



Program Directory for WebSphere Application Server for z/OS V8.5.0

Version 8 Release 5 Modification 0

Program Number 5655-W65
FMIDs HBBO850, HBJA700(*) with Fix Pack 8.5.5.0

for Use with
z/OS V1.11 or higher

* Products that include WebSphere Application Server for z/OS V8.5
may omit FMID HBJA700.

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Note

Before using this information and the product it supports, be sure to read the general information under Appendix B, "Notices" on page 57.

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1.0 Introduction

This program directory is intended for system programmers who are responsible for program installation and maintenance. It contains information about the material and procedures associated with the installation of WebSphere Application Server for z/OS Version 8.5.5. This publication refers to WebSphere Application Server for z/OS V8.5 as WebSphere Application Server for z/OS and highlights WebSphere Application Server for z/OS as Version 8.5 when necessary to adequately explain installation procedures.

The Program Directory contains the following sections:

- 2.0, “Program Materials” on page 12 identifies the basic and optional program materials and documentation for WebSphere Application Server for z/OS.
- 3.0, “Program Support” on page 15 describes the IBM support available for WebSphere Application Server for z/OS.
- 4.0, “Program and Service Level Information” on page 17 lists the APARs (program level) and PTFs (service level) that have been incorporated into WebSphere Application Server for z/OS.
- 5.0, “Installation Requirements and Considerations” on page 18 identifies the resources and considerations that are required for installing and using WebSphere Application Server for z/OS.
- 6.0, “Installation Instructions” on page 27 provides detailed installation instructions for WebSphere Application Server for z/OS V8.5. It also describes the procedures for activating the functions of WebSphere Application Server for z/OS V8.5, or refers to appropriate publications.
- Appendix A, “Using Compressed Repositories to Install WebSphere Application Server for z/OS Version 8.5.5” on page 43 provides detailed installation instructions for installing WebSphere Application Server for z/OS V8.5 from Installation Manager repositories on product media (DVD). This installation method is an alternative to the traditional SMP/E install.

Before installing WebSphere Application Server for z/OS, read the *CBPDO Memo To Users* and the *CBPDO Memo To Users Extension* that are supplied with this program in softcopy format and this Program Directory; then keep them for future reference. Section 3.2, “Preventive Service Planning” on page 15 tells you how to find any updates to the information and procedures in this Program Directory.

WebSphere Application Server for z/OS is supplied in a Custom-Built Product Delivery Offering (CBPDO, 5751-CS3). The Program Directory that is provided in softcopy format on the CBPDO tape is identical to the hardcopy format that is provided with your order. All service and HOLDDATA for WebSphere Application Server for z/OS V8.5 are included on the CBPDO tape.

WebSphere Application Server for z/OS V8.5 can also be installed on z/OS from Installation Manager repositories on product media without using SMP/E to install the repositories. For details and complete instructions, see Appendix A, “Using Compressed Repositories to Install WebSphere Application Server for z/OS Version 8.5.5” on page 43.

Note: DO NOT use this non-SMP/E installation method if you install WebSphere Application Server for z/OS with a SystemPac or ServerPac.

1.1 New Features in this Release

The new features that are described here are current as of the original release of the product version.

- **New Liberty profile** - a lightweight application foundation

The Liberty profile is a highly composable, fast to start, ultra lightweight profile of the application server that is optimized for developer productivity and smaller, simpler production server.

- **Fast, flexible, and simplified application development**

Use the new Liberty profile to jump-start application development, and speed project completion.

- **Intelligent management and enhanced resiliency**

Take advantage of integrated intelligent management capabilities and enhanced resiliency of the application server for enhanced user availability. Intelligent management improvements include intelligent routing, application edition management, health management and performance management. For messaging systems, improvements for handling failures of the messaging infrastructure include automatic detection of certain types of memory leaks and improved fault tolerance to enhance service integration bus resiliency.

- **Integrated tools**

WebSphere Application Server now provides integrated tooling to help you easily develop, assemble, and deploy your applications to WebSphere Application Server Version 8.5 and includes a rapid-deployment feature for testing applications in the Version 8.5 runtime environment.

- **Improved operations, security, control, and integration**

Improve operational efficiency and controls for managing complex environments in a way that is less time consuming and resource consuming. Take advantage of the benefits of the option to select and switch between IBM WebSphere SDK Java Technology Edition Version 7.0 or 6.0 as well as powerful new batch capabilities. Enhancements for problem determination include cross component tracing (XCT), improved log and trace filtering, and support for IBM Support Assistant Data Collector. You can achieve richer application security with greater flexibility and more granular control using enhanced security with administrative audit features.

1.2 WebSphere Application Server for z/OS Description

WebSphere Application Server for z/OS

WebSphere Application Server for z/OS is a proven, high-performance transaction engine that can help you build, run, integrate, and manage dynamic business applications.

This product excels as the foundation for a service-oriented architecture with the following main benefits:

- Broad programming model and standards support

WebSphere Application Server for z/OS supports the following for leading open standards and programming models:

– Java Enterprise Edition standards support

Use continued programming model productivity and ease-of-use enhancements through support for portions of key Java Platform, Enterprise Edition (Java EE) 6.0, including the following:

- Support for key elements in the Enterprise JavaBeans (EJB) 3.1 specification.
- Support for Contexts and Dependency Injection (CDI) for the Java EE platform (JSR 299). CDI provides a programming model suitable for rapid development of applications without sacrificing the full power of the Java EE 5 platform.
- Support for key elements of the Java Connector Architecture (JCA) Version 1.6 specification.
- Apache OpenJPA 2.0 implementation of the Java Persistence API (JPA) with IBM enhancements.

Enhancements include the Type-safe Criteria API and associated Metamodel API, object relational mapping enhancements with associated JPQL updates, and runtime enhancements, such as pessimistic lock manager, second level (L2) cache, and performance.

- Dynamic cache JPA L2 cache provider for OpenJPA 2.0
- Support for key elements of Web Application Technologies.
- Support for the JAX-WS Version 2.2 specification.
- Support for the JAXB Version 2.2 specification
- Simplified development of server-side REST applications using Java API for RESTful Web Services (JAX-RS)
- Support for RESTful views of EJB applications that declare a local business interface and no-interface view enterprise beans using JAX-RS.
- Support for using Java Contexts and Dependency Injection (JCUDI) with JAX-RS.

You can use JAX-RS root resources and providers in a JCUDI-enabled web application archive. As part of Java Platform, Enterprise Edition (Java EE) 6, you can take advantage of the JCUDI feature to make applications easier to develop while increasing maintainability.

- Support for using Web Application Description Language (WADL) documents that describe the services available to users.

You can develop clients to dynamically understand RESTful services by inspecting the WADL document

- Support for JSR 196 - Java Authentication SPI for Containers (JASPI) specification, which enables third-party security providers to handle the Java Platform, Enterprise Edition (Java EE) authentication of HTTP request and response messages destined for web applications.
- Support for java:global, java:app, and java:module Java Naming and Directory Interface (JNDI) names in applications that are deployed on stand-alone servers or managed servers where the entire application is deployed on one server.

– OSGi applications programming model

The OSGi applications programming model helps you develop and deploy modular applications that use both Java EE and OSGi technologies. You can design and build applications and suites of applications from coherent, multiversion, reusable OSGi modules that are accessed only through well-defined interfaces. This reduces complexity, and provides the greatest flexibility to maintain and evolve an application after its first release. The OSGi applications support includes the following major features:

- Use the OSGi Enterprise Specification 4.2 Blueprint Container for declarative assembly of components.

This support simplifies unit test outside of the application server.

- Use extensions to the Blueprint component model for declarative transactions and container-managed Java Persistence API (JPA).
- Develop OSGi application projects using IBM Rational, Application Developer, which enforces OSGi visibility rules so that projects can only access packages from other projects that explicitly declare them as part of the project externals.

This provides environmental support to development best practices.

- Compose isolated enterprise applications using multiple, multiversion bundles that have a dynamic life cycle.
- Deploy an application archive file that need not contain all the resources required by the application, but can contain just the application-specific content plus metadata that points to shared libraries (bundles).

This means that application archive files can be smaller. It also means that, when a library is shared by several OSGi applications, only one copy of the library is loaded into memory.

- Use an integrated bundle repository, and configure the locations of external repositories, to support the provisioning of bundles to applications.
- Deploy existing web application archives (WAR files) as web application bundles (WAB).

This allows web applications to use the OSGi module system.

- Simultaneously load multiple versions of classes in the same application, using standard OSGi mechanisms
- Administratively update deployed applications in a modular way, at the bundle level.
- Support for applications that use their own versions of common utility classes, distinct from the versions that are used by the server runtime environment. Do this without needing to configure application Java EE application class loader policies, such as PARENT_LAST mode.
- Use federated lookup mechanisms between the local Java Naming and Directory Interface (JNDI) and the OSGi service registry.

– XML programming model

Use the XML support provided with this product to work with web applications that process data using standard XML technologies like Extensible Stylesheet Language Transformations (XSLT), XML Path Language (XPath), and XML Query Language (XQuery).

- Service Component Architecture (SCA) programming model

SCA offers a simple and powerful way to construct applications based on Service-Oriented Architecture (SOA).

SCA uses the Apache Tuscany open source technology to provide an implementation of the published SCA specifications.
- Communications Enabled Applications (CEA) programming model

CEA support provides REST and Web Service interfaces to enable existing applications to quickly take advantage of communications features involving phone calls and web collaboration.
- Session Initiation Protocol (SIP) programming model

Integrated SIP servlet support speeds development of converged communications applications.
- Fast, flexible, and simplified application foundation

WebSphere Application Server for z/OS includes the following highlights to improve productivity and help deliver improved total cost of ownership benefits:

 - Simplified installation and maintenance

Achieve faster value through a simplified product installation, update, and uninstallation with integrated prerequisite and interdependency checking by using IBM Installation Manager.

 - Installation Manager is a single installation program that loads and installs product components from a structured collection of files that is called a repository.
 - Easily determine available product and maintenance packages, easily install selected packages after prerequisite and interdependency checking, and uninstall and roll back previously installed packages.
 - Use remote or local repositories to install, modify, or update WebSphere Application Server for z/OS products and related components such as:
 - WebSphere Application Server for z/OS base
 - WebSphere Application Server for z/OS DMZ secure proxy server
 - IBM HTTP Server
 - WebSphere Customization Toolbox
 - Improved productivity

Increase your return on investment and improve the flexibility of your business by making application services more reusable and accessible to new users in an enterprise environment using the following enhancements:

 - Support for connecting to multi-instance WebSphere MQ queue managers.

You can provide host and port information in the form of a connection name list, which a connection factory or activation specification uses to connect to a multi-instance queue manager.

- Support for singleton session enterprise beans as Java API for XML Web Services (JAX-WS) endpoints.
- Specify a policy set and bindings for a service reference that is different from the policy set attachment for the service.
- Specify CustomProperties policy and binding to set generic properties that are not supported in other policy types.

The CustomProperties policy provides an alternative way to set a binding property instead of using the JAX-WS programming model to set the property on the BindingProvider object.

- Simplified development of server-side REST applications using Java API for RESTful Web Services (JAX-RS).
- Support for using Java Contexts and Dependency Injection (JCDI) with JAX-RS.

You can use JAX-RS root resources and providers in a JCDI-enabled web application archive. As part of Java Platform, Enterprise Edition (Java EE) 6, you can take advantage of the JCDI feature to make applications easier to develop while increasing maintainability.

- Extend the interactivity of Enterprise and Web commerce applications with Communications Enabled Applications (CEA) for integrated telephony and collaborative web services.

Using a single core application, you can enable multiple modes of communication. The CEA capability delivers call control, notifications, and interactivity and provides the platform for more complex communications.

- Install, uninstall, and update enterprise application files by adding them to a monitored directory.

This feature is now supported when running the application server on z/OS as well as the application server on other operating systems.

- Support for both client affinity and client reroute for applications that use DB2 databases. Use client affinity functions to control the order of servers that are tried during initial connection processing or the client reroute functions to specify alternate server locations when connections to a database server fails.
- Connect your applications to the latest versions of a wide array of industry-leading databases to enable maximum deployment flexibility. WebSphere Application Server Version 8.0 has been tested with the following new databases and JDBC drivers:

- Derby 10.5
- DataDirect Connect for Java Database Connectivity (JDBC) driver V4.1

– Improved security

You can securely build and deliver applications and environments that use new capabilities in WebSphere Application Server for z/OS V8.5 including the following features:

- Support for OASIS Web Services Security SAML Token Profile 1.1 usage scenarios that use SAML Assertions as security tokens in web services SOAP security to exchange client identity and other security information across security domains.

- Support for JSR 196: Java Authentication SPI for Containers (JASPI) specification, which enables third-party security providers to handle the Java Platform, Enterprise Edition (Java EE) authentication of HTTP request and response messages destined for web applications.
- Support for configuring federated repositories at the domain level in a multiple security domain environment.

Now, when you copy a security domain from the global level, the users and groups defined at the global level are also copied to the security domain. This is also true when copying from an existing domain. A newly created security domain that uses the file-based VMM repository requires that the user populate the repository with users and groups.

- Propagate an LtpaToken2 cookie to downstream web single sign-on applications using an application programming interface (API).
- Generate SAML tokens and to propagate SAML tokens in SOAP messages using the Web Services Security application programming interfaces (WSS API). For web services clients, this is an alternative solution to using policy set attachments.

Both SAML bearer subject confirmation method and SAML sender-vouches subject confirmation methods are supported.

- Request SAML tokens from an external Security Token Service (STS) and then propagate the SAML token in web services request messages from a web services client using WSS APIs.

Both SAML bearer subject confirmation method and SAML sender-vouches subject confirmation methods are supported.

- Manage self-issue SAML token configuration using wsadmin commands.
- Support for all security updates as defined in the Java Servlet 3.0 specification (JSR-315), including the new servlet security annotations, use of new programmatic security APIs, and the dynamic updating of the servlet security configuration.
- Generate and consume tokens using WS-Trust Issue and WS-Trust Validate requests for JAX-WS web services that use Web Services Security.

As a result of these requests, the login module issues, validates, or exchanges tokens with a WS-Trust Security Token Service, such as the service that is provided with the IBM Tivoli, Federated Identity Manager.

- Enhancements to the security auditing service to assist with audit compliance.
- Security configuration report now includes information about session security, web attributes, and the HttpOnly setting to enable you to get a more complete view of your server security settings
- More security features of the server are enabled by default for enhanced security hardening.
- New browser attribute for single sign on (SSO) to prevent client-side applications (such as Java scripts) from accessing cookies to prevent some cross-site scripting vulnerability

- High performance

Achieve total cost of ownership benefits through unmatched performance and scalability characteristics including the following advantages:

- Provide high availability for a WebSphere MQ queue manager that is connected to WebSphere Application Server by specifying multiple connection names in your WebSphere Application Server definition for the WebSphere MQ link sender channel.

If the active gateway queue manager fails, the service integration bus can use this information to reconnect to a standby gateway queue manager.

- Enhance performance by disabling WebSphere MQ functionality in WebSphere Application Server, provided you do not need to take advantage of any WebSphere MQ functionality.

By default, when a WebSphere Application Server process or an application client process starts, and while this process is running, an amount of processing is done to support WebSphere MQ-related function, regardless of whether any WebSphere MQ-related function is ever used.

- Cutting-edge performance for real applications in commercial environments.
- A unified clustering framework that brings workload balancing, dependability, and other benefits to the application servers in your heterogeneous environment.

- Extensive Deployment Environments

WebSphere Application Server for z/OS V8.5 includes the following highlights to improve administration as you migrate existing applications and infrastructures to virtual and Cloud deployments:

- Effective management

Focus resources on innovation instead of maintenance, and reduce the costs of managing your environment with effective and simplified management tools.

- Complete job manager actions and run jobs from a deployment manager. The deployment manager administrative console has "Jobs" navigation tree choices similar to those in the job manager administrative console.
- Collect Java dumps and core files using the administrative console to help diagnose memory-related or application server CPU utilization problems.
- Use the Reliability Availability and Serviceability (RAS) granularity capabilities to assign different RAS attribute values to different sets of requests within the same application server.

This capability improves the reliability, availability, and serviceability of the application server and the requests it processes.

- Take advantage of batch processing capabilities provided in the application server to accommodate applications that must perform batch work alongside transactional applications.
- Store and access log, trace, System.err, and System.out information produced by the application server or your applications quickly and conveniently using the High Performance Extensible Logging (HPEL) log and trace framework.

HPEL logs can also be viewed with the new administrative console log viewing functionality, which uses Web 2.0 technology to provide a powerful tabular view and simple mechanisms to filter logs that are local or remote.

- Quickly recover a damaged node using the `-asExistingNode` parameter of the `addNode` command.
- Access data from multiple components without causing timeouts or other unwanted situations by sharing locks between transaction branches.

You can share locks between transaction branches when accessing data where multiple DB2 Java Database Connectivity (JDBC) connections to the same database exist that are in the same transaction, from the same or different servers.

- Define and register a remote host target with the job manager using the `registerHost` command.

Unlike targets that are WebSphere Application Server profiles and are registered using the `registerWithJobManager` command at the deployment manager or administrative agent, a remote host target is not required to have any WebSphere Application Server products installed.

- Enhance the output of application properties files by running the `AdminTask extractConfigProperties` command with the `UseNewApplicationOutput` option.

The option enables you to easily locate and edit application property values.

- Use the new `enableClientModule` option to specify to deploy client modules.
- View an SCA composite definition by exporting it to a file using scripting, in addition to viewing the SCA composite definition in the administrative console.

By exporting an SCA composite definition, you can preserve information about the composite.

- Export WSDL and XSD documents that are used by an SCA composition unit using the administrative console, in addition to using `wsadmin` scripting.
- Submit a job to manage profiles using the `manageprofiles` job of the job manager to create, augment, or delete a WebSphere Application Server profile.
- Improve the reliability, availability, and serviceability of the application server and the requests it processes by using the request-level RAS granularity capabilities.
- Create and manage target groups using the `TargetGroup` command with the `wsadmin` tool.

– Simplified migration

Migrate your application server environment using the `WASPreUpgrade` and `WASPostUpgrade` command-line tools or the Migration Management tool graphical user interface (GUI). You can migrate from WebSphere Application Server Version 6.0, 6.1, 7.0, and 8.0 to WebSphere Application Server for z/OS V8.5

- Integrated tooling

Accelerate developer productivity through integrated and optimized developer tooling. Rational Application Developer Version 8.0 provides capabilities for you to develop applications, assemble and deploy your applications to WebSphere Application Server for z/OS and includes a rapid-deployment feature for testing applications in the Version 8.0 runtime environment.

DMZ secure proxy server

The DMZ secure proxy server for WebSphere Application Server for z/OS can be used to provide a secure platform for your proxy server.

The DMZ Secure Proxy Server for IBM WebSphere Application Server installation allows you to install your proxy server in the demilitarized zone (DMZ), while reducing the security risk that might occur if you choose to install an application server in the DMZ to host a proxy server. The risk is reduced by removing any functionality from the application server that is not required to host the proxy servers, but that could pose a security risk. Installing the secure proxy server in the DMZ rather than the secured zone presents new security challenges. However, the secure proxy server is equipped with capabilities to provide protection from these challenges.

The following capabilities are available to harden the security of the DMZ Secure Proxy Server for IBM WebSphere Application Server and to determine the level of security to assign.

- Startup user permissions
- Routing considerations
- Administration options
- Error handling
- Denial of service protection

WebSphere Application Server plug-ins V8.5

WebSphere Application Server for z/OS works with a web server to route requests for dynamic content, such as servlets, from web applications. The web servers are necessary for directing traffic from browsers to the applications that run on an application server. The web server plug-in uses the XML configuration file to determine whether a request is for an application server.

The WebSphere Application Server for z/OS Web server plug-ins are used to establish and maintain persistent HTTP and HTTPS connections to application servers.

When the plug-in is ready to send a request to the application server, it first checks its connection pool for existing connections. If an existing connection is available the plug-in checks its connection status. If the status is still good, the plug-in uses that connection to send the request. If a connection does not exist, the plug-in creates one. If a connection exists but has been closed by the application server, the plug-in closes that connection and opens a new one.

IBM HTTP Server V8.5

IBM HTTP Server for WebSphere Application Server for z/OS provides advanced web server capabilities with consistent management and security in a WebSphere Application Server for z/OS environment. IBM HTTP Server for WebSphere Application Server for z/OS is based on Apache HTTP Server.

1.3 WebSphere Application Server for z/OS V8.5 FMIDs

WebSphere Application Server for z/OS consists of the following FMIDs:

<i>Figure 1. Basic FMIDs</i>	
FMID	Description
HBBO850	WebSphere Application Server for z/OS V8.5 repository
HBJA700	IBM WebSphere SDK Java Technology Edition V7.0 repository

The WebSphere Application Server for z/OS V8.5 product is comprised of FMIDs HBBO850 and HBJA700. However, other products that include WebSphere Application Server for z/OS V8.5 may omit FMID HBJA700 if Java 7 functionality is not needed.

For these products, you can ignore the installation instructions presented in this program directory for IBM WebSphere SDK Java Technology Edition V7.0.

2.0 Program Materials

An IBM program is identified by a program number. The program number for WebSphere Application Server for z/OS V8.5 is 5655-W65.

Basic Machine-Readable Materials are materials that are supplied under the base license and feature numbers, and are required for the use of the product. Optional Machine-Readable Materials are orderable under separate feature numbers, and are not required for the product to function.

The program announcement material describes the features supported by WebSphere Application Server for z/OS V8.5. Ask your IBM representative for this information if you have not already received a copy.

2.1 Basic Machine-Readable Material

The distribution medium for this program is magnetic tape or downloadable files. This program is in SMP/E RELFILE format and is installed by using SMP/E. See 6.0, "Installation Instructions" on page 27 for more information about how to install the program.

You can find information about the physical tape for the basic machine-readable materials for WebSphere Application Server for z/OS V8.5 in the *CBPDO Memo To Users Extension*.

2.2 Optional Machine-Readable Material

WebSphere Application Server for z/OS V8.5 has no optional machine-readable materials.

2.3 Program Publications

The following sections identify the basic and optional publications for WebSphere Application Server for z/OS V8.5.

Please note that the main documentation distribution medium for WebSphere Application Server for z/OS V8.5 is the Information Center, which can be accessed via the product documentation page at

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

In addition to the Information Center, relevant WebSphere Application Server for z/OS product documentation is available in PDF format at the same URL.

2.3.1 Basic Program Publications

Figure 2 on page 13 identifies the basic unlicensed program publications for WebSphere Application Server for z/OS V8.5. One copy of each of these publications is included when you order the basic materials for WebSphere Application Server for z/OS V8.5. Additional copies can be obtained from the IBM Publications Web Site at URL: <http://www.ibm.com/shop/publications/order/>. For additional information contact your IBM representative.

<i>Figure 2. Basic Material: Unlicensed Publications</i>	
Publication Title	Form Number
Program Directory for WebSphere Application Server for z/OS V8.5	GI11-9488-01
License Information WebSphere Application Server for z/OS V8.5	GA32-0896-01
Carefully read the WebSphere Application Server for z/OS V8.5 IBM International Program License Agreement GA32-0896-01, a copy of which will be provided to you with the order (Hardcopy or Electronic format); The License Agreement may contain terms that supersede the Licensed terms included with this program component.	

Basic unlicensed or licensed publications are available for download at the WebSphere Application Server for z/OS library page:

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

Figure 3 identifies the basic licensed program publications for WebSphere Application Server for z/OS V8.5. The first copy is available at no charge to the licensees of the basic material by ordering the 800 feature number. Order additional copies by using the 8xxx feature number. A fee is charged for additional copies.

<i>Figure 3 (Page 1 of 2). Basic Material: Licensed Publications</i>		
Publication Title	Form Number	Feature Number
WebSphere Application Server for z/OS V8.5 Installing your application serving environment	GA32-1069	Library page
WebSphere Application Server for z/OS V8.5 Migrating, coexisting, and interoperating	GA32-1080	Library page
WebSphere Application Server for z/OS V8.5 Setting up the application serving environment	GA32-1070	Library page
WebSphere Application Server for z/OS V8.5 Developing and deploying applicaitons	SA23-1071	Library page
WebSphere Application Server for z/OS V8.5 Securing applications and their environment	SA23-1073	Library page

Figure 3 (Page 2 of 2). Basic Material: Licensed Publications

Publication Title	Form Number	Feature Number
WebSphere Application Server for z/OS V8.5 Administering application and their environment	SA23-1074	Library page
WebSphere Application Server for z/OS V8.5 Tuning guide	SA23-1077	Library page
WebSphere Application Server for z/OS V8.5 Troubleshooting and support	GA32-1075	Library page

All of the documents listed here are available for use at the WebSphere Application Server for z/OS V8.5 Information Center.

2.3.2 Optional Program Publications

WebSphere Application Server for z/OS V8.5 has no optional publications provided.

2.4 Program Source Materials

No program source materials or viewable program listings are provided for WebSphere Application Server for z/OS V8.5.

2.5 Publications Useful During Installation

You might want to use the publications listed in Figure 4 during the installation of WebSphere Application Server for z/OS V8.5. To order copies, contact your IBM representative or visit the IBM Publications Center at <http://ehone.ibm.com/publications/servlet/pbi.wss?CTY=US>.

Figure 4. Publications Useful During Installation

Publication Title	Form Number
<i>IBM SMP/E for z/OS User's Guide</i>	SA22-7773
<i>IBM SMP/E for z/OS Commands</i>	SA22-7771
<i>IBM SMP/E for z/OS Reference</i>	SA22-7772
<i>IBM SMP/E for z/OS Messages, Codes, and Diagnosis</i>	GA22-7770
<i>IBM Software Delivery Standard Packaging Rules for z/OS-Based Products</i>	SC23-3695
<i>z/OS MVS JCL Reference</i>	SA22-7597
<i>z/OS System Codes</i>	SA22-7626
<i>Installation Manager for z/OS V1.5.2 Program Directory</i>	GI11-9487-00

3.0 Program Support

This section describes the IBM support available for WebSphere Application Server for z/OS.

3.1 Program Services

Contact your IBM representative for specific information about available program services.

3.2 Preventive Service Planning

Before you install WebSphere Application Server for z/OS, make sure that you have reviewed the current Preventive Service Planning (PSP) information. The PSP Buckets maintain current lists (which have been identified since the package was created) of any recommended or required service for the installation of this package. This service includes software PSP information that contains HIPER and required PTFs against the base release.

If you obtained WebSphere Application Server for z/OS as part of a CBPDO, HOLDDATA is included.

If the CBPDO for WebSphere Application Server for z/OS is older than two weeks old by the time you install the product materials, you should contact the IBM Support Center or use S/390 Software Xcel to obtain the latest PSP Bucket information. You can also obtain the latest PSP Bucket information by going to the following Web site:

<http://www14.software.ibm.com/webapp/set2/psearch/search?domain=psp>

For program support, access the Software Support Web site at <http://www-01.ibm.com/software/support/>.

PSP Buckets are identified by UPGRADEs, which specify product levels; and SUBSETs, which specify the FMIDs for a product level. The UPGRADE and SUBSET values for WebSphere Application Server for z/OS V8.5 are shown as follows:

Figure 5. PSP Upgrade and Subset ID

UPGRADE	SUBSET	Description
WASAS850	HBBO850	WebSphere Application Server for z/OS V8.5
WASAS850	HBJA700	IBM WebSphere SDK Java Technology Edition V7.0

You should also consult the following PSP bucket for information related to the IBM Installation Manager.

Figure 6. PSP Upgrade and Subset ID

UPGRADE	SUBSET	Description
IIMZOSV1	HGIN140	Installation Manager for z/OS V1

3.3 Statement of Support Procedures

Report any problems which you feel might be an error in the product materials to your IBM Support Center. You may be asked to gather and submit additional diagnostics to assist the IBM Support Center in their analysis.

Figure 7 on page 16 identifies the component IDs (COMPID) for WebSphere Application Server for z/OS V8.5.

<i>Figure 7. Component IDs</i>			
FMID	COMPID	Component Name	RETAIN Release
HBBO850	5655I3500	WebSphere Application Server for z/OS V8.5	850
HBBO850	5655N0212	DMZ secure proxy server V8.5	850
HBBO850	5655I3511	Web server plug-ins V8.5	850
HBBO850	5655I3510	IBM HTTP Server V8.5	850
HBJA700	5655W6507	IBM WebSphere SDK Java Technology Edition V7.0	700
HBBO850	5655W6514	Liberty Profile	850

4.0 Program and Service Level Information

This section identifies the program and relevant service levels of WebSphere Application Server for z/OS. The program level refers to the APAR fixes that have been incorporated into the program. The service level refers to the PTFs that have been incorporated into the program.

4.1 Program Level Information

No APARs have been incorporated into WebSphere Application Server for z/OS V8.5.

4.2 Service Level Information

No PTFs against this release of WebSphere Application Server for z/OS have been incorporated into the product tape.

WebSphere Application Server for z/OS Version 8.5.5 made substantial changes and improvements in the installation of the Liberty profile.

The installation instructions in this Program Directory assume that Fix Pack 8.5.5 or a later set of Fix Pack PTFs have been installed.

5.0 Installation Requirements and Considerations

The following sections identify the system requirements for installing and activating WebSphere Application Server for z/OS V8.5. The following terminology is used:

- *Driving system*: the system used to install the program; where SMP/E executes.
The program might have specific operating system or product level requirements for using processes, such as binder or assembly utilities during the installation.
- *Target system*: the system on which the program is configured and run.
The program might have specific product level requirements, such as needing access to the library of another product for link-edits. These requirements, either mandatory or optional, might directly affect the element during the installation or in its basic or enhanced operation.

In many cases, you can use a system as both a driving system and a target system. However, you can make a separate IPL-able clone of the running system to use as a target system. The clone must include copies of all system libraries that SMP/E updates, copies of the SMP/E CSI data sets that describe the system libraries, and your PARMLIB and PROCLIB.

Use separate driving and target systems in the following situations:

- When you install a new level of a product that is already installed, the new level of the product will replace the old one. By installing the new level onto a separate target system, you can test the new level and keep the old one in production at the same time.
- When you install a product that shares libraries or load modules with other products, the installation can disrupt the other products. By installing the product onto a separate target system, you can assess these impacts without disrupting your production system.

5.1 Driving System Requirements

This section describes the environment of the driving system that is required to install WebSphere Application Server for z/OS V8.5.

5.1.1 Machine Requirements

The driving system can run in any hardware environment that supports the required software.

5.1.2 Programming Requirements

Figure 8. Driving System Software Requirements

Program Number	Product Name	Minimum VRM	Minimum Service Level will satisfy these APARs	Included in this product's shipment?
5694-A01	z/OS	V01.11.00	N/A	No
APAR OA34228 must be applied to the z/OS driving system				
APAR OA30453 must be applied to the z/OS driving system				
5655-G44	IBM SMP/E for z/OS	V03.5	N/A	No
Any one of the following:				
5655-N98	IBM 31-bit SDK for z/OS, JAVA 2 Technology Edition, Version 5	V05.0	N/A	No
-- OR --				
5655-N99	IBM 64-bit SDK for z/OS, JAVA 2 Technology Edition, V5	V05.0	N/A	No

Note: Installation may require migration to new z/OS releases to be service supported. See http://www-03.ibm.com/systems/z/os/zos/support/zos_eos_dates.html.

5.2 Target System Requirements

This section describes the environment of the target system that is required to install and use WebSphere Application Server for z/OS V8.5.

5.2.1 Machine Requirements

The target system can run in any hardware environment that supports the required software.

5.2.2 Programming Requirements

5.2.2.1 Installation Requisites: Installation requisites identify products that are required by and *must* be present on the system or products that are not required by but *should* be present on the system for the successful installation of this product.

Mandatory installation requisites identify products that are required on the system for the successful installation of this product. These products are specified as PREs or REQs.

Figure 9. Target System Mandatory Installation Requisites

Program Number	Product Name	Minimum VRM	Minimum Service Level will satisfy these APARs	Included in this product's shipment?
5694-A01	z/OS	V01.11.00	N/A	No
APAR OA34228 must be applied to the z/OS target system				
APAR OA30453 must be applied to the z/OS target system				
5655-G44	IBM SMP/E for z/OS	V03.5.0	N/A	No
5655-W65	IBM Installation Manager	V1.5.2 or above	N/A	No
Any one of the following:				
5655-N98	IBM 31-bit SDK for z/OS, JAVA 2 Technology Edition, Version 5	V05.0.0	N/A	No
-- OR --				
5655-N99	IBM 64-bit SDK for z/OS, JAVA 2 Technology Edition, V5	V05.0.0	N/A	No

Note: Installation may require migration to new z/OS releases to be service supported. See http://www-03.ibm.com/systems/z/os/zos/support/zos_eos_dates.html.

Conditional installation requisites identify products that are *not* required for successful installation of this product but can resolve such things as certain warning messages at installation time. These products are specified as IF REQs.

WebSphere Application Server for z/OS V8.5 has no conditional installation requisites.

5.2.2.2 Operational Requisites: Operational requisites are products that are required by and *must* be present on the system or products that are not required by but *should* be present on the system for this product to operate all or part of its functions.

Mandatory operational requisites identify products that are required for this product to operate its basic functions. These products are specified as PREs or REQs.

<i>Figure 10. Target System Mandatory Operational Requisites</i>	
Program Number	Product Name and Minimum VRM/Service Level
5694-A01	z/OS V01.11.00 or later
5694-A01	PTF UA51978 (for z/OS V01.11.00) required for IHS V8.5 with SSL
5694-A01	APAR fix OA37620 required for Liberty Profile
5694-A01	APAR fix OA38745 required for distributed mapping identity functon
5694-A01	APAR fix OA39035 required for Liberty Profile

Conditional operational requisites identify products that are *not* required for this product to operate its basic functions but are required at run time for this product to operate specific functions. These products are specified as IF REQs.

WebSphere Application Server for z/OS V8.5 has no conditional operational requisites.

5.2.2.3 Toleration/Coexistence Requisites: Toleration/coexistence requisites identify products that must be present on sharing systems. These systems can be other systems in a multisystem environment (not necessarily sysplex), a shared DASD environment (such as test and production), or systems that reuse the same DASD environment at different time intervals.

WebSphere Application Server for z/OS V8.5 has no toleration/coexistence requisites.

5.2.2.4 Incompatibility (Negative) Requisites: Negative requisites identify products that must *not* be installed on the same system as this product.

WebSphere Application Server for z/OS V8.5 has no negative requisites.

5.2.3 DASD Storage Requirements

WebSphere Application Server for z/OS V8.5 libraries can reside on all supported DASD types.

Figure 11 lists the total space that is required for each type of library.

<i>Figure 11 (Page 1 of 2). Total DASD Space Required by WebSphere Application Server for z/OS V8.5</i>			
Product	Library Type	Total Space Required (3390 Trks)	File System Requirements
WebSphere Application Server base HBBO850			
	Target	20	
	Distribution	85500	

Figure 11 (Page 2 of 2). Total DASD Space Required by WebSphere Application Server for z/OS V8.5

Product	Library Type	Total Space Required (3390 Trks)	File System Requirements
	File Systems		
		85500	Installation Manager repository (Application Server)
		45000	For each copy of base WebSphere Application Server for z/OS base product (full profile)
		3000	For each copy of base WebSphere Application Server for z/OS Liberty Profile
		18000	For each copy of DMZ secure proxy server code
		1200	For each copy of Web server plug-ins code
		1200	For each copy of IBM HTTP Server V8.5 code
IBM WebSphere SDK Java Technology Edition V7.0 HBJA700			
	Target	20	
	Distribution	30000	
	File Systems		
		30000	Installation Manager repository (IBM WebSphere SDK Java Technology Edition V7.0)
		12000	For each copy of IBM WebSphere SDK Java Technology Edition V7.0 (full profile or DMZ Secure Proxy)
		6000	For each copy of IBM WebSphere SDK Java Technology Edition V7.0 (Liberty Profile)

Notes:

- For non-RECFM U data sets, IBM recommends using system-determined block sizes for efficient DASD utilization. For RECFM U data sets, IBM recommends using a block size of 32760, which is most efficient from the performance and DASD utilization perspective.
- Abbreviations used for data set types are shown as follows.
 - U** Unique data set, allocated by this product and used by only this product. This table provides all the required information to determine the correct storage for this data set. You do not need to refer to other tables or program directories for the data set size.
 - S** Shared data set, allocated by this product and used by this product and other products. To determine the correct storage needed for this data set, add the storage size given in this table to those given in other tables (perhaps in other program directories). If the data set already exists, it must have enough free space to accommodate the storage size given in this table.

E Existing shared data set, used by this product and other products. This data set is *not* allocated by this product. To determine the correct storage for this data set, add the storage size given in this table to those given in other tables (perhaps in other program directories). If the data set already exists, it must have enough free space to accommodate the storage size given in this table.

If you currently have a previous release of this product installed in these libraries, the installation of this release will delete the old release and reclaim the space that was used by the old release and any service that had been installed. You can determine whether these libraries have enough space by deleting the old release with a dummy function, compressing the libraries, and comparing the space requirements with the free space in the libraries.

For more information about the names and sizes of the required data sets, see 6.1.4, "Allocate SMP/E Target and Distribution Libraries" on page 30.

3. Abbreviations used for the file system path type are as follows.

- N** New path, created by this product.
- X** Path created by this product, but may already exist from a previous release.
- P** Previously existing path, created by another product.

4. All target and distribution libraries listed have the following attributes:

- The default name of the data set may be changed.
- The default block size of the data set may be changed.
- The data set may be merged with another data set that has equivalent characteristics.
- The data set may be either a PDS or a PDSE.

5. All target libraries listed have the following attributes:

- These data sets can be SMS-managed, but they are not required to be SMS-managed.
- These data sets are not required to reside on the IPL volume.
- The values in the "Member Type" column are not necessarily the actual SMP/E element types that are identified in the SMPMCS.

6. All target libraries that are listed and contain load modules have the following attributes:

- These data sets can be in the LPA, but they are not required to be in the LPA.
- These data sets can be in the LNKLIST.
- These data sets are not required to be APF-authorized.

Figure 12 (Page 1 of 2). Storage Requirements for SMP/E Work Data Sets

Library DDNAME	T Y P E	O R G	R E C F M	L R E C L	No. of 3390 Trks	No. of DIR Blks
SMPWRK1	S	PDS	FB	80	120	10
SMPWRK2	S	PDS	FB	80	30	10
SMPWRK3	S	PDS	FB	80	9500	150

Figure 12 (Page 2 of 2). Storage Requirements for SMP/E Work Data Sets

Library DDNAME	T Y P E	O R G	R E C F M	L R E C L	No. of 3390 Trks	No. of DIR Blks
SMPWRK4	S	PDS	FB	80	80	10
SMPWRK5	S	PDS	FB	80	45000	400
SYSUT1	U	SEQ	--	--	24000	0
SYSUT2	U	SEQ	--	--	30	0
SYSUT3	U	SEQ	--	--	30	0
SYSUT4	U	SEQ	--	--	30	0

The following table provides an estimate of the storage needed in the SMP/E data sets for WebSphere Application Server for z/OS V8.5. You must add the estimates to those of any other programs and service that you install to determine the total additional storage requirements.

If the table indicates that the SMPLTS data set must be a PDSE and your existing SMPLTS is a PDS, you must allocate a new PDSE and copy your SMPLTS into it; then change the SMPLTS DDDEF entry to indicate the new PDSE data set.

Figure 13. Storage Requirements for SMP/E Data Sets

Library DDNAME	T Y P E	O R G	R E C F M	L R E C L	No. of 3390 Trks	No. of DIR Blks
SMPLTS	E	PDS	U	0	50	1
SMPMTS	E	PDS	FB	80	15	5
SMPPTS	E	PDS	FB	80	50000	500
SMPSCDS	E	PDS	FB	80	15	2
SMPSTS	E	PDS	FB	80	15	2

The following figures describe the target and distribution libraries and file system paths required to install WebSphere Application Server for z/OS V8.5. The storage requirements of WebSphere Application Server for z/OS must be added to the storage required by other programs having data in the same library or path.

Note: The data in these tables should be used when determining which libraries can be merged into common data sets. In addition, since some ALIAS names may not be unique, ensure that no naming conflicts will be introduced before merging libraries.

Figure 14. Storage Requirements for Target Libraries

Library DDNAME	Member Type	Target Volume	T Y P E	O R G	R E C F M	L R E C L	No. of 3390 Trks	No. of DIR Blks
SBBOEXEC	EXEC	TVOL1	U	PDS	VB	255	10	5
SBBOJCL	Sample	TVOL2	U	PDS	FB	80	10	5
SBJAEXEC	EXEC	TVOL1	U	PDS	VB	255	10	5
SBJAJCL	Sample	TVOL2	U	PDS	FB	80	10	5

Figure 15. File System Paths

DDNAME	T Y P E	Path Name
SBBOIMR	N	/usr/lpp/InstallationManagerRepository/HBBO850/IBM
SBJAIMR	N	/usr/lpp/InstallationManagerRepository/HBJA700/IBM
SMPJHOME	E	/usr/lpp/java/J5.0

Figure 16. Storage Requirements for Distribution Libraries

Library DDNAME	T Y P E	O R G	R E C F M	L R E C L	No. of 3390 Trks	No. of DIR Blks
ABBOEXEC	U	PDS	VB	255	10	5
ABBOIMR	U	PDS-E	VB	255	85500	1000
ABBOJCL	U	PDS	FB	80	10	5
ABJAEXEC	U	PDS	VB	255	10	5
ABJAIMR	U	PDS-E	VB	255	30000	1000
ABJAJCL	U	PDS	FB	80	10	5

WebSphere Application Server for z/OS requires several thousand additional tracks (3390 tracks) for run-time data sets. The amount of space depends on the application server structure to be used, the applications to be run, and the amount of data storage the applications require.

5.3 FMIDs Deleted

Installing WebSphere Application Server for z/OS might result in the deletion of other FMIDs. To see which FMIDs will be deleted, examine the ++VER statement in the SMPMCS of the product.

If you do not want to delete these FMIDs at this time, install WebSphere Application Server for z/OS into separate SMP/E target and distribution zones.

Note: These FMIDs are not automatically deleted from the Global Zone. If you want to delete these FMIDs from the Global Zone, see the SMP/E manuals for instructions.

5.4 Special Considerations

The installation of WebSphere Application Server for z/OS requires a minimum IBM Installation Manager level of Version 1.5.2. Apply PTF UK77059 to the Installation Manager install kit, FMID HGIN140 before creating your Installation Manager on z/OS.

If you already have an Installation Manager at a lower level than Version 1.5.2, then:

- Apply PTF UK77059 to the Installation Manager install kit, FMID HGIN140, to update the install kit.
- Rerun the GIN2INST sample job to invoke the *installc*, *userinstc*, or *groupinstc* command from the updated install kit, while specifying the same parameters you used to create the Installation Manager. This process will update your Installation Manager to the level in the Installation Manager install kit.

The WebSphere Application Server for z/OS V8.5 product is comprised of FMIDs HBBO850 and HBJA700. However, other products that include WebSphere Application Server for z/OS V8.5 may omit FMID HBJA700 if Java 7 functionality is not needed.

For these products, you can ignore the installation instructions presented in this program directory for IBM WebSphere SDK Java Technology Edition V7.0.

6.0 Installation Instructions

This chapter describes the installation method and the step-by-step procedures to install and to activate the functions of WebSphere Application Server for z/OS V8.5.

6.1 Installing WebSphere Application Server for z/OS V8.5 base

WebSphere Application Server for z/OS V8.5 base is installed using the IBM Installation Manager and a repository containing the WebSphere Application Server for z/OS product code.

You can install the traditional WebSphere Application Server for z/OS runtime (referred to here as the "full profile"), the new lightweight Liberty Profile, or both.

Complete installation will require an IBM Installation Manager (version 1.5.2 or above) on your z/OS system. To create an the Installation Manager, follow the instructions presented in the Installation Manager for z/OS V1.5.2 Program Directory, GI11-9487-00, which can be accessed here:

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

Install the IBM Installation Manager repository for WebSphere Application Server for z/OS using SMP/E as explained in section 6.5.2, "Create SMP/E zones (optional)" on page 39 through 6.5.8, "Perform SMP/E ACCEPT" on page 41.

The use of the Installation Manager to create the product code for WebSphere Application Server for z/OS base is explained in 6.1.9, "Mount the WebSphere Application Server for z/OS V8.5 product repository" on page 32 through 6.1.11, "Install the WebSphere Application Server for z/OS V8.5 full profile" on page 32.

6.1.1 Sample Jobs for WebSphere Application Server for z/OS V8.5 base

The following sample installation jobs are provided as part of the product to help you install WebSphere Application Server for z/OS:

Figure 17 (Page 1 of 3). Sample Installation Jobs - HBBO850

Job Name	Job Type	Description	RELFILE
BBOCSICR	SETUP	Sample job to create an SMP/E global zone and required data sets	IBM.HBBO850.F1
BBOZNCRT	SETUP	Sample job to create an SMP/E target zone and dlib zone, and required data sets	IBM.HBBO850.F1
BBORECEV	RECEIVE	Sample job to receive SMP/E deliverables for the WebSphere Application Server for z/OS product repository	IBM.HBBO850.F1

Figure 17 (Page 2 of 3). Sample Installation Jobs - HBBO850

Job Name	Job Type	Description	RELFILE
BBOALLOC	ALLOCATE	Sample job to allocate target and distribution libraries for the WebSphere Application Server for z/OS product repository	IBM.HBBO850.F1
BBOISMKD	MKDIR	Sample job to allocate the system paths for the WebSphere Application Server for z/OS product repository	IBM.HBBO850.F1
BBODDDEF	DDDEF	Sample job to define SMP/E DDDEFs for the WebSphere Application Server for z/OS product repository	IBM.HBBO850.F1
BBOAPPLY	APPLY	Sample APPLY job for the WebSphere Application Server for z/OS product repository	IBM.HBBO850.F1
BBOACCEP	ACCEPT	Sample ACCEPT job for the WebSphere Application Server for z/OS product repository	IBM.HBBO850.F1
BBO1CFS	ALLOCIM	Sample job to allocate a file system for the WebSphere Application Server for z/OS full profile	IBM.HBBO850.F1
BBO1INST	INSTALL	Sample job to install the WebSphere Application Server for z/OS full profile with the IBM Installation Manager	IBM.HBBO850.F1
BBO1UNIN	UNINSTALL	Sample job to uninstall the WebSphere Application Server for z/OS full profile	IBM.HBBO850.F1
BBO2CFS	ALLOCIM	Sample job to allocate a file system for the DMZ secure proxy server product	IBM.HBBO850.F1
BBO2INST	INSTALL	Sample job to install the DMZ secure proxy server product with the IBM Installation Manager	IBM.HBBO850.F1
BBO2UNIN	UNINSTALL	Sample job to uninstall the DMZ secure proxy server product	IBM.HBBO850.F1
BBO3CFS	ALLOCIM	Sample job to allocate a file system for the WebSphere Application Server for z/OS Web server plug-ins	IBM.HBBO850.F1
BBO3INST	INSTALL	Sample job to install the Web server plug-ins V8.0 product with the IBM Installation Manager	IBM.HBBO850.F1
BBO3UNIN	UNINSTALL	Sample job to uninstall the Web server plug-ins V8.0 product	IBM.HBBO850.F1
BBO4CFS	ALLOCIM	Sample job to allocate a file system for the IBM HTTP Server product	IBM.HBBO850.F1
BBO4INST	INSTALL	Sample job to install the IBM HTTP Server product with the IBM Installation Manager	IBM.HBBO850.F1
BBO4UNIN	UNINSTALL	Sample job to uninstall the IBM HTTP Server product	IBM.HBBO850.F1

Figure 17 (Page 3 of 3). Sample Installation Jobs - HBBO850

Job Name	Job Type	Description	RELFILE
BBO5CFS	ALLOCIM	Sample job to allocate a file system for the WebSphere Application Server for z/OS Liberty Profile	IBM.HBBO850.F1
BBO5INST	INSTALL	Sample job to install the WebSphere Application Server for z/OS Liberty Profile with IBM Installation Manager	IBM.HBBO850.F1
BBO5UNIN	UNINSTALL	Sample job to uninstall the WebSphere Application Server for z/OS Liberty Profile	IBM.HBBO850.F1

You can access the sample installation jobs by performing an SMP/E RECEIVE and then copying the jobs from the relfiles to a work data set for editing and submission. See Figure 17 on page 27 to find the appropriate relfile data set.

You can also copy the sample installation jobs from the tape or product files by submitting the following job. Depending on your distribution medium, use either the //TAPEIN or the //FILEIN DD statement and comment out or delete the other statement. Before you submit the job, add a job card and change the lowercase parameters to uppercase values to meet the requirements of your site.

```
//STEP1 EXEC PGM=IEBCOPY
//SYSPRINT DD SYSOUT=*
//TAPEIN DD DSN=IBM.HBBO850.F1,UNIT=tunit,
// VOL=SER=volser,LABEL=(x,SL),
// DISP=(OLD,KEEP)
//FILEIN DD DSN=IBM.HBBO850.F1,UNIT=SYSALLDA,DISP=SHR,
// VOL=SER=filevol
//OUT DD DSNAME=jcl-library-name,
// DISP=(NEW,CATLG,DELETE),
// VOL=SER=dasdvol,UNIT=SYSALLDA,
// SPACE=(TRK,(primary,secondary,dir))
//SYSUT3 DD UNIT=SYSALLDA,SPACE=(CYL,(1,1))
//SYSIN DD *
COPY INDD=xxxxIN,OUTDD=OUT
/*
```

See the following information to update the statements in the previous sample:

TAPEIN:

tunit is the unit value that matches the product tape.

volser is the volume serial that matches the product tape.

x is the tape file number that indicates the location of the data set name on the tape.

See the documentation that is provided by CBPDO for the location of IBM.fmid.Fy on the tape.

FILEIN:

filevol is the volume serial of the DASD device where the downloaded files reside.

OUT:

jcl-library-name is the name of the output data set where the sample jobs are stored.

dasdvol is the volume serial of the DASD device where the output data set resides.

SYSIN:

xxxxIN is either TAPEIN or FILEIN depending on your input DD statement.

6.1.2 Create SMP/E zones (optional)

You can install the WebSphere Application Server for z/OS V8.5 repository using an existing SMP/E global zone, or create a new one.

To create a new SMP/E global zone, edit and submit sample job BBOCSICR.

You can install the WebSphere Application Server for z/OS repository into existing target and distribution zones, or create new ones.

To create new SMP/E target and distribution zones, edit and submit sample job BBOZNCRT.

Note: The Installation Manager repository for WebSphere Application Server for z/OS is only required when building the WebSphere Application Server for z/OS code. Therefore, you may want to store them separately, apart from software libraries that must be replicated on each system in your data center.

6.1.3 Perform SMP/E RECEIVE

If you have obtained WebSphere Application Server for z/OS as part of a CBPDO, use the RCVPDO job in the CBPDO RIMLIB data set to receive the WebSphere Application Server for z/OS repository FMID, service, and HOLDDATA that are included on the CBPDO tape. For more information, see the documentation that is included in the CBPDO.

The FMID for the WebSphere Application Server for z/OS repository is HBBO850.

Expected Return Codes and Messages: You will receive return code of 0 if the job runs correctly.

6.1.4 Allocate SMP/E Target and Distribution Libraries

Edit and submit sample job BBOALLOC to allocate the SMP/E target and distribution libraries for the WebSphere Application Server for z/OS repository. Consult the instructions in the sample job for more information.

Expected Return Codes and Messages: You will receive return code of 0 if the job runs correctly.

6.1.5 Allocate File system Paths

Edit and submit sample job BBOISMKD to mount the file system for the WebSphere Application Server for z/OS repository at mountpoint

```
-PathPrefix-/usr/lpp/InstallationManagerRepository/HBBO850
```

and create required subdirectories. Consult the instructions in the sample job for more information.

Expected Return Codes and Messages: You will receive return code of 0 if the job runs correctly, unless some of the required directories already exist, in which case you will receive a return code of 4.

6.1.6 Create DDDEF Entries

Edit and submit sample job BBODDDEF to create DDDEF entries for the SMP/E target and distribution libraries for the WebSphere Application Server for z/OS repository. Consult the instructions in the sample job for more information.

Expected Return Codes and Messages: You will receive return code of 0 if the job runs correctly.

6.1.7 Perform SMP/E APPLY

Edit and submit sample job BBOAPPLY to perform an SMP/E APPLY CHECK for the WebSphere Application Server for z/OS repository. Consult the instructions in the sample job for more information. After you take actions that are indicated by the APPLY CHECK, remove the CHECK operand and run the job again to perform the APPLY.

Note: The GROUPEXTEND operand indicates that SMP/E applies all requisite SYSMODs. The requisite SYSMODS might be applicable to other functions.

Expected Return Codes and Messages from APPLY CHECK: You will receive a return code of 0 if this job runs correctly, unless one or more HOLDs was bypassed, in which case you will receive a return code of 4.

Expected Return Codes and Messages from APPLY: You will receive a return code of 0 if this job runs correctly, unless one or more HOLDs was bypassed, in which case you will receive a return code of 4.

6.1.8 Perform SMP/E ACCEPT

Edit and submit sample job BBOACCEP to perform an SMP/E ACCEPT CHECK for WebSphere Application Server for z/OS repository. Consult the instructions in the sample job for more information.

After you take actions that are indicated by the ACCEPT CHECK, remove the CHECK operand and run the job again to perform the ACCEPT.

Note: The GROUPEXTEND operand indicates that SMP/E accepts all requisite SYSMODs. The requisite SYSMODS might be applicable to other functions.

Expected Return Codes and Messages from ACCEPT CHECK: You will receive a return code of 0 or 4 if this job runs correctly, unless one or more HOLDS was bypassed, in which case you will receive a return code of 4.

Expected Return Codes and Messages: from ACCEPT You will receive a return code of 0 or 4 if this job runs correctly, unless one or more HOLDS was bypassed, in which case you will receive a return code of 4.

6.1.9 Mount the WebSphere Application Server for z/OS V8.5 product repository

The SBBOIMR file system now contains the Installation Manager repository files for the WebSphere Application Server for z/OS product. If PTFs were applied, it may also contain additional fix packs for WebSphere Application Server for z/OS - any of which can be installed.

Unmount the SBBOIMR file system and remount it *read-only* at a location of your choice. The recommended location is:

```
/usr/lpp/InstallationManagerRepository/HBBO850
```

6.1.10 Create a file system for installing the WebSphere Application Server for z/OS V8.5 full profile

Edit and submit sample job BBO1CFS to allocate and mount a file system for the WebSphere Application Server for z/OS full profile code. Consult the instructions in the sample job for more information.

Mount this file system at the location where the IBM Installation Manager will install, uninstall, or apply maintenance to the products in the file system. The mount location does not need to be the same location at which the file system is mounted in production.

Expected Return Codes and Messages: You will receive a return of 0 if the job runs correctly.

6.1.11 Install the WebSphere Application Server for z/OS V8.5 full profile

Edit and submit sample job BBO1INST to install the WebSphere Application Server for z/OS. Consult the instructions in the sample job for more information.

By default, the latest version of the product is installed from the product repository with the default list of optional features.

To install a particular level of the product from the repository, see the instructions in the sample job.

You can also specify optional features and national language to be installed. See the WebSphere Application Server for z/OS V8.5 information center for the details.

Expected Return Codes and Messages: You will receive a return of 0 if the job runs correctly.

When the installation is complete, unmount the product file system and remount it on your target system at the location at which it is to be accessed.

6.1.12 Create a file system for installing the WebSphere Application Server for z/OS V8.5 Liberty Profile

Edit and submit sample job BBO5CFS to allocate and mount a file system for the WebSphere Application Server for z/OS Liberty Profile code. Consult the instructions in the sample job for more information.

Mount this file system at the location where the IBM Installation Manager will install, uninstall, or apply maintenance to the products in the file system. The mount location does not need to be the same location at which the file system is mounted in production.

Expected Return Codes and Messages: You will receive a return of 0 if the job runs correctly.

6.1.13 Install the WebSphere Application Server for z/OS V8.5 Liberty Profile

Edit and submit sample job BBO5INST to install the WebSphere Application Server for z/OS Liberty Profile. Consult the instructions in the sample job for more information.

By default, the latest version of the product is installed from the product repository with the default list of optional features.

To install a particular level of the product from the repository, see the instructions in the sample job.

Expected Return Codes and Messages: You will receive a return of 0 if the job runs correctly.

When the installation is complete, unmount the product file system and remount it on your target system at the location at which it is to be accessed.

6.2 Installing WebSphere Application Server for z/OS V8.5 DMZ secure proxy server

WebSphere Application Server for z/OS DMZ secure proxy server is installed using the Installation Manager and a repository containing the WebSphere Application Server for z/OS product.

You must first create an IBM Installation Manager on your z/OS system if you have not already done so. Follow the instructions in the IBM Installation Manager information center located here:

<http://publib.boulder.ibm.com/infocenter/install/v1r5/index.jsp>

A summary of using the Installation Manager is located in the Installation Manager for z/OS V1.5.2 Program Directory, GI11-9487-00, which can be accessed here:

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

The following instructions assume that the repository is mounted at:

`/usr/lpp/InstallationManagerRepository/HBBO850`

6.2.1 Create a file system for installing the WebSphere Application Server for z/OS V8.5 DMZ secure proxy server product

Edit and submit sample job BBO2CFS to allocate and mount a file system for the WebSphere Application Server for z/OS DMZ secure proxy server product. Consult the instructions in the sample job for more information.

Mount this file system at the location where the Installation Manager will install the product code. The file system must be mounted read/write at this location whenever the Installation Manager will install, uninstall, or apply maintenance to the products in the file system. The mount location does not need to be the same location at which the file system is mounted in production.

Expected Return Codes and Messages: You will receive return code of 0 if the job runs correctly.

6.2.2 Install the WebSphere Application Server for z/OS V8.5 DMZ secure proxy server code

Edit and submit sample job BBO2INST to install the WebSphere Application Server for z/OS DMZ secure proxy server product. Consult the instructions in the sample job for more information.

By default, the latest version of the product is installed from the product repository.

To install a particular level of the product from the repository, see the instructions in the sample job.

Expected Return Codes and Messages: You will receive return code of 0 if the job runs correctly.

When the installation is complete, unmount the product file system and remount it on your target system at the location at which it is to be accessed.

6.3 Installing WebSphere Application Server for z/OS V8.5 Web server plug-ins

Web server plug-ins are installed using the Installation Manager and a repository containing the WebSphere Application Server for z/OS product.

You must first create an IBM Installation Manager on your z/OS system if you have not already done so. Follow the instructions in the IBM Installation Manager information center located here:

<http://publib.boulder.ibm.com/infocenter/install/v1r5/index.jsp>

A summary of using the Installation Manager is located in the Installation Manager for z/OS V1.5.2 Program Directory, GI11-9487-00, which can be accessed here:

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

The following instructions assume that the repository is mounted at

`/usr/lpp/InstallationManagerRepository/HBBO850`

6.3.1 Create a file system for installing the Web server plug-ins

Edit and submit sample job BBO3CFS to allocate and mount a file system for the Web server plug-ins. Consult the instructions in the sample job for more information.

Mount this file system at the location where the Installation Manager will install the product code. The file system must be mounted read/write at this location whenever the Installation Manager will install, uninstall, or apply maintenance to the products in the file system. The mount location does not need to be the same location at which the file system is mounted in production.

Expected Return Codes and Messages: You will receive return code 0 if the job runs correctly.

6.3.2 Installing the Web server plug-ins code

Edit and submit sample job BBO3INST to install the Web server plug-ins. Consult the instructions in the sample job for more information.

By default, the latest version of the product is installed from the product repository. To install a particular level of the product from the repository, see the instructions in the sample job.

When the installation is complete, unmount the product file system and remount it on your target system at the location at which it is to be accessed.

6.4 Installing IBM HTTP Server

WebSphere Application Server for z/OS IBM HTTP Server V8.5 is installed using the Installation Manager and a repository containing the WebSphere Application Server for z/OS product.

You must first create an IBM Installation Manager on your z/OS system if you have not already done so. Follow the instructions in the IBM Installation Manager information center located here:

<http://publib.boulder.ibm.com/infocenter/install/v1r5/index.jsp>

A summary of using the Installation Manager is located in the Installation Manager for z/OS V1.5.2 Program Directory, GI11-9487-00, which can be accessed here:

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

The following instructions assume that the repository is mounted at:

`/usr/lpp/InstallationManagerRepository/HBBO850`

6.4.1 Create a file system for installing the IBM HTTP Server V8.5 product

Edit and submit sample job BBO4CFS to allocate and mount a file system for the IBM HTTP Server product code. Consult the instructions in the sample job for more information.

Mount this file system at the location where the Installation Manager will install the product code. The file system must be mounted read/write at this location whenever the Installation Manager will install, uninstall, or apply maintenance to the products in the file system. The mount location does not need to be the same location at which the file system is mounted in production.

Expected Return Codes and Messages: You will receive a return code of 0 if the job runs correctly.

6.4.2 Install the IBM HTTP Server V8.5 code

Edit and submit sample job BBO4INST to install the the IBM HTTP Server product code. Consult the instructions in the sample job for more information.

By default, the latest level of the product in the repository is installed. To install a specific level, see the instructions in the sample job.

Expected Return Codes and Messages: You will receive return code of 0 if the job runs correctly.

When the installation is complete, unmount the product file system and remount it on your target system at the location at which it is to be accessed.

6.5 Installing IBM WebSphere SDK Java Technology Edition Version 7

IBM WebSphere SDK Java Technology Edition V7.0 is an *optional* Java level that can be installed into, and used with, a copy of the WebSphere Application Server for z/OS V8.5 product, in addition to the IBM WebSphere SDK Java Technology Edition V6.0 that is included with the WebSphere Application Server base. This optional level of Java can also be used with the new Liberty Profile. Once the IBM WebSphere SDK Java Technology Edition V7.0 is installed, you can configure and run servers using either the 31- or 64-bit versions of the Version 6 SDK, or the 31- or 64-bit versions of the Version 7 SDK.

Complete installation will require an IBM Installation Manager (version 1.5.2 or above) on your z/OS system. To create an the Installation Manager, follow the instructions presented in the Installation Manager for z/OS V1.5.2 Program Directory, GI11-9487-00, which can be accessed here:

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

Install the IBM Installation Manager repository for SDK Java Technology Edition V7.0 using SMP/E as explained in section 6.5.2, “Create SMP/E zones (optional)” on page 39 through 6.5.8, “Perform SMP/E ACCEPT” on page 41.

The use of the Installation Manager to create the product code for SDK Java Technology Edition V7.0 is explained in 6.5.9, “Mount the IBM WebSphere SDK Java Technology Edition V7.0 product repository” on page 41 through 6.5.10, “Install the SDK Java Technology Edition V7.0” on page 41.

6.5.1 Sample Jobs for IBM WebSphere SDK Java Technology Edition V7.0

The following sample installation jobs are provided as part of the product to help you install SDK Java Technology Edition V7.0:

Figure 18 (Page 1 of 2). Sample Installation Jobs - HBJA700

Job Name	Job Type	Description	RELFILE
BJACSICR	SETUP	Sample job to create an SMP/E global zone and required data sets	IBM.HBJA700.F1
BJAZNCRT	SETUP	Sample job to create an SMP/E target zone and dlib zone, and required data sets	IBM.HBJA700.F1
BJARECEV	RECEIVE	Sample job to receive SMP/E deliverables for the SDK Java Technology Edition V7.0 product repository	IBM.HBJA700.F1
BJAALLOC	ALLOCATE	Sample job to allocate target and distribution libraries for the SDK Java Technology Edition V7.0 product repository	IBM.HBJA700F1
BJAISMKD	MKDIR	Sample job to allocate the system paths for the SDK Java Technology Edition V7.0 product repository	IBM.HBJA700.F1

Figure 18 (Page 2 of 2). Sample Installation Jobs - HBJA700

Job Name	Job Type	Description	RELFILE
BJADDDEF	DDDEF	Sample job to define SMP/E DDDEFs for the SDK Java Technology Edition V7.0 product repository	IBM.HBJA700.F1
BJAAPPLY	APPLY	Sample APPLY job for the SDK Java Technology Edition V7.0 product repository	IBM.HBJA700.F1
BJAACCEP	ACCEPT	Sample ACCEPT job for the SDK Java Technology Edition V7.0 product repository	IBM.HBJA700.F1
BJA1INST	INSTALL	Sample job to install the SDK Java Technology Edition V7.0 product with the IBM Installation Manager (for full profile)	IBM.HBJA700.F1
BJA1UNIN	UNINSTALL	Sample job to uninstall the SDK Java Technology Edition V7.0 product (for full profile)	IBM.HBJA700.F1
BJA2INST	INSTALL	Sample job to install the SDK Java Technology Edition V7.0 product with the IBM Installation Manager (for DMZ secure proxy server)	IBM.HBJA700.F1
BJA2UNIN	UNINSTALL	Sample job to uninstall the SDK Java Technology Edition V7.0 product (for DMZ secure proxy server)	IBM.HBJA700.F1
BJA3INST	INSTALL	Sample job to install the SDK Java Technology Edition V7.0 product with the IBM Installation Manager (for Liberty Profile)	IBM.HBJA700.F1
BJA3UNIN	UNINSTALL	Sample job to uninstall the SDK Java Technology Edition V7.0 product (for Liberty Profile)	IBM.HBJA700.F1

You can access the sample installation jobs by performing an SMP/E RECEIVE and then copying the jobs from the relfiles to a work data set for editing and submission. See Figure 18 on page 37 to find the appropriate relfile data set.

You can also copy the sample installation jobs from the tape or product files by submitting the following job. Depending on your distribution medium, use either the //TAPEIN or the //FILEIN DD statement and comment out or delete the other statement. Before you submit the job, add a job card and change the lowercase parameters to uppercase values to meet the requirements of your site.

```
//STEP1 EXEC PGM=IEBCOPY
//SYSPRINT DD SYSOUT=*
//TAPEIN DD DSN=IBM.HBJA700.F1,UNIT=tunit,
//      VOL=SER=volser,LABEL=(x,SL),
//      DISP=(OLD,KEEP)
//FILEIN DD DSN=IBM.HBJA700.F1,UNIT=SYSALLDA,DISP=SHR,
//      VOL=SER=filevol
//OUT DD DSNAME=jcl-library-name,
//      DISP=(NEW,CATLG,DELETE),
//      VOL=SER=dasdvol,UNIT=SYSALLDA,
```

```
//      SPACE=(TRK,(primary,secondary,dir))
//SYSUT3 DD UNIT=SYSALLDA,SPACE=(CYL,(1,1))
//SYSIN  DD *
        COPY INDD=xxxxIN,OUTDD=OUT
/*
```

See the following information to update the statements in the previous sample:

TAPEIN:

tunit is the unit value that matches the product tape.

volser is the volume serial that matches the product tape.

x is the tape file number that indicates the location of the data set name on the tape.

See the documentation that is provided by CBPDO for the location of IBM.fmid.Fy on the tape.

FILEIN:

filevol is the volume serial of the DASD device where the downloaded files reside.

OUT:

jcl-library-name is the name of the output data set where the sample jobs are stored.

dasdvol is the volume serial of the DASD device where the output data set resides.

SYSIN:

xxxxIN is either TAPEIN or FILEIN depending on your input DD statement.

6.5.2 Create SMP/E zones (optional)

You can install the WebSphere Application Server for z/OS repository using an existing SMP/E global zone, or create a new one.

To create a new SMP/E global zone, edit and submit sample job BJACSICR.

You can install the WebSphere Application Server for z/OS repository into existing target and distribution zones, or create new ones.

To create new SMP/E target and distribution zones, edit and submit sample job BJAZNCRT.

Note: The Installation Manager repository for WebSphere Application Server for z/OS is only required when building the WebSphere Application Server for z/OS code. Therefore, you may want to store them separately, apart from software libraries that must be replicated on each system in your data center.

6.5.3 Perform SMP/E RECEIVE

If you have obtained IBM WebSphere SDK Java Technology Edition V7.0 as part of a CBPDO, use the RCVPDO job in the CBPDO RIMLIB data set to receive the IBM WebSphere SDK Java Technology Edition V7.0 repository FMID, service, and HOLDDATA that are included on the CBPDO tape. For more information, see the documentation that is included in the CBPDO.

The FMID for the IBM WebSphere SDK Java Technology Edition V7.0 repository is HBJA700.

Expected Return Codes and Messages: You will receive return code of 0 if the job runs correctly.

6.5.4 Allocate SMP/E Target and Distribution Libraries

Edit and submit sample job BJAALLOC to allocate the SMP/E target and distribution libraries for the IBM WebSphere SDK Java Technology Edition V7.0 repository. Consult the instructions in the sample job for more information.

Expected Return Codes and Messages: You will receive return code of 0 if the job runs correctly.

6.5.5 Allocate File system Paths

Edit and submit sample job BJAISMKD to mount the file system for the IBM WebSphere SDK Java Technology Edition V7.0 repository at mountpoint

```
-PathPrefix-/usr/lpp/InstallationManagerRepository/HBJA700
```

and create required subdirectories. Consult the instructions in the sample job for more information.

Expected Return Codes and Messages: You will receive return code of 0 if the job runs correctly, unless some of the required directories already exist, in which case you will receive a return code of 4.

6.5.6 Create DDDEF Entries

Edit and submit sample job BJADDDEF to create DDDEF entries for the SMP/E target and distribution libraries for the IBM WebSphere SDK Java Technology Edition V7.0 repository. Consult the instructions in the sample job for more information.

Expected Return Codes and Messages: You will receive return code of 0 if the job runs correctly.

6.5.7 Perform SMP/E APPLY

Edit and submit sample job BJAAPPLY to perform an SMP/E APPLY CHECK for the IBM WebSphere SDK Java Technology Edition V7.0 repository. Consult the instructions in the sample job for more information. After you take actions that are indicated by the APPLY CHECK, remove the CHECK operand and run the job again to perform the APPLY.

Note: The GROUPEXTEND operand indicates that SMP/E applies all requisite SYSMODs. The requisite SYSMODS might be applicable to other functions.

Expected Return Codes and Messages from APPLY CHECK: You will receive a return code of 0 if this job runs correctly, unless one or more HOLDs was bypassed, in which case you will receive a return code of 4.

Expected Return Codes and Messages from APPLY: You will receive a return code of 0 if this job runs correctly, unless one or more HOLDs was bypassed, in which case you will receive a return code of 4.

6.5.8 Perform SMP/E ACCEPT

Edit and submit sample job BJAACCEP to perform an SMP/E ACCEPT CHECK for IBM WebSphere SDK Java Technology Edition V7.0 repository. Consult the instructions in the sample job for more information.

After you take actions that are indicated by the ACCEPT CHECK, remove the CHECK operand and run the job again to perform the ACCEPT.

Note: The GROUPEXTEND operand indicates that SMP/E accepts all requisite SYSMODs. The requisite SYSMODS might be applicable to other functions.

Expected Return Codes and Messages from ACCEPT CHECK: You will receive a return code of 0 or 4 if this job runs correctly, unless one or more HOLDS was bypassed, in which case you will receive a return code of 4.

Expected Return Codes and Messages: from ACCEPT You will receive a return code of 0 or 4 if this job runs correctly, unless one or more HOLDS was bypassed, in which case you will receive a return code of 4.

6.5.9 Mount the IBM WebSphere SDK Java Technology Edition V7.0 product repository

The SBJAIMR file system now contains the Installation Manager repository files for the SDK Java Technology Edition V7.0 product. If PTFs were applied, it may also contain additional one fix pack level for SDK Java Technology Edition V7.0

Unmount the SBJAIMR file system and remount it *read-only* at a location of your choice. The recommended location is:

```
/usr/lpp/InstallationManagerRepository/HBJA700
```

6.5.10 Install the SDK Java Technology Edition V7.0

Select a copy of the WebSphere Application Server for z/OS V8.5 product code into which the new Java SDK will be installed. Mount the file system containing this product code at the original path used to install it with the Installation Manager.

Edit and submit sample job BJA1INST to install the IBM WebSphere SDK Java Technology Edition V7.0 for use with the WebSphere Application Server for z/OS full profile.

Edit and submit sample job BJA2INST to install the IBM WebSphere SDK Java Technology Edition V7.0 for use with the WebSphere Application Server for z/OS DMZ secure proxy server.

Edit and submit sample job BJA3INST to install the IBM WebSphere SDK Java Technology Edition V7.0 for use with the WebSphere Application Server for z/OS Liberty Profile. Consult the instructions in the sample job for more information.

By default, the latest version of the product is installed from the product repository with the default list of optional features.

To install a particular level of the product from the repository, see the instructions in the sample job.

Expected Return Codes and Messages: You will receive a return of 0 if the job runs correctly.

When the installation is complete, unmount the product file system and remount it on your target system at the location at which it is to be accessed.

6.6 Activating WebSphere Application Server for z/OS V8.5

For instructions on how to activate and use WebSphere Application Server for z/OS, including DMZ secure proxy server, Web server plug-ins V8.0, and Liberty Profile, see the WebSphere Application Server for z/OS V8.5 information center, accessible from this URL:

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

For instructions on how to activate and use IBM HTTP Server, see the IBM HTTP Server V8.5 information center, accessible from this URL:

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

At this URL, click the V8.5 tab, then find either the WebSphere Application Server for z/OS V8.5 or IBM HTTP Server V8.5 information centers and click "view page".

Appendix A. Using Compressed Repositories to Install WebSphere Application Server for z/OS Version 8.5.5

This appendix describes the installation method and the step-by-step procedures to install and to activate the functions of WebSphere Application Server for z/OS Version 8.5.5 using compressed repositories on product media (DVD), as an alternative to the traditional SMP/E install.

The compressed repositories were refreshed as part of Fix Pack 8.5.5.0 to include updated base levels of all repositories, as well as a new smaller repository for the Liberty Profile. This section describes the contents of the compressed repository disks at the Fix Pack 8.5.5.0 level.

A.1 Setting up the product repositories

WebSphere Application Server for z/OS Version 8.5.5 is installed using the IBM Installation Manager and one or more repositories containing the WebSphere Application Server for z/OS product code.

The following sections explain how to set up the product repositories.

A.1.1 Uploading the initial repositories

Repositories containing the initial levels of the WebSphere Application Server for z/OS Version 8.5.5 product are provided on product media (DVD) in the form of compressed repository files. Depending on your order, you may receive product media as physical disks or as disk images (.iso). If you did not order physical media, create physical disks from the disk images.

The disk labelled **Compressed repositories for WebSphere Application Server for z/OS** contains the following files. File sizes are given in megabytes.

<i>Figure 19. WebSphere Application Server for z/OS V8.5.5 Compressed Repositories</i>	
File Name	File Size (megabytes)
was.repo.8550.zOS.zip	1720
was.repo.8550.liberty.zOS.zip	110
was.repo.8550.plg.zOS.zip	35
was.repo.8550.ihs.zOS.zip	33
was.repo.1104.w2mtk.zip	81
was.repo.7501.adapters.zip	18

Copy these files in binary to your z/OS system and uncompress each file into its own directory. For example, you might create the following directories on your z/OS system.

```
/repo/WAS855/full/initial  
/repo/WAS855/liberty/initial  
/repo/WAS855/plugins/initial  
/repo/WAS855/IHS/initial  
/repo/WAS855/WEB20/initial  
/repo/WAS855/adapters/initial
```

Into these directories you store the uncompressed repository contents. Total space required for the uncompressed repositories is 45000 tracks (3390). You can delete the compressed repository files from your z/OS system once they have been successfully uncompressed.

The disk labelled **Compressed repositories for SDK Java Technology Edition** contains the following file with sizes given in megabytes.

<i>Figure 20. WebSphere Java SDK V7.0 Compressed Repositories</i>	
File Name	File Size (megabytes)
was.repo.8550.java7.zOS.zip	730

If you plan to install the IBM WebSphere SDK Java Technology Edition V7.0, copy this file in binary to your z/OS system and uncompress it into an empty directory. For example, you might create the following directory on your z/OS system for this purpose.

```
/repo/WAS855/java7/initial
```

You use this directory to store the uncompressed repository contents. Total space required for the uncompressed repository is 15000 tracks (3390). You can delete the compressed repository files from your z/OS system once the files have been successfully uncompressed.

A.1.2 Downloading service repositories (optional)

To install the product at a level other than the initial product level, you will require additional fix pack repositories, which can be downloaded to your z/OS system or accessed directly from the IBM service repository. This section explains how to download service repositories from the IBM Fix Central web site.

Follow the instructions in the WebSphere Application Server for z/OS Version 8.5.5 information center to locate fix pack repositories for the components you will install. Each fix pack repository contains all files necessary to upgrade the product component from the initial level to the specific fix pack level contained in the fix pack repository.

Download the fix pack repositories for the WebSphere Application Server for z/OS product components and fix packs you plan to install. Uncompress each fix pack repository into its own directory. For example, you might create the following directories on your z/OS system.

```
/repo/WAS85/base/8.5.5.1  
/repo/WAS85/liberty/8.5.5.1
```

```
/repo/WAS85/plugins/8.5.5.1
/repo/WAS85/IHS/8.5.5.1
/repo/WAS85/WEB20/8.5.5.1
/repo/WAS85/adapters/7.5.0.5
/repo/WAS85/java7/7.0.4.2
```

You use these directories to store the fix pack repository contents. Download only the fix pack repositories you will need. You can delete the compressed fix pack repository files from your z/OS system once they have been successfully uncompressed.

A.1.3 Accessing the Web-based service repository (optional)

Instead of downloading fix pack repositories, you can obtain fix pack content directly from the Web-based product service repository.

You will need an IBM Software user ID and password.

Issue the following Installation Manager command to create a keyring file containing your IBM Software user ID and password.

```
imutilsc saveCredential
-keyring filename
-userName userID -userPassword password
-url http://www.ibm.com/software/repositorymanager/com.ibm.websphere.zOS.v85/repository.xml
```

For example:

```
/InstallationManager/bin/eclipse/tools/imutilsc saveCredential
-keyring /u/madmin/WAS.keyring
-userName jsmith998 -userPassword tr1sfm0tp
-url http://www.ibm.com/software/repositorymanager/
com.ibm.websphere.zOS.v85/repository.xml
```

Make sure that the keyring file can be read by the user ID that will invoke the Installation Manager to install or apply maintenance to WebSphere Application Server for z/OS Version 8.5.5.

A.2 Using the IBM Installation Manager

Use IBM Installation Manager to install the components of WebSphere Application Server for z/OS. For more information, see the Installation Manager Program Directory, or the Installation Manager information center.

<http://publib.boulder.ibm.com/infocenter/install/v1r5/index.jsp>

The product installation is performed with the *imcl* install command:

```
imcl install package_name
  -installationDirectory installation_path
  -sharedResourcesDirectory shared_resources_location
  -repositories repository_list
  -acceptLicense
```

The package name identifies the product to be installed, and may be followed by an underscore and a specific product level in the form *v.r.m.date_time*. If you do not specify a particular level, then the latest level in the repository list is installed.

Use the Installation Manager command `listAvailablePackages` to see the product levels that can be installed.

```
imcl listAvailablePackages -repositories repository_list
```

For some packages, you can also specify a list of optional features, separated by commas, after the package name.

```
imcl install package,feature,feature
```

The installation path is the directory into which the product will be installed. It must be writeable by the Installation Manager user ID. If the Installation Manager is set up to run in group mode, then the directory must have group write permissions (`chmod g+w`) and be owned by the Installation Manager group.

The shared resources directory is used to collect and validate files and metadata. This directory should contain at least 30000 tracks (of free space), and cannot be used by more than one Installation Manager. The shared resources location is set during the first product install and cannot be changed unless all products have been uninstalled.

Once installation is complete, the files in the shared resources directory are only needed for product rollback when the product repositories are not available. If the product repositories will remain available to your system, you can add the following option to the *imcl* install command to direct the Installation manager to clear the shared resources directory once installation is complete. This prevents the shared resources directory space requirements from growing over time.

```
-preferences com.ibm.cic.common.core.preferences.preserveDownloadedArtifacts=false
```

The repository list must contain the initial product repository, and any desired fix pack repositories. Each repository is specified as a file path or URL (file:, ftp:, or http:). Separate the repositories in the list with commas, but no spaces.

To add the Web-based service repository to the repository search order, include the `-useServiceRepository` option, and a `-keyring` option to point to a keyring file containing your IBM Software user ID and password.

```
-useServiceRepository -keyring keyring_file
```

The `-acceptLicense` option indicates that you have read and accept the license terms, which can usually be found in the root of the product repository or in a directory named `lafiles`.

A.2.1 Example 1

Install using only the initial repository

```
/InstallationManager/bin/eclipse/tools/imcl
install com.ibm.websphere.zOS.v85
  -installationDirectory /usr/lpp/zWebSphere/V8R5
  -sharedResourcesDirectory /InstallationManager/sharedResources
  -repositories /repo/WAS855/base/initial
  -acceptLicense
```

A.2.2 Example 2

Install using only the initial repository and a fix pack repository, deleting the shared resources when finished.

```
/InstallationManager/bin/eclipse/tools/imcl
install com.ibm.websphere.zOS.v85
  -installationDirectory /usr/lpp/zWebSphere/8.5.5.1
  -sharedResourcesDirectory /InstallationManager/sharedResources
  -preferences
    com.ibm.cic.common.core.preferences.preserveDownloadedArtifacts=false
  -repositories /repo/WAS855/base/initial,/repo/WAS855/base/8.5.5.1
  -acceptLicense
```

A.2.3 Example 3

Install a particular level, using the service repository. The shared resources location is already set and does not need to be re-specified.

```
/InstallationManager/bin/eclipse/tools/imcl
install com.ibm.websphere.zOS.v85_8.5.5001_20140202_0100
  -installationDirectory /usr/lpp/zWebSphere/8.5.5.1
  -preferences
    com.ibm.cic.common.core.preferences.preserveDownloadedArtifacts=false
  -repositories /repo/WAS855/base/initial
  -useServiceRepository -keyring keyring_file
  -acceptLicense
```

A.3 Installing WebSphere Application Server for z/OS V8.5 application server component

Use IBM Installation Manager to create one or more copies of the WebSphere Application Server for z/OS application server full profile.

Allocate a file system on z/OS with 45000 tracks (3390) of free space.

Add any additional space for stack extension products, and add 12000 tracks (3390) if you will also be installing IBM WebSphere SDK Java Technology Edition V7.0 into this copy of WebSphere Application Server for z/OS.

Choose an installation location and mount the file system. It must be writeable by the Installation Manager user ID.

Using the Installation Manager user ID, invoke the *imcl* install command to install the application server product:

```
installation_manager_binaries /eclipse/tools/imcl
install com.ibm.websphere.zOS.v85
  -installationDirectory installation_path
  -sharedResourcesDirectory shared_resources_location
  -repositories repository_list
  -acceptLicense
```

The package name for the application server is com.ibm.websphere.zOS.v85.

For Example,

```
/InstallationManager/bin/eclipse/tools/imcl
install com.ibm.websphere.zOS.v85
  -installationDirectory /usr/lpp/zWebSphere/V8R5
  -sharedResourcesDirectory /InstallationManager/sharedResources
  -repositories /repo/WAS85/base/initial,/repo/WAS855/base/8.5.5.1
  -acceptLicense
```

When installation is complete, unmount the product file system and remount it on your target system at the location at which it is to be accessed.

A.3.1 Optional Features

The following features are available for the application server component of WebSphere Application Server for z/OS Version 8.5.5.

```
core.feature          (required)
ejbdeploy
embeddablecontainer
thinclient
samples
```

By default, the following features are installed:

```
core.feature,ejbdeploy,embeddablecontainer,thinclient
```

You can choose a different set of optional features by adding a comma and feature list after the package name in the *imcl* install command.

```
imcl install core.feature,samples
```

If you provide a feature list, this overrides the default feature list.

Features can be added or removed with the *imcl* modify command.

A.4 Installing WebSphere Application Server for z/OS V8.5 Liberty Profile

Use IBM Installation Manager to create one or more copies of the WebSphere Application Server for z/OS application server Liberty Profile.

Allocate a file system on z/OS with 3000 tracks (3390) of free space.

Add any additional space for stack extension products, and add 6000 tracks (3390) if you will also be installing IBM WebSphere SDK Java Technology Edition V7.0 into this copy of WebSphere Application Server for z/OS.

Choose an installation location and mount the file system. It must be writeable by the Installation Manager user ID.

Using the Installation Manager user ID, invoke the *imcl* install command to install the application server product:

```
installation_manager_binaries /eclipse/tools/imcl
install com.ibm.websphere.liberty.zOS.v85
-installationDirectory installation_path
```

```
-sharedResourcesDirectory shared_resources_location  
-repositories repository_list  
-acceptLicense
```

The package name for the application server is `com.ibm.websphere.liberty.zOS.v85`.

For Example,

```
/InstallationManager/bin/eclipse/tools/imcl  
install com.ibm.websphere.liberty.zOS.v85  
-installationDirectory /usr/lpp/zWebSphere/Liberty/V8R5  
-sharedResourcesDirectory /InstallationManager/sharedResources  
-repositories /repo/WAS855/liberty/initial  
-acceptLicense
```

When installation is complete, unmount the product file system and remount it on your target system at the location at which it is to be accessed.

A.4.1 Optional Features

The following optional features are available with the Liberty Profile of WebSphere Application Server for z/OS V8.5.5.

```
embeddablecontainer  
extprogmodels
```

By default, both optional features are installed.

If you provide a feature list, this overrides the default feature list.

Features can be added or removed with the `imcl` modify command.

A.5 Installing the WebSphere Application Server for z/OS Version 8.5.5 DMZ secure proxy server

Use the IBM Installation Manager to create one or more copies of the WebSphere Application Server for z/OS DMZ secure proxy server component.

Note: Program components for the DMZ secure proxy server are found in the same initial and fix pack repositories as for the application server component.

Allocate a file system on z/OS with 18000 tracks (3390) of free space. Add 12000 tracks (3390) if you will also be installing IBM WebSphere SDK Java Technology Edition V7.0 into this copy of the WebSphere Application Server for z/OS DMZ secure proxy server component.

Choose an installation location and mount the file system. It must be writeable by the Installation Manager user ID.

Using the Installation Manager user ID, invoke the *imcl* install command to install the application server product:

```
installation_manager_binaries /eclipse/tools/imcl
install com.ibm.websphere.NDDMZ.zOS.v85
-installationDirectory installation_path
-sharedResourcesDirectory shared_resources_location
-repositories repository_list
-acceptLicense
```

The package name for the DMZ secure proxy server is com.ibm.websphere.NDDMZ.zOS.v85.

A.5.1 Example - DMZ secure proxy server

```
/InstallationManager/bin/eclipse/tools/imcl
install com.ibm.websphere.NDDMZ.zOS.v85
-installationDirectory /usr/lpp/zWebSphere_SPS/V8R5
-sharedResourcesDirectory /InstallationManager/sharedResources
-repositories /repo/WAS855/base/initial,/repo/WAS855/base/8.5.5.1
-acceptLicense
```

When the installation is complete, unmount the product file system and remount it on your target system at the location at which it is to be accessed.

A.6 Installing the WebSphere Application Server for z/OS V8.5 Web server plug-ins

Use the Installation Manager to create one or more copies of the WebSphere Application Server for z/OS Version 8.5.5 Web server plug-ins component.

Allocate a file system on z/OS with 900 tracks (3390) of free space.

Choose an installation location and mount the file system.

Using the Installation manager user ID, invoke the *imcl* install command to install the Web server plug-ins.

```
installation_manager_binaries /eclipse/tools/imcl
install com.ibm.websphere.PLG.zOS.v85
-installationDirectory installation_path
-sharedResourcesDirectory shared_resources_location
-repositories repository_list
-acceptLicense
```

The package name for the Web server plug-ins is com.ibm.websphere.PLG.zOS.v85.

A.6.1 Example - Web server plug-ins

```
/InstallationManager/bin/eclipse/tools/imcl
install com.ibm.websphere.PLG.zOS.v85
  -installationDirectory /usr/lpp/zWebSphere_Plugins/V8R5
  -sharedResourcesDirectory /InstallationManager/sharedResources
  -repositories /repo/WAS855/plugins/initial
  -useServiceRepository -keyring /u/imadmin/WAS.keyring
  -acceptLicense
```

A.7 Installing the IBM HTTP Server

Use IBM Installation Manager to create one or more copies of the IBM HTTP Server component.

Allocate a file system on z/OS with 900 tracks (3390) of free space.

Choose an installation location and mount the file system. It must be writeable by the Installation Manager user ID.

Using the Installation Manager user ID, invoke the *imcl* command to install the IBM HTTP Server:

```
installation_manager_binaries /eclipse/tools/imcl
install com.ibm.websphere.IHS.zOS.v85
  -installationDirectory installation_path
  -sharedResourcesDirectory shared_resources_location
  -repositories repository_list
  -acceptLicense
```

The package name for the IBM HTTP Server is com.ibm.websphere.IHS.zOS.v85.

A.7.1 Example - IBM HTTP Server

```
/InstallationManager/bin/eclipse/tools/imcl
install com.ibm.websphere.IHS.zOS.v85
  -installationDirectory /usr/lpp/IHSA/V8R5
  -sharedResourcesDirectory /InstallationManager/sharedResources
  -repositories /repo/WAS855/base/initial,/repo/WAS855/IHS/8.5.5.1
  -acceptLicense
```

When the installation is complete, unmount the product file system and remount it on your target system at the location at which it is to be accessed.

A.8 Installing the WEB 2.0 and Mobile Toolkit

Use the IBM Installation Manager to create one or more copies of the WEB 2.0 and Mobile Toolkit component of WebSphere Application Server for z/OS.

Allocate a file system on z/OS with 5000 tracks (3390) of free space.

Choose an installation location and mount the file system. It must be writeable by the Installation Manager user ID.

Using the Installation Manager user ID, invoke the *imcl* command to install the WEB 2.0 and Mobile Toolkit.

```
installation_manager_binaries /eclipse/tools/imcl
install com.ibm.websphere.W2MTK.v11
-installationDirectory installation_path
-sharedResourcesDirectory shared_resources_location
-repositories repository_list
-acceptLicense
```

The package name for the WEB 2.0 and Mobile Toolkit is com.ibm.websphere.W2MTK.v11.

A.8.1 Example - WEB 2.0 and Mobile Toolkit

```
/InstallationManager/bin/eclipse/tools/imcl
install com.ibm.websphere.W2MTK.v11
-installationDirectory /opt/IBM/WebSphere/W2MTK
-sharedResourcesDirectory /InstallationManager/sharedResources
-repositories /repo/WAS855/WEB20/initial
-useServiceRepository -keyring /u/imadmin/WAS.keyring
-acceptLicense
```

When the installation is complete, unmount the product file system and remount it on your target system at the location at which it is to be accessed.

A.9 Installing the WebSphere Adapters

Use the IBM Installation Manager to create one or more copies of the WebSphere Adapters component of WebSphere Application Server for z/OS.

Allocate a file system on z/OS with 600 tracks (3390) of free space.

Choose an installation location and mount the file system. It must be writeable by the Installation Manager user ID.

Using the Installation Manager user ID, invoke the *imcl* command to install the WebSphere Adapters.

```
installation_manager_binaries /eclipse/tools/imcl
install com.ibm.websphere.adapters.v75,features
-installationDirectory installation_path
-sharedResourcesDirectory shared_resources_location
-repositories repository_list
-acceptLicense
```

The package name for the WebSphere Adapters is com.ibm.websphere.adapters.v75.

At least one of the following optional features must be installed: JDE, SAP, PeopleSoft, Siebel, OracleEBS

A.9.1 Example - WebSphere Adapters

```
/InstallationManager/bin/eclipse/tools/imcl
install com.ibm.websphere.adapters.v75,SAP,Siebel
-installationDirectory /opt/IBM/WebSphere/Adapters
-sharedResourcesDirectory /InstallationManager/sharedResources
-repositories /repo/WAS855/adapters/initial
-useServiceRepository -keyring /u/imadmin/WAS.keyring
-acceptLicense
```

When the installation is complete, unmount the product file system and remount it on your target system at the location at which it is to be accessed.

A.10 Installing the IBM WebSphere SDK Java Technology Edition V7.0

Use IBM Installation Manager to install the optional IBM WebSphere SDK Java Technology Edition V7.0. This component is not installed into a new file system; instead, it is installed into the product file system for the application server or DMZ secure proxy server component.

Mount the product file system into which the IBM WebSphere SDK Java Technology Edition V7.0 will be installed. Make sure that it is mounted at the correct installation location. The file system will require approximately 12000 tracks (3390) of free space.

Using the Installation Manager user ID, invoke the *imcl* install command to install the WebSphere Java SDK V7.0:

```
installation_manager_binaries /eclipse/tools/imcl
install com.ibm.websphere.IBMJAVA.v70
-installationDirectory installation_path
-sharedResourcesDirectory shared_resources_location
-repositories repository_list
```

-acceptLicense

The package name for the IBM WebSphere SDK Java Technology Edition V7.0 is com.ibm.websphere.IBMJAVA.v70.

A.10.1 Example - WebSphere Java SDK V7.0

```
/InstallationManager/bin/eclipse/tools/imcl
install com.ibm.websphere.IBMJAVA.v70
  -installationDirectory /usr/lpp/zWebSphere/V8R5
  -repositories /repo/WAS855/java/initial
  -useServiceRepository -keyring /u/imadmin/WAS.keyring
  -acceptLicense
```

A.11 Installing the IBM WebSphere SDK Java Technology Edition V7.0 for use with the Liberty Profile

Use IBM Installation Manager to install the optional IBM WebSphere SDK Java Technology Edition V7.0. This component is not installed into a new file system; instead, it is installed into the product file system containing the WebSphere Application Server for z/OS Liberty Profile.

Mount the product file system into which the IBM WebSphere SDK Java Technology Edition V7.0 will be installed. Make sure that it is mounted at the correct installation location. The file system will require approximately 6000 tracks (3390) of free space.

Using the Installation Manager user ID, invoke the *imcl* install command to install the WebSphere Java SDK V7.0:

```
installation_manager_binaries /eclipse/tools/imcl
install com.ibm.websphere.liberty.IBMJAVA.v70
  -installationDirectory installation_path
  -sharedResourcesDirectory shared_resources_location
  -repositories repository_list
  -acceptLicense
```

The package name for the IBM WebSphere SDK Java Technology Edition V7.0 is com.ibm.websphere.liberty.IBMJAVA.v70.

A.11.1 Example - WebSphere Java SDK V7.0

```
/InstallationManager/bin/eclipse/tools/imcl
install com.ibm.websphere.liberty.IBMJAVA.v70
  -installationDirectory /usr/lpp/zWebSphere/Liberty/V8R5
  -repositories /repo/WAS855/java/initial
  -useServiceRepository -keyring /u/imadmin/WAS.keyring
  -acceptLicense
```

A.12 Activating WebSphere Application Server for z/OS Version 8.5.5

For instructions on how to activate and use WebSphere Application Server for z/OS, including DMZ secure proxy server, Web server plug-ins V8.0, and Liberty Profile see the WebSphere Application Server for z/OS Version 8.5.5 information center, accessible from this URL:

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

For instructions on how to activate and use IBM HTTP Server, see the IBM HTTP Server V8.5 information center, accessible from this URL:

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

At this URL, click the V8.0 tab, then find either the WebSphere Application Server for z/OS V8.5 or IBM HTTP Server V8.5 information centers and click "view page".

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Program Directory for WebSphere Application Server for z/OS Version 8.5.5, June 2013

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very satisfied	<----->				very dissatisfied	not applicable
1	2	3	4	5	N	

	Satisfaction					
Ease of product installation	1	2	3	4	5	N
Contents of Program Directory	1	2	3	4	5	N
Installation Verification Programs	1	2	3	4	5	N
Time to install the product	1	2	3	4	5	N
Readability and organization of Program Directory tasks	1	2	3	4	5	N
Necessity of all installation tasks	1	2	3	4	5	N
Accuracy of the definition of the installation tasks	1	2	3	4	5	N
Technical level of the installation tasks	1	2	3	4	5	N
Ease of getting the system into production after installation	1	2	3	4	5	N

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- CBPDO
- CustomPac
- ServerPac
- Independent
- Other

Is this the first time your organization has installed this product?

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- No

Were the people who did the installation experienced with the installation of z/OS products?

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IBM Corporation
P.O. Box 12195
Dept. AAWA/Bldg. 503
3039 Cornwallis Rd
Research Triangle Park NC 27709-2195
United States of America
E-Mail: wasdoc@us.ibm.com



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