WebSphere Application Server for z/OS V5.0.1:

System Administration

GA22-7962-00

Note
Before using this information, be sure to read the general information under on page v.

Compilation date: September 25, 2003

Contents

Trademarks and service marks

The following terms are trademarks of IBM Corporation in the United States, other countries, or both:

- Everyplace
- iSeries
- IBM
- Redbooks
- ViaVoice
- WebSphere
- zSeries

Java and all Java-based trademarks are trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.

Microsoft, Windows, Windows NT, and the Windows logo are trademarks of Microsoft Corporation in the United States, other countries, or both.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Other company, product and service names may be trademarks or service marks of others.

Chapter 1. Welcome to System Administration

System administration provides a variety of tools for administering the WebSphere Application Server product:

- **Console**

  The administrative console is a graphical interface that provides many features to guide you through deployment and systems administration tasks. Use it to explore available management options.

  Use both the MVS console and the WebSphere for z/OS WebSphere for z/OS administrative console to administer WebSphere for z/OS. For example:
  - Use MVS commands issued from the MVS console to start the base application server controller region, and the node agent and deployment manager.
  - In a base application server configuration, you must start the first server with an MVS operator command. Once the first server is started, you can then use the administrative console, if it has this application, to start other application servers in the node. Once the Deployment Manager and Node Agent are active (in an ND configuration), you can use the administrative console to start and stop application servers.
  - WLM starts all servant regions using Address Space Create (ASCRE) The WebSphere for z/OS administrative console allows you to display and modify WebSphere for z/OS applications and the environment in which they run.
- **Scripting**

  The WebSphere administrative (wsadmin) scripting program is a powerful, non-graphical command interpreter environment enabling you to execute administrative operations in a scripting language. You can also submit scripting language programs for execution. The wsadmin tool is intended for production environments and unattended operations.
- **Commands**

  Command line tools are simple programs that you run from an operating system command line prompt to perform specific tasks, as opposed to general purpose administration. Using the tools, you can start and stop application servers, check server status, add or remove nodes, and complete similar tasks.
- **Programming**

  The product supports a Java programming interface for developing administrative programs. All of the administrative tools supplied with the product are written according to the API, which is based on the industry standard Java Management Extensions (JMX) specification.

Data

Administrative tasks typically involve defining new configurations of the product or performing operations on managed resources within the environment. IBM WebSphere Application Server configuration data is kept in files. Because all product configuration involves changing the content of those files, it is useful to know the structure and content of the configuration files.

The WebSphere Application Server product includes an implementation of the JMX specification. All operations on managed resources in the product go through JMX functions. This means a more standard framework underlying your administrative operations, as well as the ability to tap into the systems management infrastructure programmatically.

Administrative agents

Servers, nodes and node agents, cells and the deployment manager are fundamental concepts in the administrative universe of the product. It is also important to understand the various processes in the administrative topology and the operating environment in which they apply.

A base WebSphere Application Server (single server) installation includes only the Application Server process. A single server installation can host one or more sets of managed servers, known as nodes. A managed server is a single WebSphere Application Server JVM instance, running in its own process. A node cannot span multiple machines, but a machine can have multiple nodes, each with multiple managed servers. There is no node agent or network deployment manager involved in this configuration. No coordination between application server processes is supported in the single server environment. Administration is limited to a single process at a time.

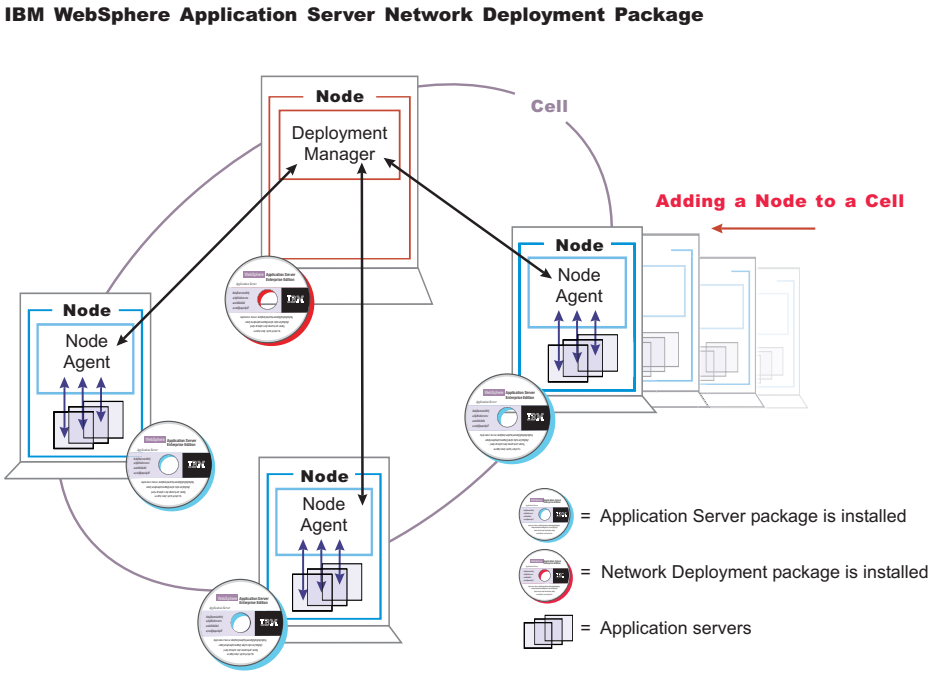
IBM WebSphere Application Server Package

A Network Deployment installation can support a network of computer systems that are configured to run collaborating instances of a single server installation. Each computer having a single server installation is known as a node. The Network Deployment product provides centralized administration and workload management for a set of nodes, known as a cell. A cell has a master administrative repository that stores all of the cell's configuration data.

One computer is designated as the central deployment manager machine. The central deployment manager program (dmgr) oversees the cell.

In the Network Deployment product, each node has a node agent that serves as an intermediary between the application servers on the node and the deployment manager that oversees the entire cell.

Administrative logic running in a node agent keeps the configuration data of a node synchronized with the configuration data of all nodes within a cell.



You establish a multiple machine environment (a cell) through a series of installation and configuration steps.

Chapter 2. Using the administrative console

The administrative console is a Web-based tool that you use to manage the IBM WebSphere Application Server productas well as the Network Deployment product. The administrative console supports a full range of product administrative activities.

1. Start the server for the administrative console.Start the server for the administrative console.For the Network Deployment product, the administrative console belongs to the deployment manager (dmgr) process, which you start with the **startmanager** command**startmanager** command.
2. Access the administrative console.
3. After you point a Web browser at the URL for the administrative console, enter your user ID and, if needed, a password on a Login page.
4. Browse the administrative console.
5. Specify console preferences.
6. Access help.

Related tasks

Running an Application Server with a non-root user ID and the nodeagent as root
Use this task to configure an Application Server to run as non-root.

"Running the deployment manager with a non-root user ID" on page 288

Running an Application Server and nodeagent with a non-root user ID

Starting and stopping the administrative console

The administrative console application is installed during the initial installation process. To access the administrative console, you must start it and then log in. After you finish working in the console, save your work and log out.

1. Start the administrative console.
   a. Verify that the application server for the administrative console is running.Verify that the application server for the administrative console is running.For the Network Deployment product, the deployment manager (dmgr) process for the administrative console must be running. Use the wasadmin **startManager** command to start the deployment manager.Issue the **startManager** command at the MVS console to start the deployment manager.
   b. Enable cookies in the Web browser that you use to access the administrative console. The administrative console requires that you enable cookies for it to work correctly.
   c. In the same Web browser, type `http://`*`your_server_name`*`:9090/admin` where *your_server_name* is the short or fully qualified host name for the machine containing the administrative server. When the administrative console is on the local machine, *your_server_name* can be `localhost`. On Windows platforms, use the actual host name if localhost is not recognized.

      For a listing of supported Web browsers, see WebSphere Application Server system requirements at

      `http://www.ibm.com/software/webservers/appserv/doc/latest/prereq.html`

Note: The URL appears on two lines for printing purposes. Enter the URL on one line in your browser.

d. Wait for the console to load into the browser.

If you cannot start the administrative console because the console port conflicts with an application already running on the machine, change the port number in the

install_root/config/cells/*cell_name*/
nodes/*node_name*/servers/*server_name*/server.xml

and *install_root*/config/cells/*cell_name*/virtualhosts.xml files. Change all occurrences of port 9090 (or whatever port was selected during installation of WebSphere Application Server) to the desired port for the console. Alternatively, shut down the other application that uses the conflicting port before starting the WebSphere Application Server product.

Note: The directory path for the server.xml file appears on two lines for printing purposes.

2. A Login page appears after the console starts. Log into the console.
   a. Enter your user name (or user ID).

      Changes made to server configurations are saved to the user ID. Server configurations also are saved to the user ID if there is a session timeout.

      A user ID lasts for the duration of the session for which it was used to log in. If you enter an ID that is already in use (and in session), you are prompted to do one of the following:
      - Force the existing user ID out of session. The configuration file used by the existing user ID is saved in the temp area.
      - Wait for the existing user ID to log out or time out of the session.
      - Specify a different user ID.

   b. If the console is secured, you must also enter a password for the user name. The console is secured if the following has been done for the console:
      1) Specified security user IDs and passwords
      2) Enabled global security

   c. Click **OK**.
3. Stop the administrative console. Click **Save** on the console taskbar to save work that you have done and then click **Logout** to exit the console.

   Note that if you close the browser before saving your work, when you next log in under the same user ID, you can recover any unsaved changes.

Note to Linux users: If you have difficulty using the administrative console on Linux, try using the Netscape Communicator 7.1 browser based on Mozilla 1.0. The browser release is not officially supported by the WebSphere Application Server product but users have been able to access the console successfully with it.

Related tasks

Chapter 2, “Using the administrative console,” on page 5

Login settings

Use this page to specify the user for the WebSphere Application Server administrative console. If you are using global security, then you also specify a password.

Specifying a user allows you to resume work done previously with the product. After you type in a user ID, click **OK** to proceed to the next page and access the administrative console.

To view this page, start the administrative console.

Related tasks

"Starting and stopping the administrative console" on page 5

Related reference

"Administrative console buttons" on page 9

User ID

Specifies a string identifying the user. The user ID must be unique to the administrative server.
Work that you do with the product and then save before exiting the product will be saved to a configuration identified by the user ID that you enter. To later access work done under that user ID, specify the user ID in the Login page.

If you are logging in from a client machine that currently has a browser open on the administrative console and you connect to the same server, your two connections might share the same HTTP session object, whether or not you are logging in under different user IDs. You must use two different types of browsers (for example, Microsoft Internet Explorer and Netscape Communicator) to log in to the administrative console from the same client machine in order to work from two different HTTP session objects, whether or not you use the same user ID. That is, if you need two concurrent sessions on the same client machine, access the administrative console from two different browser types.

Note that you can use the same browser type to log in twice to the console, but you must log in from different physical hosts and use different user IDs. For example, suppose that Joe logs into the administrative console under the user ID *joe* on the physical host *myhost1* using an Internet Explorer browser. Joe can log into the same console a second time using an Internet Explorer browser, but he must use a different user ID (such as *peggy*) and a different physical host (such as *myhost2*).

Data type String

Another user is currently logged in with the same user name

Specifies whether to log out the user and continue work with the user ID specified or to return to the Login page and specify a different user ID or wait for the user to log out.
This field appears if the user closed a Web browser while browsing the administrative console and did not first log out, then opened a new browser and tried accessing the administrative console.

Work with the master configuration

When enabled, specifies that you want to use the default administrative configuration and not use the configuration last used for the user's session. Changes made to the user's session since the last saving of the administrative configuration will be lost.
This field appears only if the user changed the administrative configuration and then logged out without saving the changes.

Data type Boolean
Default false

Recover changes made in prior session

When enabled, specifies that you want to use the same administrative configuration last used for the user's session. Recovers changes made by the user since the last saving of the administrative configuration for the user's session. This field appears only if the user changed the administrative configuration and then logged out without saving the changes.

Data type	Boolean
Default	true

Administrative console areas

Use the administrative console to create and manage resources, applications and servers or to view product messages.

To view the administrative console, ensure that the application server for the administrative console is running. Point a Web browser at the URL for the administrative console, enter your user ID and, if needed, a password on a Login page.

The console has the following main areas, which you can resize as desired:

Related tasks

Chapter 2, "Using the administrative console," on page 5

"Starting and stopping the administrative console" on page 5

Related reference

"Login settings" on page 6

"Preferences settings" on page 15

Taskbar

The taskbar offers options for returning to the console Home page, saving changes to administrative configurations, specifying console-wide preferences, logging out of the console, and accessing product information.

Navigation tree

The navigation tree on the left side of the console offers links to console pages that you use to create and manage components in a WebSphere Application Server administrative cell.

Click on a **+** beside a tree folder or item to expand the tree for the folder or item. Click on a **-** to collapse the tree for the folder or item. Double-click on an item in the tree view to toggle its state between expanded and collapsed.

WorkSpace

The workspace on the right side of the console contains pages that you use to create and manage configuration objects such as servers and resources. Click links in the navigation tree to view the different types of configured objects. Within the workspace, click on configured objects to view their configurations, run-time status, and options. Click **Home** in the taskbar to display the workspace Home page, which contains links to information on using the WebSphere Application Server product.

WebSphere Status

The status messages area at the bottom of the console provides information on messages returned by the WebSphere Application Server as to problems in your administrative configuration as well as messages about run-time events. Click **Previous** or **Next** to toggle among displays of configuration problems and run-time events.

You can adjust the interval between automatic refreshes in the Preferences settings.

Administrative console buttons

The following button choices are available on various pages of the administrative console, depending on which product features you have enabled.

- **Abort.** Aborts a transaction that is not yet in the prepared state. All operations that the transaction completed are undone.
- **Add.** Adds the selected or typed item to a list, or produces a dialog for adding an item to a list.
- **Add Node.** Displays the Add Node page, in which you specify the host name and SOAP connector port for a node you want added to a cell.
- **Apply.** Saves your changes to a page without exiting the page.
- **Back.** Displays the previous page or item in a sequence. Note that the administrative console does not support using the Back and Forward buttons of a browser. Using those buttons can cause intermittent problems. Use the Back or Cancel buttons on the administrative console panels instead.
- **Browse.** Opens a dialog that enables you to look for a file on your system.
- **Cancel.** Exits the current page or dialog, discarding unsaved changes. Note that the administrative console does not support using the Back and Forward buttons of a browser. Using those buttons can cause intermittent problems. Use the Cancel button on the administrative console panels instead.
- **Change.** In the context of security, lets you search the user registry for a user ID for an application to run under. In the context of container properties, lets you change the data source the container is using.
- **Clear.** Clears your changes and restores the most recently saved values.
- **Clear Selections.** Clears any selected cells in the tables on this tabbed page.
- **Close.** Exits the dialog.
- **Commit.** Releases all locks held by a prepared transaction and forces the transaction to commit.
- **Copy.** Creates copies of the selected application servers.
- **Create.** Saves your changes to all tabbed pages in a dialog and exits the dialog.
- **Delete.** Removes the selected instance.
- **Details.** Shows the details about a transaction.
- **Done.** Saves your changes to all tabbed pages in a dialog and exits the dialog.
- **Down.** Moves downward through a list.
- **Dump.** Activates a dump of a traced application server.
- **Edit.** Lets you edit the selected item in a list, or produces a dialog box for editing the item.
- **Export.** Accesses a page for exporting EAR files for an enterprise application.
- **Export DDL.** Accesses a page for exporting DDL files for an enterprise application.
- **Export Keys.** Exports LTPA keys to other domains.
- **Filter.** Produces a dialog box for specifying the resources to view in the tables on this tabbed page.
- **Finish.** Forces a transaction to finish, regardless of whether its outcome has been reported to all participating applications.
- **First.** Displays the first record in a series of records.
- **Full Resynchronize.** Synchronizes the user's configuration immediately. Click this button on the Nodes page if automatic configuration synchronization is

disabled, or if the synchronization interval is set to a long time, and a configuration change has been made to the cell repository that needs to be replicated to that node. Clicking this button clears all synchronization optimization settings and performs configuration synchronization anew, so there will be no mismatch between node and cell configuration after this operation is performed. This operation can take a while to perform.

- **Generate Keys.** Generates new LTPA keys. When security is turned on for the first time with LTPA as the authentication mechanism, LTPA keys are automatically generated with the password entered in the panel. If new keys need to be generated, use this button after the server is back up with security turned on. Clicking this button generates the keys and propagates them to all active servers (cell, node, and application servers). The new keys can be used to encrypt and decrypt the LTPA tokens. Click **Save** on the console taskbar to save the new keys and the password in the repository.
- **Immediate Stop.** Stops the server, but bypasses the normal server quiesce process that would allow in-flight requests to complete before shutting down the whole server process. This shutdown mode is faster than the normal server stop processing, but some application clients may receive exceptions.
- **Import Keys.** Imports new LTPA keys from other domains. To support single sign on (SSO) in WebSphere across multiple WebSphere domains (cells), LTPA keys and a password should be shared among the domains. After exporting the keys from one of the cells into a file, clicking this button imports the keys into all active servers (cell, node and application servers). The new keys can be used to encrypt and decrypt the LTPA token. Click **Save** on the console taskbar to save the new keys and the password in the repository.
- **Install.** Displays the Preparing for application install page, which you use to deploy an application or EJB or Web component onto an application server.
- **Install RAR.**The Install RAR button opens a dialog used to install a JCA connector and create a resource adapter for it.
- **Manage Transactions.** Displays a list of active transactions running on a server. You can forcibly finish any transaction that has stopped processing because a transactional resource is not available.
- **Modify.** Opens a dialog used to change a specification.
- **Move.** Moves the selected application servers to a different location in the administrative cell. When prompted, specify the target location.
- **New.** Displays a page which you use to define a new instance. For example, clicking **New** on the Application Servers page displays a page on which can configure a new application server.
- **Next.** Displays the next page, frame, or item in a sequence.
- **OK.** Saves your changes and exits the page.
- **Ping.** Attempts to contact selected application servers.
- **Previous.** Displays the previous page, frame, or item in a sequence.
- **Quit.** Exits a dialog box, discarding any unsaved changes.
- **Refresh.** Refreshes the view of data for instances currently listed on this tabbed page.
- **RegenerateKey.** Regenerates a key for global data replication. If you are using the DES or TRIPLE_DES encryption type, regenerate a key at regular intervals (for example, monthly) to enhance security.
- **Remove.** Deletes the selected item.
- **Remove Node.** Deletes the selected node.
- **Reset.** Clears your changes on the tab or page and restores the most recently saved values.
- **Restart.** Stops the selected objects and starts them again.
- **Restart all Servers on Node.** Stops all application servers on the node and starts them again.
- **Retrieve new.** Retrieves a new record.

- **Save.** Saves the changes in your local configuration to the master configuration.
- **Select.** For resource analysis, lets you select a scope in which to monitor resources.
- **Set.** Saves your changes to settings in a dialog.
- **Settings.** Displays a dialog for editing servlet-related resource settings.
- **Settings in use.** Displays a dialog showing the settings now in use.
- **Start.** In the context of application servers, starts selected application servers. In the context of data collection, starts collecting data for the tables on this tabbed page.
- **Stop.** In the context of server components such as application servers, stops the selected server components. In the context of a data collection, stops collecting data for the tables on a tabbed page. In the context of nodes, stops servers on the selected nodes. In the context of deployment managers, stops the deployment manager server.
- **Synchronize.** Synchronizes the user's configuration immediately. Click this button on the Nodes page if automatic configuration synchronization is disabled, or if the synchronization interval is set to a long time, and a configuration change has been made to the cell repository that needs to be replicated to that node. Clicking this button requests that a node synchronization operation be performed using the normal synchronization optimization algorithm. This operation is fast but might not fix problems from manual file edits that occur on the node. So it is possible for the node and cell configuration to be out of synchronization after this operation is performed. If problems persist, use **Full Resynchronize**.
- **Terminate** Deletes the Application Server process that cannot be stopped by the Stop or Immediate Stop commands. Some application clients may receive exceptions. Always attempt Immediate Stop before using this option.
- **Test Connection** After you have defined and saved a data source, you can click this button to ensure that the parameters in the data source definition are correct. On the collection panel, you can select multiple data sources and test them all at once.
- **Uninstall.** Deletes a deployed application from the WebSphere Application Server configuration repository. Also deletes application binary files from the file system.
- **Update.** Replaces an application deployed on a server with an updated application. As part of the updating, you might need to complete steps on the Preparing for application install and Update Application pages.
- **Update Resource List.** Updates the data on a table. Discovers and adds new instances to the table.
- **Use Cell CSI.** Enables OMG Common Secure Interoperability (CSI) protocol.
- **Use Cell SAS.** Enables IBM Secure Association Service (SAS).
- **Use Cell Security.** Enables cell security.
- **View.** Opens a dialog on a file.

Administrative console page features

This topic provides information about the basic elements of an administrative console page, such as the various tabs one can expect to encounter.

Administrative console pages are arranged in a few basic patterns. Understanding their layout and behavior will help you use them more easily.

Collection pages

Use collection pages to manage a collection of existing administrative objects. A collection page typically contains one or more of the following elements:

Scope, Filter, and Preferences
These are described in "Administrative console scope settings" on page 17, "Administrative console filter settings" on page 16, and "Administrative console preference settings" on page 16.

Table of existing objects
The table displays existing administrative objects of the type specified by the collection page. The table columns summarize the values of the key settings for these objects. If no objects exist yet, an empty table is displayed. Use the available buttons to create a new object.

Buttons for performing actions
The available buttons are described in "Administrative console buttons" on page 9. In most cases, you need to select one or more of the objects in the table, then click a button. The action will be applied to the selected objects.

Sort toggle buttons
Following column headings in the table are icons for sort ascending (^) and sort descending (v). By default, items such as names are sorted in descending order (alphabetically). To enable another sorting order, click on the icons for the column whose items you want sorted.

Detail pages

Use detail pages to configure specific administrative objects, such as an application server. A detail page typically contains one or more of the following elements:

Configuration tabbed page
This tabbed page is for modifying the configuration of an administrative object.

Runtime tabbed page
This tabbed page displays the configuration that is currently in use for the administrative object. It is read-only in most cases.

Buttons for performing actions
The available buttons are described in "Administrative console buttons" on page 9.

Wizard pages

Use wizard pages to complete a configuration process comprised of several steps. Be aware that wizards show or hide certain steps depending on the characteristics of the specific object you are configuring.

Administrative console navigation tree actions

Use the navigation tree of the administrative console to access pages for creating and managing servers, applications, resources, and other components.

To view the navigation tree, go to the WebSphere Application Server administrative console and look at the tree on the left side of the console. The tree provides navigation to configuration tasks and run-time information. The main topics available on the tree are shown below. To use the tree, expand a main topic of interest and select an item from the expanded list in order to display a page on which you can complete your work.

Related tasks

Chapter 2, "Using the administrative console," on page 5

Related reference

"Login settings" on page 6

Servers
Enables you to configure administrative servers and other types of servers such as JMS servers.

Applications
Enables you to install applications onto servers and manage the installed applications.

Resources
Enables you to configure resources and to view information on resources existing in the administrative cell.

Security
Accesses the Security Center, which you use to secure applications and servers and to manage users of the administrative console.

Environment
Enables you to configure hosts, Web servers, variables and other components.

System Administration
Enables you to manage components and users of a Network Deployment product.

Troubleshooting
Enables you to check for and track configuration errors and problems.

Administrative console taskbar actions

Use the taskbar of the administrative console to return to the console Home page, save changes that you have made to administrative configurations, specify console preferences, log out of the console, and access product information.

To view the taskbar, go to the WebSphere Application Server administrative console and look at the horizontal bar near the top of the console. The taskbar provides several actions.

Related tasks

Chapter 2, "Using the administrative console," on page 5

Related reference

"Preferences settings" on page 15

"Login settings" on page 6

Home
Displays the administrative console Home page in the workspace. The workspace is on the right side of the console. The Home page provides links to information on using the WebSphere Application Server product.

Save
Displays the Save page, which you use to save work that you have done in the administrative console.

Changes made to administrative configurations are saved to a master repository comprised of .xml configuration files. To see what changes are saved, expand **View items with changes**. Periodically save your work to ensure that you do not inadvertently lose changes that you have made.

Preferences
Displays the Preferences page, in which you can specify whether you want the administrative console workspace page to refresh automatically after changes, confirmation dialogs to display, and the default scope to be the administrative console node.

Logout
Logs you out of the administrative console session and displays the Login page. If you have changed the administrative configuration since last saving the configuration to the master repository, the Save page displays before returning to the Login page. Click **Save** to save the changes to the master repository, **Discard** to exit the session without saving changes, or **Logout** to exit the session without saving changes but with the opportunity to recover your changes when you return to the console.

Help
Opens a new Web browser on online help for the WebSphere Application Server product.

Hide/Show Field and Page Descriptions toggle
Enables you to select whether information on console pages and fields within the pages is shown. Icons on the right-hand side of the taskbar provide the toggle.

WebSphere status settings
Use the WebSphere Status area of the administrative console to view error and run-time event messages returned by WebSphere Application Server.

The WebSphere Status area displays along the bottom of the console and remains visible as you navigate from the WebSphere Home page to other pages. The area displays two frames: **WebSphere Configuration Problems** and **WebSphere Runtime Messages**. Click **Previous** or **Next** to toggle between the frames.

Click the icon in the upper-right of the area to refresh the information displayed. You can adjust the interval between automatic refreshes in the **Preferences** settings.

Related tasks

Detecting and handling problems with run-time components

Related reference

"Administrative console preference settings" on page 16

WebSphere Configuration Problems
Displays the number of workspace files. This frame also displays the number of problems with the administrative configuration for the user ID.
Click on the number to view detailed information on the problems.

WebSphere Runtime Message
Displays the number of messages returned by WebSphere Application Server as well as the number of error messages(**x** icon), warning messages (**!** icon), and informational messages (**i** icon).
Click on the number of messages to view details.

Specifying console preferences

Throughout the administrative console are pages that have **Preferences**, **Filter**, and **Scope** fields near the top of the pages. To customize how much data is shown, select options in **Preferences**, **Filter** and **Scope**.

For example, examine the **Preferences** field for the Enterprise Applications page:

1. Go to the navigation tree of the administrative console and select **Applications > Enterprise Applications**.
2. Expand **Preferences**.

3. For the **Maximum rows** field, specify the maxiumum number of rows to be displayed when the collection is large. The default is 25. Rows that exceed the maximum number will appear on subsequent pages.
4. For the **Filter history** field, place a checkmark beside **Retain filter criteria** if you want the last filter criteria entered in the filter function to be retained. When you return to the Applications page, the page will initially use the retained filter criteria to display the collection of applications in the table below. Otherwise, remove the checkmark beside **Retain filter criteria** to not retain the last filter criteria.
5. Click **Apply** to apply your selections or click **Reset** to return to the default values. The default is not to enable (not have a checkmark beside) **Retain filter criteria**.

Other pages have similar fields in which you specify console preferences. While **Preferences**, **Filter** and **Scope** control how much data is shown in the console, the **Preferences** taskbar option controls general behavior of the console. Click **Preferences** on the console taskbar to view the Preferences page. Additionally, you can select whether information on console pages and fields within console pages is shown using the **Hide Field and Page Descriptions toggle**. Icons on the right-hand side of the taskbar provide the toggle.

Preferences settings

Use the Preferences page to specify whether you want the administrative console workspace to refresh automatically after changes, the default scope to be the administrative console node, confirmation dialogs to display, and the workspace banner and descriptions to display.

To view this administrative console page, click **Preferences** on the console taskbar.

Related tasks

Chapter 2, “Using the administrative console,” on page 5

Related reference

“Administrative console buttons” on page 9

Enable WorkSpace Auto-Refresh

Specifies whether you want the administrative console workspace to redraw automatically after the administrative configuration changes.
The default is for the workspace to redraw automatically. If you direct the console to create a new instance of, for example, an application server, the Application Servers page refreshes automatically and shows the new server’s name in the collection of servers.

Specifying that the workspace not redraw automatically means that you must re-access a page by clicking on the console navigation tree or links on collection pages to see changes made to the administrative configuration.

Data type	Boolean
Default	true

Do not confirm WorkSpace Discards

Specifies whether confirmation dialogs display after a request to delete an object. The default is for confirmation dialogs not to display.

Data type	Boolean
Default	false

Use Default Scope
Specifies whether the default scope is the administrative console node. The default is for the scope not to be the console node.

Data type	Boolean
Default	false

Hide/Show Banner
Specifies whether the WebSphere Application Server banner along the top of administrative console displays. The default is for the banner to display.

Data type	Boolean
Default	true

Hide/Show Descriptions
Specifies whether information on console pages and fields within the pages is shown. The Hide/Show Field and Page Descriptions icons on the right of the taskbar provide the same function. The default is to show page and field descriptions.

Data type	Boolean
Default	true

Administrative console preference settings
Use the Preference settings to specify how you would like information to be displayed on an administrative console page.

Maximum rows

Maximum number of rows to display per page when the collection is large.

Filter history

Whether to use the same filter criteria to display this page the next time you visit it.

Select the **Retain filter criteria** check box to retain the last filter criteria entered. When you return to the page later, retained filter criteria control the application collection that appears in the table.

Administrative console filter settings
Use the Filter settings to specify how to filter entries shown in a collection view.

Select the column to filter, then enter the filter criteria.

Column to filter

Use the drop-down list to select the column to filter. When you apply the filter, the collection table is modified accordingly.

For example, select **Application Servers** if you plan to enter criteria by which to filter application server names.

Filter criteria

In the field beside the drop-down list, enter a string that must be found in the name of a collection entry to qualify the entry to appear in the collection table. The string can contain %, *, or ? symbols as wildcard characters. For example, enter `*App*` to find any application server whose name contains the string ***App***.

Prefix each of the characters `( ) ^ * % { } \ + $` with a `\` so that the regular expression engine performing the search correctly matches the

supplied search criteria. For example, to search for all JDBC providers containing ***(XA)*** in the provider name, specify the following:

```
*\(XA\)
```

Administrative console scope settings

Use Scope settings to filter the contents of an administrative console collection table to a particular cell, node, or server, for example. Changing the value for **Scope** allows you to see other variables that apply to an object and might change the contents of the collection table.

Click **Browse** next to a field to see choices for limiting the scope of the field. If a field is read-only, you cannot change the scope. For example, if only one server exists, you cannot switch the scope to a different server.

Cell Limits the visibility to all servers on the named cell.
Node Limits the visibility to all servers on the named node.
Server Limits the visibility to the named server.

The server scope has precedence over the node and cell scopes, and the node scope has precedence over the cell scope. Note that objects are created at only one scope, though they might be visible at more than one scope.

Related reference

"Administrative console buttons" on page 9

Accessing help

The WebSphere Application Server product provides information on using the product and information about specific pages and fields.

1. To view information on console pages and fields within console pages, enable the **Hide Field and Page Descriptions toggle**. Icons on the right-hand side of the console taskbar provide the toggle. Click on the **i** icon beside a field or page description to view help (reference) information.
2. Access product information.
   - Click **Home** on the admininstrative console taskbar and select a link to information on using the WebSphere Application Server product. The link to the InfoCenter provides concept, task and reference information.
   - Click **Help** on the administrative console taskbar and select from the list of reference topics. This same information can be accessed by clicking on the **i** icon beside a field or page description.

Related tasks

Chapter 2, "Using the administrative console," on page 5

Administrative console: Resources for learning

Use the following links to find relevant supplemental information about the IBM WebSphere Application Server administrative console. 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:
- "Administrative console: Resources for learning" on page 17
- "Administrative console: Resources for learning" on page 17

Programming instructions and examples
- WebSphere Application Server education

Administration
- Listing of all IBM WebSphere Application Server Redbooks
- System Administration for WebSphere Application Server V5 -- Part 1: Overview of V5 Administration

Related tasks

Chapter 2, "Using the administrative console," on page 5

Chapter 3. Using the MVS console

Use the MVS console to manage the IBM WebSphere Application Server product as well as the Network Deployment product.

1. See the *z/OS MVS System commands* manual at http://www.ehone.ibm.com/public/applications/publications/cgibin/pbi.cgi for information on how to use MVS operator commands.
2. Optionally use standard console automation products to automate WebSphere for z/OS operations. All automations for the WebSphere for z/OS environment are done using interfaces from the MVS console. Products such as Netview are presented copies of messages that are to be displayed on the MVS console. These automation products can also enter commands into the system using a ″virtual″ MVS console as a source.

Chapter 4. Deploying and managing using scripting

Scripting is a non-graphical alternative that you can use to configure and manage the WebSphere Application Server. The WebSphere Application Server wsadmin tool provides the ability to execute scripts. The wsadmin tool supports a full range of product administrative activities.

To deploy and manage applications, you can also use the administrative console which runs in the Deployment Manager for the cell.To configure and manage the WebSphere Application Server, you can also use the administrative console which runs in the Deployment Manager for the cell. For more information about using the administrative console, see Deploying and managing with the GUI. There are also several command line tools that can be used to start, stop, and monitor WebSphere Application Server processes and nodes. These tools only work on local servers and nodes. They cannot operate on a remote server or node. See Managing using command line tools for more information.

1. Launch a scripting client.
2. Install applications into runtime.
3. Edit applications.
4. Display installed applications.
5. Uninstall applications.
6. Identify attributes and operations for running objects.
7. Modify and query running object attributes.
8. Invoke operations on running objects.
9. Modify the configurations.
10. Modify nested attributes.

Related reference

"Example: Using the wsadmin tool in a secure environment" on page 215

Migrating from Systems Management Scripting API (SMAPI) V4 to wsadmin V5

The purpose of this section is to provide guidance for migrating from WebSphere Application Server V4 Systems Management Scripting Application Programming Interface (SMAPI) to wsadmin in V5.

The SMAPI feature of WebSphere Application Server V4 provides the same functionality as the graphical user interface to Systems Management (systems management enhanced user interface). The only scripting language supported by the SMAPI is REXX. The SMAPI provides predefined REXX functions that allow the user to perform administration functions (`CB390FCG`) and operation functions (`CB390CMD`). There are also functions to generate input (XMLGEN) and parse the output (XMLPARSE, XMLFIND, and XMLEXTRACT) from the administration and operations applications.

The wsadmin client scripting tool in WebSphere Application Server V5 replaces the SMAPI of WebSphere Application Server V4. Version 5 distinguishes between functions that modify or query the Systems Management configuration from functions that control runtime operational commands. The wsadmin scripting

client uses the Bean Scripting Framework (BSF) and is based on Java™ Management Extensions (JMX). Java™ Command Language (JACL) is the supported scripting language. The wsadmin tool provides the ability to run scripting commands interactively from a wsadmin shell, from the command line, or from a script. The wsadmin tool operates on configurations and running objects through the following set of management objects: AdminConfig for configuration commands, AdminControl for operational commands, AdminApp for application management commands, and Help. Each object has commands that you use to perform administrative tasks. The wsadmin tool requires that you specify a scripting object, a command, and command arguments.

This article shows how to create WebSphere Application Server V5 scripts that perform actions similar to those performed by V4 SMAPI.

1. Identify the SMAPI command type in the script, configuration or operation.
   - Configuration command types use the `CB390CFG` command. You can list, create, delete, and change various configuration objects like the conversation, system, servers, Java™ platform Enterprise Edition (J2EE) resources, and so on with this command.
   - Operation command types use the `CB390CMD` command. You can start, stop, cancel, restart. You can also list defined server instances.
2. Find the corresponding V5 objects that the V4 configuration command can be performed on. In V5, the AdminConfig management object uses the `create`, `list`, `modify`, `remove`, `show`, and `showAttribute` commands on configuration objects. V5 configuration objects include Server, ModuleDeployment, Node, ServerCluster, URL, VirtualHost, and URLProvider in addition to the ones listed in the following table.

V4 SMAPI configuration object	V5 wsadmin configuration type
Conversation	Not applicable
System	Not applicable
Sysplex	Not applicable
Server	Not applicable
J2EE server	ServerGroup
J2EE Application	use AdminApp object
Server Instance	Server
Container	Not applicable
LRM	Not applicable
LRMI	Not applicable
Container/LRM associations	Not applicable
Application Family	Not applicable
J2EE resources/J2EE resource Instances	J2CConnectionFactory/J2CResourceAdapter/JMSConnectionFacto

3. Determine the V5 attribute names by using the online help commands of the AdminConfig object. Examples include `attributes`, `defaults`, `parents`, `required`, or `types`.
4. Convert application installation commands. For application installation, use the AdminApp object `installInteractive` command to complete a successful installation. Then locate message `WASX7278I` in the `wsadmin.traceout` log file. Use the data in the message to construct an installation command for your source.

5. Convert operational commands. The following illustrates an example:

V4 SMAPI action	V5 wsadmin ojbect and command
CB390CMD(″-action 'start' -servername 'BBOASR1' -serverinstancename '*' -output 'FCT33'″)	$AdminControl startServer server1

6. Save configuration changes. In V5, configuration changes are made to a temporary workspace. These changes are not committed to the WebSphere Application Server configuration until you invoke the `save` command on the AdminConfig object. If your script makes configuration changes, for example, creates, removes, or changes objects, or installs or uninstalls applications, invoke the following command to commit the change:

   ```
   $AdminConfig save
   ```

   Related reference

   "Wsadmin tool" on page 35

Example: Migrating - Starting an application server

The following examples demonstrate how to start an application server with WebSphere Application Server V4 and V5:

- V4 SMAPI REXX script

```
call syscalls 'ON'
 signal on error

 rc = 0
 rc = CB390CMD
("-action 'start'
-servername
'BBOASR1'
-serverinstancename
'*' -output 'FCT33'")
 if (rc == 4) then
  do say
"FCT Test #33 failed"
  Exit
 end

 rc = XMLPARSE
("FCT33" "ALL")
 if (rc == 4) then
  do say "FCT
Test #33 failed
while XMLPARSE"
  Exit
 end
 say "FCT Test
#33 completed"
 exit

 error:
 say "Error in
FCT Test #33" rc
"at line" sigl
 say sourceline
(sigl)
 exit
```

- V5 wsadmin tool

  The command sequence given below accomplishes approximately the same thing as the V4 SMAPI commands.

If you are connected to a server in a base installation, you cannot request to start another one. You can only start an application server if you have a Network Deployment installation. In a Network Deployment installation, use the following:

```
$AdminControl
startServer
server1 mynode
```

When the wsadmin scripting tool successfully starts a WebSphere Application Server, you see a message similar to the following:

```
WASX7262I: Start
completed for
server "server1"
on node "mynode"
```

Related reference

"AdminControl object for scripted administration" on page 69

Example: Migrating - Installing an application

The following examples demonstrate how to install an application in the WebSphere Application Server V4 and V5:

- V4 SMAPI REXX script

```
call syscalls 'ON'
 signal on error
 say "FCT Test
#processearfile"

 name. = 0
 name.1 =
"conversationname"
 name.2 =
"j2eeservername"
 name.3 =
"earfilename"
 val. = 0
 val.1 =
"API Functiontest"
 val.2 =
"BBOASR4"
 val.3 =
"/tmp/filetransfer
_resolved.ear"

 rc = 4
  i = 1

 /* Generate
XML Input */
 do while
(name.i <> '0')
  rc = XMLGEN
("tempin" name.i
val.i)
  if
(rc == 4) then
   do say
"FCT Test
#processearfile
failed while XMLGEN"
  exit
  end
 i = i+1
 end;
```

```
  /* Call the
function:
processearfile */
 rc = CB390CFG
("-action
'processearfile'
-xmlinput
'inputprocessearfile.
xml' -input 'tempin'
-output
'processearfile'")
 if (rc == 4)
then
  do say
"FCT Test
#processearfile
failed"
 exit
 end

 /* Parse the
result */
 rc = XMLPARSE
("processearfile"
"ALL")
 if (rc == 4)
then
     do
     say "FCT
Test #processearfile
failed while
XMLPARSE"
 exit
 end

 say "FCT Test
#processearfile
completed"
 return 0
 exit

 error:
 say "Error in
FCT Test
#processearfile" rc
"at line" sigl
 say sourceline
(sigl)
 exit
```

- V5 wsadmin tool

  The command sequence given below accomplishes approximately the same thing as the V4 SMAPI commands.

  – Start the wsadmin scripting tool:

    ```
    $WAS_ROOT/AppServer/
    bin:> ./wsadmin.sh
    ```

    When the wsadmin scripting tool successfully starts, you see a message similar to the following:

    ```
    WASX7209I: Connected
    to process "server1"
    on node SY1 using
    SOAP connector;  The
      type of process
    ```

```
is: UnManagedProcess
 WASX7029I: For
help, enter:
"$Help help"
```

– Construct the attribute string:

```
set attrs
[list -node SY1
-server server1]
```

– Install the application:

```
$AdminApp install
../installableApps/
filetransfer.ear
$attrs
```

When the application successfully installs, you see a series of messages similar to the following:

```
WASX7327I: Contents
of was.policy file:
  grant codeBase
"file:${application}" {
   permission
java.security.
AllPermission;
 };

 ADMA5016I:
Installation of
WebSphere File
Transfer Servlet
Application started.
 ADMA5005I:
Application WebSphere
File Transfer Servlet
Application configured in
  WebSphere repository
 ADMA5001I:
Application binaries
saved in  /WebSphere/
V5R0M0/AppServer/wstemp/
Scriptf3964b86cb/
workspace/cells/SY1/
applications/WebSphere
File Transfer Servlet
Application.ear/
WebSphere File Transfer
Servlet Application.ear
 ADMA5011I: Cleanup
of temp dir for app
WebSphere File Transfer
Servlet Application done.
 ADMA5013I:
Application WebSphere
File Transfer Servlet
Application installed
successfully.
```

– Save your changes:

```
$AdminConfig save
```

You can use the AdminApp `taskInfo` command to obtain information about each task option:

```
$AdminApp taskInfo
../installableApps/
filetransfer.ear
MapWebModToVH
```

The taskInfo command results in information similar to the following:

```
MapWebModToVH:
Selecting Virtual
Hosts for Web Modules
 Specify the
virtual host where
you want to install
the Web modules
contained in
 your application.
Web modules can be
installed on the
same virtual host
or dispersed among
several hosts.

 WASX7348I: Each
element of the
MapWebModToVH task
consists of the
following 3 fields:
"webModule", "uri",
"virtualHost". Of
these fields, the
following may be
assigned values:
"virtualHost" and
the following are
required:
"virtualHost"

 The current
contents of the task
after running default
bindings are:
 webModule:
WebSphere Admin File
Transfer Application
 uri: filetransfer.
war,WEB-INF/web.xml
 virtualHost:
admin_host
```

You can use the AdminApp installInteractive command to step through all the installation tasks, one at a time. If you use the installInteractive command to successfully install an application, an option string logs in the wsadmin.traceout file under the message ID WASX7278I. You can copy and paste this option string into wsadmin scripts.

Related reference

"Example: Listing running applications on running servers using wsadmin" on page 184

"Example: Starting an application using wsadmin" on page 186

"Example: Stopping running applications on a server using wsadmin" on page 186

Example: Migrating - Uninstalling an application

The following examples demonstrate how to uninstall an application in the WebSphere Application Server V4 and V5:

- V4 SMAPI REXX script

```
call syscalls 'ON'
 signal on error
 say "FCT Test
#processearfile"

 name. = 0
 name.1 =
"conversationname"
 name.2 =
"j2eeservername"
 name.3 =
"earfilename"
 val. = 0
 val.1 =
"API Functiontest"
 val.2 =
"BBOASR4"
 val.3 =
"/tmp/filetransfer
_resolved.ear"

 rc = 4
  i = 1

 /* Generate
XML Input */
 do while
(name.i <> '0')
  rc = XMLGEN
("tempin" name.i
val.i)
  if (rc == 4)
then
   do say
"FCT Test
#processearfile
failed while XMLGEN"
  exit
  end
 i = i+1
 end;

  /* Call the
function:
processearfile */
 rc = CB390CFG
("-action
'processearfile'
-xmlinput
'inputprocessearfile.
xml' -input 'tempin'
-output
'processearfile'")
 if (rc == 4) then
  do say "FCT
Test #processearfile
failed"
 exit
 end

 /* Parse the
```

```
result */
 rc = XMLPARSE
("processearfile"
"ALL")
 if (rc == 4)
then
     do
     say "FCT
Test #processearfile
failed while
XMLPARSE"
 exit
 end

 say "FCT Test
#processearfile
completed"
 return 0
 exit

 error:
 say "Error in
FCT Test
#processearfile" rc
"at line" sigl
 say sourceline
(sigl)
 exit
```

- V5 wsadmin tool

  The command sequence given below accomplishes approximately the same thing as the V4 SMAPI commands.

  – List the installed applications:

    ```
    $AdminApp list
    ```

    When the wsadmin scripting tool lists the installed applications, you see output similar to the following:

    ```
    WebContainer
    TestApplication
     adminconsole
     Greeting
     IvtApp
    ```

  – Uninstall the IvtApp application:

    ```
    $AdminApp uninstall
    ivtApp
    ```

    When the application successfully uninstalls, you see a series of messages similar to the following:

    ```
    ADMA5017I:
    Uninstallation
    of ivtApp started.
    ADMA5104I:
    Server index
    entry for SY1
    was updated
    successfully.
    ADMA5102I:
    Deletion of
    config data for
    ivtApp from
    config repository
    completed
    successfully.
    ADMA5011I:
    ```

```
Cleanup of temp
dir for app
ivtApp done.
ADMA5106I:
Application
ivtApp uninstalled
successfully.
```

– Save your changes:

```
$AdminConfig save
```

Related reference

"Example: Listing running applications on running servers using wsadmin" on page 184

"Example: Starting an application using wsadmin" on page 186

"Example: Stopping running applications on a server using wsadmin" on page 186

Example: Migrating - Defining a Java™ 2 Enterprise Edition resource

The following examples demonstrate how to define a Java ™ 2 Enterprise Edition (J2EE) resource in the WebSphere Application Server V4 and V5:

- V4 SMAPI REXX script

```
call syscalls 'ON'
 signal on error

 name. = 0
 name.1 =
"conversationname"
 name.2 =
"j2eeresourcename"
 name.3 =
"j2eeresourcedescription"
 name.4 =
"j2eeresourcetype"
 val. = 0
 val.1 =
"API Functiontest"
 val.2 =
"db2resA"
 val.3 =
"my DB2 resource"
 val.4 =
"DB2datasource"

 rc = 4
 i = 1
 do while
(name.i <> '0')
  rc = XMLGEN
("tempin" name.i
val.i)
  if (rc == 4)
then
   do say
"create J2EE
resource failed
during XMLGEN"
  exit
  end
 i = i+1
 end;

 rc = CB390CFG
```

```
("-action
'createj2eeresource'
-xmlinput
'inputcreate
j2eeresource.xml'
-input 'tempin'
-output 'test.
create.resource'")
 if (rc == 4) then
  do say
"create J2EE
resource failed"
  exit
 end
 exit
 error:
 say "script
error at line" sigl
 say sourceline
(sigl)
 exit
```

- V5 wsadmin tool

  The command sequence given below accomplishes approximately the same thing as the V4 SMAPI commands.

  – Set the node:

    ```
    set node
    [$AdminConfig getid
    /Node:SY1/]
    ```

    When the wsadmin scripting tool sets the node, you see output similar to the following:

    ```
    SY1(cells/SY1/
    nodes/SY1:node.
    xml#Node_1)
    ```

  – Set the provider:

    ```
    set provider
    [$AdminConfig
    create JDBCProvider
    $node
    {{classpath /db2beta
    /db2710/class
    es/db2j2classes.zip}
    {implementationClassName
    com.ibm.db2.jcc.
    DB2ConnectionPool
    DataSource}
    {name myDB2driver}}]
    ```

    When the application successfully sets the provider, you see a message similar to the following:

    ```
    myDB2driver(cells/SY1/
    nodes/SY1:resources.
    xml#JDBCProvider_3)
    ```

  – Create the J2EE resource:

    ```
    $AdminConfig create
    DataSource $provider
    {{name db2resA}
    {description My DB2
    resource}}
    ```

    When the wsadmin scripting tool creates the J2EE resource, you see output similar to the following:

```
db2resA(cells/SY1/
nodes/SY1:resources.
xml#DataSource_2)
```

– Save your changes:

```
$AdminConfig save
```

Example: Migrating - Stopping an application server

The following examples demonstrate how to stop an application server with WebSphere Application Server V4 and V5:

- V4 SMAPI REXX script

```
call syscalls 'ON'
 signal on error

 rc = 0
 rc = CB390CMD
("-action 'stop'
-servername 'BBOASR4'
-serverinstancename
'*' -output 'FCT34'")
 if (rc == 4) then
  do say "FCT
Test #34 failed"
  exit
 end
 rc = XMLPARSE
("FCT34" "ALL")
 if (rc == 4) then
  do say "FCT
Test #34 failed
while XMLPARSE"
  exit
 end
 say "FCT Test
#34 completed"
 exit

 error:
 say "Error in
FCT Test #34" rc
"at line" sigl
 say sourceline
(sigl)
 exit
```

- V5 wsadmin tool

  The command sequence given below accomplishes approximately the same thing as the V4 SMAPI commands.

  Stop the application server:

```
$AdminControl
stopServer server1
mynode
```

  When the wsadmin scripting tool successfully stops a WebSphere Application Server, you see messages similar to the following:

```
WASX7337I: Invoked
stop for server
"server1" Waiting
for stop completion.
WASX7264I: Stop
completed for
server "server1"
on node "mynode"
```

Related reference

"AdminControl object for scripted administration" on page 69

Launching scripting clients

You can run scripting commands in several different ways. The command for invoking a scripting process is located in the `WebSphere/AppServer/bin` directory or the `WebSphere/DeploymentManager/bin` directory. To invoke a scripting process, use the `wsadmin.bat` file for a Windows system, and the `wsadmin.sh` file for a UNIX system.

To specify the method for executing scripts, perform one of the following wsadmin tool options:

- Run scripting commands interactively.

  Execute wsadmin with an option other than `-f` or `-c`.

  An interactive shell appears with a wsadmin prompt. From the wsadmin prompt, enter any JACL command. You can also invoke commands on the AdminControl, AdminApp, AdminConfig, or Help wsadmin objects. The following example is a command invocation and sample output on Windows systems:

  ```
  wsadmin.bat
  ```

  ```
  WASX7209I: Connected
  to process server1
  on node myhost using
  SOAP connector;
  The type of process
  is: UnManagedProcess
  WASX7029I: For help,
  enter: "$Help help"
  wsadmin>$AdminApp list
  adminconsole
  DefaultApplication
  ivtApp
  wsadmin>exit
  ```

  To leave an interactive scripting session, use the **quit** or **exit** commands. These commands do not take any arguments.
- Run scripting commands as individual commands.

  Execute wsadmin with the `-c` option. For example, on Windows systems:

  ```
  wsadmin -c
  "$AdminApp list"
  ```

  For example, on UNIX systems:

  ```
  wsadmin.sh -c
  "\$AdminApp list"
  ```

  or

  ```
  wsadmin.sh -c
  '$AdminApp list'
  ```

  Example output:

  ```
  WASX7209I: Connected
  to process "server1"
  on node myhost using
  SOAP connector;
  The type of process
  ```

```
is: UnManagedProcess
adminconsole
DefaultApplication
ivtApp
```

- Run scripting commands in a script.

  Execute wsadmin with the `-f` option, and place the commands you want to execute into the file. For example:

  ```
  wsadmin -f
  al.jacl
  ```

  where the *al.jacl* file contains the following commands:

  ```
  set apps
  [$AdminApp list]
  puts $apps
  ```

  Example output:

  ```
  WASX7209I: Connected
  to process "server1"
  on node myhost using
  SOAP connector;  The
  type of process is:
  UnManagedProcess
   adminconsole
   DefaultApplication
   ivtApp
  ```

  Note: WebSphere for z/OS supports multiple encoding for the jacl command files. The default encoding for the jacl command file is ASCII. To run an EBCDIC encoded jacl file, add the following JVM argument to the wsadmin.sh file:

  ```
  -Dscript.encoding=Cp1047
  ```

  You can alternatively have two versions of the wsadmin.sh file, one that references the ASCII version of the jacl file and another that references the EBCDIC version of the jacl file. For example, copy the wsadmin.sh file to wsadminE.sh. Then add

  ```
  -Dscript.encoding=Cp1047
  ```

  to the wsadminE.sh file.

- Run scripting commands in a profile.

  A *profile* is a script that runs before the main script, or before entering interactive mode. You can use profiles to set up a scripting environment customized for the user or the installation.

  To run scripting commands in a profile, execute the wsadmin tool with the `-profile` option, and place the commands you want to execute into the profile. For example:

  ```
  wsadmin.bat -profile
  alprof.jacl
  ```

  where the *alprof.jacl* file contains the following commands:

  ```
  set apps
  [$AdminApp list]
  puts "Applications
  currently installed:
  \n$apps"
  ```

  Example output:

```
WASX7209I: Connected
to process "server1"
on node myhost using
SOAP connector;
The type of process
is: UnManagedProcess
 Applications
currently installed:
 adminconsole
 DefaultApplication
 ivtApp
 WASX7029I: For help,
enter: "$Help help"
 wsadmin>
```

To customize the script environment, specify one or more profiles to run.

Related concepts

"Scripting objects" on page 39

Related reference

"Properties used by scripted administration" on page 211

Wsadmin tool

The WebSphere Application Server wsadmin tool provides the ability to execute scripts. You can use the wsadmin tool to manage a WebSphere Application Server V5.0 installation. This tool uses the Bean Scripting Framework (BSF), which supports a variety of scripting languages to configure and control your WebSphere Application Server installation. The WebSphere Application Server only supports the JACL scripting language only.

The wsadmin launcher makes Java objects available through language specific interfaces. Scripts use these objects for application management, configuration, operational control, and for communication with MBeans running in WebSphere server processes.

The WebSphere Application Server wsadmin tool provides the ability to execute scripts. You can use the wsadmin tool to manage a WebSphere Application Server V5.0 server installation, as well as configuration, application deployment, and server runtime operations. This tool uses the Bean Scripting Framework (BSF), which supports a variety of scripting languages to configure and control your WebSphere Application Server installation. The WebSphere Application Server only supports the JACL scripting language only.
The command line invocation syntax for the wsadmin scripting client follows:

```
wsadmin [-h(help)]

[-?]

[-c <commands>]

[-p <properties_
file_name>]

[-profile <profile_
script_name>]

[-f <script_
file_name>]

[-javaoption
```

```
java_option]

[-lang language]

[-wsadmin_classpath
classpath]

[-conntype SOAP
[-host host_name]
[-port port_number]
[-user userid]
[password password] |

     RMI [-host
     host_name]
     [-port
     port_number]
     [-user userid]
     [-password
     password] |

     NONE
]

[script parameters]
```

Where *script parameters* represent any arguments other than the ones listed above. The `argc` variable contains their number, and `argv` variable contains their contents

Options

-c command
Designates a single command to execute.

Multiple `-c` options can exist on the command line. They run in the order that you supply them.

-f scriptname
Designates a script to execute.

Only one `-f` option can exist on the command line.

-lang
Specifies the language of the script file, command, or interactive shell. In WebSphere Application Server V5.0, Jacl is the only supported scripting language.

This argument is required if not determined from the script file name. It overrides language determinations that are based on a script file name, or the `com.ibm.ws.scripting.defaultLang` property. There is no default value for the `-lang` argument. If the command line or the property does not supply the script language, and the wsadmin tool cannot determine it, an error message generates.

It overrides language determinations that are based on a script file name, or the `com.ibm.ws.scripting.defaultLang` property defined in the `wsadmin.properties` file. There is no default value for the `-lang` argument. If the command line or the property does not supply the script language, and the wsadmin tool cannot determine it, an error message generates.

-p
Specifies a properties file.

The file listed after -p, represents a Java properties file that the scripting process reads. Three levels of default properties files load before the properties

file you specify on the command line. The first level is the installation default, wsadmin.properties, located in the WebSphere Application Server properties directory. The second level is the user default, wsadmin.properties, located in your home directory. The third level is the properties file pointed to by the environment variable WSADMIN_PROPERTIES.

Multiple -p options can exist on the command line. They invoke in the order that you supply them.

-profile
Specifies a profile script.

The profile script runs before other commands, or scripts. If you specify -c, the profile executes before it invokes this command. If you specify -f, the profile executes before it runs the script. In interactive mode, you can use the profile to perform any standard initialization that you want. You can specify multiple -profile options on the command line, and they invoke in the order that you supply them.

-? Provides syntax help.

-help
Provides syntax help.

-conntype
Specifies the type of connection to use.

This argument consists of a string that determines the type, for example, SOAP, and the options that are specific to that connection type. Possible types include: SOAP, RMI, and NONE.

The options for -conntype include: host, port, user, and password.

The options SOAP and RMI for -conntype also include: host, port, user, and password.

Use the -conntype NONE option to run in local mode. The result is that the scripting client is not connected to a running server.

Use the -conntype NONE option to run in local mode. The result is that the scripting client is not connected to a running server. This allows for users to manage server configuration and the installation and/or uninstallation of applications, without the application server running.

-wsadmin_classpath
Use this option to make additional classes available to your scripting process.

Follow this option with a classpath string. For example:

```
c:/MyDir/Myjar.jar;d:/yourdir/yourdir.jar.
```

The classpath is then added to the classloader for the scripting process.

You can also specify this option in a properties file that is used by the wsadmin tool. The property is com.ibm.ws.scripting.classpath. If you specify -wsadmin_classpath on the command line, the value of this property overrides any value specified in a properties file. The classpath property and the command line options are not concatenated.

In the following syntax examples, *mymachine* is the name of the host in the wsadmin.properties file, specified by com.ibm.ws.scripting.port:

SOAP connection to the local host
Use the options defined in the wsadmin.properties file.

SOAP connection to the *mymachine* host

```
wsadmin -f test1.jacl -profile setup.jacl -conntype SOAP -host
mymachine
```

RMI connection with security

```
wsadmin -connector RMI -userid userid -password password
```

Local mode of operation to perform a single command

```
wsadmin -conntype NONE -c "$AdminApp uninstall app"
```

Related reference

"wsadmin tool performance tips" on page 216

Jacl

Jacl is an alternate implementation of TCL, and is written entirely in Java code.

Jacl basic command The basic syntax for a Jacl command is:

```
Command arg1
arg2 arg3 ...
```

The command is either the name of a built-in command or a Jacl procedure. For example:

```
puts stdout
{Hello, world!}
=> Hello, World!
```

In this example, the command is `puts`, which takes two arguments: an I/O stream identifier and a string. `puts` writes the string to the I/O stream along with a trailing new line character. Arguments are interpreted by the command. In the example, `stdout` is used to identify the standard output stream. The use of `stdout` as a name is a convention employed by puts and the other I/O commands. Use stderr to identify the standard error output, and use `stdin` to identify the standard input.

Note: When writing Jacl scripts for windows systems, enclose directory paths that include spaces with quotes. For example:

```
"C:\Program Files\
WebSphere\AppServer\
InstallableApps\
somesample.ear"
```

On windows systems, special care must also be taken with path descriptions because Jacl uses the backslash character as an escape character. To fix this, either replace each backslash with a forward slash, or use double backslashes in Windows path statements. For example: `C:/` or `C:\\`

For more information about Jacl, see the Scripting: Resources for Learning article.

Scripting: Resources for learning

Use the following links to find relevant supplemental information about the Jacl scripting language. 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.

Programming instructions and examples

- Tcl for WebSphere Application Server administrators
- Jacl: A Tcl implementation in Java

Scripting objects

The wsadmin tool operates on configurations and running objects through the following set of management objects: AdminConfig, AdminControl, AdminApp, and Help. Each of these objects has commands that you can use to perform administrative tasks. The wsadmin tool requires that you specify a scripting object, a command, and command arguments.

WebSphere Application Server System Management separates administrative functions into two categories: functions that deal with the configuration of WebSphere Application Server installations, and functions that deal with the currently running objects in WebSphere Application Server installations.

Scripts deal with both categories of objects. For example, an application server is divided into two distinct entities. One entity represents the configuration of the server which resides persistently in a repository on permanent storage. You can create, query, change, or remove this configuration without starting an application server process. The AdminConfig and AdminApp objects handle configuration functionality. You can invoke configuration functions with or without being connected to a server.

The second entity represents the running instance of an application server by a *Java Management Extensions (JMX) MBean*. This instance can have attributes that you can interrogate and change, and operations that you can invoke. These operational actions taken against a running application server do not have an effect on the persistent configuration of the server. The attributes that support manipulation from an MBean differ from the attributes the corresponding configuration supports. The configuration can include many attributes that you cannot query or set from the live running object. The WebSphere Application Server scripting support provides functions to locate configuration objects, and live running objects.

Note: Objects in the configuration do not always represent objects that are currently running. The AdminControl object manages running objects.

You can use the Help object to obtain information about the AdminConfig, AdminApp and AdminControl objects, and to obtain interface information about running MBeans.

Related concepts

"Jacl" on page 38

Related reference

"Wsadmin tool" on page 35

Help object for scripted administration

The Help object provides general help and dynamic online information about the currently running MBeans.

You can use the Help object as an aid in writing and running scripts with the AdminControl object. Some methods include: attributes, operations, AdminConfig, and AdminControl.

The following public methods are available for the Help object:

AdminApp

Provides a summary of all of the available methods for the AdminApp object.

Parameters	none
Return type	java.lang.String

Example output:

```
WASX7095I: The
AdminApp object
allows application
objects to
be manipulated --
this includes
installing,
uninstalling, editing,
and listing.
The following
commands are
supported by
AdminApp:
edit Edit the
properties of
an application
editInteractive
Edit the properties
of an application
interactively
export Export
application to a file
exportDDL Extract
DDL from application
to a directory
help Show help
information
install Installs
an application,
given a file name
and an option string.
installInteractive
Installs an application
in interactive
mode, given a
file name and an
option string.
list List all
installed applications
listModules List
the modules in a
specified application
options Shows the
options available,
either for a
given file, or in
general.
taskInfo Shows
detailed information
pertaining to a
given install task
for a given file
uninstall Uninstalls
an application,
given an
application name and
an option string
```

AdminConfig

Provides a summary of all of the available methods for the AdminConfig object.

Parameters none

Return type java.lang.String

Example output:

```
WASX7053I: The
following functions
are supported
by AdminConfig:


create Creates a
configuration object,
given a type,
a parent, and

a list of attributes


create Creates a
configuration object,
given a type,
a parent, a

list of attributes,
and an attribute name
for the new object

remove Removes the
specified
configuration object

list Lists all
configuration objects
of a given type

list Lists all
configuration objects
of a given type,
contained

within the scope
supplied

show Show all the
attributes of a
given configuration
object

show Show specified
attributes of a
given configuration
object

modify Change
specified attributes
of a given
configuration object

getId Show the
configId of an
object, given a
```

```
string version of

its containment

contents Show the
objects which a
given type contains

parents Show the
objects which
contain a given type

attributes Show
the attributes
for a given type

types Show the
possible types
for configuration

help Show help
information
```

AdminControl

Provides a summary of all of the available methods for the AdminControl object.

Parameters	none
Return type	java.lang.String

Example output:

```
WASX7027I: The following
functions are supported
by AdminControl:


getHost returns String
representation of
connected host

getPort returns String
representation of
port in use

getType returns String
representation of
connection type in use

reconnect reconnects
with server

queryNames Given
ObjectName and
QueryExp, retrieves
set of ObjectNames

that match.

queryNames Given
String version of
ObjectName,
retrieves String of

ObjectNames that
match.
```

```
getMBeanCount
returns number
of registered beans

getDomainName
returns "WebSphere"

getDefaultDomain
returns "WebSphere"

getMBeanInfo Given
ObjectName, returns
MBeanInfo structure
for MBean

isInstanceOf Given
ObjectName and class
name, true if MBean
is of that class

isRegistered true if
supplied ObjectName
is registered

isRegistered true if
supplied String version
of ObjectName is
registered

getAttribute Given
ObjectName and name
of attribute,
returns value of

attribute

getAttribute Given
String version of
ObjectName and
name of attribute,

returns value
of attribute

getAttributes Given
ObjectName and
array of attribute
names, returns

AttributeList

getAttributes Given
String version of
ObjectName and
attribute names,

returns String of
name value pairs

setAttribute Given
ObjectName and
Attribute object,
set attribute for MBean

specified
```

```
setAttribute Given
String version of
ObjectName,
attribute name and

attribute value,
set attribute for
MBean specified

setAttributes Given
ObjectName and
AttributeList object,
set attributes for

the MBean specified

invoke Given
ObjectName, name
of method, array
of parameters and

signature, invoke
method on MBean
specified

invoke Given String
version of ObjectName,
name of method,
String version

of parameter
list, invoke
method on MBean
specified.

invoke Given
String version of
ObjectName, name
of method, String
version

of parameter list,
and String version
of array of
signatures, invoke

method on MBean
specified.

makeObjectName
Return an
ObjectName built
with the given
string

completeObjectName
Return a String
version of an
object name given a

template name

trace Set the
wsadmin trace
```

```
specification

help Show help
information
```

all Provides a summary of the information that the MBean defines by name.

Parameters	name -- java.lang.String
Return type	java.lang.String

Example output:

```
Name: WebSphere:
cell=pongo,name=
TraceService,mbean
Identifier=cells/
pongo/nodes/pongo/
servers/server1/
server.xml#Trace
Service_1,type=
TraceService,node=
pongo,process=server1
   Description: null
   Class name: javax.
  management.
  modelmbean.
  RequiredModelMBean

 Attribute       Type  Access
 ringBufferSize  int   RW
 traceSpecification
java.lang.String RW

   Operation
   int getRingBufferSize()
   void setRingBufferSize(int)
   java.lang.String
getTraceSpecification()
   void setTraceState
(java.lang.String)
   void appendTraceString
(java.lang.String)
   void dumpRingBuffer
(java.lang.String)
   void clearRingBuffer()
   [Ljava.lang.String;
listAllRegisteredComponents()
   [Ljava.lang.String;
listAllRegisteredGroups()
   [Ljava.lang.String;
listComponentsInGroup
(java.lang.String)
   [Lcom.ibm.websphere.
ras.TraceElementState;
getTracedComponents()
   [Lcom.ibm.websphere.
ras.TraceElementState;
getTracedGroups()
   java.lang.String
getTraceSpecification
(java.lang.String)
   void processDumpString
(java.lang.String)
   void checkTraceString
(java.lang.String)
   void setTraceOutputToFile
(java.lang.String, int,
```

```
int, java.lang.String)
   void setTraceOutput
ToRingBuffer(int,
java.lang.String)
   java.lang.String
rolloverLogFileImmediate
(java.lang.String,
java.lang.String)


   Notifications
   jmx.attribute.changed

   Constructors
```

attributes
Provides a summary of all of the attributes that the MBean defines by name.

Parameters	name -- java.lang.String
Return type	java.lang.String

Example output:

```
Attribute Type Access

ringBufferSize
java.lang.Integer RW

traceSpecification
java.lang.String RW
```

classname
Provides a class name that the MBean defines by name.

Parameters	name -- java.lang.String
Return type	java.lang.String

Example output:

```
javax.management.
modelmbean.
RequiredModelMBean
```

constructors
Provides a summary of all of the constructors that the MBean defines by name.

Parameters	name -- java.lang.String
Return type	java.lang.String

Example output:

```
Constructors
```

description
Provides a description that the MBean defines by name.

Parameters	name -- java.lang.String
Return type	java.lang.String

Example output:

```
Managed object
for overall
server process.
```

help

Provides a summary of all of the available methods for the help object.

Parameters none

Return type java.lang.String

```
WASX7028I: The
following functions
are supported by Help:


attributes given
an MBean, returns
help for attributes

operations given
an MBean, returns
help for operations

given an MBean
and an operation
name, return signature

information

constructors given
an MBean, returns
help for constructors

description given an
MBean, returns help
for description

notifications given
an MBean, returns
help for notifications

class name given an
MBean, returns help
for class name

all given an MBean,
returns help for
all the above

help returns this
help text

AdminControl returns
general help text
for the AdminControl
object

AdminConfig returns
general help text
for the AdminConfig
object

AdminApp returns
general help text
for the AdminApp object
```

message

Displays information for a message ID.

Parameters message ID

Return type java.lang.String

Example usage:

```
$Help message CNTR0005W
```

Example output:

```
Explanation: The container
was unable to passivate
an enterprise bean due
to exception {2}
User action: Take action
based upon message
in exception {2}
```

notifications

Provides a summary of all the notifications that the MBean defines by name.

Parameters name -- java.lang.String
Return type java.lang.String

Example output:

```
Notification

websphere.
messageEvent.audit

websphere.
messageEvent.fatal

websphere.
messageEvent.error

websphere.
seriousEvent.info

websphere.
messageEvent.warning

jmx.attribute.
changed
```

operations

Provides a summary of all of the operations that the MBean defines by name.

Parameters name -- java.lang.String
Return type java.lang.String

Example output:

```
Operation
int getRing
BufferSize()
void setRing
BufferSize(int)
java.lang.String
getTraceSpecification()
void setTraceState
(java.lang.String)
void appendTrace
String(java.lang.String)
void dumpRingBuffer
(java.lang.String)
void clearRingBuffer()
```

```
[Ljava.lang.String;
listAllRegistered
Components()
[Ljava.lang.String;
listAllRegisteredGroups()
[Ljava.lang.String;
listComponentsInGroup
(java.lang.String)
[Lcom.ibm.websphere.
ras.TraceElementState;
getTracedComponents()
[Lcom.ibm.websphere.
ras.TraceElementState;
getTracedGroups()
java.lang.String
getTraceSpecification
(java.lang.String)
void processDump
String(java.lang.String)
void checkTraceString
(java.lang.String)
void setTraceOutput
ToFile(java.lang.String,
int, int,
java.lang.String)
void setTraceOutput
ToRingBuffer(int,
java.lang.String)
java.lang.String
rolloverLogFileImmediate
(java.lang.String,
java.lang.String)
```

operations

Provides the signature of the opname operation for the MBean defined by name.

Parameters	name -- java.lang.String, opname -- java.lang.String
Return type	java.lang.String

Example output:

```
void processDump
String(java.
lang.String)

Description: Write
the contents of
the Ras services
Ring Buffer to
the specified file.

Parameters:

Type  java.lang.String
Name  dumpString
Description  a String
in the specified
format to process
or null.
```

Related concepts

"Jacl" on page 38

Related reference

"AdminApp object for scripted administration"
"AdminControl object for scripted administration" on page 69
"AdminConfig object for scripted administration" on page 81

AdminApp object for scripted administration

Use the AdminApp object to install, modify, and administer applications. The AdminApp object interacts with the WebSphere Application Server management and configuration services to make application inquiries and changes. This includes installing and uninstalling applications, listing modules, exporting, and so on.

You can start the scripting client when no server is running, if you want to use only local operations. To run in local mode, use the `-conntype NONE` option to start the scripting client. You will receive a message that you are running in the local mode. If a server is currently running, it is not recommended to run the AdminApp tool in local mode.

The following public methods are available for the AdminApp object:

deleteUserAndGroupEntries
Deletes users or groups for all roles, and deletes userids and passwords for all of the RunAs roles defined in the application.

Parameters:	appname
Return Type:	none

Example usage:

```
$AdminApp
deleteUserAndGroupEntries
myapp
```

edit
Edits an application or module in interactive mode.

Parameters:	appname -- java.lang.String options -- java.lang.String
Return Type:	java.lang.String

Example usage:

```
$AdminApp edit
"JavaMail Sample"
{-MapWebModToVH
{{"JavaMail
Sample WebApp"
mtcomps.war,WEB-INF/
web.xml newVH}}}
```

Note: The **edit** command changes the application deployment. Specify these changes in the options parameter. No options are required for the **edit** command.

editInteractive
Edits an application or module in interactive mode.

Parameters:	appname -- java.lang.String options -- java.lang.String
Return Type:	java.lang.String

Example usage:

```
$AdminApp editInteractive
ivtApp
```

Note: The **editInteractive** command changes the application deployment. Specify these changes in the options parameter. No options are required for the **editInteractive** command.

export

Exports the application appname parameter to a file you specify by file name.

Parameters: appname, filename
Return Type: none

Example usage:

```
$AdminApp export
"My App"
/usr/me/myapp.ear
```

exportDDL

Extracts the data definition language (DDL) from the application appname parameter to the directoryname parameter that a directory specifies. The options parameter is optional.

Parameters: appname, directoryname, options
Return Type: none

Example usage:

```
$AdminApp exportDDL
"My App" /usr/me/DDL
{-ddlprefix myApp}
```

help

Displays general help for the AdminApp object.

Parameters: none
Return Type: none

Example usage:

```
$AdminApp help
```

Example output:

```
wsadmin>$AdminApp help
WASX7095I: The AdminApp
object allows
application objects to
be manipulated
including installing,
uninstalling, editing,
and listing.  Most of
the commands supported
by AdminApp operate
in two modes: the
default mode is one
in which AdminApp
communicates with the
WebSphere server to
accomplish its tasks.
```

```
A local mode is also
possible, in which no
server communication
takes place.
The local
mode of operation is
invoked by including
the "-conntype NONE"
flag in the
option string supplied
to the command.

The following commands
are supported by
AdminApp; more detailed
information about each
of these commands is
available by using the
"help" command of
AdminApp and supplying
the name of the command
as an argument.

edit            Edit
      the properties
      of an application
editInteractive Edit the
      properties of an
      application
      interactively
export          Export
      application
      to a file
exportDDL      Extract DDL from
      application to
      a directory
help           Show help
      information
install         Installs an
      application,
      given a file
      name and an
      option string.
installInteractive
                Installs an
      application in
      interactive mode,
      given a file name
                and an option
      string.
list            List all
      installed
      applications
listModules     List the modules
      in a specified
      application
options         Shows the options
      available, either
      for a given file,
      or in general.
taskInfo        Shows detailed
      information
      pertaining to a
      given install task
                for a given file
uninstall       Uninstalls an
```

```
application, given
an application
name and
          an option string
```

help
Displays help for an AdminApp command or installation option.

Parameters: operation name
Return Type: none

Example usage:

```
$AdminApp help uninstall
```

Example output:

```
wsadmin>$AdminApp
help uninstall
WASX7102I: Method:
uninstall
Arguments: application
name, options
Description: Uninstalls
application named by
"application name"
using the options
supplied by String 2.
Method: uninstall
Arguments: application
name
Description: Uninstalls
the application
specified by
"application name"
using default options.
```

install
Installs an application in non-interactive mode, given a fully qualified file name and a string of installation options. The options parameter is optional.

Parameters: earfile, options
Return Type: none

Example usage:

```
$AdminApp install
c:/apps/myapp.ear
```

There are many options available for this command. You can obtain a list of valid options for an EAR file with the following command:

```
$AdminApp options
<earfilename>
```

You can also obtain help for each object with the following command:

```
$AdminApp help
<optionname>
```

installInteractive
Installs an application in interactive mode, given a fully qualified file name and a string of installation options. The options parameter is optional.

Parameters: earfile, options

Return Type: none

Example usage:

```
$AdminApp installInteractive
c:/websphere/appserver/
installableApps/jmsample.ear
```

list

Lists the applications installed in the configuration.

Parameters: none
Return Type: java.lang.String

Example usage:

```
$AdminApp list
```

Example output:

```
wsadmin>$AdminApp list
adminconsole
DefaultApplication
ivtApp
```

listModules

Lists the modules in an application.

Parameters: appname -- java.lang.String options -- java.lang.String
Return Type: java.lang.String

The options parameter is optional. The valid option is `-server`. This option lists the application servers on which the modules are installed.

Example usage:

```
$AdminApp listModules
ivtApp
```

Example output:

```
ivtApp#ivtEJB.
jar+META-INF/
ejb-jar.xml
ivtApp#ivt_app.
war+WEB-INF/web.xml
```

This example is formed by the concatenation of `appname`, `#`, `module URI`, `+`, and `DD URI`. You can pass this string to the `edit` and `editInteractive` AdminApp commands.

Options

Displays a list of options for installing an EAR file.

Parameters: earfile
Return Type: Information about the valid installation options for an EAR file.

Example usage:

```
$AdminApp options
c:/websphere/appserver/
installableApps/
jmsample.ear
```

taskInfo

Provides information about a particular task option for an application file.

Parameters: earfile, task name
Return Type: none

Example usage:

```
$AdminApp taskInfo
c:/websphere/appserver/
installableApps/
jmsample.ear
MapWebModToVH
```

Example output:

```
MapWebModToVH:
Selecting
virtual hosts
for Web modules
Specify the
virtual host
where you want
to install the
Web modules
contained in
your application.
Web modules can
be installed on
the same virtual
host or dispersed
among several hosts.
Each element of
the MapWebModToVH
task consists of
the following 3
fields: "webModule,"
"uri," "virtualHost."
Of these fields,
the following may
be assigned new
values: "virtualHost"
and the following
are required:
"virtualHost"

The current
contents of the
task after
running default
bindings are:
webModule:
JavaMail Sample
WebApp
uri: mtcomps.
war,WEB-INF/
web.xml
virtualHost:
default_host
```

updateAccessIDs

Updates the access id information for users and groups assigned to various roles defined in the application. The access ids are read from the user registry and saved in the application bindings. This operation improves runtime performance of the application. You should call it after installing an application or after editing security role specific information for an installed application.

This method cannot be invoked when `-conntype` is set to `NONE`. You must be connected to server to invoke this command.

The `bAll` boolean parameter retrieves and saves all access IDs for users and groups in the application bindings. Specify `false` if you want to retrieve access ids for users or groups that do not have an access id in the application bindings.

Parameters: appname, bALL
Return Type: none

Example usage:

```
$AdminApp updateAccessIDs
myapp true
```

Related concepts

"Jacl" on page 38

Related reference

"Help object for scripted administration" on page 39

"AdminControl object for scripted administration" on page 69

"AdminConfig object for scripted administration" on page 81

Installation options for the AdminApp object

You can specify the following installation options for the AdminApp object.

Related reference

"Example: Obtaining information about task options for the AdminApp **install** command" on page 68

appname:

Specifies the name of the application. The default is the display name of the application.

BackendIdSelection:

Specifies the backend ID for the enterprise bean jar modules that have container managed persistence (CMP) beans. An enterprise bean jar module can support multiple backend configurations as specified using the Application Assembly Tool.

Use this option to change the backend ID during installation. This option is not available in an **edit** command.

Example usage:

```
$AdminApp install
c:/myapp.ear
{-BackendIdSelection
{{Annuity20EJB
Annuity20EJB.jar,
META-INF/ejb-jar.xml
DB2UDBNT_V72_1}}}
```

BindJndiForEJBMessageBinding:

Binds enterprise beans to listener port names.

Ensure each message-driven enterprise bean in your application or module is bound to a listener port name. Use this option to provide missing data or update a task.

Example usage:

```
$AdminApp install
c:/myapp.ear
{-BindJndiForEJB
MessageBinding
{{mymdb myMDB
mymdb.jar,META-INF/
ejb-jar.xml
myMDBListenPort}}}
```

Use the **taskInfo** command of the AdminApp object to obtain information about the data needed for your application. You only need to provide data for rows or entries that are missing information, or those where you want to update the existing data.

BindJndiForEJBNonMessageBinding:

Binds enterprise beans to Java Naming and Directory Interface (JNDI) names.

Ensure each non message-driven enterprise bean in your application or module is bound to a JNDI name. Use this option to provide missing data or update a task.

Example usage:

```
$AdminApp install
c:/myapp.ear
{-BindJndiForEJBNon
MessageBinding
{{"Increment Bean
Jar" Inc Increment.
jar,META-INF/
ejb-jar.xml IncBean}}}
```

Use the **taskInfo** command of the AdminApp object to obtain information about the data needed for your application. You only need to provide data for rows or entries that are missing information, or those where you want to update the existing data.

cell:

Specifies the cell name for the AdminApp object installation functions.

cluster:

Specifies the cluster name for the AdminApp object installation functions.

Note: This option only applies to a Network Deployment environment.

contextroot:

Specifies the context root you use when installing a stand-alone WAR file.

CorrectOracleIsolationLevel:

Specifies the isolation level for the Oracle type provider. Use this option to provide missing data or update a task.

Example usage:

```
$AdminApp install
c:/myapp.ear
{-CorrectOracle
IsolationLevel
{{AsyncSender
jms/MyQueue
ConnectionFactory
jms/Resource1 2}}
```

The last field of each entry specifies the isolation level. Valid isolation level values are 2 or 4.

Use the **taskInfo** command of the AdminApp object to obtain information about the data needed for your application. You only need to provide data for rows or entries that are missing information, or those where you want to update the existing data.

CorrectUseSystemIdentity:

Replaces RunAs System to RunAs Roles.

The enterprise beans you install contain RunAs system identity. You can optionally change this identity to a RunAs role. Use this option to provide missing data or update a task.

Example usage:

```
$AdminApp install
c:/myapp.ear
{-CorrectUseSystem
Identity {{Inc
"Increment Bean Jar"
Increment.jar,META-
INF/ejb-jar.xml
getValue() RunAsUser2
user2 password2}
{Inc "Increment
Bean Jar" Increment.
jar,META-INF/
ejb-jar.xml
Increment()
RunAsUser2 user2
password2}}}
```

Use the **taskInfo** command of the AdminApp object to obtain information about the data needed for your application. You only need to provide data for rows or entries that are missing information, or those where you want to update the existing data.

DataSourceFor10CMPBeans:

Specifies optional data sources for individual 1.x container managed persistence (CMP) beans.

Mapping a specific data source to a CMP bean overrides the default data source for the module that contains the enterprise bean. Use this option to provide missing data or update a task.

Example usage:

```
$AdminApp install
c:/myapp.ear
{-DataSourceFor
10CMPBeans
{{"Increment
Bean Jar" Inc
Increment.jar,
META-INF/ejb-jar.xml
jdbc/Sample
DataSource user1
password1}}}
```

Use the **taskInfo** command of the AdminApp object to obtain information about the data needed for your application. You only need to provide data for rows or entries that are missing information, or those where you want to update the existing data.

DataSourceFor20CMPBeans:

Specifies optional data sources for individual 2.x container managed persistence (CMP) beans.

Mapping a specific data source to a CMP bean overrides the default data source for the module that contains the enterprise bean. Use this option to provide missing data or update a task.

Example usage:

```
$AdminApp install
c:/myapp.ear
{-DataSourceFor20
CMPBeans {{Customer
EjbJar CustomerEJB
customreEjb.jar,
META-INF/ejb-jar.xml
ejb/customerEjb
"per connection
factory"}
{SupplierEjbJar
supplierEjb supplierEjb.
jar,META-INF/ejb-
jar.xml ejb/supplierEjb
container}}}
```

The last field in each entry of this task specifies the value for resource authorization. Valid values for resource authorization are `per connection factory` or `container`.

Use the **taskInfo** command of the AdminApp object to obtain information about the data needed for your application. You only need to provide data for rows or entries that are missing information, or those where you want to update the existing data.

DataSourceFor10EJBModules:

Specifies the default data source for the enterprise bean module that contains 1.x container managed persistence (CMP) beans. Use this option to provide missing data or update a task.

Example usage:

```
$AdminApp install
c:/myapp.ear
{-DataSourceFor
10EJBModules
{{"Increment
Bean Jar"
Increment.jar,
META-INF/ejb-jar.
xml jdbc/Sample
DataSource user1
password1}}}
```

Use the **taskInfo** command of the AdminApp object to obtain information about the data needed for your application. You only need to provide data for rows or entries that are missing information, or those where you want to update the existing data.

DataSourceFor20EJBModules:

Specifies the default data source for the enterprise bean 2.x module that contains 2.x container managed persistence (CMP) beans. Use this option to provide missing data or update a task.

Example usage:

```
$AdminApp install
c:/myapp.ear
{-DataSourceFor
20CMPBeans
{{CustomerEjbJar
CustomerEJB
customreEjb.jar,
META-INF/ejb-jar.
xml ejb/customerEjb
"per connection
factory"}
 {SupplierEjbJar
supplierEjb
supplierEjb.jar,
META-INF/ejb-jar.
xml ejb/supplierEjb
container}}}
```

The last field in each entry of this task specifies the value for resource authorization. Valid values for resource authorization is `per connection factory` or `container`.

Use the **taskInfo** command of the AdminApp object to obtain information about the data needed for your application. You only need to provide data for rows or entries that are missing information, or those where you want to update the existing data.

defaultbinding.cf.jndi:

Specifies the Java Naming and Directory Interface (JNDI) name for the default connection factory

defaultbinding.cf.resauth:

Specifies the RESAUTH for the connection factory.

defaultbinding.datasource.jndi:

Specifies the Java Naming and Directory Interface (JNDI) name for the default datasource.

defaultbinding.datasource.password:

Specifies the password for the default datasource.

defaultbinding.datasource.username:

Specifies the user name for the default datasource.

defaultbinding.ejbjndi.prefix:

Specifies the prefix for the enterprise bean Java Naming and Directory Interface (JNDI) name.

defaultbinding.force:

Specifies that the default bindings should override the current bindings.

defaultbinding.strategy.file:

Specifies a custom default bindings strategy file.

defaultbinding.virtual.host:

Specifies the default name for a virtual host.

depl.extension.reg:

Specifies the location of the properties file for deployment extensions.

deployejb:

Specifies to run `EJBDeploy` during installation. This option does not require a value.

The default value is `nodeployejb`.

deployejb.classpath:

Specifies an extra class path for `EJBDeploy`.

deployejb.dbschema:

Specifies the database schema for `EJBDeploy`.

deployejb.dbtype:

Specifies the database type for `EJBDeploy`.

Possible values include the following:

```
CLOUDSCAPE_V5
 DB2UDB_V72
 DB2UDBOS390_V6
 DB2UDBISERIES
 INFORMIX_V73
 INFORMIX_V93
 MSSQLSERVER_V7
 MSSQLSERVER_2000
 ORACLE_V8
 ORACLE_V9I
 SYBASE_V1200
```

For a list of current supported database vendor types, run `ejbdeploy -?`.

deployejb.rmic:

Specifies extra RMIC options to use for `EJBDeploy`.

deployws:

Specifies to deploy WebServices during installation. This option does not require a value.

The default value is: `nodeployws`.

deployws.classpath:

Specifies the extra classpath to use when you deploy WebServices.

deployws.jardirs:

Specifies the extra extension directories to use when you deploy WebServices.

distributeApp:

Specifies that the application management component distributes application binaries. This option does not require a value.

This is the default setting.

EnsureMethodProtectionFor10EJB:

Selects method protections for unprotected methods of 1.x enterprise beans. Specify to leave the method as unprotected, or assign protection which denies all access. Use this option to provide missing data or update to a task.

Example usage:

```
$AdminApp install
c:/myapp.ear
{-EnsureMethod
ProtectionFor10EJB
{{"Increment EJB Module"
 IncrementEJBBean.
jar,META-INF/
ejb-jar.xml ""}
{"Timeout EJB Module"
 TimeoutEJBBean.
```

```
jar,META-INF/
ejb-jar.xml
methodProtection.
denyAllPermission}}}
```

The last field in each entry of this task specifies the value of the protection. Valid protection values include: `methodProtection.denyAllPermission`. You can also leave the value blank if you want the method to remain unprotected.

Use the **taskInfo** command of the AdminApp object to obtain information about the data needed for your application. You only need to provide data for rows or entries that are missing information, or those where you want to update the existing data.

EnsureMethodProtectionFor20EJB:

Selects method protections for unprotected methods of 2.x enterprise beans. Specify to assign a security role to the unprotected method, add the method to the exclude list, or mark the method as unchecked. You can assign multiple roles for a method by separating roles names with commas. Use this option to provide missing data or update to a task.

Example usage:

```
$AdminApp install
c:/myapp.ear
{-EnsureMethod
ProtectionFor20EJB
{{CustmerEjbJar
customerEjb.jar,
META-INF/ejb-jar.xml
methodProtection.
uncheck}
{SupplierEjbJar
supplierEjb.jar,
META-INF/ejb-jar.xml
methodProtection.
exclude}}}
```

The last field in each entry of this task specifies the value of the protection. Valid protection values include: `methodProtection.uncheck`, `methodProtection.exclude`, or a list of security roles separated by commas.

Use the **taskInfo** command of the AdminApp object to obtain information about the data needed for your application. You only need to provide data for rows or entries that are missing information, or those where you want to update the existing data.

installdir:

Specifies the directory to place the application binaries.

MapModulesToServers:

Specifies the application server where you want to install modules that are contained in your application. You can install modules on the same server, or disperse them among several servers. Use this option to provide missing data or update to a task.

Example usage:

```
$AdminApp install
c:/myapp.ear
{-MapModulesTo
Servers {{"Increment
Bean Jar"
Increment.jar,
META-INF/ejb-jar.
xml WebSphere:
cell=mycell,node=
mynode,server=
server1}
{"Default
Application"
default_app.war,
WEB-INF/web.xml
WebSphere:cell=
mycell,node=
mynode,server=
server1}
{"Examples
Application"
examples.war,
WEB-INF/web.xml
WebSphere:cell=
mycell,node=
mynode,server=
server1}}}
```

Use the **taskInfo** command of the AdminApp object to obtain information about the data needed for your application. You only need to provide data for rows or entries that are missing information, or those where you want to update the existing data.

MapEJBRefToEJB:

Maps enterprise Java references to enterprise beans. You must map each enterprise bean reference defined in your application to an enterprise bean. Use this option to provide missing data or update to a task.

Example usage:

```
$AdminApp install
c:/myapp.ear
{-MapEJBRefToEJB
{{"Examples
Application" ""
examples.war,
WEB-INF/web.
xml BeenThereBean
com.ibm.websphere.
beenthere.
BeenThere IncBean}}}
```

Use the **taskInfo** command of the AdminApp object to obtain information about the data needed for your application. You only need to provide data for rows or entries that are missing information, or those where you want to update the existing data.

MapResEnvRefToRes:

Maps resource environment references to resources. You must map each resource environment reference defined in your application to a resource. Use this option to provide missing data or update to a task.

Example usage:

```
$AdminApp install
c:/myapp.ear
{-MapResEnvRefToRes
{{AsyncSender AsyncSender
asyncSenderEjb.
jar,META-INF/ejb-jar.xml
jms/ASYNC_SENDER_QUEUE
javax.jms.Queue
jms/Resource2}}}
```

Use the **taskInfo** command of the AdminApp object to obtain information about the data needed for your application. You only need to provide data for rows or entries that are missing information, or those where you want to update the existing data.

MapResRefToEJB:

Maps resource references to resources. You must map each resource reference defined in your application to a resource. Use this option to provide missing data or update to a task.

Example usage:

```
$AdminApp install
c:/myapp.ear
{-MapResRefToEJB
{{AsyncSender AsyncSender
asyncSenderEjb.jar,
META-INF/ejb-jar.
xml jms/MyQueue
ConnectionFactory
javax.jms.Queue
ConnectionFactory
jms/Resource1}
{"Catalog Component"
TheCatalog
catalogEjb.jar,
META-INF/ejb-jar.xml
jdbc/CatalogData
Source javax.sql.
DataSource
jdbc/Resource2}}}
```

Use the **taskInfo** command of the AdminApp object to obtain information about the data needed for your application. You only need to provide data for rows or entries that are missing information, or those where you want to update the existing data.

MapRolesToUsers:

Maps users to roles. You must map each role defined in the application or module to a user or group from the domain user registry. You can specify multiple users or groups for a single role by separating them with a `|`. Use this option to provide missing data or update to a task.

Example usage:

```
$AdminApp install
c:/myapp.ear
{-MapRolesToUsers
{{"All Role"
No Yes "" ""}
```

```
{"Every Role"
Yes No "" ""}
{DenyAllRole No
No user1 group1}}}
```

Use the **taskInfo** command of the AdminApp object to obtain information about the data needed for your application. You only need to provide data for rows or entries that are missing information, or those where you want to update the existing data.

MapRunAsRolesToUsers:

Maps RunAs Roles to users. The enterprise beans you install contain predefined RunAs roles. Enterprise beans that need to run as a particular role for recognition while interacting with another enterprise bean use RunAs roles. Use this option to provide missing data or update to a task.

Example usage:

```
$AdminApp install
c:/myapp.ear
{-MapRunAsRoles
ToUsers {{UserRole
user1 password1}
{AdminRole
administrator
administrator}}}
```

Use the **taskInfo** command of the AdminApp object to obtain information about the data needed for your application. You only need to provide data for rows or entries that are missing information, or those where you want to update the existing data.

MapWebModToVH:

Selects virtual hosts for Web modules. Specify the virtual host where you want to install the Web modules contained in your application. You can install Web modules on the same virtual host, or disperse them among several hosts. Use this option to provide missing data or update to a task.

Example usage:

```
$AdminApp install
c:/myapp.ear
{-MapWebModToVH
{{"Default Application"
default_app.war,
WEB-INF/web.xml
default_host}
{"Examples Application"
examples.war,
WEB-INF/web.xml
default_host}}}
```

Use the **taskInfo** command of the AdminApp object to obtain information about the data needed for your application. You only need to provide data for rows or entries that are missing information, or those where you want to update the existing data.

node:

Specifies the node name for the AdminApp installation functions.

nodeployejb:

Specifies not to run `EJBDeploy` during installation. This option does not require a value.

This value is the default setting.

nodeployws:

Specifies to not deploy WebServices during installation. This option does not require a value.

This value is the default setting.

nodistributeApp:

Specifies that the application management component does not distribute application binaries. This option does not require a value.

The default setting is `distributeApp`.

nopreCompileJSPs:

Specifies not to precompile JavaServer Pages files. This option does not require a value.

This is the default setting.

nouseMetaDataFromBinary:

Specifies that the metadata used at run time, for example, deployment descriptors, bindings, extensions, and so on, come from the configuration repository. This option does not require a value.

This is the default setting. Use `useMetaDataFromBinary` to indicate that the metadata used at run time comes from the EAR file.

nousedefaultbindings:

Specifies not to use default bindings for installation. This option does not require a value.

This is the default setting.

preCompileJSPs:

Specifies to precompile JavaServer Pages files. This option does not require a value.

The default is `nopreCompileJSPs`.

server:

Specifies the server name for the AdminApp installation functions.

update:

Updates the installed application with a new version of the EAR file. This option does not require a value.

The application that is being updated, specified by the `appname` option, must already be installed in the WebSphere Application Server configuration. The update action merges bindings from the new version with the bindings from the old version, uninstalls the old version, and installs the new version. The binding information from new version of the EAR file is preferred over the corresponding one from the old version. If any element of binding is missing in the new version, the corresponding element from the old version is used.

update.ignore.old:

Specifies that during the update action, bindings from the installed version of the application are ignored. This option does not require a value.

Applies only if you specify the `update` option.

update.ignore.new:

Specifies that during the update action, bindings from the new version of the application are ignored. This option does not require a value.

Applies only if you specify the `update` option.

useMetaDataFromBinary:

Specifies that the metadata used at run time, for example, deployment descriptors, bindings, extensions, and so on, come from the EAR file. This option does not require a value.

The default value is `nouseMetaDataFromBinary` which means that the metadata used at run time comes from the configuration repository.

usedefaultbindings:

Specifies to use default bindings for installation. This option does not require a value.

The default setting is `nousedefaultbindings`.

verbose:

Causes additional messages to display during installation. This option does not require a value.

Example: Obtaining information about task options for the AdminApp install command

You can obtain information online about the AdminApp task options by using the AdminApp `taskInfo` method.

- You can use the `options` method to see the requirements for an EAR file if you construct installation command lines. The `taskInfo` command provides detailed information for each task option with a default binding applied to the result.
- The options for the AdminApp **install** command can be complex if you specify various types of binding information, for example, Java Naming and Directory Interface (JNDI) name, data sources for enterprise bean modules, or virtual hosts for Web modules. An easy way to specify command line installation options is

to use a feature of the **installInteractive** command that generates the options for you. After you install the application interactively once and specify all the updates that you need, look for message WASX7278I in the wsadmin output log. The default output log for wsadmin is `wsadmin.traceout`. You can cut and paste the data in this message into a script, and modify it. For example:

```
WASX7278I: Generated
command line:
install c:/websphere
/appserver/
installableapps/
jmsample.ear
{-BindJndiForEJBNon
MessageBinding
{{deplmtest.jar
MailEJBObject
deplmtest.jar,
META-INF/ejb-jar.
xml ejb/JMSampEJB1 }}
-MapResRefToEJB
{{deplmtest.jar
MailEJBObject
deplmtest.jar,
META-INF/ejb-jar.
xml mail/MailSession9
javax.mail.Session mail/
DefaultMailSessionX }
{"JavaMail Sample
WebApp"  mtcomps.war,
WEB-INF/web.xml mail/
MailSession9 javax.
mail.Session mail/
DefaultMailSessionY }}
-MapWebModToVH
{{"JavaMail Sample
WebApp" mtcomps.war,
WEB-INF/web.xml
newhost }}
-nopreCompileJSPs
-novalidateApp
-installed.ear.
destination c:/
mylocation
-distributeApp
-nouseMetaData
FromBinary}
```

Related reference

"Installation options for the AdminApp object" on page 56

AdminControl object for scripted administration

Use the AdminControl object to invoke operational commands that deal with running objects in the WebSphere Application Server. Many of the AdminControl methods have multiple signatures so that they can either invoke in a `raw` mode using Parameters: specified by Java Management Extensions (JMX), or using strings for Parameters:. In addition to operational commands, the AdminControl object supports some utility methods for tracing, reconnecting with a server, and converting data types.

completeObjectName

A convenience method that creates a string representation of a complete ObjectName value based based on a fragment. This method does not communicate with the server to find a matching ObjectName value. If it finds

several MBeans that match the fragment, the method returns the first one.

Parameters: name -- java.lang.String
Return Type: java.lang.String

Example usage:

```
set serverON [$AdminControl completeObjectName node=mynode,type=Server,*]
```

getAttribute
Returns the value of the attribute for the name you provide.

Parameters: name -- java.lang.String; attribute -- java.lang.String
Return Type: java.lang.String

Example usage:

```
set objNameString [$AdminControl completeObjectName WebSphere:type=Server,*]
$AdminControl getAttribute $objNameString processType
```

getAttribute_jmx
Returns the value of the attribute for the name you provide.

Parameters: name -- ObjectName; attribute -- java.lang.String
Return Type: java.lang.String

Example usage:

```
set objNameString [$AdminControl completeObjectName WebSphere:type=Server,*]
set objName [java::new javax.management.ObjectName $objNameString]
$AdminControl getAttribute_jmx $objNameString processType
```

getAttributes
Returns the attribute values for the names you provide.

Parameters: name -- String; attributes -- java.lang.String
Return Type: java.lang.String

Example usage:

```
set objNameString [$AdminControl completeObjectName WebSphere:type=Server,*]
$AdminControl getAttributes $objName "cellName nodeName"
```

getAttributes_jmx
Returns the attribute values for the names you provide.

Parameters: name -- ObjectName; attributes -- java.lang.String[]
Return Type: javax.management.AttributeList

Example usage:

```
set objectNameString [$AdminControl completeObjectName WebSphere:type=Server,*]
set objName [java:;new javax.management.ObjectName $objectNamestring]
set attrs [java::new {String[]} 2 {cellName nodeName}]
$AdminControl getAttributes_jmx $objName $attrs
```

getCell
Returns the name of the connected cell.

Parameters: none
Return Type: java.lang.String

Example usage:

```
$AdminControl getCell
```

Example output:

```
Mycell
```

getConfigId

A convenience method from an ObjectName or ObjectName fragment that creates a configuration ID. Use this ID with the $AdminConfig method. Not all Mbeans that run have configuration objects that correspond. If there are several Mbeans that correspond to an ObjectName fragment, a warning issues and a configuration ID builds for the first Mbean it finds.

Parameters: name -- java.lang.String
Return Type: java.lang.String

Example usage:

```
set threadpoolCID [$AdminControl getConfigId node=mynode,type=ThreadPool,*]
```

Example usage:

```
set serverConfigId [$AdminControl getConfigId node=SY1,type=Server,*]
```

getDefaultDomain

Returns the default domain name from the server.

Parameters: none
Return Type: java.lang.String

Example usage:

```
$AdminControl getDefaultDomain
```

Example output:

```
WebSphere
```

getDomainName

Returns the domain name from the server.

Parameters: none
Return Type: java.lang.String

Example usage:

```
$AdminControl getDomainName
```

Example output:

```
WebSphere
```

getHost

Returns the name of your host.

Parameters: none
Return Type: java.lang.String

Example usage:

```
$AdminControl getHost
```

Example output:

```
myhost
```

getMBeanCount

Returns the number of Mbeans registered in the server.

Parameters:	none
Return Type:	java.lang.Integer

Example usage:

```
$AdminControl getMBeanCount
```

Example output:

```
114
```

getMBeanInfo_jmx

Returns the Java management extension MBeanInfo structure that corresponds to an OjbectName value. There is no string signature for this method, because the Help object displays most of the information available from getMBeanInfo.

Parameters:	name -- ObjectName
Return Type:	javax.management.MBeanInfo

Example usage:

```
set objName [java::new javax.management.ObjectName [
$AdminControl completeObjectName type=Server,*]]
$AdminControl getMBeanInfo_jmx $objName
```

(split for publication)

Example output:

```
javax.management.modelmbean.ModelMBeanInfoSupport@10dd5f35
```

getNode

Returns the name of the connected node.

Parameters:	none
Return Type:	java.lang.String

Example usage:

```
$AdminControl getNode
```

Example output:

```
Myhost
```

getPort

Returns the name of your port.

Parameters:	none
Return Type:	java.lang.String

Example usage:

```
$AdminControl getPort
```

Example output:

```
8877
```

getPropertiesForDataSource

Deprecated, no replacement.

This command incorrectly assumes the availability of a configuration service when running in connected mode.

Parameters: configId -- java.lang.String
Return Type: java.lang.String

Example usage:

```
set ds [lindex [$AdminConfig list DataSource] 0]
$AdminControl getPropertiesForDataSource $ds
```

Example output:

```
WASX7389E: Operation not supported - getPropertiesForDataSource command
is not supported.
```

getType

Returns the connection type.

Parameters: none
Return Type: java.lang.String

Example usage:

```
$AdminControl getType
```

Example output:

```
SOAP
```

help

Returns general help text for the AdminControl object.

Parameters: none
Return Type: java.lang.String

Example usage:

```
$AdminControl help
```

Example output:

```
WASX7027I: The AdminControl object enables the manipulation
        of MBeans running in a WebSphere server process.  The number and type
        of MBeans available to the scripting client depends on the server to
        which the client is connected.  If the client is connected to a
        Deployment Manager, then all the MBeans running in the Deployment
        Manager are visible, as are all the MBeans running in the Node Agents
        connected to this Deployment Manager, and all the MBeans running in
        the application servers on those nodes.

        The following commands are supported by AdminControl; more detailed
        information about each of these commands is available by using the
        "help" command of AdminControl and supplying the name of the command
        as an argument.

        Note that many of these commands support two different sets of
        signatures: one that accepts and returns strings, and one low-level
        set that works with JMX objects like ObjectName and AttributeList.
        In most situations, the string signatures are likely to be more useful,
        but JMX-object signature versions are supplied as well.  Each of these
        JMX-object signature commands has "_jmx" appended to the command name.
        Hence there is an "invoke" command, as well as a "invoke_jmx" command.
```

```
completeObjectName
                Return a String version of an object name given a
                template name
getAttribute_jmx
                Given ObjectName and name of attribute, returns value of
                attribute
getAttribute    Given String version of ObjectName and name of attribute,
                returns value of attribute
getAttributes_jmx
                Given ObjectName and array of attribute names, returns
                AttributeList
getAttributes   Given String version of ObjectName and attribute names,
                returns String of name value pairs

getCell         returns the cell name of the connected server
getConfigId     Given String version of ObjectName, return a config id for
                the corresponding configuration object, if any.
getDefaultDomain
                returns "WebSphere"
getDomainName   returns "WebSphere"

getHost         returns String representation of connected host
getMBeanCount   returns number of registered beans
getMBeanInfo_jmx
                Given ObjectName, returns MBeanInfo structure for MBean

getNode         returns the node name of the connected server
getPort         returns String representation of port in use
getType         returns String representation of connection type in use
help            Show help information
invoke_jmx      Given ObjectName, name of method, array of parameters and
                signature, invoke method on MBean specified
invoke          Invoke a method on the specified MBean
isRegistered_jmx
                true if supplied ObjectName is registered
isRegistered    true if supplied String version of ObjectName is registered
makeObjectName  Return an ObjectName built with the given string
queryNames_jmx  Given ObjectName and QueryExp, retrieves set of ObjectNames
                that match.
queryNames      Given String version of ObjectName, retrieves String of
                ObjectNames that match.
reconnect       reconnects with server
setAttribute_jmx
                Given ObjectName and Attribute object, set attribute for MBean
                specified
setAttribute    Given String version of ObjectName, attribute name and
                attribute value, set attribute for MBean specified
setAttributes_jmx
                Given ObjectName and AttributeList object, set attributes for
                the MBean specified
startServer     Given the name of a server, start that server.
stopServer      Given the name of a server, stop that server.
testConnection  Test the connection to a DataSource object
trace           Set the wsadmin trace specification
```

help

Returns help text for the specific method of the AdminControl object. The method name is not case sensitive.

Parameters: method -- java.lang.String
Return Type: java.lang.String

Example usage:

```
$AdminControl help getAttribute
```

Example output:

```
WASX7043I: Method: getAttribute
Arguments: object name, attribute
Description: Returns value of "attribute" for the MBean described by "object name."
```

invoke

Invokes the object operation without any parameter. Returns the result of the invocation.

Parameters: name -- java.lang.String; operationName -- java.lang.String

Return Type: java.lang.String

Example usage:

```
set objNameString [$AdminControl completeObjectName WebSphere:type=Server,*]
$AdminControl invoke $objNameString stop
```

invoke

Invokes the object operation using the parameter list that you supply. The signature generates automatically. The types of Parameters: are supplied by examining the MBeanInfo that the MBean supplies. Returns the string result of the invocation.

Parameters: name -- java.lang.String; operationName -- java.lang.String; params -- java.lang.String

Return Type: java.lang.String

Example usage:

```
set objNameString [$AdminControl completeObjectName WebSphere:type=Server,*]
$AdminControl invoke $objNameString appendTraceString com.ibm.*=all=enabled
```

invoke

Invokes the object operation by conforming the parameter list to the signature. Returns the result of the invocation.

Parameters: name -- java.lang.String; operationName -- java.lang.String; params -- java.lang.String; sigs -- java.lang.String

Return Type: java.lang.String

Example usage:

```
set objNameString [$AdminControl completeObjectName WebSphere:type=Server,*]
$AdminControl invoke $objNameString appendTraceString com.ibm.*=all=enabled java.lang.String
```

invoke_jmx

Invokes the object operation by conforming the parameter list to the signature. Returns the result of the invocation.

Parameters: name -- ObjectName; operationName -- java.lang.String; params -- java.lang.Object[]; signature -- java.lang.String[]

Return Type: java.lang.Object

Example usage:

```
set objNameString [$AdminControl completeObjectName WebSphere:type=TraceService,*]
set objName [java::new javax.management.ObjectName $objNameString]
set parms [java::new {java.lang.Object[]} 1 com.ibm.ejs.sm.*=all=disabled]
set signature [java::new {java.lang.String[]} 1 java.lang.String]
$AdminControl invoke_jmx $objName appendTraceString $parms $signature
```

isAlive

Parameters: none
Return Type: session

Example usage:

```
$AdminControl isAlive
```

isInstanceof

If the ObjectName value is a member of the class you provide, then the value is true.

Parameters: name -- java.lang.String;class name -- java.lang.String
Return Type: boolean

Example usage:

```
set objNameString [$AdminControl completeObjectName WebSphere:type=Server,*]
$AdminControl isInstanceOf $objNameString java.lang.Object
```

isInstanceof_jmx

If the ObjectName value is a member of the class you provide, then the value is true.

Parameters: name -- ObjectName;class name -- java.lang.String
Return Type: boolean

Example usage:

```
set objName [java::new javax.management.ObjectName WebSphere:type=Server,*]
$AdminControl isInstanceOf_jmx $objName java.lang.Object
```

isRegistered

If the ObjectName value is registered in the server, then the value is true.

Parameters: name -- java.lang.String
Return Type: boolean

Example usage:

```
set objNameString [$AdminControl completeObjectName WebSphere:type=Server,*]
$AdminControl isRegistered $objNameString
```

isRegistered_jmx

If the ObjectName value is registered in the server, then the value is true.

Parameters: name -- ObjectName
Return Type: boolean

Example usage:

```
set objName [java::new javax.management.ObjectName WebSphere:type=Server,*]
$AdminControl isRegistered_jmx $objName
```

makeObjectName

A convenience method that creates an ObjectName value based on the strings input. This method does not communicate with the server, so the ObjectName value that results might not exist. If the string you supply contains an extra set of double quotes, they are removed. If the string does not begin with a Java Management eXtensions (JMX) domain, or a string followed by a colon, then

the WebSphere string prepends to the name.

Parameters: name -- java.lang.String
Return Type: javax.management.ObjectName

Example usage:

```
set objName [$AdminControl makeObjectName WebSphere:type=Server,node=mynode,*]
```

queryNames
Returns a string that lists all ObjectNames based on the name template.

Parameters: name -- java.lang.String
Return Type: java.lang.String

Example usage:

```
$AdminControl queryNames WebSphere:type=Server,*
```

Example output:

```
WebSphere:cell=BaseApplicationServerCell,name=server1,mbeanIdentifier=server1,
type=Server,node=mynode,process=server1
```

(split for publication)

queryNames_jmx
Returns a set of ObjectName objects, based on the ObjectName and QueryExp that you provide.

Parameters: name -- javax.management.ObjectName;query -- javax.management.QueryExp
Return Type: java.util.Set

Example usage:

```
set objName [java::new javax.management.ObjectName WebSphere:type=Server,*]
set null [java::null]
$AdminControl queryNames_jmx $objName $null
```

Example output:

```
[WebSphere:cell=BaseApplicationServerCell,name=server1,mbeanIdentifier=server1,
type=Server,node=mynode,process=server1]
```

(split for publication)

reconnect
Reconnects to the server, and clears information out of the local cache.

Parameters: none
Return Type: none

Example usage:

```
$AdminControl reconnect
```

Example output:

```
WASX7074I: Reconnect of SOAP connector to host myhost completed.
```

setAttribute
Sets the attribute value for the name you provide.

Parameters: name -- java.lang.String; attributeName -- java.lang.String; attributeValue -- java.lang.String
Return Type: none

Example usage:

```
set objNameString [$AdminControl completeObjectName WebSphere:type=TraceService,*]
$AdminControl setAttribute $objNameString traceSpecification com.ibm.*=all=disabled
```

setAttribute_jmx
Sets the attribute value for the name you provide.

Parameters: name -- ObjectName; attribute -- javax.management.Attribute
Return Type: none

Example usage:

```
set objectNameString [$AdminControl completeObjectName WebSphere:type=TraceService,*]
set objName [java:;new javax.management.ObjectName $objectNamestring]
set attr [java::new javax.management.Attribute traceSpecification com.ibm.*=all=disabled]
$AdminControl setAttribute_jmx $objName $attr
```

setAttributes
Sets the attribute values for the names you provide and returns a list of successfully set names.

Parameters: name -- String; attributes -- java.lang.String
Return Type: java.lang.String

Example usage:

```
set objNameString [$AdminControl completeObjectName WebSphere:type=TracesService,*]
$AdminControl setAttributes $objNameString {{traceSpecification com.ibm.ws.*=all=enabled}}
```

setAttributes_jmx
Sets the attribute values for the names you provide and returns a list of successfully set names.

Parameters: name -- ObjectName; attributes -- javax.management.AttributeList
Return Type: javax.management.AttributeList

Example usage:

```
set objectNameString [$AdminControl completeObjectName WebSphere:type=TraceService,*]
set objName [java:;new javax.management.ObjectName $objectNamestring]
set attr [java::new javax.management.Attribute traceSpecification com.ibm.ws.*=all=enabled]
set alist [java::new javax.management.AttributeList]
$alist add $attr
$AdminControl setAttributes_jmx $objName $alist
```

startServer
Starts the specified application server by locating it in the configuration. This command uses the default wait time. You can only use this command if the scripting client is connected to a NodeAgent. It returns a message to indicate if the server starts successfully.

Parameters: server name -- java.lang.String
Return Type: java.lang.String

Example usage:

```
$AdminControl startServer server1
```

startServer

Starts the specified application server by locating it in the configuration. The start process waits the number of seconds specified by the wait time for the server to start. You can only use this command if the scripting client is connected to a NodeAgent. It returns a message to indicate if the server starts successfully.

Parameters: server name -- java.lang.String, wait time - java.lang.String

Return Type: java.lang.String

Example usage:

```
$AdminControl startServer server1 100
```

startServer

Starts the specified application server by locating it in the configuration. This command uses the default wait time. You can use this command when the scripting client is either connected to a NodeAgent or Deployment Manager process. It returns a message to indicate if the server starts successfully.

Parameters: server name -- java.lang.String, node name -- java.lang.String

Return Type: java.lang.String

Example usage:

```
$AdminControl startServer server1 myNode
```

startServer

Starts the specified application server by locating it in the configuration. The start process waits the number of seconds specified by the wait time for the server to start. You can use this command when the scripting client is either connected to a NodeAgent or Deployment Manager process. It returns a message to indicate if the server starts successfully.

Parameters: server name -- java.lang.String, node name -- java.lang.String, wait time -- java.lang.String

Return Type: java.lang.String

Example usage:

```
$AdminControl startServer server1 myNode 100
```

stopServer

Stops the specified application server. It returns a message to indicate if the server stops successfully.

Parameters: server name -- java.lang.String

Return Type: java.lang.String

Example usage:

```
$AdminControl stopServer server1
```

stopServer

Stops the specified application server. If you set the flag to `immediate`, the server stops immediately. Otherwise, a normal stop occurs. This command returns a message to indicate if the server stops successfully.

Parameters: server name -- java.lang.String, immediate flag -- java.lang.String
Return Type: java.lang.String

Example usage:

```
$AdminControl stopServer server1 immediate
```

stopServer
Stops the specified application server. It returns a message to indicate if the server stops successfully.

Parameters: server name -- java.lang.String, node name -- java.lang.String
Return Type: java.lang.String

Example usage:

```
$AdminControl stopServer server1 myNode
```

stopServer
Stops the specified application server. If you set the flag to `immediate`, the server stops immediately. Otherwise, a normal stop occurs. This command returns a message to indicate if the server stops successfully.

Parameters: server name -- java.lang.String, node name -- java.lang.String, immediate flag -- java.lang.String
Return Type: java.lang.String

Example usage:

```
$AdminControl stopServer server1 myNode immediate
```

testConnection
A convenience method communicates with the DataSourceCfgHelper Mbean to test a DataSource connection. This command works with DataSource resided in the configuration repository. If the DataSource to be tested is in the temporary workspace that holds the update to the repository, you have to save the update to the configuration repository before running this command. Use this method with the configuration ID that corresponds to the DataSource and the WAS40DataSource object types. The return value is a message containing the message indicating a successful connection or a connection with warning. If the connection fails, an exception is thrown from the server indicating the error.

Parameters: configId -- java.lang.String
Return Type: java.lang.String

Example usage:

```
set ds [lindex [$AdminConfig list DataSource] 0]
$AdminControl testConnection $ds
```

Example output:

```
WASX7217I: Connection to provided datasource was successful.
```

TestConnection
Deprecated.

This command can give false results and does not work when connected to a NodeAgent. As of V5.0.2, the preferred way to test a Datasource connection is with the **testConnection** command passing in the DataSource configId as the only parameter.

Parameters: configId -- java.lang.String; props -- java.lang.String
Return Type: java.lang.String

Example usage:

```
set ds [lindex [$AdminConfig list DataSource] 0]
$AdminControl testConnection $ds {{prop1 val1}}
```

Example output:

```
WASX7390E: Operation not supported - testConnection command with config id
and properties arguments is not supported. Use testConnection command with
config id argument only.
```

trace

Sets the trace specification for the scripting process to the value that you specify.

Parameters: traceSpec -- java.lang.String
Return Type: none

Example usage:

```
$AdminControl trace com.ibm.ws.scripting.*=all=enabled
```

Related concepts

"Jacl" on page 38

Related reference

"AdminApp object for scripted administration" on page 50
"Help object for scripted administration" on page 39
"AdminConfig object for scripted administration"

Example: Collecting arguments for the AdminControl object

Ensure the arguments parameter is a single string. Each individual argument in the string can contain spaces. Collect each argument that contains spaces in some way.

- An example of how to obtain an MBean follows:

```
set am [$AdminControl
queryNames type=
ApplicationManager,
process=server1,*]
```

- There are three ways to collect arguments that contain spaces. Choose one of the following alternatives:
  - `$AdminControl invoke $am startApplication {"JavaMail Sample"}`
  - `$AdminControl invoke $am startApplication {{JavaMail Sample}}`
  - `$AdminControl invoke $am startApplication "\"JavaMail Sample\""`

AdminConfig object for scripted administration

Use the AdminConfig object to invoke configuration commands and to create or change elements of the WebSphere Application Server configuration.

You can start the scripting client without a running server, if you only want to use local operations. To run in local mode, use the `-conntype NONE` option to start the

scripting client. You will receive a message that you are running in the local mode. If a server is currently running it is not recommended to run the AdminConfig tool in local mode.

The following public methods are available for the AdminConfig object:

attributes
Returns a list of the top level attributes for a given type.

Arguments:	object type **Note:** The name of the object type that you input here is the one based on the XML configuration files and does not have to be the same name that the administrative console displays.
Returns:	a list of attributes

Example usage:

```
$AdminConfig attributes ApplicationServer
```

Example output:

```
"properties Property*" "serverSecurity ServerSecurity" "server Server@" "id Long"
"stateManagement StateManageable" "name String" "moduleVisibility
EEnumLiteral(MODULE, COMPATIBILITY, SERVER, APPLICATION)" "services Service*"
"statisticsProvider StatisticsProvider"
```

(split for publication)

checkin
Checks a file, that the document URI describes, into the configuration repository.

Note: This method only applies to deployment manager configurations.

Arguments:	document URI, filename, opaque object
Returns:	none

Example usage:

```
$AdminConfig checkin cells/MyCell/Node/MyNode/serverindex.xml c:\\mydir\myfile $obj
```

The document URI is relative to the root of the configuration repository, for example, `c:\WebSphere\AppServer\config`. The file specified by `filename` is used as the source of the file to check. The opaque object is an object that the **extract** command of the AdminConfig object returns by a prior call.

contents
Obtains information about object types.

Arguments:	object type **Note:** The name of the object type that you input here is the one based on the XML configuration files and does not have to be the same name that the administrative console displays.
Returns:	a list of object types

Example usage:

```
$AdminConfig contents JDBCProvider
```

Example output:

```
{DataSource DataSource}
{WAS40DataSource WAS40DataSource}
```

convertToCluster

Converts a server so that it is the first member of a new ServerCluster.

Arguments:	server id, cluster name
Returns:	the configuration id of the new cluster

Example usage:

```
set serverid [$AdminConfig getid /Server:myServer/]
   $AdminConfig convertToCluster $serverid myCluster
```

Example output:

```
myCluster(cells/mycell/clusters/myCluster:cluster.xml#ClusterMember_2
```

create

Creates configuration objects.

Arguments:	type, parent ID, attributes **Note:** The name of the object type that you input here is the one based on the XML configuration files. It does not have to be the same name that the administrative console displays.
Returns:	a string with configuration object names

Example usage:

```
set jdbc1 [$AdminConfig getid /JDBCProvider:jdbc1/]
$AdminConfig create DataSource $jdbc1 {{name ds1}}
```

Example output:

```
ds1(cells/mycell/nodes/DefaultNode/servers/server1:resources.xml#DataSource_6)
```

createClusterMember

Creates a new server as a member of an existing cluster.

This method creates a new server object on the node that the `node id` argument specifies. This server is created as a new member of the existing cluster specified by the `cluster id` argument, and contains attributes specified in the `member attributes` argument. The server is created using the server template specified by the `template id` attribute, and contains the name specified by the `memberName` attribute. The `memberName` attribute is required.

Arguments:	cluster id, node id, member attributes **Note:** The name of the object type that you input here is the one based on the XML configuration files. It does not have to be the same name that the administrative console displays.
Returns:	the configuration id of the new cluster member

Example usage:

```
set clid [$AdminConfig getid /ServerCluster:myCluster/]
set nodeid [$AdminConfig getid /Node:mynode/]
set template [$AdminConfig getid /Node:mynode/Server:myServer/]
$AdminConfig createClusterMember $clid $nodeid {{memberName newMem1} {weight 5
$template
```

Example output:

```
myCluster(cells/mycell/clusters/myCluster:cluster.xml#ClusterMember_2)
```

createDocument

Creates a new document in the configuration repository.

The `documentURI` argument names the document to create in the repository. The `filename` argument must be a valid local file name where the contents of the document exist.

Arguments:	documentURI, filename
Returns:	none

Example usage:

```
$AdminConfig createDocument cells/mycell/myfile.xml c:\\mydir\\myfile
```

createUsingTemplate

Creates a type of object with the given parent, using a template.

Arguments:	type, parent id, attributes, template ID
Returns:	the configuration ID of a new object

Example usage:

```
set node [$AdminConfig getid /Node:mynode/]
set templ [$AdminConfig listTemplates JDBCProvider "DB2 JDBC Provider (XA)"]
$AdminConfig createUsingTemplate JDBCProvider $node {{name newdriver}} $templ
```

defaults

Displays the default values for attributes of a given type.

This method displays all of the possible attributes contained by an object of a specific type. If the attribute has a default value, this method also displays the type and default value for each attribute.

Arguments:	type **Note:** The name of the object type that you input here is the one based on the XML configuration files. It does not have to be the same name that the administrative console displays.
Returns:	a string containing a list of attributes with its type and value

Example usage:

```
$AdminConfig defaults TuningParams
```

Example output:

```
Attribute                    Type                         Default
 usingMultiRowSchema          Boolean                      false
 maxInMemorySessionCount      Integer                      1000
 allowOverflow                Boolean                      true
 scheduleInvalidation         Boolean                      false
 writeFrequency               ENUM
 writeInterval                Integer                      120
```

```
writeContents                   ENUM
invalidationTimeout             Integer                         30
invalidationSchedule            InvalidationSchedule
```

deleteDocument

Deletes a document from the configuration repository.

The `documentURI` argument names the document that will be deleted from the repository.

Arguments:	documentURI
Returns:	none

Example usage:

```
$AdminConfig deleteDocument cells/mycell/myfile.xml
```

existsDocument

Tests for the existence of a document in the configuration repository.

The `documentURI` argument names the document to test in the repository.

Arguments:	documentURI
Returns:	a true value if the document exists

Example usage:

```
$AdminConfig existsDocument cells/mycell/myfile.xml
```

Example output:

```
1
```

extract

Extracts a configuration repository file described by document URI and places it in the file named by `filename`.

Note: This method only applies to deployment manager configurations.

Arguments:	document URI, filename
Returns:	an opaue java.lang.Object to use when checking in the file

Example usage:

```
set obj [$AdminConfig extract cells/MyCell/Node/MyNode/serverindex.xml c:\\mydir\myfile]
```

The document URI is relative to the root of the configuration repository, for example, `c:\WebSphere\AppServer\config`. If the file specified by `filename` exists, the extracted file replaces it.

getCrossDocumentValidationEnabled

Returns a message with the current cross-document enablement setting.

This method returns true if cross-document validation is enabled.

Arguments:	none
Returns:	a string containing the message with the cross-document validation setting

Example usage:

```
$AdminConfig getCrossDocumentValidationEnabled
```

Example output:

```
WASX7188I: Cross-document validation enablement set to true
```

getid

Returns the configuration id of an object.

Arguments:	containment path
Returns:	the configuration id for an object described by the given containment path

Example usage:

```
$AdminConfig getid /Cell:testcell/Node:testNode/JDBCProvider:Db2JdbcDriver/
```

Example output:

```
Db2JdbcDriver(cells/testcell/nodes/testnode/resources.xml#JDBCProvider_1)
```

getObjectName

Returns a string version of the object name for the corresponding running MBean.

This method returns an empty string if there is no corresponding running MBean.

Arguments:	configuration id
Returns:	a string containing the object name

Example usage:

```
set server [$AdminConfig getid /Node:mynode/Server:server1/]
$AdminConfig getObjectName $server
```

Example output:

```
WebSphere:cell=mycell,name=server1,
mbeanIdentifier=cells/mycell/nodes/mynode/servers/server1/server.xml
#Server_1,type=Server,node=mynode,process=server1,
processType=UnManagedProcess
```

getSaveMode

Returns the mode used when you invoke a `save` command.

Possible values include the following:

- overwriteOnConflict - saves changes even if they conflict with other configuration changes
- rollbackOnConflict - causes a save operation to fail if changes conflict with other configuration changes. This value is the default.

Arguments:	none
Returns:	a string containing the current save mode setting

Example usage:

```
$AdminConfig getSaveMode
```

Example output:

```
rollbackOnConflict
```

getValidationLevel

Returns the validation used when files are extracted from the repository.

Arguments: none
Returns: a string containing the validation level

Example usage:

```
$AdminConfig getValidationLevel
```

Example output:

```
WASX7189I: Validation level set to HIGH
```

getValidationSeverityResult
Returns the number of validation messages with the given severity from the most recent validation.

Arguments: severity
Returns: a string indicating the number of validation messages of the given severity

Example usage:

```
$AdminConfig getValidationSeverityResult 1
```

Example output:

```
16
```

hasChanges
Returns `true` if unsaved configuration changes exist.

Arguments: none
Returns: a string indicating if unsaved configuration changes exist

Example usage:

```
$AdminConfig hasChanges
```

Example output:

```
1
```

help
Displays static help information for the AdminConfig object.

Arguments: none
Returns: a list of options

Example usage:

```
$AdminConfig help
```

Example output:

```
WASX7053I: The AdminConfig object communicates with the
        Config Service in a WebSphere server to manipulate configuration data
        for a WebSphere installation.  AdminConfig has commands to list, create,

        remove, display, and modify configuration data, as well as commands to
        display information about configuration data types.

        Most of the commands supported by AdminConfig operate in two modes:
        the default mode is one in which AdminConfig communicates with the
        WebSphere server to accomplish its tasks.  A local mode is also
        possible, in which no server communication takes place.  The local
```

```
        mode of operation is invoked by bringing up the scripting client with
        no server connected using the command line "-conntype NONE" option
        or setting the "com.ibm.ws.scripting.connectionType=NONE" property in
        the wsadmin.properties.

        The following commands are supported by AdminConfig; more detailed
        information about each of these commands is available by using the
        "help" command of AdminConfig and supplying the name of the command
        as an argument.

attributes      Show the attributes for a given type
checkin         Check a file into the the config repository.
convertToCluster
                converts a server to be the first member of a
                new ServerCluster
create          Creates a configuration object, given a type, a parent, and
                a list of attributes, and optionally an attribute name for the
                new object
createClusterMember
                Creates a new server that is a member of an
                existing cluster.
createDocument  Creates a new document in the config repository.
installResourceAdapter
                Installs a J2C resource adapter with the given rar
                file name and an option string in the node.
createUsingTemplate
                Creates an object using a particular template type.
defaults        Displays the default values for attributes of a given type.
deleteDocument  Deletes a document from the config repository.
existsDocument  Tests for the existence of a document in the config repository.
extract         Extract a file from the config repository.
getCrossDocumentValidationEnabled
                Returns true if cross-document validation is enabled.
getid           Show the configId of an object, given a string version of
                its containment
getObjectName   Given a config id, return a string version of the ObjectName
                for the corresponding running MBean, if any.
getSaveMode     Returns the mode used when "save" is invoked
getValidationLevel
                Returns the validation used when files are extracted from the
                repository.
getValidationSeverityResult
                Returns the number of messages of a given
                severity from the most recent validation.
hasChanges      Returns true if unsaved configuration changes exist
help            Show help information
list            Lists all configuration objects of a given type
listTemplates   Lists all available configuration templates of a given
                type.
modify          Change specified attributes of a given configuration object
parents         Show the objects which contain a given type
queryChanges    Returns a list of unsaved files
remove          Removes the specified configuration object
required        Displays the required attributes of a given type.
reset           Discard unsaved configuration changes
save            Commit unsaved changes to the configuration repository
setCrossDocumentValidationEnabled
                Sets the cross-document validation enabled mode.
setSaveMode     Changes the mode used when "save" is invoked
setValidationLevel
                Sets the validation used when files are extracted from the
                repository.
show            Show the attributes of a given configuration object
showall         Recursively show the attributes of a given configuration
```

```
                object, and all the objects contained within each attribute.
showAttribute   Displays only the value for the single attribute specified.
types           Show the possible types for configuration
validate        Invokes validation
```

installResourceAdapter

Installs a J2C resource adapter with the given RAR file name and an option string in the node.

The RAR file name is the fully qualified file name that resides in the node that you specify. The valid options include the following:

- `rar.name`
- `rar.desc`
- `rar.archivePath`
- `rar.classpath`
- `rar.nativePath`

All options are optional. The `rar.name` option is the name for the J2CResourceAdapter. If you do not specify this option, the display name in the rar deployment descriptor is used. If that is not specified, the RAR file name is used. The `rar.desc` option is a description of the J2CResourceAdapter. The `rar.archivePath` is the name of the path where the file is to be extracted. If you do not specify this option, the archive will be extracted to the `$\{CONNECTOR_INSTALL_ROOT\}` directory. The `rar.classpath` is the additional class path.

Arguments:	rar file name, node, options
Returns:	the configuration id of new J2CResourceAdapter object

Example usage:

```
$AdminConfig installResourceAdapter c:/rar/mine.rar {
-rar.name myResourceAdapter -rar.desc "My rar file"}
mynode
```

Example output:

```
myResourceAdapter(cells/mycell/nodes/mynode:resources.xml#J2CResourceAdapter_1)
```

list

Returns a list of objects of a given type, possibly scoped by a parent.

Arguments:	object type **Note:** The name of the object type that you input here is the one based on the XML configuration files and does not have to be the same name that the administrative console displays.
Returns:	a list of objects

Example usage:

```
$AdminConfig list JDBCProvider
```

Example output:

```
Db2JdbcDriver(cells/mycell/nodes/DefaultNode/resources.xml#JDBCProvider_1)
Db2JdbcDriver(cells/mycell/nodes/DefaultNode/servers/
deploymentmgr/resources.xml#JDBCProvider_1) Db2JdbcDriver(
cells/mycell/nodes/DefaultNode/servers/nodeAgent/
resources.xml#JDBCProvider_1)
```

(split for publication)

listTemplates
Displays a list of template object IDs.

Arguments:	object type **Note:** The name of the object type that you input here is the one based on the XML configuration files and does not have to be the same name that the administrative console displays.
Returns:	a list of template IDs

Example usage:

```
$AdminConfig listTemplates JDBCProvider
```

This example displays a list of all JDBCProvider templates available on the system.

modify
Supports modification of object attributes.

Argurments:	object, attributes
Returns:	none

Example usage:

```
$AdminConfig modify ConnFactory1(
cells/mycell/nodes/DefaultNode/servers/deploymentmgr/
resources.xml#GenericJMSConnectionFactory_1)
{{userID newID} {password newPW}}
```

(split for publication)

parents
Obtains information about object types.

Arguments:	object type **Note:** The name of the object type that you input here is the one based on the XML configuration files and does not have to be the same name that the administrative console displays.
Returns:	a list of object types

Example usage:

```
$AdminConfig parents JDBCProvider
```

Example output:

```
Cell
Node
Server
```

queryChanges
Returns a list of unsaved configuration files.

Arguments:	none
Returns:	a string containing a list of files with unsaved changes

Example usage:

```
$AdminConfig queryChanges
```

Example output:

```
WASX7146I: The following configuration files contain unsaved changes:
cells/mycell/nodes/mynode/servers/server1/resources.xml
```

remove

Removes a configuration object.

Arguments:	object
Returns:	none

Example usage:

```
$AdminConfig remove ds1(cells/mycell/nodes/DefaultNode/servers/server1:
resources.xml#DataSource_6)
```

required

Displays the required attributes contained by an object of a certain type.

Argument:	type **Note:** The name of the object type that you input here is the one based on the XML configuration files. It does not have to be the same name that the administrative console displays.
Returns:	a string containing a list of required attributes with its type

Example usage:

```
$AdminConfig required URLProvider
```

Example output:

```
Attribute                   Type
streamHandlerClassName      String
protocol                    String
```

reset

Resets the temporary workspace that holds updates to the configuration.

Arguments:	none
Returns:	none

Example usage:

```
$AdminConfig reset
```

save

Saves changes in the configuration repository.

Arguments:	none
Returns:	none

Example usage:

```
$AdminConfig save
```

setCrossDocumentValidationEnabled

Sets the cross-document validation enabled mode. Values include `true` or `false`.

Argument: flag
Returns: none

Example usage:

```
$AdminConfig setCrossDocumentValidationEnabled true
```

setSaveMode

Allows you to toggle the behavior of the save command. The default is `rollbackOnConflict`. When a conflict is discovered while saving, the unsaved changes are not committed. The alternative is `overwriteOnConflict` which saves the changes to the configuration repository even if there are conflicts.

Arguments: mode
Returns: none

Example usage:

```
$AdminConfig setSaveMode overwriteOnConflict
```

setValidationLevel

Sets the validation used when files are extracted from the repository.

There are five validation levels: `none`, `low`, `medium`, `high`, or `highest`.

Argument: level
Returns: a string containing the validation level setting

Example usage:

```
$AdminConfig setValidationLevel high
```

Example output:

```
WASX7189I: Validation level set to HIGH
```

show

Returns the top level attributes of the given object.

Arguments: object, attributes
Returns: a string containing the attribute value

Example usage:

```
$AdminConfig show Db2JdbcDriver(cells/mycell/nodes/DefaultNode/resources.xm#JDBCProvider_1)
```

Example output:

```
{name "Sample Datasource"} {description "Data source for the Sample entity beans"}
```

showall

Recursively shows the attributes of a given configuration object.

Arguments: object, attributes
Returns: a string containing the attribute value

Example usage:

```
$AdminConfig showall "Default Datasource(
cells/mycell/nodes/DefaultNode/servers/server1:resources.xml
#DataSource_1)
```

(split for publication)

Example output:

```
{authMechanismPreference BASIC_PASSWORD}
{category default}
{connectionPool {{agedTimeout 0}
{connectionTimeout 1000}
{maxConnections 30}
{minConnections 1}
{purgePolicy FailingConnectionOnly}
{reapTime 180}
{unusedTimeout 1800}}}
{datasourceHelperClassname com.ibm.websphere.rsadapter.CloudscapeDataStoreHelper}
{description "Datasource for the WebSphere Default Application"}
{jndiName DefaultDatasource}
{name "Default Datasource"}
{propertySet {{resourceProperties {{{description "Location of Cloudscape default database."}
{name databaseName}
{type java.lang.String}
{value ${WAS_INSTALL_ROOT}/bin/DefaultDB}} {{name remoteDataSourceProtocol}
{type java.lang.String}
{value {}}} {{name shutdownDatabase}
{type java.lang.String}
{value {}}} {{name dataSourceName}
{type java.lang.String}
{value {}}} {{name description}
{type java.lang.String}
{value {}}} {{name connectionAttributes}
{type java.lang.String}
{value {}}} {{name createDatabase}
{type java.lang.String}
{value {}}}}}}
{provider "Cloudscape JDBC Driver(cells/pongo/nodes/pongo/servers/server1:
resources.xml#JDBCProvider_1)"}
{relationalResourceAdapter "WebSphere Relational Resource Adapter(
cells/pongo/nodes/pongo/servers/server1:resources.xml#builtin_rra)"}
{statementCacheSize 0}
```

(split for publication)

showAttribute

Displays only the value for the single attribute that you specify.

The output of this command is different from the output of the show command when a single attribute is specified. The showAttribute command does not display a list that contains the attribute name and value. It only displays the attribute value.

Argument:	config id, attribute
Returns:	a string containing the attribute value

Example usage:

```
set ns [$AdminConfig getid /Node:mynode/]
$AdminConfig showAttribute $n hostName
```

Example output:

```
mynode
```

types

Returns a list of the configuration object types that you can manipulate.

Arguments:	none
Returns:	a list of object types

Example usage:

```
$AdminConfig types
```

Example output:

```
AdminService
Agent
ApplicationConfig
ApplicationDeployment
ApplicationServer
AuthMechanism
AuthenticationTarget
AuthorizationConfig
AuthorizationProvider
AuthorizationTableImpl
BackupCluster
CMPConnectionFactory
CORBAObjectNameSpaceBinding
Cell
CellManager
Classloader
ClusterMember
ClusteredTarget
CommonSecureInteropComponent
```

validate

Invokes validation.

This command requests configuration validation results based on the files in your workspace, the value of the cross-document validation enabled flag, and the validation level setting. The scope of this request is the object named by the `config id` argument.

Argument:	config id
Returns:	a string containing results of validation

Example usage:

```
$AdminConfig validate
```

Example output:

```
WASX7193I: Validation results are logged in
c:\WebSphere5\AppServer\logs\wsadmin.valout:
Total number of messages: 16
WASX7194I: Number of messages of severity 1: 16
```

(split for publication)

Related concepts

"Jacl" on page 38

Related reference

"AdminApp object for scripted administration" on page 50

"AdminControl object for scripted administration" on page 69

"Help object for scripted administration" on page 39

ObjectName, Attribute, and AttributeList

WebSphere Application Server scripting commands use the underlying Java Management Extensions (JMX) classes, ObjectName, Attribute, and AttributeList, to manipulate object names, attributes and attribute lists.

WebSphere Application Server ObjectNames uniquely identify running objects. ObjectNames consist of the following:

- The domain name `WebSphere`.
- Several key properties, for example:
  - **`type`** - Indicates the type of object that is accessible through the MBean. For example, ApplicationServer, EJBContainer
  - **`name`** - Represents the display name of the particular object. For example, MyServer
  - **`node`** - Represents the name of the node on which the object runs
  - **`process`** - Represents the name of the server process in which the object runs
  - **`mbeanIdentifier`** - Correlates the MBean instance with corresponding configuration data

When ObjectNames classes are represented by strings, they have the following pattern:

```
[domainName]:
property=value
[,property=value]*
```

For example, you can specify `WebSphere:name=My Server, type=ApplicationServer,node=n1,*` to specify an application server named `My Server` on node `n1`. (The asterisk is a wild card character, used so that you do not have to specify the entire set of key properties.) The AdminControl commands that take strings as parameters expect strings that look like this example when specifying running objects (MBeans). You can obtain the ObjectName for a running object with the **getObjectName** command.

Attributes of these objects consist of a name and a value. You can extract the name and value with the **getName** and **getValue** commands. You can also extract a list of attributes.

Modifying nested attributes with the wsadmin tool

The attributes for a WebSphere Application Server configuration object are often deeply nested. For example, a JDBCProvider object has an attribute factory, which is a list of the J2EEResourceFactory type objects. These objects can be DataSource objects that contain a connectionPool attribute with a ConnectionPool type that contains a variety of primitive attributes.

1. Invoke the AdminConfig object commands interactively, in a script, or use the **wsadmin -c** commands from an operating system command prompt.
2. Obtain the configuration ID of the object, for example:

   ```
   set t1 [$AdminConfig
   getid /DataSource:
   TechSamp/]
   ```

   where:

`set`	is a Jacl command
`t1`	is a variable name
`$AdminConfig`	is an object representing the WebSphere Application Server configuration
`getid`	is an AdminConfig command
`DataSource`	is the object type

TechSamp	is the name of the object that will be modified

3. Modify one of the object parents and specify the location of the nested attribute within the parent, for example:

```
$AdminConfig modify
$t1 {{connectionPool
{{reapTime 2003}}}}
```

   where:

`$AdminConfig`	is an object representing the WebSphere Application Server configuration
`modify`	is an AdminConfig command
`$t1`	evaluates to the ID of host node specified in step number 2
`connectionPool`	is an attribute
`reapTime`	is a nested attribute within the connectionPool attribute
2003	is the value of the reapTime attribute

4. Save the configuration by issuing an AdminConfig **save** command. For example:

```
$AdminConfig save
```

   Use the **reset** command of the AdminConfig object to undo changes that you made to your workspace since your last save.

An alternative way to modify nested attributes is to modify the nested attribute directly, for example:

```
set techsamp
[$AdminConfig
getid /DataSource:
TechSamp/]
set poolattribute
[$AdminConfig
show $techsamp
connectionPool]
set pool [lindex
[lindex
$poolattribute 0] 1]
$AdminConfig
modify $pool
{{reapTime 2003}}
```

In this example, the first command gets the configuration id of the DataSource, and the second command gets the connectionPool attribute. You need the third command because `show` returns a list of name and value pairs, and you need to extract the actual value of the connectionPool attributes. The fourth command sets the reapTime attribute on the ConnectionPool object directly.

Managing configurations with scripting

Configuration management scripts use the AdminConfig object to access the repository where configuration information is stored. You can use the AdminConfig object to list configuration objects and their attributes, create configuration objects, modify configuration objects, remove configuration objects, and obtain help.

1. Decide how you want to execute the script. If you want to run the script immediately from the command line, enter it surrounded by quotes as a parameter to the **wsadmin -c** command. To save the script for repeated use, compose it in a file and execute it with the **wsadmin -f** command. If you want to compose and run the script interactively, issue the **wsadmin** command without the -c or -f flags. For more information about executing scripts, see Launching scripting clients
2. Write an AdminConfig script command statement to perform a management task, for example:

   ```
   $AdminConfig command
   ```

3. Save the configuration changes with the following command: `$AdminConfig save` Use the **reset** command of the AdminConfig object to undo changes that you made to your workspace since your last save.

Related concepts

"Jacl" on page 38

Related reference

"AdminConfig object for scripted administration" on page 81

Creating configuration objects using the wsadmin tool

Perform this task if you want to create an object. To create new objects from the default template, use the **create** command. Alternatively, you can create objects using an existing object as a template with the **createFromTemplate** command.

1. Invoke the AdminConfig object commands interactively, in a script, or use the **wsadmin -c** command from an operating system command prompt.
2. Use the AdminConfig object `listTemplates` command to list available templates:

   ```
   $AdminConfig listTemplates
   JDBCProvider
   ```

   where:

`$AdminConfig`	is an object representing the WebSphere Application Server configuration
`listTemplates`	is an $AdminConfig command
`JDBCProvider`	is an object type

3. Assign the ID string that identifies the existing object to which the new object is added. You can add the new object under any valid object type. The following example uses a node as the valid object type:

   ```
   set n1 [$AdminConfig
   getid /Node:mynode/]
   ```

where:

`set`	is a Jacl command
`n1`	is a variable name
`$AdminConfig`	is an object representing the WebSphere Application Server configuration
`getid`	is an $AdminConfig command
`Node`	is the object type
`mynode`	is the host name of the node where the new object is added

4. Specify the template that you want to use:

```
set tl [$AdminConfig
listTemplates JDBCProvider
"DB2 JDBC Provider (XA)"]
```

`set`	is a Jacl command
`tl`	is a variable name
`listTemplates`	is an $AdminConfig command
`JDBCProvider`	is an object type
`DB2 JDBC Provider (XA)`	is the name of the template to use for the new object

If you supply a string after the name of a type, you get back a list of templates with display names that contain the string you supplied. In this example, the AdminConfig **listTemplates** command returns the JDBCProvider template whose name matches *DB2 JDBC Provider (XA)*.

5. Create the object with the following command:

```
$AdminConfig
createUsingTemplate
JDBCProvider $n1
{{name newdriver}}
$tl
```

where:

`createUsingTemplate`	is an AdminConfig command
`JDBCProvider`	is an object type
`$n1`	evaluates the ID of the host node specified in step number 3
`name`	is an attribute of JDBCProvider objects
`newdriver`	is the value of the name attribute
`$tl`	evaluates the ID of the template specified in step number 4

Note: All **create** commands use a template unless there are no templates to use. If a default template exists, the command creates the object.

6. Save the configuration changes with the following command: `$AdminConfig save` Use the **reset** command of the AdminConfig object to undo changes that you made to your workspace since your last save.

Related reference

"Example: Finding available templates" on page 106

Specifying configuration objects using the wsadmin tool

To manage an existing configuration object, you identify the configuration object and obtain configuration ID of the object to be used for subsequent manipulation.

1. Invoke the AdminConfig object commands interactively, in a script, or use the **wsadmin -c** command from an operating system command prompt.
2. Obtain the configuration ID with one of the following ways:
   - Obtain the ID of the configuration object with the **getid** command, for example:

     ```
     set var [$AdminConfig
     getid /type:name/]
     ```

`set`	is a Jacl command
`n1`	is a variable name
`$AdminConfig`	is an object representing the WebSphere Application Server configuration
`getid`	is an $AdminConfig command
`/type:`*name*`/`	is the hierarchical containment path of the configuration object
`type`	is the object type **Note:** The name of the object type that you input here is the one based on the XML configuration files and does not have to be the same name that the administrative console displays.
name	is the optional name of the object

You can specify multiple `/type:name/` in the string, for example, `/type:name/type:name/type:name/`. If you just specify the type in the containment path without the name, include the colon, for example, `/type:/`. The containment path must be a path containing the correct hierarchical order. For example, if you specify `/Server:server1/Node:node/` as the containment path, you will not receive a valid configuration ID because `Node` is parent of `Server` and should come before `Server` in the hierarchy.

This command returns all the configuration IDs that match the representation of the containment and assigns them to a variable.

To look for all the server configuration IDs resided in mynode, use the following example:

```
set nodeServers
[$AdminConfig getid
/Node:mynode/Server:/]
```

To look for server1 configuration ID resided in mynode, use the following example:

```
set server1
[$AdminConfig getid
/Node:mynode/Server:
server1/]
```

To look for all the server configuration IDs, use the following example:

```
set servers
[$AdminConfig
getid /Server:/]
```

- Obtain the ID of the configuration object with the **list** command, for example:

```
set var
[$AdminConfig
list type]
```

or

```
set var
[$AdminConfig
list type scopeId]
```

where:

`set`	is a Jacl command
`var`	is a variable name
`$AdminConfig`	is an object representing the WebSphere Application Server configuration
`list`	is an $AdminConfig command
`type`	is the object type **Note:** The name of the object type that you input here is the one based on the XML configuration files and does not have to be the same name that the administrative console displays.
`scopeId`	is the configuration ID of a cell, node, or server object

This command returns a list of configuration object IDs of a given type. If you specify the *scopeId*, the list of objects returned is within the scope specified. The list returned is assigned to a variable.

To look for all the server configuration IDs, use the following example:

```
set servers
[$AdminConfig
list Server]
```

To look for all the server configuration IDs in mynode, use the following example:

```
set scopeid
[$AdminConfig getid
/Node:mynode/]
set nodeServers
[$AdminConfig list
Server $scopeid]
```

3. If there are more than more configuration IDs returned from the **getid** or **list** command, the IDs are returned in a list syntax. One way to retrieve a single element from the list is to use the **lindex** command. The following example retrieves the first configuration ID from the server object list:

```
set allServers
[$AdminConfig
getid /Server:/]
set aServer
[lindex $allServer 0]
```

For other ways to manipulate the list and then perform pattern matching to look for a specified configuration object, refer to the Jacl syntax.

You can now use the configuration ID in any subsequent AdminConfig commands that require a configuration ID as a parameter.

Listing attributes of configuration objects using the wsadmin tool

1. Invoke the AdminConfig object commands interactively, in a script, or use the **wsadmin -c** command from an operating system command prompt.
2. List the attributes of a given configuration object type, using the **attributes** command, for example:

   ```
   $AdminConfig attributes
   type
   ```

   where:

`$AdminConfig`	is an object representing the WebSphere Application Server configuration
`attributes`	is an $AdminConfig command
`type`	is an object type

   This command returns a list of attributes and its data type.

   To get a list of attributes for the JDBCProvider type, use the following example command:

   ```
   $AdminConfig attributes
   JDBCProvider
   ```

3. List the required attributes of a given configuration object type, using the **required** command, for example:

   ```
   $AdminConfig required
   type
   ```

   where:

`$AdminConfig`	is an object representing the WebSphere Application Server configuration
`required`	is an $AdminConfig command
`type`	is an object type

   This command returns a list of required attributes.

   To get a list of required attributes for the JDBCProvider type, use the following example command:

   ```
   $AdminConfig required
   JDBCProvider
   ```

4. List attributes with defaults of a given configuration object type, using the **defaults** command, for example:

   ```
   $AdminConfig defaults
   type
   ```

where:

`$AdminConfig`	is an object representing the WebSphere Application Server configuration
`defaults`	is an $AdminConfig command
`type`	is an object type

This command returns a list of all attributes, types, and defaults.

To get a list of attributes with defaults displayed for the JDBCProvider type, use the following example command:

```
$AdminConfig defaults
JDBCProvider
```

Modifying configuration objects with the wsadmin tool

1. Invoke the AdminConfig object commands interactively, in a script, or use wsadmin `-c` from an operating system command prompt.
2. Retrieve the configuration ID of the objects that you want to modify, for example:

   ```
   set jdbcProvider1
   [$AdminConfig getid
   /JDBCProvider:
   myJdbcProvider/]
   ```

   where:

`set`	is a Jacl command
`jdbcProvider1`	is a variable name
`$AdminConfig`	is an object representing the WebSphere Application Server configuration
`getid`	is an $AdminConfig command
`/JDBCProvider:`*`myJdbcProvider`*`/`	is the hierarchical containment path of the configuration object
`JDBCProvider`	is the object type
`myJdbcProvider`	is the optional name of the object

3. Show the current attribute values of the configuration object with the show command, for example:

   ```
   $AdminConfig show
   $jdbcProvider1
   ```

   where:

`$AdminConfig`	is an object representing the WebSphere Application Server configuration
`show`	is an AdminConfig command
`$jdbcProvider1`	evaluates to the ID of host node specified in step number 2

4. Modify the attributes of the configuration object, for example:

```
$AdminConfig modify
$jdbcProvider1
{{description
"This is my
new description"}}
```

where:

`$AdminConfig`	is an object representing the WebSphere Application Server configuration
`modify`	is an AdminConfig command
`$jdbcProvider1`	evaluates to the ID of host node specified in step number 3
`description`	is an attribute of server objects
`This is my new description`	is the value of the description attribute

You can also modify several attributes at the same time. For example:

```
{{name1 val1}
{name2 val2}
{name3 val3}}
```

5. Save the configuration changes with the following command: `$AdminConfig save` Use the **reset** command of the AdminConfig object to undo changes that you made to your workspace since your last save.

Removing configuration objects with the wsadmin tool

Use this task to delete a configuration object from the configuration repository. This action only affects the configuration. If there is a running instance of a configuration object when you remove the configuration, the change has no effect on the running instance.

1. Invoke the AdminConfig object commands interactively, in a script, or use the **wsadmin -c** command from an operating system command prompt.
2. Assign the ID string that identifies the server you want to remove:

```
set s1 [$AdminConfig
getid /Node:mynode
/Server:myserver/]
```

where:

`set`	is a Jacl command
`s1`	is a variable name
`$AdminConfig`	is an object representing the WebSphere Application Server configuration
`getid`	is an $AdminConfig command
`Node`	is an object type
`mynode`	is the host name of the node from which the server is removed
`Server`	is an object type
`myserver`	is the name of the server to remove

3. Issue the following command:

```
$AdminConfig remove
$s1
```

where:

`remove`	is an AdminConfig command
`$s1`	evaluates the ID of the server specified in step number 2

4. Save the configuration changes with the following command: `$AdminConfig save` Use the **reset** command of the AdminConfig object to undo changes that you made to your workspace since your last save.

The WebSphere Application Server configuration no longer contains a specific server object. Running servers are not affected.

Related reference

"AdminConfig object for scripted administration" on page 81

Changing the WebSphere Application Server configuration using wsadmin

For this task, the wsadmin scripting client must be connected to the deployment manager server.

You can use the wsadmin AdminConfig and AdminApp objects to make changes to the WebSphere Application Server configuration. The purpose of this article is to illustrate the relationship between the commands used to change the configuration and the files used to hold configuration data. This discussion assumes that you have a network deployment installation, but the concepts are very similar for a WebSphere Application Server installation.

1. Invoke the AdminConfig object commands interactively, in a script, or use the **wsadmin -c** commands from an operating system command prompt.
2. Set a variable for creating a server:

```
set n1 [$AdminConfig
getid /Node:
mynode/]
```

where:

`set`	is a Jacl command
`n1`	is a variable name
`$AdminConfig`	is an object representing the WebSphere Application Server configuration
`getid`	is an AdminConfig command
`Node`	is the object type
mynode	is the name of the object that will be modified

3. Create a server with the following command:

```
set serv1 [$AdminConfig
create Server $n1
{{name myserv}}]
```

where:

`set`	is a Jacl command

`serv1`	is a variable name
`$AdminConfig`	is an object representing the WebSphere Application Server configuration
`create`	is an AdminConfig command
`Server`	is an AdminConfig object
`$n1`	evaluates to the ID of host node specified in step number 2
`name`	is an attribute
myserv	is the value of the name attribute

After this command completes, some new files can be seen in a workspace used by the deployment manager server on behalf of this scripting client. A workspace is a temporary repository of configuration information that administrative clients use. Any changes made to the configuration by an administrative client are first made to this temporary workspace. For scripting, only when a **save** command is invoked on the AdminConfig object, these changes are transferred to the real configuration repository. Workspaces are kept in the `wstemp` subdirectory of a WebSphere Application Server installation.

4. Make a configuration change to the server with the following command:

```
$AdminConfig modify
$serv1 {{stateManagement
{{initialState STOP}}}}
```

where:

`$AdminConfig`	is an object representing the WebSphere Application Server configuration
`modify`	is an AdminConfig command
`$serv1`	evaluates to the ID of host node specified in step number 3
`stateManagement`	is an attribute
`initialState`	is a nested attribute within the stateManagement attribute
STOP	is the value of the initialState attribute

This command changes the initial state of the new server. After this command completes, one of the files in the workspace is changed.

5. Install an application on the server.
6. Save the configuration changes with the following command: `$AdminConfig save` Use the **reset** command of the AdminConfig object to undo changes that you made to your workspace since your last save.
7. Set the variable for node synchronize.

Note: This step only applies to network deployment installations.
A node synchronization is necessary in order to propagate configuration changes to the affected node or nodes. By default this occurs periodically, as long as the node can communicate with the deployment manager. It is possible to cause this to happen explicitly by performing the following:

```
set Sync1 [$AdminControl
completeObjectName
name]
```

where:

`set`	is a Jacl command
`Sync1`	is a variable name
`$AdminControl`	is an object that enables the manipulation of MBeans running in a WebSphere server process
`completeObjectName`	is an $AdminControl command
name	is a fragment of the object name. It is used to find the matching object name. For example: `type=Server, name=serv1,*`. It can be any valid combination of domain and key properties. For example, type, name, cell, node, process, etc.

8. Synchronize by issuing the following command:

   Note: This step only applies to network deployment installations.

   ```
   $AdminControl invoke
   $Sync1 sync
   ```

   where:

`$AdminControl`	is an object that enables the manipulation of MBeans running in a WebSphere server process
`invoke`	is an AdminControl command
`$Sync1`	evaluates to the ID of the server specified in step number 7
`sync`	is an attribute of modify objects

   When the synchronization is complete, the files created in the `c:/WebSphere/DeploymentManager/config` directory now exist on the *mynode* node, in the `c:/WebSphere/AppServer/config` directory.

Configuration management examples with wsadmin

There are examples that illustrate how to perform the important configuration management tasks. These examples show how to use features such as templates, and AdminConfig commands. They also show how to configure security, servers, and other resources in your installation. Basic knowledge of the syntax for the Jacl scripting language is helpful in order to understand and modify the examples.

Example: Finding available templates

Some configuration object types, for example, Server and other resource types, have templates that you can use when you create an object. If you create a JDBCProvider object using the `create` command, this object is built with the default template. If you know that you need a particular type of JDBCProvider object, you can use a template for that type.

Use the AdminConfig object **listTemplates** command to list available templates, for example:

```
$AdminConfig
listTemplates
JDBCProvider
```

- There is a variation of this command that makes it easier to locate a particular template or set of templates. If you supply a string after the name of a type, you only get back a list of templates display names that contain the supplied string, for example:

```
$AdminConfig
listTemplates
JDBCProvider DB2
```

  This command returns a list of templates with display names containing *DB2*.
- You can use the **show** command with any template like any other configuration object, to see the attributes of the template object, for example:

```
set jdbc
[$AdminConfig
listTemplates
JDBCProvider DB2]
set jdbc1
[lindex $jdbc 0]
$AdminConfig
show $jdbc1
```

Example: Creating new virtual hosts using a template

Some configuration object types have templates that you can use when you create a virtual host.

- Create a new virtual host template *virtualhostname.xml* in the following directory:

```
<WAS-ROOT>\config
\templetes\custom\
```

  – Copy and paste the following file into the new virtual host template:

```
<WAS-ROOT>\config
\templetes\default
\virtualhosts.xml
```

  – Edit and customize the new *virtualhostname.xml* file.
- Use the **reset** command to recognize new templates, for example:

```
$AdminConfig reset
```

- Use the AdminConfig object **listTemplates** command to list available templates, for example:

```
$AdminConfig
listTemplates
VirtualHost
```

  Example output:

```
default_host
(templates/default:
virtualhosts.xml#
VirtualHost_1)
my_host
(templates/
default:
virtualhosts.
xml#VirtualHost_1)
```

  Note: To list the new templates, restart DeploymentManager or use the AdminConfig object **reset** command.
- Create a new virtual host using the custom template, for example:

```
set cell [$AdminConfig
getid /Cell:
NetworkDeploymentCell/]
set vtempl
[$AdminConfig
listTemplates
VirtualHost
```

```
my_host]
$AdminConfig
createUsingTemplate
VirtualHost $cell
{{name newVirHost}}
$vtempl
```

- Save the changes with the following command:

```
$AdminConfig save
```

Note: The administrative console does not support the use of custom templates. The new template that you create will not be visible in the administrative console panels.

Example: Interpreting the output of the AdminConfig attributes command

The **attributes** command is a wsadmin tool on-line help feature. When you issue the **attributes** command, the information that displays does not represent a particular configuration object. It represents information about configuration object types, or object metadata. This article discusses how to interpret the attribute type display.

- Simple attributes

```
$AdminConfig attributes
ExampleType1
"attr1 String"
```

Types do not display as fully qualified names. For example, `String` is used for `java.lang.String`. There are no ambiguous type names in the model. For example, `x.y.ztype` and `a.b.ztype`. Using only the final portion of the name is possible, and it makes the output easier to read.

- Multiple attributes

```
$AdminConfig attributes
ExampleType2
"attr1 String" "attr2
Boolean" "attr3 Integer"
```

All input and output for the scripting client takes place with strings, but `attr2 Boolean` indicates that `true` or `false` are appropriate values. The `attr3 Integer` indicates that string representations of integers (″42″) are needed. Some attributes have string values that can take only one of a small number of predefined values. The wsadmin tool distinguishes these values in the output by the special type name ENUM, for example:

```
$AdminConfig attributes
ExampleType3
"attr4 ENUM
(ALL, SOME, NONE)"
```

where: `attr4` is an ENUM type. When you query or set the attribute, one of the values is `ALL`, `SOME`, or `NONE`. The value `A_FEW` results in an error.

- Nested attributes

```
$AdminConfig attributes
ExampleType4
"attr5 String"
"ex5 ExampleType5"
```

The `ExampleType4` object has two attributes: a string, and an `ExampleType5` object. If you do not know what is contained in the ExampleType5 object, you can use

another **attributes** command to find out. The **attributes** command displays only the attributes that the type contains directly. It does not recursively display the attributes of nested types.

- Attributes that represent lists

  The values of these attributes are object lists of different types. The `*` character distinguishes these attributes, for example:

  ```
  $AdminConfig attributes
  ExampleType5
  "ex6 ExampleType6*"
  ```

  In this example, objects of the `ExampleType5` type contain a single attribute, `ex6`. The value of this attribute is a list of `ExampleType6` type objects.

- Reference attributes

  An attribute value that references another object. You cannot change these references using modify commands, but these references display because they are part of the complete representation of the type. Distinguish reference attributes using the `@` sign, for example:

  ```
  $AdminConfig attributes
  ExampleType6
  "attr7 Boolean"
  "ex7 ExampleType7@"
  ```

  `ExampleType6` objects contain references to `ExampleType7` type objects.

- Generic attributes

  These attributes have generic types. The values of these attributes are not necessarily this generic type. These attributes can take values of several different specific types. When you use the AdminConfig attributes command to display the attributes of this object, the various possibilities for specific types are shown in parentheses, for example:

  In this example, the `beast` attribute represents an object of the generic `AnimalType`. This generic type is associated with three specific subtypes. The wsadmin tool gives these subtypes in parentheses after the name of the base type. In any particular instance of `ExampleType8`, the `beast` attribute can have a value of `HorseType`, `FishType`, or `ButterflyType`. When you specify an attribute in this way, using a modify or create command, specify the type of `AnimalType`. If you do not specify the `AnimalType`, a generic `AnimalType` object is assumed (specifying the generic type is possible and legitimate). This is done by specifying `beast:HorseType` instead of `beast`.

Related reference

"Example: Showing attributes with the AdminConfig object"

"Example: Modifying attributes with the AdminConfig object" on page 110

Example: Showing attributes with the AdminConfig object

In the wsadmin tool, the AdminConfig **attributes** object displays configuration object types, or object metadata, and does not represent a particular configuration object. This article discusses using the metadata information to show configuration objects.

- Showing simple attributes

  Each attribute in a configuration object is represented as a `{name value}` list.

  ```
  $AdminConfig show
  $myEndPoint
  {host  port}
  {host myHost}
  {port 1234}
  ```

The example configuration object has two attributes. The value of the name attribute is *myHost*. The value of the port attribute is 1234.

- Showing attributes with subtypes

  For example, this **show** command returns:

```
$AdminConfig
show $myex8
{name Halibut}
{beast myfish
(cells/mycell/
adocument.xml#
FishType_1)}
```

  The name of the second attribute displays as beast. The value of beast for this particular ExampleType8 object has type FishType.

- Showing string list attributes

  Several attributes on various objects have type String*. The String* type is a list of strings. These attributes can represent class paths, for example:

```
$AdminConfig
show $obj1
classpath
{classpath
c:/mine/one.
jar;c:/two.
jar;f:/myother/
three.jar}
```

Example: Modifying attributes with the AdminConfig object

The **modify** command changes objects in the configuration. In the wsadmin tool, the AdminConfig **attributes** command displays configuration object types, or object metadata, and does not represent a particular configuration object. This article discusses using the metadata information to modify configuration objects.

- Modifying simple attributes

  For example:

```
$AdminConfig modify
$myex1 {{attr1
sampleStringValue}}
```

  or

```
$AdminConfig modify
$myex1 "{attr1
sampleStringValue}"
```

  For multiple attributes:

```
$AdminConfig
attributes
ExampleType2
"attr1 String"
"attr2 Boolean"
"attr3 Integer"
$AdminConfig
modify $myex2
{{attr1 "new
string"} {attr2
false} {attr3 43}}
```

  In this example, you supply values for all three of the attributes that the ExampleType2 defines. If you enter the following:

```
$AdminConfig modify
$myex2 {{attr3 43}}
```

The attr1 and attr2 attributes would not change.

The following is an example that uses an attribute of ENUM type:

```
$AdminConfig
attributes
ExampleType3
"attr4 ENUM
(ALL, SOME, NONE)"
$AdminConfig
modify $myex3
{{attr4 NONE}}
```

- Modifying nested attributes

  For example, you want to modify the ex10 attribute of an object of type ExampleType9:

  ```
  $AdminConfig
  attributes
  ExampleType9
  "attr9a String"
  "ex10
  ExampleType10"
  $AdminConfig
  attributes
  ExampleType10
  "attr10a String"
  ```

  There are two ways to modify this object:
  - Modify this attribute directly. Perform the following steps:
    1. Obtain the configuration ID of the ex10 object:

       ```
       $AdminConfig show
       $myex9
       {attr9a
       MyFavoriteStrings}
       {ex10 MyEx10
       (cells/mycell/
       adocument.xml#
       ExampleType10_1)}
       ```

    2. Modify the ExampleType10 object:

       ```
       $AdminConfig modify
       MyEx10(cells/mycell/
       adocument.xml#
       ExampleType10_1)
       {{attr10a
       yetAnotherString}}
       ```

  - Modify the nested attribute of its containing object. Use the nested attributes syntax:

    ```
    $AdminConfig modify
    $myex9 {{ex10
    {{attr10a
    yetAnotherString}}}}
    ```

- Modifying list attributes

  List attribute values represent a list of objects. For example, the ServerCluster type has an attribute called *BackupClusters* which contains an object collection of the BackupCluster type. The syntax for this type of attribute involves the members of the collection containing an extra set of braces around them, for example:

```
$AdminConfig modify
$cluster1
{{backupClusters
{{{backupClusterName
cell20}} {{backup
ClusterName bc4}}}}}
```

In this example, the **modify** command takes a string that represents a list of attributes, a single attribute called `backupClusters`. The `backupClusters` attribute contains a list of objects of of type BackupCluster. The list contains two objects, and each object is represented by exactly one attribute. `{{backupClusterName cell20}}` represents one object of the BackupCluster type, `{{backupClusterName bc4}}` represents a second BackupCluster object, and `{{{backupClusterName cell20}} {{backupClusterName bc4}}}` is the collection of these objects associated with the backupClusters attribute. The same syntax is required even if there is only a single object in the list. When supplying these list attributes, the list is added to the existing list. Be aware that there is no way to delete from a list. To remove the entire list, set the value of a list attribute to an empty string, for example, `("")`. The **modify** command given in the above example, results in the addition of the backupClusters attribute to the existing contents.

The following is an example of modifying a nested attribute:

```
$AdminConfig modify
$cluster1
{{name "App
Cluster #3"}
{preferLocal false}
{enableDynamicWLM
true} {backupClusters
{{{backupClusterName
cell20}
{domainBootstrapAddress
{{port 555}
{host myhost}}}}
{{backupClusterName
rrkbc4}}}} {members
{{{weight 1}
{memberName name1}}
{{weight 2}
{memberName name2}}
{{weight 3}
{memberName name3}}}}}
```

This example list has five attributes: `name`, `preferLocal`, `enableDynamicWLM`, `backupClusters`, and `members`. The `members` attribute is a list of three objects, each of which consists of two sub-attributes, `weight` and `memberName`. The `backupClusters` attribute is a list of two objects. The first of these objects contains one simple subattribute and one complex subattribute. The complex subattribute contains two more subattributes, port and host.

The final variation on specifying configuration objects relates to the fact that some attributes represent generic objects that have different types of values. When you use the AdminConfig attributes command to display the attributes of an object, the various possibilities for specific types are shown in parentheses, for example:

```
$AdminConfig attributes
MyType
"name String"
```

```
"components Component
(SpecificType1,
SpecificType2,
SpecificType3)*"
```

In this example, the component attribute represents a list of objects. Each member of the components attribute is the component type. Component is a generic type with three specific subtypes. When you specify an attribute in a **modify** or **create** command, specify the type of component. If you do not specify the type of component, a generic component object is assumed. To specify a particular component, use `components:SpecificType1` instead of `components`, for example:

```
$AdminConfig modify
$myMyType
{{name name1}
{components:
SpecificType2
{{{attr1 val1}
{attr2 val2}}
{{attr1 val1a}
{attr2 val2a}}}}}
```

This command modifies two attributes of the `myMyType` object: name and components.

- Modifying string list attributes

  String list attributes have several attributes on various objects. These objects have the `String*` type, which is a list of strings. These attributes can represent class paths, for example. To update this list of strings, separate the members of the list by semi-colons. Use semi-colons with all platforms. The syntax for modifying these attributes is a list of strings, and not lists of attribute or name-value pairs, for example:

  ```
  $AdminConfig modify
  $obj1 {{classpath
  c:/mine/one.jar;"
  c:/Program Files/
  two.jar";f:/myother/
  three.jar"}}
  ```

Example: Listing configuration objects with wsadmin

List configuration objects with the **list** command:

- To get a list of all configuration objects of a specific type, use the following example:

  ```
  $AdminConfig list
  Server
  ```

  Example output:

  ```
  dmgr(cells/mycell/
  nodes/mynode/
  servers/dmgr:
  server.xml#Server_1)
  nodeagent(cells/
  mycell/nodes/
  mynode/servers/
  nodeagent:server.
  xml#Server_1)
  server1(cells/
  mycell/nodes/
  mynode/servers/
  server1:server.
  xml#Server_1)
  ```

- To list all configuration objects of a given type within a scope:
  1. Obtain the ID of the configuration object to be used as the scope.

     To use the configuration ID as a scope, the configuration id must be the same for a cell, node, or server object.

     To get a configuration ID for a cell object, use the following example:

     ```
     set scopeId
     [$AdminConfig
     getid /Cell:
     mycell/]
     ```

     To get a configuration ID for a node object, use the following example:

     ```
     set scopeId
     [$AdminConfig
     getid /Cell:
     mycell/Node:
     mynode/]
     ```

     To get a configuration ID for a server object, use the following example:

     ```
     set scopeId
     [$AdminConfig
     getid /Cell:
     mycell/Node:
     mynode/Server:
     server1/]
     ```
  2. List the configuration objects within a scope.

     To look for all the server configuration IDs within the node, use one of the following examples:

     ```
     set scopeId
     [$AdminConfig
     getid /Cell:
     mycell/Node:
     mynode/]
     $AdminConfig
     list Server
     $scopeId
     ```

     ```
     set scopeId
     [$AdminConfig
     getid /Cell:
     mycell/Node:
     mynode/]
     set nodeServers
     [$AdminConfig
     list Server
     $scopeId]
     ```

     The second example command assigns the returned list to a Jacl variable for subsequent use.

Example: Identifying valid configuration attributes for objects

You can determine valid attributes by using the AdminConfig **attributes** command.

The following example identifies the valid attributes for a node:

```
$AdminConfig
attributes Node
```

This example produces the following output:

```
"defaultAppBinaries
Directory String"
"discoveryProtocol
```

```
ENUM(UDP, TCP,
MULTICAST)"
"properties Property
(TypedProperty)*"
"appInstallWorkarea
String"
"name String"
"hostName String"
```

Related reference

"Example: Interpreting the output of the AdminConfig attributes command" on page 108

Example: Changing the location of the activity log

Change the location of the activity log by modifying the serviceLog attribute. The RASLoggingService object contains the serviceLog attribute.

The following example modifies the serviceLog attribute:

```
set dmgr1 [$AdminConfig
getid /Server:dmgr/]
set rls [$AdminConfig
list RASLoggingService
$dmgr1]
set logFile [list name
\${LOG_ROOT}/newlog.log]
set logAttr
[list $logFile]
set attr [list [list
serviceLog $logAttr]]
$AdminConfig modify
$rls $attr
```

Example: Modifying port numbers in the serverindex file

This topic provides reference information about modifying port numbers in the `serverindex.xml` file. The end points of the `serverindex.xml` file are part of different objects in the configuration.

Use the following attributes to modify the `serverindex.xml` file:

- **BOOTSTRAP_ADDRESS**

  An attribute of the NameServer object that exists inside the server. It is used by the naming client to specify the naming server to look up the initial context. To modify its end point, obtain the ID of the NameServer object and issue a **modify** command, for example:

  ```
  set s
  [$AdminConfig
  getid /Server:
  server1/]
  set ns
  [$AdminConfig
  list NameServer
  $s]
  $AdminConfig
  modify $ns
  {{BOOTSTRAP_
  ADDRESS
  {{port 2810}
  {host myhost}}}
  ```

- **SOAP_CONNECTOR-ADDRESS**

  An attribute of the SOAPConnector object that exists inside the server. It is the port that is used by http transport for incoming SOAP requests. To modify its end point, obtain the ID of the SOAPConnector object and issue a **modify** command, for example:

```
set s
[$AdminConfig
getid /Server:
server1/]
set soap
[$AdminConfig
list SOAPConnector
$s]
$AdminConfig
modify $soap
{{SOAP_CONNECTOR_
ADDRESS {{host
myhost}
{port 8881}}}}
```

- **DRS_CLIENT_ADDRESS**

  An attribute of the SystemMessageServer object that exists inside the server. It is the port used to configure the Data Replication Service (DRS) which is a JMS-based message broker system for dynamic caching. To modify its end point, obtain the ID of the SystemMessageServer object and issue a **modify** command, for example:

```
set s
[$AdminConfig
getid /Server:
server1/]
set soap
[$AdminConfig list
SystemMessageServer
$s]
$AdminConfig modify
$soap
{{DRS_CLIENT_
ADDRESS {{host
myhost}
{port 7874}}}}
```

- **JMSSERVER_QUEUED_ADDRESS and JMSSERVER_DIRECT_ADDRESS**

  An attribute of the JMSServer object that exists inside the server. These are ports used to configure the WebSphere Application Server JMS provifder topic connection factory settings. To modify its end point, obtain the ID of the JMSServer object and issue a **modify** command, for example:

```
set s
[$AdminConfig
getid /Server:
server1/]
set soap
[$AdminConfig
list JMSServer $s]
$AdminConfig
modify $soap
{{JMSSERVER_QUEUED
_ADDRESS {{host
myhost}
{port 5560}}}}
$AdminConfig modify
$soap
{{JMSSERVER_DIRECT_
ADDRESS {{host
myhost}
{port 5561}}}}
```

- **NODE_DISCOVERY_ADDRESS**

An attribute of the NodeAgent object that exists inside the server. It is the port used to receive the incoming process discovery messages inside a node agent process. To modify its end point, obtain the ID of the NodeAgent object and issue a **modify** command, for example:

```
set nodeAgentServer
[$AdminConfig getid
/Server:myhost/]
set nodeAgent
[$AdminConfig list
NodeAgent
$nodeAgentServer]
$AdminConfig modify
$nodeAgent
{{NODE_DISCOVERY_
ADDRESS {{host
myhost}
{port 7272}}}}
```

- **CELL_DISCOVERY_ADDRESS**

  An attribute of the deploymentManager object that exists inside the server. It is the port used to receive the incoming process discovery messages inside a deployment manager process. To modify its end point, obtain the ID of the deploymentManager object and issue a **modify** command, for example:

```
set netmgr
[$AdminConfig
getid /Server:
netmgr/]
set deployment
Manager
[$AdminConfig
list CellManager
$netmgr]
$AdminConfig
modify $deployment
Manager
{{CELL_MULTICAST_
DISCOVERY_ADDRESS
{{host myhost}
{port 7272}}}}
$AdminConfig modify
$deploymentManager
{{CELL_DISCOVERY_
ADDRESS {{host
myhost}
{port 7278}}}}
```

Example: Disabling a component using wsadmin

An example of disabling the name server component of a configured server follows. You can modify this example to disable a different component.

- Identify the server and assign it to the server variable.

```
set server
[$AdminConfig
getid /Cell:
mycell/Node:
mynode/Server:
server1/]
```

  Example output:

```
server1(cells/
mycell/nodes/
mynode/servers/
server1:server.
xml#Server_1)
```

- List the components belonging to the server and assign them to the components variable.

```
set components
[$AdminConfig
list Component
$server]
```

  The components variable contains a list of components.

  Example output:

```
(cells/mycell/
nodes/mynode/
servers/server1:
server.xml#
ApplicationServer_1)
(cells/mycell/
nodes/mynode/
servers/server1:
server.xml#
EJBContainer_1)
(cells/mycell/
nodes/mynode/
servers/server1:
server.xml#
NameServer_1)
(cells/mycell/
nodes/mynode/
servers/server1:
server.xml#
WebContainer_1)
```

- Identify the name server component and assign it to the nameServer variable.

  Since the name server component is the third element in the list, retrieve this element by using index 2.

```
set nameServer
[lindex
$components 2]
```

  Example output:

```
(cells/mycell/
nodes/mynode/
servers/server1:
server.xml#
NameServer_1)
```

- Disable the name server component by changing the nested initialState attribute belonging to the stateManagement attribute.

```
$AdminConfig modify
$nameServer
{{stateManagement
{{initialState
STOP}}}}
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Disabling a service using wsadmin

An example disabling the trace service of a configured server follows. You can modify this example to disable a different service.

- Identify the server and assign it to the server variable.

```
set server
[$AdminConfig
getid /Cell:
mycell/Node:
mynode/Server:
server1/]
```

Example output:

```
server1(cells/
mycell/nodes/
mynode/servers/
server1:server.
xml#Server_1)
```

- List all the services belonging to the server and assign them to the services variable.

```
set services
[$AdminConfig
list Service
$server]
```

This command returns a list of services.

Example output:

```
(cells/mycell/
nodes/mynode/
servers/server1:
server.xml#
AdminService_1)
(cells/mycell/
nodes/mynode/
servers/server1:
server.xml#
DynamicCache_1)
(cells/mycell/
nodes/mynode/
servers/server1:
server.xml#
MessageListenerService_1)
(cells/mycell/
nodes/mynode/
servers/server1:
server.xml#
ObjectRequestBroker_1)
(cells/mycell/
nodes/mynode/
servers/server1:
server.xml#
PMIService_1)(cells/mycell/
nodes/mynode/
servers/server1:
server.xml#
RASLoggingService_1)
(cells/mycell/nodes/
mynode/servers/
server1:server.
xml#SessionManager_1)
(cells/mycell/
nodes/mynode/servers/
server1:server.xml#
TraceService_1)
(cells/mycell/nodes/
mynode/servers/
server1:server.xml#
TransactionService_1)
```

- Identify the trace service and assign it to the traceService variable.

  Since trace service is the 8th element in the list, retrieve this element by using index 7.

  ```
  set traceService
  [lindex $services 7]
  ```

  Example output:

  ```
  (cells/mycell/
  nodes/mynode/
  servers/server1:
  server.xml#
  TraceService_1)
  ```
- Disable the trace service by modifying the enable attribute.

  ```
  $AdminConfig modify
  $traceService
  {{enable false}}
  ```
- Save the changes with the following command:

  ```
  $AdminConfig save
  ```

Example: Configuring a trace using wsadmin

The following example sets the trace for a configured server:

- Identify the server and assign it to the server variable:

  ```
  set server [$AdminConfig
  getid /Cell:mycell/Node:
  mynode/Server:server1/]
  ```

  Example output:

  ```
  server1(cells/mycell/
  nodes/mynode/servers/
  server1:server.xml#
  Server_1)
  ```
- Identify the trace service belonging to the server and assign it to the tc variable:

  ```
  set tc [$AdminConfig
  list TraceService
  $server]
  ```

  Example output:

  ```
  (cells/mycell/nodes/
  mynode/servers/server1:
  server.xml#TraceService_1)
  ```
- Set the trace string.

  The following example sets the trace string for a single component:

  ```
  $AdminConfig modify
  $tc {{startupTrace
  Specification
  com.ibm.websphere.
  management.
  *=all=enabled}}
  ```

  The following command sets the trace string for multiple components:

  ```
  $AdminConfig modify $tc
  {{startupTraceSpecification
  com.ibm.websphere.management.
  *=all=enabled:com.ibm.ws.
  management.*=all=enabled:
  com.ibm.ws.runtime.
  *=all=enabled}}
  ```
- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring the Java virtual machine using wsadmin

An example modifying the Java virtual machine (JVM) of a server to turn on debug follows:

- Identify the server and assign it to the server1 variable.

```
set server1
[$AdminConfig
getid /Cell:mycell/
Node:mynode/
Server:server1/]
```

  Example output:

```
server1(cells/mycell/
nodes/mynode/servers/
server1:server.xml#
Server_1)
```

- Identify the JVM belonging to this server and assign it to the jvm variable.

```
set jvm [$AdminConfig
list JavaVirtualMachine
$server1]
```

  Example output:

```
(cells/mycell/nodes/
mynode/servers/server1:
server.xml#
JavaVirtualMachine_1)
```

- Modify the JVM to turn on debug.

```
$AdminConfig modify
$jvm {{debugMode true}
{debugArgs "-Djava.
compiler=NONE -Xdebug
-Xnoagent -Xrunjdwp:
transport=dt_socket,
server=y,suspend=n,
address=7777"}}
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring an enterprise bean container using wsadmin

An example of viewing and modifying an enterprise bean (EJB) container of an application server follows:

- Identify the application server and assign it to the server variable.

```
set server
[$AdminConfig
getid /Cell:
mycell/Node:
mynode/Server:
server1/]
```

  Example output:

```
server1(cells/
mycell/nodes/
mynode/servers/
server1:server.
xml#Server_1)
```

- Identify the EJB container belonging to the server and assign it to the ejbContainer variable.

```
set ejbContainer
[$AdminConfig
list EJBContainer
$server]
```

Example output:

```
(cells/mycell/
nodes/mynode/
servers/server1:
server.xml#
EJBContainer_1)
```

- View all the attributes of the EJB container.

  The following example command does not show nested attributes:

  ```
  $AdminConfig show
  $ejbContainer
  ```

  Example output:

  ```
  {cacheSettings
  (cells/mycell/
  nodes/myode/servers
  /server1:server.
  xml#EJBCache_1)}
  {components {}}
  {inactivePool
  CleanupInterval
  30000}
  {parentComponent
  (cells/mycell/
  nodes/myode/
  servers/server1:
  server.xml#
  ApplicationServer_1)
  {passivationDirectory
  ${USER_INSTALL_
  ROOT}/temp}
  {properties {}}
  {services
  {(cells/mycell/
  nodes/myode/servers/
  server1:server.xml#
  MessageListener
  Service_1)}
  {stateManagement
  (cells/mycell/
  nodes/mynode/
  servers/server1:
  server.xml#
  StateManageable_10)}
  ```

  The following example command includes nested attributes:

  ```
  $AdminConfig showall
  $ejbContainer
  ```

  Example output:

  ```
  {cacheSettings
  {{cacheSize 2053}
    {cleanupInterval
  3000}}}
  {components {}}
  {inactivePool
  CleanupInterval
  30000}
  {parentComponent
  ```

```
(cells/mycell/
nodes/mynode/
servers/server1:
server.xml#
ApplicationServer_1)}
{passivationDirectory
${USER_INSTALL_
ROOT}/temp}
{properties {}}
{services
{{{context (cells/
mycell/nodes/mynode/
servers/server1:
server.xml#
EJBContainer_1)}
  {listenerPorts {}}
  {properties {}}
  {threadPool
{{inactivityTimeout
3500}
    {isGrowable
false}
    {maximumSize
50}
    {minimumSize
10}}}}}}
{stateManagement
{{initialState START}
  {managedObject
(cells/mycell/nodes/
mynode/servers/
server1:server.xml#
EJBContainer_1)}}}}
```

- Modify the attributes.

  The following example command modifies the EJB cache settings which are nested attributes:

  ```
  &AdminConfig modify
  $ejbContainer
  {{cacheSettings
  {{cacheSize 2500}
  {cleanupInterval
  3500}}}}
  ```

  The following example command modifies the cleanup interval attribute:

  ```
  $AdminConfig modify
  $ejbContainer
  {{inactivePool
  CleanupInterval
  15000}}
  ```

- Save the changes with the following command:

  ```
  $AdminConfig save
  ```

Example: Configuring HTTP transport using wsadmin

This example configures the Web container HTTP transport.

- Identify the application server and assign it to the server variable.

  ```
  set server [$AdminConfig
  getid /Cell:mycell/Node:
  mynode/Server:server1/]
  ```

  Example output:

```
server1(cells/mycell/
nodes/mynode/servers/
server1:server.xml#
Server_1)
```

- Identify the Web container belonging to the server and assign it to the wc variable.

```
set wc [$AdminConfig
list WebContainer
$server]
```

Example output:

```
(cells/mycell/nodes/
mynode/servers/
server1:server.xml#
WebContainer_1)
```

- List all the transports belonging to the Web Container and assign it to the transports variable.

```
set transportsAttr
[$AdminConfig
showAttribute
$wc transports]
set transports
[lindex
$transportsAttr 0]
```

These commands return the transport objects from the transports attribute in a list format.

Example output:

```
(cells/mycell/nodes/
mynode/servers/
server1:server.
xml#HTTPTransport_1)
(cells/mycell/nodes/
mynode/servers/
server1:server.
xml#HTTPTransport_2)
```

- Identify the transport to be modified and assign it to the transport variable.

```
set transport
[lindex $transports 0]
```

Example output:

```
(cells/mycell/nodes/
mynode/servers/server1:
server.xml#
HTTPTransport_1)
```

- Modify the address attribute to change the host and port.

```
$AdminConfig modify
$transport {{address
{{host {myHost}}
{port 9081}}}}
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring the message listener service using wsadmin

An example configuring the message listener service for an application server follows:

- Identify the application server and assign it to the server variable:

```
set server
[$AdminConfig getid
/Cell:mycell/Node:
mynode/Server:
server1/]
```

Example output:

```
server1(cells/mycell/
nodes/mynode/servers/
server1:server.xml#
Server_1)
```

- Identify the message listener service belonging to the server and assign it to the mls variable:

```
set mls [$AdminConfig
list MessageListener
Service $server]
```

Example output:

```
(cells/mycell/nodes/
mynode/servers/server1:
server.xml#Message
ListenerService_1)
```

- Modify various attributes.

  This example command changes the thread pool attributes:

```
$AdminConfig modify
$mls {{threadPool
{{inactivityTimeout
4000} {isGrowable
true} {maximumSize
100} {minimumSize
25}}}}
```

This example modifies the property of the first listener port:

```
set lports
[$AdminConfig
showAttribute $mls
listenerPorts]
set lport [lindex
$lports 0]
$AdminConfig modify
$lport
{{maxRetries 2}}
```

This example adds a listener port:

```
$AdminConfig create
ListenerPort $mls
{{name listenerPort1}
{connectionFactory
JNDIName cf/mycf}
{destinationJNDIName
ds/myds}}
```

Example output:

```
listenerPort1(cells/
mycell/nodes/mynode/
servers/server1:server.
xml#ListenerPort_2)
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring an ORB service using wsadmin

The following example modifies the Object Request Broker (ORB) service for an application server:

- Identify the application server and assign it to the server variable:

```
set server
[$AdminConfig
getid /Cell:
mycell/Node:
mynode/Server:
server1/]
```

  Example output:

```
server1(cells/
mycell/nodes/
mynode/servers/
server1:server.
xml#Server_1)
```

- Identify the ORB belonging to the server and assign it to the orb variable:

```
set orb
[$AdminConfig list
ObjectRequestBroker
$server]
```

  Example output:

```
(cells/mycell/
nodes/mynode/
servers/server1:
server.xml#
ObjectRequestBroker_1)
```

- Modify the attributes:

```
$AdminConfig
modify $orb
{{connectionCache
Maximum 252}
{noLocalCopies
true}}
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring for database session persistence using wsadmin

The following example configures the session management of a Web container for database session persistence.

Before performing this task you have to create a JDBC provider and create a data source that points to an existing database.

- Identify the application server and assign it to the server variable:

```
set server
[$AdminConfig
getid /Cell:
mycell/Node:
mynode/Server:
server1/]
```

  Example output:

```
server1(cells/
mycell/nodes/
mynode/servers/
server1:server.
xml#Server_1)
```

- Identify the session management belonging to the server and assign it to the smgr variable:

```
set smgr
[$AdminConfig
list SessionManager
$server]
```

  Example output:

```
(cells/mycell/
nodes/mynode/
servers/server1:
server.xml#
SessionManager_1)
```

- Modify database session persistence:

```
$AdminConfig
modify $smgr
{{sessionDatabase
Persistence
{{datasource
JNDIName jdbc/
mySession}
{userId myUser}
{password
myPassword}}}}
```

  This command sets the minimum set of attributes to configure database session persistence. You can optionally modify the db2RowSize and tableSpaceName attributes too.

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring for serialization session access using wsadmin

The following example configures session management of a Web container for serialization session access.

- Idenitfy the application server and assign it to the server variable:

```
set server
[$AdminConfig
getid /Cell:
mycell/Node:
mynode/Server:
server1/]
```

  Example output:

```
server1(cells/
mycell/nodes/
mynode/servers/
server1:server.
xml#Server_1)
```

- Identify the session management belonging to the server and assign it to the smgr variable:

```
set smgr
[$AdminConfig
list Session
Manager $server]
```

  Example output:

```
(cells/mycell/
nodes/mynode/
servers/server1:
server.xml#
SessionManager_1)
```

- Enable serialization session access.
  - The following example sets the maximum wait time a servlet waits on a session before continuing execution:

    ```
    $AdminConfig
    modify $smgr
    {{allowSerialized
    SessionAccess
    true}
    {maxWaitTime 20}}
    ```
  - The following example allows servlet execution to abort when the session request times out:

    ```
    $AdminConfig modify
    $smgr {{allow
    SerializedSession
    Access true}
    {maxWaitTime 20}
    {accessSessionOn
    Timeout true}}
    ```
- Save the changes with the following command:

  ```
  $AdminConfig save
  ```

Example: Configuring for session tracking using wsadmin

The following example configures the session management of a Web container for session tracking:

- Identify the application server and assign it to the server variable:

  ```
  set server
  [$AdminConfig
  getid /Cell:
  mycell/Node:
  mynode/Server:
  server1/]
  ```

  Example output:

  ```
  server1(cells/
  mycell/nodes/
  mynode/servers/
  server1:server.
  xml#Server_1)
  ```
- Identify the session management belonging to the server and assign it to the smgr variable:

  ```
  set smgr
  [$AdminConfig
  list SessionManager
  $server]
  ```

  Example output:

  ```
  (cells/mycell/
  nodes/mynode/
  servers/server1:
  server.xml#
  SessionManager_1)
  ```
- Modify attributes related to session tracking:
  - This example command enables cookies and modifies cookie setting:

```
$AdminConfig modify
$smgr {{enableCookies
true} {defaultCookie
Settings {{maximumAge
10}}}}
```

– This example command enables protocol switch rewriting:

```
$AdminConfig
modify $smgr
{{enableProtocol
SwitchRewriting
true} {enableUrl
Rewriting false}
{enableSSLTracking
false}}
```

– This example command enables URL rewriting:

```
$AdminConfig modify
$smgr {{enableUrl
Rewriting true}
{enableProtocol
SwitchRewriting
false} {enableSSL
Tracking false}}
```

– This example command enables SSL tracking:

```
$AdminConfig
modify $smgr
{{enableSSLTracking
true} {enable
ProtocolSwitch
Rewriting false}
{enableUrl
Rewriting false}}
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring for processes using wsadmin

The following example modifies the process definition of a server:

- Identify the server and assign it to the server1 variable:

```
set server1
[$AdminConfig
getid /Cell:
mycell/Node:
mynode/Server:
server1/]
```

Example output:

```
server1(cells/
mycell/nodes/
mynode/servers/
server1:server.
xml#Server_1)
```

- Identify the process definition belonging to this server and assign it to the processDef variable:

```
set processDef
[$AdminConfig
list JavaProcessDef
$server1]
set processDef
[$AdminConfig
showAttribute
$server1
processDefinition]
```

Example output:

```
(cells/mycell/
nodes/mynode/
servers/server1:
server.xml#
JavaProcessDef_1)
```

- Change the attributes.
  - This example changes the working directory:

    ```
    $AdminConfig
    modify $processDef
    {{workingDirectory
    c:/temp/user1}}
    ```

  - This example modifies the stderr file name:

    ```
    set errFile
    [list stderrFilename
    \${LOG_ROOT}/server1
    /new_stderr.log]
    set attr
    [list $errFile]
    $AdminConfig modify
    $processDef [subst
    {{ioRedirect
    {$attr}}}]
    ```

  - This example modifies the process priority:

    ```
    $AdminConfig
    modify $processDef
    {{execution
    {{processPriority
    15}}}}
    ```

  - This example changes the maximum startup attempts:

    ```
    $AdminConfig modify
    $processDef
    {{monitoringPolicy
    {{maximumStartupAttempts
    1}}}}
    ```

    You can modify this example to change other attributes in the process definition object.
- Save the changes with the following command:

  ```
  $AdminConfig save
  ```

Example: Configuring a shared library using wsadmin

The following example configures an application server to use a shared library.

- Identify the server and assign it to the server variable:

  ```
  set server
  [$AdminConfig getid
  /Cell:mycell/Node:
  mynode/Server:
  server1/]
  ```

  Example output:

  ```
  server1(cells/mycell/
  nodes/mynode/servers/
  server1:server.xml#
  Server_1)
  ```

- Create the shared library in the server:

```
$AdminConfig create
Library $server
{{name mySharedLibrary}
{classPath
c:/mySharedLibrary
Classpath}}
```

Example output:

```
MyshareLibrary
(cells/mycell/
nodes/mynode/
servers/server1:
libraries.xml#
Library_1)
```

- Identify the application server from the server and assign it to the appServer variable:

```
set appServer
[$AdminConfig list
ApplicationServer
$server]
```

Example output:

```
server1(cells/
mycell/nodes/mynode/
servers/server1:
server.xml#
ApplicationServer_1
```

- Identify the class loader in the application server and assign it to the classLoader variable.

To use the existing class loader associated with the server, the following commands use the first class loader:

```
set classLoaders
[$AdminConfig
showAttribute
$appServer
classloaders]
set classLoader
[lindex
$classLoaders 0]
```

Create a new class loader, by doing the following:

```
set classLoader
[$AdminConfig create
Classloader $appServer
{{mode PARENT_FIRST}}]
```

Example output:

```
(cells/mycell/
nodes/mynode/
servers/server1:
server.xml#
Classloader_1)
```

- Associate the created shared library with the application server through the class loader.

```
$AdminConfig create
LibraryRef $classLoader
{{libraryName
MyshareLibrary}
{sharedClassloader
true}}
```

Example output:

```
(cells/mycell/nodes/
mynode/servers/server1:
server.xml#LibraryRef_1)
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring a variable map using wsadmin

This example creates a variable map to an existing server.

- Idenitfy the server and assign it to the server variable.

```
set server [$AdminConfig
getid /Cell:mycell/Node:
mynode/Server:server2/]
```

Example output:

```
server2(cells/mycell/
nodes/mynode/servers/
server2:server.xml#
Server_2)
```

- Create an empty variable map for the server and assign it to the varMap variable.

```
set varMap
[$AdminConfig
create VariableMap
$server {}]
```

Example output:

```
(cells/mycell/nodes/
mynode/servers/
server2:variables.
xml#VariableMap_1)
```

This example is to create a variable map. If your server already has an existing variable map, then you can use the following to get its configuration object:

```
set varMap
[$AdminConfig getid
/Cell:mycell/Node:
mynode/Server:server2/
VariableMap:/]
```

- Set up variable map entry attributes.

In the following example, you create variable map entries DB2_INSTALL_ROOT and DB2_LIB_DIR. DB2_LIB_DIR is going to refer back to DB2_INSTALL_ROOT:

```
set nameattr1
[list symbolicName
DB2_INSTALL_ROOT]
set valattr1
[list value
"c:/db2/sqllib"]
set nameattr2
[list symbolicName
DB2_LIB_DIR]
set valattr2
[list value
"\${DB2_INSTALL
_ROOT}/lib"]
set attr1
[list $nameattr1
$valattr1]
set attr2 [list
```

```
$nameattr2
$valattr2]
set attrs [list
$attr1 $attr2]
```

Example output:

```
{{symbolicName
DB2_INSTALL_ROOT}
{value c:/db2/sqllib}}
{{symbolicName
DB2_LIB_DIR}
{value {${DB2_
INSTALL_ROOT}/lib}}}
```

- Modify the entries attribute in the variable map to add the two new entries.

```
$AdminConfig modify
$varMap [subst
{{entries {$attrs}}}]
```

- To view the variable map:

```
$AdminConfig showall
$varMap
```

Example output:

```
{entries
{{{symbolicName
DB2_INSTALL_ROOT}
{value c:/db2/
sqllib}}
{{symbolicName
DB2_LIB_DIR}
{value ${DB2_
INSTALL_ROOT}/
lib}}}}
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring name space bindings using wsadmin

This example configures name space binding on a cell.

- Identify the cell and assign it to the cell variable.

```
set cell
[$AdminConfig
getid /Cell:
mycell/]
```

Example output:

```
mycell(cells/
mycell/cell.
xml#Cell_1)
```

- Add a new name space binding on the cell. There are four binding types to choose from when configuring a new name space binding. They are string, EJB, CORBA, and indirect.
  - To configure a string type name space binding:

```
$AdminConfig create
StringNameSpace
Binding $cell
{{name binding1}
{nameInNameSpace
myBindings/
myString}
```

```
{stringToBind
"This is the
String value
that gets bound"}}
```

Example output:

```
binding1(cells/
mycell:namebindings.
xml#StringName
SpaceBinding_1)
```

– To configure an enterprise bean type name space binding:

```
$AdminConfig create
EjbNameSpaceBinding
$cell {{name binding2}
{nameInNameSpace
myBindings/myEJB}
{applicationNodeName
mynode}
{bindingLocation
SINGLESERVER}
{applicationServer
Name server1}
{ejbJndiName
ejb/myEJB}}
```

This example is for an EJB located in a server. For EJB in a cluster, change the configuration example to:

```
$AdminConfig create
EjbNameSpaceBinding
$cell {{name binding2}
{nameInNameSpace
myBindings/myEJB}
{bindingLocation
SERVERCLUSTER}
{application
ServerName
cluster1}
{ejbJndiName
ejb/myEJB}}
```

Example output:

```
binding2(cells/
mycell:namebindings.
xml#EjbNameSpace
Binding_1)
```

– To configure a CORBA type name space binding:

```
$AdminConfig create
CORBAObjectName
SpaceBinding $cell
{{name binding3}
{nmeInNameSpace
myBindings/myCORBA}
{corbanameUrl
corbaname:iiop:
somehost.somecompany.
com:2809#stuff/
MyCORBAOjbect}
{federatedContext
false}}
```

Example output:

```
binding3(cells/
mycell:namebindings.
xml#CORBAObjectName
SpaceBinding_1)
```

– To configure an indirect type name space binding:

```
$AdminConfig create
IndirectLookupName
SpaceBinding $cell
{{name binding4}
{nameInNameSpace
myBindings/
myIndirect}
{providerURL
corbaloc::myCompany.
com:9809/Name
ServiceServerRoot}
{jndiName jndi/
name/for/EJB}}
```

Example output:

```
binding4(cells/
mycell:namebindings.
xml#IndirectLookup
NameSpaceBinding_1)
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Creating a cluster using wsadmin

An example creating a cluster using an existing server follows:

- Identify the server to convert to a cluster and assign it to the server variable:

```
set server
[$AdminConfig
getid /Cell:mycell/
Node:mynode/Server:
server1/]
```

- Convert the existing server to a cluster by using the **convertToCluster** command passing in the existing server and the cluster name:

```
$AdminConfig
convertToCluster
$server myCluster1
```

This command converts a cluster named myCluster with server1 as its member.

An example of this output follows:

```
myCluster1(cells/
mycell/cluster/
myCluster1:cluster.
xml#ClusterMember_1)
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Creating a cluster member using wsadmin

An example creating a cluster member to an existing cluster follows:

- Identify the existing cluster and assign it to the cluster variable:

```
set cluster
[$AdminConfig
getid /ServerCluster
:mycluster1/]
```

An example of this output follows:

```
myCluster1(cells/
mycell/cluster/
myCluster1:cluster.
xml#ServerCluster_1)
```

- Identify the node to create the new server and assign it to the node variable:

```
set node
[$AdminConfig
getid /Node:
mynode/]
```

  An example of this output follows:

```
mynode(cells/mycell
/nodes/mynode:
node.xml#Node_1)
```

- (Optional) Identify the cluster member template and assign it to the serverTemplate variable:

```
set serverTemplate
[$AdminConfig
listTemplates Server]
```

  An example of this output follows:

```
server1(templates/
default/nodes/
servers/server1:
server.xml#Server_1)
```

- Create the new cluster member, by using the **createClusterMember** command.

  The following example creates the new cluster member, passing in the existing cluster configuration ID, existing node configuration ID, and the new member attributes:

```
$AdminConfig
createClusterMember
$cluster $node
{{memberName
clusterMember1}}
```

  The following example creates the new cluster member with a template, passing in the existing cluster configuration ID, existing node configuration ID, the new member attributes, and the template ID:

```
$AdminConfig
createClusterMember
$cluster $node
{{memberName
clusterMember1}}
$serverTemplate
```

  An example of this output follows:

```
clusterMember1
(cells/mycell/
clusters/myCluster1:
cluster.xml$
ClusterMember_2)
```

Example: Configuring a JDBC provider using wsadmin

An example configuring a new JDBC provider follows:

- Identify the parent ID and assign it to the node variable.

```
set node [$AdminConfig
getid  /Cell:mycell/
Node:mynode/]
```

This example uses the node configuration object as the parent. You can modify this example to use cell or server configuration object as the parent.

An example of this output follows:

```
mynode(cells/mycell/
nodes/mynode:node.
xml#Node_1)
```

- Identify the required attributes:

```
$AdminConfig required
JDBCProvider
```

An example of this output follows:

```
Attribute     Type
name     String
implementationClassName
String
```

- Set up the required attributes and assign it to the jdbcAttrs variable:

```
set n1 [list
name JDBC1]
set implCN [list
implementationClassName
myclass]
set  jdbcAttrs
[list  $n1  $implCN]
```

An example of this output follows:

```
{name {JDBC1}}
{implementationClassName
{myclass}}
```

You can modify the example to setup non-required attributes for JDBC provider.

- Create a new JDBC provider using node as the parent:

```
$AdminConfig create
JDBCProvider
$node $jdbcAttrs
```

An example of this output follows:

```
JDBC1(cells/mycell/
nodes/mynode:
resources.xml#
JDBCProvider_1)
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring a new data source using wsadmin:

- Identify the parent ID:

```
set newjdbc
[$AdminConfig getid
/Cell:mycell/Node:
mynode/JDBCProvider:
JDBC1/]
```

Example output:

```
JDBC1(cells/mycell/
nodes/mynode:resources.
xml#JDBCProvider_1)
```

- Obtain the required attributes:

```
$AdminConfig required
DataSource
```

Example output:

```
Attribute   Type
name    String
```

- Setting up required attributes:

```
set name
[list name DS1]
set dsAttrs
[list $name]
```

- Create a data source:

```
set newds
[$AdminConfig
create DataSource
$newjdbc $dsAttrs]
```

Example output:

```
DS1(cells/mycell/
nodes/mynode:resources.
xml#DataSource_1)
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring a new connection pool using wsadmin:

- Identify the parent ID:

```
set newds [$AdminConfig
getid /Cell:mycell/
Node:mynode/
JDBCProvider:JDBC1/
DataSource:DS1/]
```

Example output:

```
DS1(cells/mycell/
nodes/mynode:
resources.xml$
DataSource_1)
```

- Creating connection pool:

```
$AdminConfig create
ConnectionPool
$newds {}
```

Example output:

```
(cells/mycell/nodes/
mynode:resources.xml#
ConnectionPool_1)
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring a new data source custom property using wsadmin:

- Identify the parent ID:

```
set newds [$AdminConfig
getid /Cell:mycell/Node:
mynode/JDBCProvider:
JDBC1/DataSource:DS1/]
```

Example output:

```
DS1(cells/mycell/
nodes/mynode:
resources.xml$
DataSource_1)
```

- Create the J2EE resource property set:

```
set newPropSet
[$AdminConfig create
J2EEResourcePropertySet
$newds {}]
```

  Example output:

```
(cells/mycell/nodes/
mynode:resources.xml#
J2EEResourcePropertySet_8)
```

- Get required attribute:

```
$AdminConfig required
J2EEResourceProperty
```

  Example output:

```
Attribute  Type
name       String
```

- Set up attributes:

```
set name
[list name RP4]
set rpAttrs
[list $name]
```

- Create a J2EE resource property:

```
$AdminConfig create
J2EEResourceProperty
$newPropSet $rpAttrs
```

  Example output:

```
RP4(cells/mycell/nodes/
mynode:resources.xml#
J2EEResourceProperty_8)
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring a new J2CAuthentication data entry using wsadmin:

- Identify the parent ID:

```
set security
[$AdminConfig getid
/Cell:mycell/Security:/]
```

  Example output:

```
(cells/mycell:security.
xml#Security_1)
```

- Get required attributes:

```
$AdminConfig required
JAASAuthData
```

  Example output:

```
Attribute  Type
alias      String
userId     String
password   String
```

- Set up required attributes:

```
set alias
[list alias myAlias]
set userid
[list userId myid]
set password
```

```
[list password secret]
set jaasAttrs
[list $alias
$userid $password]
```

Example output:

```
{alias myAlias}
{userId myid}
{password secret}
```

- Create JAAS auth data:

```
$AdminConfig create
JAASAuthData
$security $jaasAttrs
```

Example output:

```
(cells/mycell:security.
xml#JAASAuthData_2)
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring a new WAS40 data source using wsadmin:

- Identify the parent ID:

```
set newjdbc
[$AdminConfig getid
/JDBCProvider:JDBC1/]
```

Example output:

```
JDBC1(cells/mycell/
nodes/mynode:resources.
xml$JDBCProvider_1)
```

- Get required attributes:

```
$AdminConfig required
WAS40DataSource
```

Example output:

```
Attribute    Type
name    String
```

- Set up required attributes:

```
set name [list
name was4DS1]
set ds4Attrs
[list $name]
```

- Create WAS40DataSource:

```
set new40ds [$AdminConfig
create WAS40DataSource
$newjdbc $ds4Attrs]
```

Example output:

```
was4DS1(cells/mycell/
nodes/mynode:resources.
xml#WAS40DataSource_1)
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring a new WAS40 connection pool using wsadmin:

- Identify the parent ID:

```
set new40ds
[$AdminConfig
getid /Cell:
mycell/Node:mynode
/JDBCProvider:
JDBC1/
WAS40DataSource:
was4DS1/]
```

Example output:

```
was4DS1(cells/
mycell/nodes/
mynodes:resources.
xml$WAS40DataSource_1)
```

- Get required attributes:

```
$AdminConfig required
WAS40ConnectionPool
```

Example output:

```
Attribute       Type
minimumPoolSize   Integer
maximumPoolSize   Integer
connectionTimeout Integer
idleTimeout       Integer
orphanTimeout     Integer
statementCacheSize Integer
```

- Set up required attributes:

```
set mps [list
minimumPoolSize 5]
set minps [list
minimumPoolSize 5]
set maxps [list
maximumPoolSize 30]
set conn [list
connectionTimeout 10]
set idle [list
idleTimeout 5]
set orphan [list
orphanTimeout 5]
set scs [list
statementCacheSize 5]
set 40cpAttrs
[list $minps $maxps
$conn $idle $orphan
$scs]
```

Example output:

```
{minimumPoolSize 5}
{maximumPoolSize 30}
{connectionTimeout 10}
{idleTimeout 5}
{orphanTimeout 5}
{statementCacheSize 5}
```

- Create was40 connection pool:

```
$AdminConfig create
WAS40ConnectionPool
$new40ds $40cpAttrs
```

Example output:

```
(cells/mycell/nodes/
mynode:resources.xml#
WAS40ConnectionPool_1)
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring a new WAS40 custom property using wsadmin:

- Identify the parent ID:

```
set new40ds
[$AdminConfig
getid /Cell:
mycell/Node:
mynode/JDBCProvider:
JDBC1/
WAS40DataSource:
was4DS1/]
```

  Example output:

```
was4DS1(cells/
mycell/nodes/
mynodes:resources.
xml$WAS40DataSource_1)
```

- Get required attributes:

```
set newPropSet
[$AdminConfig create
J2EEResourcePropertySet
$newds {}]
```

  Example output:

```
(cells/mycell/nodes/
mynode:resources.
xml#J2EEResource
PropertySet_9)
```

- Get required attribute:

```
$AdminConfig required
J2EEResourceProperty
```

  Example output:

```
Attribute  Type
name       String
```

- Set up required attributes:

```
set name
[list name RP5]
set rpAttrs
[list $name]
```

- Create J2EE Resource Property:

```
$AdminConfig create
J2EEResourceProperty
$newPropSet $rpAttrs
```

  Example output:

```
RP5(cells/mycell/
nodes/mynode:
resources.xml#
J2EEResourceProperty_9)
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring a new JMS provider using wsadmin

- Identify the parent ID:

```
set node [$AdminConfig
getid /Cell:mycell/
Node:mynode/]
```

Example output:

```
mynode(cells/mycell/
nodes/mynode:node.
xml#Node_1)
```

- Get required attributes:

```
$AdminConfig required
JMSProvider
```

Example output:

```
Attribute        Type
name     String
externalInitialContextFactory
String
externalProviderURL  String
```

- Set up required attributes:

```
set name [list
name JMSP1]
set extICF [list
externalInitial
ContextFactory
"Put the external
initial context
factory here"]
set extPURL [list
externalProviderURL
"Put the external
provider URL here"]
set jmspAttrs [list
$name $extICF
$extPURL]
```

Example output:

```
{name JMSP1}
{externalInitial
ContextFactory
{Put the external
initial context
factory here }}
{externalProviderURL
{Put the external
provider URL here}}
```

- Create the JMS provider:

```
set newjmsp
[$AdminConfig create
JMSProvider $node
$jmspAttrs]
```

Example output:

```
JMSP1(cells/mycell/
nodes/mynode:resources.
xml#JMSProvider_1)
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring a new JMS destination using wsadmin:

- Identify the parent ID:

```
set newjmsp
[$AdminConfig getid
/Cell:mycell/Node:
myNode/JMSProvider:
JMSP1]
```

Example output:

```
JMSP1(cells/mycell/
nodes/mynode:
resources.xml#
JMSProvider_1)
```

- Get required attributes:

```
$AdminConfig required
GenericJMSDestination
```

Example output:

```
Attribute       Type
name       String
jndiName    String
externalJNDIName  String
```

- Set up required attributes:

```
set name [list
name JMSD1]
set jndi [list
jndiName
jms/JMSDestination1]
set extJndi
[list externalJNDIName
jms/extJMSD1]
set jmsdAttrs
[list $name
$jndi $extJndi]
```

Example output:

```
{name JMSD1}
{jndiName
jms/JMSDestination1}
{externalJNDIName
jms/extJMSD1}
```

- Create generic JMS destination:

```
$AdminConfig create
GenericJMSDestination
$newjmsp  $jmsdAttrs
```

Example output:

```
JMSD1(cells/mycell/
nodes/mynode:resources.
xml#GenericJMSDestination_1)
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring a new JMS connection using wsadmin:

- Identify the parent ID:

```
set newjmsp [$AdminConfig
getid /Cell:mycell/Node:
myNode/JMSProvider:JMSP1]
```

Example output:

```
JMSP1(cells/mycell/nodes/
mynode:resources.xml#
JMSProvider_1)
```

- Get required attributes:

```
$AdminConfig required
GenericJMSConnectionFactory
```

Example output:

```
Attribute       Type
name       String
jndiName    String
externalJNDIName  String
```

- Set up required attributes:

```
set name [list
name JMSCF1]
set jndi [list
jndiName jms/
JMSConnFact1]
set extJndi
[list external
JNDIName
jms/extJMSCF1]
set jmscfAttrs
[list $name
$jndi $extJndi]
```

Example output:

```
{name JMSCF1}
{jndiName
jms/JMSConnFact1}
{externalJNDIName
jms/extJMSCF1}
```

- Create generic JMS connection factory:

```
$AdminConfig create
GenericJMSConnection
Factory $newjmsp
$jmscfAttrs
```

Example output:

```
JMSCF1(cells/mycell/
nodes/mynode:
resources.xml#
GenericJMSConnection
Factory_1)
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring a new WebSphere queue connection factory using wsadmin:

- Identify the parent ID:

```
set newjmsp
[$AdminConfig getid
/Cell:mycell/Node:
mynode/JMSProvider:
JMSP1/]
```

Example output:

```
JMSP1(cells/mycell/
nodes/mynode:
resources.xml#
JMSProvider_1)
```

- Get required attributes:

```
$AdminConfig required
WASQueueConnectionFactory
```

Example output:

```
Attribute   Type
name     String
jndiName   String
```

- Set up required attributes:

```
set name [list
name WASQCF]
set jndi [list
jndiName jms/WASQCF]
set mqcfAttrs
[list $name $jndi]
```

Example output:

```
{name WASQCF}
{jndiName jms/
WASQCF}
```

- Create was queue connection factories:

```
$AdminConfig
create WASQueue
ConnectionFactory
$newjmsp $mqcfAttrs
```

Example output:

```
WASQCF(cells/
mycell/nodes/
mynode:resources.
xml#WASQueue
ConnectionFactory_1)
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring a new WebSphere topic connection factory using wsadmin:

- Identify the parent ID:

```
set newjmsp [$AdminConfig
getid /Cell:mycell/
Node:mynode/JMSProvider:
JMSP1/]
```

Example output:

```
JMSP1(cells/mycell/
nodes/mynode:resources.
xml#JMSProvider_1)
```

- Get required attributes:

```
$AdminConfig required
WASTopicConnectionFactory
```

Example output:

```
Attribute  Type
name       String
jndiName   String
port ENUM(DIRECT, QUEUED)
```

- Set up required attributes:

```
set name [list
name WASTCF]
set jndi [list
jndiName
jms/WASTCF]
set port [list
port QUEUED]
set mtcfAttrs
[list $name
$jndi $port]
```

Example output:

```
{name WASTCF}
{jndiName
jms/WASTCF}
{port QUEUED}
```

- Create was topic connection factories:

```
$AdminConfig create
WASTopicConnection
Factory $newjmsp
$mtcfAttrs
```

Example output:

```
WASTCF(cells/mycell/
nodes/mynode:
resources.xml#
WASTopicConnection
Factory_1)
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring a new WebSphere queue using wsadmin:

- Identify the parent ID:

```
set newjmsp [$AdminConfig
getid /Cell:mycell/Node:
mynode/JMSProvider:JMSP1/]
```

Example output:

```
JMSP1(cells/mycell/
nodes/mynode:resources.
xml#JMSProvider_1)
```

- Get required attributes:

```
$AdminConfig required
WASQueue
```

Example output:

```
Attribute Type
name   String
jndiName String
```

- Set up required attributes:

```
set name [list
name WASQ1]
set jndi [list
jndiName jms/WASQ1]
set wqAttrs
[list $name $jndi]
```

Example output:

```
{name WASQ1}
{jndiName jms/WASQ1}
```

- Create was queue:

```
$AdminConfig create
WASQueue $newjmsp
$wqAttrs
```

Example output:

```
WASQ1(cells/mycell/
nodes/mynode:resources.
xml#WASQueue_1)
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring a new WebSphere topic using wsadmin:

- Identify the parent ID:

```
set newjmsp [$AdminConfig
getid /Cell:mycell/Node:
mynode/JMSProvider:JMSP1/]
```

Example output:

```
JMSP1(cells/mycell/
nodes/mynode:resources.
xml#JMSProvider_1)
```

- Get required attributes:

```
$AdminConfig required
WASTopic
```

Example output:

```
Attribute Type
name   String
jndiName String
topic  String
```

- Set up required attributes:

```
set name [list
name WAST1]
set jndi [list
jndiName jms/WAST1]
set topic [list
topic "Put
your topic here"]
set wtAttrs
[list $name
$jndi $topic]
```

Example output:

```
{name WAST1}
{jndiName jms/WAST1}
{topic {Put
your topic here}}
```

- Create was topic:

```
$AdminConfig create
WASTopic $newjmsp
$wtAttrs
```

Example output:

```
WAST1(cells/mycell/
nodes/mynode:
resources.xml#
WASTopic_1)
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring a new MQ queue connection factory using wsadmin:

- Identify the parent ID:

```
set newjmsp
[$AdminConfig
getid /Cell:
mycell/Node:
mynode/
JMSProvider:
JMSP1/]
```

Example output:

```
JMSP1(cells/
mycell/nodes/
mynode:resources.
xml#JMSProvider_1)
```

- Get required attributes:

```
$AdminConfig required
MQQueueConnection
Factory
```

Example output:

```
Attribute   Type
name     String
jndiName   String
```

- Set up required attributes:

```
set name [list
name MQQCF]
set jndi [list
jndiName jms/
MQQCF]
set mqqcfAttrs
[list $name
$jndi]
```

Example output:

```
{name MQQCF}
{jndiName
jms/MQQCF}
```

- Create was topic:

```
$AdminConfig create
MQQueueConnection
Factory $newjmsp
$mqqcfAttrs
```

Example output:

```
MQQCF(cells/mycell/
nodes/mynode:
resources.xml#
MQQueueConnection
Factory_1)
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring a new MQ topic connection factory using wsadmin:

- Identify the parent ID:

```
set newjmsp
[$AdminConfig
getid /Cell:
mycell/Node:
mynode/
JMSProvider:
JMSP1/]
```

Example output:

```
JMSP1(cells/
mycell/nodes/
mynode:resources.
xml#JMSProvider_1)
```

- Get required attributes:

```
$AdminConfig
required
MQTopicConnection
Factory
```

Example output:

```
Attribute   Type
name     String
jndiName   String
```

- Set up required attributes:

```
set name
[list name
MQTCF]
set jndi
[list jndiName
jms/MQTCF]
set mqtcfAttrs
[list $name
$jndi]
```

Example output:

```
{name MQTCF}
{jndiName
jms/MQTCF}
```

- Create mq topic connection factory:

```
$AdminConfig
create MQTopic
ConnectionFactory
$newjmsp
$mqtcfAttrs
```

Example output:

```
MQTCF(cells/
mycell/nodes/
mynode:resources.
xml#MQTopic
ConnectionFactory_1)
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring a new MQ queue using wsadmin:

- Identify the parent ID:

```
set newjmsp
[$AdminConfig
getid /Cell:
mycell/Node:
mynode/
JMSProvider:
JMSP1/]
```

  Example output:

```
JMSP1(cells/
mycell/nodes/
mynode:resources.
xml#JMSProvider_1)
```

- Get required attributes:

```
$AdminConfig required
MQQueue
```

  Example output:

```
Attribute       Type
name       String
jndiName    String
baseQueueName  String
```

- Set up required attributes:

```
set name [list
name MQQ]
set jndi [list
jndiName jms/MQQ]
set baseQN [list
baseQueueName
"Put the base
queue name here"]
set mqqAttrs
[list $name
$jndi $baseQN]
```

  Example output:

```
{name MQQ}
{jndiName jms/MQQ}
{baseQueueName
{Put the base
queue name here}}
```

- Create mq queue factory:

```
$AdminConfig
create MQQueue
$newjmsp $mqqAttrs
```

  Example output:

```
MQQ(cells/mycell/
nodes/mynode:
resources.xml#
MQQueue_1)
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring a new MQ topic using wsadmin:

- Identify the parent ID:

```
set newjmsp
[$AdminConfig
getid /Cell:
mycell/Node:
mynode/JMSProvider:
JMSP1/]
```

  Example output:

```
JMSP1(cells/
mycell/nodes/
mynode:resources.
xml#
JMSProvider_1)
```

- Get required attributes:

```
$AdminConfig required
MQTopic
```

  Example output:

```
Attribute       Type
name            String
jndiName        String
baseTopicName   String
```

- Set up required attributes:

```
set name
[list name MQT]
set jndi
[list jndiName
jms/MQT]
set baseTN
[list baseTopicName
"Put the base
topic name here"]
set mqtAttrs
[list $name
$jndi $baseTN]
```

  Example output:

```
{name MQT}
{jndiName jms/MQT}
{baseTopicName
{Put the base
topic name here}}
```

- Create mq topic factory:

```
$AdminConfig create
MQTopic $newjmsp
$mqtAttrs
```

  Example output:

```
MQT(cells/mycell/
nodes/mynode:
resources.xml#
MQTopic_1)
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring a new mail provider using wsadmin

- Identify the parent ID:

```
set node
[$AdminConfig
getid /Cell:mycell/
Node:mynode/]
```

Example output:

```
mynode(cells/
mycell/nodes/
mynode:node.
xml#Node_1)
```

- Get required attributes:

```
$AdminConfig required
MailProvider
```

Example output:

```
Attribute   Type
name    String
```

- Set up required attributes:

```
set name
[list name MP1]
set mpAttrs
[list $name]
```

- Create the mail provider:

```
set newmp
[$AdminConfig
create MailProvider
$node $mpAttrs]
```

Example output:

```
MP1(cells/mycell/
nodes/mynode:
resources.xml#
MailProvider_1)
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring a new mail session using wsadmin:

- Identify the parent ID:

```
set newmp
[$AdminConfig
getid /Cell:
mycell/Node:
mynode/
MailProvider:MP1/]
```

Example output:

```
MP1(cells/
mycell/nodes/
mynode:resources.
xml#
MailProvider_1)
```

- Get required attributes:

```
$AdminConfig required
MailSession
```

Example output:

```
Attribute   Type
name     String
jndiName    String
```

- Set up required attributes:

```
set name [list
name MS1]
set jndi [list
jndiName
mail/MS1]
set msAttrs
[list $name
$jndi]
```

  Example output:

```
{name MS1}
{jndiName
mail/MS1}
```

- Create the mail session:

```
$AdminConfig
create MailSession
$newmp $msAttrs
```

  Example output:

```
MS1(cells/mycell/
nodes/mynode:
resources.xml#
MailSession_1)
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring a new protocol provider using wsadmin:

- Identify the parent ID:

```
set newmp
[$AdminConfig
getid /Cell:
mycell/Node:
mynode/Mail
Provider:MP1/]
```

  Example output:

```
MP1(cells/
mycell/nodes/
mynode:resources.
xml#MailProvider_1)
```

- Get required attributes:

```
$AdminConfig required
ProtocolProvider
```

  Example output:

```
Attribute    Type
protocol   String
classname    String
```

- Set up required attributes:

```
set protocol
[list protocol
"Put the protocol
here"]
set classname
[list classname
"Put the class
```

```
name here"]
set ppAttrs
[list $protocol
$classname]
```

Example output:

```
{protocol protocol1}
{classname classname1}
```

- Create the protocol provider:

```
$AdminConfig create
ProtocolProvider
$newmp $ppAttrs
```

Example output:

```
(cells/mycell/nodes/
mynode:resources.xml#
ProtocolProvider_4)
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring a new custom property using wsadmin:

- Identify the parent ID:

```
set newmp
[$AdminConfig
getid /Cell:
mycell/Node:
mynode/
MailProvider:MP1/]
```

Example output:

```
MP1(cells/mycell/
nodes/mynode:
resources.xml#
MailProvider_1)
```

- Create J2EE resource property set:

```
set newPropSet
[$AdminConfig create
J2EEResourcePropertySet
$newmp {}]
```

Example output:

```
(cells/mycell/nodes/
mynode:resources.xml#
J2EEResourcePropertySet_2)
```

- Get required attributes:

```
$AdminConfig required
J2EEResourceProperty
```

Example output:

```
Attribute   Type
name      String
```

- Set up the required attributes:

```
set name [list
name CP1]
set cpAttrs
[list $name]
```

Example output:

```
{name CP1}
```

- Create a J2EE resource property:

```
$AdminConfig create
J2EEResourceProperty
$newPropSet $cpAttrs
```

Example output:

```
CP1(cells/mycell/
nodes/mynode:
resources.xml#
J2EEResourceProperty_2)
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring a new resource environment provider using wsadmin

An example configuring a new resource environment provider follows:

- Identify the parent ID and assign it to the node variable.

```
set node
[$AdminConfig
getid  /Cell:
mycell/Node:
mynode/]
```

An example of this output follows:

```
mynode(cells/
mycell/nodes/
mynode:node.
xml#Node_1)
```

- Identify the required attributes:

```
$AdminConfig
required Resource
EnvironmentProvider
```

An example of this output follows:

```
Attribute Type
name     String
```

- Set up the required attributes and assign it to the repAttrs variable:

```
set n1 [list
name REP1]
set repAttrs
[list $name]
```

- Create a new resource environment provider:

```
set newrep
[$AdminConfig
create Resource
Environment
Provider $node
$repAttrs]
```

An example of this output follows:

```
REP1(cells/
mycell/nodes/
mynode:resources
.xml#Resource
Environment
Provider_1)
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring custom properties for a resource environment provider using wsadmin: An example configuring a new custom property for a resource environment provider follows:

- Identify the parent ID and assign it to the newrep variable.

```
set newrep
[$AdminConfig
getid /Cell:
mycell/Node:
mynode/Resource
Environment
Provider:REP1/]
```

  An example of this output follows:

```
REP1(cells/
mycell/nodes/
mynode:resources
.xml#Resource
Environment
Provider_1)
```

- Identify the required attributes:

```
$AdminConfig
required
J2EEResourceProperty
```

  An example of this output follows:

```
Attribute Type
name     String
```

- Set up the required attributes and assign it to the repAttrs variable:

```
set name
[list name RP]
set rpAttrs
[list $name]
```

- Create a J2EE resource property set:

```
set newPropSet
[$AdminConfig
create
J2EEResource
PropertySet
$newrep {}]
```

  An example of this output follows:

```
(cells/mycell/
nodes/mynode:
resources.xml#
J2EEResource
PropertySet_1)
```

- Create a J2EE resource property:

```
$AdminConfig
create
J2EEResource
Property
$newPropSet
$rpAttrs
```

  An example of this output follows:

```
RP(cells/mycell/
nodes/mynode:
resources.xml#
J2EEResource
Property_1)
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring a new referenceable using wsadmin: An example configuring a new referenceable follows:

- Identify the parent ID and assign it to the newrep variable.

```
set newrep [$AdminConfig
getid  /Cell:mycell/
Node:mynode/Resource
EnvironmentProvider:
REP1/]
```

  An example of this output follows:

```
REP1(cells/mycell/
nodes/mynode:
resources.xml#
ResourceEnvironment
Provider_1)
```

- Identify the required attributes:

```
$AdminConfig
required
Referenceable
```

  An example of this output follows:

```
Attribute   Type
factoryClassname  String
classname   String
```

- Set up the required attributes:

```
set fcn [list
factoryClassname
REP1]
set cn [list
classname NM1]
set refAttrs
[list $fcn $cn]
```

  An example of this output follows:

```
{factoryClassname
{REP1}} {classname
{NM1}}
```

- Create a new referenceable:

```
set newref
[$AdminConfig
create Referenceable
$newrep  $refAttrs]
```

  An example of this output follows:

```
(cells/mycell/
nodes/mynode:
resources.xml#
Referenceable_1)
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring a new resource environment entry using wsadmin: An example configuring a new resource environment entry follows:

- Identify the parent ID and assign it to the newrep variable.

```
set newrep [$AdminConfig
getid  /Cell:mycell/Node:
mynode/ResourceEnvironment
Provider:REP1/]
```

An example of this output follows:

```
REP1(cells/mycell/nodes/
mynode:resources.xml#
ResourceEnvironment
Provider_1)
```

- Identify the required attributes:

```
$AdminConfig required
ResourceEnvEntry
```

An example of this output follows:

```
Attribute      Type
name           String
jndiName       String
referenceable  Referenceable@
```

- Set up the required attributes:

```
set name [list
name REE1]
set jndiName
[list jndiName myjndi]
set newref
[$AdminConfig getid
/Cell:mycell/Node:
mynode/Referenceable:/]
set ref [list
referenceable $newref]
set reeAttrs [list
$name $jndiName $ref]
```

- Create the resource environment entry:

```
$AdminConfig create
ResourceEnvEntry
$newrep $reeAttrs
```

An example of this output follows:

```
REE1(cells/mycell/
nodes/mynode:resources.
xml#ResourceEnvEntry_1)
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring custom properties for resource environment entries using wsadmin: An example configuring a new custom property for a resource environment entry follows:

- Identify the parent ID and assign it to the newree variable.

```
set newree
[$AdminConfig
getid  /Cell:
mycell/Node:
mynode/Resource
EnvEntry:REE1/]
```

An example of this output follows:

```
REE1(cells/mycell/
nodes/mynode:
resources.xml#
ResourceEnvEntry_1)
```

- Create the J2EE custom property set:

```
set newPropSet
[$AdminConfig create
J2EEResourcePropertySet
$newree {}]
```

  An example of this output follows:

```
(cells/mycell/nodes/
mynode:resources.xml#
J2EEResourcePropertySet_5)
```

- Identify the required attributes:

```
$AdminConfig required
J2EEResourceProperty
```

  An example of this output follows:

```
Attribute Type
name      String
```

- Set up the required attributes:

```
set name
[list name RP1]
set rpAttrs
[list $name]
```

- Create the J2EE custom property:

```
$AdminConfig create
J2EEResourceProperty
$newPropSet $rpAttrs
```

  An example of this output follows:

```
RPI(cells/mycell/
nodes/mynode:
resources.xml#
J2EEResourceProperty_1)
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring a new URL provider using wsadmin

An example configuring a new URL provider follows:

- Identify the parent ID and assign it to the node variable.

```
set node
[$AdminConfig
getid  /Cell:
mycell/Node:
mynode/]
```

  An example of this output follows:

```
mynode(cells/
mycell/nodes/
mynode:node.
xml#Node_1)
```

- Identify the required attributes:

```
$AdminConfig
required
URLProvider
```

  An example of this output follows:

```
Attribute Type
streamHandler
ClassName String
protocol  String
name      String
```

- Set up the required attributes:

```
set name [list
name URLP1]
set shcn [list
streamHandler
ClassName "Put
the stream
handler classname
here"]
set protocol
[list protocol
"Put the
protocol here"]
set urlpAttrs
[list $name
$shcn $protocol]
```

An example of this output follows:

```
{name URLP1}
{streamHandler
ClassName {Put
the stream
handler classname
here}} {protocol
{Put the
protocol here}}
```

- Create a URL provider:

```
$AdminConfig create
URLProvider $node
$urlpAttrs
```

An example of this output follows:

```
URLP1(cells/mycell/
nodes/mynode:
resources.xml#
URLProvider_1)
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring custom properties for URL providers using wsadmin: An example configuring a new custom property for URL providers follows:

- Identify the parent ID and assign it to the newurlp variable.

```
set newurlp [$AdminConfig
getid  /Cell:mycell/Node:
mynode/URLProvider:URLP1/]
```

An example of this output follows:

```
URLP1(cells/mycell/nodes/
mynode:resources.xml#
URLProvider_1)
```

- Create a J2EE resource property set:

```
set newPropSet
[$AdminConfig create
J2EEResourcePropertySet
$newurlp {}]
```

An example of this output follows:

```
(cells/mycell/nodes/
mynode:resources.xml#
J2EEResourcePropertySet_7)
```

- Identify the required attributes:

```
$AdminConfig required
J2EEResourceProperty
```

An example of this output follows:

```
Attribute  Type
name       String
```

- Set up the required attributes:

```
set name
[list name RP2]
set rpAttrs
[list $name]
```

- Create a J2EE resource property:

```
$AdminConfig create
J2EEResourceProperty
$newPropSet $rpAttrs
```

An example of this output follows:

```
RP2(cells/mycell/
nodes/mynode:resources.
xml#J2EEResource
Property_1)
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring a new URL using wsadmin: An example configuring a new URL follows:

- Identify the parent ID and assign it to the newurlp variable.

```
set newurlp
[$AdminConfig
getid  /Cell:
mycell/Node:
mynode/
URLProvider:URLP1/]
```

An example of this output follows:

```
URLP1(cells/
mycell/
nodes/mynode:
resources.
xml#URLProvider_1)
```

- Identify the required attributes:

```
$AdminConfig required
URL
```

An example of this output follows:

```
Attribute  Type
name       String
spec       String
```

- Set up the required attributes:

```
set name [list
name URL1]
set spec [list
spec "Put the
```

```
spec here"]
set urlAttrs
[list $name
$spec]
```

An example of this output follows:

```
{name URL1}
{spec {Put the
spec here}}
```

- Create a URL:

```
$AdminConfig
create URL
$newurlp $urlAttrs
```

An example of this output follows:

```
URL1(cells/mycell/
nodes/mynode:
resources.xml#URL_1)
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring custom properties for URLs using wsadmin: An example configuring a new custom property for a URL follows:

- Identify the parent ID and assign it to the newurl variable.

```
set newurl [$AdminConfig
getid /Cell:mycell/Node:
mynode/URLProvider:
URLP1/URL:URL1/]
```

An example of this output follows:

```
URL1(cells/mycell/nodes/
mynode:resources.xml#URL_1)
```

- Create a J2EE resource property set:

```
set newPropSet
[$AdminConfig create
J2EEResourcePropertySet
$newurl{}]
```

An example of this output follows:

```
(cells/mycell/nodes/
mynode:resources.xml#
J2EEResourcePropertySet_7)
```

- Identify the required attributes:

```
$AdminConfig required
J2EEResourceProperty
```

An example of this output follows:

```
Attribute   Type
name        String
```

- Set up the required attributes:

```
set name [list name RP3]
set rpAttrs [list $name]
```

- Create a J2EE resource property:

```
$AdminConfig create
J2EEResourceProperty
$newPropSet $rpAttrs
```

An example of this output follows:

```
RP3(cells/mycell1/nodes/
mynode:resources.xml#
J2EEResourceProperty_7)
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring a new J2C resource adapter using wsadmin

An example configuring a new J2C resource adapter follows:

- Identify the parent ID and assign it to the node variable.

```
set node [$AdminConfig
getid /Cell:mycell1/
Node:mynode/]
```

An example of this output follows:

```
mynode(cells/mycell1/
nodes/mynode:node.
xml#Node_1)
```

- Identify the required attributes:

```
$AdminConfig required
J2CResourceAdapter
```

An example of this output follows:

```
Attribute     Type
name         String
```

- Set up the required attributes:

```
set rarFile c:/
currentScript/
cicseci.rar
set option
[list  -rar.name
RAR1]
```

- Create a resouce adapter:

```
set newra
[$AdminConfig
installResourceAdapter
$rarFile mynode
$option]
```

An example of this output follows:

```
RAR1(cells/mycell1/
nodes/mynode:resources.
xml#J2CResourceAdapter_1)
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring custom properties for J2C resource adapters using wsadmin: An example configuring a new custom property for a J2C resource adapters follows:

- Identify the parent ID and assign it to the newra variable.

```
set newra [$AdminConfig
getid /Cell:mycell1/Node:
mynode/J2CResourceAdapter:
RAR1/]
```

An example of this output follows:

```
RAR1(cells/mycell1/nodes/
mynode:resources.xml#
J2CResourceAdapter_1)
```

- Create a J2EE resource property set:

```
set newPropSet [$AdminConfig
create J2EEResourcePropertySet
$newra {}]
```

  An example of this output follows:

```
(cells/mycell/nodes/
mynode:resources.xml#
J2EEResourcePropertySet_8)
```

- Identify the required attributes:

```
$AdminConfig required
J2EEResourceProperty
```

  An example of this output follows:

```
Attribute  Type
name       String
```

- Set up the required attributes:

```
set name
[list name RP4]
set rpAttrs
[list $name]
```

- Create a J2EE resource property:

```
$AdminConfig create
J2EEResourceProperty
$newPropSet $rpAttrs
```

  An example of this output follows:

```
RP4(cells/mycell/
nodes/mynode:
resources.xml#
J2EEResourceProperty_8)
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring a new J2C connection factory using wsadmin: An example configuring a new J2C resource factory follows:

- Identify the parent ID and assign it to the newra variable.

```
set newra [$AdminConfig
getid /Cell:mycell/Node:
mynode/J2CResourceAdapter:
RAR1/]
```

  An example of this output follows:

```
RAR1(cells/mycell/nodes/
mynode:resources.xml#
J2CResourceAdapter_1)
```

- Identify the required attributes:

```
$AdminConfig required
J2CConnectionFactory
```

  An example of this output follows:

```
Attribute  Type
name       String
```

- Set up the required attributes:

```
set name [list
name J2CCF1]
set j2ccfAttrs
[list $name]
```

- Create a connection factory:

```
$AdminConfig create
J2CConnectionFactory
$newra $j2ccfAttrs
```

  An example of this output follows:

```
J2CCF1(cells/mycell/
nodes/mynode:resources.
xml#J2CConnectionFactory_1)
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring custom properties for J2C connection factories using wsadmin: An example configuring a new custom property for a J2C resource factories follows:

- Identify the parent ID and assign it to the newcf variable:

```
set newcf [$AdminConfig
getid /J2CConnection
Factory:J2CCF1/]
```

  An example of this output follows:

```
J2CCF1(cells/mycell/
nodes/mynode:resources.
xml#J2CConnection
Factory_1)
```

- Create a J2EE resource property set:

```
set newPropSet
[$AdminConfig create
J2EEResourcePropertySet
$newcf {}]
```

  An example of this output follows:

```
(cells/mycell/nodes/
mynode:resources.xml#
J2EEResourcePropertySet_8)
```

- Identify the required attributes:

```
$AdminConfig required
J2EEResourceProperty
```

  An example of this output follows:

```
Attribute  Type
name       String
```

- Set up the required attributes:

```
set name
[list name RP4]
set rpAttrs
[list $name]
```

- Create a J2EE resource property:

```
$AdminConfig create
J2EEResourceProperty
$newPropSet $rpAttrs
```

  An example of this output follows:

```
RP4(cells/mycell/
nodes/mynode:resources.
xml#J2EEResource
Property_8)
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring new J2C authentication data entries using wsadmin: An example configuring new J2C authentication data entries follows:

- Identify the parent ID and assign it to the security variable.

```
set security
[$AdminConfig
getid /Security:
mysecurity/]
```

- Identify the required attributes:

```
$AdminConfig required
JAASAuthData
```

  An example of this output follows:

```
Attribute   Type
alias       String
userId      String
password    String
```

- Set up the required attributes:

```
set alias [list
alias myAlias]
set userid [list
userId myid]
set password
[list password
secret]
set jaasAttrs
[list $alias
$userid $password]
```

  An example of this output follows:

```
{alias myAlias}
{userId myid}
{password secret}
```

- Create JAAS authentication data:

```
$AdminConfig create
JAASAuthData $security
$jaasAttrs
```

  An example of this output follows:

```
(cells/mycell/nodes/
mynode:resources.xml#
JAASAuthData_2)
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Enabling and disabling global security with a profile

The default profile sets up procedures so that you can enable and disable global security based on LocalOS registry.

- You can use the help command to find out the arguments that you need to provide with this call, for example:

```
securityon help
```

  An example of this output follows:

```
Syntax: securityon
user password
```

- To enable global security based on the LocalOS registry, use the following procedure call and arguments:

```
securityon user1
password1
```

- To disable global security based on the LocalOS registry, use the following procedure call:

  ```
  securityoff
  ```

Example: Enabling and disabling Java 2 security using wsadmin

An example of enabling and disabling Java 2 security follows:

- Identify the security configuration object and assign it to the security variable:

  ```
  set security
  [$AdminConfig
  list Security]
  ```

  An example of this output follows:

  ```
  (cells/mycell:
  security.xml#Security_1)
  ```

- Modify the enforceJava2Security attribute.

  To enable Java 2 security:

  ```
  $AdminConfig modify
  $security
  {{enforceJava2Security
  true}}
  ```

  To disable Java 2 security:

  ```
  $AdminConfig modify
  $security
  {{enforceJava2Security
  false}}
  ```

- Save the changes with the following command:

  ```
  $AdminConfig save
  ```

Managing running objects with scripting

Operation management scripts use the AdminControl object to communicate with the MBeans that represent running objects. You can use the AdminControl object to list running objects and their attributes, invoke actions on running objects, obtain help, and obtain dynamic information about running MBeans.

1. Decide how you want to execute the script. If you want to run the script immediately from the command line, enter it surrounded by quotes as a parameter to the **wsadmin -c** command. To save the script for repeated use, compose it in a file and execute it with the **wsadmin -f** command. If you want to compose and run the script interactively, issue the **wsadmin** command without the -c or -f flags. For more information about executing scripts, see Launching scripting clients
2. Write an AdminControl script command statement to perform a management task, for example:

   ```
   $AdminControl command
   ```

   Related concepts

   "Jacl" on page 38

   Related reference

   "AdminControl object for scripted administration" on page 69

Specifying running objects using the wsadmin tool

1. Invoke the AdminContol object commands interactively, in a script, or use the **wsadmin -c** command from an operating system command prompt.

2. Obtain the configuration ID with one of the following ways:
   - Obtain the object name with the **completeObjectName** command, for example:

     ```
     set var
     [$AdminControl
     completeObjectName
     template]
     ```

     where:

`set`	is a Jacl command
`var`	is a variable name
`$AdminControl`	is an object that enables the manipulation of MBeans running in a WebSphere server process
`completeObjectName`	is an $AdminControl command
`template`	is a string containing a segment of the object name to be matched. The template has the same format as an object name with the following pattern: `[domainName]:property=value[,property=value]*`. See Object name, Attribute, Attribute list for more information.

     If there are several MBeans that match the template, the **completeObjectName** command only retuns the first match. The matching MBean object name is then assigned to a variable.

     To look for *server1* MBean in *mynode*, use the following example:

     ```
     set server1
     [$AdminControl
     completeObjectName
     node=mynode,
     server:server1*]
     ```

   - Obtain the object name with the **queryNames** command, for example:

     ```
     set var
     [$AdminControl
     queryNames template]
     ```

     where:

`set`	is a Jacl command
`var`	is a variable name
`$AdminControl`	is an object that enables the manipulation of MBeans running in a WebSphere Application server process.
`queryNames`	is an $AdminConfig command
`template`	is a string containing a segment of the object name to be matched. The template has the same format as an object name with the following pattern: `[domainName]:property=value[,property=value]*`

The difference between **querNames** and **completeObjectName** commands is the **queryNames** command returns a list of all the MBean object names that matches the template.

To look for all the MBeans, use the following example:

```
set allMbeans
[$AdminControl
queryNames *]
```

To look for all the server MBeans, use the following example:

```
set servers
[$AdminControl
queryNames
type=Server,*]
```

To look for all the server Mbeans in mynode, use the following example:

```
set nodeServers
[$AdminControl
queryNames node=
mynode,type=Server,*]
```

3. If there are more than one running objects returned from the **queryNames** command, the objects are returned in a list syntax. One simple way to retrieve a single element from the list is to use the **lindex** command. The following example retrieves the first running object from the server list:

```
set allServers
[$AdminControl
queryNames
type=Server,*]
set aServer
[lindex
$allServers 0]
```

For other ways to manipulate the list and then perform pattern matching to look for a specified configuration object, refer to the Jacl syntax.

You can now use the running object in with other AdminControl commands that require an object name as a parameter.

Related concepts

"ObjectName, Attribute, and AttributeList" on page 94

Identifying attributes and operations for running objects with the wsadmin tool

Use the Help object **attributes** or **operations** commands to find information on a running MBean in the server.

1. Invoke the AdminControl object commands interactively, in a script, or use the **wsadmin -c** tool from an operating system command prompt.
2. Specify a running object.
3. Use the **attributes** command to display the attributes of the running object:

```
$Help attributes
MBeanObjectName
```

where:

`$Help`	is the object that provides general help and information for running MBeans in the connected server process
`attributes`	is a $Help command
`MBeanObjectName`	is the string representation of the MBean object name obtained in step 2

4. Use the **operations** command to find out the operations supported by the MBean:

```
$Help operations
MBeanObjectname
```

or

```
$Help operations
MBeanObjectname
operationName
```

where:

`$Help`	is the object that provides general help and information for running MBeans in the connected server process
`operations`	is a $Help command
`MBeanObjectname`	is the string representation of the MBean object name obtained in step number 2
`operationName`	(optional) is the specified operation for which you want to obtain detailed information

If you do not provide the `operationName`, all operations supported by the MBean return with the signature for each operation. If you specify `operationName`, only the operation that you specify returns and it contains details which include the input parameters and the return value. To display the operations for the server MBean, use the following example:

```
set server
[$AdminControl
completeObjectName
type=Server,name=
server1,*]
$Help operations
$serv
```

To display detailed information about the stop operation, use the following example:

```
$Help operations
$server stop
```

Performing operations on running objects using the wsadmin tool

1. Invoke the AdminContol object commands interactively, in a script, or use the **wsadmin -c** command from an operating system command prompt.
2. Obtain the object name of the running object with the following command:

```
$AdminControl
completeObjectName
name
```

where:

`$AdminControl`	is an object that enables the manipulation of MBeans running in a WebSphere server process
`completeObjectName`	is an $AdminControl command
name	is a fragment of the object name. It is used to find the matching object name. For example: `type=Server,name=serv1,*`. It can be any valid combination of domain and key properties. For example, type, name, cell, node, process, etc.

3. Issue the following command:

```
set s1 [$AdminControl
completeObjectName
type=Server,
name=server1,*]
```

where:

`set`	is a Jacl command
`s1`	is a variable name
`$AdminControl`	is an object that enables the manipulation of MBeans running in a WebSphere server process
`completeObjectName`	is an $AdminControl command
`type`	is the object name property key
Server	is the name of the object
`name`	is the object name property key
server1	is the name of the server where the operation will be invoked

4. Invoke the operation with the following command:

```
$AdminControl invoke
$s1 stop
```

where:

`$AdminControl`	is an object that enables the manipulation of MBeans running in a WebSphere server process
`invoke`	is an AdminControl command
`$s1`	is the ID of the server specified in step number 3
`stop`	is an attribute of invoke objects

The following example is for operations that require parameters:

```
set traceServ
[$AdminControl
completeObjectName
type=TraceService,
process=server1,*]
$AdminControl
invoke $traceServ
appendTraceString
"com.ibm.ws.management.
*=all=enabled"
```

Modifying attributes on running objects with the wsadmin tool

1. Invoke the AdminContol object commands interactively, in a script, or use the **wsadmin -c** command from an operating system command prompt.
2. Obtain the name of the running object with the following command:

   ```
   $AdminControl
   completeObjectName
   name
   ```

   where:

`$AdminControl`	is an object that enables the manipulation of MBeans running in a WebSphere server process
`completeObjectName`	is an AdminControl command
name	is a fragment of the object name. It is used to find the matching object name. For example: `type=Server,name=serv1,*`. It can be any valid combination of domain and key properties. For example, type, name, cell, node, process, etc.

3. Issue the following command:

   ```
   set ts1 [$AdminControl
   completeObjectName
   name]
   ```

   where:

`set`	is a Jacl command
`ts1`	is a variable name
`$AdminControl`	is an object that enables the manipulation of MBeans running in a WebSphere server process
`completeObjectName`	is an $AdminControl command
name	is a fragment of the object name. It is used to find the matching object name. For example: `type=Server,name=serv1,*`. It can be any valid combination of domain and key properties. For example, type, name, cell, node, process, etc.

4. Modify the running object with the following command:

   ```
   $AdminControl setAttribute
   $ts1 ringBufferSize 10
   ```

   where:

`$AdminControl`	is an object that enables the manipulation of MBeans running in a WebSphere server process

`setAttribute`	is an AdminControl command
`$ts1`	evaluates to the ID of the server specified in step number 3
`ringBufferSize`	is an attribute of modify objects
`10`	is the value of the ringBufferSize attribute

You can also modify multiple attribute name and value pairs, for example:

```
set ts1 [$AdminControl
completeObjectName
type=TraceService,
process=server1,*]
$AdminControl
setAttributes $ts1
{{ringBufferSize 10}
{traceSpecification
com.ibm.*
=all=disabled}}
```

The new attribute values are returned to the command line.

Related reference

"Example: Identifying running objects" on page 175

Example: Turning traces on and off in a server process with the wsadmin tool

Operation management examples with wsadmin

There are examples that illustrate how to manage running objects using wsadmin. Use these examples to identify running objects, modify them and invoke actions on them with the AdminControl object. Basic knowledge of the syntax for the Jacl scripting language is helpful in order to understand and modify the examples.

Example: Representing lists and javax.management.AttributeList objects with strings when scripting

Represent lists and javax.management.AttributeList objects using strings when scripting. These objects have different syntax conventions depending on the scripting language and whether the list or `AttributeList` object is input or output. The Java Management Extensions (JMX) Specification says the following about the Attribute and AttributeList classes:

- The Attribute class represents a single attribute-value pair
- The AttributeList class represents a list of attribute-value pairs

The Attribute and AttributeList objects are typically used for conveying the attribute values of an MBean, as the result of a getter operation, or as the argument of a setter operation.

Jacl

When using the Jacl interface, contruct lists using the standard Jacl list syntax. For example, a list of two attribute names might look like: `{passivationDirectory inactivePoolCleanupInterval}` On output, the wsadmin tool does not display the enclosing brackets, and you can manipulate the result as a Jacl list. An `AttributeList` object is represented by a Jacl lists. The outer, enclosing list represents the entire AttributeList class, and can have any number of interior lists. The interior lists each have a length of two, where the first element is the attribute name, and the second element is a string representation of the attribute value. For example, `{{passivationDirectory c:/temp}}` is an attribute list containing a single attribute name and value, and `{{traceSpecification com.ibm.*=all=enabled}`

{ringBufferSize 0}} contains two attributes. Enter input (in a script) string AttributeLists exactly like this. If the value of the attribute contains a space, then enclose the value in another set of curly braces, or in double quotes: {{passivationDirectory "c:/My Folder/temp"}} On output, the outer set of parenthesis does not display, which makes the output value a Jacl list that the script can easily manipulate.

Example: Identifying running objects

In the WebSphere Application Server, MBeans represent running objects. You can interrogate the MBean server to see the objects it contains. Use the AdminControl object to interact with running MBeans.

- Use the **queryNames** command to see running MBean objects. For example:

  ```
  $AdminControl
  queryNames *
  ```

  This command returns a list of all MBean types. Depending on the server to which your scripting client attaches, this list can contain MBeans that run on different servers:
  - If the client attaches to a stand-alone WebSphere Application Server, the list contains MBeans that run on that server.
  - If the client attaches to a node agent, the list contains MBeans that run in the node agent and MBeans that run on all application servers on that node.
  - If the client attaches to a deployment manager, the list contains MBeans that run in the deployment manager, all of the node agents communicating with that deployment manager, and all application servers on the nodes served by those node agents.
- The list that the queryNames command returns is a string representation of JMX ObjectName objects. For example:

  ```
  WebSphere:cell=
  MyCell,name=
  TraceService,
  mbeanIdentifier
  =TraceService,
  type=TraceService,
  node=MyNode,
  process=server1
  ```

  This example represents a TraceServer object that runs in *server1* on *MyNode*.
- The single queryNames argument represents the ObjectName object for which you are searching. The asterisk ("*") in the example means return all objects, but it is possible to be more specific. As shown in the example, ObjectName has two parts: a domain, and a list of key properties. For MBeans created by the WebSphere Application Server, the domain is WebSphere. If you do not specify a domain when you invoke queryNames, the scripting client assumes the domain is WebSphere. This means that the first example query above is equivalent to:

  ```
  $AdminControl
  queryNames
  WebSphere:*
  ```
- WebSphere Application Server includes the following key properties for the ObjectName object:
  - name
  - type
  - cell
  - node
  - process
  - mbeanIdentifier

These key properties are common. There are other key properties that exist. You can use any of these key properties to narrow the scope of the **queryNames** command. For example:

```
$AdminControl
queryNames
WebSphere:type=
Server,node=
myNode,*
```

This example returns a list of all MBeans that represent server objects running the node *myNode*. The, * at the end of the `ObjectName` object is a JMX wildcard designation. For example, if you enter the following:

```
$AdminControl
queryNames
WebSphere:type=
Server,node=
myNode
```

you get an empty list back because the argument to queryNames is not a wildcard. There is no Server MBean running that has exactly these key properties and no others.

- If you want to see all the MBeans representing applications running on a particular node, invoke the following example:

```
$AdminControl
queryNames
WebSphere:type=
Application,
node=myNode,*
```

Example: Dumping threads in a server process

Use the AdminControl object to dump the Java threads of a running server.

- For example, in Jacl:

```
set jvm [$AdminControl
completeObjectName
type=JVM,process=
server1,*]
$AdminControl invoke
$jvm dumpThreads
```

This example produces a Java core file. You can use this file for problem determination.

Example: Setting up profiles to make tracing easier when scripting

Set up a profile to make tracing easier. The following profile example turns tracing on and off:

```
proc ton {} {
  global
AdminControl
  set ts
[lindex
[$AdminControl
queryNames
type=TraceService,
*] 0]
  $AdminControl
setAttribute $ts
traceSpecification
com.ibm.=all=
enabled
}
```

```
proc toff {} {
  global
AdminControl
  set ts
[lindex
[$AdminControl
queryNames
type=TraceService,
*] 0]
  $AdminControl
setAttribute $ts
traceSpecification
com.ibm.*=all=
disabled
}

proc dt {} {
  global
AdminControl
  set jvm
[lindex
[$AdminControl
queryNames
type=JVM,*] 0]
  $AdminControl
invoke $jvm
dumpThreads
}
```

If you start the wsadmin tool with this profile, you can use the **ton** command to turn on tracing in the server, the **toff** command to turn off tracing, and the **dt** command to dump the Java threads. For more information about running scripting commands in a profile, see the Launching Scripting Clients article.

Related reference

"Wsadmin tool" on page 35

Example: Starting a server using wsadmin

The following example starts an application server with the node specified.

- The following command starts server1 in mynode node:

```
$AdminControl
startServer
server1 mynode
```

  Example output:

```
WASX7319I: The
serverStartup
SyncEnabled
attribute is
set to false.
A start
will be
attempted for
server "server1"
but the
configuration
information for
node "mynode"
may not be current.
WASX7262I:
```

```
Start completed
for server
"server1" on
node "mynode"
```

- The **startServer** command has several command syntax options. If you have Network Deployment installation, you have to use one of following:

```
$AdminControl
startServer
serverName
nodeName

$AdminControl
startServer
serverName
nodeName waitTime
```

- If you have an application server base installation, you can use the following syntax in addition to the previous syntax:

```
$AdminControl
startServer
serverName

$AdminControl
startServer
serverName
waitTime
```

Example: Stopping a server using wsadmin

The following example stops an application server with the node specified.

- The following command stops *server1* in node *mynode*.

```
$AdminControl stopServer
server1 mynode
```

Example output:

```
WASX7337I: Invoked
stop for server
"server1" Waiting
for stop completion.
WASX7264I: Stop
completed for
server "server1"
on node "mynode"
```

- The stop command has serveral command syntaxes.

If you have Network Deployment installation, use the one of following command syntax:

```
$AdminControl
stopServer server
Name nodeName

$AdminControl
stopServer
serverName
nodeName
immediate
```

If you have application server base installation, you can use the following syntax, in addition to the previous syntax:

```
$AdminControl
stopServer serverName

$AdminControl stopServer
serverName immediate
```

Example: Querying the server state using the wsadmin tool

The following example queries the server state.

- Identify the server and assign it to the server variable.

```
set server
[$AdminControl
completeObjectName
cell=mycell,node=
mynode,name=server1,
type=Server,*]
```

  This command returns the server MBean that matches the partial object name string.

  Example output:

```
WebSphere:cell=
mycell,name=server1,
mbeanIdentifier=
server.xml#Server_1,
type=Server,node=
mynode,process=
server1,processType=
ManagedProcess
```

- Query for the state attribute.

```
$AdminControl
getAttribute
$server state
```

  The **getAttribute** command returns the value of a single attribute.

  Example output:

```
STARTED
```

Example: Querying the product identification using wsadmin

The following example queries the product version information.

- Identify the server and assign it to the server variable.

```
set server
[$AdminControl
completeObjectName
type=Server,name=
server1,node=
mynode,*]
```

  Example output:

```
WebSphere:cell=
mycell,name=
server1,mbean
Identifier=server.
xml#Server_1,type=
Server,node=mynode,
process=server1,
processType=
ManagedProcess
```

- Query the server version. The product information is stored in the serverVersion attribute. The **getAttribute** command returns the attribute value of a single attribute, passing in the attribute name.

```
$AdminControl
getAttribute
$server1
serverVersion
```

Example output for a Network Deployment installation follows:

```
IBM WebSphere
Application
Server Version
Report
   --------------

Platform Information
   ----------

 Name: IBM WebSphere
Application Server
 Version: 5.0


Product Information
 ----------

  ID: BASE
  Name: IBM WebSphere
Application Server
  Build Date: 9/11/02
  Build Level: r0236.11
  Version: 5.0.0


 Product Information
 -----------

 ID: ND
 Name: IBM WebSphere
Application Server
for Network Deployment
 Build Date: 9/11/02
 Build Level: r0236.11
 Version: 5.0.0

   ---------------
   End Report
   ---------------
```

Example: Starting a listener port using wsadmin

The following example starts a listener port on an application server.

- Identify the listener port MBeans for the application server and assign it to the lPorts variable.

```
set lPorts [$AdminControl
queryNames type=Listener
Port,cell=mycell,node=
mynode,process=server1,*]
```

This command returns a list of listener port MBeans.

Example output:

```
WebSphere:cell=mycell,
name=ListenerPort,
mbeanIdentifier=server.
xml#ListenerPort_1,
type=ListenerPort,
node=mynode,process
=server1
WebSphere:cell=
mycell,name=listener
Port,mbeanIdentifier=
```

```
ListenerPort,type=
server.xml#Listener
Port_2,node=mynode,
process=server1
```

- Start the listener port if it is not started with the following example:

```
foreach lPort
$lPorts {
     set state
[$AdminControl
getAttribute
$lport started]
     if {$state
== "false"} {

$AdminControl
invoke $lPort
start
     }
  }
```

This piece of Jacl code loops through the listener port MBeans. For each listener port MBean, get the attribute value for the started attribute. If the attribute value is set to `false`, then start the listener port by invoking the start operation on the MBean.

Example: Testing data source connection using wsadmin to call a method on the MBean

The following example tests a dataSource, to ensure a connection to the database.

Note: 5.0.1 + While this method still works for Version 5.0.1, it might not work in future releases of the product.

- Identify the DataSourceCfgHelper MBean and assign it to the dshelper variable.

```
set dshelper
[$AdminControl
queryNames
type=DataSource
CfgHelper,
process=server1*,]
```

Example output:

```
WebSphere:cell=
mycell,name=
DataSourceCfgHelper,
mbeanIdentifier=
DataSourceCfgHelper,
type=DataSource
CfgHelper,node=
mynode,process=
server1
```

- Test the connection.

```
$AdminControl invoke
$dshelper test
ConnectionToData
Source "COM.ibm.
db2.jdbc.DB2XAData
Source db2admin
db2admin
{{databaseName
sample}}
c:/sqllib/java/
db2java.zip en US"
```

This example command invokes the testConnectionToDataSource operation on the MBean, passing in the classname, userid, password, database name, JDBC driver class path, language, and country.

Example output:

```
DSRA8025I:
Successfully
connected to
DataSource
```

5.0.1 + The Preferred Method

Instead of using the method *testConnectionToDataSource* , use the method *testConnection* and pass in the configuration ID of the data source.

```
set myds
[$AdminConfig
getid
"/JDBCProvider:
Sybase 12.0
JDBC Driver/
DataSource:
sybaseds/"]

$AdminControl
invoke
$dshelper
testConnection
$myds
```

To aid in making a batch program, the command returns a value instead of a message. A return value of **0** means success. A return value of **1 - n** means success, but with a number of warnings. If the process fails, you receive an exception message.

Example: Configuring transaction properties for a server using wsadmin

The following example configures the run-time transaction properties for an application server.

- Identify the transaction service MBean for the application server.

  ```
  set ts [$AdminControl
  completeObjectName
  cell=mycell,node=
  mynode,process=
  server1,type=
  TransactionService,*]
  ```

  This command returns the transaction service MBean for server1

  Example output:

  ```
  WebSphere:cell=
  mycell,name=
  TransactionService,
  mbeanIdentifier=
  TransactionService,
  type=Transaction
  Service,node=mynode,
  process=server1
  ```

- Modify the attributes. The following example is for the Windows operating system:

```
$AdminControl invoke
$ts {{transactionLog
Directory c:/WebSphere/
AppServer/tranlog/
server1} {client
InactivityTimeout 30}
{totalTranLifetime
Timeout 180}}
```

The clientInactivityTimeout is in seconds. The totalTranLifetimeTimeout is in milliseconds. A value of 0 in either attribute means no timeout limit.

Example: Starting a cluster using wsadmin

The following example starts a cluster:

- Identify the ClusterMgr MBean and assign it to the clusterMgr variable.

```
set clusterMgr
[$AdminControl
completeObject
Name cell=mycell,
type=ClusterMgr,*]
```

This command returns the ClusterMgr MBean.

Example output:

```
WebSphere:cell=
mycell,name=
ClusterMgr,
mbeanIdentifier=
ClusterMgr,type=
ClusterMgr,
process=dmgr
```

- Refresh the list of clusters.

```
$AdminControl
invoke $clusterMgr
retrieveClusters
```

This command calls the retrieveClusters operation on the ClusterMgr MBean.

- Identify the Cluster MBean and assign it to the cluster variable.

```
set cluster
[$AdminControl
completeObject
Name cell=mycell,
type=Cluster,
name=cluster1]
```

This command returns the Cluster MBean.

Example output:

```
WebSphere:cell=
mycell,name=
cluster1,mbean
Identifier=
Cluster,type=
Cluster,process=
cluster1
```

- Start the cluster.

```
$AdminControl
invoke $cluster
start
```

This command invokes the start operation on the Cluster MBean.

Example: Stopping a cluster using wsadmin

The following example stops a cluster:

- Identify the Cluster MBean and assign it to the cluster variable.

```
set cluster
[$AdminControl
completeObjectName
cell=mycell,
type=Cluster,
name=cluster1]
```

  This command returns the Cluster MBean.

  Example output:

```
WebSphere:cell=
mycell,name=
cluster1,mbean
Identifier=
Cluster,type=
Cluster,process=
cluster1
```

- Stop the cluster.

```
$AdminControl
invoke $cluster
stop
```

  This command invokes the stop operation on the Cluster MBean.

Example: Querying cluster state using wsadmin

The following example queries the state of the cluster:

- Identify the Cluster MBean and assign it to the cluster variable.

```
set cluster
[$AdminControl
completeObjectName
cell=mycell,type=
Cluster,name=
cluster1]
```

  This command returns the Cluster MBean.

  Example output:

```
WebSphere:cell=
mycell,name=
cluster1,mbean
Identifier=
Cluster,type=
Cluster,process=
cluster1
```

- Query the cluster state.

```
$AdminControl
getAttribute
$cluster state
```

  This command returns the value of the run-time state attribute.

Example: Listing running applications on running servers using wsadmin

The following example lists all the running applications on all the running servers on each node of each cell.

- Provide this example as a Jacl script file and run it with the ″-f″ option:

```
1  #-------------------------------------------------------------
2  # lines 4 and 5 find all the cell and process them one at a time
3  #-------------------------------------------------------------
4  set cells [$AdminConfig list Cell]
5  foreach cell $cells {
6     #-----------------------------------------------------------------------
7     # lines 10 and 11 find all the nodes belonging to the cell and
8     # process them at a time
9     #-----------------------------------------------------------------------
10    set nodes [$AdminConfig list Node $cell]
11    foreach node $nodes {
12       #---------------------------------------------------------------
13       # lines 16-20 find all the running servers belonging to the cell
14       # and node, and process them one at a time
15       #---------------------------------------------------------------
16       set cname [$AdminConfig showAttribute $cell name]
17       set nname [$AdminConfig showAttribute $node name]
18       set servs [$AdminControl queryNames type=Server,cell=$cname,node=$nname,*]
19       puts "Number of running servers on node $nname: [llength $servs]"
20       foreach server $servs {
21           #-----------------------------------------------------------
22           # lines 25-31 get some attributes from the server to display;
23           # invoke an operation on the server JVM to display a property.
24           #-----------------------------------------------------------
25           set sname [$AdminControl getAttribute $server name]
26           set ptype [$AdminControl getAttribute $server processType]
27           set pid   [$AdminControl getAttribute $server pid]
28           set state [$AdminControl getAttribute $server state]
29           set jvm [$AdminControl queryNames type=JVM,cell=$cname,node=$nname,
process=$sname,*]
30           set osname [$AdminControl invoke $jvm getProperty os.name]
31           puts "  $sname ($ptype) has pid $pid; state: $state; on $osname"
32
j3           #-----------------------------------------------------------
34           # line 37-42 find the applications running on this server and
35           # display the application name.
35           #-----------------------------------------------------------
37           set apps [$AdminControl queryNames type=Application,cell=$cname,
node=$nname,process=$sname,*]
38           puts "  Number of applications running on $sname: [llength $apps]"
39           foreach app $apps {
40              set aname [$AdminControl getAttribute $app name]
41              puts "    $aname"
42           }
43           puts "-----------------------------------------------------"
44           puts ""
45
46        }
47     }
48  }
```

- Example output:

```
Number of running servers on node mynode: 2
    mynode (NodeAgent) has pid 3592; state: STARTED; on Windows 2000
    Number of applications running on mynode: 0
  -----------------------------------------------------

    server1 (ManagedProcess) has pid 3972; state: STARTED; on Windows 2000
    Number of applications running on server1: 0
  -----------------------------------------------------

  Number of running servers on node mynodeManager: 1
    dmgr (DeploymentManager) has pid 3308; state: STARTED; on Windows 2000
    Number of applications running on dmgr: 2
      adminconsole
      filetransfer
  -----------------------------------------------------
```

Example: Starting an application using wsadmin

The following example starts an application:

- Identify the application manager MBean for the server where the application resides and assign it the appManager variable.

```
 set appManager
[$AdminControl
queryNames cell=
mycell,node=
mynode,type=
Application
Manager,process=
server1,*]
```

  This command returns the application manager MBean.

  Example output:

```
WebSphere:cell=
mycell,name=
ApplicationManager,
mbeanIdentifier=
ApplicationManager,
type=Application
Manager,node=
mynode,process=
server1
```

- Start the application.

```
$AdminControl
invoke $appManager
startApplication
myApplication
```

  This command invokes the startApplication operation on the MBean, passing in the application name to start.

Example: Stopping running applications on a server using wsadmin

The following example stops all running applications on a server:

- Identify the application manager MBean for the server where the application resides, and assign it to the appManager variable.

```
set appManager
[$AdminControl
queryNames cell=
mycell,node=
mynode,type=
Application
Manager,process=
server1,*]
```

  This command returns the application manager MBean.

  Example output:

```
WebSphere:cell=
mycell,name=
ApplicationManager,
mbeanIdentifier=
ApplicationManager,
type=Application
Manager,node=
mynode,process=
server1
```

- Query the running applications belonging to this server and assign the result to the apps variable.

```
set apps
[$AdminControl
queryNames cell=
mycell,node=
mynode,type=
Application,
process=server1,*]
```

  This command returns a list of application MBeans.

  Example output:

```
WebSphere:cell=
mycell,name=
adminconsole,
mbeanIdentifier=
deployment.xml#
Application
Deployment_1,
type=Application,
node=mynode,
Server=server1,
process=server1,
J2EEName=adminconsole
WebSphere:cell=
mycell,name=
filetransfer,
mbeanIdentifier=
deployment.xml#
Application
Deployment_1,
type=Application,
node=mynode,Server=
server1,process=
server1,J2EEName=
filetransfer
```

- Stop all the running applications.

```
foreach app
$apps {
     set
appName
[$AdminControl
getAttribute
$app name]
     $AdminControl
invoke $appManager
stopApplication
$appName
  }
```

  This command stops all the running applications by invoking the stopApplication operation on the MBean, passing in the application name to stop.

Example: Querying application state using wsadmin

The following examples queries for the presence of Application MBean to find out whether the application is running.

```
$AdminControl
completeObjectName
type=Application,
name=myApplication,*
```

If myApplication is running, then there should be an MBean created for it. Otherwise, the command returns nothing. If myApplication is running, the following is the example output:

```
WebSphere:cell=
mycell,name=
myApplication,
mbeanIdentifier=cells
/mycell/applications/
myApplication.ear/
deployments/
myApplication/
deployment.xml#
ApplicationDeployment_1,
type=Application,node=
mynode,Server=dmgr,
process=dmgr,
J2EEName=myApplication
```

Example: Updating the Web server plug-in configuration files using wsadmin

This examples regenerates the web serer plugin configuration file.

- Identify the web server plugin configuraiton file generator MBean and assign it to the pluginGen variable.

  ```
  set pluginGen
  [$AdminControl
  completeObjectName
  type=PluginCfg
  Generator,*]
  ```

  Example output:

  ```
  WebSphere:cell=
  pongoNetwork,
  name=PluginCfg
  Generator,mbean
  Identifier=
  PluginCfgGenerator,
  type=PluginCfg
  Generator,node=
  pongoManager,
  process=dmgr
  ```

- Generate the updated plugin configuration file.

  ```
  $AdminControl
  invoke $pluginGen
  generate
  "c:/WebSphere/
  DeploymentManager
  c:/WebSphere/
  DeploymentManager
  /config mycell
  null null
  plugin-cfg.xml"
  ```

  This example command assumes a Windows system install. It invokes the generate operation on the MBean, passing in the install root directory, configuration root directory, cell name, node name, server name, and output file name. To pass in null as the value of an argument, enter null as given in the example. This is provided for operation that allows null as the value of its argument and processes null differently from an empty string. In this example, both node and server are set to null. The generate operation generates plugin configuration for all the nodes and servers resided in the cell. The output file plugin-cfg.xml is created in the config root directory.

You can modify this example command to generate plugin configuration for a particular node or server by specifying the node and server names.

Managing applications with scripting

Application management scripts use the AdminApp object to manage applications in the application server configuration. You can use the AdminApp object to install and uninstall applications, list installed applications, edit application configurations and obtain help. It is important to save application configuration changes because the application configuration information is part of the server configuration.

1. Decide how you want to execute the script. If you want to run the script immediately from the command line, enter it surrounded by quotes as a parameter to the **wsadmin -c** command. To save the script for repeated use, compose it in a file and execute it with the **wsadmin -f** command. If you want to compose and run the script interactively, issue the **wsadmin** command without the -c or -f flags. For more information about executing scripts, see Launching scripting clients.
2. Write an AdminApp script command statement to perform a task, for example:
   `$AdminApp command`
3. Save the configuration changes with the following command: `$AdminConfig save` Use the **reset** command of the AdminConfig object to undo changes that you made to your workspace since your last save.

Related concepts

"Jacl" on page 38

Related reference

"AdminApp object for scripted administration" on page 50

Installing applications with the wsadmin tool

Steps for using the AdminApp object commands to install an application into the run time follow:

1. Invoke the AdminApp object commands interactively, in a script, or use the **wsadmin -c** command from an operating system command prompt.
2. Issue one of the following commands:

   The following command uses the EAR file and the command option information to install the application:

```
$AdminApp install
c:/MyStuff/
application1.ear
{-server serv2}
```

   where:

`$AdminApp`	is an object allowing application objects to be managed
`install`	is an AdminApp command
c:/MyStuff/application1.ear	is the name of the application to install
`server`	is an installation option
serv2	is the value of the server option

The following command changes the application information by prompting you through a series of installation tasks:

```
$AdminApp installInteractive
c:/MyStuff/application1.ear
```

where:

`$AdminApp`	is an object allowing application objects to be managed
`installInteractive`	is an AdminApp command
c:/MyStuff/application1.ear	is the name of the application to install

In a Network Deployment environment only, the following command uses the EAR file and the command option information to install the application on a cluster:

```
$AdminApp install
c:/MyStuff/application1.
ear {-cluster
cluster1}
```

where:

`$AdminApp`	is an object allowing application objects to be managed
`install`	is an AdminApp command
c:/MyStuff/application1.ear	is the name of the application to install
`cluster`	is an installation option
cluster1	is the value of the server option

3. Save the configuration changes with the following command: `$AdminConfig save` Use the **reset** command of the AdminConfig object to undo changes that you made to your workspace since your last save.

Related reference

"Example: Identifying supported tasks and options for an Enterprise Archive file" on page 199

"Example: Obtaining task information while installing applications" on page 198

"Example: Listing the modules in an installed application" on page 193

Installing stand-alone java archive and web archive files with wsadmin

Use the AdminApp object commands to install java archive (JAR) and web archive (WAR) files. The archive must end in `.jar` or `.war` for the wsadmin tool to be able to install. The wsadmin tool uses these extensions to figure out the archive type.

1. Invoke the AdminApp object commands interactively, in a script, or use wsadmin `-c` from an operating system command prompt.
2. Issue one of the following commands:

   The following command uses the EAR file and the command option information to install the application:

```
$AdminApp install
c:/MyStuff/m
ymodule1.jar
{-server serv2}
```

where:

`$AdminApp`	is an object allowing application objects to be managed
`install`	is an AdminApp command
c:/MyStuff/mymodule1.jar	is the name of the application that will be installed
`server`	is an installation option
serv2	is the value of the server option

The following command allows you to change the application information by prompting you through a series of installation tasks:

```
$AdminApp installInteractive
c:/MyStuff/mymodule1.jar
```

where:

`$AdminApp`	is an object allowing application objects to be managed
`installInteractive`	is an $AdminApp command
c:/MyStuff/mymodule1.jar	is the name of the application that will be installed

3. Save the configuration changes with the following command: `$AdminConfig save` Use the `reset` command of the AdminConfig object to undo changes that you made to your workspace since your last save.

Listing applications with the wsadmin tool

Use the AdminApp object commands to create a list of installed applications.

1. Invoke the AdminApp object commands interactively, in a script, or use the **wsadmin -c** command from an operating system command prompt.
2. Query the configuration and create a list, by issuing the following command:

```
$AdminApp list
```

where:

`$AdminApp`	is an object allowing application objects management
`list`	is an AdminApp command

The following is example output:

```
DefaultApplication
SampleApp
app1serv2
```

Related reference

"AdminApp object for scripted administration" on page 50

Editing application configurations with the wsadmin tool

1. Invoke the AdminApp object commands interactively, in a script, or use the **wsadmin -c** command from an operating system command prompt.
2. Issue one of the following commands:

   The following command uses the installed application and the command option information to edit the application:

   ```
   $AdminApp edit
   app1 {options}
   ```

   where:

`$AdminApp`	is an object allowing application objects management
`edit`	is an AdminApp command
app1	is the name of the application to edit
`{options}`	is a list of edit options and tasks similar to the ones for the install command

   The following command changes the application information by prompting you through a series of editing tasks:

   ```
   $AdminApp editInteractive
   app1
   ```

   where:

`$AdminApp`	is an object allowing application objects management
`editInteractive`	is an AdminApp command
app1	is the name of the application to edit

3. Save the configuration changes with the following command: `$AdminConfig save` Use the **reset** command of the AdminConfig object to undo changes that you made to your workspace since your last save.

Uninstalling applications with the wsadmin tool

1. Invoke the AdminApp object commands interactively, in a script, or use the **wsadmin -c** command from an operating system command prompt.
2. Issue the following command:

   ```
   $AdminApp uninstall
   application1
   ```

   where:

`$AdminApp`	is an object supporting application objects management
`uninstall`	is an AdminApp command
application1	is the name of the application to uninstall

   Note: Specify the name of the application you want to uninstall, not the name of the Enterprise ARchive (EAR) file.

3. Save the configuration changes with the following command: `$AdminConfig save` Use the **reset** command of the AdminConfig object to undo changes that you made to your workspace since your last save.

Uninstalling an application removes it from the WebSphere Application Server configuration and from all the servers that the application was installed on. The application binaries (EAR file contents) are deleted from the installation directory. This occurs when the configuration is saved for single server WebSphere Application Server editions or when the configuration changes are synchronized from deployment manager to the individual nodes for network deployment configurations.

Application management examples with wsadmin

There are examples that illustrate how to manage applications using wsadmin. Use these examples to see how to install, identify, configure and deinstall applications and application modules with the AdminApp object. Basic knowledge of the syntax for the Jacl scripting language is helpful in order to understand and modify the examples.

Example: Listing the modules in an installed application

Use the AdminApp object **listModules** command to list the modules in an installed application. For example, invoke the following command interactively in a script, or use wsadmin `-c` from an operating system command prompt:

```
$AdminApp listModules
DefaultApplication
-server
```

This example produces the following output:

```
wsadmin>$AdminApp
listModules
DefaultApplication
-server
DefaultApplication#
IncCMP11.jar+META-
INF/ejb-jar.xml#
WebSphere:cell=
mycell,node=mynode,
server=myserver
DefaultApplication#
DefaultWebApplication.
war+WEB-INF/web.xml#
WebSphere:cell=
mycell,node=mynode,
server=myserver
```

Example: Listing the modules in an application server: The following example lists all modules on all enterprise applications installed on `server1` in `node1`:

Note: * means that the module is installed on server1 node node1 and other node and/or server.

\+ means that the module is installed on server1 node node1 only means that the module is not installed on server1 node node1.

```
 1  #--------------------
       2  # setting
up variables to keep
server name and node name
       3  #--------------
       4  set
```

```
serverName  server1
       5  set
nodeName  node1
       6  #--------------
       7  # setting up
2 global lists to keep
the modules
       8  #--------------
       9  set  ejbList {}
      10 set webList {}
11
12 #--------------------
13 # gets all deployment
objects and assigned it
to deployments variable
14 #-------------------
15 set deployments
[$AdminConfig getid
/Deployment:/]
16
17 #--------------------
18 # lines 22 thru 148
Iterates through all the
deployment objects to
get the modules
19 # and perform
filtering to list
application that has
at least one module
installed
20 # in server1 in
node myNode
21 #-------------------
22 foreach deployment
$deployments {
23
24     # ---------------
25     # reset the lists
that hold modules for
each application
26     #--------------
27     set webList {}
28     set ejbList {}
29
30     #--------------
31     # get the
application name
32     #---------------
33     set appName [lindex
[split $deployment (] 0]
34
35     #---------------
36     # get the
deployedObjects
37     #---------------
38     set depObject
[$AdminConfig showAttribute
$deployment deployedObject]
39
40     #------------------
41     # get all modules
in the application
42     #-------------------
43     set modules [lindex
[$AdminConfig showAttribute
$depObject modules] 0]
44
```

```
45     #-------------------
46     # initialize lists
to save all the modules in
the appropriate list to
where they belong
47     #--------------------
48     set
modServerMatch {}
49     set modServer
MoreMatch {}
50     set modServer
NotMatch {}
51
52  #---------------
53         # lines 55 to 112
iterate through all modules
to get the targetMappings
54         #----------------
55         foreach module
$modules {
56             #------------
57             # setting up
some flag to do some
filtering and get modules
for server1 on node1
58             #-----------
59             set
sameNodeSameServer "false"
60            set
diffNodeSameServer "false"
61             set
sameNodeDiffServer "false"
62             set
diffNodeDiffServer "false"
63
64             #----------
65             # get the
targetMappings
66             #-----------
67             set targetMaps
[lindex [$AdminConfig
showAttribute $module
targetMappings] 0]
68
69             #-----------
70            # lines 72 to
111 iterate through all
targetMappings to get
the target
71             #------------
72             foreach
targetMap $targetMaps {
73                 #--------
74          # get the target
75                 #--------
76                 set target
[$AdminConfig showAttribute
$targetMap target]
77
78                 #---------
79          # do filtering to
skip ClusteredTargets
80                 #---------
81         set targetName
[lindex [split $target #] 1]
82         if {[regexp
"ClusteredTarget"
```

```
$targetName] != 1} {
83          set sName
[$AdminConfig showAttribute
$target name]
84          set nName
[$AdminConfig showAttribute
$target nodeName]
85
86         #--------------------------------------------
87         # do the server name match
88         #--------------------------------------------
89            if {$sName == $serverName} {
90            if {$nName == $nodeName} {
91             set sameNodeSameServer "true"
92                   } else {
93             set diffNodeSameServer "true"
94                         }
95                    } else {
96                #--------------------------------------
97                # do the node name match
98                #--------------------------------------
99                   if {$nName == $nodeName} {
100            set sameNodeDiffServer "true"
101                        } else {
102                            set diffNodeDiffServer "true"
103                        }
104                  }
105
106                 if {$sameNodeSameServer == "true"} {
107                     if {$sameNodeDiffServer == "true" || $diffNodeDiffServer == "true" || $diffN
108                         break
109                     }
110                 }
111            }
112     }
113
114     #--------------------------------------------
115     # put it in the appropriate list
116     #--------------------------------------------
117     if {$sameNodeSameServer == "true"} {
118         if {$diffNodeDiffServer == "true" || $diffNodeSameServer == "true" || $sameNodeDiffServe
119              set modServerMoreMatch [linsert $modServerMoreMatch end [$AdminConfig showAttribute
120          } else {
121              set modServerMatch [linsert $modServerMatch end [$AdminConfig showAttribute $module
122         }
123    } else {
124         set modServerNotMatch [linsert $modServerNotMatch end [$AdminConfig showAttribute $modu
125    }
126 }
127
128
129 #-----------------------------------------------------------------
130 # print the output with some notation as a mark
131 #-----------------------------------------------------------------
132 if {$modServerMatch != {} || $modServerMoreMatch != {}} {
133     puts stdout "\tApplication name: $appName"
 134 }
 135
 136 #---------------------------------------------------------
 137 # do grouping to appropriate module and print
 138 #---------------------------------------------------------
 139 if {$modServerMatch != {}} {
 140     filterAndPrint $modServerMatch "+"
 141 }
 142 if {$modServerMoreMatch != {}} {
 143     filterAndPrint $modServerMoreMatch "*"
 144 }
```

```
145  if {($modServerMatch != {} || $modServerMoreMatch != {}) "" $modServerNotMatch != {}} {
146      filterAndPrint $modServerNotMatch ""
147  }
148}
149
150
151  proc filterAndPrint {lists flag} {
152     global webList
153     global ejbList
154     set webExists "false"
155     set ejbExists "false"
156
157     #-------------------------------------------------------------------------------------
158     # If list already exists, flag it so as not to print the title more then once
159     # and reset the list
160     #-------------------------------------------------------------------------------------
161     if {$webList != {}} {
162         set webExists "true"
163         set webList {}
164     }
165     if {$ejbList != {}} {
166         set ejbExists "true"
167         set ejbList {}
168     }
169
170     #---------------------------------------------------------------------
171     # do some filtering for web modules and ejb modules
172     #---------------------------------------------------------------------
173     foreach list $lists {
174          set temp [lindex [split $list .] 1]
175          if {$temp == "war"} {
176               set webList [linsert $webList end $list]
177          } elseif {$temp == "jar"} {
178               set ejbList [linsert $ejbList end $list]
179          }
180     }
181
182     #---------------------------------------
183     # sort the list before printing
184     #---------------------------------------
185     set webList [lsort -dictionary $webList]
186     set ejbList [lsort -dictionary $ejbList]
187
188     #---------------------------------------------------------------
189     # print out all the web modules installed in server1
190     #---------------------------------------------------------------
191     if {$webList != {}} {
192         if {$webExists == "false"} {
193              puts stdout "\t\tWeb Modules:"
194         }
195         foreach web $webList {
196             puts stdout "\t\t\t$web  $flag"
197         }
198     }
199
200     #---------------------------------------------------------------
201     # print out all the ejb modules installed in server1
202     #---------------------------------------------------------------
203     if {$ejbList != {}} {
204          if {$ejbExists == "false"} {
205               puts stdout "\t\tEJB Modules:"
206          }
207          foreach ejb $ejbList {
208               puts stdout "\t\t\t$ejb  $flag"
209          }
210     }
211}
```

```
Example output for server1 on node node1:
       Application name: TEST1
                Web Modules:
                        mtcomps.war  *
                EJB Modules:
                        deplmtest.jar  +
        Application name: TEST2
                Web Modules:
                        mtcomps.war  +
                EJB Modules:
                        deplmtest.jar  +
        Application name: TEST3
                Web Modules:
                        mtcomps.war  *
                EJB Modules:
                        deplmtest.jar  *
        Application name: TEST4
                EJB Modules:
                        deplmtest.jar  *
                Web Modules:
                        mtcomps.war
```

Related reference

"Example: Listing the modules in an installed application" on page 193

Example: Obtaining task information while installing applications

The **installInteractive** command of the AdminApp object prompts you through a series of tasks when you install an application. You are presented with the title of the task, a description of the task, and the current contents of the task that you can modify.

- Use the **install** command instead of the **installInteractive** command, provide updates for each task, but you must provide all of the information on the command line. The task name specifies each task and the information you need to update the task. You can treat the task information as a two-dimensional array of string data. For example:

  ```
  -taskname {{item1a
  item2a item3a}
  {item1b item2b
  item3b} ...}
  ```

  This example is a linear representation of rows and columns, where `{item1a item2a item3a}` represents the first row, and each row for the task name has three columns.

  The number and type of the columns in this list depend on the task you specify.
- Obtain information about the data needed for each task using the **taskInfo** command of the AdminApp object. For example, there is a task called *MapWebModToVH* used to map Web modules to virtual hosts. To specify this task as part of the option string on the command line, enter the following:

  ```
  -MapWebModToVH
  {{"JavaMail Sample
  WebApp" mtcomps.war,
  WEB-INF/web.xml
  default_host}}
  ```

  Using the **taskInfo** command, you can see which of the items you can change for a task. Supply the columns for each row you modify, and the columns that you are not allowed to change must match one of the existing rows. In this case, `taskInfo` tells you that there are three items in each row, called *webModule*, *uri*, and *virtualHost* and the current column values for every row.

- Obtain help while creating complex installation commands, by using a feature of the **installInteractive** command. Install the application interactively once and specify the updates that you need. Then look for message WASX7278I in the output log for the wsadmin tool. You can cut and paste the data in this message into a script, and modify it. For example:

```
WASX7278I: Generated
command line:
install c:/websphere/
appserver/installableapps
/jmsample.ear
{-BindJndiForEJBNon
MessageBinding
{{deplmtest.jar
MailEJBObject
deplmtest.jar,
META-INF/ejb-jar.
xml ejb/JMSampEJB1 }}
-MapResRefToEJB {
{deplmtest.jar
MailEJBObject
deplmtest.jar,META
-INF/ejb-jar.xml
mail/MailSession9
javax.mail.Session
mail/DefaultMail
SessionX } {"JavaMail
Sample WebApp"
mtcomps.war,WEB-INF
/web.xml mail/
MailSession9
javax.mail.Session
mail/DefaultMail
SessionY }}
-MapWebModToVH
{{"JavaMail Sample
WebApp" mtcomps.war,
WEB-INF/web.xml
newhost }}
-nopreCompileJSPs
-novalidateApp
-installed.ear.
destination
c:/mylocation
-distributeApp
-nouseMetaData
FromBinary}
```

Example: Identifying supported tasks and options for an Enterprise Archive file

The AdminApp object **install** command takes a set of options and tasks. The following examples use the AdminApp object to obtain a list of supported tasks and options for an Enterprise Archive (EAR) file:

- To identify supported options and tasks, use the AdminApp object **options** command:

```
$AdminApp options
c:/MyStuff/
myapp1.ear
```

  This command displays a list of tasks and options.
- To identify supported options only, use the following command:

```
$AdminApp options
```

- To learn more about any of the tasks or options, use the AdminApp object **help** command. For example:

```
$AdminApp help
deployejb
```

Example: Configuring applications for enterprise bean modules using the wsadmin tool

You can use the AdminApp object to set configurations in an application. Some configuration settings are not available through the AdminApp object. This example uses the AdminConfig object to configure enterprise bean modules for all the JARs in the application.

- Get the deployment object for the application and assign it to the deployments variable:

```
set deployments
[$AdminConfig getid
/Deployment:myApp/]
```

  Example output:

```
myApp(cells/mycell/
applications/
myApp.ear/deployments/
myApp:deployment.xml#
Deployment_1)
```

- Get all the modules in the application and assign it to the modules variable:

```
set deploymentObject
[$AdminConfig
showAttribute
$deployments
deployedObject]
set modules [lindex
[$AdminConfig
showAttribute
$deploymentObject
modules] 0]
```

  Example output:

```
(cells/mycell/
applications/
myApp.ear/deployments
/myApp:deployment.xml#
WebModuleDeployment_1)
(cells/mycell/
applications/myApp.ear/
deployments/myApp:
deployment.xml#
EJBModuleDeployment_1)
(cells/mycell/
applications/myApp.ear/
deployments/myApp:
deployment.xml#
EJBModuleDeployment_2)
```

- Create an enterprise bean module configuration object for each JAR and set the timeout attribute:

```
  foreach module
$modules {
     if ([regexp
EJBModuleDeployment
$module] == 1} {
        $AdminConfig
create EJBModule
Configuration $module
{{name myejbModuleConfig}
{description "EJB Module
Config post created"}
```

```
{enterpriseBeanConfigs:
StatefulSessionBeanConfig
{{{ejbName myejb}
{timeout 10000}}}}}
     }
  }
```

You can modify this example to set other attributes for the enterprise bean module configuration.

Example output:

```
myejbModuleConfig(cells/
mycell/applications/
myApp.ear/deployments/
myApp:deployment.xml#
EJBModuleConfiguration_1)
```

- Save the changes with the following command:

```
$AdminConfig save
```

Example: Configuring applications for session management using the wsadmin tool

You can use the AdminApp object to set configurations in an application. Some configuration settings are not available through the AdminApp object. This example uses the AdminConfig object to configure session manager for the application.

- Identify the deployment configuration object for the application and assign it to the deployment variable:

```
set deployment
[$AdminConfig
getid /Deployment:
myApp/]
```

Example output:

```
myApp(cells/mycell/
applications/myApp.
ear/deployments/
myApp:deployment.
xml#Deployment_1)
```

- Retrieve the applicaton deployment and assign it to the appDeploy variable:

```
set appDeploy
[$AdminConfig
showAttribute
$deployment
deployedObject]
```

Example output:

```
(cells/mycell/
applications/
myApp.ear/
deployments/
myApp:deployment.
xml#Application
Deployment_1)
```

- To obtain a list of attributes you can set for session manager, use the attributes command:

```
$AdminConfig
attributes
SessionManager
```

Example output:

```
"accessSession
OnTimeout Boolean"
"allowSerialized
SessionAccess
Boolean"
"context
ServiceContext@"
"defaultCookie
Settings Cookie"
"enable Boolean"
"enableCookies
Boolean"
"enableProtocol
SwitchRewriting
Boolean"
"enableSSL
Tracking Boolean"
"enableSecurity
Integration
Boolean"
"enableUrl
Rewriting Boolean"
"maxWaitTime
Integer"
"properties
Property(Typed
Property)*"
"sessionDRS
Persistence
DRSSettings"
"sessionDatabase
Persistence
SessionDatabase
Persistence"
"sessionPersistence
Mode ENUM(DATABASE,
DATA_REPLICATION,
NONE)"
"tuningParams
TuningParams"
```

- Set up the attributes for the session manager:

```
set attr1
[list enable
Security
Integration true]
set attr2
[list
maxWaitTime 30]
set attr3
[list session
Persistence
Mode NONE]
set attrs
[list $attr1
$attr2 $attr3]
set sessionMgr
[list session
Management $attrs]
```

  This example sets three top level attributes in the session manager. You can modify the example to set other attributes of session manager including the nested attributes in Cookie, DRSSettings, SessionDataPersistence, and TuningParms object types. To list the attributes for those object types, use the attribute command in AdminConfig object.

Example output:

```
sessionManagement
{{enableSecurity
Integration true}
{maxWaitTime 30}
{sessionPersistence
Mode NONE}}
```

- Create the session manager for the application:

```
$AdminConfig create
ApplicationConfig
$appDeploy [list
$sessionMgr]
```

Example output:

```
(cells/mycell/
applications/
myApp.ear/
deployments/
myApp:deployment.
xml#Application
Config_1)
```

- Save the changes with the following command:

```
$AdminConfig save
```

-

Example: Configuring applications for session management in Web modules using the wsadmin tool

You can use the AdminApp object to set configurations in an application. Some configuration settings are not available through the AdminApp object. This example uses the AdminConfig object to configure session manager for Web module in the application.

- Identify the deployment configuration object for the application and assign it to the deployment variable:

```
set deployment
[$AdminConfig getid
/Deployment:myApp/]
```

Example output:

```
myApp(cells/mycell/
applications/myApp.
ear/deployments/
myApp:deployment.
xml#Deployment_1)
```

- Get all the modules in the application and assign it to the modules variable:

```
set appDeploy
[$AdminConfig
showAttribute
$deployments
deployedObject]
set modules
[lindex
[$AdminConfig
showAttribute
$appDeploy
modules] 0]
```

Example output:

```
(cells/mycell/
applications/
myApp.ear/
```

```
deployments/
myApp:deployment.
xml#WebModule
Deployment_1)
(cells/mycell/
applications/
myApp.ear/
deployments/
myApp:deployment.
xml#EJBModule
Deployment_1)
(cells/mycell/
applications/
myApp.ear/
deployments/
myApp:deployment.
xml#WebModule
Deployment_2)
```

- To obtain a list of attributes you can set for session manager, use the attributes command.:

  ```
  $AdminConfig
  attributes
  SessionManager
  ```

  Example output:

  ```
  "accessSession
  OnTimeout Boolean"
  "allowSerialized
  SessionAccess Boolean"
  "context
  ServiceContext@"
  "defaultCookie
  Settings Cookie"
  "enable Boolean"
  "enableCookies
  Boolean"
  "enableProtocol
  SwitchRewriting
  Boolean"
  "enableSSL
  Tracking Boolean"
  "enableSecurity
  Integration Boolean"
  "enableUrl
  Rewriting Boolean"
  "maxWaitTime
  Integer"
  "properties
  Property
  (TypedProperty)*"
  "sessionDRS
  Persistence
  DRSSettings"
  "sessionDatabase
  Persistence
  SessionDatabase
  Persistence"
  "sessionPersistence
  Mode ENUM(DATABASE,
  DATA_REPLICATION, NONE)"
  "tuningParams
  TuningParams"
  ```

- Set up the attributes for session manager:

```
set attr1 [list
enableSecurity
Integration true]
set attr2 [list
maxWaitTime 30]
set attr3 [list
sessionPersistence
Mode NONE]
set attr4 [list
enabled true]
set attrs [list
$attr1 $attr2
$attr3 $attr4]
set sessionMgr
[list session
Management $attrs]
```

This example sets four top level attributes in the session manager. You can modify the example to set other attributes in the seesion manager including the nested attributes in Cookie, DRSSettings, SessionDataPersistence, and TuningParms object types. To list the attributes for those object types, use the attribute command in AdminConfig object.

Example output:

```
sessionManagement
{{enableSecurity
Integration true}
{maxWaitTime 30}
{sessionPersistence
Mode NONE}
{enabled true}}
```

- Set up the attributes for Web module:

```
set nameAttr
[list name
myWebModuleConfig]
set descAttr
[list description
"Web Module
config post create"]
set webAttrs
[list $nameAttr
$descAttr $sessionMgr]
```

Example output:

```
{name myWebModule
Config} {description
{Web Module
config post create}}
{sessionManagement
{{enableSecurity
Integration true}
{maxWaitTime 30}
{sessionPersistence
Mode NONE}
{enabled true}}}
```

- Create the session manager for each Web module in the application:

```
foreach module
$modules {
     if ([regexp
WebModuleDeployment
$module] == 1} {
        $AdminConfig
create WebModule
```

```
Config $module
$webAttrs
     }
  }
```

You can modify this example to set other attributes of session manager in Web module configuration.

Example output:

```
myWebModuleConfig
(cells/mycell/
applications/
myApp.ear/deployments
/myApp:deployment.xml
#WebModuleConfiguration_1)
```

- Save the changes with the following command:

```
$AdminConfig save
```

-

Example: Exporting applications using the wsadmin tool

Exporting applications enables you to back them up and preserve their binding information. You can export your applications before you update installed applications or before you migrate to a different version of the WebSphere Application Server product.

- Export an enterprise application to a location of your choice, for example:

```
$AdminApp export
app1
C:/mystuff/
exported.ear
```

where *app1* is the name of the application that will be exported and *C:/mystuff/exported.ear* is the name of the file where the exported application will be stored.

- Export Data Definition Language (DDL) files in the enterprise bean module of an application to a destination directory, for example:

```
$AdminApp exportDDL
app1
C:/mystuff
```

where *app1* is the name of the application whose DDL files will be exported and *C:/mystuff* is the name of the directory where the DDL files export from the application.

Example: Configuring a shared library for an application

You can use the AdminApp object to set certain configurations in the application. This example uses the AdminConfig object to configure a shared library for an application.

- Identify the shared library and assign it to the library variable.
  - To create a new shared library, perform the following steps:
    1. Idenitfy the node and assign it to a variable, for example:

```
set node
[$AdminConfig
getid /Cell:
mycell/Node:
mynode/]
```

Example output:

```
mynode(cells/
mycell/nodes/
mynode:node.
xml#Node_1)
```

2. Create the shared library in the node, for example:

```
set library
[$AdminConfig
create Library
$node {{name
mySharedLibrary}
{classPath
c:/mySharedLibrary
Classpath}}]
```

Example output:

```
MySharedLibrary
(cells/mycell/
nodes/mynode:
libraries.xml#
Library_1)
```

This example creates a new shared library in the node scope. You can modify it to use the cell or server scope.

– To use an existing shared library, issue the following command:

```
set library
[$AdminConfig
getid /Library:
mySharedLibrary/]
```

Example output:

```
MySharedLibrary
(cells/mycell/
nodes/mynode:
libraries.xml#
Library_1)
```

- Identify the deployment configuration object for the application and assign it to the deployment variable:

```
set deployment
[$AdminConfig
getid /Deployment:
myApp/]
```

Example output:

```
myApp(cells/
mycell/
applications/
myApp.ear/
deployments/
myApp:deployment.
xml#Deployment_1)
```

- Retrieve the applicaton deployment and assign it to the appDeploy variable:

```
set appDeploy
[$AdminConfig
showAttribute
$deployment
deployedObject]
```

Example output:

```
(cells/mycell/
applications/
myApp.ear/
```

```
deployments/
myApp:deployment.
xml#Application
Deployment_1)
```

- Idenitfy the class loader in the application deployment and assign it to the classLoader variable:

```
set classLoader
[$AdminConfig
showAttribute
$appDeploy
classloader]
```

Example output:

```
(cells/mycell/
applications/
myApp.ear/
deployments/
myApp:deployment.
xml#Classloader_1)
```

- Associate the shared library in the application through the class loader:

```
$AdminConfig create
LibraryRef
$classLoader
{{libraryName
MyshareLibrary}
{sharedClassloader
true}}
```

Example output:

```
(cells/mycell/
applications/
myApp.ear/
deployments/
myApp:deployment.
xml#LibraryRef_1)
```

- Save the changes:

```
$AdminConfig save
```

wsadmin scripting environment

The wsadmin tool contains facilities so that you can manage and customize the scripting environment. You can make temporary alterations to the scripting environment with the following wsadmin command options:

- `-profile` - Use this option to run one or more script files after you start the scripting tool.

  Profile files are wsadmin scripts that initialize variables and define functions for the mainline scripts executed with the wsadmin tool. You can specify multiple profile options. They are executed in the order listed.
- `-p` - Use this option to specify scripting properties defined in a file.

  Edit one or more properties files to make more persistent alterations to the scripting environment. The wsadmin tool loads the following levels of properties files:
  - The properties in the `$WAS_ROOT/properties/wsadmin.properties` file.
  - The properties in the `$user_home/wsadmin.properties` file.
  - The properties indicated by the `WSADMIN_PROPERTIES` file.
  - Any properties files specified on the command line.

The properties files load in this order. The properties file loaded last takes precedence over the one loaded before it.

The properties files include specifications for the connection type, the port and host used when attempting a connection, the location where trace and logging output are directed, the temporary directory to access files while installing applications and modules, class path information to append to the list of paths to search for classes and resources, and so on.

- `-wsadmin_classpath` - Use this option to add class path information to the wsadmin class path.
- `-conntype` - Use this option to specify the type of connection between the scripting client and the server.

Related concepts

"Jacl" on page 38

wsadmin traces

The default properties file, `wsadmin.properties`, specifies that the tracing and logging information goes to the `wsadmin.traceout` file in the WebSphere `logs` directory.

It is recommended that trace output go to this or some other file. In the event of a script problem, you can examine this file for errors, or foward the file to IBM Support if necessary. The wsadmin tool also creates a log entry for each command you issue interactively or with the `-c` option, and logs the script names that the `-f` option invokes. If the `com.ibm.ws.scripting.traceString` property is set in the properties file, diagnostic information also logs to this file. If the `com.ibm.ws.scripting.traceFile` property is not set in the properties file, this information goes to the console. You can turn on traces of the WebSphere Application Server code running inside the scripting process by either specifying the `com.ibm.ws.scripting.traceString` property, or by using the AdminControl object trace method. If IBM Support personnel direct you to turn on such a trace, the output also goes to the file specified by the `com.ibm.ws.scripting.traceFile` property, or to the console, if that property is not in effect. You should use the trace command and the traceString property for setting up client traces only.

Tracing operations with the wsadmin tool

1. Invoke the AdminControl object commands interactively, in a script, or use the **wsadmin -c** command from an operating system command prompt.
2. Enable tracing with the following command:

```
$AdminControl trace
com.ibm.*=all=enabled
```

where:

`$AdminControl`	is an object that enables the manipulation of MBeans running in a WebSphere server process
`trace`	is an AdminControl command
`com.ibm.*=all=enabled`	indicates to turn on tracing

The following command disables tracing:

```
$AdminControl trace
com.ibm.*=all=disabled
```

where:

`$AdminControl`	is an object that enables the manipulation of MBeans running in a WebSphere server process
`trace`	is an AdminControl command
`com.ibm.*=all=disabled`	indicates to turn off tracing

The trace command changes the trace settings for the current session. You can change this setting persistently by editting the `wsadmin.properties` file. The property `com.ibm.ws.scripting.traceString` is read by the launcher during initialization. If it has a value, the value is used to set the trace.

A related property, `com.ibm.ws.scripting.traceFile`, designates a file to receive all trace and logging information. The `wsadmin.properties` file contains a value for this property. Run the wsadmin tool with a value set for this property. It is possible to run without this property set, where all logging and tracing goes to the administrative console.

Related reference

"Example: Setting up profiles to make tracing easier when scripting" on page 176

"Example: Dumping threads in a server process" on page 176

Profiles and scripting

Scripting provides the capability to customize the environment in which scripts run by using the profile script. You can specify a profile in the following ways:

- Specify the **-profile** command option with wsadmin. You can specify more than one profile with the use of the multiple **-profile** option. The profile is invoked in the order given. An example on the Windows system follows:

  ```
  wsadmin -profile
  c:\myprofile1.
  jacl -profile
  c:\myprofile2.jacl
  ```

  `myprofile1.jacl` is run before `myprofile2.jacl`
- Specify the profile scripts using the com.ibm.ws.scripting.profiles property in the properties file. You can specify multiple profiles by separating each profile script with a `;`. The profiles are invoked in the order given. An example of this property in the Windows system follows:

  ```
  com.ibm.ws.
  scriptng.profiles=
  c:/myprofile1.jacl;
  c:/myprofile2.jacl
  ```

If profile is set in both the **-profile** option and as a property in the properties file, the profiles listed in the property file are invoked before the profiles in the command option.

If profile is specified, the profile is run when the scripting process starts. Any command specified with the **-c** command option and script file specified with the **-f** command option runs after the profiles are executed. In this way, the command and script file can use anything set up by the profiles. If the scripting process brings up an interactive session, then any procedures and variables defined in the profiles are available to the interactive session.

Properties used by scripted administration

Specifies the Java properties used by scripting administration.

There are three levels of default property files that load before any property file specified on the command line. The first level represents an installation default, located in the WebSphere Application Server properties directory called `wsadmin.properties`. The second level represents a user default, and is located in the Java `user.home` property just as `.wscprc` was in the WebSphere Application Server V4.0. This properties file is also called `wsadmin.properties`. The third level is a properties file pointed to by the `WSADMIN_PROPERTIES` environment variable. This environment variable is defined in the environment where the wsadmin tool starts. If one or more of these property files is present, they are interpreted before any properties file present on the command line. These three levels of property files load in the order that they are specified. The properties file loaded last, overrides the ones loaded earlier.

The following Java properties are used by scripting:

com.ibm.ws.scripting.classpath
Searches for classes and resources, and is appended to the list of paths.

com.ibm.ws.scripting.connectionType
Determines the connector to use. This value can either be `SOAP`, `RMI`, or `NONE`. The `wsadmin.properties` file specifies `SOAP` as the connector.

com.ibm.ws.scripting.host
Determines the host to use when attempting a connection. If not specified, the default is the local machine.

com.ibm.ws.scripting.port
Specifies the port to use when attempting a connection. The `wsadmin.properties` file specifies `8879` as the SOAP port for a single server installation.

com.ibm.ws.scripting.defaultLang
Indicates the language to use when executing scripts. The `wsadmin.properties` file specifies Jacl as the scripting language.
The supported scripting language is `Jacl`. Other scripting languages that the Bean Scripting Framework (BSF) supports might work, but have not been tested.

com.ibm.ws.scripting.traceString
Turns on tracing for the scripting process. Tracing turned off is the default.

com.ibm.ws.scripting.traceFile
Determines where trace and log output is directed. The `wsadmin.properties` file specifies the `wsadmin.traceout` file located in the WebSphere Application Server properties directory as the value of this property.
If multiple users work with the wsadmin tool simultaneously, set different `traceFile` properties in the user properties files. If the file name contains double byte character set (DBCS) characters, use unicode format, such as `\uxxxx`, where `xxxx` is a number.

com.ibm.ws.scripting.validationOutput
Determines where the validation reports are directed. The default file is `wsadmin.valout` located in the WebsSphere Application Server `logs` directory.
If multiple users work with the wsadmin tool simultaneously, set different `validationOutput` properties in the user properties files. If the file name contains double byte character set (DBCS) characters, use unicode format, such as `\uxxxx`, where `xxxx` is a number.

com.ibm.ws.scripting.emitWarningForCustomSecurityPolicy
Controls whether message WASX7207W is emitted when custom permissions are found.
The possible values are `true` and `false`. The default value is `true`.

com.ibm.ws.scripting.tempdir
Determines the directory to use for temporary files when installing applications. The Java virtual machine API uses `java.io.temp` as the default value.

com.ibm.ws.scripting.validationLevel
Determines the level of validation to use when configuration changes are made from the scripting interface.
Possible values are: `NONE`, `LOW`, `MEDIUM`, `HIGH`, `HIGHEST`. The default is `HIGHEST`.

com.ibm.ws.scripting.crossDocumentValidationEnabled
Determines whether the validation mechanism examines other documents when changes are made to one document.
Possible values are `true` and `false`. The default value is `true`.

com.ibm.ws.scripting.profiles
Specifies a list of profiles to run automatically before running user commands, scripts, or an interactive shell.
The `wsadmin.properties` file specifies `securityProcs.jacl` and `LTPA_LDAPSecurityProcs.jacl` as the values of this property. Use the default to make security configuration easier.

Java Management Extensions connectors
Use this page to view and change the configuration for Java Management Extensions (JMX) connectors.

To view this administrative console page, click one of the following paths:
- **Servers > Application Servers >***server_name* **> Administration Services > JMX Connectors**
- **Servers > JMS Servers >***server_name* **> Administration Services > JMX Connectors**

Java Management Extensions (JMX) connectors communicate with WebSphere Application Server when you invoke a scripting process. There is no default for the type and parameters of a connector. The `wsadmin.properties` file specifies the Simple Object Access Protocol (SOAP) connector and an appropriate port number. You can also use the Remote Method Invocation (RMI) connector.

Use one of the following methods to select the connector type and attributes:
- Specify properties in a properties file.
- Indicate options on the command line.

On the z/OS platform, both the SOAP connector and the RMI connector connect to a server control region. WebSphere for z/OS internally routes MBean requests from a server control region to its servant regions as appropriate.

Type
Specifies the type of the JMX connector.

Data type	Enum
Default	SOAPConnector

Range

SOAPConnector
For JMX connections using Simple Object Access Protocol (SOAP).
RMIConnector
For JMX connections using Remote Method Invocation (RMI).
HTTPConnector
For JMX connections using HTTP.
JMSConnector
For JMX connections using Java Messaging Service (JMS).

JMX connector settings

Use this page to view the configuration for a Java Management Extensions (JMX) connector.

To view this administrative console page, click one of the following paths:

- **Servers > Application Servers >***server_name* **> Administration Services > JMX Connectors >***connector_type*
- **Servers > JMS Servers >***server_name* **> Administration Services > JMX Connectors >***connector_type*

On the z/OS platform, both the SOAP connector and the RMI connector connect to a server control region. WebSphere for z/OS internally routes MBean requests from a server control region to its servant regions as appropriate.

Type:

Specifies the type of the JMX connector.

Data type Enum
Default SOAPConnector
Range

SOAPConnector
For JMX connections using Simple Object Access Protocol (SOAP).
RMIConnector
For JMX connections using Remote Method Invocation (RMI).
HTTPConnector
For JMX connections using HTTP.
JMSConnector
For JMX connections using Java Messaging Service (JMS).

Security and scripting

- Enabling and disabling security:

  The wsadmin tool has two security related profiles by default that make security configuration easier. These profiles set up procedures that you can call to enable and disable security. The available procedures are:

`securityon`	turns global security on using LocalOS security
`securityoff`	turns global security off
`LTPA_LDAPSecurityOn`	turns LTPA/LDAP global security on using the LDAP user registry
`LTPA_LDAPSecurityOff`	turns LTPA/LDAP global security off

Enter the **securityon help** command or **LTPA_LDAPSecurityOn help** command to find out the parameters required for these procedures. For the procedures that turn security off, no parameters are required.

- Supplying user and password information:

  If you enable security for a WebSphere Application Server cell, you need to supply authentication information in order to communicate with servers.

  You can specify user and password information on a wsadmin command line or the `sas.client.props` file located in the properties directory.

  Use the **-user** and **-password** command options on the wsadmin tool to specify the user and password information.

  The properties file updates required for running in secure mode will depend on whether a Remote Method Invocation (RMI) or Simple Object Access Protocol (SOAP) connector is being used to connect.

  If you are using a Remote Method Invocation (RMI) connector, set the following properties in the `sas.client.props` file with the appropriate values:

  ```
  com.ibm.CORBA.
  loginUserid=
  com.ibm.CORBA.
  loginPassword=
  ```

  Change the value of the following property from prompt to properties:

  ```
  com.ibm.CORBA.
  loginSource=
  properties
  ```

  The default value for this property is prompt in the `sas.client.props` file. If you leave the default value, a dialog box appears with a password prompt. If the script is running unattended, if will appear to hang.

  If you are using a Simple Object Access Protocol (SOAP) connector, set the following properties in the `soap.client.props` file with the appropriate values:

  ```
  com.ibm.SOAP.
  loginUserid=
  com.ibm.SOAP.
  loginPassword=
  com.ibm.SOAP.
  security
  Enabled=true
  ```

  There is no corresponding `com.ibm.SOAP.loginSource` property for a SOAP connector.

  If you specify user and password information on a command line and in the properties file, the command line information will override the information in the properties file.

Scripting management examples with wsadmin

There are examples that illustrate how to customize the scripting environment using wsadmin. Basic knowledge of the syntax for the Jacl scripting language is helpful in order to understand and modify the examples.

Related reference

"Example: Setting up profiles to make tracing easier when scripting" on page 176

Example: Using the wsadmin tool in a secure environment

If you enable security for a WebSphere Application Server cell, supply authentication information to communicate with servers.

The nature of the properties file updates required for running in secure mode depend on whether you connect with a Remote Method Invocation (RMI) connector, or a Simple Object Access Protocol (SOAP) connector:

- If you use a Remote Method Invocation (RMI) connector, set the following properties in the `sas.client.props` file with the appropriate values:

  ```
  com.ibm.CORBA.
  loginUserid=
  com.ibm.CORBA.
  loginPassword=
  ```

  Also, set the following property:

  ```
  com.ibm.CORBA.
  loginSource=
  properties
  ```

  The default value for this property is `prompt` in the `sas.client.props` file. If you leave the default value, a dialog box appears with a password prompt. If the script is running unattended, it appears to hang.
- If you use a Simple Object Access Protocol (SOAP) connector, set the following properties in the `soap.client.props` file with the appropriate values:

  ```
  com.ibm.SOAP.
  security
  Enabled=true
  com.ibm.SOAP.
  loginUserid=
  com.ibm.SOAP.
  loginPassword=
  ```

To specify user and password information, choose one of the following methods:

- Specify user name and password on a command line, using the **-user** and **-password** commands. For example:

  ```
  wsadmin -conntype
  RMI -port 2809
  -user u1 -password
  secret1
  ```
- Specify user name and password in the `sas.client.props` file for a RMI connector or the `soap.client.props` file for a SOAP connector.

If you specify user and password information on a command line and in the `sas.client.props` file or the `soap.client.props` file, the command line information overrides the information in the `props` file.

Example: Enabling and disabling LTPA_LDAP security with a profile using wsadmin

The following example calls the procedures set up by the default profile to enable and disable LTPA/LDAP security, based on single sign-on using LDAP user registry.

Enabling LTPA/LDAP global security:

- Use help to find out what arguments you need to provide:

  ```
  LTPA_LDAPSecurityOn
  help
  ```

  Example output:

```
Syntax:
LTPA_LDAPSecurityOn
server user password
port domain
```

- Issue the call with the arguments provided to turn on LTPA/LDAP security:

```
LTPA_LDAPSecurityOn
ldpaServer1 user1
password1 660 ibm.com
```

Example output:

```
PLEASE READ BELOW:
Done with LTPA/LDAP
security turning on
process, now you
need to restart
all the
processes to make
it affected. Then
you can start using
the client with
SOAP or RMI
connector.
```

  - If you use the SOAP connector to connect to the server, you need to modify the `soap.client.props` file in your `<install_root>/properties` directory. Update as below for SOAP connector:

```
com.ibm.SOAP.
securityEnabled=true
com.ibm.SOAP.
loginUserid=user1
com.ibm.SOAP.
loginPassword=password1
```

  - If you use the RMI connector to connect to the server, you are prompted to enter the user ID and the password. If you want to bypass the login process, you can modify `sas.client.props` file in your `<install_root>/properties` directory. Update as below for RMI connector:

```
com.ibm.CORBA.
loginSource=properties
com.ibm.CORBA.
loginUserid=user1
com.ibm.CORBA.
loginPassword=password1
```

Disabling LTPA/LDAP global security:

- Issue the following call to turn off LTPA/LDAP global security

```
LTPA_LDAPSecurityOff
```

Example output:

```
LTPA/LDAP security
is off now but you
need to restart
all the processes to
make it affected.
```

wsadmin tool performance tips

The following performance tips are for the wsadmin tool:

- When you launch a script using the `wsadmin.bat` or `wsadmin.sh` files, a new process is created with a new Java virtual machine (JVM) API. If you use scripting with multiple wsadmin **-c** commands from a batch file or a shell script, these commands execute slower than if you use a single wsadmin **-f** command.

The **-f** option runs faster because only one process and JVM API are created for installation and the Java classes for the installation only load once.

The following example executes multiple application installation commands from a batch file:

```
wsadmin -c
"$AdminApp
install
c:\\myApps\
App1.ear
{-appname appl1}"
wsadmin -c
"$AdminApp
install
c:\\myApps\
App2.ear
{-appname appl2}"
wsadmin -c
"$AdminApp
install
c:\\myApps\
App3.ear
{-appname appl3}"
```

Or, for example, you can create the following file, *appinst.jacl*, that contains the commands:

```
$AdminApp install
c:\\myApps\App1.
ear {-appname appl1}
$AdminApp install
c:\\myApps\App2.
ear {-appname appl2}
$AdminApp install
c:\\myApps\App3.ear
{-appname appl3}
```

Then invoke this file using: `wsadmin -f appinst.jacl`

- Use the AdminControl `queryNames` and `completeObjectName` commands carefully with a large installation. For example, if there are only a few beans on a single machine, the `$AdminControl queryNames *` command performs well. If a scripting client connects to the deployment manager in a multiple machine environment, use a command only if it is necessary for the script to obtain a list of all the Mbeans in the system. If you need the Mbeans on a node, it is easier to invoke `"$AdminControl queryNames node=mynode,*"`. The JMX system management infrastructure forwards requests to the system to fulfill the first query, `*`. The second query, `node=mynode,*` is targeted to a specific machine.
- The WebSphere Application Server is a distributed system, and scripts perform better if you minimize remote requests. If some action or interrogation is required on several items, for example, servers, it is more efficient to obtain the list of items once and iterate locally. This procedure applies to actions that the AdminControl command performs on running MBeans, and actions that the AdminConfig command performs on configuration objects.

Chapter 5. Managing using command line tools

There are several command line tools that you can use to start, stop, and monitor WebSphere server processes and nodes. These tools only work on local servers and nodes. They cannot operate on a remote server or node. To administer a remote server, you can use the wsadmin scripting program connected to the deployment manager for the cell in which the target server or node is configured. See Deploying and managing using scripting for more information about using the wsadmin scripting program. You can also use the V5 administrative console which runs in the deployment manager for the cell. For more information about using the administrative console, see Deploying and managing with the GUI.

To manage using command line tools, perform the following steps:

1. Open a system command prompt.
2. Change to the `bin` directory.
3. Run the command.

The command executes the requested function and produces a log file that records useful information about the parameters passed to the command and the output produced by the command. When you use the `-trace` option for the command, the additional trace data is captured in the command log file. The directory location for the log files is under the default system log root directory except for commands related to a specific server instance, in which case the log directory for that server is used. You can override the default location for the command log file using the `-logfile` option for the command.

Example: Security and the command line tools

If you want enable WebSphere Application Server security, you need to provide the command line tools with authentication information. Without authentication information, the command line tools will receive an `AccessDenied` exception when you attempt to use them with security enabled. There are multiple ways to provide authentication data:

- Most command line tools support a `-username` and `-password` option for providing basic authentication data. The userid and password that you specify should be an administrative user. For example, you can use a member of the administrative console users with operator or administrator privileges, or the administrative userid configured in the user registry. The following example demonstrates the stopNode command which specifies command line parameters:

  ```
  stopNode -username
  adminuser -password
  adminpw
  ```

- You can place the authentication data in a properties file that the command line tools read. The default file for this data is the `sas.client.props` file in the properties directory for the WebSphere Application Server.

START *appserver_proc_name* command

The **START** ***appserver_proc_name*** command reads the configuration file for the specified server process and starts the server. Depending on the options you specify, you can launch a new Java Virtual Machine (JVM) API to run the server process, or write the launch command data to a file. You can run this command

from the `install_root/bin` directory of a WebSphere Application Server installation, or a network deployment installation.

```
START appserver_
proc_name parameters
```

Parameters

The parameters for the **START** ***appserver_proc_name*** command follow:

<appserver_proc_name>
Is the name of your start procedure for WebSphere Application Server for z/OS.

<server_short_name>
Is the short name of the J2EE server you are starting.

<cell_short_name>
Is the short name of the cell containing this J2EE server.

<node_short_name>
Is the short name of the of the node containing this J2EE server.

The following example demonstrates correct syntax:

```
START appserver
_proc_name,
JOBNAME=server
_short_name,
       ENV=cell_short_name.
node_short_name.
server_short_name
```

Note: This command must be entered on a single line. It is split here for display purposes.

STOP *appserver_proc_name* command

The **STOP** ***appserver_proc_name*** command reads the configuration file for the specified server process. This command sends a Java Management Extensions (JMX) command to the server telling it to shut down. By default, the **stopServer** utility does not return control to the command line until the server completes shutting down. You can run this command from the `install_root/bin` directory of a WebSphere Application Server installation or a network deployment installation.

```
STOP appserver_
proc_name parameters
```

Parameters

The parameters for the **STOP** ***appserver_proc_name*** command follow:

<appserver_proc_name>
Is the name of your WebSphere Application Server for z/OS stop procedure.

<server_short_name>
Is the short name of the J2EE server you are stopping.

<cell_short_name>
Is the short name of the cell containing this J2EE server.

<node_short_name>
Is the short name of the of the node containing this J2EE server.

The following example demonstrates correct syntax:

```
STOP appserver_
proc_name,JOBNAME=
server_short_name,
       ENV=cell_
short_name.
node_short_name.
server_short_name
```

Note: This command must be entered on a single line. It is split here for display purposes.

START *dmgr_proc_name* command

The **START** ***dmgr_proc_name*** command reads the configuration file for the network deployment manager process and constructs a launch command. Depending on the options you specify, the **START** ***dmgr_proc_name*** command launches a new Java Virtual Machine (JVM) API to run the manager process, or writes the launch command data to a file. You must run this command from the `install_root/bin` directory of a network deployment installation.

```
START <dmgr_
proc_name>
parameters
```

Parameters

The parameters for the **START** ***dmgr_proc_name*** command follow:

<dmgr_proc_name>
Is the name of your WebSphere Application Server for z/OS deployment manager start procedure.

<server_short_name>
Is the short name of the J2EE server the deployment manager will be managing.

<cell_short_name>
Is the short name of the cell containing this J2EE server.

<node_short_name>
Is the short name of the of the node containing this J2EE server.

The following example demonstrates correct syntax:

```
START dmgr_
proc_name,
JOBNAME=
server_s
hort_name,
       ENV=
cell_short
_name.node
_short_name.
server_
short_name
```

Note: This command must be entered on a single line. It is split here for display purposes.

STOP *dmgr_proc_name* command

The **STOP** ***dmgr_proc_name*** command reads the configuration file for the network deployment manager process. It sends a Java Management Extensions (JMX) command to the manager telling it to shut down. By default, the **stopManager** utility waits for the manager to complete shutdown before it returns control to the command line. You must run this command from the `install_root/bin` directory.

```
STOP dmgr_proc_
name parameters
```

Parameters

The parameters for the **STOP** ***dmgr_proc_name*** command follow:

<dmgr_proc_name>
Is the name of your WebSphere Application Server for z/OS deployment manager stop procedure.

<server_short_name>
Is the short name of the J2EE server the deployment manager is managing.

<cell_short_name>
Is the short name of the cell containing this J2EE server.

<node_short_name>
Is the short name of the of the node containing this J2EE server.

The following example demonstrates correct syntax:

```
STOP dmgr_
proc_name,
JOBNAME=server
_short_name,
       ENV=cell_short_name.
node_short_name.
server_short_name
```

Note: This command must be entered on a single line. It is split here for display purposes.

START *nodeagent_proc_name* command

The **START** ***nodeagent_proc_name*** command reads the configuration file for the node agent process, and constructs a launch command. Depending on the options that you specify, the **START** ***nodeagent_proc_name*** command creates a new Java Virtual Machine (JVM) API to run the agent process, or writes the launch command data to a file. You must run this command from the `install_root/bin` directory of a WebSphere Application Server installation.

```
START nodeagent_
proc_name parameters
```

Parameters

The parameters for the **START** ***nodeagent_proc_name*** command follow:

<nodeagent_proc_name>
Is the name of your WebSphere Application Server for z/OS node agent start procedure.

<server_short_name>
Is the short name of the J2EE server you want this node agent to manage.

<cell_short_name>
Is the short name of the cell containing this J2EE server.

<node_short_name>
Is the short name of the of the node containing this J2EE server.

The following example demonstrates correct syntax:

```
START nodeagent_
proc_name,
JOBNAME=server
_short_name,
       ENV=cell
_short_name.
node_short_
name.server
_short_name
```

Note: This command must be entered on a single line. It is split here for display purposes.

STOP *nodeagent_proc_name* command

The **STOP** ***nodeagent_proc_name*** command reads the configuration file for the network deployment node agent process. It sends a Java Management Extensions (JMX) command to the node agent telling it to shut down. By default, the **stopNode** utility waits for the node agent to complete shutdown before it returns control to the command line. You must run this command from the `install_root/bin` directory of a WebSphere Application Server installation.

```
STOP nodeagent_
proc_name parameters
```

Parameters

The parameters for the **STOP** ***nodeagent_proc_name*** command follow:

<nodeagent_proc_name>
Is the name of your WebSphere Application Server for z/OS node agent stop procedure.

<server_short_name>
Is the short name of the J2EE server this node agent is managing.

<cell_short_name>
Is the short name of the cell containing this J2EE server.

<node_short_name>
Is the short name of the of the node containing this J2EE server.

The following example demonstrates correct syntax:

```
STOP nodeagent
_proc_name,
JOBNAME=server
_short_name,
       ENV=
cell_short_
```

```
name.node_
short_name.
server_
short_name
```

Note: This command must be entered on a single line. It is split here for display purposes.

addNode command

The **addNode** command incorporates a WebSphere Application Server installation into a cell. You must run this command from the `install_root/bin` directory of a WebSphere Application Server installation. Depending on the size and location of the new node you incorporate into the cell, this command can take a few minutes to complete.

Important: If you recycle the system that hosts an application server node, and did not set up the node agent to be an operating system daemon, you must issue a **startNode** command to re-establish the node as a member of the deployment cell.

```
addNode
<deploymgr host>
<deploymgr port>
[options]
```

The first two arguments are required. The default port number is 8879 for the default Simple Object Access Protocol (SOAP) port of the deployment manager. SOAP is the default Java Management Extensions (JMX) connector type for the command. If you install the deployment manager using coexistence ports, the default SOAP port is 8889.

Parameters

The options for the **addNode** command follow:

-nowait
Tells the **addNode** command not to wait for successful initialization of the launched node agent process.

-quiet
Suppresses the progress information that the **addNode** command prints in normal mode.

-logfile <filename>
Specifies the location of the log file to which information gets written.

-replacelog
Replaces the log file instead of appending to the current log.

-trace
Generates trace information into a file for debugging purposes.

-newtracefile
By default the **addNode** program appends to the existing trace file. This option causes the **addNode** command to overwrite the trace file.

-noagent
Tells **addNode** not to launch the node agent process for the new node.

-username <name>
Specifies the user name for authentication if security is enabled. Acts the same as the `-user` option.

-user <name>
Specifies the user name for authentication if security is enabled. Acts the same as the `-username` option.

-password <password>
Specifies the password for authentication if security is enabled.

-conntype <type>
Specifies the JMX connector type to use for connecting to the deployment manager. Valid types are SOAP or RMI, which stands for Remote Method Invocation.

-includeapps
By default the **addNode** program does not carry over applications from the stand-alone servers on the new node to the cell. This option tells **addNode** to attempt to include applications from the new node. If the application already exists in the cell, a warning is printed and the application is not installed into the cell.

By default, during application installation, application binaries are extracted in the `install_root/installedApps/cellName` directory. After addNode, the cell name of the configuration on the node that you added changes from the base cell name to the deployment manager cell name. The application binaries are located where they were before addNode was performed, for example, `install_root/installedApps/old_cellName`.

If the application was installed by explicitly specifying the location for binaries as the following:

```
${APP_INSTALL_ROOT}
/${CELL}
```

where variable `${CELL}` specifies current cell name, then upon addNode the binaries are moved to the following directory:

```
${APP_INSTALL_ROOT}
/currentCellName
```

Note: You have to use the `-includeApps` option to migrate all the applications to the new cell. Federating the node to a cell using addNode command does not merge any cell level configuration including virtualHost information. If the virtual Host and aliases for the new cell does not match WebSphere Application Server, you will not be able to access the applications running on the servers. You have to manually add all the virtualHost and host aliases to the new cell using the administrative console running on the deployment manager.

-startingport <portnumber>
Allows you to specify a port number to use as the base port number for all node agent and jms server ports created during **addNode**. This allows you to control which ports are defined for these servers, rather than using the default port values. The starting port number is incremented in order to calculate the port number for every node agent port and jms server port configured during **addNode**.

-help
Prints a usage statement.

-? Prints a usage statement.

This program does the following:
- It copies the base WebSphere Application Server cell configuration to a new cell structure. This new cell structure matches the structure of deployment manager.
- It creates a new node agent definition for the node that the cell incorporates.
- It sends commands to the deployment manager to add the documents from the new node to the cell repository.
- It performs the first configuration synchronization for the new node (ensures it is in sync with the cell).
- It launches the node agent process for the new node.

For information about port numbers, see port number settings in WebSphere Application Server versions.

For information about port numbers, see port number settings in WebSphere Application Server versions.

Note: The default Red Hat installation creates an association between the hostname of the machine and the loopback address -- 127.0.0.1. In addition, the `/etc/nsswitch.conf` file is set up to use `/etc/hosts` before trying to look up the server using a name server. This can cause failures when trying to add or administrate nodes when the deployment manager or application server is running on Red Hat.

If your deployment manager or your application server is running on Red Hat, perform the following operations on your Red Hat machines to ensure that you can successfully add and administrate nodes:
- Remove the 127.0.0.1 mapping to the local host in /etc/hosts
- Edit `/etc/nsswitch.conf` so that the hosts line reads:

  ```
  hosts: dns files
  ```

The following examples demonstrate correct syntax:

```
addNode
testhost 8879

addNode
deploymgr 8879
-trace
(produces
addNode.log
file)

addNode host25
8879 -nowait
(does not wait
for node agent
process)
```

where 8879 is the default port.

Example output:

```
D:\WebSphere\
AppServer\bin>
addnode
<dmgr_host>
ADMU0116I: Tool information
     is being logged
     in file
```

```
          D:\WebSphere\
     AppServer\logs\
     addNode.log
ADMU0001I: Begin federation
     of node <node_name>
     with Deployment
     Manager at
     <dmgr_host>:8879.
ADMU0009I: Successfully
     connected to
     Deployment Manager
     Server: <dmgr_host>:
     8879.
ADMU0505I: Servers found
     in configuration:
ADMU0506I: Server name: server1
ADMU2010I: Stopping all
     server processes
     for node
     <node_name>
ADMU0512I: Server server1
     cannot be reached.
     It appears to
     be stopped.
ADMU0024I: Deleting the old
     backup directory.
ADMU0015I: Backing up the
     original cell
     repository.
ADMU0012I: Creating Node Agent
     configuration for
     node: <node_name>
ADMU0014I: Adding node
     <node_name>
     configuration to
     cell: <cell_name>
ADMU0016I: Synchronizing
     configuration
     between node
     and cell.
ADMU0018I: Launching Node
     Agent process
     for node:
     <node_name>
ADMU0020I: Reading configuration
     for Node Agent
     process: nodeagent
ADMU0022I: Node Agent launched.
     Waiting for
     initialization
     status.
ADMU0030I: Node Agent
     initialization
     completed
     successfully.
     Process id is:
            2340
ADMU0523I: Creating Queue
     Manager for node
     <node_name> on
     server jmsserver
ADMU0525I: Details of Queue
     Manager creation
     may be seen
     in the file:
            createMQ.
     <node_name>_
```

```
     jmsserver.log
ADMU9990I:
ADMU0300I: Congratulations!
     Your node
     <node_name> has
     been successfully
           incorporated into
     the <cell_name>
     cell.
ADMU9990I:
ADMU0306I: Be aware:
ADMU0302I: Any cell-level
     documents from
     the stand-alone
     <node_name>
     configuration
     have not been
     migrated to
     the new cell.
ADMU0307I: You might
     want to:
ADMU0303I: Update the
     configuration
     on the
     <cell_name>
     Deployment
     Manager
           with values
     from the old
     cell-level
     documents.
ADMU9990I:
ADMU0306I: Be aware:
ADMU0304I: Because
    -includeapps was
    not specified,
    applications
    installed on
           the stand-alone
    node were not
    installed on
    the new cell.
ADMU0307I: You might want to:
ADMU0305I: Install
    applications onto
    the <cell_name>
    cell using wsadmin
           $AdminApp or
    the Administrative
    Console.
ADMU9990I:
ADMU0003I: Node <node_name>
    has been successfully
    federated.
```

Related tasks

Federating multiple Version 5 installation instances

Related reference

Port number settings in WebSphere Application Server versions

Establishing multimachine environments

Coexistence port definitions

serverStatus command

Use the **serverStatus** command to obtain the status of one or all of the servers configured on a node. You can run this command from the `install_root/bin` directory of a WebSphere Application Server installation or a network deployment installation.

```
serverStatus
<server>|-all
[options]
```

The first argument is required. The argument is either the name of the configuration directory of the server for which status is desired, or the -all keyword which requests status for all servers defined on the node.

Parameters

The options for the **serverStatus** command follow:

-quiet
Suppresses the progress information that **serverStatus** prints in normal mode.

-logfile <filename>
Specifies the location of the log file to which information gets written.

-replacelog
Replaces the log file instead of appending to the current log.

-trace
Generates trace information into a file for debugging purposes.

-username <name>
Specifies the user name for authentication if security is enabled. Acts the same as the `-user` option.

-user <name>
Specifies the user name for authentication if security is enabled. Acts the same as the `-username` option.

-password <password>
Specifies the password for authentication if security is enabled.

-help
Prints a usage statement.

-? Prints a usage statement.

The following examples demonstrate correct syntax:

```
serverStatus
server1

serverStatus
-all (returns
status for all
defined servers)

serverStatus
-trace (produces
serverStatus.
jlog file)
```

removeNode command

The **removeNode** command returns a node from a Network Deployment distributed administration cell to a base WebSphere Application Server installation. You must run this command from the `install_root/bin` directory of a WebSphere Application Server installation.

The **removeNode** command only removes the node-specific configuration from the cell. This command does not uninstall any applications that were installed as the result of executing an **addNode** command. Such applications can subsequently deploy on additional servers in the Network Deployment cell. As a consequence, an **addNode** command with the -includeapps option executed after a **removeNode** command does not move the applications into the cell because they already exist from the first **addNode** command. The resulting application servers added on the node do not contain any applications. To deal with this situation, add the node and use the deployment manager to manage the applications. Add the applications to the servers on the node after it is incorporated into the cell.

Note: Depending on the size and location of the new node you remove from the cell, this command can take a few minutes to complete.

```
removeNode [options]
```

All arguments are optional.

Parameters

The following are available options for the **removeNode** command:

-quiet
Suppresses the progress information that the **removeNode** command prints in normal mode.

-logfile <fileName>
Specifies the location of the log file to which information is written.

-replacelog
Replaces the log file instead of appending to the current log.

-trace
Generates trace information into a file for debugging purposes.

-timeout <seconds>
Specifies the waiting time before the node agent shutdown times out and returns an error.

-statusport <portNumber>
Specifies that an administrator can set the port number for the node agent status callback.

-username <name>
Specifies the user name for authentication if security is enabled. Acts the same as the -user option.

-user <name>
Specifies the user name for authentication if security is enabled. Acts the same as the -username option.

-password <password>
Specifies the password for authentication if security is enabled.

-force
Cleans up the local node configuration regardless of whether you can reach the deployment manager for cell repository cleanup.

-help
Prints a usage statement.

-? Prints a usage statement.

This program does the following:
- It stops all of the running server processes in the node, including the node agent process.
- It removes the configuration documents for the node from the cell repository by sending commands to the deployment manager.
- It copies the original application server cell configuration into the active configuration.

The following examples demonstrate correct syntax:

```
removeNode -quiet

removeNode -trace
(produces removeNode.
log file)
```

cleanupNode command

The **cleanupNode** command cleans up a node configuration from the cell repository. Only use this command to clean up a node if you have a node defined in the cell configuration, but the node no longer exists. You must run this command from the `install_root/bin` directory of a network deployment installation.

```
cleanupNode
<node name>
<deploymgr host>
<deploymgr port>
[options]
```

where the first argument is required.

Parameters

The options for the **cleanupNode** command follow:

-quiet
Suppresses the progress information that the **cleanupNode** command prints in normal mode.

-trace
Generates trace information into a file for debugging purposes.

The following examples demonstrate correct syntax:

```
cleanupNode myNode
cleanupNode myNode -trace
```

syncNode command

The **syncNode** command forces a configuration synchronization to occur between the node and the deployment manager for the cell in which the node is configured. Only use this command when you cannot run the node agent because the node configuration does not match the cell configuration. You must run this command from the `install_root/bin` directory of a WebSphere Application Server installation.

```
syncNode
<deploymgr host>
<deploymgr port>
[options]
```

where the first two arguments are required.

Parameters

The options for the **syncNode** command follow:

-stopservers
Tells the **syncNode** program to stop all servers on the node, including the node agent, before performing configuration synchronization with the cell.

-restart
Tells the **syncNode** command to launch the node agent process after configuration synchronization completes.

-nowait
Tells the **syncNode** command not to wait for successful initialization of the launched node agent process.

-quiet
Suppresses the progress information that the **syncNode** command prints in normal mode.

-logfile <filename>
Specifies the location of the log file to which information gets written.

-replacelog
Replaces the log file instead of appending to the current log.

-trace
Generates trace information into a file for debugging purposes.

-timeout <seconds>
Specifies the waiting time before node agent initialization times out and returns an error.

-statusport <portnumber>
Specifies that an administrator can set the port number for node agent status callback.

-username <name>
Specifies the user name for authentication if security is enabled. Acts the same as the `-user` option.

-user <name>
Specifies the user name for authentication if security is enabled. Acts the same as the `-username` option.

-password <password>
Specifies the password for authentication if security is enabled.

-conntype <type>
Specifies the Java Management Extensions (JMX) connector type to use for connecting to the deployment manager. Valid types are Simple Object Access Protocol (SOAP) or Remote Method Invocation (RMI).

-help
Prints a usage statement.

-? Prints a usage statement.

The following examples demonstrate correct syntax:

```
syncNode
testhost 8879

syncNode
deploymgr 8879
-trace (produces
syncNode.log file)

syncNode host25
4444 -stopservers
-restart (assumes
that the deployment
manager JMX
port is 4444)
```

backupConfig command

The **backupConfig** command is a simple utility to back up the configuration of your node to a file. By default, all servers on the node stop before the backup is made so that partially syncronized information is not saved. You can run this command from the `install_root/bin` directory of a WebSphere Application Server installation or a network deployment installation.

```
backupConfig
<backup_file> [options]
```

where `backup_file` specifies the file to which the backup is written. If you do not specify one, a unique name is generated.

Parameters

The options for the **backupConfig** command are:

-nostop
Tells the **backupConfig** command not to stop the servers before backing up the configuration.

-quiet
Suppresses the progress information that the **backupConfig** command prints in normal mode.

-logfile <filename>
Specifies the location of the log file to which information gets written.

-replacelog
Replaces the log file instead of appending to the current log.

-trace
Generates trace information into the log file for debugging purposes.

-username <name>
Specifies the user name for authentication if security is enabled in the server. Acts the same as the `-user` option.

-user <name>
Specifies the user name for authentication if security is enabled in the server. Acts the same as the `-username` option.

-password <password>
Specifies the password for authentication if security is enabled in the server.

-help
Prints a usage statement.

-? Prints a usage statement.

The following example demonstrates correct syntax:

```
backupConfig
```

This example creates a new file that includes the current date. For example: `WebSphereConfig_2003-04-22.zip`

```
backupConfig
myBackup.zip -nostop
```

This example creates a file called `myBackup.zip` and does not stop any servers before beginning the backup.

restoreConfig command

The **restoreConfig** command is a simple utility to restore the configuration of your node after backing up the configuration using the **backupConfig** command. By default, all servers on the node stop before the configuration restores so that a node syncronization does not occur during the restoration. If the configuration directory already exists, it will be renamed before the restoration occurs. You can run this command from the `install_root/bin` directory of a WebSphere Application Server installation or a network deployment installation.

```
restoreConfig
<backup_file>
[options]
```

where `backup_file` specifies the file the backup is written to. If you do not specify one, a unique name is generated.

Parameters

The options for the **restoreConfig** command follow:

-nostop
Tells the **restoreConfig** command not to stop the servers before backing up the configuration.

-quiet
Suppresses the progress information that the **restoreConfig** command prints in normal mode.

-location
Specifies the location where the backup files should be restored. The location defaults to the `WAS_HOME/config` directory.

-location<directory_name>
Specifies the directory where the backup file should be restored. The location defaults to the `WAS_HOME/config` directory.

-logfile <filename>
Specifies the location of the log file to which information gets written.

-replacelog
Replaces the log file instead of appending to the current log.

-trace
Generates trace information into the log file for debugging purposes.

-username <name>
Specifies the user name for authentication if security is enabled in the server. Acts the same as the `-user` option.

-user <name>
Specifies the user name for authentication if security is enabled in the server. Acts the same as the `-username` option.

-password <password>
Specifies the password for authentication if security is enabled in the server.

-help
Prints a usage statement.

-? Prints a usage statement.

The following example demonstrates correct syntax:

```
restoreConfig
WebSphereConfig_
2003-04-22.zip
```

This example restores the given file to the `WAS_HOME/config` directory.

```
restoreConfig
WebSphereConfig_
2003-04-22.zip
-location /tmp
-nostop
```

This example creates a file called `myBackup.zip` and does not stop any servers before beginning the backup.

EARExpander command

The **EARExpander** command allows you to expand an EAR file into a directory to run the application in that EAR file. It also allows you to collapse a directory containing application files into a single EAR file. You can type `EARExpander` with no arguments to learn more about its options.

```
EarExpander -ear earName
-operationDir dirName
-operation <expandcollapse>
[-expansionFlags <all|war>]
```

Parameters

The options for the **EARExpander** command are:

-ear
Specifies the name of the input ear file for expand operation or name of the output ear file for collapse operation.

-operationDir
Specifies the directory where the EAR file is expanded or specifies the directory from where files are collapsed.

-operation <expand | collapse>
The `expand` value expands an EAR file into a directory structure requred by the WebSphere Application Server run time. The `collapse` value creates an EAR file from an expanded directory structure.

-expansionFlags <all | war>
(Optional) The `all` value expands all files from all of the modules. The `war` value only expands the files from WAR modules.

The following examples demonstrate correct syntax:

```
EARExpander -ear
C:\WebSphere\AppServer\
installableApps\
DefaultApplication.ear
-operationDir  C:\MyApps
-operation expand
-expansionFlags war

EARExpander -ear
C:\backup\Default
Application.ear
-operationDir
C:\MyAppsDefault
Application.ear
-operation collapse
```

Chapter 6. Managing using mvs command line tools

See z/OS MVS System commands for information on how to use MVS operator commands.

Modify command

Use the **modify** command from the MVS console to dynamically modify WebSphere for z/OS operations.

You can use the modify command to display status of various server components and activities, including:
- Active controllers
- Trace settings
- Servants
- Sessions
- JVM Heap
- Java trace

```
f <server>,
options
```

The first argument is required. The argument is either the name of the configuration directory of the server for which status is desired, or the -all keyword which requests status for all servers defined on the node.

Parameters

The options for the **modify** command follow:

CANCEL
Used to cancel a server. *server* refers to the server short name.

You can specify the following options:

ARMRESTART
Specify if you are using ARM and want ARM to restart the server after it terminates. If you don't specify the ARMRESTART option on the CANCEL parameter, ARM will not restart the server.

HELP Get help for the CANCEL syntax.

Note: You cannot use the CANCEL parameter to cancel a cluster from the MVS console. Instead, you must cancel each of the servers that make up the cluster.

TRACEALL=n
Use TRACEALL to establish a general trace level for the server.

Valid trace levels are 0 (none), 1 (exception), 2 (basic), and 3 (detailed tracing). Under normal conditions and in production, use 1 (exception).

Note: Be careful when using a level of 3 (detailed for all components) because it can potentially yield more data than can be handled reasonably.

TRACEBASIC=n
Specify the WebSphere for z/OS components for which you want to switch on a basic level of tracing.

This command has the ability to override a different tracing level established by TRACEALL for those components.

Note: Do not change this variable unless directed by IBM service personnel.

You can specify one or more of the following options for either TRACEBASIC or TRACEDETAIL:

0 RAS

1 Common Utilities

3 COMM

4 ORB

6 OTS

7 Shasta

9 OS/390 Wrappers

A Daemon

E Security

F Externalization

J JRAS (internal tracing-via direction from IBM support)

L J2EE

TRACEDETAIL=n
Specify the WebSphere for z/OS components for which you want to switch on a detailed level of tracing.

This command activates the most detailed tracing for the specified WebSphere for z/OS components and overrides different settings inTRACEALL. The selected components *(n,...)* are identified by their component-ID (valid values are the same as for TRACEBASIC above. Subcomponents, specified by numbers, receive detailed traces. Other parts of WebSphere for z/OS receive tracing as specified on the TRACEALL variable.

Note: Do not change this variable unless directed by IBM service personnel.

TRACESPECIFIC=xxyyyzzz
Specifies tracing overrides for specific WebSphere for z/OS trace points.

Trace points are specified by 8-digit, hexadecimal numbers. To specify more than one trace point, use parentheses and separate the numbers with commas. You can also specify an environment variable name by enclosing the name in single quotes. The value of the environment variable will be handled as if you had specified that value on TRACESPECIFIC.

Note: Do not use TRACESPECIFIC unless directed by IBM service personnel.

TRACE_EXCLUDE_SPECIFIC=xxyyyzzz
Specifies trace points to exclude.

Trace points to exclude are specified by 8-digit, hexadecimal numbers. To specify more than one trace point, use parentheses and separate the numbers with commas. You can also specify an environment variable name by enclosing the name in single quotes. The value of the environment variable will be handled as if you had specified that value on TRACE_EXCLUDE_SPECIFIC. You can use TRACE_EXCLUDE_SPECIFIC as a mask to turn off otherwise-on

traces. For example, use the TRACESPECIFIC command to turn on tracing for a whole part and then use TRACE_EXCLUDE_SPECIFIC to turn off one trace within that part.

Note: Do not use TRACE_EXCLUDE_SPECIFIC unless directed by IBM service personnel.

TRACEINIT
Reset to the initial trace settings.

TRACENONE
Turns off all trace settings.

TRACETOSYSPRINT={YES|NO}
Select whether or not to send the trace to sysprint.

YES specifies to send the trace to sysprint and NO stops sending the trace to sysprint.

TRACETOTRCFILE={YES|NO}
Select whether or not to direct the trace to the TRCFILE DD card.

YES specifies to send the trace to the TRCFILE DD card and NO stops sending the trace to the TRCFILE DD card.

TRACEJAVA
Modify the Java trace string.

The java trace specification is used to control java tracing and conforms to the java trace specification rules. *=all=enabled means to enable all types of tracing for all registered trace components.

HELP
Display a list of all the keywords you may use with the modify command.

You can also use the HELP parameter after the CANCEL, and DISPLAY parameters to display lists of all the keywords you can use with either of these parameters.

DISPLAY ¦ DISPLAY,
Displays the server's name, the system name where it is running, and the current code level.

You can specify the following options:

SERVERS
This command is directed to a server and displays the name, system name, and code level for each active server in the sysplex that is in the same cell.

SERVANTS
Displays a list of ASIDs of servants attached to the server against which you issued the display command.

TRACE
Display trace information for a server controller.

You can further modify this command with one of the following options:

SRS Display trace information for all servants, one at a time.

ALL Display trace information for the controller and all servants one at a time.

JAVA Display the Java trace string settings for a server controller.You can further modify this command with one of the following options:

SRS Display Java trace information for all servants, one at a time.

ALL Display Java trace information for the controller and all servants one at a time.

HELP Display a list of all the keywords you may use with the modify display trace java command.

HELP Display a list of all the keywords you may use with the modify display trace command.

JVMHEAP

Display the JVM heap information for a server controller.

You can further modify this command with one of the following options:

SRS Display the JVM heap information for all servants, one at a time.

ALL Display the JVM heap information for the controller and all servants, one at a time.

HELP Display a list of all the keywords you may use with the modify display javaheap command.

SESSIONS

Display session information for the server.

You can further modify this command with one of the following options:

LISTENERS

Display the listening port numbers for each protocol. This is actually the default, so the *f server,sessions* and the *f server,sessions,listeners* commands would have the same outcome.

SERVER

Display the number of sessions in use for each protocol on the server.

You can further modify this command with one of the following options:

TCPIIOP

Display the number of TCP/IP IIOP sessions active on the server.

You can further modify this command with one of the following options:

LIST List the server session information for the TCP/IP IIOP protocol.

HELP Display a list of all the keywords you may use with the modify display session server tcpipiiop command.

Note: The LIST and HELP parameters are also available with the other session protocol display commands.

LOCALIIOP
Display the number of LOCALIIOP sessions active on the server.

SSLIIOP
Display the number of SSLIIOP sessions active on the server.

HTTP Display the number of HTTP sessions active on the server.

HTTPS
Display the number of HTTPS sessions active on the server.

HELP Display a list of all the keywords you may use with the modify display session server command.

HELP Display help for the modify display sessions command.

HELP Display a list of all the keywords you may use with the modify command.

Example: Canceling application clusters and servers with the modify command

Before you begin: You cannot cancel a cluster from the MVS console. Instead, you must cancel each of the servers that make up the cluster.

Example 1: The following command will cancel the *bbo5acr* server:

```
f bbo5acr,cancel
```

Example 2: The following command will cancel the *bbo5acr* server and instruct ARM to restart it after it terminates:

```
f bbo5acr,cancel,
armrestart
```

Example: Establishing a general level of trace

To establish a general trace level for the server, use the following command:

```
f server,
traceall=n
```

Valid trace levels are 0 (none), 1 (exception), 2 (basic), and 3 (detailed tracing). Under normal conditions and in production, use 1 (exception).

Example: The following command will turn on exception level tracing for the bbo5acr server:

```
f bbo5acr,
traceall=1
```

Here is a sample display:

```
F BBO5ACR,
TRACEALL=1
BBOO0211I
```

```
MODIFY COMMAND
TRACEALL=1
COMPLETED
SUCCESSFULLY
```

Example: Setting basic and detailed trace levels

To specify the WebSphere for z/OS components for which you want to switch on a basic level of tracing, use the following command:

```
f server,
tracebasic=(n,...)
```

Example 1: The following command will turn on a basic level of tracing for the Daemon component on server *bbo5acr*:

```
f bbo5acr,
tracebasic=a
```

Here is a sample display:

```
F BBO5ACR,
TRACEBASIC=A
BBOO0211I MODIFY
COMMAND
TRACEBASIC=A
COMPLETED SUCCESSFULLY
```

To specify the WebSphere for z/OS components for which you want to switch on a detailed level of tracing use the following command:

```
f server,
tracedetail=(n,...)
```

Example 2: The following command will turn on a detailed level of tracing for security on server *bbo5acr*:

```
f bbo5acr,
tracedetail=e
```

Here is a sample display:

```
F BBO5ACR,
TRACEDETAIL=E
BBOO0211I
MODIFY COMMAND
TRACEDETAIL=E
COMPLETED
SUCCESSFULLY
```

Example: Setting specific trace points

To set specific trace points, use the following command:

```
f server,
tracespecific=n
| (n,...)
```

Example 1: The following command will turn on the specific trace point 04006001:

```
f bbo5acr,
tracespecific=
04006001
```

Example 2: The following command will turn on the specific trace points 04006001 and 04006027:

```
f bbo5acr,
tracespecific=
(04006001,04006027)
```

Example 3: The following command will turn on the specific trace points set in the environment variable *tracepoints*:

```
f bbo5acr,
tracespecific=
'tracepoints'
```

Example: Excluding specific trace points

To exclude specific trace points, use the following command:

```
f server,
trace_exclude_
specific=n
| (n,...)
```

Example: The **tracespecific** command below turns on tracing for a whole part and then the *trace_exclude_specific* turns off tracing for the point 04006031 within that part.:

```
f bbo5acr,
tracespecific=
04006000

f bbo5acr,
trace_exclude
_specific=04006031
```

Example: Resetting to the initial trace settings

To reset to the initial trace settings use the following command:

```
f server,
traceinit
```

Example: Turning off tracing

To turn off tracing, use the following command:

```
f server,
tracenone
```

Example: Sending the trace to sysprint

To send the trace to sysprint, use the following command:

```
f server,
tracetosysprint=yes
```

To stop sending the trace to sysprint, use the following command:

```
f server,
tracetosysprint=no
```

Example: Displaying servants

To display servants, use the following command:

```
f server,
display,servants
```

Example: The following command will display servants for the bbo5acr server:

```
f bbo5acr,
display,servants
```

Here is a sample display:

```
F BBO5ACR,
DISPLAY,SERVANTS
BBOO0185I
SERVER BBO5SR4/
BBOASR4A HAS
1 SERVANT
PROCESS
(ASID: 0038x)
BBOO0188I END
OF OUTPUT FOR
COMMAND DISPLAY,
SERVANTS
```

Example: Displaying trace settings and Java string trace settings

To display the trace settings for a server instance, use the following command:

```
f server,
display,trace
```

Example 1: The following command will display trace settings for the bbo5acr server:

```
f bbo5acr,
display,trace
```

Here is a sample display:

```
F BBO5ACR,
DISPLAY,TRACE
BBOO0224I
TRACE INFORMATION
FOR SERVER
BBO5SR4/BBOASR4A/
STC00047
BBOO0197I
LOCATION =
SYSPRINT BUFFER
BBOO0197I
AGGREGATE TRACE
LEVEL = 1
BBOO0197I
EXCEPTION
TRACING = RAS(0),
Common Utilities
(1), COMM(3),
ORB(4), OTS(6),
Shasta(7),
OS/390 Wrappers(9),
Daemon(A),
Security(E),
Externalization(F),
JRAS(J), J2EE(L)
BBOO0197I BASIC
TRACING =
BBOO0197I
DETAILED TRACING =
BBOO0197I TRACE
SPECIFIC = NONE
SPECIFIED
BBOO0197I TRACE
EXCLUDE SPECIFIC =
NONE SPECIFIED
BBOO0225I TRACE
INFORMATION FOR
```

```
SERVER BBO5SR4/
BBOASR4A/STC00047
COMPLETE
BBOO0188I END
OF OUTPUT FOR
COMMAND DISPLAY,
TRACE
```

To display the Java trace string settings for a server, use the following command:

```
f server,
display,trace,
java
```

Example 2: The following command will display Java trace settings for the bbo5acr server:

```
f bbo5acr,
display,trace,
java
```

Here is a sample display:

```
F BBO5ACR,
DISPLAY,TRACE,
JAVA
BBOO0196I TRACE
INFORMATION FOR
SERVER BBO5SR4/
BBOASR4A
BBOJ0050I CTL
(STC00047):*
=all=disabled
BBOO0188I END
OF OUTPUT FOR
COMMAND DISPLAY,
TRACE,JAVA
```

To display the Java trace information for all servants, one at a time.

```
f server,
display,trace,
java.srs
```

Example 3: The following command will display Java trace settings for the bbo5acr server:

```
f bbo5acr,
display,trace,
java,srs
```

Here is a sample display:

```
F BBO5ACR,
DISPLAY,TRACE,
JAVA,SRS
BBOO0196I
TRACE INFORMATION
FOR SERVER
BBO5SR4/BBOASR4A
BBOJ0050I
SR(STC00048):
*=all=disabled
BBOO0188I END
OF OUTPUT FOR
COMMAND DISPLAY,
TRACE,JAVA,SRS
```

To display the Java trace information for the controller and all servants, one at a time.

```
f server,
display,trace,
java.all
```

Example 4: The following command will display Java trace settings for the controller and all servants:

```
f bbo5acr,
display,trace,
java,all
```

Here is a sample display:

```
F BBO5ACR,
DISPLAY,TRACE,
JAVA,ALL
BBOO0196I TRACE
INFORMATION
FOR SERVER
BBO5SR4/BBOASR4A
BBOJ0050I
CTL(STC00047):
*=all=disabled
BBOJ0050I
SR(STC00048):
*=all=disabled
BBOO0188I END
OF OUTPUT FOR
COMMAND DISPLAY,
TRACE,JAVA,ALL
```

Example: Displaying JVM heap information

To display the JVM heap information for a server controller, use the following command:

```
f server,
display,jvmheap
```

Example 1: The following command will display JVM heap information for the bbo5acr server:

```
f bbo5acr,
display,jvmheap
```

Here is a sample display:

```
F BBO5ACR,
DISPLAY,JVMHEAP
BBOO0201I JVM
HEAP INFORMATION
FOR SERVER
BBO5SR4/BBOASR4A/
STC00047
BBOO0202I
(STC00047)
HEAP(MIDDLEWARE),
COUNT(00000000),
FREE STORAGE(
396FA70), TOTAL
STORAGE( 7FFFA00)
BBOO0204I JVM
HEAP INFORMATION
FOR SERVER
BBO5SR4/BBOASR4A/
```

```
STC00047 COMPLETE
BBOO0188I END
OF OUTPUT FOR
COMMAND
DISPLAY,JVMHEAP
```

To display the JVM heap information for all servants one at a time, use the following command:

```
f server,
display,jvmheap,
srs
```

Example 2: The following command will display JVM heap information for all servants in the bbo5acr server:

```
f bbo5acr,
display,jvmheap,
srs
```

Here is a sample display:

```
F BBO5ACR,
DISPLAY,JVMHEAP,
SRS
+BBOO0201I JVM
HEAP INFORMATION
FOR SERVER
BBO5SR4/BBOASR4A/
STC00048
+BBOO0202I
(STC00048)
HEAP(MIDDLEWARE),
COUNT(00000001),
FREE STORAGE(
 25F4030),
TOTAL STORAGE
( 7FFFA00)
+BBOO0204I JVM
HEAP INFORMATION
FOR SERVER
BBO5SR4/BBOASR4A/
STC00048 COMPLETE
BBOO0188I END
OF OUTPUT FOR
COMMAND DISPLAY,
JVMHEAP,SRS
```

To display the JVM heap information for the controller and all servants of a server one at a time, use the following command:

```
f server,
display,jvmheap,all
```

Example 3: The following command will display JVM heap information for the controller and all servants in the bbo5acr server:

```
f bbo5acr,display,
jvmheap,all
```

Here is a sample display:

```
F BBO5ACR,
DISPLAY,JVMHEAP,
ALL
BBOO0201I JVM
HEAP INFORMATION
FOR SERVER
```

```
BBO5SR4/BBOASR4A/
STC00047
BBOO0202I
(STC00047)
HEAP(MIDDLEWARE),
COUNT(00000000),
FREE STORAGE(
396FA70),
TOTAL STORAGE
( 7FFFA00)
BBOO0204I JVM
HEAP INFORMATION
FOR SERVER
BBO5SR4/BBOASR4A/
STC00047 COMPLETE
+BBOO0201I JVM
HEAP INFORMATION
FOR SERVER
BBO5SR4/BBOASR4A/
STC00048
+BBOO0202I
(STC00048)
HEAP(MIDDLEWARE),
COUNT(00000001),
FREE STORAGE(
 25F4030),
TOTAL STORAGE
( 7FFFA00)
+BBOO0204I JVM
HEAP INFORMATION
FOR SERVER
BBO5SR4/BBOASR4A/
STC00048 COMPLETE
BBOO0188I END
OF OUTPUT FOR
COMMAND DISPLAY,
JVMHEAP,ALL
```

Example: Displaying sessions

To display sessions, use the following command:

```
f server,
display,sessions
```

Example 1: Since "listeners" is the default, either of the following command will display session listeners for the bbo5acr server:

```
f bbo5acr,
display,sessions
```

or

```
f bbo5acr,
display,
sessions,listeners
```

Here is a sample display:

```
F BBO5ACR,
DISPLAY,SESSIONS,
LISTENERS
BBOO0189I
PROTOCOLS AND
LISTENING PORTS
FOR SERVER
BBO5SR4/BBOASR4A
BBOO0190I
```

```
TCPIIOP 2809
BBOO0190I
SSLIIOP 6000
BBOO0190I
HTTP 9088
BBOO0190I
HTTPS 443
BBOO0188I END
OF OUTPUT FOR
COMMAND DISPLAY,
SESSIONS,LISTENERS
```

To display server sessions counts, use the following command:

```
f server,
display,sessions,
server
```

Example 2: The following command will display the server session counts for all protocols used by the bbo5acr server:

```
f bbo5acr,display,
sessions,server
```

Here is a sample display:

```
F BBO5ACR,DISPLAY,
SESSIONS,SERVER
BBOO0191I SERVER
SESSION COUNTS
FOR PROTOCOLS
USED BY SERVER
BBO5SR4/BBOASR4A
BBOO0192I
TCPIIOP 2
BBOO0192I
LOCALIIOP 0
BBOO0192I
SSLIIOP 0
BBOO0192I
HTTP 0
BBOO0192I
HTTPS 0
BBOO0188I END OF
OUTPUT FOR COMMAND
DISPLAY,SESSIONS,
SERVER
```

You can further refine the modify command to display, or list, the number of sessions used by a specific protocol. The available options are:

- tcpiiop
- localiiop
- ssliiop
- http
- https

In addition, you can also specify to display the results or list the results by leaving off the list modifer or including the list modifier, respectively.

Example 1: The following command will display the number of sessions using the TCP/IP IIOP protocol on the bbo5acr server:

```
f bbo5acr,display,
sessions,server,
tcpiiop
```

Here is a sample display:

```
F BBO5ACR,DISPLAY,
SESSIONS,SERVER,
TCPIIOP
BBOO0193I SERVER
BBO5SR4/BBOASR4A
HAS 2 TCPIIOP
SERVER SESSIONS
BBOO0188I END OF
OUTPUT FOR COMMAND
DISPLAY,SESSIONS,
SERVER,TCPIIOP
```

Example: Displaying status of a server

To display the status of a server, use the following command:

```
f server,display
```

Example: The following command will display status for the bbo5acr server:

```
f bbo5acr,display
```

Here is a sample display:

```
F BBO5ACR,DISPLAY
BBOO0173I SERVER
BBO5SR4/BBOASR4A
ACTIVE ON SY1 AT
LEVEL wd5xo03.
BBOO0188I END OF
OUTPUT FOR COMMAND
DISPLAY
```

Example: Displaying status of clusters

To display the status of clusters in the active controller, use the following command:

```
f server,
display,servers
```

Example: The following command will display status for the bbo5acr server:

```
f bbo5acr,
display,servers
```

Here is a sample display:

```
F BBO5ACR,
DISPLAY,SERVERS
BBOO0182I
SERVER ASID
SYSTEM LEVEL
BBOO0183I
CBDAEMON/DAEMON01
31x SY1 wd5xo03
BBOO0183I
BBO5SR4 /BBOASR4A
1F6x SY1 wd5xo03
BBOO0188I END
OF OUTPUT FOR
COMMAND
DISPLAY,SERVERS
```

Example: Getting help for the modify command

You can get syntax help for the various levels of the modify command.

Example 1: The following command will display a list of all the keywords you may use with the modify command:

```
f bbo5acr,
help
```

Here is a sample display:

```
F BBO5ACR,
HELP
BBOO0178I
THE COMMAND
MODIFY MAY
BE FOLLOWED
BY ONE OF
THE FOLLOWING
KEYWORDS:
BBOO0179I
CANCEL -
CANCEL THIS
CONTROL REGION
BBOO0179I
TRACEALL -
SET OVERALL
TRACE LEVEL
BBOO0179I
TRACEBASIC -
SET BASIC
TRACE COMPONENTS
BBOO0179I
TRACEDETAIL -
SET DETAILED
TRACE COMPONENTS
BBOO0179I
TRACESPECIFIC -
SET SPECIFIC
TRACE POINTS
BBOO0179I
TRACEINIT -
RESET TO
INITIAL TRACE
SETTINGS
BBOO0179I
TRACENONE -
TURN OFF
ALL TRACING
BBOO0179I
TRACETOSYSPRINT -
SEND TRACE
OUTPUT TO
SYSPRINT
(YES/NO)
BBOO0179I
TRACETOTRCFILE -
SEND TRACE
OUTPUT TO
TRCFILE DD
CARD (YES/NO)
BBOO0179I
DISPLAY -
DISPLAY STATUS
BBOO0179I
TRACE_EXCLUDE_
SPECIFIC -
EXCLUDE SPECIFIC
TRACE POINTS
```

```
BBOO0179I
TRACEJAVA -
SET JAVA
TRACE OPTIONS
```

Example 2: The following command will display a list of all the keywords you may use with the modify display command:

```
f bbo5acr,
display,help
```

Here is a sample display:

```
F BBO5ACR,
DISPLAY,HELP
BBOO0178I
THE COMMAND
DISPLAY, MAY
BE FOLLOWED
BY ONE OF
THE FOLLOWING
KEYWORDS:
BBOO0179I
SERVERS -
DISPLAY
ACTIVE
CONTROL REGIONS
BBOO0179I SERVANTS -
DISPLAY SERVANT
PROCESSES OWNED
BY THIS CONTROL
PROCESS
BBOO0179I SESSIONS -
DISPLAY INFORMATION
ABOUT COMMUNICATIONS
SESSIONS
BBOO0179I TRACE -
DISPLAY INFORMATION
ABOUT TRACE SETTINGS
BBOO0179I JVMHEAP -
DISPLAY JVM HEAP
STATISTICS
BBOO0188I END OF
OUTPUT FOR COMMAND
DISPLAY,HELP
```

Example 3: The following command will display a list of all the keywords you may use with the modify display sessions command:

```
f bbo5acr,display,
sessions,help
```

Here is a sample display:

```
F BBO5ACR,DISPLAY,
SESSIONS,HELP
BBOO0178I THE
COMMAND DISPLAY,
SESSIONS, MAY BE
FOLLOWED BY
ONE OF THE
FOLLOWING KEYWORDS:
BBOO0179I LISTENERS -
DISPLAY LISTENER
INFORMATION
BBOO0179I SERVER -
DISPLAY SERVER
```

```
SESSION INFORMATION
BBOO0188I END OF
OUTPUT FOR COMMAND
DISPLAY,SESSIONS,HELP
```

Example: Modifying the Java trace string

To modify the Java trace string, use the following command:

```
f server, tracejava='
trace specification'
```

Example: The following command enables all types of tracing for all registered trace components:

```
f bbo5acr,tracejava=
'*=all=enabled'
```

Note: The single quotes are a required part of the syntax.

Display command

Examples

Use the following display command examples to monitor your WebSphere Application Server.

- Display active replies
- Display active address spaces
- Display the status of address spaces registered for automatic restart management
- Display units of work (transactions) for the Information Management System

Example: Displaying active replies

Displaying active replies from the MVS console allows you to observe system activity and determine if the system requires an operator response.

Issue the following command to display (list) all active replies:

```
d r,r
```

Example: Displaying active address spaces

Use the display command to display active address spaces. For example, use the display command to determine if the location service daemon is up:

d a,l	Displays a list of all address spaces.
d a,a	Displays a list of all active address spaces.
d a,*address-space-name*	Displays only the address space in which you are interested. This command is recommended over the first two because it does not yield such a lengthy list on a production system. Of course, you need to know the name of the address space for which you are looking. Example: d a,bboasr1
d a,bbo*	Displays a list of all active address spaces that start with BBO.

Example: Displaying the status of address spaces registered for automatic restart management

Perform the following steps to use automatic restart management (ARM) to display the status of ARM registered address spaces (including the address spaces of server instances) in the WebSphere for z/OS environment:

1. Initialize all servers.
2. Issue one or both of the following commands:
   - To display all registered address spaces (including the address spaces of server instances), issue the command:

     ```
     d xcf,armstatus,
     detail
     ```
   - To display the status of a particular server instance, use the display command and identify the job name. For example, to display the status of the Daemon server instance (job BBODMN), issue:

     ```
     d  xcf,armstatus,
     jobname=bbodmn,detail
     ```

Example: Displaying units of work (transactions) for the Information Management System

You can display units of work (transactions) for Information Management System (IMS):

1. To display the status of a specific transaction, issue the command:

   ```
   /dis tran
   trans-name
   ```
2. To display the status of a specific program, issue the command:

   ```
   /dis prog
   program-name
   ```
3. To display the number of Message Processing Regions (MPRs) that are currently active, issue the command:

   ```
   /display
   active region
   ```

   For more information about IMS commands, see the *IMS/ESA Summary of Operator Commands* manual on the IBM Publications Center Web site.

Chapter 7. Deploying and managing using programming

This section describes how to use Java administrative APIs for customizing the WebSphere Application Server administrative system. WebSphere Application Server supports access to the administrative functions through a set of Java classes and methods. You can write a Java program that performs any of the administrative features of the WebSphere Application Server administrative tools. You can also extend the basic WebSphere Application Server administrative system to include your own managed resources. For more information, view the JMX Javadoc.

1. Decide that you want to write a Java administrative program. Instead of writing a Java administrative program, consider several other options that you can use to manage WebSphere Application Server processes. These options include: wsadmin, the administrative console, or the administrative command line tools. The administrative tools provide most of the functions you might need to manage the product and the applications that run in the WebSphere Application Server. You can use the command line tools from automation scripts to control the servers. Scripts written for the wsadmin scripting tool offer a wide range of possible custom solutions that you can develop quickly.

   You might have management features for your application or operating environment that are not implemented in the basic WebSphere Application Server administrative system. In this case, you can use the administrative classes and methods to add newly managed objects to the administrative system. You can also incorporate WebSphere Application Server administration into other Java programs by using the Java administrative APIs.
2. Create a custom Java admininstrative client program using the Java administrative APIs. (Optional)
3. Extend the WebSphere Application Server administrative system with custom MBeans. (Optional)

Creating a custom Java administrative client program using WebSphere Application Server administrative Java APIs

This section describes how to develop a Java program using the WebSphere Application Server administrative APIs for accessing the WebSphere administrative system. For more information, view the JMX Javadoc.

1. Develop an administrative client program.
2. Build the administrative client program by compiling it with javac and providing the location of the necessary JAR files in the classpath argument. For example, if your installation directory is `w:\DeploymentManager/DeploymentManager` a typical command would look like the following example:

   ```
   javac -classpath
   w:\DeploymentManager\lib\admin.jar;w:\DeploymentManager\lib\wsexception.jar;
   w:\DeploymentManager\lib\jmxc.jar
   MyAdminClient.java
   ```

   Note: Command split for display purposes

```
javac -classpath
/DeploymentManager/lib/admin.jar;/DeploymentManager/lib/wsexception.jar;
/DeploymentManager/lib/jmxc.jar
MyAdminClient.java
```

Note: Command split for display purposes

3. Run the administrative client program by setting up the run-time environment so that the program can find all of the prerequisites. Many of the batch or script files in the `bin` directory under the installation root perform a similar function. An example of a batch file that runs an administrative client program named `MyAdminClient` follows:

```
@echo off

call "%~dp0setupCmdLine.bat"

"%JAVA_HOME%\bin\java" "%CLIENTSAS%" "-Dwas.install.root=%WAS_HOME%"
"-Dwas.repository.root=%CONFIG_ROOT%"
-Dcom.ibm.CORBA.BootstrapHost=%COMPUTERNAME%
-classpath "%WAS_CLASSPATH%;w:\DeploymentManager\classes;
w:\DeploymentManager\lib\admin.jar;
w:\DeploymentManager\lib\wasjmx.jar" MyAdminClient %*
```

Note: Split for display purposes

```
@echo off

binDir=`dirname "$0"`
. "$binDir/setupCmdLine.sh"

"$JAVA_HOME/bin/java" "$CLIENTSAS" "-Dwas.install.root=$WAS_HOME"
"-Dwas.repository.root=$CONFIG_ROOT"
-Dcom.ibm.CORBA.BootstrapHost=$COMPUTERNAME
-classpath "$WAS_CLASSPATH;/DeploymentManager/classes;
/DeploymentManager/lib/admin.jar;
/DeploymentManager/lib/wasjmx.jar" MyAdminClient $@
```

Note: Split for display purposes

Developing an administrative client program

This page contains examples of key features of an administrative client program that utilizes WebSphere Application Server administrative APIs and Java Management Extentions (JMX). WebSphere Application Server administrative APIs provide control of the operational aspects of your distributed system as well as the ability to update your configuration. This page also demonstrates examples of operational control. For information, view the Administrative Javadoc, theJMX Javadoc, or the MBean Javadoc.

1. Create an AdminClient instance. An administrative client program needs to invoke methods on the AdminService object that is running in the deployment manager (or the application server in the base installation). The AdminClient class provides a proxy to the remote AdminService object through one of the supported Java Management Extensions (JMX) connectors. The following example shows how to create an AdminClient instance:

```
Properties connectProps = new Properties();
connectProps.setProperty(
AdminClient.CONNECTOR_TYPE, AdminClient.CONNECTOR_TYPE_SOAP);

connectProps.setProperty(AdminClient.CONNECTOR_HOST, "localhost");
connectProps.setProperty(AdminClient.CONNECTOR_PORT, "8879");
AdminClient adminClient = null;
try
```

```
{
       adminClient = AdminClientFactory.createAdminClient(connectProps);
}
catch (ConnectorException e)
{
       System.out.println("Exception creating admin client: " + e);
}
```

2. Find an MBean Once you obtain an AdminClient instance, you can use it to access managed resources in the administration servers and application servers. Each managed resource registers an MBean with the AdminService through which you can access the resource. The MBean is represented by an ObjectName instance that identifies the MBean. An ObjectName consists of a domain name followed by an unordered set of one or more key properties. For the WebSphere Application Server, the domain name is `WebSphere` and the key properties defined for administration are as follows:

type	The type of MBean. For example: Server, TraceService, Java Virtual Machine (JVM).
name	The name identifier for the individual instance of the MBean.
cell	The name of the cell that the MBean is executing.
node	The name of the node that the MBean is executing.
process	The name of the process that the MBean is executing.

   You can locate an MBean by querying for them with ObjectNames that match desired key properties. The following example shows how to find the MBean for the NodeAgent of node MyNode:

```
String nodeName = "MyNode";
String query = "WebSphere:type=NodeAgent,node=" + nodeName + ",*";
ObjectName queryName = new ObjectName(query);
ObjectName nodeAgent = null;
Set s = adminClient.queryNames(queryName, null);
if (!s.isEmpty())
    nodeAgent = (ObjectName)s.iterator().next();
else
    System.out.println("Node agent MBean was not found");
```

3. Use the MBean. What a particular MBean allows you to do depends on that MBean's management interface. It may declare attributes that you can obtain or set. It may declare operations that you can invoke. It may declare notifications for which you can register listeners. For the MBeans provided by the WebSphere Application Server, you can find information about the interfaces they support in the MBean javadoc. The following example invokes one of the operations available on the NodeAgent MBean that we located above. The following example will start the *MyServer* application server:

```
String opName = "launchProcess";
String signature[] = { "java.lang.String" };
String params[] = { "MyServer" };
try
{
     adminClient.invoke(nodeAgent, opName, params, signature);
}
catch (Exception e)
{
     System.out.println("Exception invoking launchProcess: " + e);
}
```

4. Register for events. In addition to managing resources, the Java Management Extensions (JMX) API also supports application monitoring for specific administrative events. Certain events produce notifications, for example, when a server starts. Administrative applications can register as listeners for these notifications. The WebSphere Application Server provides a full implementation of the JMX notification model, and provides additional function so you can receive notifications in a distributed environment. For a complete list of the notifications emitted from WebSphere Application Server MBeans, refer to the `com.ibm.websphere.management.NotificationConstants` class in the Javadoc. The following is an example of how an object can register itself for event notifications emitted from an MBean using the node agent ObjectName:

   ```
   adminClient.addNotificationListener(nodeAgent, this, null, null);
   ```

   In this example, the `null` value will result in receiving all of the node agent MBean event notifications. You can also use the `null` value with the `handback` object.

5. Handle the events. Objects receive JMX event notifications via the handleNotification method which is defined by the NotificationListener interface and which any event receiver must implement. The following example is an implementation of handleNotification that reports the notifications that it receives:

   ```
   public void handleNotification(Notification n, Object handback)
   {
        System.out.println("************************************************");
        System.out.println("* Notification received at " + new Date().toString());
        System.out.println("* type      = " + ntfyObj.getType());
        System.out.println("* message   = " + ntfyObj.getMessage());
        System.out.println("* source    = " + ntfyObj.getSource());
        System.out.println(
        "* seqNum    = " + Long.toString(ntfyObj.getSequenceNumber()));
        System.out.println("* timeStamp = " + new Date(ntfyObj.getTimeStamp()));
        System.out.println("* userData  = " + ntfyObj.getUserData());
        System.out.println("************************************************");
   }
   ```

   Related tasks

   "Creating a custom Java administrative client program using WebSphere Application Server administrative Java APIs" on page 255

Administrative client program example

The following example is a complete administrative client program. Copy the contents to a file named `MyAdminClient.java`. After changing the node name and server name to the appropriate values for your configuration, you can compile and run it using the instructions from Creating a custom Java administrative client program using WebSphere Application Server administrative Java APIs

```
import java.util.Date;
import java.util.Properties;
import java.util.Set;

import javax.management.InstanceNotFoundException;
import javax.management.MalformedObjectNameException;
import javax.management.Notification;
import javax.management.NotificationListener;
import javax.management.ObjectName;

import com.ibm.websphere.management.AdminClient;
import com.ibm.websphere.management.AdminClientFactory;
import com.ibm.websphere.management.exception.ConnectorException;

public class AdminClientExample implements NotificationListener
```

```
{

    private AdminClient adminClient;
    private ObjectName nodeAgent;
    private long ntfyCount = 0;

    public static void main(String[] args)
    {
       AdminClientExample ace = new AdminClientExample();

       // Create an AdminClient
       ace.createAdminClient();

       // Find a NodeAgent MBean
       ace.getNodeAgentMBean("ellington");

       // Invoke launchProcess
       ace.invokeLaunchProcess("server1");

       // Register for NodeAgent events
       ace.registerNotificationListener();

       // Run until interrupted
       ace.countNotifications();
    }

    private void createAdminClient()
    {
        // Set up a Properties object for the JMX connector attributes
        Properties connectProps = new Properties();
        connectProps.setProperty(
        AdminClient.CONNECTOR_TYPE, AdminClient.CONNECTOR_TYPE_SOAP);
        connectProps.setProperty(AdminClient.CONNECTOR_HOST, "localhost");
        connectProps.setProperty(AdminClient.CONNECTOR_PORT, "8879");

        // Get an AdminClient based on the connector properties
        try
        {
            adminClient = AdminClientFactory.createAdminClient(connectProps);
        }
        catch (ConnectorException e)
        {
            System.out.println("Exception creating admin client: " + e);
            System.exit(-1);
        }

        System.out.println("Connected to DeploymentManager");
    }


    private void getNodeAgentMBean(String nodeName)
    {
        // Query for the ObjectName of the NodeAgent MBean on the given node
        try
        {
            String query = "WebSphere:type=NodeAgent,node=" + nodeName + ",*";
            ObjectName queryName = new ObjectName(query);
            Set s = adminClient.queryNames(queryName, null);
            if (!s.isEmpty())
                nodeAgent = (ObjectName)s.iterator().next();
            else
            {
                System.out.println("Node agent MBean was not found");
                System.exit(-1);
            }
        }
        catch (MalformedObjectNameException e)
```

```
            {
                System.out.println(e);
                System.exit(-1);
            }
            catch (ConnectorException e)
            {
                System.out.println(e);
                System.exit(-1);
            }

            System.out.println("Found NodeAgent MBean for node " + nodeName);
        }

        private void invokeLaunchProcess(String serverName)
        {
            // Use the launchProcess operation on the NodeAgent MBean to start
            // the given server
            String opName = "launchProcess";
            String signature[] = { "java.lang.String" };
            String params[] = { serverName };
            boolean launched = false;
            try
            {
                Boolean b = (Boolean)adminClient.invoke(

    nodeAgent, opName, params, signature);
                launched = b.booleanValue();
                if (launched)
                    System.out.println(serverName + " was launched");
                else
                    System.out.println(serverName + " was not launched");

            }
            catch (Exception e)
            {
                System.out.println("Exception invoking launchProcess: " + e);
            }
        }

        private void registerNotificationListener()
        {
            // Register this object as a listener for notifications from the
            // NodeAgent MBean.  Don't use a filter and don't use a handback
            // object.
            try
            {
                adminClient.addNotificationListener(nodeAgent, this, null, null);
                System.out.println("Registered for event notifications");
            }
            catch (InstanceNotFoundException e)
            {
                System.out.println(e);
            }
            catch (ConnectorException e)
            {
                System.out.println(e);
            }
        }

        public void handleNotification(Notification ntfyObj, Object handback)
        {
            // Each notification that the NodeAgent MBean generates will result in
            // this method being called
            ntfyCount++;
            System.out.println("*************************************************");
            System.out.println("* Notification received at " + new Date().toString());
            System.out.println("* type      = " + ntfyObj.getType());
```

```
            System.out.println("* message   = " + ntfyObj.getMessage());
            System.out.println("* source    = " + ntfyObj.getSource());
            System.out.println(
            "* seqNum    = " + Long.toString(ntfyObj.getSequenceNumber()));
            System.out.println("* timeStamp = " + new Date(ntfyObj.getTimeStamp()));
            System.out.println("* userData  = " + ntfyObj.getUserData());
            System.out.println("************************************************");

        }

        private void countNotifications()
        {
            // Run until killed
            try
            {
                while (true)
                {
                    Thread.currentThread().sleep(60000);
                    System.out.println(ntfyCount + " notification have been received");
                }
            }
            catch (InterruptedException e)
            {
            }
        }

}
```

Related tasks

"Developing an administrative client program" on page 256

Extending the WebSphere Application Server administrative system with custom MBeans

You can extend the WebSphere Application Server administration system by supplying and registering new Java Management Extensions (JMX) MBeans (see JMX 1.0 Specification for details) in one of the WebSphere processes. JMX MBeans represent the management interface for a particular piece of logic. All of the managed resources within the standard WebSphere 5.0 infrastructure are represented as JMX MBeans. There are a variety of ways in which you can create your own MBeans and register them with the JMX MBeanServer running in any WebSphere process. For more information, view the MBean Javadoc.

1. Create custom JMX MBeans.

   You have some alternatives to select from, when creating MBeans to extend the WebSphere administrative system. You can use any existing JMX MBean from another application. You can register any MBean that you tested in a JMX MBeanServer outside of the WebSphere Application Server environment in a WebSphere Application Server process. Including Standard MBeans, Dynamic MBeans, Open MBeans, and Model MBeans.

   In addition to any existing JMX MBeans, and ones that were written and tested outside of the WebSphere Application Server environment, you can use the special distributed extensions provided by WebSphere and create a WebSphere ExtensionMBean provider. This alternative provides better integration with all of the distributed functions of the WebSphere administrative system. An ExtensionMBean provider implies that you supply an XML file that contains an MBean Descriptor based on the DTD shipped with the WebSphere Application Server. This descriptor tells the WebSphere system all of the attributes, operations, and notifications that your MBean supports. With this information,

the WebSphere system can route remote requests to your MBean and register remote Listeners to receive your MBean event notifications.

All of the internal WebSphere MBeans follow the Model MBean pattern (see WebSphere Application Server administrative MBean documentation for details). Pure Java classes supply the real logic for management functions, and the WebSphere MBeanFactory class reads the description of these functions from the XML MBean Descriptor and creates an instance of a ModelMBean that matches the descriptor. This ModelMBean instance is bound to your Java classes and registered with the MBeanServer running in the same process as your classes. Your Java code now becomes callable from any WebSphere Application Server administrative client through the ModelMBean created and registered to represent it.

5.0.1 + User MBeans that run on both the WebSphere Application Server distributed platforms and the WebSphere Application Server for z/OS platform may require special coding to function properly in the z/OS multiprocess model. On WebSphere Application Server distributed platforms where each application server runs in a single Java™ Virtual Machine (JVM), there is only one MBean server. The MBean server controls all MBeans that are registered within that application server. On the WebSphere Application Server for z/OS platform, there is a control process and a federation of servant processes, each with their own MBean server. The control process has its own MBean proxy server to distribute requests among the servant processes. See the detailed discussion of the JMX MBean multiprocess model request flow.

2. Register the new MBeans. There are several ways to register your MBean with the MBeanServer in a WebSphere Application Server process. The following list describes the available options:
   - Go through the AdminService interface. You can call the registerMBean() method on the AdminService interface and the invocation is delegated to the underlying MBeanServer for the process, after appropriate security checks. You can obtain a reference to the AdminService using the getAdminService() method of the AdminServiceFactory class.
   - Get MBeanServer instances directly. You can get a direct reference to the JMX MBeanServer instance running in any WebSphere Application Server process, by calling the getMBeanServer() method of the MBeanFactory class. You get a reference to the MBeanFactory class by calling the getMBeanFactory() method of the AdminService interface. Registering the MBean directly with the MBeanServer instance can result in that MBean not participating fully in the distributed features of the WebSphere Application Server administrative system.
   - Go through the MBeanFactory class. If you want the greatest possible integration with the WebSphere Application Server system, then use the MBeanFactory class to manage the life cycle of your MBean through the activateMBean and deactivateMBean methods of the MBeanFactory class. Use these methods, by supplying a subclass of the RuntimeCollaborator abstract superclass and an XML MBean descriptor file. Using this approach, you supply a pure Java class that implements the management interface defined in the MBean descriptor. The MBeanFactory class creates the actual ModelMBean and registers it with the WebSphere Application Server administrative system on your behalf.
   - Use the JMXManageable and CustomService interface. You can make the process of integrating with WebSphere administration even easier, by implementing a CustomService interface, that also implements the JMXManageable interface. Using this approach, you can avoid supplying the RuntimeCollaborator. When your CustomService interface is initialized, the WebSphere MBeanFactory class reads your XML MBean descriptor file and

creates, binds, and registers an MBean to your CustomService interface automatically. After the shutdown method of your CustomService is called, the WebSphere Application Server system automatically deactivates your MBean.

Regardless of the approach used to create and register your MBean, you must set up proper Java 2 security permissions for your new MBean code. The WebSphere AdminService and MBeanServer are tightly protected using Java 2 security permissions and if you do not explicitly grant your code base permissions, security exceptions are thrown when you attempt to invoke methods of these classes. If you are supplying your MBean as part of your application, you can set the permissions in the `was.policy` file that you supply as part of your application metadata. If you are using a CustomService interface or other code that is not delivered as an application, you can edit the `library.policy` file in the node configuration, or even the `server.policy` file in the `properties` directory for a specific installation.

Java 2 security permissions

You must grant Java 2 security permissions to application scoped code for JMX and WebSphere Application Server administrative privileges in order to allow the code to call WebSphere Application Server administrative and JMX methods.

- To invoke JMX class and interface methods, at least one of the following permissions are required:

  ```
  permission com.tivoli.jmx.MBeanServerPermission "MBeanServer.*"
  permission com.tivoli.jmx.MBeanServerPermission "MBeanServerFactory.*"
  ```

  where the individual target names are:

  ```
  MBeanServer.addNotificationListener
  MBeanServer.createMBean
  MBeanServer.deserialize
  MBeanServer.getAttribute
  MBeanServer.getDefaultDomain
  MBeanServer.getMBeanCount
  MBeanServer.getMBeanInfo
  MBeanServer.getObjectInstance
  MBeanServer.instantiate
  MBeanServer.invoke
  MBeanServer.isRegistered
  MBeanServer.queryMBeans
  MBeanServer.queryNames
  MBeanServer.registerMBean
  MBeanServer.removeNotificationListener
  MBeanServer.setAttribute
  MBeanServer.unregisterMBean
  MBeanServerFactory.createMBeanServer
  MBeanServerFactory.newMBeanServer
  MBeanServerFactory.findMBeanServer
  MBeanServerFactory.releaseMBeanServer
  ```

- For WebSphere Application Server administrative APIs, the permissions are the following:

  ```
  permission com.ibm.websphere.security.WebSphereRuntimePermission "AdminPermission";
  ```

Java™ Management Extensions MBean multiprocess model request flow for WebSphere Application Server for z/OS

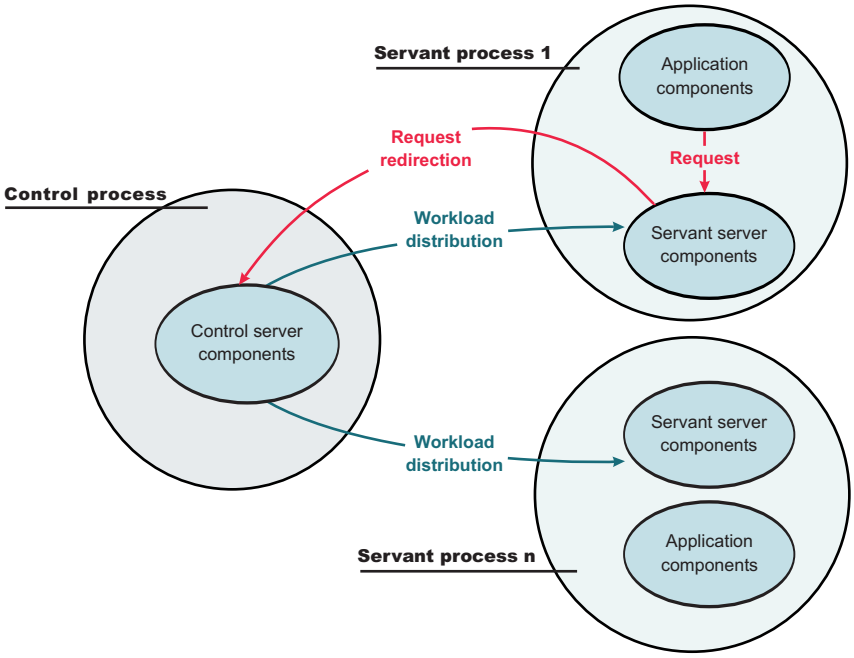
Java Management Extensions (JMX) dynamic proxy capability allows applications that depend on JMX operations to exhibit uniform observed behavior whether the server architecture uses a single process model or a multiprocess model.

All MBeans that the WebSphere runtime provides are capable of running under the single process model employed by WebSphere Application Server on distributed platforms, or the multiprocess model employed by WebSphere Application Server for z/OS. User MBean providers may need to modify their MBeans so that they work on both the WebSphere Application Server distributed platforms and the WebSphere Application Server for z/OS. For more information, view the application server API Javadoc.

The simplified dynamic proxy model presented here discusses the two general request flows that exist in the multiprocess model. Operation requests on an MBean can be initiated from one of two places:

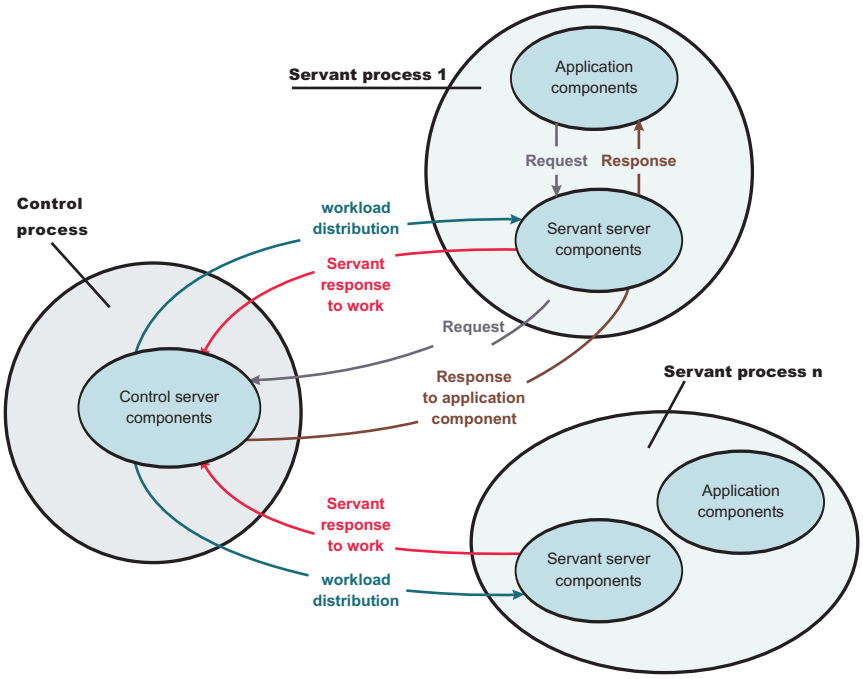
- Within an application component running under the same servant process as the MBean.
- Outside the server through one of the JMX connectors (SOAP, Remote Method Invocation (RMI), HTTP, and so on).

Requests that come from an application component generally follow this flow. The application component sends its request to the servant components. The servant components redirect the request to the control process where the dynamic proxy for the MBean runs. WebSphere Application Server automatically generates the MBean dynamic proxy during runtime. If the request calls a method that the MBean provider defined with a unicall option, the dynamic proxy in the control process randomly dispatches the work, in conjunction with Workload Management (WLM), to one servant process. If the request calls a method that the MBean provider defined with a multicall option, the dynamic proxy in the control process, in conjunction with WLM, distributes the work to all the servant processes.



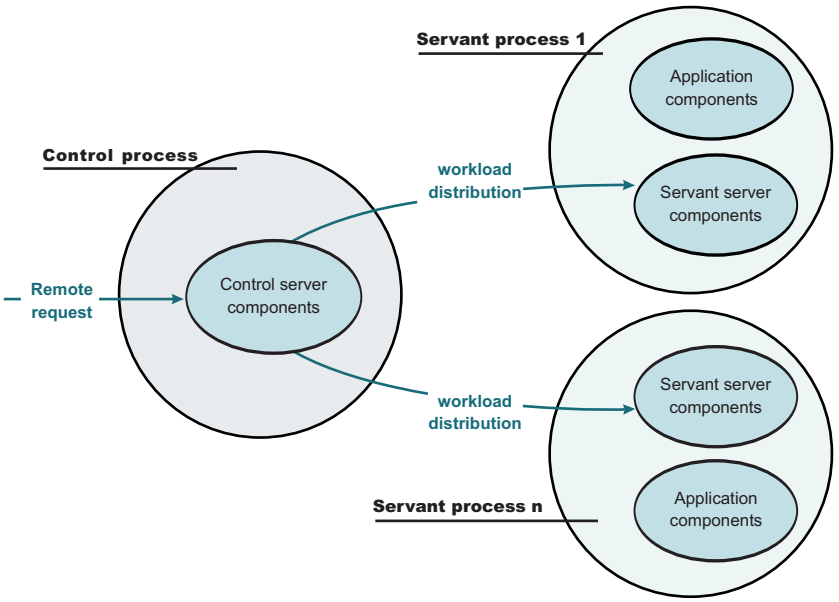
Each servant process that completes the work optionally sends a response back to the control process. If the MBean was defined with a unicall option, and the return type is anything but void, the control process returns the response to the servant that made the request. The servant server components then return the response to the application component. If the MBean was defined with a multicall option, the MBean that runs inside each servant process executes separately and finishes

processing the request at different times. Once all the requests have been processed, a result aggregation and an event aggregation may need to be performed in order to properly return a result to the application component.

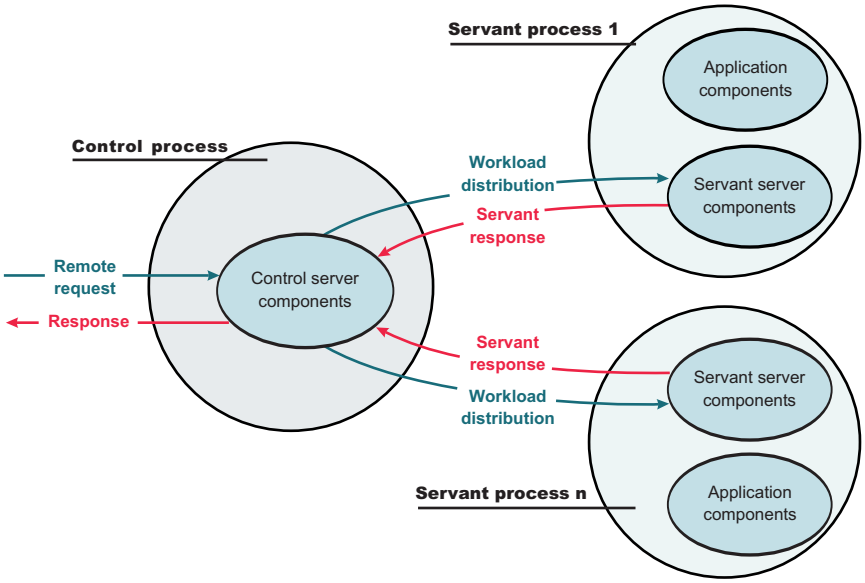


Requests that come from a remote location outside the server generally follow this flow. The remote location sends its request to the control process where the dynamic proxy for the MBean runs. WebSphere Application Server automatically generates the MBean dynamic proxy during runtime. The next part of the request process behaves the same as a request that originates from an application component. If the request calls a method that the MBean provider defined with a unicall option the dynamic proxy in thecontrol process randomly dispatches the work, in conjunction with Workload Management (WLM), to one servant process. If the request calls a method that the MBean provider defined with a multicall option, the dynamic proxy in the control process, in conjunction with WLM,

distributes the work to all the servant processes.



The flow of the response back to the remote location is similar to the response back to the application component. Each servant process that completes the work optionally sends a response back to the control process. If the MBean was defined with a unicall option, and the return type is anything but void, the control process returns the response to the remote location. If the MBean was defined with a multicall option, the MBean that runs inside each servant process executes separately and finishes processing the request at different times. Once all the requests have been processed, a result aggregation and an event aggregation may need to be performed in order to properly return a result to the remote location.



Java™ Management Extensions dynamic proxy concepts

A Java Management Extensions (JMX) dynamic proxy coordinates MBean requests among multiprocess servers. This section discusses the main terms associated with a JMX dynamic proxy.

Control process
Receives requests and distributes them to servant processes so that the application server can do work for the requests.

Servant process
Receives work from the control process and carries out the work.

Unicall option versus the multicall option
Use the unicall option on the proxyInvocationType method when a request invokes an arbitrary servant process or servant processes. Use the multicall option on the proxyInvocationType method when a request goes to multiple servant processes and the servant processes return different results.

The following example shows an MBean descriptor that was developed for a single process model (before) and modified for a multiprocess model (after).

Before

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE MBean SYSTEM "MbeanDescriptor.dtd">
<MBean type="SampleStateMBean"
  version="5.0"
  description="Sample State MBean for the documentation example.">

  <attribute description="The name of the MBean."
    getMethod="getMBeanName" name="mbeanName" type="java.lang.String"/>
  <attribute description="The state of the MBean."name="state"
    getMethod="getState" setMethod="setState" type="java.lang.String"/>
  <operation
    description="Initialize the State MBean."
    impact="ACTION" name="initializeState" role="operation"
    targetObjectType="objectReference" type="void>
    <signature>
      <parameter description="The name of the MBean."
        name="mbeanName" type="java.lang.String"/>
      <parameter description="The initial state of the MBean."
        name="mbeanName" type="java.lang.String"/>
    </signature>
  </operation>
</MBean>
```

After

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE MBean SYSTEM "MbeanDescriptor.dtd">
<MBean type="SampleStateMBean"
  version="5.0"
  platform="dynamicproxy"
  description="Sample State MBean for the documentation example.">

  <attribute description="The name of the MBean."
    getMethod="getMBeanName" name="mbeanName" type="java.lang.String"/>
  <attribute description="The state of the MBean."name="state"
    getMethod="getState" setMethod="setState" type="java.lang.String"/>
    proxyInvokeType="unicall" proxySetterInvokeType="multicall"/>
  <operation
    description="Initialize the State MBean."
    impact="ACTION" name="initializeState" role="operation"
    targetObjectType="objectReference" type="void" proxyInvokeType="multicall">
    <signature>
      <parameter description="The name of the MBean."
        name="mbeanName" type="java.lang.String"/>
      <parameter description="The initial state of the MBean."
        name="mbeanName" type="java.lang.String"/>
    </signature>
  </operation>
</MBean>
```

Make the user MBean run in dynamic proxy mode by specifying `dynamicproxy` on the platform attribute. If there is no platform attribute on the MBean descriptor, the user MBean deployed on WebSphere Application Server for z/OS automatically uses the dynamic proxy mode.

Update the attribute xml tag or the operation xml tag, as shown in the After example, to specify the unicall behavior or the multicall behavior in the multiprocess environment. If there is no proxyInvokeType option or proxySetterInvokeType option, the behavior defaults to unicall. In the After example, the getMBeanName method and the getState method run with unicall behavior. The setState method and the initializeState method run with multicall behavior.

Single process model

The single process application server has one server runtime. There is generally one instance of each major runtime component on which the MBean acts- one Enterprise Java™ Bean (EJB) container, one Web container, one Java™ 2, one Enterprise Edition (J2EE) connection manager, and so on. This model assumes that each MBean invocation on the server executes in the same process and the same Java™ Virtual Machine (JVM).

Multiprocess model

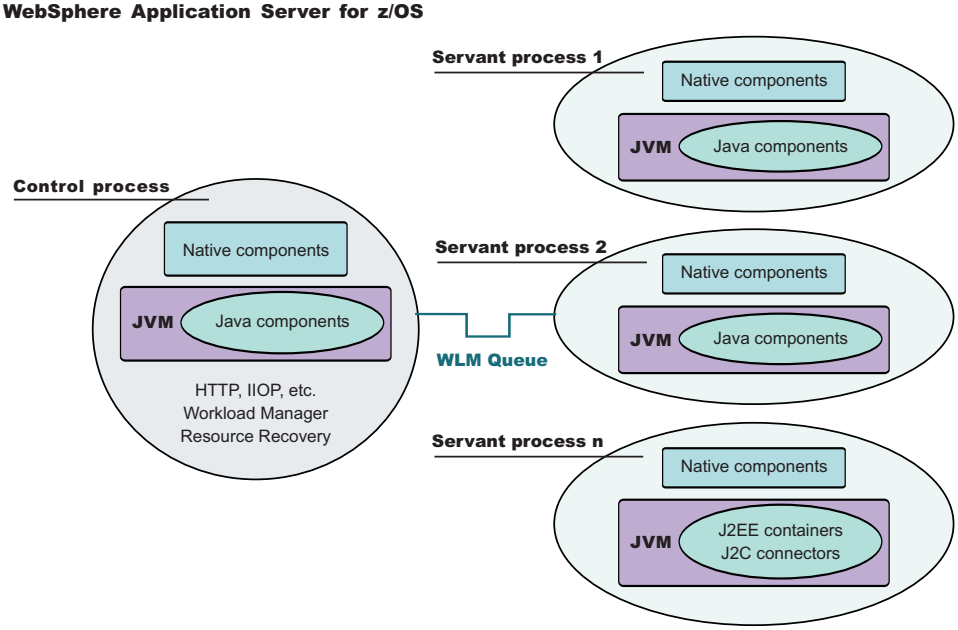
The multiprocess model asserts that a single server instance is a federation of Java™ Virtual Machines (JVMs), each executing in a separate operating process. The control process is responsible for such server functions as communication endpoints, authorization, resource recovery, and workload management. All other JVMs are servant JVMs. They are worker JVMs in which application requests execute. They take direction from, and interact only with, the control process.

All inbound and outbound requests go through the control process. Client request arrive at the control process. The control process, with assistance from Workload Manager (WLM), dispatches the work to the servant processes.

The number of servant processes is managed by WLM and varies based on demand. The demand is measured against installation specific performance goals, expressed as WLM policy. Each servant process is identical and hosts the necessary application server components to enable the Java™ 2, one Enterprise Edition (J2EE) application programming model. The servant processes rely on the control process for numerous services, such as communication, security, and transaction control.

The multiprocess model imposes additional demands on the Java™ Management Extension (JMX) infrastructure over the single process model. Administrative requests to a multiprocess server often require coordination among the processes that comprise the application server. The JMX

infrastructure includes additional facilities to enable this coordination.



State Object Support for dynamic proxy MBean

com.ibm.websphere.management.dynamicproxy.StateObject class: The MBean provider extends the StateObject abstract class. Specify the subclass of the StateObject class in order for the JMX runtime to instantiate it before the dynamic proxy MBean completes its initialization. The JMX runtime attaches it to the dynamic proxy Invocation Handler interface to keep track of the current state of the dynamic proxy before and after the MBean method is executed. The JMX runtime also attaches the StateObject class to the Result Aggregation interface class as well as the Event Handler interface class to allow appropriate aggregation application.

Result Aggregation Handler Support interface

com.ibm.websphere.management.dynamicproxy.AggregationHandler class: The result aggregation handler support interface defines the method an MBean provider uses to handle result aggregation in a dynamic proxy enabled WebSphere Application Server for z/OS MBean. Specify the aggregationHandlerClass attribute on the MBeanDescriptor MBean xml tag. Implement the interface for MBean methods that use the multicall proxyInvokeType option and that return a return value. The interface determines the method for which this aggregation is to be processed. It then properly aggregates all servant MBean results that the servant processes pass back to the control process, and then compiles a single result to be returned to the caller.

Event Aggregation Handler Support interface

com.ibm.websphere.management.dynamicproxy.EventHandler interface class: The event agregation handler support interface defines the method an MBean provider uses to handle event aggregation in a dynamic proxy enabled WebSphere Application Server for z/OS MBean. Specify the eventHandlerClass attribute on the MBeanDescriptor MBean xml tag. The interface handles all incoming servant MBean events and aggregates them to filter out duplicate events from multiple servant MBeans. It sends one event back to the listener of the dynamic proxy MBean. The interface adjusts the current dynamic proxy MBean state according to the MBean provider's requirements.

Invocation Handler Support interface

com.ibm.websphere.management.dynamicproxy.InvocationHandler class: The invocation handler support interface defines the preInvoke and postInvoke methods that a WebSphere Application Server for z/OS dynamic proxy MBean implements when it requires state management information. The MBean uses the information to coordinate with the servant MBeans in cases where the multicall invocation type is required. Specify the invocationHandlerClass attribute on the MBeanDescriptor MBean xml tag. Use the interface for dynamic proxy MBeans which require state management before and after invoking a method which changes its state.

User MBean

The user MBean resides in the servant process and handles requests through its dynamically created proxy MBean, which runs inside the control process. An MBean provider can package handlers with the user MBean so that the provider hooks in his own specialized processing for the following situations:

- Result aggregation
- Event aggregation
- Invocation handling
- State management of objects

Example: StateSampleMBean

Use this example to guide you in developing user MBeans that work for the WebSphere Application Server on both the distributed platforms and the z/OS platform. The example uses all the special handlers to show its dynamic proxy MBean responsibilities and capabilities. The StateSampleMBean example keeps track of its state and generates state change events when it invokes setter methods.

MBeanDescriptor

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE MBean SYSTEM "MbeanDescriptor.dtd">
<MBean type="SampleStateMBean"
  aggregationHandlerClass="com.ibm.ws390.sample.SampleStateAggregationHandler"
  eventHandlerClass="com.ibm.ws390.sample.SampleStateEventHandler"
  invocationHandlerClass="com.ibm.ws390.sample.SampleStateInvocationHandler"
  stateObjectClass="com.ibm.ws390.sample.SampleState"
  version="5.0"
  platform="dynamicproxy"
  description="Sample State MBean for the documentation example.">

  <attribute description="The name of the MBean."
    getMethod="getMBeanName" name="mbeanName" type="java.lang.String"
    proxyInvokeType="unicall"/>
  <attribute description="The state of the MBean." name="state"
    getMethod="getState" setMethod="setState" type="java.lang.String"
    proxyInvokeType="multicall" proxySetterInvokeType="multicall"/>
  <operation
    description="Initialize the State MBean."
    impact="ACTION" name="initializeState" role="operation"
    targetObjectType="objectReference" type="void" proxyInvokeType="multicall">
    <signature>
      <parameter description="The name of the MBean."
        name="mbeanName" type="java.lang.String"/>
      <parameter description="The initial state of the MBean."
        name="mbeanName" type="java.lang.String"/>
    </signature>
  </operation>

  <notification name="j2ee.state.starting" severity="6" log="false"
                description="This sample state MBean is in starting state.">
      <notificationType>j2ee.state.starting</notificationType>
```

```
  </notification>
  <notification name="j2ee.state.running" severity="6" log="false"
                description="This sample state MBean is in running state.">
      <notificationType>j2ee.state.running</notificationType>
  </notification>
  <notification name="j2ee.state.stopping" severity="6" log="false"
                description="This sample state MBean is in stopping state.">
      <notificationType>j2ee.state.stopping</notificationType>
  </notification>
  <notification name="j2ee.state.stopped" severity="6" log="false"
                description="This sample state MBean is in stopped state.">
      <notificationType>j2ee.state.stopped</notificationType>
  </notification>
</MBean>
```

SampleState implementation

```
package com.ibm.ws390.sample;

import com.ibm.ejs.ras.Tr;
import com.ibm.ejs.ras.TraceComponent;
import java.io.Serializable;
import com.ibm.websphere.management.dynamicproxy.StateObject;

public class SampleState extends StateObject {

    private static TraceComponent tc =
    Tr.register(SampleState.class,"SampleState",null);

    // Package protected STATE constants.
    static final String STATE_STARTING = "j2ee.state.starting";
    static final String STATE_RUNNING  = "j2ee.state.running";
    static final String STATE_STOPPING = "j2ee.state.stopping";
    static final String STATE_STOPPED  = "j2ee.state.stopped";

    // Dynamicproxy State is initialized with STOPPED state.
    private String state = STATE_STOPPED;

    public SampleState() {
        if (tc.isEntryEnabled()) Tr.entry(tc,"<init>");

        // State is initialized during "state" initialization above,
        // but can also be initialized here in the constructor as well.
        /*
        state = "WebSphere for z/OS App Server ready for e-business";
        */

        if (tc.isEntryEnabled()) Tr.exit(tc,"<init>");
    }

    public synchronized String getState() {
        if (tc.isEntryEnabled()) Tr.entry(tc,"getState");
        if (tc.isEntryEnabled()) Tr.exit(tc,"getState",state);
        return state;
    }

    public synchronized void setState(String state) {
        if (tc.isEntryEnabled()) Tr.entry(tc,"setState",state);
        this.state = state;
        if (tc.isEntryEnabled()) Tr.exit(tc,"setState");
    }

    public synchronized String getStateObjectInfo() {
        return state;
    }
}
```

SampleStateAggregationHandler implementation

```
package com.ibm.ws390.sample;

import com.ibm.websphere.management.dynamicproxy.AggregationHandler;
import com.ibm.websphere.management.dynamicproxy.StateObject;

import com.ibm.ejs.ras.Tr;
import com.ibm.ejs.ras.TraceComponent;

public class SampleStateAggregationHandler implements AggregationHandler {

    private static TraceComponent tc =
    Tr.register(SampleStateAggregationHandler.class,"SampleState",null);

    /**
     * Return an aggregated result from a multicall Mbean operation which
     * compiles through all servant MBeans' results and returns a respective
     * single return value for an invoked method.
     *
     * @param  methodName           MBean method name
     * @param  params               MBean method parameters
     * @param  signatures           MBean method signatures
     * @param  servantMBeanResults  Result of each servant MBean instances
     *                              invoked by the dynamicproxy multicast
     *                              invocation.
     *                              Note: this value can be "null" OR can be
     *                              an array of "null"s in case return value
     *                              of the method is "void." Implementation
     *                              of this method MUST handle this case to
     *                              avoid a <code>NullPointerException</code>.
     * @param stateObject
     *        MBean provider provided <code>StateObject</code> used by
     *        dynamicproxy MBean in CR to manage its state. Note: this object
     *        MAY BE null if "stateObjectClass" was not specified OR internal
     *        error occurred during initialization of this dynamicproxy MBean.
     *        Implmentation MUST properly handle "null" input.
     *
     * @return aggregated result as defined by MBean xml for specified
     *         MBean operation.
     */
    public Object aggregateResults(String methodName,
                                   Object[] params,
                                   String[] signatures,
                                   Object[] servantMBeanResults,
                                   StateObject stateObject) {

       if (tc.isEntryEnabled()) Tr.entry(tc,"aggregateResults",methodName);

       // As you can see from the MBeanDescriptor of SampleStateMBean,
       // it declares the following four methods:
       // 1. String getMBeanName()         [proxyInvokeType == unicall]
       // 2. String getState()             [proxyInvokeType == multicall]
       // 3. void setState(String)         [proxyInvokeType == multicall]
       // 4. void initializeState()        [proxyInvokeType == multicall]
       //
       // Looking at the above methods, only method that requires aggregation
       // is #2 getState method which is a multicall MBean operation AND
       // it returns a value that can be aggregated.
       //
       // In this example, we simply take each servants' getState MBean
       // request result and concatenate them into one long String that
       // displays each servants' state.
       if (methodName.equals("getState")) {
           StringBuffer stateBuf = new StringBuffer();

           for (int i=0; i<servantMBeanResults.length; i++) {
               stateBuf.append("SERVANT #" + i + " state ==" +
```

```
                                servantMBeanResults[i] + "|== ");
            }
            return stateBuf.toString();
        }
        // If we also had an example method which returns say an int,
        // getNumberOfMBeans(), it can take the similar approach
        // and to add each servants' getNumberOfMBeans() result together here.
        /* example added for non-existent method: int getNumberOfMBeans()
        else if (methodName.equals("getNumberOfMBeans")) {
            int aggregatedResult = 0;

            for (int i=0; i<servantMBeanResults.length; i++) {
                aggregatedResult += (int) servantMBeanResults[i];
            }
            return aggregatedResult;
        }
        */

        return methodName + " is NOT handled by " + getClass().getName() + "!";
    }

}
```

Chapter 8. Working with server configuration files

Application server configuration files define the available application servers, their configurations, and their contents.

You should periodically save changes to your administrative configuration. You can change the default locations of configuration files, as needed.

1. Edit configuration files. The master repository is comprised of .xml configuration files. You can edit configuration files using the administrative console, scripting, wsadmin commands, programming, or by editing a configuration file directly.
2. Save changes made to configuration files. Using the console, you can save changes as follows:
   a. Click **Save** on the taskbar of the administrative console.
   b. Put a checkmark in the **Synchronize changes with Nodes** check box.
   c. On the Save page, click **Save**.
3. Handle temporary configuration files resulting from a session timing out.
4. Change the location of temporary configuration files.
5. Change the location of backed-up configuration files.
6. Change the location of temporary workspace files.
7. Back up and restore configurations.

Related reference

Example: Setting custom properties for an HTTP transport

Configuration documents

WebSphere Application Server stores configuration data for servers in several documents in a cascading hierarchy of directories. The configuration documents describe the available application servers, their configurations, and their contents. Most configuration documents have XML content.

Hierarchy of directories of documents

The cascading hierarchy of directories and the documents' structure support multi-node replication to synchronize the activities of all servers in a cell. In a Network Deployment environment, changes made to configuration documents in the cell repository, are automatically replicated to the same configuration documents that are stored on nodes throughout the cell.

At the top of the hierarchy is the **cells** directory. It holds a subdirectory for each cell. The names of the cell subdirectories match the names of the cells. For example, a cell named *cell1* has its configuration documents in the subdirectory *cell1*.

On the Network Deployment node, the subdirectories under the cell contain the entire set of documents for every node and server throughout the cell. On other nodes, the set of documents is limited to what applies to that specific node. If a configuration document only applies to *node1*, then that document exists in the configuration on *node1* and in the Network Deployment configuration, but not on any other node in the cell.

Each cell subdirectory has the following files and subdirectories:

- The `cell.xml` file, which provides configuration data for the cell
- Files such as `security.xml`, `virtualhosts.xml`, `resources.xml`, and `variables.xml`, which provide configuration data that applies across every node in the cell
- The **clusters** subdirectory, which holds a subdirectory for each cluster defined in the cell. The names of the subdirectories under clusters match the names of the clusters.

  Each cluster subdirectory holds a cluster.xml file, which provides configuration data specifically for that cluster.
- The **nodes** subdirectory, which holds a subdirectory for each node in the cell. The names of the nodes subdirectories match the names of the nodes.

  Each node subdirectory holds files such as `variables.xml` and `resources.xml`, which provide configuration data that applies across the node. Note that these files have the same name as those in the containing cell's directory. The configurations specified in these node documents override the configurations specified in cell documents having the same name. For example, if a particular variable is in both cell- and node-level `variables.xml` files, all servers on the node use the variable definition in the node document and ignore the definition in the cell document.

  Each node subdirectory holds a subdirectory for each server defined on the node. The names of the subdirectories match the names of the servers. Each server subdirectory holds a `server.xml` file, which provides configuration data specific to that server. Server subdirectories might hold files such as `security.xml`, `resources.xml` and `variables.xml`, which provide configuration data that applies only to the server. The configurations specified in these server documents override the configurations specified in containing cell and node documents having the same name.
- The **applications** subdirectory, which holds a subdirectory for each application deployed in the cell. The names of the applications subdirectories match the names of the deployed applications.

  Each deployed application subdirectory holds a `deployment.xml` file that contains configuration data on the application deployment. Each subdirectory also holds a **META-INF** subdirectory that holds a J2EE application deployment descriptor file as well as IBM deployment extensions files and bindings files. Deployed application subdirectories also hold subdirectories for all .war and entity bean .jar files in the application. Binary files such as .jar files are also part of the configuration structure.

An example file structure is as follows:

```
cells
  cell1
     cell.xml resources.xml virtualhosts.xml variables.xml security.xml
     nodes
        nodeX
           node.xml variables.xml resources.xml serverindex.xml
           serverA
              server.xml variables.xml
           nodeAgent
              server.xml variables.xml
        nodeY
           node.xml variables.xml resources.xml serverindex.xml
     applications
        sampleApp1
           deployment.xml
           META-INF
              application.xml ibm-application-ext.xml ibm-application-bnd.xml
        sampleApp2
```

```
deployment.xml
META-INF
   application.xml ibm-application-ext.xml ibm-application-bnd.xml
```

Changing configuration documents

You can use one of the administrative tools (console, wsadmin, Java APIs) to modify configuration documents or edit them directly. It is preferable to use the administrative console because it validates changes made to configurations. ″“Configuration document descriptions”″ states whether you can edit a document using the administrative tools or must edit it directly.

Related tasks

Chapter 8, “Working with server configuration files,” on page 275

Related reference

“Configuration document descriptions”

Configuration document descriptions

Most configuration documents have XML content. The table below describes the documents and states whether you can edit them using an administrative tool or must edit them directly.

If possible, edit a configuration document using the administrative console because it validates any changes that you make to configurations. You can also use one of the other administrative tools (wsadmin or Java APIs) to modify configuration documents. Using the administrative console or wsadmin scripting to update configurations is less error prone and likely quicker and easier than other methods.

However, you cannot edit some files using the administrative tools. Configuration files that you must edit manually have an X in the **Manual editing required** column in the table below.

Document descriptions

Configuration file	Locations	Purpose	Manual editing required
admin-authz.xml	config/cells/*cell_name*/	Define a role for administrative operation authorization.	X
app.policy	config/cells/*cell_name*/nodes/*node_name*/	Define security permissions for application code.	X
cell.xml	config/cells/*cell_name*/	Identify a cell.	
cluster.xml	config/cells/*cell_name*/clusters/*cluster_name*/	Identify a cluster and its members and weights. This file is only available with the Network Deployment product.	

deployment.xml	config/cells/*cell_name*/applications/*application_name*/	Configure application deployment settings such as target servers and application-specific server configuration.	
filter.policy	config/cells/*cell_name*/	Specify security permissions to be filtered out of other policy files.	X
integral-jms-authorizations.xml	config/cells/*cell_name*/	Provide security configuration data for the integrated messaging system.	X
library.policy	config/cells/*cell_name*/nodes/*node_name*/	Define security permissions for shared library code.	X
multibroker.xml	config/cells/*cell_name*/	Configure a data replication message broker.	
namestore.xml	config/cells/*cell_name*/	Provide persistent name binding data.	X
naming-authz.xml	config/cells/*cell_name*/	Define roles for a naming operation authorization.	X
node.xml	config/cells/*cell_name*/nodes/*node_name*/	Identify a node.	
pmirm.xml	config/cells/*cell_name*/	Configure PMI request metrics.	X
resources.xml	config/cells/*cell_name*/ config/cells/*cell_name*/nodes/*node_name*/ config/cells/*cell_name*/nodes/*node_name*/servers/*server_name*/	Define operating environment resources, including JDBC, JMS, JavaMail, URL, JCA resource providers and factories.	
security.xml	config/cells/*cell_name*/	Configure security, including all user ID and password data.	
server.xml	config/cells/*cell_name*/nodes/*node_name*/servers/*server_name*/	Identify a server and its components.	

serverindex.xml	config/cells/*cell_name*/nodes/*node_name*/	Specify communication ports used on a specific node.	
spi.policy	config/cells/*cell_name*/nodes/*node_name*/	Define security permissions for service provider libraries such as resource providers.	X
variables.xml	config/cells/*cell_name*/ config/cells/*cell_name*/nodes/*node_name*/ config/cells/*cell_name*/nodes/*node_name*/servers/*server_name*/	Configure variables used to parameterize any part of the configuration settings.	
virtualhosts.xml	config/cells/*cell_name*/	Configure a virtual host and its MIME types.	

Object names

When you create a new object using the administrative console or a wsadmin command, you often must specify a string for a name attribute. Most characters are allowed in the name string. However, the name string cannot contain the following characters:

/	forward slash
\	backslash
*	asterisk
,	comma
:	colon
;	semi-colon
=	equal sign
+	plus sign
?	question mark
|	vertical bar
<	left angle bracket
>	right angle bracket
&	ampersand (and sign)
%	percent sign
'	single quote mark
"	double quote mark
]]>	
.	period (not valid if first character; valid if a later character)

Configuration repositories

A configuration repository stores configuration data. By default, configuration repositories reside in the *config* subdirectory of the product installation root directory.

A cell-level repository stores configuration data for the entire cell and is managed by a file repository service that runs in the deployment manager. The deployment manager and each node have their own repositories. A node-level repository stores configuration data needed by processes on that node and is accessed by the node agent and application servers on that node.

When you change a WebSphere Application Server configuration by creating an application server, installing an application, changing a variable definition or the like, and then save the changes, the cell-level repository is updated. The file synchronization service distributes the changes to the appropriate nodes.

Related tasks

Chapter 8, "Working with server configuration files," on page 275

Handling temporary configuration files resulting from session timeout

If the console is not used for 15 minutes or more, the session times out. The same thing happens if you close the browser window without saving the configuration file. Changes to the file are saved to a temporary file when the session times out, after 15 minutes.

When a session times out, the configuration file in use is saved under the userid/timeout directory under the ServletContext's temp area. This is value of the javax.servlet.context.tempdir attribute of the ServletContext. By default, it is:
install_root/temp/hostname/Administration/admin/admin.war

You can change the temp area by specifying it as a value for the tempDir init-param of the action servlet in the deployment descriptor (web.xml) of the administrative application.

The next time you log on to the console, you are prompted to load the saved configuration file. If you decide to load the saved file:

1. If a file with the same name exists in the *install_root*/config directory, that file is moved to the userid/backup directory in the temp area.
2. The saved file is moved to the *install_root*/config directory.
3. The file is then loaded.

If you decide not to load the saved file, it is deleted from the userid/timeout directory in the temp area.

The configuration file is also saved automatically when the same user ID logs into the non-secured console again, effectively starting a different session. This process is equivalent to forcing the existing user ID out of session, similar to a session timing out.

Related tasks

Chapter 8, "Working with server configuration files," on page 275

Changing the location of temporary configuration files

The configuration repository uses copies of configuration files and temporary files while processing repository requests. It also uses a back-up directory while managing the configuration. You can change the default locations of these files from the configuration directory to a directory of your choice using system variables or the administrative console.

The default location for the configuration temporary directory is CONFIG_ROOT/temp. Change the location by doing either of the following:

- Set the system variable *was.repository.temp* to the location you want for the repository temporary directory. Set the system variable when launching a Java process using the -D option. For example, to set the default location of the repository temporary directory, use the following option:

  ```
  -Dwas.repository.temp=%CONFIG_ROOT%/temp
  ```

- Use the administrative console to change the location of the temporary repository file location for each server configuration. For example, on the Network Deployment product, to change the setting for a deployment manager, do the following:
  1. Click **System Administration > Deployment Manager** in the navigation tree of the administrative console. Then, click **Administration Services**, **Repository Service**, and **Custom Properties**.
  2. On the Properties page, click **New**.
  3. On the settings page for a property, define a property for the temporary file location. The key for this property is `was.repository.temp`. The value can include WebSphere Application Server variables such as `${WAS_TEMP_DIR}/config`. Then, click **OK**.

The system property set using the first option takes precedence over the configuration property set using the second option.

Related tasks

Chapter 8, "Working with server configuration files," on page 275

Changing the location of backed-up configuration files

During administrative processes like adding a node to a cell or updating a file, configuration files are backed up to a back-up location. The default location for the back-up configuration directory is CONFIG_ROOT/backup. Change the location by doing either of the following:

- Set the system variable *was.repository.backup* to the location you want as the repository back-up directory. Set the system variable when launching a Java process using the -D option. For example, to set the default location of the repository back-up directory, use the following option:

  ```
  -Dwas.repository.backup=%CONFIG_ROOT%/backup
  ```

- Use the administrative console to change the location of the repository back-up directory for each server configuration. For example, on the Network Deployment product, do the following to change the setting for a deployment manager:
  1. Click **System Administration > Deployment Manager** in the navigation tree of the administrative console. Then, click **Administration Services**, **Repository Service**, and **Custom Properties**.
  2. On the Properties page, click **New**.
  3. On the settings page for a property, define a property for the back-up file location. The key for this property is `was.repository.backup`. The value can

include WebSphere Application Server variables such as `${WAS_TEMP_DIR}/backup`. Then, click **OK**.

The system property set using the first option takes precedence over the configuration property set using the second option.

Related tasks

Chapter 8, "Working with server configuration files," on page 275

Changing the location of temporary workspace files

The administrative console workspace allows client applications to navigate the configuration. Each workspace has its own repository location defined either in the system property or the property passed to a workspace manager when creating the workspace: workspace.user.root or workspace.root, which is calculated as %workspace.root%/*user_ID*/workspace/wstemp.

The default workspace root is calculated based on the user installation root: %user.install.root%/wstemp. You can change the default location of temporary workspace files by doing either of the following:

- Change the setting for the system variable *workspace.user.root* or *workspace.root* so its value is no longer set to the default location. Set the system variable when launching a Java process using the -D option. For example, to set the default location the full path of the root of all users' directories, use the following option:

  `-Dworkspace.user.root=`*`full_path_for_root_of_all_user_directories`*
- Change the setting it at the user level with the programming APIs. When you create the workspace, set the WorkSpaceManager.WORKSPACE_USER_ROOT property on the API.

Related tasks

Chapter 8, "Working with server configuration files," on page 275

Backing up and restoring administrative configurations

WebSphere Application Server represents its administrative configurations as XML files. You should back up configuration files on a regular basis.

1. Synchronize administrative configuration files.
   a. Click **System Administration > Nodes** in the console navigation tree to access the Nodes page.
   b. Click **Full Resynchronize**. The resynchronize operation resolves conflicts among configuration files and can take several minutes to run.
2. Run the backupConfig command to back up configuration files.
3. Run the restoreConfig command to restore configuration files. Specify backup files that do not contain invalid or inconsistent configurations.

Related concepts

"Configuration documents" on page 275

Server configuration files: Resources for learning

Use the following links to find relevant supplemental information about administering WebSphere Application Server server configuration files. 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:
- "Server configuration files: Resources for learning" on page 282
- "Server configuration files: Resources for learning" on page 282

Programming instructions and examples
- WebSphere Application Server education

Administration
- Listing of all IBM WebSphere Application Server Redbooks
- System Administration for WebSphere Application Server V5 -- Part 1: Overview of V5 Administration

Related tasks

Chapter 8, "Working with server configuration files," on page 275

Backing up the WebSphere for z/OS system

Use the following guidelines to back up parts of your WebSphere for z/OS system.

1. Back up the RMDATA log for Resource Recovery Service (RRS). Otherwise, a failure could force you to do a cold start of RRS.
2. Set the ARCHIVE log retention period to one day.
3. Incorporate the following items in your normal backup procedures:
   - WebSphere for z/OS procedure libraries.
   - WebSphere for z/OS load libraries.
   - The directory where WebSphere for z/OS run-time information is written. The default is */WebSphere/V5R0M0*.
4. Back up your own application executables, databases, and bindings.
5. If you wish to back up a single server, you can use the export/import function in the Administrative Console. For details on how to do this, see the assembling applications information.

Chapter 9. Managing administrative agents

After you install and set up the Network Deployment product, you probably will not need to change the configuration of its components much, if at all. You might want to manage configuration data stored in files by configuring a file synchronization service (part of managing nodes in step 5). However, you will mainly need to monitor and control incorporated nodes, and the resources on those nodes, using the administrative console or other administrative tools.

1. Use the settings page for an administrative service to configure administrative services.
2. Use the settings page for a repository service to configure administrative repositories.
3. Configure cells.
4. Configure deployment managers.
5. Manage nodes.
6. Manage node agents.
7. Configure remote file services.
8. 5.0.1 + Configuring location service daemons.

Related concepts

"Configuration repositories" on page 280

"Configuration documents" on page 275

Related tasks

Establishing multimachine environments

Cells

Cells are arbitrary, logical groupings of one or more nodes in a WebSphere Application Server distributed network.

A cell is a configuration concept, a way for administrators to logically associate nodes with one another. Administrators define the nodes that make up a cell according to whatever criteria make sense in their organizational environments.

Administrative configuration data is stored in XML files. A cell retains master configuration files for each server in each node in the cell. Each node and server also have their own local configuration files. Changes to a local node or server configuration file are temporary, if the server belongs to the cell. While in effect, local changes override cell configurations. Changes at the cell level to server and node configuration files are permanent. Synchronization occurs at designated events, such as when a server starts.

Related concepts

"Node" on page 290

Configuring cells

When you installed the WebSphere Application Server Network Deployment product, a cell was created. A cell provides a way to group one or more nodes of your Network Deployment product. You probably will not need to reconfigure the cell. To view information about and manage a cell, use the settings page for a cell.

1. Access the settings page for a cell. Click **System Administration > Cell** from the navigation tree of the administrative console.
2. If the protocol that the cell uses to retrieve information from a network is not appropriate for your system, select the appropriate protocol. By default, a cell uses Transmission Control Protocol (TCP). If you want the cell to use User Diagram Protocol, select **UDP** from the drop-down list for **Cell Discovery Protocol** on the settings page for the cell. It is unlikely that you will need to change the cell's protocol configuration from TCP.
3. Specify an end point to hold the discovery address. An end point designates a host name and port. You can specify any string; for example, `my_cell_endpoint`. It is unlikely that you will need to change the cell's end point configuration.
4. Click **Properties** and define any name-value pairs needed by your deployment manager.
5. When you installed the WebSphere Application Server Network Deployment product, a node was added to the cell. You can add additional nodes on the Node page. Click **Nodes** to access the Node page, which you use to manage nodes.

Related concepts

"Cells" on page 285

"Deployment managers" on page 287

"Node" on page 290

Related reference

End point collection
Use this page to view and manage communication end points used by run-time components running within a process. End points provide host and port specifications for a server.

Cell settings

Use this page to set the discovery protocol and address end point for an existing cell. A cell is a configuration concept, a way for an administrator to logically associate nodes according to whatever criteria make sense in the administrator's organizational environment.

To view this administrative console page, click **System Administration > Cell**.

Related concepts

"Cells" on page 285

Related tasks

"Configuring cells" on page 285

Related reference

"Administrative console buttons" on page 9

"Administrative console page features" on page 11

Custom property collection
Use this page to view and manage arbitrary name-value pairs of data, where the name is a property key and the value is a string value that can be used to set internal system configuration properties.

"Node collection" on page 292

Name

Specifies the name of the existing cell.

Data type String

Short Name
Specifies the short name of the cell. The name is 1-8 characters, alpha-numeric or national language. It cannot start with a numeric.
The short name property is read only. It was defined during installation and customization.

Cell Discovery Protocol
Specifies the protocol that the cell follows to retrieve information from a network. Select from one of two protocol options:
UDP User Datagram Protocol (UDP)
TCP Transmission Control Protocol (TCP)

Data type	String
Default	TCP

Discovery Address Endpoint Name
Specifies the name of the end point that contains the discovery address.

Data type	String

Deployment managers

Deployment managers are administrative agents that provide a centralized management view for all nodes in a cell, as well as management of clusters and workload balancing of application servers across one or several nodes in some editions. WebSphere Application Server for z/OS uses WLM as the primary vehicle for workload balancing

A deployment manager hosts the administrative console. A deployment manager provides a single, central point of administrative control for all elements of the entire WebSphere Application Server distributed cell.

Related tasks

"Configuring deployment managers"

Configuring deployment managers

When you installed the WebSphere Application Server Network Deployment product, a deployment manager was created. A deployment manager provides a single, central point of administrative control for all elements in a WebSphere Application Server distributed cell. You probably will not need to reconfigure the deployment manager. To view information about and manage a deployment manager, use the settings page for a deployment manager.

1. Access the settings page for a deployment manager. Click **System Administration > Deployment Manager** from the navigation tree of the administrative console.
2. Change the default name as desired in the **Name** field, and click **OK**.
3. Configure the deployment manager as desired by clicking on a property such as **Custom Services** and specifying settings on the resulting pages. A deployment manager is like an application server and you can configure a deployment manager in a manner similar to the way you configure an application server.

Related concepts

"Deployment managers"

Running the deployment manager with a non-root user ID

By default, the Network Deployment product on Linux and UNIX platforms uses the root user to run the deployment manager, which is the `dmgr` process. You can use a non-root user to run the deployment manager.

If global security is enabled, the user registry must not be Local OS. Using the Local OS user registry requires the dmgr process to run as root.

For the steps that follow, assume that:
- `wasadmin` is the user to run all servers
- `wasnode` is the node name
- `wasgroup` is the user group
- `dmgr` is the deployment manager
- `/opt/WebSphere/DeploymentManager` is the installation root

To configure a user to run the deployment manager, complete the following steps:

1. Log on to the Network Deployment system as root.
2. Create user `wasadmin` with primary group `wasgroup`.
3. Reboot the machine on a Windows platform. Log off and back on a Linux or UNIX-based platform.
4. Start the deployment manager process with the `startManager.sh` (or `startManager.bat`) scriptSTART *dmgr_proc_name* command .

   From the `/bin` directory of the installation root:

   ```
   startManager.sh
   ```
5. Stop all servers, including the server1 and jmsserver processes.

   Use the `stopServer.sh` (or `stopServer.bat`) scriptSTOP *appserver_proc_name* command.

   From the `/bin` directory of the installation root:

   ```
   stopServer.sh server1
   stopServer.sh jmsserver
   ```
6. Define the `dmgr` process to run as a `wasadmin` process.

   Click **System Administration > DeploymentManager > Process Definition > Process Execution** and change these values:

Property	Value
Run As User	wasadmin
Run As Group	wasgroup
UMASK	002

7. Save the configuration.
8. Stop the deployment manager with the `stopManager.sh` (or `stopManager.sh`) scriptSTOP *dmgr_proc_name* command.

   From the `/bin` directory of the installation root:

   ```
   stopManager.sh
   ```
9. As root, use operating system tools to change file permissions on Linux and UNIX-based platforms:

   ```
   chgrp wasgroup /opt/WebSphere
   chgrp wasgroup /opt/WebSphere/DeploymentManager
   chgrp -R wasgroup /opt/WebSphere/DeploymentManager/config
   chgrp -R wasgroup /opt/WebSphere/DeploymentManager/logs
   chgrp -R wasgroup /opt/WebSphere/DeploymentManager/wstemp
   ```

```
chgrp -R wasgroup /opt/WebSphere/DeploymentManager/installedApps
chgrp -R wasgroup /opt/WebSphere/DeploymentManager/temp
chgrp -R wasgroup /opt/WebSphere/DeploymentManager/tranlog
chmod g+w /opt/WebSphere
chmod g+w /opt/WebSphere/DeploymentManager
chmod -R g+w  /opt/WebSphere/DeploymentManager/config
chmod -R g+w /opt/WebSphere/DeploymentManager/logs
chmod -R g+w /opt/WebSphere/DeploymentManager/wstemp
chmod -R g+w /opt/WebSphere/DeploymentManager/installedApps
chmod -R g+w /opt/WebSphere/DeploymentManager/temp
chmod -R g+w /opt/WebSphere/DeploymentManager/tranlog
```

10. Log in as `wasadmin` on the Network Deployment node.
11. From wasadmin, start the deployment manager process with the `startManager.sh` (or `startManager.bat`) scriptSTART *dmgr_proc_name* command .

    From the `/bin` directory of the installation root:

    ```
    startManager.sh
    ```

You can start a deployment manager process from a non-root user.

Related tasks

Running an Application Server with a non-root user ID and the nodeagent as root
Use this task to configure an Application Server to run as non-root.

Running an Application Server and nodeagent with a non-root user ID

Deployment manager settings

Use this page to name a deployment manager, to stop its running, and to link to other pages which you can use to define additional properties for the deployment manager. A deployment manager provides a single, central point of administrative control for all elements of the entire WebSphere Application Server distributed cell.

To view this administrative console page, click **System Administration > Deployment Manager**.

Related concepts

"Cells" on page 285

"Deployment managers" on page 287

Related tasks

"Configuring deployment managers" on page 287

Related reference

"Administrative console buttons" on page 9

"Administrative console page features" on page 11

"Administration service settings" on page 293

Custom service collection
Use this page to view a list of services available to the application server and to see whether the services are enabled. A custom service provides the ability to plug into a WebSphere application server and define code that runs when the server starts or shuts down.

End point collection
Use this page to view and manage communication end points used by run-time components running within a process. End points provide host and port specifications for a server.

Object Request Broker service settings in administrative console
Use this page to configure the Java Object Request Broker (ORB) service.

Process definition settings
Use this page to view or change settings for a process definition, which provides command-line information for starting or initializing starting, initializing, or stopping a process.

Name
Specifies a logical name for the deployment manager. The name must be unique within the cell.

Data type String

Process ID
Specifies a string identifying the process.

Data type String

Cell Name
Specifies the name of the cell for the deployment manager. The default is the name of the host computer on which the deployment manager is installed with *Network* appended.

Data type String
Default *host_name*Network

Node Name
Specifies the name of the node for the deployment manager. The default is the name of the host computer on which the deployment manager is installed with *Manager* appended.

Data type String
Default *host_name*Manager

State
Indicates the state of the deployment manager. The state is *Started* when the deployment manager is running and *Stopped* when it is not running.

Data type String
Default Started

Node

A node is a logical grouping of managed servers.

A node usually corresponds to a physical computer system with a distinct IP host address. Node names usually are identical to the host name for the computer.

A node agent manages all WebSphere Application Server servers on a node. The node agent represents the node in the management cell.

Related tasks

"Managing nodes" on page 291

Chapter 9, "Managing administrative agents," on page 285

Managing nodes

A node is a grouping of managed servers. To view information about and manage nodes, use the Nodes page. To access the Nodes page, click **System Administration > Nodes** in the console navigation tree.

1. Add a node.
   a. Ensure that an application server is running on the remote host for the node that you are adding. Also ensure that the application server has a SOAP connector on the port for the host.
   b. Go to the Nodes page and click **Add Node**. On the Add Node page, specify a host name and SOAP connector port for the deployment manager, then click **OK**.

   The node is added to the WebSphere Application Server environment and the name of the node appears in the collection on the Nodes page.
2. If the discovery protocol that a node uses is not appropriate for the node, select the appropriate protocol. On the Nodes page, click on the node to access the settings for the node. Select a value for **Discovery Protocol**. By default, a node uses Transmission Control Protocol (TCP). You will likely not need to change a node's protocol configuration from TCP. However, if you do need to change the discovery protocol value, here are some guidelines:
   - For a managed process, use **multicast**. A ManagedProcess supports multicast only because multicasting allows all application servers in one node to listen to one port instead of to one port for each server. A benefit of using multicast is that you do not have to configure the discovery port for each application server or prevent conflicts in ports. A drawback of using multicast is that you must ensure that your machine is connected to the network when application servers (not including the node agent) launch because a multicast address is shared by the network and not by the local machine. If your machine is not connected to the network when application servers launch, the multicast address will not be shared with the application servers.
   - For a node agent or deplyment manager, use **TCP** or **UDP**. Do not use **multicast**.
3. Define a custom property for a node.
   a. On the Nodes page, click on the node for which you want to define a custom property.
   b. On the settings for the node, click **Custom Properties**.
   c. On the Property collection page, click **New**.
   d. On the settings page for a property instance, specify a name-value pair and a description for the property, then click **OK**.
4. If you added a node or changed a node's configuration, synchronize the node's configuration. On the Node Agents page, ensure that the node agent for the node is running. Then, on the Nodes page, put a checkmark in the check box beside the node whose configuration files you want to synchronize and click **Synchronize** or **Full Resynchronize**.

   Clicking either button sends a request to the node agent for that node to perform a configuration synchronization immediately, instead of waiting for the periodic synchronization to occur. This is important if automatic configuration synchronization is disabled, or if the synchronization interval is set to a long time, and a configuration change has been made to the cell repository that needs to be replicated to that node. Settings for automatic synchronization are on the File Synchronization Service page.

Synchronize requests that a node synchronization operation be performed using the normal synchronization optimization algorithm. This operation is fast but might not fix problems from manual file edits that occur on the node. So it is still possible for the node and cell configuration to be out of synchronization after this operation is performed.

Full Resynchronize clears all synchronization optimization settings and performs configuration synchronization anew, so there will be no mismatch between node and cell configuration after this operation is performed. This operation can take longer than the **Synchronize** operation.

5. Stop servers on a node. On the Nodes page, put a checkmark in the check box beside the node whose servers you want to stop running and click **Stop**.
6. Remove a node. On the Nodes page, put a checkmark in the check box beside the node you want to delete and click **Remove Node**.

Related concepts

"Node" on page 290

Node collection

Use this page to manage nodes in the WebSphere environment. Nodes group managed servers.

To view this administrative console page, click **System Administration > Nodes**.

Related concepts

"Node" on page 290

Related tasks

"Managing nodes" on page 291

Related reference

"Administrative console buttons" on page 9

"Administrative console filter settings" on page 16

"Administrative console preference settings" on page 16

"Administrative console page features" on page 11

Name

Specifies a name for a node that is unique within the cell.

A node name usually is identical to the host name for the computer. That is, a node usually corresponds to a physical computer system with a distinct IP host address.

Node settings

Use this page to view or change the configuration or topology settings for a node instance.

To view this administrative console page, click **System Administration > Nodes >***node_name*.

Related concepts

"Node" on page 290

Related tasks

"Managing nodes" on page 291

Related reference

"Administrative console buttons" on page 9

"Administrative console page features" on page 11

Custom property collection

Use this page to view and manage arbitrary name-value pairs of data, where

the name is a property key and the value is a string value that can be used to set internal system configuration properties.

Name:

Specifies a logical name for the node. The name must be unique within the cell.

A node name usually is identical to the host name for the computer.

Data type	String

Short Name:

Specifies the name of a node. The name is 1-8 characters, alpha-numeric or national language. It cannot start with a numeric.

The short name property is read only. It was defined during installation and customization.

Discovery Protocol:

Specifies the protocol used by servers to discover the presence of other servers.

Select from one of three protocol options:
UDP User Datagram Protocol (UDP)
TCP Transmission Control Protocol (TCP)
multicast
IP multicast protocol

Data type	String
Default	TCP
Range	Valid values are UDP, TCP, or multicast.

Administration service settings

Use this page to view and change the configuration for an administration service.

To view this administrative console page, click one of the following paths:
- **Servers > Application Servers >***server_name* **> Administration Services**
- **Servers > JMS Servers >***server_name* **> Administration Services**

Related reference

"Administrative console buttons" on page 9

"Administrative console page features" on page 11

"Java Management Extensions connectors" on page 212

Custom property collection
Use this page to view and manage arbitrary name-value pairs of data, where the name is a property key and the value is a string value that can be used to set internal system configuration properties.

"Repository service settings" on page 295

Standalone

Specifies whether the server process is a participant in a Network Deployment cell or not. If true, the server does not participate in distributed administration. If false, the server participates in the Network Deployment system.

The default value for base WebSphere Application Server installations is true. When addNode runs to incorporate the server into a Network Deployment cell, the value switches to false.

Data type Boolean
Default true

Preferred Connector

Specifies the preferred JMX Connector type. Available options, such as SOAPConnector or RMIConnector, are defined using the JMX Connectors page.

Data type String

Extension MBean Providers collection

Use this page to view and change the configuration for JMX extension MBean providers.

You can configure JMX extension MBean providers to be used to extend the existing WebSphere managed resources in the core administrative system. Each MBean provider is a library containing an implementation of a JMX MBean and its MBean XML Descriptor file.

To view this administrative console page, click one of the following paths:

- **Servers > Application Servers >***server_name* **> Administration Services > Extension MBean Providers**
- **Servers > JMS Servers >***server_name* **> Administration Services > Extension MBean Providers**

Classpath
The classpath within the provider library where the MBean Descriptor can be located.

Description
An arbitrary descriptive text for the Extension MBean Provider configuration.

Name The name used to identify the Extension MBean provider library.

Extension MBean Provider settings

Use this page to view and change the configuration for a JMX extension MBean provider.

You can configure a library containing an implementation of a JMX MBean, and its MBean XML Descriptor file, to be used to extend the existing WebSphere managed resources in the core administrative system

To view this administrative console page, click one of the following paths:

- **Servers > Application Servers >***server_name* **> Administration Services > Extension MBean Providers >***provider_library_name*
- **Servers > JMS Servers >***server_name* **> Administration Services > Extension MBean Providers >***provider_library_name*

Classpath:

The classpath within the provider library where the MBean Descriptor can be located. The class loader needs this information to load and parse the Extension MBean XML Descriptor file.

Data type String

Description:

An arbitrary descriptive text for the Extension MBean Provider configuration. Use this field for any text that helps identify or differentiate the provider configuration.

Data type String

Name:

The name used to identify the Extension MBean provider library.

Data type String

Repository service settings

Use this page to view and change the configuration for an administrative service repository.

To view this administrative console page, click one of the following paths:

- **Servers > Application Servers >***server_name* **> Administration Services > Repository Service**
- **Servers > JMS Servers >***server_name* **> Administration Services > Repository Service**

Related reference

"Administrative console buttons" on page 9

"Administrative console page features" on page 11

Custom property collection
Use this page to view and manage arbitrary name-value pairs of data, where the name is a property key and the value is a string value that can be used to set internal system configuration properties.

Audit Enabled

Specifies whether to audit repository updates in the log file. The default is to audit repository updates.

Data type Boolean
Default true

Node agents

Node agents are administrative agents that route administrative requests to servers.

A node agent is a server that runs on every host computer system that participates in the WebSphere Application Server Network Deployment product. It is purely an administrative agent and is not involved in application serving functions. A node agent also hosts other important administrative functions such as file transfer services, configuration synchronization, and performance monitoring.

A node agent is a server that runs on every host computer system that participates in the WebSphere Application Server Network Deployment product. It is purely an administrative agent and is not involved in application serving functions. A node

agent also hosts other important administrative functions such as file transfer services and configuration synchronization.

Related tasks

"Managing node agents"

Managing node agents

Node agents are administrative agents that represent a node to your system and manage the servers on that node. Node agents monitor application servers on a host system and route administrative requests to servers. A node agent is created automatically when a node is added to a cell.

1. View information about a node agent. Use the Node Agents page. Click **System Administration > Node Agents** in the console navigation tree. To view additional information about a particular node agent or to further configure a node agent, click on the node agent's name under **Name**.
2. Stop and then restart the processing of a node agent. On the Node Agents page, place a checkmark in the check box beside the node agent you want to restart, then click **Restart**. It is important to keep a node agent running because a node agent must be running in order for application servers on the node managed by the node agent to run.
3. Stop and then restart all application servers on the node managed by the node agent. On the Node Agents page, place a checkmark in the check box beside the node agent that manages the node whose servers you want to restart, then click **Restart all Servers on Node**. Note that the node agent for the node must be processing (step 2) in order to restart application servers on the node.
4. Stop the processing of a node agent. On the Node Agents page, place a checkmark in the check box beside the node agent you want to stop processing, then click **Stop**.

Related concepts

"Node agents" on page 295

Related tasks

Running an Application Server and nodeagent with a non-root user ID

Running an Application Server with a non-root user ID and the nodeagent as root
Use this task to configure an Application Server to run as non-root.

Node agent collection

Use this page to view information about node agents. Node agents are administrative agents that monitor application servers on a host system and route administrative requests to servers. A node agent is the running server that represents a node in a Network Deployment environment.

To view this administrative console page, click **System Administration > Node Agents >***node_agent*.

Related concepts

"Node agents" on page 295

Related tasks

"Managing node agents"

Related reference

"Administrative console buttons" on page 9

"Administrative console filter settings" on page 16

"Administrative console preference settings" on page 16

"Administrative console page features" on page 11

Name
Specifies a logical name for the node agent server.

Node
Specifies a name for the node. The node name is unique within the cell.
A node name usually is identical to the host name for the computer. That is, a node usually corresponds to a physical computer system with a distinct IP host address.

Status
Indicates whether the node agent server is started or stopped.
Note that if the status of servers such application servers is *Unavailable*, the node agent is not running in the servers' node and you must restart the node agent before you can start the servers.

Node agent server settings
Use this page to view information about and configure a node agent. A node agent coordinates administrative requests and event notifications among servers on a machine. A node agent is the running server that represents a node in a Network Deployment environment.
To view this administrative console page, click **System Administraton > Node Agents >***node_agent_name*.

The **Configuration** tab provides editable fields and the **Runtime** tab provides read-only information. The **Runtime** tab is available only when the node agent server is running.

A node agent must be started on each node in order for the deployment manager node to be able to collect and control servers configured on that node. If you use configuration synchronization support, a node agent coordinates with the deployment manager server to synchronize the node's configuration data with the master copy managed by the deployment manager.

Related concepts

"Node agents" on page 295

Related tasks

"Managing node agents" on page 296

Related reference

"Administrative console buttons" on page 9

"Administrative console page features" on page 11

"Administration service settings" on page 293

Custom service collection
Use this page to view a list of services available to the application server and to see whether the services are enabled. A custom service provides the ability to plug into a WebSphere application server and define code that runs when the server starts or shuts down.

End point collection
Use this page to view and manage communication end points used by run-time components running within a process. End points provide host and port specifications for a server.

"File transfer service settings" on page 300

"File synchronization service settings" on page 300

Object Request Broker service settings in administrative console
Use this page to configure the Java Object Request Broker (ORB) service.

Diagnostic trace service settings
Use this page to review and modify the properties of the diagnostic trace service.

Process definition settings
Use this page to view or change settings for a process definition, which provides command-line information for starting or initializing starting, initializing, or stopping a process.

Name:

Specifies a logical name for the node agent server.

Data type	String
Default	NodeAgent Server

Process ID:

Specifies a string identifying the process.

Data type	String

Cell Name:

Specifies the name of the cell for the node agent server.

Data type	String
Default	*host_name*Network

Node Name:

Specifies the name of the node for the node agent server.

Data type	String

State:

Indicates whether the node agent server is started or stopped.

Data type	String
Default	Started

Remote file services

Configuration documents describe the available application servers, their configurations, and their contents. Two file services manage configuration documents: the file transfer service and the file synchronization service.

The file services do the following:

File transfer service
The file transfer service enables the moving of files between the network manager and the nodes. It uses the HTTP protocol to transfer files. When

you enable security in the WebSphere Application Server product, the file transfer service uses certificate-based mutual authentication. You can use the default key files in a test environment. Ensure that you change the default key file to secure your system.

The ports used for file transfer are defined in the Network Deployment server configuration under its WebContainer HTTP transports.

File synchronization service

The file synchronization service ensures that a file set on each node matches that on the deployment manager node. This service promotes consistent configuration data across a cell. You can adjust several configuration settings to control file synchronization on individual nodes and throughout a system.

This service runs in the deployment manager and node agents, and ensures that configuration changes made to the cell repository are propagated to the appropriate node repositories. The cell repository is the master repository, and configuration changes made to node repositories are not propagated up to the cell. During a sychronization operation a node agent checks with the deployment manager to see if any configuration documents that apply to the node have been updated. New or updated documents are copied to the node repository, and deleted documents are removed from the node repository.

The default behavior is for each node agent to periodically run a synchronization operation. You can configure the interval between operations or disable the periodic behavior. You can also configure the synchronization service to synchronize a node repository before starting a node on the server.

Related concepts

"Configuration documents" on page 275

"Node agents" on page 295

Related tasks

"Configuring remote file services"

"Managing node agents" on page 296

Configuring remote file services

Configuration data for the WebSphere Application Server product resides in files. Two services help you reconfigure and otherwise manage these files: the file transfer service and file synchronization service.

By default, the file transfer service is always configured and enabled at a node agent, so you do not need to take additional steps to configure this service. However, you might need to configure the file synchronization service.

1. Go to the File Synchronization Service page. Click **System Administration > Node Agents** in the console navigation tree. Then, click the node agent for which you want to configure a synchronization server and click **File Synchronization Service**.
2. On the File Synchronization Service page, customize the service that helps make configuration data consistent across a cell by moving updated configuration files from the deployment manager to the node. Change the values for properties on the File Synchronization Service page. The file synchronization service is always started, but you can control how it runs by changing the values.

Related concepts

"Remote file services" on page 298

File transfer service settings

Use this page to configure the service that transfers files from the deployment manager to individual remote nodes.

To view this administrative console page, click **System Administration > Node Agents >***node_agent_name* **> File Transfer Service**.

Related concepts

"Remote file services" on page 298

Related reference

"Administrative console buttons" on page 9

"Administrative console page features" on page 11

Custom property collection
Use this page to view and manage arbitrary name-value pairs of data, where the name is a property key and the value is a string value that can be used to set internal system configuration properties.

Startup

Specifies whether the server attempts to start the specified service. Some services are always enabled and disregard this property if set. The default has a checkmark in the check box, and is enabled.

Data type	Boolean
Default	true

Retries count

Specifies the number of times you want file transfer service to retry sending or receiving a file after a communication failure occurs.

Data type	Integer
Default	3

Retry wait time

Specifies the number of seconds to wait between retrying a failed file transfer.

Data type	Integer
Default	10

File synchronization service settings

Use this page to specify that a file set on one node matches that on the central deployment manager node and to ensure consistent configuration data across a cell.

You can synchronize files on individual nodes or throughout your system.

To view this administrative console page, click **System Administration > Node Agents >***node_agent_name* **> File Synchronization Service**.

Related concepts

"Remote file services" on page 298

Related tasks

"Configuring remote file services" on page 299

Related reference

"Administrative console buttons" on page 9

"Administrative console page features" on page 11

Custom property collection
Use this page to view and manage arbitrary name-value pairs of data, where the name is a property key and the value is a string value that can be used to set internal system configuration properties.

Startup

Specifies whether the server attempts to start the specified service. Some services are always enabled and disregard this property if set. The default has a checkmark in the check box, and is enabled.

Data type	Boolean
Default	true

Synchronization Interval

Specifies the number of minutes that elapse between synchronizations. The default is 1 minute. Increase the time interval to synchronize files less often.

Data type	Integer
Units	Minutes
Default	1

Automatic Synchronization

Specifies whether to synchronize files automatically after a designated interval. When enabled, the node agent automatically contacts the deployment manager every synchronization interval to attempt to synchronize the node's configuration repository with the master repository owned by the deployment manager. Remove the checkmark from the check box if you want to control when files are sent to the node.

Data type	Boolean
Default	true

Startup Synchronization

Specifies whether the node agent attempts to synchronize the node configuration with the latest configurations in the master repository prior to starting an application server.
The default is not to synchronize files prior to starting an application server. Enabling the setting ensures that the node agent has the latest configuration but increases the amount of time it takes to start the application server.

Note that this setting has no effect on the startServer command. The startServer command launches a server directly and does not use the node agent.

Data type	Boolean
Default	false

Synchronize Application Binaries

Specifies whether to synchronize configuration data in application binary files. When enabled, changes to application binary files at the Deployment Manager are copied to the nodes on which the applications run.

The default is to synchronize application binary files.

Data type	Boolean
Default	true

Exclusions

Specifies files or patterns that should not be part of the synchronization of configuration data. Files in this list are not copied from the master configuration repository to the node, and are not deleted from the repository at the node. The default is to have no files specified.

You only need to specify files to exclude from synchronization when the synchronization is enabled. To specify a file, type in a file name and then press **Enter**. Each file name appears on a separate line.

Data type	String
Units	Files names or patterns

Administrative agents: Resources for learning

Use the following links to find relevant supplemental information about WebSphere Application Server administrative agents and distributed administration. 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:
- "Administrative agents: Resources for learning"
- "Administrative agents: Resources for learning"

Programming instructions and examples
- WebSphere Application Server education

Administration
- Listing of all IBM WebSphere Application Server Redbooks
- System Administration for WebSphere Application Server V5 -- Part 1: Overview of V5 Administration

Related tasks

Chapter 9, "Managing administrative agents," on page 285

Location service daemons

Location Service Daemons provide the CORBA location service in support of Remote Method Invocation and Internet Inter-ORB Protocol (RMI/IIOP).

When a client makes a remote Enterprise Java Bean (EJB) call, a location service daemon determines which server or servers are eligible to process the request. The location service daemon makes the decision in consultation with the z/OS workload management function (WLM). The daemon then routes the request to the

selected server, which establishes a CORBA session with the client. Subsequent calls to the same EJB flow directly over the established session.

There is one location service daemon for each system in a cell. An example of a system is the z/OS operating system on a logical partition (LPAR).

Determining if the location service daemon is up.

Before starting either clusters or servers, you need to know if the location service daemon is up.

To determine this, issue one of the display commands from the MVS console.

You know the system is up if you see the address space for which you are looking.

Steps for stopping or canceling the location service daemon from the MVS console

If you cancel the location service daemon, it cancels all other applications servers on the system.

Issue one of the following commands to stop the location service daemon:

Option	Description
STOP DAEMON01	
CANCEL DAEMON01	
CANCEL DAEMON01,ARMRESTART	

Use the cancel command that has the ARMRESTART option if automatic restart management (ARM) is active and you want ARM to restart the location service daemon.

Modifying location service daemon settings

The location service daemon is an integral component of the Remote Method Invocation and Internet Inter-ORB Protocol (RMI/IIOP) communication function for the WebSphere Application Server for z/OS. The daemon works in conjunction with z/OS workload management to distribute RMI requests (for example Enterprise Java Beans (EJB) requests) among application servers in a cell. Configuration of the location service daemon is required.

Before you begin

Complete the following items as appropriate.

Configuring the location service daemon

You must first configure the location service daemon in the WebSphere customization dialogs. Once you configure the daemon, you can modify or view the location service daemon settings from the administrative console.

Enabling security

If you want to use Secure Socket Layer (SSL) to encrypt communications to the location service daemon, ensure that you complete the following items. There is no specific `on` or `off` setting to enable SSL for the location service daemon.

- Enable global security for the cell.
- Define a valid system SSL repertoire for the location service daemon.
- Set the z/OS user ID assigned to the location service daemon started task to the same z/OS user ID associated with the key ring when the key ring was created.

1. Go to the Settings page for the location service daemon to view the help page.
2. Click **System Administration > z/OS Location Service Daemon** in the console navigation tree.
3. Specify the job name for the location service daemon, the ports it listens on, its host name or IP address, and the SSL repertoire that it uses.

You have now modified the settings for the location service daemon.

Related concepts

"Location service daemons" on page 302

Related tasks

Steps to create a new System SSL repertoire alias

Setting up SSL security for WebSphere Application Server for z/OS
This topic assumes you understand the SSL protocol and how Cryptographic Services System SSL works on z/OS or OS/390. Secure Sockets Layer (SSL) is used by multiple components within WebSphere Application Server to provide trust and privacy. These components are the built-in HTTP Transport, the ORB (client and server), and the secure LDAP client. Configuring SSL is different between client and server with WebSphere Application Server. If you want the added security of protected communications and user authentication in a network, you can use Secure Sockets Layer (SSL) security.

Setting up a Keyring for use by WebSphere Application Server for z/OS

Related reference

Secure Sockets Layer configuration repertoire settings
Use this page to define a new Secure Sockets Layer (SSL) alias. Through the SSL configuration repertoire, administrators can define any number of SSL settings to use in configuring the Hypertext Transfer Protocol with SSL (HTTPS), Internet InterORB Protocol with SSL (IIOPS) or Lightweight Directory Access Protocol with SSL (LDAPS) connections. You can pick one of the SSL settings defined here from any location within the administrative console that supports SSL connections. This simplifies the SSL configuration process because you can reuse many of these SSL configurations by specifying the alias in multiple places.

z/OS Location service daemon settings

Use this page to set the location service daemon for this cell.

Changes made to these settings apply to each location service daemon in a cell. There is one location service daemon on each system in a cell. An example of a system is the z/OS operating system on a logical partition (LPAR).

To view this administrative console page, click **System Administration > z/OS Location Service Daemon**.

Related concepts

"Location service daemons" on page 302

Related reference

"Administrative console buttons" on page 9

Job name

Specifies the job name of the location service daemon. The name is 1-8 characters, alphanumeric or national language characters, (@#$).

Data type	String
Default	None

Host name

Specifies the host name or IP address to use when contacting the location service daemon.

Data type	String
Default	None

Port

Specifies the port on which the location service daemon listens for Remote Method Invocation and Internet Inter-ORB (RMI/IIOP) requests.
The system reserves port numbers less than 1024 for TCP/IP applications; do not use port numbers between 1 and 1023.

Data type	Integer
Default	None
Range	1 to 65535

SSL port

Specifies the port on which the location service daemon listens for encrypted Remote Method Invocation and Internet Inter-ORB (RMI/IIOP) requests.
The system reserves port numbers less than 1024 for TCP/IP applications; do not use port numbers between 1 and 1023.

Data type	Integer
Default	None
Range	1 to 65535

SSL Settings

Specifies a predefined list of Secure Socket Layer settings for connections. These settings are System SSL repertoires that you configured on the SSL Repertoire panel. Select one repertoire from the list.

Notices

References in this publication to IBM products, programs, or services do not imply that IBM intends to make these available in all countries in which IBM operates. Any reference to an IBM product, program, or service is not intended to state or imply that only IBM's product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any of IBM's intellectual property rights may be used instead of the IBM product, program, or service. Evaluation and verification of operation in conjunction with other products, except those expressly designated by IBM, is the user's responsibility.

IBM may have patents or pending patent applications covering subject matter in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

IBM Director of Licensing
IBM Corporation
500 Columbus Avenue
Thornwood, New York 10594 USA

Licensees of this program who wish to have information about it for the purpose of enabling: (i) the exchange of information between independently created programs and other programs (including this one) and (ii) the mutual use of the information which has been exchanged, should contact:

IBM Corporation
Mail Station P300
522 South Road
Poughkeepsie, NY 12601-5400
USA
Attention: Information Requests

Such information may be available, subject to appropriate terms and conditions, including in some cases, payment of a fee.

Trademarks and service marks

The following terms are trademarks of IBM Corporation in the United States, other countries, or both:

- AIX
- CICS
- Cloudscape
- DB2
- DFSMS
- Everyplace
- iSeries
- IBM
- IMS
- Informix
- iSeries

- Language Environment
- MQSeries
- MVS
- OS/390
- RACF
- Redbooks
- RMF
- SecureWay
- SupportPac
- ViaVoice
- VisualAge
- VTAM
- WebSphere
- z/OS
- zSeries

The term CORBA used throughout this book refers to Common Object Request Broker Architecture standards promulgated by the Object Management Group, Inc.

Java and all Java-based trademarks are trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.

The Duke logo is a trademark or registered trademark of Sun Microsystems, Inc. in the United States and other countries.

Microsoft, Windows, Windows NT, and the Windows logo are trademarks of Microsoft Corporation in the United States, other countries, or both.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Other company, product and service names may be trademarks or service marks of others.

Trademarks and service marks

The following terms are trademarks of IBM Corporation in the United States, other countries, or both:

- AIX
- CICS
- Cloudscape
- DB2
- DFSMS
- Everyplace
- iSeries
- IBM
- IMS
- Informix
- iSeries
- Language Environment
- MQSeries
- MVS
- OS/390
- RACF
- Redbooks
- RMF
- SecureWay
- SupportPac
- ViaVoice
- VisualAge
- VTAM
- WebSphere
- z/OS
- zSeries

The term CORBA used throughout this book refers to Common Object Request Broker Architecture standards promulgated by the Object Management Group, Inc.

Java and all Java-based trademarks are trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.

The Duke logo is a trademark or registered trademark of Sun Microsystems, Inc. in the United States and other countries.

Microsoft, Windows, Windows NT, and the Windows logo are trademarks of Microsoft Corporation in the United States, other countries, or both.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Other company, product and service names may be trademarks or service marks of others.