admin Scripting|$L
WSBAC1AA|5|0|0|0| |1=adminConsoleFilesComponent|adminC
WSBC04AA|5|0|0|0| |1=pbwServerConfigWithMQGood|pbwSamp
WSBSMAA|5|0|0|0| |1=Samples|Samples|$L(com.ibm.ws.inst
WSBSM2AA|5|0|0|0| |1=samplesRegKeyComponent|samplesReg
```

## Example of the vpd.properties file after a coexistence or migration installation

The following example shows the first ten entries of the vpd.properties file when you install V5.1 of the base WebSphere Application Server product onto a Windows platform that already has V5.0.2 installed.

The example shows partial entries and breaks the lines for formatting purposes. Highlighting shows differences in the identifiers and the installation directories of the components. V5.1 identifiers have "51" at the end except for the application clients identifier.

The last two lines in the example show how entries identify a second instance of a component with a common identifier. Highlighting in these lines shows how to identify entries for a particular version.

```
WSBJD8AA51|1|3| |1| |1=javaRegistryComponent|javaRegistryUpdate| | | |
  D:\WebSphere\AppServer51|0|0|1|...
WSBACAA|5|0|0|0| |1=Admin Console|Admin Console|...
  D:\WebSphere\AppServer50|0|2|...
WSBSM2AA51|5|1|0|0| |1=samplesRegKeyComponent|...
  D:\WebSphere\AppServer51|0|0|1|
WSBAC2AA|5|0|0|0| |1=adminConsoleRegKeyComponent|...
  D:\WebSphere\AppServer50|0|0|1|...
WSBSR4AA|5|0|0|0| |1=serverConfigWithoutSamplesComponent|...
  D:\WebSphere\AppServer50|0|0|1|
WSBMSAA|5|0|0|0| |1=mqSeriesServer|MQSeries Server|...
  C:\Program Files\IBM\WebSphere MQ|0|1|...
WSBAS2AA51|5|1|0|0| |1=adminScriptingRegKeyComponent|adminScriptingR
WSBSR4AA51|5|1|0|0| |1=serverConfigWithoutSamplesComponent|config| |
WSBC05AA|5|0|0|0| |1=IsmpLauncherComponent|IsmpLauncherComponent| |
WSBAC1AA51|5|1|0|0| |1=adminConsoleFilesComponent|adminConsoleFiles|
.
.
.
WSBMQ4AA|5|0|0|0| |2=mqSeriesPropFilesComponent|...
  D:\WebSphere\AppServer51\properties|0|0|1|...
WSBMQ4AA|5|0|0|0| |1=mqSeriesPropFilesComponent|...
  D:\WebSphere\AppServer50\properties|0|0|1|...
```

## Example of the vpd.properties file after uninstalling V5.1 but keeping the embedded messaging feature

The following example shows entries for the vpd.properties file after uninstalling the V5.1 base product but keeping the embedded messaging feature for use with coexisting WebSphere Application Server products. The example shows all entries for V5.1 that remain in the file after uninstalling V5.1.

The example shows partial entries and breaks the lines for formatting purposes. Highlighting identifies the V5.1 entries that still remain in the file. The last line shows an entire entry.

```
WSBACAA|5|0|0|0| |1=Admin Console|Admin Console|...
  D:\WebSphere\AppServer50|0|2|...
WSBAA51|5|1|0|0| |1=WebSphere Application Server|...
  D:\WebSphere\AppServer51...
WSBMQ4AA|5|0|0|0| |2=mqSeriesPropFilesComponent|...
  D:\WebSphere\AppServer51\properties|0|0|1|...
WSBMQAA|5|0|0|0| |2=MQSeries|MQSeries|...
  D:\WebSphere\AppServer51|0|0|1|...
WSBMS2AA|5|0|0|0| |2=mqSeriesWindowsConfig|...
  D:\WebSphere\AppServer51|0|0|1|...
WSBMQ3AA|5|0|0|0| |2=mqSeriesLibFilesComponent|...
  D:\WebSphere\AppServer51\lib|0|0|1|...
WSBMS1AA|5|0|0|0| |2=mqSeriesWindowsInstall|...
  D:\WebSphere\AppServer51|0|0|1|...
WSBMQ2AA|5|0|0|0| |2=mqSeriesBinComponent|...
  D:\WebSphere\AppServer51\bin|0|0|1|...
WSBMQ1AA|5|0|0|0| |2=mqSeriesSetupFileComponent|
```

```
mqSeriesSetupFileComponent| | | |
D:\WebSphere\AppServer51\_uninst\mq|0|0|1|
WSBMQAA|5|0|0|0| |2|0|false| |true|3|WSBMQ1AA|5|0|0|0| |2
```

## Editing the vpd.properties file before reinstalling V5.1

If you uninstall V5.1 in a coexistence or migration environment, you can reinstall the product.

There are two options for reinstalling the product:

- Installing into a new directory.  
Edit the vpd.properties file to remove the **WSBAA51** entry.  
Select another installation path during the installation.
- Edit the vpd.properties file to remove all entries that identify V5.1 and reinstall into the same directory structure as the original V5.1 product.  
Edit the vpd.properties file in a flat-file editor. Edit the file on the operating platform where the file resides to avoid problems with line-end characters. Use an editor that shows line breaks so that you can see each identifier at the beginning of a line.

With either option, you can select coexistence and assign non-conflicting ports, or select migration and migrate the configuration from the V5.0.x product to the V5.1 product. You can also select to neither coexist or migrate to run each product when the other is not running.

Perform the following procedure to remove all entries in the vpd.properties file and to reinstall into the original V5.1 installation root directory:

1. Back up the vpd.properties file before you edit it.
2. Search for and delete lines that start with an identifier that ends in "51". For example, delete the following entry from the file:

```
WSBAA51|5|1|0|0| |1=WebSphere Application Server|IBM WebSphere Application Server
D:\WebSphere\AppServer51|0|0|1|WSBAA51|5|1|0|0| |1|0|false|"_uninst" "uninst"
```

3. Search for and delete all multiple instance entries that specify the original installation root. For example, delete the following entries from the file:

```
WSBMQ4AA|5|0|0|0| |2=mqSeriesPropFilesComponent|
mqSeriesPropFilesComponent| | | |
D:\WebSphere\AppServer51\properties|0|0|1|
WSBMQAA|5|0|0|0| |2|0|false| |true|3|WSBMQ4AA|5|0|0|0| |2
WSBMQAA|5|0|0|0| |2=mqSeries|MQSeries|...
D:\WebSphere\AppServer51|0|0|1|...
WSBMS2AA|5|0|0|0| |2=mqSeriesWindowsConfig|...
D:\WebSphere\AppServer51|0|0|1|...
WSBMQ3AA|5|0|0|0| |2=mqSeriesLibFilesComponent|...
D:\WebSphere\AppServer51\lib|0|0|1|...
WSBMS1AA|5|0|0|0| |2=mqSeriesWindowsInstall|...
D:\WebSphere\AppServer51|0|0|1|...
WSBMQ2AA|5|0|0|0| |2=mqSeriesBinComponent|...
D:\WebSphere\AppServer51\bin|0|0|1|...
WSBMQ1AA|5|0|0|0| |2=mqSeriesSetupFileComponent|
mqSeriesSetupFileComponent| | | |
D:\WebSphere\AppServer51\_uninst\mq|0|0|1|
WSBMQAA|5|0|0|0| |2|0|false| |true|3|WSBMQ1AA|5|0|0|0| |2
```

4. Rename the installation root directory to back it up. For example, change the name from D:\WebSphere\AppServer51 to D:\WebSphere\AppServer51Backup.
5. Reinstall the base WebSphere Application Server into the D:\WebSphere\AppServer51 directory.



## Identifying entries in the vpd.properties file

Use the following table to help identify product entries. The first three characters of any identifier are unique to a product. Version 5.1 identifiers end with "51" as the last two characters except for the application clients, which is the same for all versions.

Table 67. Identifiers in the vpd.properties file for WebSphere products

| Identifier | Product   |
|------------|---|
| WSB...     | WebSphere Application Server (base product)                                       |
| WSB...51   | WebSphere Application Server, Version 5.1   |
| WSBM...    | WebSphere Application Server embedded messaging feature                           |
| WSC...     | WebSphere Application Server application clients, all releases                    |
| WSE...     | WebSphere Application Server Enterprise, Version 5.0.x                            |
| WSE...51   | WebSphere Business Integration Server Foundation, Version 5.1                     |
| WSN...     | WebSphere Application Server Network Deployment                                   |
| WSN...51   | WebSphere Application Server Network Deployment, Version 5.1                      |
| WSNM...    | WebSphere Application Server Network Deployment embedded messaging client feature |
| WSM...     | WebSphere MQ (the stand-alone product, not the embedded messaging feature)        |

## Uninstalling base WebSphere Application Server

This task describes using the uninstaller program to uninstall WebSphere Application Server.

Before uninstalling, verify that you have no open Web browsers that are accessing the administrative console.

**Uninstalling products in the proper order** Depending on the WebSphere Application Server products you installed, uninstall all that you intend to uninstall in this order:

1. **5.1+** WebSphere Business Integration Server Foundation on Network Deployment
  2. **5.1+** WebSphere Business Integration Server Foundation on base nodes
  3. WebSphere Application Server Network Deployment
  4. WebSphere Application Server (base product)
1. Stop any browsers, delete any configuration instances, and stop any Java processes related to WebSphere Application Server products as described in "Uninstalling the product" on page 295.
  2. Change directories to the `_uninst` directory before issuing the **uninstall** command. The command file is located in the `install_root/_uninst` directory on a Linux or UNIX-based platform, and in the `install_root\_uninst` directory on a Windows system.  
For example, to change directories on a Linux platform, issue this command if your installation root is `/opt/WebSphere/AppServer`:  

```
cd /opt/WebSphere/AppServer/_uninst
```
  3. Issue the **uninstall** command. The command file is named `uninstall` for Linux and UNIX-based platforms and `Uninstall.exe` on Windows platforms. The command file for V5.0.x on Linux for S/390 platforms\* is named `uninstall.sh`. For V5.1 the command file is named `uninstall`, as it is on other Linux platforms.

\*Linux for S/390 platforms refers to the Linux distributions available from Linux distributors that run on IBM eServer zSeries and S/390 systems in 31-bit mode.

On Windows platforms, call the **Uninstall.exe** command:

```
install_root\_uninst\Uninstall.exe
```

Call the program directly from the *install\_root*\\_uninst directory. For example, if the installation root is C:\WebSphere\AppServer, issue the following command:

```
C:\WebSphere\AppServer\_uninst> Uninstall.exe
```

On Linux and UNIX-based platforms, issue the **uninstall** command from the *install\_root*/\_uninst directory:

```
uninstall
```

(To uninstall V5.0.x on a Linux for S/390 platform, use the `uninstall.sh` script.)

Uninstalling the product also selects the feature uninstaller programs, such as the uninstaller program for the plug-ins feature.

The V5.1 uninstaller wizard prompts you whether to uninstall the embedded messaging feature when the feature is present. To obey licensing rules, always remove the embedded messaging feature unless there are other product instances on the machine that also share the code. The V5.0.x uninstaller program does not have this enhancement of leaving the embedded messaging feature code installed. Therefore, the procedure for uninstalling WebSphere Application Server varies slightly, depending on the version you are uninstalling.

The uninstaller wizard begins and displays a panel.

In V5.0.x the uninstaller program displays a language selection panel.

4. Click **Next** to begin uninstalling the product. In situations where the embedded messaging feature is installed, the V5.1 uninstaller wizard displays the panel that prompts you whether to uninstall the embedded messaging feature. Click **Next** on that panel to continue uninstalling the product. The uninstaller wizard displays a summary panel that lists the product and features that you are uninstalling.
5. Click **Next** to continue uninstalling the product.
6. Click **Finish** to close the wizard after the wizard removes the product.

You can uninstall WebSphere Application Server.

## Uninstalling in a migration scenario

This task describes uninstalling in a migration scenario. Uninstall during the migration procedure when there is an incompatibility such as exists when migrating WebSphere Application Server, Version 5.0.1 with the embedded messaging feature to Version 5.1. Uninstall after migrating Version 5.0.x to Version 5.1 to uninstall one of the two nodes in the migration process, either the V5.0.x node or the V5.1 node.

Several scenarios can occur when uninstalling during migration or after migration. Unless there is an incompatibility with the products you are migrating between, you would leave the old product installed during a time of testing and verification. After you make a decision whether to keep or uninstall the new product, you uninstall either the old product or the new one. Various scenarios that you can follow include:

- Uninstalling during migration because the old product is not compatible with the new one
- Uninstalling a node that does not have the embedded messaging feature
- Uninstalling a base node that has the embedded messaging server and client feature
- Uninstalling a node that has the embedded messaging client feature

Select one of the following optional steps that describes your scenario.

1. Stop any browsers, delete any configuration instances, and stop any Java processes related to WebSphere Application Server products as described in “Uninstalling the product” on page 295.
2. Uninstall the product by selecting one of the following paths:
  - Uninstall during migration because the old product is not compatible with the new one. The general process for uninstalling during migration is described in “Migrating Version 5.0.0 or Version 5.0.1 of WebSphere Application Server with embedded messaging to Version 5.1” on page 347. Uninstall the product with the following procedure.

- a. Run the uninstall command from the *install\_root\\_uninst* directory of the product that you are uninstalling.
  - b. Run the platform-specific uninstalling procedure to complete the removal by removing all artifacts of the earlier product from the system.
  - c. Complete the migration by installing the new product and running the WASPostUpgrade tool after the installation is complete.
- Uninstall a node that does not have the embedded messaging feature.
  - Uninstall a node that has the embedded messaging server and client feature.
  - Uninstall a node that has the embedded messaging client feature.

You can uninstall a node during migration or after migration.

### Uninstalling a node when the embedded messaging feature is not installed

This task describes the proper procedure for uninstalling a node that does not have the embedded messaging feature installed.

Uninstalling a base WebSphere Application Server node after migration is affected by the presence of the embedded messaging feature. If the embedded messaging feature is not installed, uninstalling the product is fairly straightforward. This task describes uninstalling when there is no embedded messaging feature.

1. Stop any browsers, delete any configuration instances, and stop any Java processes related to WebSphere Application Server products as described in “Uninstalling the product” on page 295.
2. Uninstall a base node that is not federated.

You can uninstall a base node that does not have the embedded messaging feature installed.

### Uninstalling a base node that has the embedded messaging server and client feature

This task describes uninstalling a base WebSphere Application Server node after migrating from Version 5.0.2 to WebSphere Application Server, Version 5.1. In most situations you uninstall V5.0.2 after migrating to V5.1. However, some situations might require that you uninstall V5.1 while both versions are on the machine.

Before uninstalling, verify that you have no open Web browsers that are accessing the administrative console.

1. Stop any browsers, delete any configuration instances, and stop any Java processes related to WebSphere Application Server products as described in “Uninstalling the product” on page 295.
2. Identify which base node you are uninstalling. Uninstall either the V5.0.2 node and leave the V5.1 node installed, or uninstall the V5.1 node and leave the V5.0.2 node installed. Write down the installation root directory of the node you intend to uninstall if the path names are similar. Examples in this task use the following path names for nodes on a Linux platform:
  - **V5.0.2:** /opt/WebSphere/AppServer50
  - **V5.1:** /opt/WebSphere/AppServer51

The required steps to uninstall each node are different. Each set of steps is presented as sub-steps in an optional step in this procedure.

3. Optional: Uninstall the V5.0.2 node.
  - a. Change directories to the V5.1 *install\_root51/bin* directory.  
For example, issue this command to change directories on a Linux platform:
 

```
cd /opt/WebSphere/AppServer51/bin
```
  - b. Start the V5.1 server1 process to preserve the queue manager. For example, use the following command to start the V5.1 server1 node on a Linux platform:
 

```
startServer.sh server1
```

It is possible that the V5.1 server1 process might crash while uninstalling the V5.0.2 node. You restart the process in a later step so it is not a concern if it crashes.

It is also possible that the queue manager might not be preserved, in which case you simply recreate it. You recreate the queue manager in a later step if it is not present, so it is not a concern if you lose the queue manager other than the loss of persistent data, such as messages and durable subscriptions.

- c. Run the **pre\_uninst502mq** command. The command helps avoid removing the embedded messaging feature code. On Windows platforms, the command creates dummy registry entries. On all platforms, the command creates a dummy queue manager, WAS\_COEXIST, that helps retain the embedded messaging feature code. Run the script from the *install\_root/bin* directory of the V5.1 installation:

```
pre_uninst502mq.sh
```

- d. Change directories to the *install\_root50/\_uninst* directory in the V5.0.2 installation root before issuing the **uninstall** command. The command file is located in the *install\_root50/\_uninst* directory on a Linux or UNIX-based platform, and in the *install\_root50\\_uninst* directory on a Windows system.

For example, use this command to change directories on a Linux platform:

```
cd /opt/WebSphere/AppServer50/_uninst
```

- e. Issue the **uninstall** command. The command file is named `uninstall` for Linux and UNIX-based platforms and `Uninstall.exe` on Windows platforms. The command file for V5.0.x on Linux for S/390 platforms\* is named `uninstall.sh`.

\*Linux for S/390 platforms refers to the Linux distributions available from Linux distributors that run on IBM eServer zSeries and S/390 systems in 31-bit mode.

On Windows platforms, call the **Uninstall.exe** command:

```
install_root\_uninst\Uninstall.exe
```

Call the program directly from the *install\_root\\_uninst* directory. For example, if the installation root is `C:\WebSphere\AppServer50`, issue the following command:

```
C:\WebSphere\AppServer50\_uninst> Uninstall.exe
```

On Linux and UNIX-based platforms, issue the **uninstall** command from the *install\_root/\_uninst* directory:

```
uninstall
```

(To uninstall V5.0.x on a Linux for S/390 platform, use the `uninstall.sh` script.)

- f. Change directories to the V5.1 *install\_root51/bin* directory.

For example, issue this command to change directories on a Linux platform:

```
cd /opt/WebSphere/AppServer51/bin
```

- g. Run the **post\_uninst502mq** command. The command removes the dummy registry entries. Run the script from the *install\_root/bin* directory of the V5.1 installation:

```
post_uninst502mq.sh
```

- h. Delete the dummy queue manager if it still exists. Issue the following commands from the *install\_root51/bin* directory to delete the dummy queue manager:

```
endmqm WAS_COEXIST  
dltmqm WAS_COEXIST
```

- i. Recreate the default queue manager if necessary. Issue the **createmq** command from the *install\_root51/bin* directory to create the default queue manager. Issue the command on one line. The following examples show the commands on several line for clarity:

**Linux and UNIX platforms:**

```
createmq.sh install_root51  
           cellName  
           nodeName  
           server1
```

**Windows platforms:**

```

createmq.bat install_root51
             cellName
             nodeName
             server1           mq_dir
             broker_dir

```

The command that the installer program used to create your original queue manager is in the *install\_root51/logs/createMQ.nodeName\_server1.log* file.

- j. Stop and restart the V5.1 Application Server. For example, run these commands from the *install\_root51/bin* directory to recycle the server1 process on a Linux platform:

```
stopServer.sh server1
```

```
startServer.sh server1
```

- k. Optional: Uninstall manually before reinstalling. This step is required before you can reinstall the V5.0.x product into the same installation root directory. Otherwise you must reinstall the product into another directory.
4. Optional: Uninstall the V5.1 node.

- a. Change directories to the V5.0.2 *install\_root50/bin* directory. For example, issue this command to change directories on a Linux platform:

```
cd /opt/WebSphere/AppServer50/bin
```

- b. Start the V5.0.2 server1 process to preserve the queue manager. For example, use the following command to start the V5.0.2 server1 node on a Linux platform:

```
startServer.sh server1
```

It is possible that the V5.0.2 server1 process might crash while uninstalling the V5.1 node. You restart the process in a later step so it is not a concern if the V5.0.2 server1 process crashes.

It is also possible that the queue manager might not be preserved, in which case you simply recreate it. You recreate the queue manager in a later step if it is not present, so it is not a concern if you lose the queue manager other than the loss of persistent data, such as messages and durable subscriptions.

- c. Change directories to the *install\_root51/\_uninst* directory in the V5.1 installation root before issuing the **uninstall** command. The command file is located in the *install\_root51/\_uninst* directory on a Linux or UNIX-based platform, and in the *install\_root51\\_uninst* directory on a Windows system.

For example, use this command to change directories on a Linux platform:

```
cd /opt/WebSphere/AppServer51/_uninst
```

- d. Issue the **uninstall** command. The command file is named `uninstall` for Linux and UNIX-based platforms and `Uninstall.exe` on Windows platforms.

On Windows platforms, call the **Uninstall.exe** command:

```
install_root51\_uninst\Uninstall.exe
```

Call the program directly from the *install\_root51\\_uninst* directory. For example, if the installation root is `C:\WebSphere\AppServer51`, issue the following command:

```
C:\WebSphere\AppServer51\_uninst> Uninstall.exe
```

On Linux and UNIX-based platforms, issue the **uninstall** command from the *install\_root/\_uninst* directory:

```
uninstall
```

- e. Use the uninstaller wizard panel to keep the embedded messaging feature code installed. When the V5.1 uninstaller wizard displays a panel that prompts you whether to uninstall the embedded messaging feature, clear the check box to leave the feature installed so that the V5.0.2 node can continue to use the code.
- f. After the uninstaller removes the V5.1 code, change directories to the *install\_root50/bin* directory.

- g. Recreate the default queue manager if necessary. Issue the `createmq` command from the `install_root50/bin` directory to create the default queue manager. Issue the command on one line. The following examples show the commands on several lines for clarity:

**Linux and UNIX platforms:**

```
createmq.sh install_root50
           cellName
           nodeName
           server1
```

**Windows platforms:**

```
createmq.bat install_root50
             cellName
             nodeName
             server1           mq_dir
             broker_dir
```

The command that the installer program used to create your original queue manager is in the `install_root50/logs/createMQ.nodeName_server1.log` file.

- h. Stop and restart the V5.0.2 Application Server. For example, run these commands from the `install_root50/bin` to recycle the `server1` process and the `nodeagent` process on a Linux platform:

```
stopServer.sh server1
```

```
startServer.sh server1
```

- i. Optional: Uninstall V5.1 artifacts before reinstalling V5.1. Select a platform-specific procedure for completing the removal of the product:
- Uninstall manually on all platforms but Solaris and HP-UX before reinstalling.
  - Uninstall manually on Solaris platforms before reinstalling.
  - Uninstall manually on HP-UX platforms before reinstalling.

This step is required before you can reinstall the product into the same installation root directory.

You can uninstall a base node that has the embedded messaging server and client feature.

## Uninstalling when the embedded messaging client feature is installed

This topic describes uninstalling when the embedded messaging client feature is installed on more than one base WebSphere Application Server node on the machine. When there is more than one node on a machine using the client feature, uninstalling a single node can remove the embedded messaging client code so that none of the nodes can access it. This topic describes how to avoid that situation.

This task describes how to uninstall a V5.0.2 node that has the client feature and a V5.1 node that has the feature. You have the option of uninstalling either node. But you do not have to uninstall both nodes.

Select your scenario in the following procedure.

1. Stop any browsers, delete any configuration instances, and stop any Java processes related to WebSphere Application Server products as described in “Uninstalling the product” on page 295.
2. Uninstall the node. Select your scenario from the following list of procedures:
  - Uninstall a V5.0.2 unfederated base node that has the embedded messaging client feature.
  - Uninstall a V5.1 unfederated base node that has the embedded messaging client feature.

You can uninstall a node that has the client feature.

### ***Uninstalling V5.0.2 when the embedded messaging client feature is installed:***

This task describes how to uninstall the base WebSphere Application Server, Version 5.0.2 product when the product has the embedded messaging client feature.



Uninstalling a V5.0.x node that has the embedded messaging client feature affects all other nodes that also use the feature. The uninstaller program on V5.0.x does not give you the option of leaving the client feature installed when you uninstall a product. However, you can rename the *install\_root/\_uninst/mq* directory to keep the code for the embedded messaging client feature installed when you uninstall the product.

Two alternatives exist for preserving the embedded messaging client code:

- **Renaming the *\_uninst/mq* directory before uninstalling the V5.0.2 product**

If you rename the *\_uninst/mq* directory before uninstalling the V5.0.2 product, you do not have to reinstall the embedded messaging client feature because you avoid uninstalling the client. Renaming the directory is the recommended method whenever possible.

- **Reinstalling the embedded messaging client code after uninstalling the V5.0.2 product**

If you uninstall V5.0.2 without renaming the *\_uninst/mq* directory, you also uninstall the embedded messaging client code. You can recover by reinstalling the embedded messaging client feature. The general procedure is to uninstall V5.0.2 and to reinstall the client feature from the V5.1 product installation image, which is usually the product CD-ROM. You can also reinstall the client feature from the V5.0.2 product installation image, which is usually where you downloaded and unzipped Fix Pack 2. However, you might have a product CD-ROM for V5.0.2 on some platforms.

Before uninstalling, verify that you have no open Web browsers that are accessing the administrative console.

1. Stop any browsers, delete any configuration instances, and stop any Java processes related to WebSphere Application Server products as described in “Uninstalling the product” on page 295.
2. Optional: Rename the *install\_root/\_uninst/mq* directory to prevent uninstalling the embedded messaging client feature, uninstall the product, and rename the directory to its original name.
  - a. Rename the *install\_root/\_uninst/mq* directory to prevent uninstalling the embedded messaging client feature.
  - b. Follow the normal procedure for uninstalling the V5.0.2 node.
  - c. Rename the *install\_root/\_uninst/mq* directory to its correct name.
3. Optional: Reinstall the embedded messaging client feature on a Windows platform. You do not have to reinstall the embedded messaging client if you renamed the *install\_root/\_uninst/mq* directory as described in the earlier step.
  - a. Locate the V5.1 product CD-ROM.
  - b. Identify the original installation location of the embedded messaging client feature on a Windows machine. Use the administrative console of the V5.1 product to examine the value of the *MQ\_INSTALL\_ROOT* variable in **Environment > Manage WebSphere variables**.
  - c. Optional: Issue the command to reinstall the embedded messaging client code on a Windows platform:

```
source_path\wmsetup /installc parm1 parm2 parm3 parm4
```

**source\_path**

The fully qualified file path to the **wmsetup** command, either on disk or in the *\messaging\client* directory on the product CD-ROM.

**parm1**

The file path where the embedded messaging feature was originally installed, which is by default *C:\Program Files\IBM\WebSphere MQ* on a Windows platform.

**parm2**

The source location of embedded messaging software, such as the *\messaging\client* directory on the product CD-ROM.

**parm3**

The path and file name for recording log messages.

#### parm4

A code that represents the installation language. For example, 1033 for US English.

For example, you can use the following command by entering it all on one line:

```
E:\WASTEST\messaging\client\Setup\wmsetup /installc
C:\Program Files\IBM\WebSphere MQ
I:\Windows\messaging\client
C:\temp\mq_install.log
1033
```

4. Issue the command to reinstall the embedded messaging client code on a Linux or UNIX-based platform. You do not have to reinstall the embedded messaging client if you renamed the *install\_root/\_uninst/mq* directory as described in the earlier step. **Command to use on a Linux or UNIX-based platform:**

```
source_path/wmsetup installc logfile
```

#### source\_path

The fully qualified file path to the **wmsetup** command, either on disk or in the */messaging/client* directory on the product CD-ROM.

#### logfile

The path and file name for recording log messages.

For example:

```
./wmsetup installc /tmp/mq_install.log
```

You can uninstall a V5.0.2 node that uses the embedded messaging client feature without affecting other nodes that also use the client feature.

#### **Uninstalling V5.1 and leaving the embedded messaging client feature installed:**

This task describes how to uninstall the base WebSphere Application Server, Version 5.1 product when the product has the embedded messaging client feature. The uninstaller program on V5.1 gives you the option of leaving the embedded messaging client feature installed when the program uninstalls the base WebSphere Application Server product.

Uninstalling a V5.1 node that has the embedded messaging client feature can affect all other nodes that use the feature. The uninstaller program on V5.1 gives you an option that you must use to uninstall a V5.1 node that uses the embedded messaging client feature if you do not want to affect other nodes that also use the feature.

1. Stop any browsers, delete any configuration instances, and stop any Java processes related to WebSphere Application Server products as described in “Uninstalling the product” on page 295.
2. Change directories to the *\_uninst* directory before issuing the **uninstall** command. The command file is located in the *install\_root/\_uninst* directory on a Linux or UNIX-based platform, and in the *install\_root\\_uninst* directory on a Windows system.

For example, to change directories on a Linux platform, issue this command if your installation root is */opt/WebSphere/AppServer*:

```
cd /opt/WebSphere/AppServer/_uninst
```

On a Windows system, you can use the Add/Remove Programs feature and bypass this step, if you prefer.

3. Issue the **uninstall** command. The command file is named *uninstall* for Linux and UNIX-based platforms and *Uninstall.exe* on Windows platforms.

On Windows platforms, call the **Uninstall.exe** command:

```
ND_install_root\_uninst\Uninstall.exe
```

Call the program directly from the *install\_root\\_uninst* directory.

For example, if the installation root is *C:\WebSphere\AppServer*, issue the following command:

```
C:\WebSphere\AppServer\_uninst> Uninstall.exe
```

On Linux and UNIX-based platforms, issue the **uninstall** command from the *install\_root/\_uninst* directory:

```
uninstall
```

Uninstalling the product also selects the feature uninstaller programs, such as the uninstaller program for the embedded messaging client feature.

The uninstaller wizard begins and displays a panel.

4. Click **Next** to begin uninstalling the product. In situations where the embedded messaging client feature is installed, the V5.1 uninstaller wizard displays another panel that prompts you whether to uninstall the embedded messaging feature.
5. Select the check box to clear it so that you do not uninstall the embedded messaging client feature. On that panel, click **Next** to continue uninstalling the product. The uninstaller wizard displays a summary panel that lists the product and features that you are uninstalling.
6. Click **Next** to continue uninstalling the product.
7. Click **Finish** to close the wizard after the wizard removes the product.
8. Optional: Uninstall manually before reinstalling. This step is required before you can reinstall the product into the same installation root directory:
  - Uninstall manually on all platforms but Solaris and HP-UX before reinstalling.
  - Uninstall manually on Solaris platforms before reinstalling.
  - Uninstall manually on HP-UX platforms before reinstalling.

You can uninstall the V5.1 base WebSphere Application Server product and leave the embedded messaging client feature installed for other product instances to use.

## Uninstalling in a coexistence scenario

This task describes how to uninstall a product in a coexistence scenario, when various releases of IBM WebSphere Application Server products might be on the same machine, each running in a uniquely named node. You can use the uninstaller program to uninstall each product.

Several scenarios can occur when uninstalling coexisting products. All of them have to do with whether the product has the embedded messaging feature installed. Steps in this task describe various scenarios you can follow:

- Uninstalling a node that does not have the embedded messaging feature
- Uninstalling a base node that has the embedded messaging server and client feature
- Uninstalling a node that has the embedded messaging client feature

Select one of the following optional steps that describes your scenario.

1. Stop any browsers, delete any configuration instances, and stop any Java processes related to WebSphere Application Server products as described in “Uninstalling the product” on page 295.
2. Uninstall a base WebSphere Application Server node that does not have an embedded messaging feature installed.
3. Uninstall a base WebSphere Application Server node that has the embedded messaging server and client feature installed.
4. Uninstall a base WebSphere Application Server node that has the embedded messaging client feature installed.

You can uninstall a WebSphere Application Server product in a coexistence scenario.

## Uninstalling manually

This task describes how to remove all artifacts of an instance of the product so that you have a clean machine with regard to the instance. Repeat the procedure for each instance of the product that you intend to remove.

Uninstalling manually occurs after running the uninstaller program, or because you cannot run the uninstaller program because the program might affect federated nodes, coexisting products, or features. The following for manually uninstalling the product are specific to the platform on which the product is installed.

Before uninstalling, verify that you have no open Web browsers that are accessing the administrative console. Otherwise, there is the potential for locked file errors as you uninstall.

Even if you run the uninstaller program to remove registry entries, uninstall the product code, and remove all related features and products, such as plug-ins, there are some files that the uninstaller program does not remove. The uninstaller program does not delete any configuration files that are changed as the result of selecting installation options, or running Samples, for example. The uninstaller program does not delete log files. The uninstaller program for the base product and the Network Deployment product also leaves a readme file in the `_uninst` directory after it runs, to describe how to completely uninstall the product.

1. Stop any embedded messaging feature services, such as WebSphere Embedded Messaging Publish And Subscribe, `jmsserver`, or WebSphere MQ queue managers, and any related Java processes.
2. Stop the IBM HTTP Server and any related Java processes.
3. Stop any WebSphere Application Server Java processes with the **stopManager** or **stopServer** commands.
4. Back up all configuration and log files. The uninstaller program leaves some log and configuration files that were changed during installation. Before manually uninstalling the product, copy all configuration and log files that are left behind in the WebSphere, the IBMHTTPServer, and the IBM/MQSeries directories. You can refer to your copy of the configuration and log files after you reinstall to compare the configuration data, if necessary.
5. Use one of the following platform-specific uninstalling procedures to delete the directories that are left behind for your product instance, and to perform other tasks that let you reinstall the product on your operating system. You cannot reinstall into the old directories. Deleting the directories and registry entries lets you reinstall with a clean system. If you do plan to reinstall the product, it is important that you follow the procedure for your platform to completely remove all artifacts of the previous installation.

The following topics describe how to uninstall the product from supported operating systems. The IBM WebSphere Application Server supported hardware, software, and APIs Web site describes which operating systems are supported.

- Manually uninstalling on AIX platforms
- Manually uninstalling on HP-UX platforms
- Manually uninstalling on Linux
- Manually uninstalling on Solaris
- Manually uninstalling on Windows

You can completely uninstall the product after which you can reinstall.

### Manually uninstalling on HP-UX platforms

This task describes how to uninstall the product on an HP-UX platform.

Use the following procedure to remove all remnants of a WebSphere Application Server product. This produces a clean system that allows you to reinstall the product. Verify that you are removing only the product instance that you intend to remove and not coexisting products, or products that you might have migrated and do not intend to delete. It is important to know the installation root directory for the product instance that you are removing.

Uninstall WebSphere Application Server products in the following sequence when you are uninstalling more than one product:

1. **5.1+** WebSphere Business Integration Server Foundation on Network Deployment
2. WebSphere Application Server Network Deployment
3. **5.1+** WebSphere Business Integration Server Foundation on the base product
4. WebSphere Application Server (base product)

In the following steps:

- The default *install\_root* for WebSphere Application Server is the /opt/WebSphere/AppServer directory.
- The default directory for IBM HTTP Server is /opt/IBMHttpServer.
- The default directories for the embedded messaging feature, which is based on WebSphere MQ, are /opt/wemps and /opt/mqm.

1. Use the **killall -9 java** command to kill all Java processes that are running.

If there are Java processes running that are not related to WebSphere Application Server products, and it is not possible to stop them, stop all WebSphere Application Server product-related processes. Use the following command to determine all processes that are running:

```
ps -ef | grep java
```

Stop all WebSphere Application Server-related processes with the **kill -9 java\_pid\_1 java\_pid\_2...java\_pid\_n** command.

2. Halt any running WebSphere MQ queue managers.
  - a. Type **dspmq** to show the state of any queue managers.
  - b. Type **endmqm -i** for each running queue manager.
  - c. Type **\$ ipcs -a** to check for any IPCs.
  - d. Type **\$ ipcrm -[qms] [ID]** to delete the IPCs.
3. Search for mqm processes by typing: **ps -eaf | grep mqm** or **ps -eaf | grep ^MQ\***. Type **kill -9 amq\_pid\_1 amq\_pid\_2 ... amq\_pid\_n** to stop any MQ processes that are running. Do not remove IBM WebSphere MQ packages if you have installed IBM WebSphere MQ as a separate product. If you have other instances of WebSphere Application Server products on the same machine, and if they use the embedded messaging feature, do not remove the embedded messaging packages or directories. You can use a **ps -e | grep #AMQ\_COMMAND#** command structure to specify the command for amq to find each amq pid.
4. Search for other related packages. Do not remove IBM WebSphere MQ packages if you have installed IBM WebSphere MQ as a separate product. If you have other instances of WebSphere Application Server products on the same machine, and if they use the embedded messaging feature, which is based on WebSphere MQ, do not remove the WebSphere MQ packages or directories.

If you do intend to remove embedded messaging feature packages, use HP-UX System Administration Manager (SAM) to remove packages for the instance that you intend to delete. Then search for the packages to verify their removal.

- a. Start the SAM utility and verify that your DISPLAY and TERM environment variables are set properly.
  - 1) Click **Software management**.
  - 2) Click **View installed software**.
  - 3) Look for these two entries in the SD list:
    - MQSERIES -> B.11.530.01 WebSphere MQ for HP-UX
    - MQSERIES -> B.11.530.03 WebSphere MQ Update (U485562) for HP-UX
    - MQSERIES -> B.11.530.04 WebSphere MQ Update (U486875) for HP-UX
  - 4) Close the SD list.
  - 5) Click **Remove local host software**.
  - 6) On the **SD Remove list**, remove these instances, if they exist:
    - MQSERIES -> B.11.530.01 WebSphere MQ for HP-UX
    - MQSERIES -> B.11.530.03 WebSphere MQ Update (U485562) for HP-UX
    - MQSERIES -> B.11.530.04 WebSphere MQ Update (U486875) for HP-UX

- a) Highlight the MQSERIES instances on the SD List.
  - b) Click **Actions > Remove...**
  - c) On **Remove Analysis** dialog, verify that **Status** is **ready**.
  - d) Click **OK**.
  - e) Check the result message displayed on the dialog.
  - f) If the removal fails, follow the instructions that appear.
- 7) Return to the **SD Remove List**.
  - 8) Click **IBM HTTP Server, MQSERIES, WEMPS, WSBA, WSNA, gsk7bas**. You can identify packages that belong to V5.1 by the 51 on the end of WSB packages and WSN packages. WSBM and WSNM packages are for the embedded messaging feature.
  - 9) Click **Actions > Mark for remove**.
  - 10) Click **Actions > Remove**.
  - 11) Click **OK** in the **Remove analysis** dialog box.
  - 12) Click **Logs** to display real-time removal of selected packages.
  - 13) Click **Done** when all packages are removed.
  - 14) Exit SAM.
- b. Verify that you removed the packages that you intend to remove. Type these commands to search for related packages:
    - 1) `swlist | grep WS` to show packages for WebSphere Application Server products and the IBM HTTP Server product.
    - 2) `swlist | grep WEMPS` to show packages for the embedded messaging feature or for the IBM WebSphere MQ product. You can delete these packages. If you have other instances of WebSphere Application Server products on the same machine, and if they use the embedded messaging feature, do not remove the embedded messaging packages or directories.
    - 3) `swlist | grep MQ` to show packages for the embedded messaging feature or for the IBM WebSphere MQ product.
5. Type `rm -rf /opt/WebSphere/AppServer/` to remove WebSphere Application Server directories in the instance installed in the `/opt/WebSphere/AppServer` installation root. Do not remove installation root directories for products that you intend to keep.
  6. Type `rm -fr /var/wemps /opt/wemps` if you are certain that there is no embedded messaging data to preserve. If you have other instances of WebSphere Application Server products on the same machine, and if they use the embedded messaging feature, do not remove the embedded messaging packages or directories.
  7. Type `rm -rf IBMHttpServer` to delete the IBM HTTP Server directory.
  8. If you do not have IBM WebSphere MQ installed as a separate product on this machine, and if you do not have the embedded messaging server and client feature installed on this machine, type `rm -fr /var/mqm /opt/mqm` if you are certain that there is no embedded messaging data to preserve. If you have other instances of WebSphere Application Server products on the same machine, and if they use the embedded messaging feature, do not remove the embedded messaging packages or directories.  
If you installed IBM WebSphere MQ as a separate product on this host to use as the messaging provider, and if you do not want to continue using WebSphere MQ, you can uninstall the product as described in the WebSphere MQ information.

When the process completes, the product is completely uninstalled. You are now ready to reinstall.

## Manually uninstalling on Linux platforms

This task describes uninstalling the product on Linux platforms.

Use the following procedure to remove all remnants of a WebSphere Application Server product. This produces a clean system that allows you to reinstall the product. Verify that you are removing only the product instance that you intend to remove and not coexisting products, or products that you might have migrated and do not intend to delete. It is important to know the installation root directory for the product instance that you are removing.



Uninstall WebSphere Application Server products in the following sequence when you are uninstalling more than one product:

1. **5.1+** WebSphere Business Integration Server Foundation on Network Deployment
2. WebSphere Application Server Network Deployment
3. **5.1+** WebSphere Business Integration Server Foundation on the base product
4. WebSphere Application Server (base product)

In the following steps:

- The default *install\_root* for WebSphere Application Server is the `/opt/WebSphere/AppServer` directory.
- The default directory for IBM HTTP Server is `/opt/IBMHttpServer`.
- The default directories for the embedded messaging feature, which is based on WebSphere MQ, are `/opt/wemps` and `/opt/mqm`.

1. Use the **killall -9 java** command to kill all Java processes that are running.

If there are Java processes running that are not related to WebSphere Application Server products, and it is not possible to stop them, stop all WebSphere Application Server product-related processes. Use the following command to determine all processes that are running:

```
ps -ef | grep java
```

Stop all WebSphere Application Server-related processes with the **kill -9 java\_pid\_1 java\_pid\_2...java\_pid\_n** command.

2. Halt any running WebSphere MQ queue managers.
  - a. Type **dspmq** to show the state of any queue managers.
  - b. Type **endmqm -i** for each running queue manager.
  - c. Type **\$ ipcs -a** to check for any IPCs.
  - d. Type **\$ ipcrm -[qms] [ID]** to delete the IPCs.
3. Type **kill -9 amq\_pid\_1 amq\_pid\_2 ... amq\_pid\_n** to stop any MQ processes that are running. You can use a `ps -e | grep #AMQ_COMMAND#` command structure to specify the command for amq to find each amq pid.
4. Search for related packages. Type these commands to search for related packages:
  - **rpm -qa | grep WS** to show packages for the WebSphere Application Server products and the IBM HTTP Server product
  - **rpm -qa | grep MQ** to show packages related to the embedded messaging feature or to IBM WebSphere MQ
  - **rpm -qa | grep wemps** to show packages related to the embedded messaging feature or to IBM WebSphere MQ

Do not remove packages for WebSphere Application Server products that you are not uninstalling. You can identify packages that belong to V5.1 by the 51 on the end of WSB packages and WSN packages. WSBM and WSNM packages are for the embedded messaging feature.

Do not remove IBM WebSphere MQ packages if you have installed IBM WebSphere MQ as a separate product.

Do not remove embedded messaging packages if you intend to leave the embedded messaging feature installed on the machine.

5. If there are packages to delete, type **rpm -e packagename** to remove any WebSphere Application Server-related packages for the product you are uninstalling.

You can remove more than one package with the following command:

```
rpm -qa | grep package_prefix | xargs rpm -e
```

However you should verify that everything in the list is something you want to remove before adding `| xargs rpm -e` to the command.

If you do intend to remove WebSphere MQ or embedded messaging packages, include them in the commands you are running to remove packages. For example, run these commands as root:

```

rpm -e MQSeriesClient-5.3.0-1
rpm -e MQSeriesMsg_Zh_CN-5.3.0-1
rpm -e MQSeriesMsg_Zh_TW-5.3.0-1
rpm -e MQSeriesMsg_de-5.3.0-1
rpm -e MQSeriesMsg_es-5.3.0-1
rpm -e MQSeriesMsg_fr-5.3.0-1
rpm -e MQSeriesMsg_it-5.3.0-1
rpm -e MQSeriesMsg_ja-5.3.0-1
rpm -e MQSeriesMsg_ko-5.3.0-1
rpm -e MQSeriesMsg_pt-5.3.0-1
rpm -e MQSeriesRuntime-5.3.0-1
rpm -e MQSeriesSDK-5.3.0-1
rpm -e MQSeriesJava-5.3.0-1
rpm -e MQSeriesServer-5.3.0-1
rpm -e MQSeriesJava-5.3.0-1
rpm -e wemps-runtime-2.1.0-0
rpm -e wemps-msg-De_DE-2.1.0-0
rpm -e wemps-msg-Es_ES-2.1.0-0
rpm -e wemps-msg-Fr_FR-2.1.0-0
rpm -e wemps-msg-It_IT-2.1.0-0
rpm -e wemps-msg-Ja_JP-2.1.0-0
rpm -e wemps-msg-Ko_KR-2.1.0-0
rpm -e wemps-msg-Pt_BR-2.1.0-0
rpm -e wemps-msg-Zh_CN-2.1.0-0
rpm -e wemps-msg-Zh_TW-2.1.0-0

```

If there is a problem with package dependencies, you can use the following command to remove the packages:

```
rpm -e packagename --nodeps --justdb
```

The `nodeps` option skips the dependency check. The `justdb` option updates only the package database, and not the file system. Using only the `nodeps` option can cause a failure in package removal if there is any mismatch in the dependent file system (files and directories).

6. Type `rm -rf /opt/WebSphere/AppServer/` to remove WebSphere Application Server directories in the instance installed in the `/opt/WebSphere/AppServer` installation root. Do not remove installation root directories for products that you intend to keep.
7. Type `rm -fr /var/wemps /opt/wemps` if you are certain that there is no embedded messaging data to preserve. If you have other instances of WebSphere Application Server products on the same machine, and if they use the embedded messaging feature, do not remove the embedded messaging packages or directories.
8. Type `rm -rf IBMHttpServer` to delete the IBM HTTP Server directory.
9. If you do not have IBM WebSphere MQ installed as a separate product on this machine, and if you do not have the embedded messaging server and client feature installed on this machine, type `rm -fr /var/mqm /opt/mqm` if you are certain that there is no embedded messaging data to preserve. If you have other instances of WebSphere Application Server products on the same machine, and if they use the embedded messaging feature, do not remove the embedded messaging packages or directories.

If you installed IBM WebSphere MQ as a separate product on this host to use as the messaging provider, and if you do not want to continue using WebSphere MQ, you can uninstall the product as described in the WebSphere MQ information.

10. Edit the `vpd.properties` file.

Do not delete or rename the `vpd.properties` file because the InstallShield for MultiPlatforms (ISMP) program uses it for other products that it installs.

When the process completes, the product is completely uninstalled. You are now ready to reinstall.

### Example of displaying package names beginning with MQ, for the embedded messaging feature

```

==>rpm -qa | grep MQ
MQSeriesMsg_Zh_CN-5.3.0-1
MQSeriesMsg_Zh_TW-5.3.0-1

```

```
MQSeriesMsg_ko-5.3.0-1
MQSeriesClient-5.3.0-1
MQSeriesMsg_de-5.3.0-1
MQSeriesMsg_es-5.3.0-1
MQSeriesMsg_fr-5.3.0-1
WSBMQ1AA-5.0-0
WSBMQ2AA-5.0-0
WSBMQ3AA-5.0-0
MQSeriesMsg_it-5.3.0-1
MQSeriesMsg_ja-5.3.0-1
MQSeriesMsg_pt-5.3.0-1
MQSeriesSDK-5.3.0-1
MQSeriesJava-5.3.0-1
MQSeriesServer-5.3.0-1
MQSeriesRuntime-5.3.0-1
```

### Example of displaying package names beginning with wemps, for the embedded messaging feature

```
==>rpm -qa | grep wemps
wemps-msg-De_DE-2.1.0-0
wemps-msg-Es_ES-2.1.0-0
wemps-msg-Fr_FR-2.1.0-0
wemps-msg-It_IT-2.1.0-0
wemps-msg-Ja_JP-2.1.0-0
wemps-msg-Ko_KR-2.1.0-0
wemps-msg-Pt_BR-2.1.0-0
wemps-msg-Zh_CN-2.1.0-0
wemps-msg-Zh_TW-2.1.0-0
wemps-runtime-2.1.0-0
```

### Example of displaying package names beginning with WSB, for the base WebSphere Application Server product

```
# rpm -qa | grep WSB
WSBSR1AA51-5.1-0
WSBMQ4AA-5.0-0
WSBTV1AA51-5.1-0
WSBJD5AA51-1.3-1
WSBDM1AA51-5.1-0
WSBJD7AA51-1.3-1
WSBDT1AA51-5.1-0
WSBMS3AA-5.0-0
WSBAU1AA51-5.1-0
WSBMQ3AA-5.0-0
WSBPL1AA51-5.1-0
WSBMS6AA-5.0-0
WSBPS1AA51-5.1-0
WSBC05AA51-5.1-0
WSBSR4AA51-5.1-0
WSBC01AA51-5.1-0
WSBSM1AA51-5.1-0
WSBAC1AA51-5.1-0
WSBMQ1AA-5.0-0
WSBJD9AA51-1.3-1
WSBGK2AA51-5.1-0
WSBES1AA-5.0-0
WSBJA1AA51-5.1-0
WSBLA1AA51-5.1-0
WSBAS1AA51-5.1-0
WSBMQ2AA-5.0-0
WSBIH1AA51-1.3-28
```

### Example of displaying package names beginning with WSN, for the WebSphere Application Server Network Deployment product

```
# rpm -qa | grep WSN
WSNC02AA51-5.1-0
WSNWG1AA51-5.1-0
WSNJD5AA51-1.3-1
WSNCF1AA51-5.1-0
WSNUR1AA51-5.1-0
WSNJD9AA51-1.3-1
WSNMQ1AA51-5.1-0
WSNCF4AA51-5.1-0
WSNMC5AA-5.0-0
WSNSR1AA51-5.1-0
WSNC01AA51-5.1-0
```

## Manually uninstalling on Solaris platforms

This task describes uninstalling the product on the Solaris operating platform.

Use the following procedure to remove all remnants of a WebSphere Application Server product. This produces a clean system that allows you to reinstall the product. Verify that you are removing only the product instance that you intend to remove and not coexisting products, or products that you might have migrated and do not intend to delete. It is important to know the installation root directory for the product instance that you are removing.

Uninstall WebSphere Application Server products in the following sequence when you are uninstalling more than one product:

1. **5.1+** WebSphere Business Integration Server Foundation on Network Deployment
2. WebSphere Application Server Network Deployment
3. **5.1+** WebSphere Business Integration Server Foundation on the base product
4. WebSphere Application Server (base product)

In the following steps:

- The default *WAS\_install\_root* for WebSphere Application Server is the `/opt/WebSphere/AppServer` directory.
  - The default directory for IBM HTTP Server is `/opt/IBMHttpServer`.
1. Use the **killall -9 java** command to kill all Java processes that are running.  
If there are Java processes running that are not related to WebSphere Application Server products, and it is not possible to stop them, stop all WebSphere Application Server product-related processes. Use the following command to determine all processes that are running:

```
ps -ef | grep java
```

Stop all WebSphere Application Server-related processes with the **kill -9 java\_pid\_1 java\_pid\_2...java\_pid\_n** command.

2. Halt any running WebSphere MQ queue managers.
  - a. Type **dspmq** to show the state of any queue managers.
  - b. Type **endmqm -i** for each running queue manager.
  - c. Type **\$ ipcs -a** to check for any IPCs.
  - d. Type **\$ ipcrm -[qms] [ID]** to delete the IPCs.
3. Issue the following command to stop any MQ processes that are running.

```
kill -9 amq_pid_1 amq_pid_2 ... amq_pid_n
```
4. Search for related packages. Type the following commands from any directory to search for related packages:
  - **pkginfo | grep WS** to show packages for WebSphere Application Server products and the IBM HTTP Server product
  - **pkginfo | grep wemps** to show packages related to the embedded messaging feature or to IBM WebSphere MQ. You can delete these packages.

- `pkginfo | grep mqm` to show packages related to the embedded messaging feature or to IBM WebSphere MQ.

Do not remove IBM WebSphere MQ packages if you have installed IBM WebSphere MQ as a separate product.

If no packages appear when using these commands, skip the next step.

5. Change directories to the directory where package information is registered.

```
cd /var/sadm/pkg
```

6. Issue the following command to remove any WebSphere Application Server-related packages.

Do not remove packages for WebSphere Application Server products that you are not uninstalling. You can identify packages that belong to V5.1 by the 51 on the end of WSB packages and WSN packages. WSBM and WSNM packages are for the embedded messaging feature.

```
pkgrm packagename1 packagename2 packagename3 ...
```

Do not remove embedded messaging packages if you intend to leave the embedded messaging feature installed on the machine.

Do not remove `mqjava`, `mqm-upd04`, or `mqm` packages if you have installed IBM WebSphere MQ as a separate product. If you have other instances of WebSphere Application Server products on the same machine, and if they use the embedded messaging feature, which is based on WebSphere MQ, do not remove the embedded messaging or `mqjava`, `mqm-upd04`, or `mqm` packages or directories.

If you do not have IBM WebSphere MQ installed as a separate product on this machine, and if you do not have the embedded messaging server and client feature installed on this machine, you can remove `wemps` packages.

Remove the `mqm` package last, or you cannot remove any other embedded messaging feature packages. You will have to reinstall the embedded messaging feature to remove the packages. If you have other instances of WebSphere Application Server products on the same machine, and if they use the embedded messaging feature, do not remove the embedded messaging packages or directories.

If you do intend to remove WebSphere MQ or embedded messaging packages, include the packages in the commands you are running to remove packages. For example, issue the following command as root to remove the embedded messaging feature:

```
pkgrm wemps mqjava mqm-upd04 mqm
```

Reply `y[es]` to all prompts.

Alternatively, you can be in any directory and use the **`pkginfo`** command to remove any package, such as those that begin with `wemps`:

```
pkginfo | grep wemps | awk '{print $2}' | xargs -i pkgrm -n {}
```

Issue the following commands from the `/var/sadm/pkg` directory to search for and remove any WebSphere Application Server product-related packages that are registered in the `/var/sadm/pkg` directory:

- a. Verify that you are in the correct directory: `cd /var/sadm/pkg`
- b. `ls |grep WSB|xargs -i pkgrm -n {}` for the base WebSphere Application Server product
- c. `ls |grep WSC|xargs -i pkgrm -n {}` for the WebSphere Application Server Java client
- d. `ls |grep wemps|xargs -i pkgrm -n {}` for the WebSphere embedded messaging publish and subscribe function
- e. `ls |grep mqjava|xargs -i pkgrm -n {}` for IBM WebSphere MQ
- f. `ls |grep mqm|xargs -i pkgrm -n {}` for IBM WebSphere MQ

A known problem in ISMP causes ISMP to rename packages beginning with **WS** to **ISWS**. Search for and remove `ISWS` packages as well:

- a. Verify that you are in the correct directory: `cd /var/sadm/pkg`
- b. `ls |grep ISWSB|xargs -i pkgrm -n {}` for the base WebSphere Application Server product
- c. `ls |grep ISWSC|xargs -i pkgrm -n {}` for the WebSphere Application Server Java client
- d. `ls |grep wemps|xargs -i pkgrm -n {}` for the WebSphere embedded messaging publish and subscribe function
- e. `ls |grep mqjava|xargs -i pkgrm -n {}` for IBM WebSphere MQ

f. `ls |grep mqm|xargs -i pkgrm -n {}` for IBM WebSphere MQ

If there is a problem removing the packages, remove the related package directories in the `/var/sadm/pkg` directory.

7. Issue the following command to remove WebSphere Application Server directories in the `/opt/WebSphere/AppServer` installation root.

```
rm -rf /opt/WebSphere/AppServer/
```

Do not remove installation root directories for products that you intend to keep.

8. Issue the following command if you are certain that there is no embedded messaging data to preserve.

```
rm -fr /var/wemps /opt/wemps
```

If you have other instances of WebSphere Application Server products on the same machine, and if they use the embedded messaging feature, do not remove the embedded messaging packages or directories.

9. Issue the following command to delete the IBM HTTP Server directory.

```
rm -rf IBMHttpServer
```

10. If you do not have IBM WebSphere MQ installed as a separate product on this machine, and if you do not have the embedded messaging server and client feature installed on this machine, issue the following command if you are certain that there is no embedded messaging data to preserve.

If you have other instances of WebSphere Application Server products on the same machine, and if they use the embedded messaging feature, do not remove the embedded messaging packages or directories.

```
rm -fr /var/mqm /opt/mqm
```

If you installed IBM WebSphere MQ as a separate product on this host to use as the messaging provider, and if you do not want to continue using WebSphere MQ, you can uninstall the product as described in the WebSphere MQ information.

When the process completes, the product is completely uninstalled. You are now ready to reinstall.

### Example of displaying package names beginning with mqm, for the embedded messaging feature

```
pkginfo |grep mqm
```

```
application mqm                WebSphere MQ for Sun Solaris
```

### Example of displaying package names beginning with wemps, for the embedded messaging feature

```
pkginfo |grep wemps
```

```
application wemps                WebSphere Embedded Messaging Publish and Subscribe Edition
```

### Example package names for the base package

```
application ISWSBIH1A            ihsComponent
application ISWSBJD9A            javaCommonConfigComponent
application ISWSBJD9A.2          javaCommonConfigComponent
application ISWSBLA1A            logAnalyzerComponent
application ISWSBLAAA            LogAnalyzer
application WSBAA                WebSphere Application Server
application WSBAAA               Application And Assembly Tools
application WSBAC1AA             adminConsoleFilesComponent
application WSBACAA              Admin Console
application WSBADAA              Admin
application WSBAS1AA             adminScriptingFilesComponent
application WSBASAA              Admin Scripting
application WSBAT1AA             applicationAssemblyToolComponent
application WSBATAA              Application Assembly Tool
application WBSAU1AA             antUtilityComponent
application WBSAUAA              Ant Utility
application WSBBC01AA            commonFiles
```



|             |          |                                     |
|-------------|----------|-------------------------------------|
| application | WSBC04AA | pbwServerConfigWithMQGood           |
| application | WSBC05AA | IsmpLauncherComponent               |
| application | WSBC0AA  | commonFeature                       |
| application | WSBDM1AA | DCMStdComponent                     |
| application | WSBDMAA  | Dynamic Cache Monitor               |
| application | WSBDT1AA | deployToolComponent                 |
| application | WSBDTAA  | Deploy Tool                         |
| application | WSBES1AA | messagingSampleFileComponentBean    |
| application | WSBESAA  | mqSeriesSamples                     |
| application | WSBGK2AA | gskitUnixComponent                  |
| application | WSBGK3AA | gskit4SolarisComponent              |
| application | WSBGKAA  | gskitFeature                        |
| application | WSBIHAA  | ihsFeature                          |
| application | WSBJA1AA | javadocComponent                    |
| application | WSBJAAA  | Javadoc                             |
| application | WSBJD4AA | javaSolarisComponent                |
| application | WSBJD7AA | javaUninstallComponent              |
| application | WSBJDAA  | Java                                |
| application | WSBMQ1AA | mqSeriesSetupFileComponent          |
| application | WSBMQ2AA | mqSeriesBinComponent                |
| application | WSBMQ3AA | mqSeriesLibFilesComponent           |
| application | WSBMQAA  | MQSeries                            |
| application | WSBMS6AA | mqSeriesSunConfig                   |
| application | WSBMSAA  | mqSeriesServer                      |
| application | WSBPL1AA | component8                          |
| application | WSBPLAA  | Plugins                             |
| application | WSBPS1AA | perfServletComponent                |
| application | WSBPSAA  | Performance Servlet                 |
| application | WSBPTAA  | PerformanceAndAnalysisTools         |
| application | WSBSM1AA | samplesComponent                    |
| application | WSBSMAA  | Samples                             |
| application | WSBSR1AA | serverStdComponent                  |
| application | WSBSRAAA | serverConfigWithoutSamplesComponent |
| application | WSBSRAA  | Server                              |
| application | WSBTV1AA | tivoliViewerComponent               |
| application | WSBTVAA  | TivoliPerformanceViewer             |

### Example package names for a V5.1 system with the base product and the Network Deployment product

|             |            |                                |
|-------------|------------|--------------------------------|
| application | IBMHTTPSV  | IBM HTTP Server                |
| application | ISIHS.bas  | HTTPServer base                |
| application | ISIHS.con  | component23                    |
| application | ISIHS.htt  | feature13                      |
| application | ISIHS.ins  | component26                    |
| application | ISIHS.ssl  | component57                    |
| application | ISWSBIH1A  | ihsComponent                   |
| application | ISWSBJD9A  | javaCommonConfigComponent      |
| application | ISWSBLA1A  | LogAnalyzerComponent           |
| application | ISWSBLAAA  | LogAnalyzer                    |
| application | ISWSNJD9A  | javaCommonConfigComponent      |
| application | ISWSNMQ1A  | mqClientFiles                  |
| application | ISWSNMQAA  | mqFeature                      |
| application | WSBAA51    | WebSphere Application Server   |
| application | WSBAAAA51  | Application And Assembly Tools |
| application | WSBAC1AA51 | adminConsoleFilesComponent     |
| application | WSBACAA51  | Admin Console                  |
| application | WSBADAA51  | Admin                          |
| application | WSBAS1AA51 | adminScriptingFilesComponent   |
| application | WSBASAA51  | Admin Scripting                |
| application | WSBAU1AA51 | antUtilityComponent            |
| application | WSBAUAA51  | Ant Utility                    |
| application | WSBC01AA51 | commonFiles                    |
| application | WSBC05AA51 | IsmpLauncherComponent          |
| application | WSBC0AA51  | commonFeature                  |
| application | WSBDM1AA51 | DCMStdComponent                |

|             |            |  |
|-------------|------------|--|
| application | WSBDMAA51  | Dynamic Cache Monitor                                      |
| application | WSBDT1AA51 | deployToolComponent  |
| application | WSBDTAA51  | Deploy Tool  |
| application | WSBES1AA   | messagingSampleFileComponentBean                           |
| application | WSBESAA    | mqSeriesSamples  |
| application | WSBGK2AA51 | gskitUnixComponent   |
| application | WSBGK3AA51 | gskit4SolarisComponent                                     |
| application | WSBGKAA51  | gskitFeature   |
| application | WSBIHAA51  | ihFeature  |
| application | WSBJA1AA51 | javadocComponent   |
| application | WSBJAAA51  | Javadoc  |
| application | WSBJD4AA51 | javaSolarisComponent                                       |
| application | WSBJD7AA51 | javaUninstallComponent                                     |
| application | WSBJDAA51  | Java   |
| application | WSBMC4AA   | mqSeriesClientUnixInstall                                  |
| application | WSBMQ1AA   | mqSeriesSetupFileComponent                                 |
| application | WSBMQ2AA   | mqSeriesBinComponent                                       |
| application | WSBMQ3AA   | mqSeriesLibFilesComponent                                  |
| application | WSBMQAA    | MQSeries   |
| application | WSBMS4AA   | mqSeriesUnixInstall  |
| application | WSBMS6AA   | mqSeriesSunConfig  |
| application | WSBMSAA    | mqSeriesServer   |
| application | WSBPL1AA51 | component8   |
| application | WSBPLAA51  | Plugins  |
| application | WSBPS1AA51 | perfServletComponent                                       |
| application | WSBPSAA51  | Performance Servlet  |
| application | WSBPTAA51  | PerformanceAndAnalysisTools                                |
| application | WSBSM1AA51 | samplesComponent   |
| application | WSBSMAA51  | Samples  |
| application | WSBSR1AA51 | serverStdComponent   |
| application | WSBSR4AA51 | serverConfigWithoutSamplesComponent                        |
| application | WSBSRAA51  | Server   |
| application | WSBTV1AA51 | tivoliViewerComponent                                      |
| application | WSBTVAA51  | TivoliPerformanceViewer                                    |
| application | WSNAA51    | WebSphere Network Deployment                               |
| application | WSNCF1AA51 | configFiles  |
| application | WSNCF4AA51 | configSunLinuxWithMQComponent                              |
| application | WSNCFAA51  | Config   |
| application | WSNCO1AA51 | commonFiles  |
| application | WSNCO2AA51 | IsmpLauncherComponent                                      |
| application | WSNCOAA51  | commonFeature  |
| application | WSNJD4AA51 | javaSolarisComponent                                       |
| application | WSNJDAA51  | Java   |
| application | WSNSR1AA51 | serverStdComponent   |
| application | WSNSRAA51  | Server   |
| application | WSNUR1AA51 | uddiComponent  |
| application | WSNURAA51  | UDDI   |
| application | WSNWG1AA51 | wsgwComponent  |
| application | WSNWGAA51  | Web Services Gateway                                       |
| application | WSNWSAA51  | Web Services   |
| application | gsk4bas    | gsk4bas  |
| application | gsk7bas    | Certificate and SSL Base Runtime (gsk7bas)                 |
| application | mqm        | WebSphere MQ for Sun Solaris                               |
| application | mqm-upd04  | WebSphere MQ for Sun Solaris 2 - U486877                   |
| application | wemps      | WebSphere Embedded Messaging Publish and Subscribe Edition |

## Manually uninstalling on Windows platforms

This task describes how to uninstall the product on a Windows platform.

Use the following procedure to remove all remnants of a WebSphere Application Server product. This produces a clean system that allows you to reinstall the product. Verify that you are removing only the product instance that you intend to remove and not coexisting products, or products that you might have migrated and do not intend to delete. It is important to know the installation root directory for the product instance that you are removing.

There are three items you must delete to remove a WebSphere Application Server product or feature: files, registry entries, and the MSI record (when you have installed the embedded messaging feature). If you are uninstalling in a coexistence environment, there are registry entries only for the installation image that you installed last. If you are uninstalling any version but the last image you installed, you need to delete only the file structure for the installation image you are deleting. You do not need to delete registry entries or the MSI record. If you are using the embedded messaging feature in other product instances on the machine, you need to delete only the file structure for the installation image you are deleting. You do not need to delete the MSI record.

Uninstall WebSphere Application Server products in the following sequence when you are uninstalling more than one product:

1. **5.1+** WebSphere Business Integration Server Foundation on Network Deployment
2. WebSphere Application Server Network Deployment
3. **5.1+** WebSphere Business Integration Server Foundation on the base product
4. WebSphere Application Server (base product)

In the following steps:

- The default installation root for WebSphere Application Server is the *drive:\Program Files\WebSphere\AppServer* directory.
- The default directory for the IBM HTTP Server feature is the *drive:\Program Files\IBMHttpServer* directory.
- The default directory for the embedded messaging feature is the *drive:\Program Files\IBM\WebSphere MQ* directory.
- The default directory for the IBM Key Management utility (for Web server support) is the *drive:\Program Files\IBM\gsk7* directory.

1. Verify that you have an Emergency Recovery Disk. Instructions for creating this disk are in the Windows help documentation.
2. Use the `regback.exe` program from the Windows Resource Kit to back up the Registry.
3. If you have not installed IBM WebSphere MQ as a separate product on this machine, and if you do not have other product instances that are using the embedded messaging feature, verify that the embedded messaging feature has been uninstalled. If you have other instances of WebSphere Application Server products on the same machine, and if they use the embedded messaging feature, do not remove the embedded messaging registry entries or directories.

- a. If you are not using the embedded messaging feature or the WebSphere MQ product on other instances on the machine, use the Add/Remove program to verify if the following programs are still listed:

IBM WebSphere EMPS  
IBM WebSphere MQ

- b. If either of these programs is still listed, complete the following steps: If you have other instances of WebSphere Application Server products on the same machine, and if they use the embedded messaging feature, do not complete these steps to remove the embedded messaging registry entries or directories.

- 1) Delete any broker or queue manager defined for WebSphere Application Server.

- To delete any broker defined for WebSphere Application Server, run the **wempsdeletebroker.exe** program, if it still exists:

```
drive:\IBM\WebSphere MQ\WEMPS\bin\wempsdeletebroker.exe brokername -q
```

The `-q` option deletes the Broker's WebSphere MQ queue manager. For example:

```
drive:\IBM\WebSphere MQ\WEMPS\bin\wempsdeletebroker.exe WAS_nodename_server1 -q
```

- To delete any Queue Manager defined for WebSphere Application Server, run the **dltmqm** command, if it still exists:

```
drive:\IBM\WebSphere MQ\bin\dltmqm.exe queuemanagename
```

- 2) If you are not using the embedded messaging feature or the WebSphere MQ product on other instances on the machine, use the Add/Remove utility to remove the following programs, if listed:

IBM WebSphere EMPS  
IBM WebSphere MQ

If you installed IBM WebSphere MQ as a separate product, do not remove it now. If you have other instances of WebSphere Application Server products on the same machine, and if they use the embedded messaging feature, do not remove the embedded messaging registry entries or directories.

- c. If you are not using the embedded messaging feature or the WebSphere MQ product on other instances on the machine, remove the WebSphere MQ Windows tray icon if it present.

The MQ Windows tray icon in the lower right corner indicates that a WebSphere MQ process (**amqmtbrn.exe**) is running. Remove the tray icon to close the process.

To remove the tray icon, right click the icon and click **Hide**.

4. Delete WebSphere Application Server product registry entries only if the instance you are removing was the last instance installed. This step is optional in a coexistence environment. Perform this step only if you are removing the image that you last installed.

If you are not using the embedded messaging feature or the WebSphere MQ product on other instances on the machine, remove any WebSphere Application Server product or feature that appears in the Add/Remove Programs panel, which is available from the Control Panel.

5. Invoke **regedit.exe** from a command prompt, to edit the Windows system registry. This step is optional in a coexistence environment. Perform this step only if you are removing the image that you last installed.

### Handle the Registry with care

**Note:** You can easily make a mistake while using the `regedit.exe` editor to view and edit registry contents. The editor does not warn you of editing errors, which can be extremely dangerous. A corrupt Registry can disrupt your system to the point where your only option is to reinstall the Windows operating system.

- a. Use **Ctrl-F** to search for all instances of **WebSphere**, **IBM HTTP Server**, or **IBM MQSeries**, to determine whether you should delete each entry. You might not be able to remove all of the entries related to WebSphere Application Server, which is not a problem. If you have other instances of WebSphere Application Server products on the same machine, and if they use the embedded messaging feature, do not remove the embedded messaging registry entries or directories.
- b. Expand and select keys related to **WebSphere Application Server** and its features, **IBM HTTP Server**, and **IBM WebSphere MQ**.

Delete the following keys:

- **5.1 +** HKEY\_LOCAL\_MACHINE\ SOFTWARE\ IBM\ HTTP Server\ 1.3.28
- **5.1 +** HKEY\_LOCAL\_MACHINE\ SOFTWARE\ IBM\ WebSphere Application Server\ 5.1.x.y, where x and y identify the specific modification and service levels
- **5.1 +** HKEY\_CURRENT\_USER\ Software\ Microsoft\ Windows\ CurrentVersion\ Explorer\ MenuOrder\ Start Menu\ Programs\ IBM WebSphere\ Application Server v5.1
- **5.1 +** HKEY\_CURRENT\_USER\ HKEY\_USERS\ S-1-5-21-3097617641-2550431553-14499587-500\ Software \ Microsoft\ Windows\ CurrentVersion\ Explorer\ MenuOrder\ Start Menu\ Programs\ IBM Websphere\ Application Server v5.1
- HKEY\_LOCAL\_MACHINE\ SOFTWARE\ IBM\ WebSphereEmbeddedMessagingPublishAndSubscribe

If you have other instances of WebSphere Application Server products on the same machine, and if they use the embedded messaging feature, do not remove this embedded messaging registry entry.

- If you have installed IBM WebSphere MQ as a separate product on this machine, or if you have other instances of WebSphere Application Server products on the same machine that use the embedded messaging feature, do not remove the following embedded messaging registry entry: **HKEY\_LOCAL\_MACHINE\SOFTWARE\IBM\MQSeries\CurrentVersion**
- c. Click **Edit > Delete** from the menu bar for each related key.
  - d. Click **Yes** when asked to confirm deletion of the key.
  - e. Click **Registry > Exit** from the menu bar when you are finished.
6. Restart the Windows platform. Reboot before reinstalling any of the products.
  7. If you have installed IBM WebSphere MQ as a separate product on this machine, or if you have other instances of WebSphere Application Server products on the same machine that use the embedded messaging feature, do not perform this step. If you intend to delete the IBM WebSphere MQ program, or to delete the embedded messaging feature from this machine, use the Microsoft MSI Cleanup Utility to remove MRI records. The utility is available from the Microsoft Web site as `msicuu.exe`. Click on the `msicuu.exe` file after downloading it, to install the utility. Once installed, the utility appears on the program menu.

When MSI starts, it lists all products that it knows about. To uninstall using this technique:

- a. Select a product and click **Remove** to remove its MSI record. These WebSphere MQ product entries might be present:
  - IBM WebSphere EMPS
  - IBM WebSphere MQ

Do not remove the entry for IBM WebSphere MQ if you installed the product separately. If you have other instances of WebSphere Application Server products on the same machine, and if they use the embedded messaging feature, do not remove the embedded messaging registry entries or directories.
8. Delete the base product installation root directory, `drive:\WebSphere\AppServer` and all subdirectories if it is the installation root directory for the instance you are uninstalling.
9. Delete the IBM HTTP Server installation root, which is usually in the `drive:\Program Files\IBMHttpServer` directory by default.
10. Delete the `drive:\IBM\WebSphere MQ\WEMPS` directory if there are no other product instances on this machine that are using the embedded messaging feature.
11. Depending on whether you installed IBM WebSphere MQ as a separate product and whether you installed the embedded messaging feature on any other installation instances on the machine, delete the WebSphere MQ directory. If you do not have IBM WebSphere MQ installed as a separate product on this machine and if you do not use the embedded messaging feature on another installation instance on the machine, delete the `drive:\IBM\WebSphere MQ` directory for the embedded messaging feature.

If you installed IBM WebSphere MQ as a separate product on this host to use as the messaging provider, and do not want to continue using WebSphere MQ, you can uninstall the product as described in the WebSphere MQ information.

12. Delete the `drive:\Program Files\IBM\gsk7` directory to remove the IBM Key Management utility.
13. Delete the `drive:\WINDOWS\IsUninst.exe` file.
14. Delete the `drive:\WINDOWS\gsk7bui.exe` file.
15. Edit the `vpd.properties` file.

Do not delete or rename the `vpd.properties` file because the InstallShield for MultiPlatforms (ISMP) program uses it for other products that it installs.

16. Restart your machine if you removed the embedded messaging feature.

When you finish, the product is completely uninstalled. You are now ready to reinstall.

---

## Reinstalling V5.1 after uninstalling and leaving the embedded messaging feature installed

This task describes how to reinstall WebSphere Application Server, Version 5.1 with the embedded messaging feature after uninstalling the product and leaving the embedded messaging feature installed. Follow this procedure to reinstall the product into its original directory.

If you uninstall V5.1 and leave the embedded messaging feature installed to work with other instances on the system, you must follow this procedure before reinstalling V5.1. The uninstaller program on V5.1 gives you the option of leaving the embedded messaging feature installed when there is another instance that has the feature installed. But the V5.0.2 uninstaller program does not have this enhancement of leaving the embedded messaging feature. Therefore, there are different procedures for preparing to reinstall, depending on the version you are reinstalling.

1. Stop any browsers, delete any configuration instances, and stop any Java processes related to WebSphere Application Server products as described in “Uninstalling the product” on page 295.
2. Uninstall manually after uninstalling V5.1. Select your scenario from the following list:
  - Uninstall V5.1 manually on Solaris platforms before reinstalling, as described in Platform-specific tips for installing and migrating.
  - Uninstall V5.1 manually on HP-UX platforms before reinstalling, as described in Platform-specific tips for installing and migrating.
  - Perform the manual uninstalling procedure for Version 5.1 nodes for platforms other than Solaris and HP-UX, as described in “Uninstalling manually” on page 312 and use the following guidelines:

### **Guidelines for running the procedure**

**Important:** When you edit the `vpd.properties` file, do not delete entries in the file for the embedded messaging feature or for V5.0.x products.

The `vpd.properties` file topic describes how to edit the file and how to identify entries in the file. For example:

- Any entry that ends with **51** is one that you want to delete. Such entries are for the V5.1 product. Remove all such entries before reinstalling.
- Look for the original installation root directory of the V5.1 product in an entry to verify that the entry is describing a component in the V5.1 product. These are the entries that you want to delete.

3. Reinstall the V5.1 product, as described in “Installing the product” on page 45. Select the embedded messaging feature when you reinstall.

You can reinstall the V5.1 product with the embedded messaging feature after uninstalling V5.1 but leaving the feature installed.

---

## Migrating and coexisting

This topic describes migrating, which is copying the configuration from a previous release of a WebSphere Application Server product into a new release. This topic also describes coexisting, which is running a new release of a WebSphere Application Server product on the same machine at the same time as you run an earlier release.

IBM Support offers tutorials on various WebSphere Application Server installation topics. See WebSphere education on demand: Installation best practices tutorials for more information. One topic describes migration. Another topic describes installing a coexisting WebSphere Application Server product.

Determine if an existing version of WebSphere Application Server is installed on the machine where you plan to install your Version 5.1 product.



If you have a previous version, you must decide whether to copy the configuration and applications of the previous version to the new version. Migration does not uninstall the previous version. The earlier release is still functional but you cannot run both releases at the same time. To run an earlier release and the new release at the same time is coexistence. You must provide non-default port assignments to support coexistence, by selecting the **coexistence** option during installation. See “Migration and coexistence overview” on page 330 for more information.

Coexistence is described as an optional step in the following procedure. Migration is also optional but the steps are not listed as optional. Use the following procedure to migrate applications and configurations:

1. Prepare to migrate or update product prerequisites and corequisites to supported versions.

Refer to the IBM WebSphere Application Server supported hardware, software, and APIs site for current requirements.

**5.1+** Examples include upgrading to the level of DB2 supported in V5.1 and the embedded messaging feature.

V5.0.0 and V5.0.1 use a level of embedded messaging that is incompatible with the level supported by V5.0.2 or V5.1. To solve this problem, upgrade V5.0.0 or V5.0.1 to V5.0.2 by applying Fix Pack 2.

2. Prepare to use the migration function of the Installation wizard, to migrate silently, or to migrate using the migration tools. You have the option of letting the Installation wizard issue the commands to use the migration tools or you can issue the commands after installation.

The Installation wizard detects a previously installed version, and displays a coexistence panel. If you choose not to coexist with the existing product, the Installation wizard displays a migration panel. You can select either option or no option.

- a. Start the administrative server of WebSphere Application Server Standard Edition (V3.5.x) or WebSphere Application Server Advanced Edition (V3.5.x or V4.0.x). When you start the administrative server, the migration tools can use the XMLConfig tool to export the configuration data repository. It is not necessary that you start the administrative server for WebSphere Application Server Advanced Single Server Edition, V4. The migration tools use the XML Metadata Interchange (XMI) configuration files directly.
- b. Select the migration option and click **Next** when using the Installation wizard. When using the silent installation method, select the appropriate option. Enter a fully qualified path for the backup directory, where the migration tools store and read the saved configuration and other files. During migration, the wizard backs up the old version of the administrative configuration and the user data files, but does not uninstall the old version. The wizard automatically configures the new installation with the previous configuration data and copies some application data to the newer version.

The Installation wizard uses the WASPreUpgrade migration tool to export the current administrative configuration. After this phase completes, the wizard runs the second phase, which uses the WASPostUpgrade migration tool to convert the backed-up administrative configuration into the new V5.1 configuration. You can stop the administrative server of the earlier version after the migration is complete. You must stop the administrative server of the earlier version before starting the V5.1 WebSphere Application Server.

The installation program prompts you for the following information during migration:

- Backup directory.
  - Currently installed WebSphere Application Server directory. You must install V5.1 in a different directory.
- c. Plan to complete the migration after the installation is complete. Here is an overview of the tasks that you must perform to complete the migration:
    - 1) Stop all servers from the earlier version.
    - 2) Load existing applications into your development environment and fix any known problems.
    - 3) Start the Application Servers in the new installation.
    - 4) Deploy the changed applications in a test environment.
    - 5) Test all applications thoroughly.
    - 6) Follow normal test procedures as you move the test environment into production.

The Installation wizard backs up the earlier version but does not uninstall it, exports the current configuration, and migrates the configuration to the new installation. If errors result when using the WASPreUpgrade tool, the Installation wizard does not run the WASPostUpgrade tool. The wizard displays the WASPreUpgrade.log and the WASPostUpgrade.log files if errors occur.

- d. Optional: “Installing silently” on page 190. You can specify non-conflicting port assignments in the silent options response file to silently configure for coexistence during the silent installation. You can also migrate the configuration from an earlier version silently. You must supply values for silent migration options when you “Customizing the base options response file” on page 191:
    - 1) Direct the installation program to migrate a previous installation by specifying the `-W previousVersionDetectedBean.previousVersionDetected="true"` parameter.
    - 2) Use one of the following values to identify the specific version to migrate:
      - For WebSphere Application Server Advanced Edition, V3.x and V4.0.x, use one of the following parameters:
        - `-W previousVersionPanelBean.selectedVersionEdition="AE"`
        - `-W previousVersionPanelBean.selectedVersionEdition="advanced"`
      - For WebSphere Application Server Advanced Single Server Edition, V4.0.x, use the `-W previousVersionPanelBean.selectedVersionEdition="AEs"` parameter.
      - For WebSphere Application Server Standard Edition, V3.x, use the `-W previousVersionPanelBean.selectedVersionEdition="standard"` parameter.
    - 3) Specify the location where the previous version is installed in the `-W previousVersionPanelBean.selectedVersionInstallLocation="/opt/WebSphere/AppServer"` parameter.
    - 4) Specify the path to the configuration file:
      - For WebSphere Application Server Advanced Edition, V3.x and V4.0.x, use the `-W previousVersionPanelBean.selectedVersionConfigFile="/opt/WebSphere/AppServer/config/admin.config"` parameter.
      - For WebSphere Application Server Advanced Single Server Edition, V4.0.x, use the `-W previousVersionPanelBean.selectedVersionConfigFile="/opt/WebSphere/AppServer/config/server-cfg.xml"` parameter.
      - For WebSphere Application Server Standard Edition, V3.x, use the `-W previousVersionPanelBean.selectedVersionConfigFile="/opt/WebSphere/AppServer/config/server-cfg.xml"` parameter.
    - 5) Specify the version number of the previous version, such as "4.0", "4.0.1", or "3.5", in the `-W previousVersionPanelBean.previousVersionSelected="4.0"` parameter.
    - 6) Indicate that you are selecting the version that you have identified with the `-W previousVersionPanelBean.migrationSelected="true"` parameter.
    - 7) Specify the backup directory where the WASPreUpgrade tool stores information from the previous version with the `-W migrationInformationPanelBean.migrationBackupDir="/tmp/migrationbackup"` parameter.
    - 8) Specify the directory for storing migration logs with the `-W migrationInformationPanelBean.migrationLogfileDir="/tmp/migrationlogs"` parameter.
  - e. **5.1+** “Migrating configuration data” on page 339 if you prefer a more incremental approach. The Migrating topic describes migrating from V4.x (little to consider) or V3.5.x (several things to consider). The topic describes differences between V3.5.x and V5.1 that result from the full compliance of V5.1 with Java 2 Platform, Enterprise Edition (J2EE) specifications.
3. “Migrating Web server configurations” on page 377.
  4. Set up multiple versions of WebSphere Application Server to coexist. No run-time conflicts can exist for multiple instances and versions of WebSphere Application Server to run at the same time on the same machine. Potential conflicts can occur in these areas:
    - Prerequisites and corequisites, including the level of the embedded messaging feature
    - Operating system registration
    - Environmental conflicts
    - File system
    - Port assignments

- a. **5.1+** “Setting up Version 3.5.x and Version 5 coexistence” on page 367.
- b. **5.1+** “Setting up Version 4.0.x and Version 5.x coexistence” on page 368.
- c. **5.1+** “Setting up Version 5 coexistence” on page 370

**5.1+** The migration function migrates all of your resources and applications, but does not migrate entities in your `classes` directory. As the Installation wizard for the WebSphere Application Server product migrates applications to Version V5.1, it also migrates any applications that use IBM WebSphere Business Integration Server Foundation Edition, Version 4.0.x.

The base migration removes (from the server configuration) those parts of your configuration that are dependent upon the Integration Server services.

Migration saves the following files in the backup directory.

**For Version 3.5.x:**

- `bin/setupCmdLine.sh` (or `bin/setupCmdLine.bat` for Windows platforms)
- `classes` (not saved for iSeries)
- `deployableEJBs` (Advanced Edition only)
- `deployedEJBs` (Advanced Edition only)
- `hosts`
- `properties`
- `servlets`

**For Version 4.0.x:**

- `bin/setupCmdLine.sh` (or `bin/setupCmdLine.bat` for Windows platforms)
- `classes` (not saved for iSeries)
- `config`
- `installableApps`
- `installedApps` (by default unless overridden within a specified developer configuration file)
- `installedConnectors` (Version 4.x Advanced Edition only)
- `properties` (including iSeries as of V5.1 migration tooling)

**For Version 5.0.x:**

- `classes` (not saved for iSeries)
- `config`
- `installableApps`
- `installedApps`
- `properties`

You can coexist with, or migrate the applications and configuration from a previous version of WebSphere Application Server.

**5.1+** Migration from V5.0.x to V5.1 does not require extensive tuning but does require that you use the new migration tools. Use the tools to migrate an embedded messaging queue manager and a federated node.

**5.1+** Migration from V4.x to V5.1 does not require extensive tuning. Migration from V3.5.x to V5.1 does require that you examine the migrating applications. See “Migrating configuration data” on page 339 for a description of fine tuning a migration. Part of the procedure for using the migration tools includes a description of what to tune after using the tools. After migrating, return to “Installing the product” on page 45.

For more information on coexistence among releases, see “Migration and coexistence overview” on page 330.

## Migration and coexistence overview

WebSphere Application Server contains migration tools that provide migration functionality. The installation wizard can call the migration tools, or you can call them at a later time. The migration tools migrate applications and configuration information to the new version, as described in Migrating and Configuration mapping during migration.

You can also find information about migrating the configuration and the applications from a previous version of WebSphere Application Server to Version 5.0.x in the IBM Redbook, Migrating to WebSphere V5.0: An End-to-End Migration Guide, SG24-6910-00.

### 5.1 +

Table 68. Overview of migrating from release to release

| Migration path | Description   |
|----------------|---|
| V5.0.x to V5.1 | <p>The migration from V5.0.x to V5.1 is routine if there is no embedded messaging feature and if the node is unfederated. You can use the installer program to migrate and have little or no post-migration tuning to perform. When the embedded messaging feature is installed, you must perform one of the following tasks:</p> <ul style="list-style-type: none"><li>• Upgrade V5.0.0 or V5.0.1 to V5.0.2 by applying Fix Pack 2 before migrating to V5.1, and run special scripts before and after uninstalling the V5.0.2 node</li><li>• Use the migration tools to save the V5.0.0 or V5.0.1 configuration data, uninstall V5.0.0 or V5.0.1, install V5.1, and use the migration tools again to restore the configuration data.</li></ul> <p>Upgrading and using the special scripts is necessary to avoid using incompatible levels of the embedded messaging feature, and to retain the queue manager and persistent data. After migrating a federated node, uninstalling the V5.0.x node can also cause the V5.1 node to unfederate unless you run the migration tools, <code>pre_uninst50ws</code> and <code>post_uninst50ws</code>, before and after uninstalling the V5.0.x node.</p> |
| V4.0.x to V5.1 | <p>The migration tools perform a fairly routine migration from V4 to V5.1. For example, Java 2 Platform, Enterprise Edition (J2EE) 1.2 enterprise archive (EAR) files in V4 work in V5.1 of WebSphere Application Server, which also supports the J2EE 1.3 specification. Similarly, it is not necessary to redeploy enterprise Java bean (EJB) 1.1 Java archive (JAR) files when moving them from V4 to V5.x, which also supports EJB 2.0 JAR files.</p>   |
| V3.5.x to V5.1 | <p>The migration from V3.5 to V5.1 involves significant changes in application structures, development, and deployment. The migration tools assist in this transition by migrating system configurations and creating J2EE artifacts, including mapping previous security settings to J2EE security roles. These security mappings let you access migrated assets during the transition. The migration tools create initial J2EE enterprise applications based on V3.5.x configurations. However, because of the significant changes in the application structures, carefully test and fine tune migrated applications using development and deployment tools.</p>  |

You can select from three combinations of migration and coexistence options in the installation wizard or when customizing the response file for silent installation:

- Migrate only
- Coexist only
- Neither migrate nor coexist

If you neither migrate nor coexist with an earlier version of WebSphere Application Server, you are choosing to ignore the previous installation. You can run only one version at a time because of conflicting default port assignments and the potential for conflicting levels of the embedded messaging feature. It is possible that both versions might run at the same time without conflict if you use non-default ports in the

earlier version and if they both use the same level of embedded messaging. To resolve conflicting port assignments, the coexistence panel lets you assign ports for Version 5 to ensure that it can run with an earlier version.

If you use the embedded messaging feature, the earlier version must use the same level of embedded messaging. For example, Version 5.0.2 and V5.1 use the CSD04 level of embedded messaging. V5.0.0 and V5.0.1 use earlier versions. V5.0.2 and later are the only versions that can coexist with V5.1, when embedded messaging is installed. If you want an instance of V5.0.0 or V5.0.1 to coexist with an instance of V5.0.2 or V5.1, upgrade the V5.0.x instance to V5.0.2 by applying Fix Pack 2.

You can specify port assignments for coexistence on the installation wizard coexistence panel, by editing configuration files, by wsadmin scripting, or by using the **Servers > Application Servers > server1 > End Points** administrative console page.

Migrating and coexisting have roughly opposite goals. The goal of migration is to reconstruct your earlier version in a nearly identical V5.1 environment, including applications, configuration settings, universal resource identifier (URI) descriptors, and Web server context roots. The installation wizard can use the migration tools to migrate the previous configuration and applications. The goal of coexistence is to create an environment that is not in conflict with an earlier version, so far as port settings are concerned. The installation wizard displays a panel where you can set non-conflicting port values that allow the V5.x product to coexist with the earlier version, without port conflicts. This allows both nodes to start and run at the same time. Coexistence processing changes the following configuration files:

- The `virtualhosts.xml` file:
  - HTTP Transport Port
  - IBM HTTP Server Port
  - HTTPS Transport Port
  - HTTP Administrative Console Port
  - HTTPS Administrative Console Secure Port
- The `serverindex.xml` file:
  - Bootstrap Port
  - SOAP Connector Address
  - DRS Client Address
  - JMS Server Queued Address
  - JMS Server Direct Address
  - SAS SSL ServerAuth Address
  - CSIV2 ServerAuth Listener Address
  - CSIV2 MultiAuth Listener Address
- The `server1/server.xml` file:
  - HTTP Transport Port
  - HTTPS Transport Port
  - HTTP Administrative Console Port
  - HTTPS Administrative Console Secure Port
  - JMS Server Security Port

See Default coexistence settings for port numbers for more information.

After choosing coexistence, start `server1` and use it to change any ports that are in conflict, so that there is no conflict with the earlier version. Then you can run both versions at the same time.

Consider these issues in a migration or coexistence scenario:

- Conflicting context roots when attempting to share the same Web server.
  - Follow the procedure in Migrating plug-ins, one machine at a time to learn how to configure a Web server for sharing between WebSphere Application Server versions. The topic links to procedures that are specific to Web server products, such as the Migrating IBM HTTP Server to support multiple WebSphere Application Server versions topic.
- Installing WebSphere Application Server multiple times on the same machine.

- Having multiple V5.0.0 or V5.0.1 instances use the embedded messaging feature and attempting to upgrade one instance to V5.0.2, or attempting to install V5.1 with the embedded messaging feature. The service level of the embedded messaging feature for V5.0.0 and V5.0.1 is not compatible with the service level for V5.0.2 or V5.1 (CSD04).

## Configuration mapping during migration

This topic describes what changes during migration, which always involves migrating a single instance to another single instance on the same machine or a separate machine. Open the information center for the Network Deployment product to learn how the migration tools map models, clones, server groups, clusters, and Lightweight Third Party Authentication (LTPA) security settings.

Many migration scenarios are possible. The Version 5.x migration tools map objects and attributes to the Version 5.x environment when you restore a configuration from a previous version.

### Bootstrap port

Migration maps a default bootstrap NameServer port setting, 900, from V3.5.x and V4.0.x Advanced Edition to the V5.x NameServer default, 2809. The migration tools map a non-default value directly into the V5.x environment.

For Advanced Single Server Edition migration, the bootstrap NameServer port maps to the NameServer value of the Application Server defined in the server configuration file.

### Command line parameters

The migration tools convert appropriate command line parameters to Java virtual machine (JVM) settings in the server process definition. Most settings are mapped directly. Some settings, such as memory heap sizes, are not migrated because their roles in the V5.x configuration either do not exist, have different meanings, or have different scopes.

### Default Server

The name of the default server in Version 5.x is server1. All objects previously owned by the DefaultServer of the prior version, are owned by server1 of Version 5.x after migration.

### Enterprise applications for cluster members

Migration does not deploy enterprise applications on cluster members when migrating from Version 3.5.x or Version 4.0.x. You must manually deploy these applications on the cluster using scripting or the deployment manager administrative console.

Automated migration of enterprise applications that are installed in a directory other than the default installedApps directory is not feasible in Version 5.x. Versions 4.0, 5.0, and 5.1 each allow enterprise applications to be installed in a location other than the default installedApps directory. However, for architectural reasons, this property is not migrated from previous versions of WebSphere Application Server to Version 5.0 or Version 5.1. The migration process instead redeploys the enterprise application to the default installedApps directory in the new version. Enterprise applications that are not installed in the default directory must be reinstalled in their new Version 5.x environment.

### Java database connectivity (JDBC) drivers and data sources

Version 5.x significantly redefines JDBC and data source objects. The migration tools map V3.5.x and V4.0.x data sources to Version 5.x data sources, using predecessor settings as input variables. The data source that is used is the WebSphere Application Server V4.0.x data source that uses the ConnectionManager architecture.

### Name bindings

Version 5.x has a new naming structure. All references, such as Enterprise JavaBeans (EJB) references that were valid in previous versions no longer work in Version 5.x. However, you can use the administrative console to add a name binding that maps an old name into the new Version 5.x naming structure. For example, the name of the Version 3.5.x or 4.0.x enterprise bean reference can be both the name of the binding and the Java Naming and Directory Interface (JNDI) name in the Version 5.x name space.



For an example, see *Migrating to WebSphere V5: An End-to-End Migration Guide*, which is available from the Redbooks Web site at <http://www.ibm.com/redbooks>.

### Node name

A Version 3.5.x and a Version 4.0.x repository can contain more than one node name and associated children. The WASPostUpgrade tool processes only those objects and children that match the node name of the migrating node. The tool identifies node names in the configuration files that it is migrating and selects any nodes names in a configuration file that match the long network name or short network name of the migrating machine.

### PageList servlet

The configuration of the PageList servlet has changed in Version 5.x. Direct use of the servlet has been deprecated. The PageList servlet is available as part of the servlet extension configuration in the Web archive (WAR) file. All references are updated to the servlet configuration supported in Version 5.

You can also use the Assembly Toolkit, which is available on the IBM WebSphere Application Server Toolkit (ASTK) CD-ROM to modify the servlet configuration.

If you use or extend the PageList servlet, you might see an error similar to the following example when running a migrated application that uses the servlet:

```
Error 500: No PageList information is configured for servlet  
EmpInfoApp.SearchByDept
```

Use the Assembly Toolkit to correct the error, by moving the usage or extension to your migrated Enterprise archive (EAR) file:

1. Start the Assembly Toolkit to load the EAR file that generates the error.
2. Open the Web modules within the EAR file.
3. Expand the Web module that generates the error.
4. Open the Web components and find the one that generates the error.
5. Expand the Servlets. The **PageList Extensions** option displays.
6. Add your extension information.
7. Save the EAR file and redeploy it.

### Properties directory, classes directory, and the lib/app directory

**5.1+** Migration copies files from prior version directories into the Version 5.1.x configuration. See the following section for more information.

#### Property file migration from Version 3.5.x and Version 4.0.x

**5.1+** V5.1 migration does migrate property files from V3.5.x and V4.0.x if these files are also present in WebSphere Application Server, V5.1. Specifically, property-file migration includes these files:

- converter.properties
- encoding.properties (If the "ko" setting is incorrect, no migration occurs.)
- sas.client.props
- TraceSettings.properties
- uddi.properties (V4.0,x only)

You must manually convert settings in other property files to the equivalent V5.1 configuration.

#### Property file migration from Version 5.0.x to Version 5.1.x

WebSphere Application Server V5.1 migrates all the property files that are installed with V5.0.x by merging settings into the V5.1.x property files with these exceptions:

- j2c.properties
- samples.properties

Migration does not overlay property files.

## Samples

No migration of Samples from previous versions is available. Equivalent Version 5.x Samples are available to use.

## Security

Java 2 Security is enabled by default in Version 5.x. Security enablement might cause some applications to run on Version 4.0 and not run on Version 5.x. Several techniques are available that you can use to define different levels of Java 2 Security in Version 5.x. One is to create a `was.policy` file as part of the application, to enable all security permissions. The migration tools call the **wsadmin** command to add an existing `was.policy` file in the Version 5.x properties directory to enterprise applications as they migrate. The migration tools perform this task while moving Version 4.0 applications into Version 5.

Global security that uses LTPA authentication in Versions 3.5.x and 4.0.x is migrated to the base WebSphere Application Server product. However, although global security was enabled in Versions 3.5.x and 4.0.x, it is disabled during migration to Version 5.x.

Version 4.0.x introduced properties to support tuning the JNDI search timeout value along with LDAP reuse connection. These two properties are now settings in the Security Center of the Version 5.x administrative console. Version 4.0.x property values are not migrated to Version 5.x settings.

- The `jndi.LDAP.SearchControl.TimeLimit` property is equivalent to the Version 5.x Search Timeout setting, which is 300 by default in Version 5.
- The `jndi.LDAP.URLContextImplementation` property is equivalent to the Version 5.x Reuse Connection setting, which is true by default in Version 5.

Use the Version 5.x administrative console to change these settings to match your Version 4 property values, if necessary.

## Servlet package name changes

The package that contains the `DefaultErrorReporter`, `SimpleFileServlet`, and `InvokerServlet` servlets has changed for Version 5.x. In Versions 3.5.x and 4.0.x, the servlets are in the `com.ibm.servlet.engine.webapp` class. In Version 5, the servlets are in the `com.ibm.ws.webcontainer.servlet` class.

## Stdin, stdout, stderr, passivation, and working directories

The location for these directories is typically within the installation directory of a previous version. The default location for `stdin`, `stdout`, and `stderr` is the `logs` directory of the Version 5.x installation root. The migration tools attempt to migrate existing passivation and working directories. Otherwise, appropriate Version 5.x defaults are used.

Using common directories between versions in a coexistence scenario can cause problems.

## Transport ports

The migration tools migrate all ports. The tools warn about port conflicts in a log when a port already exists. You must resolve port conflicts before running the servers that are in conflict, at the same time.

The default transport type of the servlet engine in Version 3.5.x is Open servlet engine (OSE). Because Version 5.x no longer supports OSE transport, the migration tools map these transports to HTTP transports, using the same port assignments.

You must manually add `VirtualHost` alias entries for each port.

## Web modules

The specification level of the Java 2 Platform, Enterprise Edition (J2EE) that Version 5.x implements requires behavior changes in the Web container for setting the content type. If a default servlet writer does not set the content type, not only does the Version 5.x Web container no longer default to it, the Web container returns the call as "null". This situation might cause some browsers to display resulting Web container tags incorrectly. Migration sets the `autoResponseEncoding` IBM extension to true for Web modules as it migrates enterprise applications. This action prevents the problem.

### Version 3.5.x to Version 5.x migration

The migration tools assist in the transition from Version 3.5.x to Version 5, by migrating system configurations and creating J2EE artifacts, including J2EE security roles mapping. The migration tools create initial J2EE enterprise applications based on Version 3.5.x configurations. However, because of the significant change in application structures, plan to carefully test and fine tune migrated applications, using development and deployment tools, to determine exactly how the applications function in Version 5.x.

Analyze the `WASPostUpgrade.log` file for detailed information about migrated enterprise beans. The J2EE programming model specifies an architecture for how applications are created and deployed. Because applications in Version 3.5.x do not have the same architecture, the `WASPostUpgrade` tool recreates applications. It creates all migrated Web resources and enterprise beans in J2EE applications. It maps all enterprise applications from the Version 3.5.x installation into J2EE applications with the same name, deployed in the same server.

The `WASPostUpgrade` tool maps Web resources and enterprise beans that are not included in an enterprise application, into a default J2EE application that includes the name of the server. The tool maps Web applications to J2EE WAR files. The tool deploys enterprise beans as EJB 1.1 beans in J2EE JAR files. The tool combines resources in a J2EE EAR file and deploys it in the Version 5.x configuration. Some differences exist between the EJB 1.0 and EJB 1.1 specifications, but in most cases, EJB 1.0 beans can run successfully as EJB 1.1 beans.

### Mapping details for V3.5.x to Version 5.x migration

- **data sources.xml**

You can use a Version 3.5.x `data sources.xml` file to augment data source configuration settings. Version 3.5.x stores the file in the `properties` directory. The migration tools migrate an existing `data sources.xml` file by merging properties in the file into the data source and JDBC driver configuration.

- **Enterprise applications**

The Version 3.5.x enterprise application entries are optional. The entries group sets of objects together for security definitions. The enterprise bean and Web application portions of the enterprise application point to their respective entries in other portions of the XML file.

Processing each enterprise application creates a J2EE application with the same name. The enterprise bean and Web application entries become pointers to the definitions of enterprise beans and Web applications. Entry details help build a J2EE application.

For enterprise bean files, the JAR file definition helps locate the JAR files to redeploy and add to the J2EE application. Document root entries in the Web application help locate the resources used within the Web application, such as HTML pages and JSP pages, which become part of the WAR file within the J2EE application. Class path entries in the Web application help locate servlets and JAR files, which become part of the WAR file within the J2EE application. Version 3.5.x migration to V5.x creates J2EE 1.2 compatible enterprise applications that contain EJB 1.1, Servlet 2.2, and JSP 1.1 level modules. This migration provides the most straight forward compatibility and enables interoperability with previous WebSphere Application Server versions.

- **Enterprise beans**

Version 3.x supports only the EJB 1.0 Components Specification level. Version 5.x supports EJB 1.1 and 2.0 components. However, many EJB 1.0 beans can successfully deploy as EJB 1.1 beans. The migration tools redeploy enterprise beans automatically as part of the application migration phase. Check the `WASPostUpgrade.log` file for deployment details of these enterprise beans. Make any necessary changes and redeploy.

No redeployment is required when moving EJB 1.1 JAR files from Version 4.

Specify only one backend data store vendor per JAR file. If enterprise beans use different backend data stores, package them into separate JAR files.

- **J2EE security**

The security authorization model in Version 3.5.x is based on the notion of enterprise application and method groups. The cross product of the enterprise application and the method groups is a WebSphere Application Server permission. The J2EE specification includes an authorization model based on roles.

To convert from the WebSphere Application Server permission model in Version 3.5.x to the role-based authorization model in Version 5, the migration tools create a one-to-one mapping from a WebSphere Application Server permission to a new role under that application. Therefore, for each enterprise application and each method group in Version 3.5.x, the migration tools create a role in Version 5, contained in the J2EE application deployment descriptor. The authorized subjects for each role are contained in an authorization table found in the J2EE application binding.

The J2EE specification includes an authorization model based on roles. WebSphere Application Server interprets the role to mean a set of permissions to access a resource. In the case of an enterprise bean method invocation, the permission to access the method on a particular bean is specified by a method permission. This method permission is associated with one or more roles in the deployment descriptor of the bean JAR file.

In the case of accessing Web resources, the permission to access a Web URI and invoke an HTTP method on that URI is specified in terms of Web resource collections and security constraints in the J2EE specification. The deployment descriptor in the WAR file of the Web application contains the security constraints and Web resource collections.

- **JSP levels**

Version 5.x runs JSP 1.0 and 1.1 objects as JSP 1.2 objects, which is the only supported level.

- **Servlet redirector**

Version 5.x does not support the servlet redirector from previous versions. The migration tools ignore these objects.

- **Servlet package name changes when migrating from V3.5.x to V5.x**

If the Version 3.5.x configuration defines the SimpleFileServlet servlet, this servlet is not migrated. The migration tools set the FileServingEnabled attribute in the `ibm-web-ext.xml` Web module file to `true`.

If the Version 3.5 configuration defines the InvokerServlet servlet, the servlet is not migrated. The migration tools set the ServeServletsByClassnameEnabled attribute in the `ibm-web-ext.xml` Web module file to `true`.

If the Version 3.5.x configuration defines the DefaultErrorReporter servlet, the servlet is migrated into the `web.xml` Web module file. Migration uses the new package to set the class name.

- **Transports**

The default transport type of the servlet engine in Version 3.5.x is Open servlet engine (OSE). Because Version 5.x no longer supports OSE transport, the migration tools map these transports to HTTP transports, using the same port assignments. You must manually add VirtualHost alias entries for each port.

### **Version 4.0.x to Version 5.x migration**

This migration is much less complicated than moving from V3.5.x to V5.x. The V4.0.x configuration is already at the J2EE 1.2 specification level. Although Version 5.x is at the J2EE 1.3 specification level, J2EE 1.2 objects are supported.

- **Enterprise beans**

No redeployment is required when moving EJB 1.1 JAR files from Version 4.0.

Specify only one backend data store vendor per JAR file. If enterprise beans use different backend data stores, package them into separate JAR files.

- **JMS Resources**

All JMS resources from Version 4.0 are mapped into generic JMS resources in the Version 5.x configuration. Reconfigure JMS resources that use IBM WebSphere MQ as IBM WebSphere MQ-specific resources. MQ JMS resources have better integration with system management. You do not need to manually define entries in the name space. You can see the backing MQ queue definitions through MQ JMS entries.

- **JSP precompiling**

In Version 4.0.x, the classes generated from JSP pages are in a package based on the directory structure of the WAR file. Any JSP at the top of the context root is in the unnamed package. JSP pages in subdirectories of the root are in packages named after the subdirectories. In Version 5, the classes generated from JSP pages are all in the `org.apache.jsp` package. Therefore, the class files are not compatible between versions.

When migrating an enterprise application from Version 4.0.x to Version 5, recompile the JSP pages to regenerate the class files into the correct packages.

The migration tools provide this support, by using the `-preCompileJSPs` option of the **wsadmin** tool during the installation of the application.

Use the same option to install any Version 4.0.x enterprise applications that you manually move to Version 5.x.

- **J2EE security**

You can apply security in two Version 4.0.x locations to enterprise applications. Information in the repository has precedence over information in the enterprise application bindings. The migration tools migrate information in the repository to the enterprise application.

- **Secure Sockets Layer (SSL) migration**

The following SSLConfig attributes that point to user-defined key files are migrated from WebSphere Application Server Advanced Edition, Version 4.0.x to V5.x as follows:

**V4.0.x settings**

```
<key_file_name>dir_name/WASLDAPKeyring.jks</key_file_name>
<trust_file_name>dir_name/WASLDAPKeyring.jks</trust_file_name>
```

The `dir_name` variable identifies the original location of the WASLDAPKeyring.jks file.

**V5.x settings**

```
keyFileName="dir_name/WASLDAPKeyring.jks"
trustFileName="dir_name/WASLDAPKeyring.jks"
```

The `dir_name` variable identifies the original location of the WASLDAPKeyring.jks file.

**V4.0.x settings**

```
<key_file_name>${WAS_HOME}/keys/WASLDAPKeyring.jks</key_file_name>
<trust_file_name>${WAS_HOME}/keys/WASLDAPKeyring.jks</trust_file_name>
```

**V5.x settings**

```
keyFileName="${USER_INSTALL_ROOT}/keys/WASLDAPKeyring.jks"
trustFileName="${USER_INSTALL_ROOT}/keys/WASLDAPKeyring.jks"
```

The migration tools do not copy the key files (for example, `.jks`, or `.kdb`) to the corresponding directory in the base WebSphere Application Server product or the Network Deployment product. You must complete the migration of the SSL configuration by copying qualifying key store files to Version 5.x directories.

If the `key-file-name` and `trust-file-name` attributes point to the `DummyServerKeyFile.jks` file in the WebSphere Application Server Advanced Edition V4.0.x configuration, the `key-file-name` and `trust-file-name` attributes are not migrated to V5.x. Instead the V5.x default value of `${USER_INSTALL_ROOT}/etc/DummyServerKeyFile.jks` is left unchanged.

- **Servlet package name changes when migrating from Version 4.0 to Version 5.x**

If the `web.xml` Web module file for Version 4.0 defines the `SimpleFileServlet` servlet, the migration tools update the class name to reflect the Version 5.x package. The tools also set the `FileServing Enabled` attribute to `true`.

If the `web.xml` file defines the `InvokerServlet` servlet, the migration tools update the class name to reflect the Version 5.x package. The tools also set the `ServeServletsByClassnameEnabled` attribute to `true`.

If the `web.xml` file defines the `DefaultErrorReporter` servlet, the migration tools update the class name to reflect the Version 5.x package.

## **Version 5.0.x to Version 5.1 migration**

Migrating V5.0.x to V5.1 is much less complicated than migrating from V4.0.x or V3.5.x. Both sides

of the migration use the same underlying definitions. The task involves mapping configuration files from the V5.0.x to the V5.1 configuration and copying installed applications into the new product. The migration tools support the migration of federated nodes and support the full migration of a Network Deployment node.

### Java heap size for migrating EAR files

When migrating all 5.0.x EAR files to V5.1 using the wsadmin tool, the WASPostUpgrade tool uses the default maximum Java heap size value of 64MB to install the EAR files.

If a V5.0.x EAR file fails to install during migration because the Java heap size is not large enough, you see a message similar to the following error:

```
java.lang.OutOfMemoryError JVMXE006:OutOfMemoryError
```

Increase the maximum Java heap size. Then use the following information to manually install the EAR file. Assume that the new maximum heap size is represented by number signs (###) in the following example. If the `install_app_name.jacl` file is in the `$WAS50_backup` directory created by migration, run the following command from the `bin` directory of the V5.1 WebSphere Application Server. (The command appears on more than one line for clarity.)

```
wsadmin -conntype NONE
        -javaoption
        -Xmx###m
        -f $WAS50_backup/install_app_name.jacl
```

If the `install_app_name.jacl` file does not exist in the `$WAS50_backup` directory created by migration, run the following command from the `install_root/bin` directory of the Version 5.1 base WebSphere Application Server product or the Network Deployment product.

### Installing the application on WebSphere Application Server, Version 5.1

Assume that:

#### Installation root

`C:\WebSphere\AppServer`

#### Number signs (###)

Maximum heap size value

`EAR_file_name`

The name of the EAR file

`app_name`

The name of the application.

`server_name`

The name of the server on which the EAR file installs

`node_name`

The name of the node on which the server is configured

The command appears on more than one line for clarity.

```
wsadmin -conntype NONE
        -javaoption
        -Xmx###m
        -c "$AdminApp install
           C:\\WebSphere\\AppServer\\installableApps\\
           EAR_file_name
        {-nodeployejb
         -appname app_name
         -server server_name
         -node node_name}"
```

### Installing the application on WebSphere Application Server Network Deployment, Version 5.1



Assume that:

**Installation root**

C:\WebSphere\DeploymentManager

**Number signs (###)**

Maximum heap size value

*EAR\_file\_name*

The name of the EAR file

*app\_name*

The name of the application.

*cluster\_name*

The name of the cluster on which the EAR file should be installed

The command appears on more than one line for clarity.

```
wsadmin -conntype NONE
        -javaoption
        -Xmx###m
        -c "$AdminApp install
           C:\WebSphere\DeploymentManager\installableApps\
           EAR_file_name>
        {-nodeployejb
         -appname app_name
         -cluster cluster_name}"
```

**No migration of configuration instances from V5.0.x to V5.1**

The migration tools do not support the migration of configuration instances from V5.0.x to V5.1

## Migrating configuration data

You can migrate administrative configurations with the Installation wizard or with the migration tools, as this task describes. If you decide to use the migration tools, do not select the Migration check box on the Migration panel of the Installation wizard.

If you use an earlier version of WebSphere Application Server, the system administrator might have fine-tuned various application and server settings for your environment. It is important to have a strategy for migrating these settings with maximum efficiency and minimal loss.

You can perform incremental migration of V3.5.x or V4.0.x nodes by calling the migration tools multiple times, each time specifying a different configuration file. Various reasons exist for having multiple configuration files. Whatever the reason, migrating one configuration file at a time lets you test applications incrementally before continuing to the next configuration file.

**5.1 +** Before using the migration tools, consult the V5.1 Release Notes document to understand what fixes you must apply to earlier versions. Applying fixes to an earlier version might also apply fixes to files that have a role in the migration. Apply any fixes to ensure the most effective migration of configurations and applications possible.

**5.1 +** The migration tools in V5.1 support migration from all supported versions of WebSphere Application Server, including V5.0.x.

IBM provides a set of migration tools for migrating administrative configurations from V3.5.x, V4.x, or V5.0.x to the base WebSphere Application Server product.

The overall migration process when you issue the commands to use the migration tools instead of letting the installation program issue the commands is:

1. Save the current configuration and necessary files with the WASPreUpgrade migration tool.
2. **5.1 +** Install the Version V5.1 product without selecting the automated migration option.

3. Restore the configuration from the earlier release with the WASPostUpgrade migration tool.

**5.1+** WASPostUpgrade uses the **backupConfig** command to save the existing V5.1 configuration before performing migration. The results are stored in the *install\_root/temp* directory. You can use the **restoreConfig** command to restore the backup, if required.

- 5.1+** Open the information center for WebSphere Business Integration Server Foundation to find installation and migration instructions for the base product and the Network Deployment product when you are migrating Enterprise to Integration Server.
- Migrate base WebSphere Application Server nodes. **Guidelines for migrating federated nodes**

| Rule  | Description   |
|---|---|
| A federated node has no control over its feature configuration.   | The deployment manager owns the configuration of all federated nodes, including the configuration of features on those nodes. When migrating a federated node, the configuration on the base node is owned by the deployment manager and cannot be changed. |
| Unfederate a node to let the node own its configuration, if you must add features to the node.            | It is always true that you must unfederate a node before adding features. You then add the node back to the cell to cause the deployment manager to add the changed configuration of the base node.   |
| Install the V5.1 node with features that make it appear to be a clone of the node that you are migrating. | When migrating, select the same features for the new node that are in the existing node. Adding or changing features can cause configuration problems in a federated node. The most trouble-free path is to select the same features.                       |
| It is possible to migrate from one machine to another.  | One of the tasks introduced in this topic describes how to migrate a federated node to V5.1 on a different machine.   |

If you are migrating a federated node, select the same type of installation that you chose when you installed the earlier release. If you selected a full installation type, select a full installation type now. If you selected a custom installation type, select a custom installation type now and select the same features that you did for the V5.0.x release. Federated nodes have configurations that are controlled by the deployment manager that controls the cell.

**5.1+** Migrating a federated node installs the same features for the V5.1 node that are in the configuration for the V5.0.x node.

If the node that you are migrating is part of a deployment manager cell, migrate the V5.0.x deployment manager to V5.1 first, before continuing this procedure. The deployment manager node must always be at the highest release level within the cell.

Select one of the following migration scenarios for information about how to migrate configuration data to base WebSphere Application Server nodes:

- Migrate WebSphere Application Server - Express to the base WebSphere Application Server product.
  - Migrate V3.5.x or V4.0.x of WebSphere Application Server to V5.1.
  - 5.1+** Migrating V3.5.x or V4.0.x of WebSphere Application Server to a remote V5.1 machine.
  - 5.1+** Migrate Version 5.0.x of WebSphere Application Server to Version 5.1.
  - 5.1+** Migrate Version 5.0.x of WebSphere Application Server to a remote Version 5.1 machine.
  - Migrate from an operating system that is no longer supported.
- Configure the Application Server after migration. Configuring the Application Server after migration is a way of verifying the results of the migration tools. You can also use Configuration mapping during

migration to verify the results of the migration. The topic has a detailed description of how the migration tools migrate objects, and what you should verify.

You can use the migration tools to migrate from one version of WebSphere Application Server to another.

## **Migrating Version 3.5.x or Version 4.0.x of WebSphere Application Server to Version 5.x**

You can use the migration tools to migrate configuration data from Version 3.5.x or Version 4.0.x of WebSphere Application Server to WebSphere Application Server V5.x.

If you use an earlier version of WebSphere Application Server, the system administrator might have fine-tuned various application and server settings for your environment. It is important to have a strategy for migrating these settings with maximum efficiency and minimal loss.

You can migrate administrative configurations with the installation wizard or manually, as this task describes. If you decide to migrate manually, do not select the migration check box on the installation wizard migration panel.

You can perform incremental manual migration by calling the migration tools multiple times, each time specifying a different configuration file. There are various reasons for having multiple configuration files. Whatever the reason, migrating one configuration file at a time lets you test applications incrementally before continuing to the next configuration file.

Manual migration provides a more incremental migration approach than the complete migration that the installation wizard provides. IBM provides a set of migration tools for migrating administrative configurations to the base WebSphere Application Server product from either edition of Version 3.5.x, or from Version 4.x. The overall migration process is to back up the current configuration and necessary files, install the Version 5 product, and restore the configuration.

Before using the migration tools, consult the Release Notes document to understand what fixes you must apply to earlier versions. Applying fixes to an earlier version might also apply fixes to files that have a role in the migration. Apply any fixes to ensure the most effective migration of configurations and applications possible.

**5.1 +** Typically you can use the WASPreUpgrade and WASPostUpgrade migration tools from V5.1 of WebSphere Application Server to upgrade from either V3.5 or V4.0 to V5.1 on the same machine. If your scenario includes migrating a V3.5.x or a V4.0.x configuration on one machine to WebSphere Application Server V5.1 on another machine, use the alternate procedure described in “Migrating Version 3.5.x or Version 4.0.x of WebSphere Application Server to a remote Version 5.1 machine” on page 343.

This topic describes using the V5.x migration tools to migrate the following products:

- WebSphere Application Server Single Server Edition, V3.5
- WebSphere Application Server Advanced Edition, V3.5
- WebSphere Application Server Advanced Edition, V4.0
- WebSphere Application Server Advanced Single Server Edition V4.0 (the steps vary slightly)

The WASPreUpgrade tool saves the existing V3.5 or V4.0 configuration into a *migration-specific-backup* directory. The WASPostUpgrade tool uses this directory to add the old configuration settings to the new V5.x environment.

1. Obtain the new product CD-ROM. On this CD is the *migration/bin* directory. This directory contains a special environment that you can use to run the WASPreUpgrade tool without installing the product.
2. Save the current configuration using the WASPreUpgrade script from the *migration/bin* directory of the product CD-ROM. Save the configuration in the *migration-specific-backup* directory:

```
WASPreUpgrade /usr/tmp/migration-specific-backup /usr/websphere/appserver yourNodeName
```

For all scenarios except V4.0.x Advanced Single Server Edition, verify that the administrative server of the existing environment is running. The WASPreUpgrade tool provides status to the screen and to log files in the *migration-specific-backup* directory. ASCII log file names start with the text WASPreUpgrade and include a date and timestamp.

The WASPreUpgrade tool saves all files from the following directories in the existing V3.5.x or the V4.0.x configuration to the *backup* directory:

**For Version 3.5.x**

- bin
- classes
- deployableEJBs (Advanced Edition only)
- deployedEJBs (Advanced Edition only)
- hosts
- properties
- servlets

**For Version 4.x**

- bin
- classes
- config (Version 4.0.x Advanced Single Server Edition only)
- installableApps
- installedApps
- installedConnectors (Version 4.0.x Advanced Edition only)
- properties

The WASPreUpgrade tool saves selected files from the V3.5.x or the V4.0.x *install\_root/bin* directory. It also exports the existing Application Server configuration from the V3.5.x or the V4.0.x repository. The WASPreUpgrade tool calls the XMLConfig tool to export the existing V3.5 or the V4.0 repository to the *websphere\_backup.xml* file in the *migration-specific-backup* directory.

V4.0.x Advanced Single Server Edition does not require the administrative server to run at the time of migration. The WASPreUpgrade tool copies the *server-cfg.xml* file from the *install\_root/config* directory to the *migration-specific-backup/config* directory.

If errors occur while running the WASPreUpgrade tool, you might have to apply fixes to the V3.5 or the V4.0 installation to successfully complete the export step. See the IBM Support page for the latest fixes that might be applicable. When viewing this information from the information center, click **Support** to link to the IBM Support page.

3. Install V5.1 of the WebSphere Application Server Version product. Do not select the migration option, if it appears.

After each use of WASPostUpgrade, verify V5.1 port settings in two files:

- Verify the BOOTSTRAP\_ADDRESS port assignment for server1 in the *serverindex.xml* file  
If the BOOTSTRAP\_ADDRESS port of the earlier version is 900, migration maps this to 2809. If the BOOTSTRAP\_ADDRESS port of the earlier version is not 900, migration maps the value to server1 in an Advanced Edition migration, or to the actual server name in an Advanced Single Server Edition migration.
  - Verify the HTTP Transport port assignments in the *server.xml* file  
WASPostUpgrade processing adds the HTTP Transport ports from the earlier version to the Version 5.1 *server.xml* file. This means that server1 contains duplicate HTTP Transport port assignments, from both the coexistence panel and the previous version *Default Server*.
4. Migrate the previous configuration to the new installation with the WASPostUpgrade tool in the *install\_root/bin* directory of the V5.1 installation. The WASPostUpgrade tool migrates V3.5.x or V4.0.x configuration information created by the WASPreUpgrade tool to the V5.1 installation. Because the V5.1 product adheres to the J2EE programming model and V3.5.x does not, significant changes are required to apply the V3.5.x configuration to a V5.1 installation.

The WASPostUpgrade tool does not migrate Samples or the administrative console application because there are already Samples and an administrative console application in V5.1. The WASPostUpgrade tool records detailed information specific to each enterprise bean it deploys, in the WASPostUpgrade.log file.

5. Stop the administrative server of the earlier version if it is running, before running the V5.1 node.
6. Configure WebSphere Application Server after migration. Configuring WebSphere Application Server after migration is a way of verifying the results of the migration tools. You can also use Configuration mapping during migration to verify the results of the migration. The topic has a detailed description of how the migration tools migrate objects, and what you should verify.

You can use the migration tools to perform a manual migration from Version 3.5.x or Version 4.0.x of WebSphere Application Server to Version 5.1.

After you test and verify that the applications and configuration data you moved to the V5.1 node is successful, you can uninstall the V3.5.x or the V4.0.x Application Server as described in the information centers for those releases. Click the **Library** link at the bottom of any V5.1 information center topic to locate the information centers for the other releases.

### **Migrating Version 3.5.x or Version 4.0.x of WebSphere Application Server to a remote Version 5.1 machine**

You can use the migration tools to perform a manual migration between two machines.

Typically you can use the WASPreUpgrade and the WASPostUpgrade migration tools from V5.1 of WebSphere Application Server to upgrade from either V3.5 or V4.0 to V5.x on the same machine.

However, some scenarios require that you migrate the V3.5 or the V4.0 configuration on one machine to V5.x on a different machine. One of these scenarios is when you install new machines for your latest V5.1 environment but need to migrate your existing V3.5.x or V4.0.x configuration from other machines.

This topic describes using the V5.1 migration tools to migrate the following products:

- WebSphere Application Server Single Server Edition, V3.5
- WebSphere Application Server Advanced Edition, V3.5
- WebSphere Application Server Advanced Edition, V4.0
- WebSphere Application Server Advanced Single Server Edition, V4.0 (the steps vary slightly)

The WASPreUpgrade tool saves the existing V3.5 or V4.0 configuration into a *migration-specific-backup* directory. The WASPostUpgrade tool uses this directory to add the old configuration settings to the new V5.1 environment.

1. Obtain the V5.1 product CD-ROM. On this CD is the *migration/bin* directory. This directory contains a special environment that you can use to run the WASPreUpgrade tool without installing V5.1.
2. Save the current configuration using the WASPreUpgrade script from the */migration/bin* directory of the V5.1 product CD-ROM, which you must mount to the V3.5 or V4.0 machine. Save the configuration in the *migration-specific-backup* directory on the V3.5 or V4.0 machine.

```
WASPreUpgrade /opt/tmp/migration-specific-backup /opt/websphere/appserver adminNodeName
```

For all scenarios except V4.0.x Advanced Single Server Edition, verify that the administrative server of the existing environment is running. The WASPreUpgrade tool provides status to the screen and to log files in the *migration-specific-backup* directory. ASCII log file names start with the text WASPreUpgrade and include a date and timestamp.

The WASPreUpgrade tool saves selected files from the V3.5.x or V4.0.x */bin* directory. It also exports the existing Application Server configuration from the V3.5.x or V4.0.x repository. The WASPreUpgrade tool calls XMLConfig to export the existing V3.5 or V4.0 repository to the *websphere\_backup.xml* file in the *migration-specific-backup* directory.



V4.0.x Advanced Single Server Edition does not require the administrative server to run at the time of migration. The WASPreUpgrade tool copies the `server-cfg.xml` file from the `install_root/config` directory to the `migration-specific-backup/config` directory.

If errors occur while running the WASPreUpgrade tool, you might have to apply fixes to the V3.5 or V4.0 installation to successfully complete the export step. See the IBM Support page for the latest fixes that might be applicable. When viewing this information from the information center, click **Support** to link to the IBM Support page.

3. Copy the `migration-specific-backup` directory from the V3.5 or V4.0 machine to the V5.x machine. Use the **ftp** command, shared storage, or some other mechanism to copy the file to the new machine. Perform the following steps on the machine with V5.x of WebSphere Application Server.
4. Copy the `migration-specific-backup/websphere_backup.xml` or the `migration-specific-backup/config/server-cfg.xml` file and store it as an archive. You edit the original file in the next step.
5. Edit the `migration-specific-backup/websphere_backup.xml` or the `/migration-specific-backup/config/server-cfg.xml` file to correct machine-dependent settings. Make the following changes in the file:
  - a. Change the node name in the `migration-specific-backup/websphere_backup.xml` file. There is no node name in the `migration-specific-backup/config/server-cfg.xml` file. If you are using the same node name for the V5.x machine that you use for the original V3.5 or the V4.0 configuration, do not change the name. Otherwise, you must change all occurrences of the V3.5 or the V4.0 node name to the node name you are using for WebSphere Application Server V5.1. The node name occurs in many XML stanzas throughout the file. Failing to change all occurrences results in an incomplete migration of data.
  - b. Change the path names in the `migration-specific-backup/websphere_backup.xml` or the `migration-specific-backup/config/server-cfg.xml` file. The configuration file refers to path names in many XML stanzas throughout the file. Update any reference to a file outside of the V3.5 or V4.0 directory structure to the equivalent directory on the new machine, even if you must create an equivalent directory. The implication of configuring a matching environment means that you might have to copy the original directory to the V5.1 machine. Or you might have to install the appropriate software.
  - c. Check files in the `properties` directories for references that contain path names. In particular, edit the `migration-specific-backup/properties/sas.client.props` and the `migration-specific-backup/properties/TraceSettings.properties` files to correct machine-dependent settings: Make the following changes in the file:
    - 1) Change the path values of any property in the file.

Each property file contains properties that refer to paths. Update any reference to a file outside of the V3.5 or V4.0 directory structure to the equivalent directory on the new machine, even if you must create an equivalent directory.
    - 2) Correct specification styles for path values that are dependent on the operating system.

You must correct path specifications if they differ from what works on the machine running V5.1.
  - d. Correct specification styles for path names that are dependent on the operating system. You must correct path specifications if they differ from what works on the machine running V5.1. For example, if you are moving from V3.5.x or V4.0.x on a Windows platform to V5.1 on a Linux platform, change any Windows-specific path in the configuration file to use the Linux path style. Change `c:\mystuff\somepath` to `/opt/mystuff/somepath`.
  - e. Change user IDs and passwords to match security requirements. You might have to change user IDs and passwords if they are not identical to those in use on the V5.1 machine.

To change an encoded password to a clear-text password, change `<password>{xor}LCoxayht</password>` to `<password>mypassword</password>`.
  - f. Change other machine-specific information. The configuration might refer to other software products or configurations that do not exist on the new machine. For example, the old machine might have a database. The V5.x configuration should still point to the database on the old machine, possibly. Modify the data source to point to the database on the V3.5 or the V4.0 machine.



6. Install V5.1 of the WebSphere Application Server without selecting the migration option.
7. Add the V3.5 or the V4.0 configuration to the V5.x configuration. Use the WASPostUpgrade tool in the `install_root/bin` directory of V5.x to add the V3.5 or the V4.0 configuration to the V5.x configuration.
 

```
WASPostUpgrade /opt/tmp/migration-specific-backup
```

The WASPostUpgrade tool records detailed information specific to each enterprise bean it deploys, in the `migration-specific-backup/WASPostUpgrade.log` file.

8. Configure WebSphere Application Server after migration. Configuring WebSphere Application Server after migration is a way of verifying the results of the migration tools. You can read Configuration mapping during migration to learn more about the results of migration. This topic has a detailed description of how the migration tools migrate objects, and what you should verify.

You can migrate WebSphere Application Server from V3.5.x or V4.0.x to a remote V5.1 machine.

## Migrating Version 5.0.x of WebSphere Application Server to a remote Version 5.1 machine

You can use the migration tools to migrate between two machines.

Typically you can use the WASPreUpgrade and the WASPostUpgrade migration tools from WebSphere Application Server, Version 5.1 to upgrade from Version 5.0.x to Version 5.1 on the same machine.

However, some scenarios require that you migrate the V5.0.x configuration on one machine to V5.1 on a different machine. One of these scenarios is when you install new machines for your V5.1 environment but need to migrate your existing V5.0.x configuration from other machines.

If the node you are migrating is part of a deployment manager cell, first, before continuing this procedure. The deployment manager node must always be at the highest release level within the cell.

This task describes how to use the V5.1 migration tools to migrate WebSphere Application Server, Version 5.0.x to Version 5.1 on a separate machine.

The WASPreUpgrade tool saves the existing V5.0.x configuration into a `migration-specific-backup` directory. The WASPostUpgrade tool uses this directory to add the old configuration settings to the new V5.1 environment.

1. Obtain the V5.1 product CD-ROM. On this CD is the `migration/bin` directory. This directory contains a special environment that you can use to run the WASPreUpgrade tool without installing V5.1.
2. Save the current configuration using the WASPreUpgrade script from the `migration/bin` directory of the V5.1 product CD-ROM, which you must mount to the V5.0.x machine. Save the configuration in the `migration-specific-backup` directory on the V5.0.x machine.

```
WASPreUpgrade /opt/tmp/migration-specific-backup /opt/websphere/appserver
```

The WASPreUpgrade tool provides status to the screen and to log files in the `migration-specific-backup` directory. ASCII log file names start with the text WASPreUpgrade and include a date and timestamp.

3. Copy the `migration-specific-backup` directory from the V5.0.x machine to the V5.1 machine. Use the **ftp** command, shared storage, or some other mechanism to copy the directory to the new machine.
4. Install V5.1 of WebSphere Application Server without selecting the migration option. Install the same features as the earlier release.
5. Add the V5.0.x configuration to the V5.1 configuration. Use the WASPostUpgrade tool in the `install_root/bin` directory of the V5.1 installation to add the V5.0.x configuration to the V5.1 configuration.

```
WASPostUpgrade /opt/tmp/migration-specific-backup
```

The WASPostUpgrade tool records detailed information specific to each enterprise bean it deploys, in the *migration-specific-backup/WASPostUpgrade.log* file.

6. Modify the configuration using the WebSphere Application Server 5.1 administration interfaces. Make these changes:
  - a. Change user IDs and passwords to match security requirements. You might have to change user IDs and passwords if they are not identical to those in use on the V5.0.x machine.
  - b. Change other machine-specific information. The configuration might refer to other software products or configurations that do not exist on the new machine. For example, the old machine might have a database. Modify the data source to point to the database on the old machine.

You can migrate WebSphere Application Server from V5.0.x to a remote V5.1 machine.

## Migrating Version 5.0.x of WebSphere Application Server to Version 5.1

The migration tools of WebSphere Application Server, Version 5.1 support migrating configuration data from V5.0.x to V5.1.

This task describes how to migrate the configuration of a V5.0.0 or a V5.0.1 node without the embedded messaging feature installed, or a V5.0.2 node with or without embedded messaging, to V5.1. This task describes how to use the V5.1 migration tools to perform the migration.

If the node you are migrating is part of a deployment manager cell, migrate the V5.0.x deployment manager to V5.1 as described in the information center for Network Deployment first, before continuing this procedure. The deployment manager node must always be at the highest release level within the cell.

If your scenario includes migrating a V5.0.x configuration on one machine to WebSphere Application Server V5.1 on another machine, use the alternate procedure described in “Migrating Version 5.0.x of WebSphere Application Server to a remote Version 5.1 machine” on page 345.

If your scenario includes migrating V5.0.0 or V5.0.1 WebSphere Application Server with embedded messaging installed, use the alternate procedure described in Migrating V5.0.0 or V5.0.1 WebSphere Application Server with embedded messaging to V5.1..

1. Stop all of the V5.0.x Application Servers that are running on the node. Use the stopServer command from the *install\_root/bin* directory. For example, issue the following commands to stop server1 and server2 on a Linux platform:

```
stopServer.sh server1
stopServer.sh server2
```

If security is enabled, specify the `-user` and `-password` parameters on the **stopServer** command.

You can migrate a V5.0.x node without stopping it. But it is not necessary to have the node running to migrate its configuration. The migration tools can retrieve all the configuration data while the node is stopped. You must stop the node before you can start the V5.1 node that you are installing.

2. Install the V5.1 product. Select the migration option when it appears. If the migration option does not appear, cancel the installation.

In some cases, such as when installing a non-English version, the installation wizard might not detect a previous version. You can force the migration panel to appear, by starting the installation with an option on the **Install.exe** or the **install** command.

For example, on Linux and UNIX-based platforms, use this command from the CD-ROM mount point:

```
install -W previousVersionDetectedBean.previousVersionDetected= "true"
```

On the migration panel, specify the same value for the node name that the V5.0.x product uses. The V5.0.x product and the V5.1 product must have identical node names. The host names can be identical but it is not a requirement.

The installer program calls the WASPreUpgrade migration tool before installing the new product, to save the configuration from the old product in a backup directory. The installer program calls the

WASPostUpgrade migration tool after installing the new product, backing up the configuration of the new product and then adding the configuration of the old product from the backup directory to the configuration of the new product.

Read the messages from the migration tools that appear on the installer program panels. Each migration tool also records events in its log file.

3. Start all V5.1 Application Servers. Issue the startServer command from the install\_root/bin directory of the V5.1 installation. For example, issue the following commands to start server1 and server2 on a Linux platform:

```
startServer.sh server1
startServer.sh server2
```

If security is enabled, specify the -user and -password parameters on the **startServer** command.

The server1 and server2 Java processes begin.

You can migrate a Version 5.0.x node to Version 5.1.

### ***Migrating Version 5.0.0 or Version 5.0.1 of WebSphere Application Server with embedded messaging to Version 5.1:***

You can use the migration tools of WebSphere Application Server, Version 5.1 to migrate from V5.0.0 or V5.0.1 to V5.1, when V5.0.0 or V5.0.1 has the embedded messaging feature installed.

This task describes how to migrate V5.0.0 or V5.0.1 with the embedded messaging feature installed, to V5.1. If V5.0.0 or V5.0.1 does not have the embedded messaging feature installed, see “Migrating Version 5.0.x of WebSphere Application Server to Version 5.1” on page 346.

Typically you can use the WASPreUpgrade and WASPostUpgrade migration tools from V5.1 of WebSphere Application Server to upgrade from V5.0.0 or V5.0.1 to V5.1 on the same machine. However, if your scenario includes migrating a V5.0.0 or V5.0.1 configuration on one machine to WebSphere Application Server V5.1 on another machine, use the alternate procedure described in “Migrating Version 5.0.x of WebSphere Application Server to a remote Version 5.1 machine” on page 345.

If the node you are migrating is part of a deployment manager cell, migrate the V5.0.x deployment manager to V5.1 first, before continuing this procedure. The deployment manager node must always be at the highest release level within the cell.

If you prefer, you can upgrade from V5.0.0 or V5.0.1 to V5.0.2 and use the migration function of the V5.1 installer to migrate from V5.0.2 to V5.1. If you prefer not to upgrade, you can use this procedure to manually migrate V5.0.0 or V5.0.1 to V5.1, when you have the embedded messaging feature installed on the V5.0.0 or V5.0.1 node.

A few problems can occur when you migrate a node that has the server function of the embedded messaging feature. The problems occur because the version of the embedded messaging feature that runs on V5.0.0 and V5.0.1 is not the same version (CSD04) that runs on V5.0.2 and V5.1.

1. Obtain the V5.1 product CD-ROM. On this CD is the migration/bin directory. This directory contains a special environment that you can use to run the WASPreUpgrade tool without installing V5.1.
2. Save the current configuration using the WASPreUpgrade script from the /migration/bin directory of the V5.1 product CD-ROM. Save the configuration in the *migration-specific-backup* directory.

```
WASPreUpgrade /opt/tmp/migration-specific-backup /opt/websphere/appserver
```

The WASPreUpgrade tool provides status to the screen and to log files in the */migration-specific-backup* directory. ASCII log file names start with the text WASPreUpgrade and include a date and timestamp.

3. If the V5.0.0 or V5.0.1 node is federated, stop the V5.1 deployment manager and the V5.0.x deployment manager. Run the from the `install_root/bin` directory of each deployment manager node. For example, use the following command to stop the deployment manager process on a Linux or UNIX-based platform:

```
./stopManager.sh
```

The script stops the deployment manager, which prevents either deployment manager from removing the base node from the cell configuration, when you uninstall the base node in the next step.

4. Optional: Uninstall the V5.0.0 or V5.0.1 node. Use the following steps to uninstall the node:
  - a. Run the uninstall command from the `install_root\_uninst` directory of the product that you are uninstalling.
  - b. Run the platform-specific uninstalling procedure to complete the removal by removing all artifacts of the earlier product from the system.
5. If the base node is a federated node, start the V5.1 deployment manager process. Run the `startManager.sh` or the `startManager.bat` script from the `install_root/bin` directory of the V5.1 deployment manager node. For example, use the following command to start the deployment manager process on a Linux or UNIX-based platform:

```
startManager.sh
```

6. Install V5.1 of WebSphere Application Server without selecting the migration option, if it appears.
7. Add the V5.0.0 or V5.0.1 configuration to the V5.1 configuration. Use the `WASPostUpgrade` tool in the `install_root/bin` directory of the V5.1 installation to add the V5.0.0 or V5.0.1 configuration to the V5.1 configuration.

```
WASPostUpgrade /opt/tmp/migration-specific-backup
```

The `WASPostUpgrade` tool records detailed information specific to each enterprise bean it deploys, in the `/migration-specific-backup/WASPostUpgrade.log` file.

8. Check the status of the migration. During migration the V5.1 deployment manager must be running for the migration tools to:
  - Update the configuration for each federated node
  - Request full synchronization

If the V5.1 deployment manager is not running, failures can occur.

*Table 69. Migration tip*

|                    |  |
|--------------------|--|
| Operating platform | Tip in “Platform-specific tips for installing and migrating” on page 146                           |
| All platforms      | Recovering from configuration errors when the deployment manager was not running during migration. |

You can perform a manual migration instead of using the installation wizard to automatically migrate from V5.0.0 or V5.0.1.

## Migrating from WebSphere Application Server - Express

You can migrate the configuration from V5.0.x WebSphere Application Server - Express to WebSphere Application Server, V5.1.

This topic describes how to use the WebSphere Application Server migration tools to migrate your applications and configuration from a stand-alone WebSphere Application Server - Express product to a stand-alone base WebSphere Application Server product.

Perform this migration before federating the base WebSphere Application Server node into a Network Deployment cell. If the base product is federated, you can remove it from the deployment manager cell with the **removeNode** command, located in the `bin` directory of the base product installation root.

1. Use the migration tools to transfer configuration settings from Express to the base product.

This step transfers configuration information for the Express remote server resources, security, variables, and virtual hosts to the base product. Security and virtual host information is stored only at cell level. Resource and variable information is stored at server, node, and cell level. All stored information is in XML files in the *install\_root/config/cells* directory of each product. For a full description of each XML file, see the Configuration documents and Configuration document descriptions topics in the information center.

The WASPreUpgrade command line tool saves selected files from the */bin* directory to a backup directory you specify as a parameter on the command. It also saves files from the following directories to the backup directory:

- classes (This directory is not saved for iSeries platforms.)
- config
- installableApps
- installedApps (or an alternate directory specified by the user)
- properties (A subset of files in this directory is saved for iSeries platforms.)

Later, use the WASPostUpgrade migration tool to restore the environment in the backup directory into the base WebSphere Application Server installation.

- a. Run the WASPreUpgrade migration tool to export application and configuration files from Express to a backup directory.

Migrating from Express to V5 involves fewer options than does migrating from another version. Therefore there are fewer options to specify on the **WASPreUpgrade** command:

```
WASPreUpgrade backupDirectoryName  
                ExpressInstall_rootName
```

For a full parameter list, see “WASPreUpgrade command” on page 359.

- b. Run the WasPostUpgrade migration tool to import file from the backup directory into the base WebSphere Application Server product:

```
WASPostUpgrade backupDirectoryName
```

For a full parameter list, see “WASPostUpgrade command” on page 361.

2. Resolve port differences.

The migration tools create a list of ports used by the combined Express/base WebSphere Application Server configuration. If the same port is used for more than one purpose, the migration tools log a message that states you must manually resolve the port conflict.

There are two groups of port differences that can remain within port assignments in the virtual hosts file, at the cell level:

- **HTTP transport ports**

WebSphere Application Server and Express use different HTTP transport ports by default. To maintain port assignments used by Express when migrating to the base WebSphere Application Server product, add the Express port values at the server level:

- a. In the WebSphere Application Server administrative console, click the **plus sign (“+”)** next to **Servers**
- b. Click **Application Servers**.
- c. Click the server on which you plan to install your applications.
- d. Click **Web Container**.
- e. Click **HTTP transports**.
- f. Use Studio Site Developer to find the original Express remote server HTTP transport ports:
  - 1) Display the **Server Configuration** view.
  - 2) Double-click the Express remote server that you are migrating.
  - 3) Click **Ports**.
  - 4) View ports defined under **Server Settings**.
- g. Click **New** in the WebSphere Application Server administrative console to create additional entries needed to define a port.

- **Advanced ports (special end points)**



There are a number of special purpose ports defined for WebSphere Application Server. These ports are described in the “Migrating and coexisting” on page 326 topic. Many advanced ports default to different values on Express than on the WebSphere Application Server. Use the WebSphere Application Server values, to continue to run both Express and the WebSphere Application Server on the same system (coexistence), or if WebSphere Application Server applications are dependent on the port values.

Retaining WebSphere Application Server port values might require you to change applications you developed for Express. Change any references to port values you are changing. To identify Express applications that require port changes, modify the Express port configuration to use WebSphere Application Server port values. Then test the applications that you intend to migrate, to identify port references that are in error.

- a. In the WebSphere Application Server administrative console, click the **plus sign (“+”)** next to **Servers**.
  - b. Click **Application Servers** to get a list of servers.
  - c. Click the server on which you intend to install the applications.
  - d. Click **End Points**.
  - e. Use Studio Site Developer to find the original Express remote server port assignments:
    - 1) Display the **Server Configuration** view.
    - 2) Double click the Express remote server that you are migrating.
    - 3) Click **Ports**.
    - 4) View **Advanced Ports** defined under **Server Settings**.
3. Verify migrated applications.
- To verify that applications are installed successfully:
- a. Click **Enterprise Applications** in the administrative console.
  - b. Check your migrated applications.
  - c. Click **Start**.

Verify that your applications start successfully.

You can successfully migrate applications to the base WebSphere Application Server product.

## Migrating from an operating system that is no longer supported

You can migrate an earlier WebSphere Application Server Version 3.5.x or Version 4.0.x release that is running on an operating system that Version 5.x does not support.

1. Start up the WebSphere Application Server Version 3.5.x or Version 4.0.x Administrative Server.
2. Run the **WASPreUpgrade** command line migration tool. There are two options. You can run the command from the migration\bin (or migration/bin) directory in the *platform\_root* of the Version 5 CD-ROM. Or, you can copy the files in the directory on the CD-ROM to a directory you create on your hard drive.

Identify the Version 3.5.x or 4.0.x release, and identify a backup directory where the command stores configuration files and migrating applications from the earlier version. See the *WASPreUpgrade* topic for command syntax.

- a. Run the command from the migration\bin (or migration/bin) directory in the *platform\_root* of the Version 5 CD-ROM. Identify the backup directory and the location of the configuration files.

```
CD_drive:\WASPreUpgrade backupDirectory filepath\WebSphere\AppServer yourNodeName
```

If this works, go to Step 4. If this does not work for some reason, perform steps 2B through 2F.

- b. Make a **migration** directory on your hard drive.
- c. Copy the WASPreUpgrade.bat (or WASPreUpgrade.sh) and the setupCmdLine.bat (or setupCmdLine.sh) files from the migration/bin directory in the *platform\_root* of the Version 5 CD-ROM, to the directory you created on your hard drive.
- d. Edit the setupCmdLine.bat (or setupCmdLine.sh) file in your new directory. Change the following variables:



- **WAS\_HOME** to point to the fully qualified path to the migration directory you created
  - **JAVA\_HOME** to point to the fully qualified path to your IBM Developer Kit or the Java directory
- e. Ensure that the executable bit is on for the `setupCmdLine.sh` and `WASPreUpgrade.sh` files in the directory that you created on your hard drive.
  - f. Run the command from the migration directory you created. Identify the backup directory and the location of the configuration files.
 

```
yourMigrationDirectory\WASPreUpgrade backupDirectory filepath\WebSphere\AppServer yourNodeName
```
3. Shut down the WebSphere Application Server Version 3.5.x or Version 4.0.x release by stopping all server nodes in the configuration, including the administrative server node.
  4. Tar or zip the backup directory and FTP it to another system.
  5. Install the new operating system, keeping the same host name. If possible, keep the system name and passwords the same as the old system. Place any database files related to applications you are migrating in the same path as the previous system. In general, try to keep paths the same. However, do not install Version 5 in the same directory as the previous version. If you do change paths and names, you can edit the XML configuration files to reflect the changes. Make such changes before running the **WASPostUpgrade** command below.
  6. FTP the backup directory from the other system and unzip it.
  7. Install WebSphere Application Server, Version 5. Do not select the migration option, if it appears.
  8. Run the **WASPostUpgrade** command line migration tool, from the `bin` directory of the Version 5 `install_root`. Specify the backup directory (and any non-standard configuration file name in the directory) that the **WASPreUpgrade** command created. See the *WASPostUpgrade* topic for proper command syntax.

```
install_root\bin\WASPostUpgrade WAS_HOME\migration
```

## Migration tools

This topic introduces the migration tools that WebSphere Application Server provides. All of the migration tools are in the `install_root/bin` directory after installation. The `WASPreUpgrade.sh` or `WASPreUpgrade.bat` scripts also ship in the `/migration/bin` directory on the product CD-ROM so that you can store the configuration of an existing release before installing the V5.1 product. It is important to use the migration tools for the version of Application Server that you are installing. The tools change over time. The tools on the product CD-ROM provide the necessary function for migrating from a previous release of Application Server to the one on the product CD-ROM. The tools on the CD-ROM match the product on the CD-ROM. If you use migration tools from an earlier release of Application Server, you are likely to encounter a problem with the migration.

### **clientUpgrade.sh (and clientUpgrade.bat)**

Upgrades the client application to a new release level.

### **pre\_uninst50ws.sh (and pre\_uninst50ws.bat)**

Prevents a federated node that you migrate to a new version, from removing the new node from the cell when you uninstall the old node.

### **post\_uninst50ws.sh (and post\_uninst50ws.bat)**

Restores the normal uninstaller environment that allows the uninstaller to remove a base node from a cell prior to uninstalling the base node.

### **pre\_uninst502mq.sh (and pre\_uninst502mq.bat)**

Prevents the uninstaller from uninstalling the embedded messaging feature and the message queue when it uninstalls a V5.0.2 node that you have migrated to V5.1.

### **post\_uninst502mq.sh (and post\_uninst502mq.bat)**

Restores the normal uninstaller environment that allows the uninstaller to uninstall a base V5.0.2 node and delete the embedded messaging feature and its queue manager.

### **WASPreUpgrade.sh (and WASPreUpgrade.bat)**

Saves the applications and configuration data from a previous installation of WebSphere Application Server to a backup directory. The `WASPostUpgrade` script restores the configuration

data from the directory to the new installation. The installer calls the WASPreUpgrade.sh script during installation, if you select migration. You can also use the command to perform a manual migration, after installing the new version.

### **WASPostUpgrade.sh (and WASPostUpgrade.bat)**

Restores the configuration data from a previous release. WASPostUpgrade reads the data from the backup directory where the WASPreUpgrade script stored the data. The installer calls the WASPostUpgrade.sh script during installation, if you select migration. You can also use the command to perform a manual migration, after installing the new version.

### **The clientUpgrade command:**

Use the **clientUpgrade** command to migrate application clients.

**Note:** WebSphere Application Server Version 5.1 does not support the Windows NT platform.

The command file is located in the bin subdirectory of the *WAS\_install\_root*, or the *ND\_install\_root* directory. By default, the *WAS\_install\_root* for WebSphere Application Server and WebSphere Application Server Enterprise is:

- Windows NT or Windows 2000 operating platforms - *drive*\WebSphere\AppServer directory
- AIX or UNIX-based operating platforms - /usr/WebSphere/AppServer directory

By default, the *ND\_install\_root* for WebSphere Application Server Network Deployment is:

- Windows NT or Windows 2000 operating platforms - *drive*\WebSphere\DeploymentManager directory
- AIX or UNIX-based operating platforms - /usr/WebSphere/DeploymentManager directory

### **Linux and UNIX-based platforms:**

```
clientUpgrade.sh EAR_file [-clientJar client_jar ]  
                    [-traceString trace_spec [-traceFile file_name ]]
```

### **Windows platforms:**

```
clientUpgrade.bat EAR_file [-clientJar client_jar ]  
                    [-traceString trace_spec [-traceFile file_name ]]
```

### **Parameters**

Supported arguments include the following:

#### **EAR\_file**

Use this parameter to specify the fully qualified path to the EAR file that contains client JAR files to process.

#### **-clientJar**

Use this optional parameter to specify a JAR file for processing. If not specified, the program transforms all client JAR files in the EAR file.

#### **-traceString -traceFile**

Use these optional parameters to gather trace information for IBM Service personnel. Specify a trace\_spec of "\*=all=enabled" (with quotation marks) to gather all trace information.

#### **-logFileLocation**

Use this optional parameter to specify an alternate location to store the log output.

The following example demonstrates correct syntax:

```
clientUpgrade EAR_file -clientJar ejbJarFile
```

### **pre\_uninst50ws command:**

The **pre\_uninst50ws** command is a V5.1 migration tool for use when you migrate a federated V5.0.x node to V5.1. The script changes the normal uninstaller program environment to prevent the uninstaller program from removing the V5.0.x or V5.1 node from the deployment manager cell while uninstalling the base V5.0.x or V5.1 node. The script also prevents the uninstaller program from removing the `jmsserver` process, which is the embedded messaging queue manager for the federated node.

A problem can occur when you uninstall an earlier version of the base WebSphere Application Server product that you migrated to Version 5.1. If the earlier node is federated, migrating the federated node to Version 5.1 gives you a federated V5.1 node, too. The new node has the same node name as the earlier node, and is a member of the same cell. The problem is that the uninstaller program issues a **removeNode** command when it uninstalls a federated node. So, if you uninstall the earlier version, the uninstaller issues a call to the deployment manager that requests the removal of the node from the cell. You are left with a V5.1 node that is configured as if it were a member of the cell and a deployment manager that does not recognize the node.

The `pre_uninst50ws` script overcomes the problem by renaming the `_nodeuninst.sh` or the `_nodeuninst.bat` script and creating a dummy script that prevents the uninstaller program from logging an error and stopping. Because the uninstaller program is not calling the script that removes the node from the cell, uninstalling the earlier version does not also unfederate the node from the cell. This lets you uninstall the previous node and still have a federated V5.1 node.

The “`post_uninst50ws` command” on page 355 restores the environment to allow the uninstaller program to remove a federated node from its cell while uninstalling the base node. If you are completely uninstalling the previous version, it is not necessary to run the `post_uninst50ws` script. If you follow the platform-specific instructions for uninstalling the previous version, you remove the `_nodeuninst.sh` or the `_nodeuninst.bat` script. So there is nothing left for the script to rename.

### Location of the command file

The command file is located in the `install_root/bin` directory of the V5.1 node.

If the installation wizard performs the initial migration, the wizard copies the scripts to the `install_root/bin` directory of the V5.0.x node that it is migrating. If you migrate the node by calling the migration tool commands, you might have to copy the following files to the `install_root/bin` directory of the V5.0.x node from the `install_root/bin` directory of the V5.1 node:

- `pre_uninst50ws.sh` and `post_uninst50ws.sh` on a Linux or UNIX-based platform
- `pre_uninst50ws.bat` and `post_uninst50ws.bat` on a Windows platform

### Recovering when you do not use the `pre_uninst50ws` script

If you uninstall a federated base node without running the `pre_uninst50ws.sh` script, you can recover by recreating whatever configuration data is lost. Lost configuration data includes any configuration that occurred while the original node was federated. Use the `addNode.sh` or the `addNode.bat` script in the `bin` directory of the installation root of the base Application Server node to add the new node back to the deployment manager cell. Do not use the `-includeapps` parameter to include applications from the node. The installer program included the applications into the deployment manager cell during installation. The `removeNode.sh` script does not delete applications from the cell.

### Using the command when removing a V5.0.x node

The script is new as of Version 5.1.

1. Copy the script files described previously if the **pre\_uninst50ws** command file is not in the `install_root/bin` directory of the WebSphere Application Server, Version 5.0.x instance.
2. Run the **pre\_uninst50ws** command from the `install_root/bin` directory of the WebSphere Application Server, Version 5.0.x instance.

3. Uninstall the WebSphere Application Server, Version 5.0.x instance.

Run the `post_uninst50ws` script from a node only when you have run the `pre_uninst50ws` script on the node and decide not to uninstall the node.

### Using the command when removing a V5.1 node

Use the `pre_uninst50ws` script if you uninstall V5.1 before uninstalling V5.0.2, to make V5.0.2 operational again.

For example, suppose you install V5.1 in spite of missing patches on your operating system and there are problems that require you to uninstall V5.1 to reinstall it. In the meantime, you bring up your V5.0.2 node to have a running WebSphere Application Server node. So you start up the V5.0.2 deployment manager, and the V5.0.2 node before uninstalling V5.1.

Uninstalling V5.1 removes the node from the deployment manager cell if and only if the V5.1 deployment manager is running. If the V5.0.2 deployment manager is running, the `remove-node` part of the uninstalling procedure fails because a V5.1 node cannot communicate with a V5.0.2 deployment manager. The V5.1 `jmsserver` process is not removed either.

However, if you start a V5.1 deployment manager, start the V5.0.2 node, and then uninstall the V5.1 node without running the `pre_uninst50ws` script, there are problems. Removing the V5.1 node causes the same effect as removing the V5.0.2 node. The deployment manager removes the configuration of the node. Follow this procedure to remove the V5.1 node without a problem.

1. Run the `pre_uninst50ws` script from the `install_root/bin` directory of the WebSphere Application Server, Version 5.1 instance.
2. Run the `pre_uninst502mq` script from the `install_root/bin` directory of the WebSphere Application Server, Version 5.0.2 instance if the embedded messaging feature is installed.
3. Uninstall the WebSphere Application Server, Version 5.1 instance.

Run the `post_uninst50ws` script from a node only when you have run the `pre_uninst50ws` script on the node and decide not to uninstall the node.

### `pre_uninst50ws.sh` command syntax for Linux and UNIX-based platforms

The command syntax is as follows:

```
pre_uninst50ws.sh
```

### `pre_uninst50ws.bat` command syntax for Windows platforms

```
pre_uninst50ws.bat
```

### Parameters

No parameters are associated with this command.

### Migrating from a V5.0.x base node to a V5.1 node

Issue the `pre_uninst50ws` command before uninstalling the V5.0.x product, from the `install_root/bin` directory of the product you are uninstalling. This command renames the `_nodeuninst.sh` or the `_nodeuninst.bat` script and creates a dummy, non-operational script. For example, on a Linux platform, issue the following command:

```
pre_uninst50ws.sh
```

## Workaround for uninstalling a federated node without the scripts

It is possible to use the WASPreupgrade tool to save the configuration of a V5.0.x instance before installing the V5.1 instance. Such a scenario is described in “Migrating Version 5.0.0 or Version 5.0.1 of WebSphere Application Server with embedded messaging to Version 5.1” on page 347. In such a scenario, you do not have access to the following files:

- `pre_uninst50ws.sh` or `pre_uninst50ws.bat`
- `post_uninst50ws.sh` or `post_uninst50ws.bat`

You can perform either of two workarounds to avoid removing the node from the cell:

- Stop the deployment manager so that it does not lose the configuration for the node that you are uninstalling.
- Rename the program on the node that you are uninstalling to prevent the node from requesting that the deployment manager remove the node from the cell:
  1. Rename the `_nodeuninst.sh` or the `_nodeuninst.bat` script.
  2. Create a dummy script named `_nodeuninst.sh` or `_nodeuninst.bat` that is not operational. The dummy script can be an empty file. This prevents the uninstaller program from logging an error and stopping.
  3. Uninstall the V5.0.x product.
  4. Delete the dummy file and restore the `_nodeuninst.sh` or the `_nodeuninst.bat` script.

### ***post\_uninst50ws* command:**

The **`post_uninst50ws`** command restores the normal uninstaller program environment in which the uninstaller program removes a federated base node from a cell prior to uninstalling the base WebSphere Application Server node. Run the `post_uninst50ws` script from a node only when you have run the `pre_uninst50ws` script on the node and decide not to uninstall the node.

## Overview

The `post_uninst50ws` tool restores the environment created by the use of the “`pre_uninst50ws` command” on page 352. The `post_uninst50ws` tool allows the uninstaller program to remove a federated node from its cell while uninstalling the base node.

If you are completely uninstalling the previous version, it is not necessary to run the `post_uninst50ws` script. If you follow the platform-specific instructions for uninstalling the previous version, as described in “Uninstalling manually” on page 312, you remove the `_nodeuninst.sh` or the `_nodeuninst.bat` script along with all other artifacts. So there is nothing left for the script to rename.

Use the `post_uninst50ws` migration tool to reverse the effects of the `pre_uninst50ws` tool when you run the `pre_uninst50ws` tool and then decide not to uninstall the product.

## Location of the command file

The command file is located in the `install_root/bin` directory of the V5.1 node.

If the installation wizard performs the initial migration, the wizard copies the scripts to the `install_root/bin` directory of the V5.0.x node that it is migrating. If you migrate the node by calling the migration tool commands, you might have to copy the following files to the `install_root/bin` directory of the V5.0.x node from the `install_root/bin` directory of the V5.1 node:

- `pre_uninst50ws.sh` and `post_uninst50ws.sh` on a Linux or UNIX-based platform
- `pre_uninst50ws.bat` and `post_uninst50ws.bat` on a Windows platform

## **post\_uninst50ws.sh command syntax for Linux and UNIX-based platforms**

The command syntax is as follows:

```
post_uninst50ws.sh
```

## **post\_uninst50ws.bat command syntax for Windows platforms**

```
post_uninst50ws.bat
```

### **Parameters**

No parameters are associated with this command.

### ***pre\_uninst502mq command:***

The **pre\_uninst502mq** command is a V5.1 migration tool for use when you migrate a V5.0.2 node with embedded messaging to V5.1. The script changes the normal uninstaller program environment to prevent the uninstaller program from removing the embedded messaging feature while uninstalling the base V5.0.2 node. Normally the uninstaller program removes the embedded messaging feature while uninstalling the product.

When you migrate the V5.0.2 base node to V5.1, the two installation instances share the same node name, the same embedded messaging feature code, and the same messaging queue manager. Uninstalling either V5 installation instance removes the instance and the embedded messaging feature. The **pre\_uninst502mq** script prevents the removal of embedded messaging when the V5.0.2 installation instance is uninstalled. The V5.1 uninstaller program has an option that you can use to prevent the removal of the embedded messaging feature.

The uninstaller program normally stops and removes the default embedded messaging queue manager process before uninstalling the feature. If another embedded messaging process is running on a Linux or UNIX-based machine, the uninstaller program cannot remove the embedded messaging feature. The **pre\_uninst502mq** script creates the **WAS\_COEXIST** queue manager to prevent the removal of the embedded messaging feature code on Linux and UNIX-based platforms. The uninstaller program does not remove the **WAS\_COEXIST** queue manager, which is active and therefore causes the uninstaller program to not remove the embedded messaging feature code.

### **Location of the command file**

The command file is located in the *install\_root/bin* directory. The command file is a script named **pre\_uninst502mq.sh** on Linux and UNIX-based platforms and **pre\_uninst502mq.bat** on Windows platforms.

## **pre\_uninst502mq.sh command syntax for Linux and UNIX-based platforms**

The command syntax is as follows:

```
pre_uninst502mq.sh
```

## **pre\_uninst502mq.bat command syntax for Windows platforms**

```
pre_uninst502mq.bat
```

### **Parameters**

No parameters are associated with this command.



## Migrating a V5.0.2 base node to a V5.1 node

Issue the **pre\_uninst502mq** command after migrating the configuration of a V5.0.2 node that has the embedded messaging feature installed, installing the V5.1 product, and before uninstalling the V5.0.2 node. After issuing the command, uninstall the V5.0.2 node. Because you are using the **pre\_uninst502mq** script, uninstalling the V5.0.2 node prevents the removal of the embedded messaging feature code.

After using the **pre\_uninst502mq** script and uninstalling the V5.0.2 product on Linux and UNIX-based platforms, perform this procedure:

1. Run the **post\_uninst502mq** script to remove the WAS\_COEXIST queue manager.
2. On Linux and UNIX-based platforms, run the following commands to verify that the WAS\_COEXIST queue manager is deleted. Run the commands as root from the *install\_root/bin* directory:  

```
endmqm WAS_COEXIST  
dltmqm WAS_COEXIST
```
3. Run the **createmq** command from the *install\_root/bin* directory to create the default queue manager:

### UNIX platforms:

```
createmq.sh install_root  
          cellName  
          nodeName  
          server1
```

### Windows platforms:

```
createmq.bat install_root  
          cellName  
          nodeName  
          server1                  mq_dir  
          broker_dir
```

The command that the installer program used to create your original queue manager is in the *install\_root/logs/createMQ.nodeName\_server1.log* file.

To create the default queue manager on a Linux node named *wasnode*, for example, run the following command:

```
createmq.sh /opt/WebSphere/AppServer wasnode wasnode server1
```

On an unfederated node, the value of the cell name parameter is the node name.

### **post\_uninst502mq** command:

The **post\_uninst502mq** command restores the normal uninstaller program environment, which lets the uninstaller program uninstall a base V5.0.2 node and delete the embedded messaging feature code. Run this command only after using the **pre\_uninst502mq** tool.

When you migrate the V5.0.2 base node to V5.1, the two installation instances share the same node name, the same embedded messaging feature code, and the same messaging queue manager. Uninstalling either V5 installation instance removes the instance and the embedded messaging feature. The **pre\_uninst502mq** tool prevents the removal of the embedded messaging feature code when the V5.0.2 installation instance is uninstalled. The V5.1 uninstaller program has an option that you can use to prevent the removal of the embedded messaging feature code.

The uninstaller program normally stops and removes the default embedded messaging queue manager process before uninstalling the feature. If another embedded messaging process is running on a Linux or UNIX-based machine, the uninstaller program cannot remove the embedded messaging feature. Therefore, the **pre\_uninst502mq** script creates the WAS\_COEXIST queue manager to prevent the removal of the embedded messaging feature code on Linux and UNIX-based platforms. The uninstaller program

does not remove the WAS\_COEXIST queue manager, which is active and therefore causes the uninstaller program to not remove the embedded messaging feature code.

On Windows platforms, the `pre_uninst502mq` script prevents the removal of the embedded messaging feature code by creating dummy registry entries. After using the `pre_uninst502mq` script and uninstalling the V5.0.2 product, run the `post_uninst502mq` script on Windows platforms to remove the dummy registry entries.

### Location of the command file

The command file is located in the `install_root/bin` directory. The command file is a script named `post_uninst502mq.sh` on Linux and UNIX-based platforms and `post_uninst502mq.bat` on Windows platforms.

### post\_uninst502mq.sh command syntax for Linux and UNIX-based platforms

The command syntax is as follows:

```
post_uninst502mq.sh
```

### post\_uninst502mq.bat command syntax for Windows platforms

```
post_uninst502mq.bat
```

### Parameters

No parameters are associated with this command.

### Migrating a V5.0.2 base node to a V5.1 node

Issue the `pre_uninst502mq` command after migrating the configuration of a V5.0.2 node that has the embedded messaging feature installed, installing the V5.1 product, and before uninstalling the V5.0.2 node. After issuing the command, uninstall the V5.0.2 node. Because you are using the `pre_uninst502mq` script, uninstalling the V5.0.2 node prevents the removal of the embedded messaging feature code.

After using the `pre_uninst502mq` script and uninstalling the V5.0.2 product on Linux and UNIX-based platforms, perform this procedure:

1. Run the `post_uninst502mq` script to remove the WAS\_COEXIST queue manager.
2. On Linux and UNIX-based platforms, run the following commands to verify that the WAS\_COEXIST queue manager is deleted. Run the commands as root from the `install_root/bin` directory:

```
endmqm WAS_COEXIST
dltmqm WAS_COEXIST
```

3. Run the `createmq` command from the `install_root/bin` directory to create the default queue manager:

#### UNIX platforms:

```
createmq.sh install_root
           cellName
           nodeName
           server1
```

#### Windows platforms:

```
createmq.bat install_root
             cellName
             nodeName
             server1           mq_dir
             broker_dir
```

The command that the installer program used to create your original queue manager is in the `install_root/logs/createMQ.nodeName_server1.log` file.

To create the default queue manager on a Linux node named `wasnode`, for example, run the following command:

```
createmq.sh /opt/WebSphere/AppServer wasnode wasnode server1
```

On an unfederated node, the value of the cell name parameter is the node name.

### **WASPreUpgrade command:**

The **WASPreUpgrade** command is a migration tool that saves the configuration and applications of a previous version or release to a Version 5.1 WebSphere Application Server node.

### **Location of command file**

The command file is located in the `install_root/bin` directory. The command file is a script named `WASPreUpgrade.sh` for Linux and UNIX-based platforms or `WASPreUpgrade.bat` for Windows platforms.

### **WASPreUpgrade.sh command syntax for Linux and UNIX-based platforms**

The command syntax is as follows:

```
WASPreUpgrade.sh backupDirectory
                  currentWASDirectory
                  [adminNodeName]
                  [-nameServiceHost host_name [-nameServicePort port_number ]]
                  [-import xmiDataFile ]
                  [-traceString trace_spec [-traceFile file_name ]]
```

### **WASPreUpgrade.bat command syntax for Windows platforms**

```
WASPreUpgrade backupDirectory
               currentWASDirectory
               [adminNodeName]
               [-nameServiceHost host_name [-nameServicePort port_number ]]
               [-import xmiDataFile ]
               [-traceString trace_spec [-traceFile file_name ]]
```

### **Parameters**

The first two arguments are required and positional. The third argument is required and positional only when upgrading from WebSphere Application Server, Version 3.5.x or Advanced Edition, Version 4.0.x.

Supported arguments include:

#### **adminNodeName**

Optional, positional name of the node containing the administrative server for the currently installed product. The value of this argument must match the node name given in the topology tree on the Topology tab of the administrative console for the currently installed product. The `WASPreUpgrade` tool calls the XMLConfig tool using this parameter. This parameter is only required when upgrading from WebSphere Application Server Standard Edition, Version 3.5.x, WebSphere Application Server Advanced Edition, Version 3.5.x, or WebSphere Application Server Advanced Edition, Version 4.0.x.

No equivalent parameter is available in the silent installation options response file.

#### **backupDirectory**

Required positional name of the directory in which the `WASPreUpgrade` tool stores the saved configuration and files, and from which the `WASPostUpgrade` tool later reads the configuration and files. The `WASPreUpgrade` tool creates the directory if the directory does not already exist.

This parameter is equivalent to the `-W migrationInformationPanelBean.migrationBackupDir="/tmp/migrationbackup"` parameter in the silent installation options response file.

### **currentWASDirectory**

Required positional name of the installation root for the current V3.5.x, V4.x, or V5.0.x installation. This version can be either WebSphere Application Server Standard Edition, V3.5.x, WebSphere Application Server Advanced Edition, V3.5.x, any form of WebSphere Application Server, V4.0.x, and any form of V5.0.x, including WebSphere Application Server - Express.

This parameter is equivalent to the `-W previousVersionPanelBean.selectedVersionInstallLocation="/opt/WebSphere/AppServer"` parameter in the silent installation options response file.

### **-import xmiDataFile**

The name of the WebSphere Application Server Advanced Single Server Edition, Version 4.0 XML Metadata Interchange (XMI) configuration file to process. This parameter is optional because the program uses the `config\server-cfg.xml` file by default.

When migrating a configuration that uses anything other than the default `server-cfg.xml` file name, you must use the `-import` option along with a path to point to the non-default XMI configuration file. You also must use the `-import` and `path` option when running the `WASPostUpgrade` tool later, to point to the non-default XMI configuration file in the directory created by the `WASPreUpgrade` tool.

This parameter is equivalent to the `-W previousVersionPanelBean.selectedVersionConfigFile="/opt/WebSphere/AppServer/config/server-cfg.xml"` parameter in the silent installation options response file.

### **-nameServiceHost -nameServicePort**

When specified, the `WASPreUpgrade` tool passes these optional parameters to the `XMLConfig` tool. Use these parameters to override the default host name and port number used by the `XMLConfig` tool.

No equivalent parameter is available in the silent installation options response file.

### **-traceString trace\_spec -traceFile file\_name**

Optional parameters to gather trace information for IBM Service personnel. Specify a trace specification of `"*=all=enabled"` (with quotation marks) to gather all trace information.

No equivalent parameter is available in the silent installation options response file.

## **Logging**

The `WASPreUpgrade` tool displays status to the screen while it runs. The tool also saves a more extensive set of logging information in the `backup` directory. You can view the `WASPreUpgrade.log` file with a text editor.

## **Migrating from V3.5.x Standard Edition or Advanced Edition, or from V4.0.x Advanced Edition**

The following example specifies a backup directory named `backupDirectory`, and identifies the root of the existing installation as `d:\WebSphere\AppServer`.

```
WASPreUpgrade backupDirectory d:\WebSphere\AppServer yourNodeName
```

## **Migrating from V4.0.x Advanced Single Server Edition with multiple backup directories**

This example shows how to migrate incrementally, to migrate separate configuration files from a single node with a single installation of WebSphere Application Server Advanced Single Server Edition. To migrate more than one configuration file, you must run the `WASPreUpgrade` tool multiple times to multiple backup directories because not all of the applications are in the same `installedApps` directory. For this reason, using a single backup directory for all runs of the `WASPreUpgrade` tool is not recommended. Use a separate backup directory for each run. The intent of this example is to show how to migrate a single node with multiple configuration files.

1. Run the following `WASPreUpgrade` commands to migrate applications A, B, C, D, and E, which reside in three separate application directories. Server assumptions include:
  - The Application Server uses the default configuration file, `server-cfg.xml`, as well as `myServer1-cfg.xml` and `01dServer-cfg.xml`.

- ```
> WASPreUpgrade C:\WAS4ABBACKUP G:\WebSphere\AppServer
> WASPreUpgrade C:\WAS4CDBACKUP G:\WebSphere\AppServer
  -import G:\WebSphere\AppServer\config\myServer1-cfg.xml
> WASPreUpgrade C:\WAS4EBACKUP G:\WebSphere\AppServer
  -import G:\WebSphere\AppServer\config\01dServer-cfg.xml
```
2. Run the following WASPostUpgrade commands to restore the applications and configurations to the Version 5 Application Server:

```
> WASPostUpgrade C:\WAS4ABBACKUP
> WASPostUpgrade C:\WAS4CDBACKUP -import C:\WAS4CDBACKUP\myServer1-cfg.xml
> WASPostUpgrade C:\WAS4EBACKUP -import C:\WAS4EBACKUP\01dServer-cfg.xml
```

## Migrating from V5.0.0 or V5.0.1 with the embedded messaging feature **5.1+**

This example shows how to migrate a single instance of base WebSphere Application Server, V5.0.0. Verify that you have stopped all Java processes related to the WebSphere Application Server product that you are migrating. Run the WASPreUpgrade tool against the installedApps directory.

1. Run the following WASPreUpgrade.bat command to migrate all applications in the installedApps directory of the V5.0.0 Application Server, which has an installation root of C:\Program Files\WebSphere\AppServer.

```
> WASPreUpgrade C:\WAS500BACKUP C:\Program Files\WebSphere\AppServer
```
2. Run the following WASPostUpgrade commands to restore the applications and configurations to the Version 5 Application Server:

```
> WASPostUpgrade C:\WAS500BACKUP
```

### **WASPostUpgrade command:**

The **WASPostUpgrade** command is a migration tool for adding the configuration and applications of a previous version or release to the current WebSphere Application Server node. The configuration includes migrated applications. The tool adds all migrated applications into the *install\_root/installedApps* directory of the current product. The tool locates the saved configuration that the WASPreUpgrade tool saves through a parameter you use to specify the *backup* directory.

### **Location of command file**

The command file is located in the *install\_root/bin* directory. The command file is a script named WASPostUpgrade.sh for Linux and UNIX-based platforms or WASPostUpgrade.bat for Windows platforms.

### **WASPostUpgrade.sh command syntax for Linux and UNIX-based platforms**

The command syntax is as follows:

```
WASPostUpgrade.sh backupDirectory
  [-import xmi_data_file]
  [-cellName cell_name]
  [-nodeName node_name]
  [-serverName server_name]
  [-webModuleAdditionalClasspath classpath]
  [-documentRootLimit number]
  [-substitute "key1=value1[;key2=value2;...]"]
  [-portBlock port_starting_number]
  [-backupConfig true | false]
  [-replacePorts true | false]
  [[-traceString trace_spec [-traceFile file_name]]
```

The first argument is required.

## WASPostUpgrade.bat command syntax for Windows platforms

```
WASPostUpgrade backupDirectory
    [-import xmi_data_file]
    [-cellName cell_name]
    [-nodeName node_name]
    [-serverName server_name]
    [-webModuleAdditionalClasspath classpath]
    [-documentRootLimit number]
    [-substitute "key1=value1;key2=value2;[...]"]
    [-portBlock port_starting_number]
    [-backupConfig true | false]
    [-replacePorts true | false]
    [[-traceString trace_spec [-traceFile file_name]]
```

The first argument is required.

### Parameters

Supported arguments include:

#### 5.1+ **-backupConfig true | false**

An optional parameter used to back up the existing configuration of the Version 5.1 instance before adding the saved configuration from the earlier release to the Version 5.1 instance. The default is true, to use the **backupConfig** command to save a copy of the Version 5.1 configuration into the `install_root/temp` directory. Use the **restoreConfig** command to restore that configuration as required.

No equivalent parameter is available in the silent installation options response file.

#### **backupDirectory**

Required name of the directory in which the WASPreUpgrade tool stores the saved configuration and files. The WASPostUpgrade tool reads the configuration and files stored in this directory. The WASPreUpgrade tool creates this directory if it does not already exist.

This parameter is equivalent to the `-W migrationInformationPanelBean.migrationBackupDir="/tmp/migrationbackup"` parameter in the silent installation options response file.

#### **-cellName** *cell\_name*

An optional parameter to specify the cell name for the program to update. If not specified, the program inspects the configuration for cell names. When one cell name exists, the program uses it. Otherwise, the program returns an error.

This parameter is equivalent to the `-W nodeNameBean.cellName="nodenameNetwork"` parameter in the silent installation options response file for the Network Deployment product. No equivalent parameter is available in the silent installation options response file for the base product.

#### **-documentRootLimit** *number*

An optional parameter to specify the number of files that the program copies from the document-root field of Web-application. It is only applicable to Version 3.5.x upgrades. If not specified, the default is 300.

No equivalent parameter is available in the silent installation options response file.

#### **-import** *xmi\_data\_file*

The name of the WebSphere Application Server Advanced Single Server Edition, Version 4.0 XML Metadata Interchange (XMI) configuration file to process. This parameter is optional because the program uses the `config\server-cfg.xml` file by default.

This parameter is ignored when migrating from V5.0.x, including WebSphere Application Server-Express, V5.



When migrating a configuration that uses anything other than the default `server-cfg.xml` file name, you must use the `-import` option along with the path to the non-default XML configuration file in the directory created by the WASPreUpgrade tool.

This parameter is equivalent to the `-W previousVersionPanelBean.selectedVersionConfigFile="/opt/WebSphere/AppServer/config/server-cfg.xml"` parameter in the silent installation options response file.

**-nodeName** *node\_name*

An optional parameter to specify the node name for the program to update. If not specified, the program inspects the configuration for node names. When one node name exists, the program uses it. Otherwise, the program returns an error.

This parameter is equivalent to the `-W nodeNameBean.nodeName="nodenameManager"` parameter in the silent installation options response file for the Network Deployment product. No equivalent parameter is available in the silent installation options response file for the base product.

**-portBlock** *port\_starting\_number*

An optional parameter used to specify the starting value to use when creating ports.

No equivalent parameter is available in the silent installation options response file.

**5.1 + -replacePorts true | false**

An optional parameter used to define how to migrate virtual host and server transport ports. The default is `false`, to not replace default port definitions. By default the migration adds configuration data from the previous version to the existing data in the V5.1.x configuration. In some cases existing port definitions from the earlier release were carefully set to avoid port conflicts with other products. In such cases, it is likely that you would want to migrate the settings into V5.1.x. Use the `-replacePorts` parameter to totally replace settings in the V5.1.x environment with the settings from the previous version. Select `true` to replace all virtual host alias port settings during migration. If migrating from V5.0.x or later, transport settings in existing servers are replaced by the settings from the previous version.

**-serverName** *server\_name*

An optional parameter to specify the server name for the program to update. If not specified, the program inspects the configuration for server names. When one server name exists, with an Application Server name that matches, the program uses it. Otherwise, the program creates a new server.

**-substitute** *key1=value1;key2=value2;...*

Optional argument passed to the XMLConfig tool. Specify values for security variables to substitute (for example, `-substitute "NODE_NAME=admin_node;APP_SERVER=default_server"`).

In the input XML data file, each key appears as `$key$` for substitution. This argument substitutes any occurrence of `$NODE_NAME$` with `admin_node` and `$APP_SERVER$` with `default_server` in the input XML file.

If the substitution string contains semicolons, use `$semiColon$` to distinguish the string from the `;` delimiter. On Linux and UNIX-based platforms, add an escape character to each dollar sign (\$) within the substitution string (for example, `\$semiColon\$`).

This parameter is applicable for configurations saved from Advanced Edition, Versions 3.5.x and 4.0.x.

No equivalent parameter is available in the silent installation options response file.

**-traceString** *trace\_spec* **-traceFile** *file\_name*

An optional parameters to gather trace information for IBM Service personnel. Specify a trace specification of `"*=all=enabled"` (with quotation marks) to gather all trace information.

No equivalent parameter is available in the silent installation options response file.

**-webModuleAdditionalClasspath** *classpath*

An optional parameter to specify the path or the path and file names of specific directories or files that

you do not want copied into the Web archive (WAR) file. Instead, the program adds the paths and the files to the Web Module extension (`ibm-web-ext.xml`) `additionalClassPath` attribute. This parameter is applicable only when migrating a Version 3.5.x installation.

No equivalent parameter is available in the silent installation options response file.

## Logging

The `WASPostUpgrade` tool displays status to the screen while running. This tool also saves a more extensive set of logging information in the `logs` directory. You can view the `WASPostUpgrade.log` file with a text editor.

## Migrating from V3.5.x Standard Edition or Advanced Edition, or from V4.0.x Advanced Edition

The following example specifies a backup directory named `backupDirectory`, and identifies the root of the existing installation as `d:\WebSphere\AppServer`.

```
WASPreUpgrade backupDirectory d:\WebSphere\AppServer yourNodeName
```

## Migrating from V4.0.x Advanced Single Server Edition with multiple backup directories

This example shows how to migrate separate configuration files incrementally from a single node with a single installation of WebSphere Application Server Advanced Single Server Edition. To migrate more than one configuration file, you must run the `WASPreUpgrade` tool multiple times to multiple backup directories because not all of the applications are in the same `installedApps` directory. For this reason, using a single backup directory for all the runs of the `WASPreUpgrade` tool is not recommended. Use a separate backup directory for each run. The intent of this example is to show how to migrate a single node with multiple configuration files.

1. Run the following `WASPreUpgrade` commands to migrate applications A, B, C, D, and E, which reside in three separate application directories. Server assumptions include:
  - The Application Server uses the `server-cfg.xml` default configuration file, as well as the `myServer1-cfg.xml` and the `OldServer-cfg.xml` files.

```
> WASPreUpgrade "C:\WAS4ABBACKUP" G:\WebSphere\AppServer
> WASPreUpgrade "C:\WAS4CDBACKUP" G:\WebSphere\AppServer
  -import G:\WebSphere\AppServer\config\myServer1-cfg.xml
> WASPreUpgrade "C:\WAS4EBACKUP" G:\WebSphere\AppServer
  -import G:\WebSphere\AppServer\config\OldServer-cfg.xml
```
2. Run the following `WASPostUpgrade` commands to restore the applications and configurations to the Version 5.1 Application Server:

```
> WASPostUpgrade C:\WAS4ABBACKUP
> WASPostUpgrade "C:\WAS4CDBACKUP" -import "C:\WAS4CDBACKUP\myServer1-cfg.xml"
> WASPostUpgrade "C:\WAS4EBACKUP" -import "C:\WAS4EBACKUP\OldServer-cfg.xml"
```

## Migrating from V5.0.0 or V5.0.1 with the embedded messaging feature **5.1+**

This example shows how to migrate a single instance of base WebSphere Application Server, V5.0.0. Verify that you have stopped all Java processes related to the WebSphere Application Server product that you are migrating. Run the `WASPreUpgrade` tool against the `installedApps` directory.

1. Run the following `WASPreUpgrade.bat` command to migrate all applications in the `installedApps` directory of the V5.0.0 Application Server, which has an installation root of `C:\Program Files\WebSphere\AppServer`.

```
> WASPreUpgrade "C:\WAS500BACKUP" C:\Program Files\WebSphere\AppServer
```
2. Run the following `WASPostUpgrade` commands to restore the applications and configurations to the Version 5 Application Server:

```
> WASPostUpgrade "C:\WAS500BACKUP"
```

## Coexistence support

*Coexistence*, as it applies to WebSphere Application Server products, is the ability of multiple installations of WebSphere Application Server to run on the same machine at the same time. Multiple installations include multiple versions and multiple instances of one version. Coexistence also implies various combinations of Web server interaction.

Version 5.x WebSphere Application Server products can coexist with the following supported versions. The installation wizard looks for these existing installations to determine if it should prompt for coexistence information:

- IBM WebSphere Application Server Standard Edition and Advanced Edition, Version 3.5.5 and up
- IBM WebSphere Application Server Advanced Server Single Edition and Advanced Edition, Version 4.0.2 and later
- IBM WebSphere Business Integration Server Foundation Edition, Version 4.1 and later
- IBM WebSphere Application Server, Version 5.0.0 and later
- IBM WebSphere Application Server Network Deployment, Version 5.0.0 and later
- IBM WebSphere Application Server Enterprise, Version 5.0.0 and later
- IBM WebSphere Application Server, Version 5.1.0
- IBM WebSphere Application Server Network Deployment, Version 5.1.0

All combinations of V3.5.x products, V4.x products, and V5.x products can coexist so long as there are no port conflicts. There are some coexistence limitations for V5 products that have the embedded messaging feature installed, as described later. These limitations are described as *No EM* in the following description.

V3.5.5 and later and V4.0.2 and later can coexist with the Version 5.1 WebSphere Application Server clients:

Table 70. Multiversion WebSphere Application Server clients coexistence scenarios

| Installed product                                                                        | WebSphere Application Server clients, V5.1 |
|------------------------------------------------------------------------------------------|--------------------------------------------|
| IBM WebSphere Application Server Standard Edition, Version 3.5.5 and later               | No EM                                      |
| IBM WebSphere Application Server Advanced Edition, Version 3.5.5 and later               | No EM                                      |
| IBM WebSphere Application Server Advanced Single Server Edition, Version 4.0.2 and later | No EM                                      |
| IBM WebSphere Application Server Advanced Edition, Version 4.0.2 and later               | No EM                                      |
| IBM WebSphere Business Integration Server Foundation Edition, Version 4.1 and later      | No EM                                      |
| IBM WebSphere Application Server, Version 5.0.0                                          | No EM                                      |
| IBM WebSphere Application Server Network Deployment, Version 5.0.0                       | No EM                                      |
| IBM WebSphere Business Integration Server Foundation, Version 5.0.0                      | No EM                                      |
| IBM WebSphere Application Server, Version 5.0.1                                          | No EM                                      |
| IBM WebSphere Application Server Network Deployment, Version 5.0.1                       | No EM                                      |
| IBM WebSphere Business Integration Server Foundation, Version 5.0.1                      | No EM                                      |
| IBM WebSphere Application Server, Version 5.0.2                                          | Supported                                  |
| IBM WebSphere Application Server Network Deployment, Version 5.0.2                       | Supported                                  |

Table 70. Multiversion WebSphere Application Server clients coexistence scenarios (continued)

| Installed product                                                   | WebSphere Application Server clients, V5.1 |
|---------------------------------------------------------------------|--------------------------------------------|
| IBM WebSphere Business Integration Server Foundation, Version 5.0.2 | Supported                                  |
| IBM WebSphere Application Server clients, Version 5.0.2             | Not supported                              |
| IBM WebSphere Application Server, Version 5.1                       | Supported                                  |
| IBM WebSphere Application Server Network Deployment, Version 5.1    | Supported                                  |

**5.1+** V3.5.5 and later products and V4.0.2 and later products can coexist with V5.1 of the base product.

**5.1+** V3.5.5 and later products and V4.0.2 and later products can coexist with V5.x products:

Table 71. Multiversion coexistence scenarios

| Installed product                               | V5.0.0 and V5.0.1  |                    |            | V5.0.2 and V5.1    |                    |                   |
|-------------------------------------------------|--------------------|--------------------|------------|--------------------|--------------------|-------------------|
|                                                 | Application Server | Network Deployment | Enterprise | Application Server | Network Deployment | Enterprise V5.0.2 |
| Standard Edition V3.5.5 and later               | Supported          | Supported          | Supported  | Supported          | Supported          | Supported         |
| Advanced Edition V3.5.5 and later               | Supported          | Supported          | Supported  | Supported          | Supported          | Supported         |
| Advanced Single Server Edition V4.0.2 and later | Supported          | Supported          | Supported  | Supported          | Supported          | Supported         |
| Advanced Edition V4.0.2 and later               | Supported          | Supported          | Supported  | Supported          | Supported          | Supported         |
| Enterprise Edition V4.1 and later               | Supported          | Supported          | Supported  | Supported          | Supported          | Supported         |
| WebSphere Application Server clients V4.0.x     | No EM              | No EM              | No EM      | No EM              | No EM              | No EM             |
| Application Server, V5.0.0                      | Supported          | Supported          | Supported  | No EM              | No EM              | No EM             |
| Network Deployment V5.0.0                       | Supported          | Supported          | Supported  | No EM              | No EM              | No EM             |
| Enterprise, V5.0.0                              | Supported          | Supported          | Supported  | No EM              | No EM              | No EM             |
| WebSphere Application Server clients V5.0.0     | Supported          | Supported          | Supported  | No EM              | No EM              | No EM             |
| Application Server V5.0.1                       | Supported          | Supported          | Supported  | No EM              | No EM              | No EM             |
| Network Deployment V5.0.1                       | Supported          | Supported          | Supported  | No EM              | No EM              | No EM             |
| Enterprise V5.0.1                               | Supported          | Supported          | Supported  | No EM              | No EM              | No EM             |
| WebSphere Application Server clients V5.0.1     | Supported          | Supported          | Supported  | No EM              | No EM              | No EM             |

Table 71. Multiversion coexistence scenarios (continued)

| Installed product                           | V5.0.0 and V5.0.1  |                    |            | V5.0.2 and V5.1    |                    |                   |
|---------------------------------------------|--------------------|--------------------|------------|--------------------|--------------------|-------------------|
|                                             | Application Server | Network Deployment | Enterprise | Application Server | Network Deployment | Enterprise V5.0.2 |
| Application Server V5.0.2                   | No EM              | No EM              | No EM      | Supported          | Supported          | Supported         |
| Network Deployment V5.0.2                   | No EM              | No EM              | No EM      | Supported          | Supported          | Supported         |
| Enterprise V5.0.2                           | No EM              | No EM              | No EM      | Supported          | Supported          | Supported         |
| WebSphere Application Server clients V5.0.2 | No EM              | No EM              | No EM      | Supported          | Supported          | Supported         |
| Application Server V5.1                     | No EM              | No EM              | No EM      | Supported          | Supported          | Supported         |
| Network Deployment V5.1                     | No EM              | No EM              | No EM      | Supported          | Supported          | Supported         |
| WebSphere Application Server clients V5.1   | No EM              | No EM              | No EM      | Supported          | Supported          | Supported         |

**5.1+ No EM:** This status in the preceding tables describes an incompatibility between the embedded messaging features in different levels of Version 5. Version 5.0.0 and V5.0.1 support the embedded messaging feature at a service level less than CSD04, which is what V5.0.2 and V5.1 support. Because all V5 instances that coexist on a machine must use the same level of embedded messaging, there is a coexistence problem when two V5 instances use different levels of embedded messaging. If you want V5.0.0 to coexist with V5.1, for example, upgrade V5.0.0 to V5.0.2 by applying Fix Pack 2. See *Upgrading V5.0.0 or V5.0.1 to V5.0.2*.

In addition to multiversion coexistence, WebSphere Application Server also lets you install multiple times on one machine (multiple installation instances), or install once and have multiple configurations (multiple configuration instances).

Multiple Version 5 instances on one machine include:

- Multiple Application Server instances from multiple installations of the base WebSphere Application Server product
- Multiple Application Server configuration instances from a single installation of the base product
- Multiple deployment manager instances from multiple installations of the Network Deployment product
- Multiple deployment manager configuration instances from a single installation of the Network Deployment product

## Setting up Version 3.5.x and Version 5 coexistence

You must migrate prerequisite and corequisite programs to the levels required by WebSphere Application Server, Version 5. You must also identify ports in use in Version 3.5.x before you begin the Version 5 installation, to avoid possible conflicts during coexistence. The first two steps in this task describe these activities.

You can install WebSphere Application Server Version 3.5.5 (and later) and Version 5 on the same node. When the Version 5 installation wizard detects the Version 3.5.x installation, it displays the migration and coexistence panel, where you can select either option, or neither option. If you select coexistence, the installation wizard displays the port number panel, to ensure you install Version 5 without port conflicts.

Silent installation also supports configuring for coexistence silently. You can specify non-conflicting port assignments in the options response file.

By default, there are port conflicts between Version 3.5.x and Version 5 that you must resolve. Also, if you migrate more than two Version 3.5.5 nodes to Version 5, there are port conflicts that you must resolve, as described in the *Setting up Version 5 coexistence* topic.

1. Migrate prerequisite and corequisite programs to the levels required by WebSphere Application Server, Version 5.

Refer to the IBM WebSphere Application Server supported hardware, software, and APIs site for current requirements.

2. Resolve port conflicts.

Refer to the “Port number settings in WebSphere Application Server versions” on page 372 topic to see a list of default port numbers, and where they are defined.

Inspect the configuration of the Version 3.5.x product, either WebSphere Application Server Advanced Edition, or WebSphere Application Server Standard Edition.

If necessary, use the following command to examine existing node and port settings when the administrative server is running.

```
xmlConfig -export config.xml -nodeName theNodeName
```

Review the output xml file to look for `<node action="update" name="nodename">` to determine the node name. You can also find port number assignments in the output.xml file. The installation wizard displays a default set of coexistence port numbers as suggested Version 5 port numbers. Change the values to ports that are not in use. The installation wizard uses whatever values you approve.

Change conflicting HTTP transport ports manually, if necessary. See “Changing HTTP transport ports” on page 230.

3. Associate a Web server with each WebSphere Application Server:
  - Use a separate Web server for each WebSphere Application Server.
    - a. Create a Web server instance using the Web server documentation.
    - b. Select the appropriate Web server plug-in feature during WebSphere Application Server installation, and identify the Web server configuration file location. (For example, identify the location of the `httpd.conf` file for IBM HTTP Server.)
  - Use the same Web server for both WebSphere Application Server versions.

Upgrade the Web server to the common level supported by both versions of the Application Server. Prepare the same Web server to support both Application Server versions:

    - Migrate IBM HTTP Server.
    - Migrate Sun Java System Web Server (formerly the Sun ONE Web Server and the iPlanet Web Server).
    - Migrate Lotus Domino.
    - Migrate Microsoft IIS.

4. Fix any problems with environmental variables on Windows platforms.

For example, installing WebSphere Application Server, Version 5 updates the system variable `PATH`, potentially affecting tools with the same name across installations. To run tools with conflicting names, alter the `PATH` environment variable in a command window and place the directory for the former installation before the directory for the latter installation. For example, `PATH=E:\WebSphere\AppServer\35\bin;%PATH%`. Then, invoke the tools from the `bin` directory.

## Setting up Version 4.0.x and Version 5.x coexistence

You must migrate prerequisite and corequisite programs to the levels required by WebSphere Application Server, Version 5.x. You must also identify ports in use in Version 4.0.x before you begin the Version 5.x installation, to avoid possible conflicts during coexistence. The first two steps in this task describe these activities.



You can install WebSphere Application Server Version 4.0.x and Version 5 on the same node. When the Version 5 installation wizard detects the Version 4.0.x installation, it displays the migration and coexistence panel, where you can select either option, both options, or neither option. If you select coexistence, the installation wizard displays the coexistence panel to ensure you install Version 5 without port conflicts.

Silent installation also supports configuring for coexistence silently. You can specify non-conflicting port assignments in the options response file, as described in “Installing silently” on page 190.

By default, there are port conflicts between Version 4.0.x and Version 5 that you must resolve. Also, if you migrate more than two Version 4.0.x nodes to Version 5, there are port conflicts that you must resolve, as described in the *Setting up Version 5 coexistence* topic.

1. Migrate prerequisite and corequisite programs to the levels required by WebSphere Application Server, Version 5.

Refer to the IBM WebSphere Application Server supported hardware, software, and APIs site for current requirements.

2. Resolve port conflicts.

Refer to the Port number settings in WebSphere Application Server versions topic to see a list of default port numbers, and where they are defined.

Inspect the configuration of the previous version:

- **For WebSphere Application Server Advanced Single Server Edition, Version 4.0.x:** Inspect the `server-cfg.xml` file to get port values for the configuration.
- **For WebSphere Application Server Advanced Edition, Version 4.0.x:** Inspect the `admin.config` file to get port values for the configuration. When the administrative server is running, use this command:

```
xmlConfig -export config.xml -nodeName theNodeName
```

Review the `config.xml` file to look for `<node action="update" name="nodename">` to find the appropriate node and port number assignments in the file. The installation wizard displays a default set of coexistence port numbers as suggested Version 5 port numbers. Change the values to ports that are not in use. The installation wizard uses whatever values you approve.

Change conflicting HTTP transport ports manually, if necessary.

3. Associate a Web server with each WebSphere Application Server.

- Use a separate Web server for each WebSphere Application Server.
  - a. Create a Web server instance using the Web server documentation.
  - b. Select the appropriate Web Server plug-in feature during WebSphere Application Server installation, and identify the Web server configuration file location. (For example, identify the location of the `httpd.conf` file for IBM HTTP Server.)
- Use the same Web server for both WebSphere Application Server versions.

To use the same Web server for both Application Server versions, you must first upgrade the Web server to the common level supported by both versions of the application server.

Follow this procedure to use the same Web server for both WebSphere Application Server versions.

- a. Select the appropriate Web Server plug-in feature during WebSphere Application Server installation, and identify the Web server configuration file location. (For example, identify the location of the `httpd.conf` file for the IBM HTTP Server that is associated with Version 4.0.x.)
  - b. Edit the Web server configuration file to remove entries for Version 4.0.x, as described in “Migrating plug-ins, one machine at a time” on page 380. The WebSphere Application Server, Version 5 plug-in acts as the routing agent to route requests to both versions.
  - c. Generate the plug-in configuration files for both versions of the Application Server.
  - d. Replace the original `plugin-cfg.xml` file of the Version 5 installation with the master file.
4. Fix any problems with environmental variables on Windows platforms. For example, installing WebSphere Application Server, Version 5.1 updates the system variable `PATH`, potentially affecting tools with the same name across installations. To run tools with conflicting names, alter the `PATH`

environment variable in a command window and place the directory for the former installation before the directory for the latter installation. For example, `PATH=E:\WebSphere\AppServer\40\bin;%PATH%`. Then, invoke the tools from the `bin` directory.

## Setting up Version 5 coexistence

This task describes how to install a Version 5.1 product to coexist with another installation instance of Version 5.1 or Version 5.0.x.

After installing the WebSphere Application Server product, you can install it again on the same machine.

Select the new installation option from the installation wizard panel, to install a new instance instead of adding features to the last installation, and to install into a separate installation directory. Select the coexistence option to provide nonconflicting ports.

Each installation of the base product is a stand-alone Application Server (`server1`) with its own set of unique configuration files.

Be aware of multiple instance limitations:

- If you attempt to install V5.0.2 or V5.1 when V5.0.0 or V5.0.1 with the embedded messaging feature is already on the machine, you cannot select the embedded messaging feature. An incompatibility exists between the service level versions of embedded messaging. The level of embedded messaging for V5.0.0 and V5.0.1 differs from the level supported on V5.0.2 and V5.1. Upgrade the V5.0.0 or V5.0.1 node to V5.0.2 before installing another instance of V5.0.2 or V5.1.
- If you install more than one instance, the most recent installation is the only one in the operating system registry.
- If you install more than two instances, the third and subsequent installations require that you change all port numbers on the coexistence panel, to avoid potential conflicts.
- To uninstall a registered product instance, always use the operating system remove program function, such as the Add/Remove Program utility on Windows platforms. To uninstall an unregistered instance, use the **Uninstall.exe** or **uninstall** command in the `install_root/_uninstall` directory that matches the instance you intend to remove.

Reasons to use multiple installation instances include:

- You can achieve complete isolation between each WebSphere Application Server instance. You can uninstall one instance independently of the others.
- You can install the base WebSphere Application Server more than once on the same machine.
- **5.1+** You can install the base V5.0.x and V5.1 WebSphere Application Server on the same machine although you must consider the limitation regarding the embedded messaging feature.

Reasons to not use multiple installation instances include:

- The machine might have a hard disk space constraint.
- You can use the operating system registry to locate the last installed instance of a WebSphere Application Server product only.

When you install any product a second time, the last installation is the one that appears in the registry.

- Uninstalling the last instance removes any record of the product in the registry.

Suppose you have installed three instances of the base WebSphere Application Server product. You use the remove program function of the operating system to uninstall the registered third copy of the base product. A registry record no longer exists that indicates the existence of the other two installation instances. Other applications cannot use a query of the operating system registry to detect the presence of either base WebSphere Application Server product instance.

The Creating multiple Version 5 configuration instances topic describes installing the base WebSphere Application Server product once and creating multiple configuration instances.

Use the following procedure to install multiple installation instances.

1. Upgrade V5.0.0 or V5.0.1 with embedded messaging to V5.0.2.
2. Use the installation wizard to install another installation. If you intend to share a single Web server among installations, install a Web server plug-in feature during one installation only, as described in the next step.
3. Share a Web server among multiple installation instances.
  - a. Select a Web server plug-in feature during one installation only.
  - b. Generate the plug-in configuration files for every installation instance.
  - c. Edit the `plugin-cfg.xml` configuration files to merge them into one master configuration.
  - d. Replace the original `plugin-cfg.xml` file with the master file on the Application Server where you selected the Web server plug-in feature.

You can access samples from only one of the installation instances.

4. Create additional servers in a multiple instance or coexistence environment.
5. Change port assignments in configuration files if you have a node that you cannot start because of port conflicts.

### Upgrading a Version 5.0.0 or Version 5.0.1 product to Version 5.0.2

Install Fix Pack 2 from the Support site for WebSphere Application Server, to upgrade Version 5.0.0 or Version 5.0.1 to Version 5.0.2. Upgrading to Version 5.0.2 also upgrades the service level of the embedded messaging feature to CSD04. This upgrade is important for migrating to Version 5.1, and also for coexisting with Version 5.0.2 and Version 5.1 instances. Version 5.0.0 and Version 5.0.1 cannot coexist with Version 5.0.2 and Version 5.1 when the embedded messaging feature is installed.

Apply Fix Pack 2 to the Application Server, to upgrade the service level of the embedded messaging feature.

Fix packs are available on the Support site for WebSphere Application Server. Download all of the ZIP files for Fix Pack 2 that you require. A separate ZIP file is available for the client and for each WebSphere Application Server product.

1. Locate the download page for Fix Pack 2 on the Support site. See WebSphere Application Server Version 5.0 Fix Pack 2 (Version 5.0.2) at <http://www-1.ibm.com/support/docview.wss?rs=860&context=SW600&q=Fix+Pack+2&uid=swg24005012> for information about applying Fix Pack 2.
2. Download the ZIP files for Fix Pack 2 to a read/write directory. Installing from a read-only directory is not supported at this time. The directory must have no spaces in its name.
3. Unzip the file into the directory. In addition to Fix Pack 2, the ZIP file also contains the update installer program, which you use to install the Fix Pack. The update installer program is also known as the `updateInstaller` program or the update installation wizard.
4. Use the update installer to install Fix Pack 2, as described in “Installing interim fixes, cumulative fixes, and fix packs” on page 230. Use either the wizard interface, with the **updateWizard** command, or its silent, command-line interface, with the **updateSilent** command.
5. Refer to the readme file for Fix Pack 2 to continue. The readme file is included in the ZIP file for the fix pack. There is also another readme file for update installer.

The download page for Fix Pack 2 at the Support site contains the most current version of the readme files, which you can download separately from the ZIP files for Fix Pack 2.

You can upgrade V5.0.0 or V5.0.1 to V5.0.2 by installing Fix Pack 2.

## Port number settings in WebSphere Application Server versions

This topic provides reference information about identifying port numbers in versions of WebSphere Application Server, as a means of determining port conflicts that might occur when you intend for an earlier version to coexist or interoperate with Version 5.1.

### Version 3.5.x port numbers

Resolve port conflicts by inspecting the configuration of the Version 3.5.x product, either WebSphere Application Server Advanced Edition or WebSphere Application Server Standard Edition. When the administrative server is running, use this command to examine current node and port settings:

```
xmlConfig -export config.xml -nodeName theNodeName
```

Look for the OSE Remote port assignments.

Table 72. WebSphere Application Server Version 3.5.x default port definitions in the admin.config file

| Port name                         | Standard Edition | Advanced Edition |
|-----------------------------------|------------------|------------------|
|                                   | Value            |                  |
| Isdport (Location Service Daemon) | 9000             | 9000             |
| bootstrapPort                     | 900              | 900              |
| LSDSSL (With security on)         | 9001             | 9001             |

### Version 4.0.x port numbers

**For WebSphere Application Server Advanced Single Server Edition, Version 4.0.x:** Inspect the server-cfg.xml file to find the Web container HTTP transports port values for the configuration.

**For WebSphere Application Server Advanced Edition, Version 4.0.x:** When the administrative server is running, use this command to extract the configuration from the database:

```
xmlConfig -export config.xml -nodeName theNodeName
```

Look for the Web container HTTP transports port assignments.

Table 73. Port definitions for WebSphere Application Server V4.0.x

| Port name                         | Value | Advanced Edition | EnterpriseEdition | Advanced Single Server Edition |
|-----------------------------------|-------|------------------|-------------------|--------------------------------|
|                                   |       | File             |                   |                                |
| bootstrapPort                     | 900   |                  |                   |                                |
| IsdPort                           | 9000  | admin.config     | admin.config      |                                |
| LSDSSLPort                        | 9001  |                  |                   |                                |
| HTTP transport port               | 9080  |                  |                   |                                |
| HTTPS transport port              | 9443  |                  |                   | server-cfg.xml                 |
| Admin Console HTTP transport port | 9090  | database         | database          |                                |
| ObjectLevelTrace                  | 2102  |                  |                   |                                |
| diagThreadPort                    | 7000  |                  |                   |                                |

### Version 5.x port numbers

You can use the administrative console to configure the Version 5.x Application Server, to resolve conflicting ports.

Table 74. Port definitions for WebSphere Application Server Version 5.x

| Port name                                               | WebSphere Application Server |                                                                              |
|---------------------------------------------------------|------------------------------|------------------------------------------------------------------------------|
|                                                         | Value                        | File                                                                         |
| HTTP_TRANSPORT                                          | 9080                         |                                                                              |
| HTTPS Transport Port (HTTPS_TRANSPORT)                  | 9443                         |                                                                              |
| HTTP Admin Console Port (HTTP_TRANSPORT_ADMIN)          | 9090                         | server.xml and virtualhosts.xml                                              |
| HTTPS Admin Console Secure Port (HTTPS_TRANSPORT_ADMIN) | 9043                         |                                                                              |
| Internal JMS Server (JMSSERVER_SECURITY_PORT)           | 5557                         | server.xml                                                                   |
| JMSSERVER_QUEUED_ADDRESS                                | 5558                         | serverindex.xml                                                              |
| JMSSERVER_DIRECT_ADDRESS                                | 5559                         |                                                                              |
| BOOTSTRAP_ADDRESS                                       | 2809                         | serverindex.xml                                                              |
| SOAP_CONNECTOR_ADDRESS                                  | 8880                         | serverindex.xml                                                              |
| SAS_SSL_SERVERAUTH_LISTENER_ADDRESS                     | 0                            | serverindex.xml                                                              |
| CSIV2_SSL_SERVERAUTH_LISTENER_ADDRESS                   | 0                            | serverindex.xml                                                              |
| CSIV2_SSL_MUTUALAUTH_LISTENER_ADDRESS                   | 0                            |                                                                              |
| ORB_LISTENER_ADDRESS                                    | 0                            | serverindex.xml                                                              |
| IBM HTTP Server Port                                    | 80                           | virtualhosts.xml, plugin-cfg.xml, and <i>IHSinstall_root/conf/httpd.conf</i> |
| IBM HTTP Server Admin Port                              | 8008                         | <i>IHSinstall_root/conf/admin.conf</i>                                       |

## Default coexistence settings for port numbers

This topic provides reference information for identifying port numbers in WebSphere Application Server, Version 5.x in coexistence mode.

You must verify that you are using ports that do not conflict with other products and programs running on your node. These ports are the default coexistence ports. You can display the default coexistence ports when the installation wizard detects a previous installation of Application Server and displays the check box for selecting coexistence ports. Select the check box to show the ports. Change the ports to avoid conflicts.

You can also force the installation wizard to display the coexistence ports by using the following parameter on the installation command. The example shows the installation command for Linux and UNIX-based systems. You can find the commands for supported operating systems in "Installing the product" on page 45.

You can also force the appearance of the coexistence panel to change conflicting port number assignments. For example, the AIX WebSM system management server listens on port 9090 by default. To avoid a conflict with the administrative console port (HTTP\_TRANSPORT\_ADMIN) assignment, which is also 9090 by default, force the coexistence panel to appear using this command:

```
./install -W coexistenceOptionsBean.showCoexistence="true"
```

### Default port numbers for coexistence for Version V5.1

After installing a product with the port numbers that you select on the coexistence panel (or in the response file for a silent installation), you can use the administrative console to configure port numbers and resolve conflicting ports.

Table 75. Default port settings for coexistence for V5.1

| Port name                                               | WebSphere Application Server | File                                                                         |
|---------------------------------------------------------|------------------------------|------------------------------------------------------------------------------|
|                                                         | Value                        |                                                                              |
| HTTP_TRANSPORT                                          | 9085                         |                                                                              |
| HTTPS Transport Port (HTTPS_TRANSPORT)                  | 9444                         |                                                                              |
| HTTP Admin Console Port (HTTP_TRANSPORT_ADMIN)          | 9091                         | server.xmlvirtualhosts.xml                                                   |
| HTTPS Admin Console Secure Port (HTTPS_TRANSPORT_ADMIN) | 9044                         |                                                                              |
| Internal JMS Server (JMSSERVER_SECURITY_PORT)           | 5567                         | server.xml                                                                   |
| JMSSERVER_QUEUED_ADDRESS                                | 5568                         | serverindex.xml                                                              |
| JMSSERVER_DIRECT_ADDRESS                                | 5569                         |                                                                              |
| BOOTSTRAP_ADDRESS                                       | 2810                         | serverindex.xml                                                              |
| SOAP_CONNECTOR_ADDRESS                                  | 8881                         | serverindex.xml                                                              |
| SAS_SSL_SERVERAUTH_LISTENER_ADDRESS                     | 0                            | serverindex.xml                                                              |
| CSIV2_SSL_SERVERAUTH_LISTENER_ADDRESS                   | 0                            | serverindex.xml                                                              |
| CSIV2_SSL_MUTUALAUTH_LISTENER_ADDRESS                   | 0                            |                                                                              |
| ORB_LISTENER_ADDRESS                                    | 9109                         | serverindex.xml                                                              |
| IBM HTTP Server Port                                    | 81                           | virtualhosts.xml, plugin-cfg.xml, and <i>IHSinstall_root/conf/httpd.conf</i> |
| IBM HTTP Server Admin Port                              | 8009                         | <i>IHSinstall_root/conf/admin.conf</i>                                       |

### Detailed definitions of coexistence ports

Use the tables as a reference for finding information about the ports that appear on the coexistence panel of the installation wizard.

| Port names, default value, and description                                                                                                                                                                                                                                                                                                                                                                                                             | Value |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| <ul style="list-style-type: none"> <li>Field name in the installation wizard: <b>HTTP Transport Port</b></li> <li>Field name in the base WebSphere Application Server server.xml configuration file: HTTPTransport_1 EndPoint_1</li> <li>virtualhosts.xml: HostAlias_1</li> <li>Field name in the silent installation response file: coexistencePanelBean.httpTransportPort</li> <li>Base WebSphere Application Server, default value: 9080</li> </ul> | 9085  |

| Port names, default value, and description                                                                                                                                                                                                                                                                                                                                                                                                               | Value |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| <ul style="list-style-type: none"> <li>Field name in the installation wizard: <b>HTTPS Transport Port</b></li> <li>Field name in the base WebSphere Application Server server.xml configuration file: HTTPTransport_2 EndPoint_2</li> <li>virtualhosts.xml: HostAlias_3</li> <li>Field name in the silent installation response file: coexistencePanelBean.httpsTransportPort</li> <li>Base WebSphere Application Server, default value: 9443</li> </ul> | 9444  |



| Port names, default value, and description                                                                                                                                                                                                                                                                                                                                                                                                                    | Value |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| <ul style="list-style-type: none"> <li>Field name in the installation wizard: <b>HTTP Admin Console Port</b></li> <li>Field name in the base WebSphere Application Server <code>server.xml</code> configuration file: HTTPTransport_3 EndPoint_3</li> <li><code>virtualhosts.xml</code>: HostAlias_4</li> <li>Field name in the silent installation response file: <code>coexistencePanelBean.adminConsolePort</code></li> <li>Default value: 9090</li> </ul> | 9091  |

| Port names, default value, and description                                                                                                                                                                                                                                                                                                                                                                                                                                  | Value |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| <ul style="list-style-type: none"> <li>Field name in the installation wizard: <b>HTTPS Admin Console Secure Port</b></li> <li>Field name in the base WebSphere Application Server <code>server.xml</code> configuration file: HTTPTransport_4 EndPoint_4</li> <li><code>virtualhosts.xml</code>: HostAlias_5</li> <li>Field name in the silent installation response file: <code>coexistencePanelBean.secureAdminConsolePort</code></li> <li>Default value: 9043</li> </ul> | 9044  |

| Port names, default value, and description                                                                                                                                                                                                                                                                                                                                                                                              | Value                   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| <ul style="list-style-type: none"> <li>Field name in the installation wizard: <b>Bootstrap port</b></li> <li>Field name in the base WebSphere Application Server <code>serverindex.xml</code> configuration file: BOOTSTRAP_ADDRESS EndPoint_1</li> <li>Field name in the silent installation response file: <code>coexistencePanelBean.bootstrapPort</code></li> <li>Base WebSphere Application Server, default value: 2809</li> </ul> | Base: 2810,<br>ND: 9917 |

You can use the connector type and port number parameters of certain commands to identify the bootstrap port number that you specify for the RMI connector address in a coexistence scenario. For example, to use the **wsadmin** command in a coexistence environment, you can specify either of the following commands:

```
wsadmin.bat/sh -conntype RMI -port portNumber
wsadmin.bat/sh -conntype SOAP -port portNumber
```

Alternatively, you can update the `wsadmin.properties` file located in the `install_root/properties` directory to contain the new port values. If you update this file, you do not need to specify the port parameter when using the `wsadmin` tool.

The SOAP connection type uses the SOAP connector address port number described next.

If you edit the `serverindex.xml` file, verify that the host name is the valid host name for the machine and not the generic `localhost` identifier.

| Port names, default value, and description                                                                                                                                                                                                                                                                                                                                                                                                                  | Value                   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| <ul style="list-style-type: none"> <li>Field name in the installation wizard: <b>SOAP Connector Address</b></li> <li>Field name in the base WebSphere Application Server <code>serverindex.xml</code> configuration file: SOAP_CONNECTOR-ADDRESS EndPoint_2</li> <li>Field name in the silent installation response file: <code>coexistencePanelBean.soapConnectorAddress</code></li> <li>Base WebSphere Application Server, default value: 8880</li> </ul> | Base: 8881,<br>ND: 8889 |

You can use the connector type and port number parameters of certain commands to identify the port number that you specify for the SOAP connector address in a coexistence scenario. For example, to use the **wsadmin** command in a coexistence environment, you can specify either of the following commands:

```
wsadmin.bat/sh -conntype RMI -port portNumber
wsadmin.bat/sh -conntype SOAP -port portNumber
```

Alternatively, you can update the `wsadmin.properties` file located in the `install_root/properties` directory to contain the new port values. If you update this file, you do not need to specify the port parameter when using the `wsadmin` tool.

The remote method invocation (RMI) connection type uses the bootstrap port number described previously.

| Port names, default value, and description                                                                                                                                                                                                                                                                                                                                                            | Value |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| <ul style="list-style-type: none"> <li>Field name in the installation wizard: <b>JMS server queued address</b></li> <li>Field name in the base WebSphere Application Server serverindex.xml configuration file: JMSSERVER_QUEUED_ADDRESS EndPoint_4</li> <li>Field name in the silent installation response file: coexistencePanelBean.jmsServerQueuedAddress</li> <li>Default value: 5558</li> </ul> | 5568  |

| Port names, default value, and description                                                                                                                                                                                                                                                                                                                                       | Value |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| <ul style="list-style-type: none"> <li>Field name in the installation wizard: <b>JMS server security port</b></li> <li>Field name in the base WebSphere Application Server server.xml configuration file: JMSserver_1 Address_3</li> <li>Field name in the silent installation response file: coexistencePanelBean.jmsServerSecurityPort</li> <li>Default value: 5557</li> </ul> | 5567  |

| Port names, default value, and description                                                                                                                                                                                                                                                                                                                                                            | Value |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| <ul style="list-style-type: none"> <li>Field name in the installation wizard: <b>JMS Server Direct Address</b></li> <li>Field name in the base WebSphere Application Server serverindex.xml configuration file: JMSSERVER_DIRECT_ADDRESS EndPoint_5</li> <li>Field name in the silent installation response file: coexistencePanelBean.jmsServerDirectAddress</li> <li>Default value: 5559</li> </ul> | 5569  |

| Port names, default value, and description                                                                                                                                                                                                                                                                                                                                                                                                                                       | Value                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| <ul style="list-style-type: none"> <li>Field name in the installation wizard: <b>SAS SSL ServerAuth Address</b></li> <li>Field name in the serverindex.xml configuration file: SAS_SSL_SERVERAUTH_LISTENER_ADDRESS EndPoint_6</li> <li>Field name in the silent installation response file: coexistencePanelBean.sasSSLServerAuthAddr</li> <li>Base WebSphere Application Server, default value: 0; With security, assign your own non-conflicting value: <i>nnnn</i></li> </ul> | Base: 0, ND:<br>9819 |

Assign a coexistence port other than 0, which dynamically takes a free port. You must have a fixed port that clients can use to find the Secure Authentication Service (SAS) Secure Sockets Layer (SSL) ServerAuth address. No mechanism exists for clients to use to find a dynamically assigned port.

| Port names, default value, and description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Value                |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| <ul style="list-style-type: none"> <li>Field name in the installation wizard: <b>CSIV2 ServerAuth Listener Address</b></li> <li>Field name in the base WebSphere Application Server serverindex.xml configuration file: CSIV2_SSL_SERVERAUTH_LISTENER_ADDRESS EndPoint_7</li> <li>Field name in the silent installation response file: coexistencePanelBean.csivServerAuthListenerAddr</li> <li>Base WebSphere Application Server, default value: 0; With security, assign your own non-conflicting value: <i>nnnn</i></li> <li>Network Deployment, default value: 9403 but is not enabled until you enable security</li> </ul> | Base: 0, ND:<br>9502 |

Assign a coexistence port other than 0, which dynamically takes a free port. You must have a fixed port that clients can use to find the Common Secure Interoperability Specification, Version 2 (CSIV2) ServerAuth listener address. No mechanism exists for clients to use to find a dynamically assigned port.

| Port names, default value, and description                                                                                                                                                                           | Value        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| <ul style="list-style-type: none"> <li>Installation wizard name: <b>CSIV2 MultiAuth Listener Address</b></li> </ul>                                                                                                  | Base: 0, ND: |
| <ul style="list-style-type: none"> <li>Field name in the base WebSphere Application Server <code>serverindex.xml</code> configuration file: <code>CSIV2_SSL_MUTUALAUTH_LISTENER_ADDRESS EndPoint_8</code></li> </ul> | 9503         |
| <ul style="list-style-type: none"> <li>Field name in the silent installation response file: <code>coexistencePanelBean.csivMultiAuthListenerAddr</code></li> </ul>                                                   |              |
| <ul style="list-style-type: none"> <li>Base WebSphere Application Server, default value: 0; With security, assign your own non-conflicting value: <i>nnnn</i></li> </ul>                                             |              |
| <ul style="list-style-type: none"> <li>Network Deployment, default value: 9402 but you must enable security to enable this value</li> </ul>                                                                          |              |

Assign a coexistence port other than 0, which dynamically takes a free port. You must have a fixed port that clients can use to find the Common Secure Interoperability Specification, Version 2 (CSIV2) MultiAuth listener address. No mechanism exists for clients to use to find a dynamically assigned port.

| Port names, default value, and description                                                                                                                            | Value                       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|
| <ul style="list-style-type: none"> <li>Field name in the installation wizard: <b>ORB Listener Port</b></li> </ul>                                                     | Base: 9109, ND              |
| <ul style="list-style-type: none"> <li>Field name in the base WebSphere Application Server <code>serverindex.xml</code> configuration file: Not applicable</li> </ul> | V5.0.x: 9101,<br>ND V5.1.x: |
| <ul style="list-style-type: none"> <li>Field name in the silent installation response file: Not applicable - See note.</li> </ul>                                     | 9703                        |
| <ul style="list-style-type: none"> <li>Base WebSphere Application Server default value: Not applicable</li> </ul>                                                     |                             |

Setting the object request broker (ORB) listener port to a value of 0 or greater causes all object references in the name space to specify their connection to the server and not depend on the location service daemon (LSD) to redirect connections to the server. An `ORB_LISTENER_ADDRESS` value equal to 0 starts the server on any available port and does not use the LSD. A value greater than 0 starts the server on the specified port and does not use the LSD.

Set the ORB listener port after a silent installation of the Network Deployment product.

| Port names, default value, and description                                                                                                                             | Value |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| <ul style="list-style-type: none"> <li>Field name in the base WebSphere Application Server installation wizard: <b>IBM HTTP Server Port</b></li> </ul>                 | 81    |
| <ul style="list-style-type: none"> <li>Field name in the base WebSphere Application Server <code>virtualhosts.xml</code> file: <code>HostAlias_2</code></li> </ul>     |       |
| <ul style="list-style-type: none"> <li>Field name in the <code>plugin-cfg.xml</code> configuration file: <code>Virtual Host</code></li> </ul>                          |       |
| <ul style="list-style-type: none"> <li>Field name in the IBM HTTP Server <code>IHSinstall_root\conf\httpd.conf</code> configuration file: <code>Port</code></li> </ul> |       |
| <ul style="list-style-type: none"> <li>Default value: 80</li> </ul>                                                                                                    |       |
| <ul style="list-style-type: none"> <li>Field name in the silent installation response file option: <code>coexistencePanelBean.ihsPort</code></li> </ul>                |       |
| <ul style="list-style-type: none"> <li>Description: Port used to communicate with the IBM HTTP Server</li> </ul>                                                       |       |

| Port names, default value, and description                                                                                                                             | Value |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| <ul style="list-style-type: none"> <li>Field name in the base WebSphere Application Server installation wizard: <b>IBM HTTP Server Admin Port</b></li> </ul>           | 8009  |
| <ul style="list-style-type: none"> <li>Field name in the Network Deployment installation wizard: Not applicable</li> </ul>                                             |       |
| <ul style="list-style-type: none"> <li>Field name in the IBM HTTP Server <code>IHSinstall_root\conf\admin.conf</code> configuration file: <code>Port</code></li> </ul> |       |
| <ul style="list-style-type: none"> <li>Field name in the silent installation response file option: <code>coexistencePanelBean.ihsAdminPort</code></li> </ul>           |       |
| <ul style="list-style-type: none"> <li>Default value: 8008</li> </ul>                                                                                                  |       |
| <ul style="list-style-type: none"> <li>Description: Port used to communicate with the IBM HTTP administration server</li> </ul>                                        |       |

## Migrating Web server configurations

This topic describes what to do to migrate a Web server from supporting IBM WebSphere Application Server, Version 3.5.x, to support IBM WebSphere Application Server, Version 5.

If you install the Web server and Application Server on different machines, you must install the binary plug-in module and the `plugin-cfg.xml` configuration file on the same machine as the Web server, as described in step 1.

If you migrate from a V3.5.x plug-in, and your Web server uses open servlet engine (OSE) transport, you must switch to HTTP transport when migrating to V5. Step 2 describes two ways to migrate from OSE transport to HTTP transport:

- Migrate all WebSphere Application Server machines from V3.5.x to V5 at one time, and migrate the Web server plug-in to support V5 only.
  - Migrate some WebSphere Application Server machines from V3.5.x to V5, and migrate the Web server plug-in to support both versions of WebSphere Application Server at the same time.
1. Install the IBM HTTP Server, Version 1.3.2x and its plug-in, or a plug-in for another supported Web server from the product CD-ROM:

**5.1+** IBM HTTP Server, Version 1.3.28.x ships with WebSphere Application Server V5.1.

- Install the HTTP Server and its plug-in on the same machine as the WebSphere Application Server, by selecting **IBM HTTP Server** and its plug-in, or select the plug-in for another supported Web server, on the feature selection page of the installation wizard.
- Install the HTTP Server and its plug-in on a different machine from the WebSphere Application Server by following this procedure:
  - a. Insert the product CD-ROM labelled, **WebSphere Application Server, IBM HTTP Server**, into the machine.
  - b. Close the LaunchPad if it starts automatically.
  - c. Change directory to the IHS directory on the product CD-ROM.
  - d. Click the installation script for your platform, to install the IBM HTTP Server:
    - UNIX-based operating platforms: **InstallIHS.sh**
    - Windows platforms: **InstallIHS.bat**

This script installs the plug-in you need and makes the necessary configuration changes for the supported Web server.

IBM HTTP Server, Version 1.3.2x can coexist with earlier versions, or can upgrade V1.3.19 and later, to V1.3.2x. Upgrading relieves you from having to uninstall and reinstall the HTTP server. Install V1.3.2x into the same directory structure as V1.3.19 and later, to upgrade the earlier version. If you install the HTTP Server into a different directory, V1.3.2x coexists with the previous version. By default, the administration server and the Web Server use the same ports as the previous version, which causes a conflict. However, you can change the port assignments on the coexistence panel of the WebSphere Application Server installation wizard.

- Change the port number assignments for the new installation if you install into a separate directory. You can change port numbers on the coexistence panel. You can back track through the installation wizard and change the port settings if you have not already done so. Or, you can change the port settings after installation, in the `httpd.conf` file in the HTTP Server directory.
- Update the IBM HTTP Server `httpd.conf` configuration entries to remove entries for earlier WebSphere Application Server versions if you install into the same directory as an earlier version.

Both Version 4 and Version 5 of the WebSphere Application Server use the same HTTP transport plug-in binary module. If the Web server configuration file contains WebSphere Application Server V4.0.x plug-in information, you must manually remove it. Otherwise, when the HTTP Server attempts to start the second V5 plug-in binary module, there is an error. The error indicates that the module is already loaded.

The configuration file might contain duplicate entries for accessing WebSphere Application Server Samples. Remove any aliases for previous versions and retain the V5 entries:

```
V3.5.x installations
Alias /IBMWebAS/ "C:\WebSphere\AppServer35\web\"
```

```
V4.0.x installations:
Alias /IBMWebAS/ "C:\WebSphere\AppServer40\web\"
Alias /WSsamples "C:\WebSphere\AppServer40\WSsamples\"
```

```
V5 installation:
Alias /WSsamples "c:\Program Files\WebSphere\AppServer\WSsamples"
Alias /IBMWebAS/ "c:\Program Files\WebSphere\AppServer\web\"
```

2. Migrate plug-ins to work with IBM WebSphere Application Server, Version 5.

- Migrate a plug-in that supports an earlier version of WebSphere Application Server to support only V5.
- Migrate a plug-in that supports an earlier version of WebSphere Application Server to support both the earlier version and V5.

This migration path includes instructions for enabling Web servers to work with both V3.5.x and V5 at the same time, or V4.x and V5 at the same time. This lets you migrate applications from the V3.5.x or V4.x Application Server to the V5 Application Server, without changing the Web server.

You now understand what you must do to install or migrate a Web server and plug-in to work with WebSphere Application Server, including installing the Web server on the same machine with the Application Server, or on different machines.

To continue, return to one of these topics:

- Installing the product
- Migrating and coexisting

## Migrating plug-ins on all nodes at once

If you migrate all earlier versions of the WebSphere Application Server to Version 5 at the same time, you can migrate all plug-ins at the same time and update the Web server to use the new binary plug-in and `plugin-cfg.xml` file. Migrating plug-ins on all nodes simultaneously is easier than migrating nodes one at a time.

1. Ensure that the Web server installation is at the supported level.
 

If you are unsure of the level of the supported Web server product, see the prerequisites Web site, IBM WebSphere Application Server supported hardware, software, and APIs site.
2. Install the correct binary plug-in module and an initial `plugin-cfg.xml` file on the Web server node.
  - If the Web server and Application Server are installed on the same node and you select the appropriate Web server plug-in during Application Server installation, the installation wizard configures the Web server configuration file for you, by adding the current entries.
  - Otherwise, insert the WebSphere Application Server CD-ROM into the Web server machine.
    - To update IBM HTTP Server and its plug-in, close the LaunchPad, if it appears. Browse the disk to select the **InstallIHS.bat** or **InstallIHS.sh** command from the IHS directory in the `platform_root` of the CD. These programs update the Web server and the binary plug-in.
    - To install the correct plug-in for another supported Web server, launch the installation program and select the **Custom installation** type. Select only the necessary Web server plug-in feature for installation. This selection installs the binary plug-in module and the initial `plugin-cfg.xml` file, and makes necessary configuration changes for the Web server. The installation wizard does not delete the previous entries for the load module (binary file) and the plug-in configuration line. You must do this migration manually as described in the Preparing to install and configure a Web server topic.
3. Migrate the nodes from Version 3.5.x to Version 5, or from Version 4.x to Version 5.
 

Select the migration option during the installation procedure. Or, use the migration tools to migrate a Version 3.5.x or 4.x installation to an existing Version 5 installation.
4. Regenerate the plug-in configuration file, as described in Regenerating the Web server plug-in configuration file.
  - If the Web server and Application Server are running on the same node, further changes to the plug-in configuration file are probably not necessary.
  - Otherwise, configure the plug-in to make sure that the `hostname` attribute for the `transports` is set to the host name or IP address on which the Application Server is running, as described in Configuring Web server plug-ins.
5. Move the `plugin-cfg.xml` file to the correct location on the Web server, as described in Installing plug-ins to specific locations.

## Migrating plug-ins, one machine at a time

It is possible to run the Version 3.5.x Open Servlet Engine (OSE) plug-in and the Version 5 HTTP plug-in, in the same Web server installation. This ability lets a cluster of Version 3.5.x machines and a cluster of Version 5 machines coexist as you migrate machines one at a time from Version 3.5.x to Version 5. It is also possible to run the Version 4.x HTTP plug-in and the Version 5 plug-in in the same Web server installation.

The most direct way to migrate a supported Web server is to let the installation wizard automatically update the Web server configuration file, as you use the wizard to install the plug-in on the Web server machine. The installation wizard adds the current entries to the Web server configuration file but does not delete the previous entries for the earlier version. You must do this migration manually, as described in the “Preparing to install and configure a Web server” on page 27 topic.

Instructions for manual, incremental migration vary by Web server product and by platform as described below.

1. Edit the system path environment variable on Windows platforms, to add the directory that contains the plug-in binary files that you copied from the Application Server. Otherwise, the Web server plug-ins do not load.
2. Reboot the computer after you update the system path, if necessary.
3. Ensure that each machine in the routing rules for the plug-in has a unique URI.

For example, you cannot have `/servlet/*` defined in both the Version 3.5.x OSE properties file and the Version 5 `plug-in-cfg.xml` configuration file. When there is duplication, operating behavior is erratic.

4. Migrate the Web server configuration and binary plug-in to the version supported by Version 5 of WebSphere Application Server.

Select the appropriate link for specific information about migrating Web server plug-ins for both Version 3.5.x and Version 4.x:

- “Migrating IBM HTTP Server to support multiple WebSphere Application Server versions”
- “Migrating the Sun Java System Web Server to support multiple WebSphere Application Server versions” on page 382
- “Migrating Lotus Domino to support multiple WebSphere Application Server versions” on page 384
- “Migrating Microsoft Internet Information Services (IIS) to support multiple WebSphere Application Server versions” on page 387

Repeat this procedure for each Web server machine that you must migrate.

### ***Migrating IBM HTTP Server to support multiple WebSphere Application Server versions:***

The following procedure assumes that you installed WebSphere Application Server Versions 4.0.x and 5, or Versions 3.5.x and 5, and that you configured each WebSphere Application Server version for the IBM HTTP Server.

**Note:** This topic does not describe installing or configuring IBM HTTP Server powered by Apache 2.0.

The second step of the procedure is in two parts. Each part describes how WebSphere Application Server Version 5 can use the same IBM HTTP Server that an earlier version of WebSphere Application Server uses. Part 1 describes a coexistence scenario on one machine, with Version 4.0.x and Version 5 each configured for and sharing the same IBM HTTP Server instance. The second part is an interoperability scenario, with Version 3.5.x and Version 5 on separate machines, sharing an IBM HTTP Server on a remote machine.

Examples sometimes appear on more than one line for ease of presentation. Directives in the `httpd.conf` file should appear on one line.



1. Upgrade the Web server to the common level supported by both versions of the Application Server. The IBM HTTP Server product supports forward coexistence only, as opposed to backward coexistence, which is not supported. For example, if a version currently exists, such as HTTP Server Version 1.3.19, you can install HTTP Server V1.3.26.x (for WebSphere Application Server V5, V5.0.1, or V5.0.2) or V1.3.28.x (for V5.1) in another directory location, and both versions coexist. In contrast, if you install HTTP Server V1.3.26.x or V1.3.28.x first and then attempt to install Version 1.3.19, without first uninstalling V1.3.26.x or V1.3.28.x, there is a coexistence problem. You must first uninstall a later version, before installing an earlier version.

**5.1+** V5.1 of WebSphere Application Server requires you to install IBM HTTP Server in a separate directory. V5.1 does not allow you to upgrade an earlier version of HTTP Server by installing into the same directory.

2. Configure the IBM HTTP Server.
  - **Part 1:** Configure a single instance of the HTTP Server to support WebSphere Application Server Versions 4.0.x and 5, on the same machine.

The `httpd.conf` file of IBM HTTP Server needs only one set of entries, to point to the Version 5 WebSphere Application Server plug-in, which provides routing services for both Version 4 and Version 5 application servers.

- a. Edit the `httpd.conf` file and remove the following Version 4.0.x entries, or change them to Version 5 entries, if the Version 5 entries are not present:

– **On Windows platforms**

- 1) Remove these Version 4.0.x entries:

```
LoadModule ibm_app_server_http_module
    drive\WebSphere\AppServer\bin\mod_ibm_app_server_http.dll
Alias /WSsamples
    "drive\WebSphere\AppServer\WSsamples"
WebSpherePluginConfig
    drive\WebSphere\AppServer\config\plugin-cfg.xml
```

- 2) Ensure that these Version 5 entries are present:

```
LoadModule ibm_app_server_http_module
    drive\WebSphere\AppServer\bin\mod_ibm_app_server_http.dll
Alias /WSsamples
    "drive\WebSphere\AppServer\WSsamples"
WebSpherePluginConfig
    drive\WebSphere\AppServer\config\cells\plugin-cfg.xml
```

– **On Linux and UNIX-based platforms**

- 1) Remove these Version 4.0.x entries:

```
LoadModule ibm_app_server_http_module/opt
    /WebSphere/AppServer/bin/mod_ibm_app_server_http.so
Alias /WSsamples "/opt
    /WebSphere/AppServer/WSsamples"
WebSpherePluginConfig /opt
    /WebSphere/AppServer/config/plugin-cfg.xml
```

- 2) Ensure that these Version 5 entries are present:

```
LoadModule ibm_app_server_http_module/opt
    /WebSphere/AppServer/bin/mod_ibm_app_server_http.so
Alias /WSsamples "/opt
    /WebSphere/AppServer/WSsamples"
WebSpherePluginConfig /opt
    /WebSphere/AppServer/config/cells/plugin-cfg.xml
```

This example is specific to the Solaris Operating Environment. Other UNIX-based platforms have different load module names. The installation root, `/opt/WebSphere/AppServer`, also varies per operating system platform. For example, the AIX `install_root` is `/usr/WebSphere/AppServer/`.

- b. Edit the Version 4.0.x `plugin-cfg.xml` file and the Version 5 `plugin-cfg.xml` file, to merge their entries into a combined file of all Web context roots.

Whenever you modify the `plugin-cfg.xml` file for either version, you must manually merge the files again, to make a master file.

- c. Put the master `plugin-cfg.xml` file in the V5 installation. Entries in the V5 file direct Web server requests to the correct V4 or V5 Application Server.
- **Part 2:** Configure a single instance of HTTP Server to support WebSphere Application Server Versions 3.5.x and 5, on different machines.

Follow these steps to enable the HTTP transport plug-in to work correctly with the version of IBM HTTP Server on the base WebSphere Application Server product CD-ROM.

- a. Move the appropriate files from the `install_root/bin` directory of a Version 5 Application Server to the location of your choice on the HTTP Server machine.
  - On a Windows platform, move the `mod_ibm_app_server_http.dll` file.
  - On a Linux or UNIX-based operating system platform, move the `mod_ibm_app_server_http.so` or `mod_ibm_app_server_http.sl` file.
  - Change the `LoadModule ibm_app_server_http_module` directive in the `httpd.conf` file on the Web server to point to the new location.
- b. Regenerate the plug-in configuration file on the Application Server machine after you have the machine migrated, as described in Regenerating the Web server plug-in configuration file.
- c. Configure the Version 5 `plugin-cfg.xml` file, as described in Configuring Web server plug-ins. Change `hostname` attributes of the transports to the host name or IP address of the V3.5 machine on which the Application Server is running. These transports direct Web server requests to the V3.5 machine. Unedited transports go to the V5 machine.
- d. Move the plug-in configuration file to the location of your choice on the Web server machine, as described in Installing plug-ins to specific locations. Change the `WebSpherePluginConfig` directive in the `httpd.conf` file to point to the location.
- e. Restart the Web server to access applications that run on both Version 3.5.x and Version 5 Application Server clusters.

Repeat the procedure for each Web server, to enable the Version 3.5.x environment plug-in to work with Version 5 Application Servers.

As you migrate an Application Server machine to Version 5:

- a. Regenerate the Version 5 Web server plug-in configuration file (`plugin-cfg.xml`) after migration.
- b. Move the new plug-in configuration file to the remote Web server machine.
- c. Remove the machine from the Version 3.5.x Open Servlet Engine (OSE) files, by either:
  - Editing the OSE files.
  - Removing the machine from the Version 3.5.x instances.
- d. Regenerate the OSE property files.

You have now migrated the IBM HTTP Server plug-in configuration to include entries for both versions of WebSphere Application Server.

### ***Migrating the Sun Java System Web Server to support multiple WebSphere Application Server versions:***

The following procedure assumes that you have installed WebSphere Application Server Versions 4.0.x and 5, or Versions 3.5.x and 5, and that you have configured each Application Server version for the Sun Java System Web server (formerly Sun ONE Web Server and the iPlanet Web Server).

This procedure is in two parts. Each part describes how WebSphere Application Server Version 5 can use the same Sun Java System Web Server as another WebSphere Application Server version. Part 1 is in step 2, which describes a coexistence scenario on one machine, with Version 4.0.x and Version 5 configured for the same Sun Java System Web Server instance, which they share. Part 2 is in step 3, which is an interoperability scenario. In the scenario, Version 3.5.x and Version 5 share a Sun Java System Web Server, but on separate machines.

Perform the following procedure to configure the Sun Java System Web Server.

1. Upgrade the Web server to the common level supported by both versions of the Application Server. This is the Sun Java System Web Server, Version 6.0 or later.

2. **Part 1:** Configure a single instance of the Sun Java System Web Server to support WebSphere Application Server V4.0.x and V5 on the same machine.

Two configuration entries are in the `magnus.conf` file and one entry is in the `obj.conf` file. Each file needs only one set of entries to point to the Version 5 WebSphere Application Server plug-in, which provides routing services for both V4 and V5 Application Servers.

- a. Remove these V4.0.x WebSphere Application Server entries from the `magnus.conf` file, if they are present:

**On Linux and UNIX-based platforms:**

```
Init fn="load-modules"
    funcs="as_init,as_handler,as_term"
    shlib="install_root/bin/libns41_http.so"
Init fn="as_init"
    bootstrap.properties=" install_root/config/plugin-cfg.xml"
```

**On Windows platforms:**

```
Init fn="load-modules"
    funcs="as_init,as_handler,as_term"
    shlib="install_root\bin\libns41_http.dll"
Init fn="as_init"
    bootstrap.properties=" install_root\config\plugin-cfg.xml"
```

- b. Add one directive to the `obj.conf` file after "`<Object name=default>`":

**On all platforms:**

```
Service fn="as_handler"
```

- c. Add two directives at the end of the `magnus.conf` file, if the entries do not already exist:

**On Linux and UNIX-based platforms:**

```
Init fn="load-modules"
    funcs="as_init,as_handler,as_term"
    shlib="/opt/WebSphere/AppServer/bin/libns41_http.so"
Init fn="as_init"
    bootstrap.properties="/opt/WebSphere/AppServer/config/cells/plugin-cfg.xml"
```

**On Windows platforms:**

```
Init fn="load-modules"
    funcs="as_init,as_handler,as_term"
    shlib="install_root\bin\libns41_http.dll"
Init fn="as_init"
    bootstrap.properties=" install_root\config\cells\plugin-cfg.xml"
```

3. **Part 2:** Configure a single instance of the Sun Java System Web Server to support WebSphere Application Server Versions 3.5.x and 5, on different machines.

- a. Copy the current binary plug-in to the HTTP Server machine. Copy the current binary plug-in from the `install_root/bin` directory of the WebSphere Application Server product to the Sun Java System Web Server machine.
  - On a Linux or UNIX-based platform, move the `libns41_http.so` or `libns41_http.slfile`.
  - On a Windows platform, move the `ns41_http.dll` file.
- b. Copy the `plugin-cfg.xml` file to the Sun Java System Web Server machine. Copy the `plugin-cfg.xml` file from the `/config/cells` directory of the installation root of the Application Server, to the Sun Java System Web Server machine.
- c. Configure the plug-in configuration file of the V5 Application Server, as described in *Configuring Web server plug-ins*. Verify that the `hostname` attributes of the transports are set to the host name or IP address of the machine on which the Application Server is running.
- d. Regenerate the plug-in configuration file on the Application Server machine after you have the machine migrated, as described in *Regenerating the Web server plug-in configuration file*.
- e. Move the plug-in configuration file, as described in *Installing plug-ins to specific locations*. Move the plug-in configuration file into the Web server installation so that it is in the location specified by the `bootstrap.properties` variable for the `Init` directive in the `magnus.conf` file of a Sun Java System V6.0 or later Web server.

- f. Restart the Web server to access applications that run on both Version 3.5.x and Version 5 Application Server clusters.
- g. Repeat the procedure for each Web server, to enable a Version 3.5.x environment plug-in to work with Version 5 Application Servers.
- h. Keep the `plugin-cfg.xml` file and the OSE files current as you migrate Application Servers. As you migrate an Application Server machine to Version 5:
  - 1) Regenerate the Version 5 Web server plug-in configuration after migration.
  - 2) Copy the new plug-in configuration file from the Application Server and replace the one on the Web server machine.
  - 3) Remove the machine from the Version 3.5.x OSE files, by either:
    - Editing the OSE files as described in the V3.5 information center.
    - Removing the machine from the list of V3.5.x instances as described in the V3.5 information center.
  - 4) Regenerate the OSE property files as described in the V3.5 information center.

You can migrate the Sun Java System Web server plug-in configuration to include entries for more than one version of WebSphere Application Server.

### ***Migrating Lotus Domino to support multiple WebSphere Application Server versions:***

The following procedure assumes that you installed WebSphere Application Server V4.0.x and V5, or V3.5.x and V5, and that you configured each Application Server version for the Domino Web server.

The second step of this procedure is in two parts. Each part describes how WebSphere Application Server Version 5 can use the same Domino Web server as another WebSphere Application Server version. The first part describes a coexistence scenario on one machine, with Version 4.0.x and Version 5 configured for the same Domino Web server instance. The second part is an interoperability scenario, with Version 3.5.x and Version 5 sharing a Domino Web server, but on separate machines.

1. Upgrade the Web server to the common level supported by both versions of the Application Server.
2. **Part 1:** Configure a single instance of Domino to support WebSphere Application Server Versions 4.0.x and 5, on the same machine. Use the following procedure to enable the HTTP transport plug-in to work correctly with Domino Version 5.05 or 5.06.
  - a. Start the Domino server.
  - b. Access the file `/webadmin.nsf` using your Web browser. For example, point your browser to `http://hokie2ks.raleigh.ibm.com/webadmin.nsf`.  
The browser prompts you for a password.
  - c. Type the short name for the administrator, and the administrator password.
  - d. Click **Configuration** on the left side of the page.
  - e. Click **Servers** on the top-left center of the page.
  - f. Double-click a server to identify it to work with V5 of the WebSphere Application Server product.
  - g. Click **Edit Server** on the top-left of the center window.
  - h. Click **Internet Protocols** in the middle of the page.
  - i. Edit the path to the Domino plug-in installed in the Version 5 `bin` directory under **DSAPI** in the middle-right of the page. For example, here is the path to the plug-in for the Solaris Operating Environment: `/opt/WebSphere/AppServer/bin/libdomino5_http.so`.  
If there are already DSAPI filter files specified, use a space to delimit the WebSphere Application Server plug-in file.
  - j. Click **Save** and **Close** on the upper-left of the center window.
  - k. On a UNIX-based platform, set the `WAS_HOME` environment variable to point to the WebSphere Application Server `install_root` directory.
  - l. Define the location of the V5 `plugin-cfg.xml` configuration file. For example, `/install_root/config/cells/plugin-cfg.xml`.

- m. Restart the Domino server. When the server starts, messages similar to these appear:

```
02/12/2001 03:05:09 PM JVM: Java virtual machine initialized.  
WebSphere Application Server DSAPI filter loaded  
02/12/2001 03:05:10 PM HTTP Web Server
```

3. **Part 2:** Configure a single instance of the Domino plug-in to support WebSphere Application Server Versions 3.5.x and 5, on different machines. Use the following procedure to enable the HTTP Transport plug-in to work correctly with Domino Version 5.05 or 5.06.
- Start the Domino server.
  - Access the file `/webadmin.nsf` using your Web browser (for example, `http://hokie2ks.raleigh.ibm.com/webadmin.nsf`). The browser prompts you for a password.
  - Give the short name for the administrator and the administrator password.
  - Click **Configuration** on the left side of the page.
  - Click **Servers** on the top-left center of the page.
  - Click the server that you intend to have work with WebSphere Application Server, Version 5.
  - Click **Edit Server** on the top-left of the center window.
  - Click **Internet Protocols** in the middle of the page.
  - Move the appropriate binary plug-in module from the `bin` directory of a V5 Application Server installation to a location of your choice on the Web server machine.
    - Windows platforms:** Move the `domino5_http.dll` file.
    - Linux and UNIX-based platforms:** Move the `libdomino5_http.sl` (or `libdomino5_http.so`) file.
  - Add the path to the Domino binary plug-in file that WebSphere Application Server provides, under **DSAPI Section** in the middle-right of the page. The plug-in is installed in the WebSphere Application Server `bin` directory but you moved it to the Web server machine in the previous step. If there are already Domino Web Server Application Programming Interface (DSAPI) filter files specified, use a space to delimit the WebSphere Application Server plug-in file.
  - Click **Save and Close** on the upper-left of the center window.
  - Move the plug-in configuration file from `install_root/config/cells/plugin-cfg.xml` of the V5 Application Server to a location of your choice on the Web server machine.
  - Define the location of the `plugin-cfg.xml` configuration file. **Linux and UNIX-based platform:** Set the `WAS_HOME` environment variable to point to the WebSphere Application Server installation root directory.

**Windows platforms:**

Add the variable **Plugin Config** to the registry under the path **HKEY\_LOCAL\_MACHINE > SOFTWARE > IBM > WebSphere Application Server > 5.x.x.x**, (where `x.x.x` is 0.0.0, 0.1.0, 0.2.0 or 1.0.0). Set the value for the variable to the location of the `plugin-cfg.xml` file, which is `install_root\config\cells\plugin-cfg.xml`.
  - Restart the Web server to access applications that run on both V3.5.x and V5 Application Server clusters.
  - Repeat the preceding steps for each Web server, to enable the Version 3.5.x environment plug-in to work with the V5 Application Servers. The rest of the procedure describes what to do as you migrate V3.5 applications to the V5 Application Server.
  - Configure the plug-in configuration file of the V5 Application Server, as described in *Configuring Web server plug-ins*. Verify that the `hostname` attributes of the transports are set to the host name or IP address of the machine on which the Application Server is running.
  - Regenerate the plug-in configuration file on the Application Server machine after you have the machine migrated, as described in *Regenerating the Web server plug-in configuration file*.
  - Move the plug-in configuration file, as described in *Installing plug-ins to specific locations*. Move the plug-in configuration file into the Web server installation so that it is in the location specified by the `bootstrap.properties` variable for the `Init` directive in the `magnus.conf` file of a Sun Java System V6.0 or later Web server.



- s. Remove the V3.5 Application Server machine from the Version 3.5.x OSE files. Perform the following actions to remove the V3.5 Application Server after you have migrated its applications to the V5 Application Server :
  - Edit the OSE files and remove the machine from the list of Version 3.5.x Application Server instances as described in the V3.5 information center.
  - Regenerate the OSE property files as described in the V3.5 information center.
- t. Restart the Domino Web server to access applications that now run on the V5 Application Server clusters.

You can migrate the Lotus Domino Web plug-in configuration to include entries for a prior version and V5 of the WebSphere Application Server product.

*Lotus Domino tips:*

### Lotus Domino Server file locations

Lotus Domino server file locations are:

- On Windows systems:
  - c:\Program Files\lotus\notes\Notes.jar
  - c:\Program Files\lotus\notes\data\names.nsf
- On the Solaris Operating Environment:
  - /opt/lotus/notes/5080/sunspa/Notes.jar
  - /opt/notesdata/names.nsf
- On AIX systems:
  - /usr/lotus/notes/50091/ibmpow/Notes.jar
  - /usr/notesdata/names.nsf

### The Domino Server plug-in might fail to configure on a Solaris platform

If this occurs during installation, a dsapi\_stderr.txt file is created in the logs directory and you get the following error messages:

```
lotus.notes.NotesException: Could not load dll for system name SUNOS
    at lotus.notes.NotesThread.load(NotesThread.java:210)
    at lotus.notes.NotesThread.<clinit>(NotesThread.java:24)
java.lang.UnsatisfiedLinkError: NnotesInitThread
    at lotus.notes.NotesThread.NnotesInitThread(Native Method)
    at lotus.notes.NotesThread.initThread(NotesThread.java:99)
    at lotus.notes.NotesThread.run(NotesThread.java:133)
```

You can configure the WebSphere Application Server or Domino Server plug-in manually using the Domino Server Web administration tool. The workarounds are as follows:

1. Start the Domino Server.
2. Enter the URL for the Domino Server Web Administration site using a browser. For example, `http://<hostname>/names.nsf`. Enter the administrator user name and password.
3. Double-click **Server-Servers**.
4. Double-click **WebServer** to configure.
5. Double-click **Edit Server**.
6. Double-click **Internet Protocol**.
7. Add the WebSphere Application Server DSAPI plug-in to the **DSAPI** field. For example, `/opt/WebSphere/AppServer/bin/libdomino5_http.so` Note: If there are already DSAPI filter files specified use a space to delimit the WebSphere plug-in file.
8. Double-click **Save and Close**.
9. Restart the Domino Server.



## Avoiding a DSAPI filter-loading error when the Lotus Domino Server starts.

On a UNIX-based operating system, if the Lotus Domino Web server starts using a non-root user, you are likely to generate a DSAPI filter-loading error when the Lotus Domino Server starts:

```
Error loading DSAPI filter.
```

```
Filter not loaded: /usr/WebSphere/AppServer/bin/libdomino5_http.a
```

Manually change the WebSphere Application Server bin directory permissions from 750 to 755 to run Lotus Domino Server as a non-root user and not generate the error. This change does, however, pose a security risk.

You must also change permissions on the WebSphere Application Server logs directory to 777 to allow Lotus Domino Server to write to the log.

If the Lotus Domino Server is started as root, the problem does not occur.

## ***Migrating Microsoft Internet Information Services (IIS) to support multiple WebSphere Application Server versions:***

The following procedure assumes that you have installed WebSphere Application Server Versions 4.0.x and 5, or Versions 3.5.x and 5, and that you have configured each Application Server version for the Microsoft Internet Information Services (IIS) Web server.

The second step of this procedure is in two parts. Each part describes how WebSphere Application Server Version 5 can use the same IBM HTTP Server as another WebSphere Application Server version. The first part describes a coexistence scenario on one machine, with Version 4.0.x and Version 5 configured for the same Microsoft IIS Web server instance. The second part is an interoperability scenario, with Version 3.5.x and Version 5 sharing a Microsoft IIS Web server, but on separate machines.

1. Upgrade the Web server to the common level being supported by both versions of the Application Server.
2. **Part 1:** Install WebSphere Application Server, Version 4.0 and WebSphere Application Server, Version 5 and select the Microsoft IIS plug-in for each installation. No further steps are necessary. The Web server is configured to support both versions.
3. **Part 2:** Configure a single instance of a remote Microsoft IIS Web server to support WebSphere Application Server Versions 3.5.x and 5, on different machines.
  - a. Start the IIS application.
  - b. Expand the tree on the left until you see **Default Web Site**. Right-click **Default Web Site** and select **New > Virtual Directory** to create a new virtual directory for the Web site instance that you intend to work with WebSphere Application Server. In the wizard for adding a virtual directory, do the following steps.
  - c. Type **sePlugins** in the **Alias to be used to Access Virtual Directory** field.
  - d. Browse to the WebSphere Application Server bin directory in the **Enter the physical path of the directory containing the content you want to publish** field.
  - e. Select the **Allow Execute Access** check box in the **What access permissions do you want to set for this directory** field.
  - f. Click **Finish** to add the sePlugins virtual directory to your default Web site.
  - g. Copy the `iisWASPlugin_http.dll` file from the bin directory of the WebSphere Application Server installation root to a location of your choice on the IIS Web server machine.
  - h. Copy the `plugin-cfg.xml` file from the `install_root\config\cells` directory of the WebSphere Application Server installation root to a location of your choice on the IIS Web server machine.

- i. Right-click on the host name in the tree on the left and click **Properties**. In the Properties dialog, do the following steps to add the Internet Services Application Programming Interface (ISAPI) filter into the IIS configuration.
  - j. Go to the **Internet Information Services** tab.
  - k. Click **WWW Service** in the **Master Properties** window.
  - l. Click **Edit** to open the **WWW Service Master Properties** window.
  - m. Click **ISAPI Filters > Add** to open the **Filter Properties** window.
  - n. Type **iisWASPlugin** in the **Filter Name** field.
  - o. Click **Browse** in the **Executable** field.
  - p. Browse to the location where you pasted the **iisWASPlugin\_http.dll** file on the IIS Web server machine.
  - q. Click the **iisWASPlugin\_http.dll** file.
  - r. Click **OK** until all open windows close.
  - s. Add the variable **Plugin Config** to the registry under the path **HKEY\_LOCAL\_MACHINE > SOFTWARE > IBM > WebSphere Application Server > 5.0.0.0**.
  - t. Set the value of **Plugin Config** variable to the location where you pasted the **plugin-cfg.xml** configuration file.
  - u. Restart the Web server to access applications that run on both V3.5.x and V5 Application Server clusters.
  - v. Repeat the preceding steps for each Web server, to enable the Version 3.5.x environment plug-in to work with the V5 Application Servers. The rest of the procedure describes what to do as you migrate V3.5 applications to the V5 Application Server.
  - w. Regenerate the plug-in configuration file on the Application Server machine after you have the machine migrated, as described in Regenerating the Web server plug-in configuration file.
  - x. Configure the plug-in configuration file of the V5 Application Server, as described in Configuring Web server plug-ins. Verify that the **hostname** attributes of the transports are set to the host name or IP address of the machine on which the Application Server is running.
  - y. Move the plug-in configuration file, as described in Installing plug-ins to specific locations. Move the plug-in configuration file into the Web server installation so that it is in the location specified by the **bootstrap.properties** variable for the **Init** directive in the **magnus.conf** file of a Sun Java System V6.0 or later Web server.
  - z. Remove the V3.5 Application Server machine from the Version 3.5.x OSE files. Perform the following actions to remove the V3.5 Application Server after you have migrated its applications to the V5 Application Server :
    - Edit the OSE files and remove the machine from the list of Version 3.5.x Application Server instances as described in the V3.5 information center.
    - Regenerate the OSE property files as described in the V3.5 information center.
  - aa. Restart the Web server to access applications that now run on the V5 Application Server clusters.

You can migrate the Microsoft IIS Web server plug-in configuration to include entries for a prior version and V5 of the WebSphere Application Server product.

---

## Configuring WebSphere Application Server after migration

The installation wizard automatically configures IBM WebSphere Application Server, Version 5.1 and all other bundled products. There is no need for additional configuration if you do not migrate from an earlier version.

If you use the installation wizard to migrate a previous installation of WebSphere Application Server, Version 3.5.x, there are some items to review before considering your environment fully configured.

1. Check the `WASPostUpgrade.log` file for deployment details of the Version 3.5.x enterprise beans. Make any necessary changes and redeploy.

**Note:** No redeployment is required when moving EJB 1.1 JAR files from Version 4.

The J2EE programming model specifies an architecture for how applications are created and deployed. The `WASPostUpgrade` tool recreates applications because Version 3.5.x applications do not have the same architecture as Version 5.1 applications. The new Version 5.1 J2EE applications contain all migrated Web resources and enterprise beans. All Version 3.5.x enterprise applications become Version 5.1 J2EE applications with the same name, deployed in the same server.

The `WASPostUpgrade` tool maps Web resources and enterprise beans that are not included in an enterprise application, into a default J2EE application that includes the name of the server. The tool maps Web applications to J2EE WAR files. The tool deploys enterprise beans as EJB 1.1 beans in J2EE JAR files. The tool combines resources in a J2EE EAR file and deploys it in the Version 5.1 configuration. There are some differences between the EJB 1.0 and EJB 1.1 Specifications, but in most cases, EJB 1.0 beans can run successfully as EJB 1.1 beans.

Version 3.5.x supports only the EJB 1.0 components specification level. Version 5.1 supports EJB 1.1 components. However, many EJB 1.0 beans can successfully deploy as EJB 1.1 beans. The migration tools redeploy enterprise beans automatically as part of the application migration phase.

2. Examine any Lightweight Third Party Authentication (LTPA) security settings you might have used, and apply the settings in the WebSphere Application Server security settings.

The `WASPostUpgrade` tool migrates applicable security settings in the Version 3.5.x environment to J2EE security attributes.

Global security that uses LTPA authentication in Versions 3.5.x and 4.0.x is migrated to the base WebSphere Application Server product. However, although global security was enabled in Versions 3.5.x and 4.0.x, it is disabled during migration to Version 5.1.

3. Check the `WASPostUpgrade.log` file in the `logs` directory, for details about JSP 0.91 objects that the migration tools do not migrate.

Version 5.1 does not support JSP 0.91 objects. The migration tools do not migrate JSP objects configured to run as JSP 0.91 objects. The migration tools do, however, recognize the objects in the output and log them. Version 5.1 runs JSP 1.0 and 1.1 objects as JSP 1.2 objects, which is its only supported level.

4. Identify and use the migration tools to migrate non-migrated nodes in Version 3.5.x and Version 4.0.x repositories that have multiple nodes.

A Version 3.5.x and a Version 4.0.x repository can contain more than one node name and its associated children. The `WASPostUpgrade` tool processes only those objects and children that match the migrating node. This determination is made by checking the names of nodes in configuration files with fully qualified and non-qualified network names of the migrating machine.

5. Examine any applications that use IBM extensions.

In many cases, IBM provides additional features and customization options that extend the specification level even further. If your existing Version 3.x applications use IBM extensions from earlier product versions, you might need to perform mandatory or optional migration to use the same kinds of extensions in the Version 5.1.

Migration from Version 4.0.x requires little conversion.

6. Update J2EE resources in client JAR files to the new resource format with the `ClientUpgrade` tool. J2EE applications might exist on the client, if the client has client JAR files with J2EE resources.
7. Migrate Version 3.5.x XML applications to supported XML APIs.

If your XML applications use XML for Java API, Version 2.0.x or earlier, you must migrate them to API Version 3.1 or the equivalent open-source version. Although there are inherent performance improvements in later versions of the XML for Java API, you can gain additional performance by explicitly using nonvalidating parsers in application environments where you can trust the data.

The most significant change is that the TX-compatible APIs are no longer available. The Document API retains the XML manipulation APIs that were in TXDocument, but you must rewrite the following functionality:

- Creating and loading an XML parser: Use a Java API for XML Processing (JAXP) factory class.
- Writing out the Document Object Model (DOM) tree: Use a serializer. One drawback to the DOM Level 2 implementation in this level of the XML for Java API is that the grammar (DTD or schema) is no longer a node in the DOM tree, so you cannot write it out. As a result, only external grammars are recommended. You can query the system ID of the root element and use it to retrieve the name from the statement. After the tree is written to an XML file, you can read the file as text and insert a statement.

In addition to the XML API changes, it is important to understand that the J2EE Version 1.3 specification mandates the use of JAXP 1.1, DOM Version 2, SAX Version 2 and SAX2 extensions, and XSL Transformations (XSLT) 1.0. JAXP Version 1.2, DOM Version 3, and SAX Version 3 are not allowed in products that are compliant with the J2EE Version 1.3 specification. This prohibition exists because the newer versions were *experimental* at the time of the J2EE Version 1.3 specification. Because WebSphere Application Server is compliant with the J2EE Version 1.3 specification, WebSphere Application Server has support for JAXP Version 1.1, DOM Version 2 and SAX Version 2 only.

You must only recompile a Version 4.0.x XML application to migrate it to the Version 5.1 level.

8. Configure WebSphere Application Server to use a database. For example, you can configure WebSphere Application Server to use DB2, as described in “Configuring WebSphere Application Server for DB2 access” on page 392.
9. Review your Java virtual machine settings to verify that you are using a heap size of at least 50 for improved startup performance.

If you have used a smaller heap size in the past, you can use the default heap size, which is now 50.

Now you are finished with pre-test configuration. You might have to fine tune your WebSphere Application Server environment as you test it. Test all redeployed applications before moving them into production.

## XML parser for Java code

On November 9, 1999, the Apache Software Foundation announced the creation of the [xml.apache.org](http://xml.apache.org) project for Open Source Extensible Markup Language (XML) solutions.

As part of that announcement, IBM announced that it was donating its XML4J, XML4C, and LotusXSL technologies to the [xml.apache.org](http://xml.apache.org) project. The parsing technologies have been renamed Xerces, and the LotusXSL technology has been renamed Xalan.

IBM is shifting its XML parsing development resources to work on the Xerces parsers. The objective is to use the Xerces code base as the foundation for XML4J and XML4C. This version of XML4J is based on the Apache Xerces2 code base.

### What is the difference between XML4J and Xerces?

IBM has tested this version of XML4J in addition to the testing done by the [xml.apache.org](http://xml.apache.org) project. The names of the main Java archive (JAR) files have changed from `xml4j.jar` to `xmlParserAPIs.jar` and `xercesImpl.jar`, and from `xml4jSamples.jar` to `xercesSamples.jar`.

This version of XML4J contains one major API change and a few relatively minor API changes from the last major release. Its major features are many bugfixes and performance improvements, as well as the addition of a few features.

XML4J 4.2.x ships with the official W3C DOM HTML Recommendation API. The major change to the API was the removal of `setSelected` from the `HTMLOptionElement` interface. To work around this change from XML4J 4.1.x, use `setAttribute` and `removeAttribute` from the interface to modify the selected attribute.

## Which part of the API is public, and which is subject to change?

To answer this question, you must understand the terms used for application program interface (API) status:

- **Public** - The typical client developer codes for this API. Any severe problem in this API is addressed. Also, the majority of this API is defined as "public" and has reached World Wide Web Consortium (W3C) Recommendation status or a similar status in the XML Core Working Group. Not much change in these interfaces is expected. A W3C Recommendation indicates that a specification is stable, contributes to Web interoperability, and has been reviewed by all W3C members, who are in favor of supporting its adoption by the industry.
- **Experimental** - These interfaces and classes reflect the latest W3C specifications and Simple API for XML (SAX) specifications from the XML Core Working Group. Because these specifications are not finalized, the interfaces are subject to change. As an experimental specification is adopted at the highest level, such as at the W3C Recommendation level, the specification is upgraded to the Public category.
- **Internal** - These classes are considered internal to Xerces, even though they might be public and have public methods. Developers with complex and specific needs, such as building an XML parser can use these classes. However, the architecture is subject to change.

The following table summarizes API status by interface content:

| API Status          | API contents (packages, interfaces, classes and methods)                                                                                                                                                                                                                                                                                                                           | Comments                                                                      |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| <b>Public</b>       | DOM Level 1 interfaces (found in org.w3c.dom, org.w3c.dom.html) and DOM Level 2 (DOM2) interfaces (found in org.w3c.dom and subpackages)<br><br>The DOM2 interfaces are implemented in the same interfaces as DOM1 as new methods.<br><br>SAX Level 1 interfaces (found in org.xml.sax. and subpackages) and SAX Level 2 (SAX2) interfaces (found in org.xml.sax. and subpackages) | DOM L1, DOM L2, SAX1, and SAX2 Interfaces are stable.                         |
| <b>Experimental</b> | DOM Level 3 (DOM3) and Core DOM Level 3 (DOM3) Abstract Schemas and Load and Save (found in org.apache.xerces.dom3 and subpackages).                                                                                                                                                                                                                                               | DOM L3 is in working draft status. XML4J provides a subset of DOM L3 support. |
| <b>Internal</b>     | All other packages are internal.                                                                                                                                                                                                                                                                                                                                                   | The internal Xerces architecture can change.                                  |

For more information see XML4J Information.

As an Apache Open Source project, the Xerces community is interested in your questions and feedback regarding the entire API, not just the part that is designated as public.

If you have specific questions, patches, or feedback regarding the Xerces API or code, visit the Apache Web site, and sign up for the mailing list. Send more basic questions or questions specific to XML4J to the AlphaWorks discussion forum.

## Which APIs do I use for new development?

Use the `org.apache.xerces.parsers.*` classes for new development. The four compatibility parser classes are replaced by the following classes:

```
org.apache.xerces.parsers.SAXParser
org.apache.xerces.parsers.DOMParser
```

Validation control has become a feature of the parser, and no longer requires separate classes.

The future direction for the parser instantiation classes is a parser instantiation API that results from the W3C DOM Level 3 effort, which is just getting underway.

To make sure that your code is as stable as possible, use the interfaces that are specified in the Public section of the preceding table (for example DOM1 and SAX1). Updates are made to the table to reflect the new interfaces and the classes that are given Public status (for example, DOM2 and SAX2).

## Is IBM making any additional support guarantees with XML4J?

IBM is not making any additional support guarantees for XML4J. In particular, IBM is not certifying that XML4J is Y2K compliant. XML4J makes no internal date calculations.

## Migrating applications to use the XML4J 4.2.2 parser and the XSLT4J 2.5.4 transformer

The Java API for XML Processing (JAXP) specification defines a pluggability mechanism for a SAX or a DOM parser using the `javax.xml.parsers` APIs. Transformers are pluggable using the `javax.xml.transform` APIs.

The IBM SDK 1.4.1 bundles in Version 5.1 include an XML4J 4.2.2 parser and an XSLT4J 2.5.4 transformer. You can use a different implementation of JAXP in an application. Package the parser and transformer in the application.

You can change an application to remove its dependency on the API in a previous version of the parser or the transformer from an earlier version of WebSphere Application Server. Package the JAR files in the application.

In both cases, set the class loader delegation mode to `PARENT_LAST` on the application or Web module.

Recommendation: Have your applications use the JAXP API instead of using the parser or transformer implementation API directly.

You must recompile a V4.0.x XML application or a V5.0.x XML application to migrate it to the Version 5.1 level.

## Configuring WebSphere Application Server for DB2 access

This topic describes configuring WebSphere Application Server on a Linux or UNIX-based platform to use multiple DB2 clients, including a V7 client and a V8.1 client.

In WebSphere Application Server Version 4, environment variables required for accessing a DB2 database, such as `CLASSPATH`, native library path, `db2instance` name and so on, are included or initialized in the WebSphere Application Server `admin.config` file or in the `setupCmdLine.sh` and the `startServer.sh` command scripts. Because WebSphere Application Server V5.x does not store administration repository information in a relational database management system (RDBMS), a database is not a prerequisite. Therefore, the installation and configuration of V5.x do not involve database configuration.



With the introduction of DB2 UDB Version 8.1, you can install both DB2 Version 7 and Version 8.1, or multiple DB2 Version 8.1 instances on the same Linux or UNIX machine. This topic describes configuring V5.x on a Linux or UNIX-based platform to use multiple DB2 clients, including a V7 client and a V8.1 client.

**5.1+** Version 5.1 of WebSphere Application Server requires that you upgrade DB2 client and server nodes to DB2 V7.2 (Fix Pack 11) or DB2 V8.1.3 (Fix Pack 3) for IBM Developer Kit for Java 1.4.1 compatibility. A DB2 client at V8.1 with Fix Pack 3 can connect to a V7.2 database server, but not for XA, which some applications require. See the IBM WebSphere Application Server supported hardware, software, and APIs Web site at <http://www.ibm.com/software/webservers/appserv/doc/latest/prereq.html> for more information. You can also open the page by clicking **Prerequisites** on the LaunchPad.

For more information about migrating to DB2 V8.1.3, see Migration to Version 8 at <http://www-3.ibm.com/cgi-bin/db2www/data/db2/udb/winos2unix/support/v8infocenter.d2w/report?target=mainFrame&fn=c0009326.htm>. (This Web address has spaces for formatting. Remove all spaces when pasting the address into a browser.)

If your WebSphere Application Server V5.x machine has only a Version 7 client or a Version 8.1 client installed, and all DB2 data sources defined in WebSphere Application Server access DB2 databases through this client, source the `db2profile` file in the login profile of your V5.x instance owner, invoke the script `db2_home/java12/usejdbc2` to use the JDBC2 drivers instead of the default JDBC1 drivers, and put the `DB2lib` directory in the `java.library.path` variable.

For example, assume that the following values are true:

|                                                                                                                      |                       |
|----------------------------------------------------------------------------------------------------------------------|-----------------------|
| WebSphere Application Server instance owner, that is the administrative user who starts WebSphere Application Server | adm00001              |
| DB2 client instance owner                                                                                            | db2inst1              |
| DB2 client instance home                                                                                             | /export/home/db2inst1 |

1. Update the `.profile` of user `adm00001`.

Add the following line:

```
. /export/home/db2inst1/sql1lib/db2profile
```

You can also add the line to the `setupCmdLine.sh` script of WebSphere Application Server.

2. Specify the JDBC provider class path.

You have two ways to specify the JDBC provider class path on the DB2 JDBC Provider definition panel of the WebSphere Application Server administration console:

- Leave the default value (`${DB2_JDBC_DRIVER_PATH}/db2java.zip`) as is. Click **Environment > Manage WebSphere Variables** in the administrative console. Set the `DB2_JDBC_DRIVER_PATH` variable to the value `/export/home/db2inst1/sql1lib/java12`. This approach is preferred.
- Enter the class path, such as `/export/home/db2inst1/sql1lib/java12/db2java.zip`.

Windows platforms support only one DB2 installation. The DB2 environment variables are populated in the system environment automatically. WebSphere Application Server does not need to set these environment variables.

3. Set DB2-required environment variables for a particular Application Server.

- a. On the administrative console of WebSphere Application Server, click **Application Servers > server > Configuration > Additional Properties > Process Definition > Additional Properties > Environment Entries > New** to create a new entry.
- b. Create a `DB2INSTANCE` entry. Enter `DB2INSTANCE` in the **Name** field, and the instance name, such as `db2v7` in the **Value** field.
- c. Create a library path entry. Create the appropriate library path:
  - **AIX:** `LIBPATH` entry

- **Linux:** LD\_LIBRARY\_PATH entry
- **Solaris:** LD\_LIBRARY\_PATH entry
- **HP-UX:** SHLIB\_PATH entry

Use the value of the DB2 native library path, such as  
 /export/home/db2v7/sql1lib/java12:/export/home/db2v7/sql1lib/lib for a V7 client, or  
 /export/home/db2v8/sql1lib/lib for a V8.1 client.

The DB2 lib directory must be on the java.library.path path. Otherwise the Application Server cannot load the db2jdbc.so library and cannot work with DB2. Even with the DB2 lib directory on the java.library.path path, you must invoke the /home/db2inst1/db2profile environment into the root shell before you start the Application Server.

4. Configure the WebSphere Application Server V5.x product to use both DB2 V7 and V8.1 clients.

In cases where both a DB2 V7 client and a V8.1 client are installed on a WebSphere Application Server V5.0.x machine, or multiple V8.1 clients are installed on a WebSphere Application Server V5.0.x or V5.1.x machine, and you intend to use two or more clients in your V5.x Application Servers, you can set DB2 environment variables based on each Application Server, instead of setting them globally as shown previously.

DB2 UDB V8 uses a new client and server communications mechanism that is based on distributed relational database architecture. While the new communications mechanism provides a number of advantages, it also introduces restrictions on the communications capability between DB2 V7 and V8 products.

Because a number of restrictions exist when using a V8 client to communicate with a V7 server, this configuration is not recommended. However, a V7 client can access a V8 server without difficulty.

If you have a WebSphere Application Server application that accesses both a V7 server and a V8 server, only one V7 client is required on the Application Server instance. Use this client to access both the V7 server and the V8 server.

You can choose to use a V7 client to access a V7 server, and use a V8 client to access a V8 server. This choice results in two versions of DB2 clients on the same WebSphere Application Server machine.

When you use a V7 client to access a V8 server, you must explicitly bind V7 packages to the V8 server. To bind packages in the V7 client environment, make a connection to the V8 server and bind both the db2cli.lst and the db2ubind.lst files. For example:

```
cd /home/db2inst1/sql1lib/bnd
db2 connect to v8server
db2 bind @db2cli.lst
db2 bind @db2ubind.lst
db2 terminate
```

One WebSphere Application Server node can support multiple Application Server instances. Each Application Server is essentially a single Java run-time environment, which is one Java virtual machine (JVM). Each JVM can have its own set of environment variables that differ from other Application Server instances.

You can set DB2 environment variables per Application Server instance to let each Application Server instance communicate with a single DB2 client instance. The client instance can have multiple databases cataloged.

Such a configuration means that you cannot have one Application Server instance communicating with both a V7 client and a V8.1 client. However, you can create another Application Server instance to communicate with a different DB2 client.

5. Match the appropriate data source to the application component.

When mapping a data source to an application component, do not mismatch data sources from different DB2 client instances.

For example, if you set the server1 Application Server instance to run in the DB2 V7 client instance, server1 application components can use only data sources defined under the same V7 client JDBC driver.

WebSphere Application Server V5.x supports defining a JDBC provider on different scopes: cell, node (the default) and server. If you have different DB2 client instances, consider defining them on the server level instead of on the node level. Server level definitions avoid possible mismatches between the data sources and different DB2 JDBC providers.

You can configure DB2 for use on WebSphere Application Server. Tune your WebSphere Application Server environment as you test it. Test all redeployed applications before moving them into production.

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## Installation: Resources for learning

Use the following links to find relevant supplemental information about installation. The information resides on IBM and non-IBM Internet sites, whose sponsors control the technical accuracy of the information.

These links are provided for convenience. Often, the information is not specific to the IBM WebSphere Application Server product, but is useful all or in part for understanding the product. When possible, links are provided to technical papers and Redbooks that supplement the broad coverage of the release documentation with in-depth examinations of particular product areas.

View links to additional information about:

- Planning, business scenarios, and IT architecture
- Programming model and decisions
- Programming instructions and examples
- Programming specifications
- Administration
- Support

### Planning, business scenarios, and IT architecture

- IBM WebSphere Application Server supported hardware, software, and APIs  
The official site for determining product prerequisites for hardware, software and APIs for all WebSphere Application Server products.
- IBM developerWorks WebSphere  
The home of technical information for developers working with WebSphere products. You can download WebSphere software, take a fast path to developerWorks zones, such as VisualAge Java or WebSphere Application Server, learn about WebSphere products through a newcomers page, tutorials, technology previews, training, and Redbooks, get answers to questions about WebSphere products, and join the WebSphere community, where you can keep up with the latest developments and technical papers.
- IBM WebSphere Application Server library and information centers Web site  
The IBM WebSphere Application Server Library Web site contains links to all WebSphere Application Server information centers, for all versions. It also lets you access each information center in your native language.
- IBM WebSphere Application Server home page  
The IBM WebSphere Application Server home page contains useful information, including support links and downloads for fixes, APARs, tools, and trials.
- IBM WebSphere software platform home page  
The IBM WebSphere software platform home page introduces WebSphere products and describes how companies can easily transform to an e-business, with software that can grow as fast as the business it supports.
- Migrating to WebSphere V5.0: An End-to-End Migration Guide, SG24-6910-00  
This IBM Redbook is the definitive migration guide for migrating earlier versions of WebSphere Application Server to Version 5. The Redbook adds a broader scope, including planning for application migration and WebSphere Studio Application Developer tooling and samples. Read this book to formulate an optimal migration strategy.
- The power of Edge of Network technology in IBM WebSphere Application Server Version 5

- A description of WebSphere Application Server Edge Components Version 5.
- WebSphere Application Server - Express, V5
  - A description of WebSphere Application Server Express, Version 5.
  - WebSphere Application Server, Version 5
    - A description of the base product, WebSphere Application Server, Version 5.
    - IBM WebSphere Business Integration Server Foundation, Version 5
      - A description of IBM WebSphere Business Integration Server Foundation, Version 5.
      - Information center for WebSphere Application Server Edge components
        - The information center for WebSphere Application Server Edge components contains complete documentation for the Caching Proxy and the Load Balancer in these PDF online books, *WebSphere Application Server Concepts, Planning, and Installation for Edge Components*, the *WebSphere Application Server Caching Proxy Administration Guide*, the *WebSphere Application Server Load Balancer Administration Guide*, and the *WebSphere Application Server Programming Guide for Edge Components*.
      - Linux on IBM eserver zSeries and S/390: ISP/ASP Solutions
        - This IBM Redbook describes how Linux can be combined with z/VM on zSeries and S/390 hardware. This combination of hardware and operating systems enables Internet Service Providers (ISP) and Application Service providers (ASP) to more efficiently provide services.
        - The book assumes a broad definition of ASP that includes production enterprise solutions as simple as file serving. In a world of discrete servers, when a new resource is required, workload can either be added to an existing server or a new one can be purchased. Often a new server is installed and the server farm grows in the enterprise.
        - S/390 and zSeries hardware, microcode and software allow physical resources to be made virtual among Linux systems. Virtual physical resources allow many hundreds of Linux systems to exist on a single server. Running multiple Linux images as guests of VM/ESA or z/VM is a smart choice.
      - Performance Analysis for Java Web sites
        - A guide to developing applications that do not have performance and scalability problems when they get deployed to production. The *Performance Analysis for Java Web Sites* book walks you through planning, designing, and testing to verify that you are not surprised when you release your new site. All of the examples use WebSphere Application Server products and applications.
        - Stacy Joines, Ruth Willenborg, and Ken Hygh have helped many customers with performance-related issues, and have authored this book to capture their experiences, and to help you test and tune your applications.
        - The book is available in book stores and on Amazon.
    - developerWorks: Patterns for e-business: Redbooks listing
      - This Web page lists links to pattern resources under these categories:
        - Current patterns Redbooks
        - Superseded patterns Redbooks (valid for back-level product versions)
        - Independent analyst reports
        - Patterns CD order offer
        - Back-level version patterns Web site (zip downloads and old Flash tutorial)
        - Customer references
        - White papers
        - Multimedia presentations and screen cams
        - Webcasts
        - Patterns development kit
        - WebSphere technical exchange presentations
    - developerWorks: IBM Patterns for e-business
      - The IBM developerWorks site is the source for IBM patterns for e-business, a set of tested, reusable intellectual assets that you can use to design and implement your e-business network and architecture!
  - Design for Scalability - An Update
    - This White paper is from the IBM High Volume Web Sites team. The White paper describes component selection and management techniques you can use to make your Web site ready to adapt to increasing

traffic. These techniques are the product of IBM experiences while working with customers seeking to improve the performance and availability of some of the largest Web sites in the world.

**Abstract:** Optimizing for scalability remains a significant challenge for e-businesses as they balance the demands for availability, reliability, security, and high performance. Vendors are responding with infrastructure options and supporting hardware and software platforms that address these requirements. This update identifies current products and emerging trends that are most likely to improve the scalability of your e-business infrastructure.

- IBM WebSphere Application Server V5.0 System Management and Configuration: WebSphere Handbook Series

This IBM Redbook provides the knowledge needed to implement WebSphere Application Server V5.0, Network Deployment runtime environment, to package and deploy Web applications, and to perform ongoing management of the WebSphere environment. It is one in a series of handbooks, designed to give you in-depth information on the entire range of WebSphere Application Server products.

This book provides an overview of the architecture, topology options, and new features of WebSphere Application Server Version 5 and WebSphere Application Server Network Deployment Version 5. It takes you through the installation steps needed to install each topology. Platform-specific chapters are included for installation on Windows, AIX, and Solaris.

The book then takes you through the process of configuring WebSphere Application Server. It is organized in the same manner as the WebSphere Application Server Administrative Console. It also includes information on packaging and deploying applications. It concludes with information on troubleshooting runtime problems.

- IBM WebSphere V4.0 Advanced Edition Handbook

This Redbook describes base application topologies and product mappings for WebSphere Application Server. Refer to the IBM Redbooks Web site for the latest update.

- The User centered design (UCD) for different project types, part 1

This Web page is the first of two articles posted to IBM developerWorks that describes useful application design activities for different types of projects.

- The User centered design (UCD) for different project types, part 2

This Web page is the latest of two articles that describes design activities that IBM scientists have found most useful in various types of projects. This article defines user interface design elements, including the design prototype, use case model, and design specification document.

### **Programming model and decisions**

- Designing e-business Solutions for Performance

This White paper describes how the design or implementation of an e-business application can affect performance.

- Managing Web Site Performance

This White paper contains tips and techniques for developers building applications that use session persistence. It also helps administrators to tune the WebSphere Application Server product appropriately for these applications.

### **Programming instructions and examples**

- IBM developerWorks

IBM developerWorks contains many excellent resources for developers, including tutorials on Web development-related topics. There is an excellent tutorial on the JDBC API.

- IBM Redbooks

The IBM Redbooks site contains many WebSphere Application Server related documents.

### **Programming specifications**

- J2EE information

For more information about J2EE specifications, visit the Sun site.

- sun.net.inetaddr.ttl property



The following Java 2 SDK, Standard Edition 1.4 Web site describes the private sun.net.inetaddr.ttl property, which works in both Java 2 SDK, Standard Edition 1.3 (WebSphere Application Server V5.0.0, V5.0.1, and V5.0.2) and Java 2 SDK, Standard Edition 1.4 (WebSphere Application Server V5.1).

- java.net.URLConnection class

The *Networking* section of this Java 2 SDK, Standard Edition 1.4 Web site describes a change in the behavior of the java.net.URLConnection class.

## Administration

- Best Practices Zone on WSDD

The WebSphere Best Practices Zone is a collection of best practices for administering WebSphere Application Server. Over time, the zone is intended to grow to include best practices for using other WebSphere software products, and to cover more topics. Use the feedback mechanism to submit your best practice suggestions.

- The IBM Glossary of Computing Terms

This glossary defines technical terms used in many IBM products. It is not a comprehensive resource of all IBM computing terms. This resource is provided for information purposes only and is updated periodically. IBM takes no responsibility for the accuracy of the information it contains.

## Support

- WebSphere education on demand: Installation best practices tutorials

IBM Support offers tutorials on various WebSphere Application Server installation topics. Topics include:

- Installing - where you install a new product or install a coexisting product (on the same machine as an existing product)
- Upgrading - where you use the update installer program to apply service to an existing installation
- Migrating - where you have an older product and you want to install a newer one but retain as many characteristics of the old system as possible
- Uninstalling - where you want to remove an existing product and reinstall the product or a newer version

- Ten Steps to Getting Support for WebSphere Application Server

If you are new to a product, you might have difficulty finding all the information you need. And if you come across a problem, where do you go for help? Whether you are a new user looking for introductory information, or an experienced user looking for a workaround for a specific defect, you can benefit immediately from extensive Web-based support from IBM. It enables you to download fix packs, search on keywords, look up FAQs, Hints and Tips, and so forth. Always use this Web resource before contacting IBM Support directly.

- WebSphere Application Server Support page

Take advantage of the Web-based Support and Service resources from IBM to quickly find answers to your technical questions. You can easily access this extensive Web-based support through the IBM Software Support portal at URL <http://www.ibm.com/software/support/> and search by product category, or by product name. For example, if you are experiencing problems specific to WebSphere Application Server, click **WebSphere Application Server** in the product list. The WebSphere Application Server Support page appears.

- AIX Fix Distribution Service Web site

A Web facility for downloading AIX Version 4 and AIX Version 3 fixes, with a limited search engine designed with the assumption that you know what fix you need. If you do not know what fix you need, there is a pointer at the Web site to the APAR Database Facility. You can also contact your authorized IBM business partner or IBM Support Center.



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- Informix
- iSeries
- Language Environment
- Lotus
- MQSeries
- MVS
- OS/390
- OS/400
- Power Architecture
- PowerPC
- RACF
- Rational
- Redbooks
- RMF
- SecureWay
- SupportPac
- Tivoli
- ViaVoice
- VisualAge
- VM/ESA
- VTAM
- WebSphere
- z/OS
- zSeries

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Printed in USA

SC31-6323-04

