



Installing your application serving environment

Note

Before using this information, be sure to read the general information under “Notices” on page 209.

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How to send your comments

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

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

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

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Chapter 1. Installing on the z/OS operating system

Installing an application serving environment under z/OS is a two-step process:

1. Load the product code using one of two delivery mechanisms:
 - IBM SystemPac or ServerPac
 - MVS Custom-Build Product Delivery Offering (CBPDO)
2. Create the WebSphere Application Server for z/OS run-time environment(s).

WebSphere Application Server for z/OS overview

The WebSphere Application Server for z/OS product lets you create unlimited numbers of standalone application servers using the Customization Dialog. However, the real strength of the product is the ability to create and manage a Network Deployment environment, in which you have installed managed application server nodes across a z/OS sysplex. You can manage all of the application servers as a group or cell by using the Administrative Console of the deployment manager. A deployment manager manages the configuration for all the managed nodes in its cell and deploys applications to any managed node in the cell. Use the Customization Dialog to create deployment managers and managed server nodes, and to federate existing standalone application servers into your cell.

The main reason to use managed nodes in a cell versus using the same number of standalone application servers is the centralized administration that the deployment manager provides for the cell. Another advantage is the ability to create clusters in a managed node that the deployment manager can then manage with simple workload balancing.

Other installable components

The product disc contains IBM HTTP Server, the Web server plug-ins for WebSphere Application Server for z/OS, and the Application Clients for WebSphere Application Server for z/OS. Each installation procedure is described in this Information Center and in the IBM HTTP Server Information Center.

How to buy IBM WebSphere Application Server for z/OS software

See your IBM representative for licensing information, or visit the How to buy WebSphere Application Server software (http://www.ibm.com/software/info/ecatalog/en_US/products/U105789N42720B65.html) Web site.

Chapter 2. Overview and new features for installing an application serving environment

This topic summarizes the contents and organization of the installation documentation, including links to conceptual overviews and descriptions of new features.

“Contents of this section: Installing your application serving environment” on page 4

This article lists links to all the major tasks involved in installing and configuring WebSphere Application Server for z/OS V6.0.1.

“What is new for installers” on page 5

This topic provides an overview of new and changed features in installation, migration, coexistence, and interoperability support.

Chapter 4, “Planning for installation,” on page 17

This topic introduces the two methods available to install WebSphere Application Server for z/OS V6.0.1 and helps you plan your product code placement and naming before you install the product.

Chapter 7, “Planning for product configuration,” on page 37

This topic describes the planning involved before you configure WebSphere Application Server for z/OS.

Release Notes

This section contains **Release Notes** for the z/OS operating system. The notes summarize late-breaking news and product limitations.

IBM WebSphere Application Server for z/OS, Version 6.0.1, Release Notes

This document contains release notes for WebSphere Application Server for z/OS, Version 6.0.1. Links are provided to the product support Web site, to product documentation, and to last minute updates, limitations, and known problems for the WebSphere Application Server for z/OS, Version 6.0.1, product.

Accessing last-minute updates, limitations, and known problems

The Version 6.0.1 release notes are available on the product support site as technotes. To see a list of the release notes for Version 6.0.1, go to the WebSphere Application Server support Web page (<http://www.ibm.com/support/search.wss?rs=404&tc=SS7K4U&q=V601Rnotes>).

Accessing hardware and software requirements

The hardware and software requirements for the WebSphere Application Server for z/OS product are provided on the System requirements Web page (http://www.ibm.com/software/webservers/appserv/zos_os390/requirements/).

Accessing product documentation

The following documentation is included with WebSphere Application Server for z/OS.

Program directory

The program directory, along with the Getting Started guide available in the Information Center, provides detailed instructions for installing WebSphere Application Server for z/OS.

Help files

The help files provide detailed instructions for completing tasks and specifying settings in the Customization Dialog and graphical systems management tools. Use the help menus, links, or buttons provided in the tool interfaces to access the help files.

Documentation on the Web

For online documentation of all WebSphere Application Server V6.x products, including WebSphere Application Server for z/OS V6.0.1, in all supported languages, go to WebSphere Application Server Version 6.0 Information Center (<http://publib.boulder.ibm.com/infocenter/ws60help/index.jsp>). All of the Version 6.x product documentation, including versions of the installed help files, is in the Information Center.

For the entire documentation set for all WebSphere Application Server products, including Adobe Acrobat PDF versions of the information, go to the WebSphere Application Server library page (<http://www.ibm.com/software/webservers/appserv/library.html>).

Accessing the product support Web site

To search for the latest technotes, downloads, fixes, and other support-related information, go to the WebSphere Application Server for z/OS support page (http://www.ibm.com/software/webservers/appserv/zos_os390/support/).

Contacting IBM Software Support

If you encounter a problem with WebSphere Application Server for z/OS, first try the following actions in any order:

- Follow the steps described in the product documentation.
- Look for related documentation in the online help.
- Look up error messages in the message reference.

If you cannot resolve your problem with any of the preceding methods, contact IBM Technical Support.

Purchasing WebSphere Application Server for z/OS entitles you to one year of telephone support under the Passport Advantage program. For details about Passport Advantage, visit the Passport Advantage Web page (http://www.lotus.com/services/passport.nsf/WebDocs/Passport_Advantage_Home).

The number for Passport Advantage members to call for support is 1-800-426-7378. Follow the prompts to reach the WebSphere Application Server for z/OS support center. Ensure you have the following information available when you call:

- Your contract or Passport Advantage number.
- Your WebSphere Application Server for z/OS version and revision level, plus any installed fixes.
- Your operating system name and version.
- Your database type and version.
- Basic topology data: how many machines are running, how many application servers, and so on.
- Any error or warning messages that are related to your problem.

Contents of this section: Installing your application serving environment

“Release Notes” on page 3

This topic highlights known problems, limitations, and workarounds as an addendum to the product documentation. Briefly review this document before installing the product.

Chapter 3, “Task overview: installing,” on page 11

This topic describes the installation and customization of all the installable components.

Chapter 4, “Planning for installation,” on page 17

This topic describes the planning involved before you install the product.

Chapter 5, “Installing the product and additional software,” on page 21

This topic describes how to install the product.

Chapter 6, “Preparing the base operating system,” on page 25

This topic describes the actions you need to take to prepare your base operating system for WebSphere Application Server for z/OS.

Chapter 7, “Planning for product configuration,” on page 37

This topic describes the planning involved before you configure the product.

Chapter 8, “Configuring the product after installation,” on page 91

This topic describes the configuration tasks you must undertake to configure the product after you install it.

Chapter 9, “Applying product maintenance,” on page 167

This topic describes the tasks you must perform to apply product maintenance.

Chapter 10, “Troubleshooting installation and configuration,” on page 173

This topic describes how to identify and handle a variety of problems that you may encounter during installation activities.

What is new for installers

This topic highlights what is new or changed in Version 6.0.x for users who plan to install, upgrade, or migrate the product, including coexistence and interoperability concerns.

There are many notable changes that have taken place in the WebSphere Application Server for z/OS product. Of note is that the Java Software Development Kit is now shipped, installed and serviced as part of the WebSphere Application Server for z/OS product. There is no longer a separate FMID for the SDK. This makes the WebSphere Application Server for z/OS product independent of any other SDK installed on the same z/OS systems. The shipped SDK resides in `install_root/java`.

Another big change is the removal of MQ Series integrated JMS from the shipment and installation of WebSphere Application Server for z/OS. You can use either a separate MQ Series license or the new service integration bus architecture for messaging services. If you set up the integrated JMS under Version 5.0 or Version 5.1, you can continue to use any JMS servers on nodes which have not yet migrated to Version 6.0.1.

You also now have the ability to incrementally upgrade nodes in a cell. This new feature is discussed in *New: Incremental cell upgrade* in the *Administering applications and their environment* PDF book.

New ability to create managed nodes directly

You can now directly configure managed nodes (with a node agent but no application servers) and add them to a Network Deployment cell. Create new application servers in the node using scripting or the administrative console. It is no longer necessary to create a stand-alone application server (formerly called a base application server) to build a Network Deployment cell.

New application server address space

Each application server controller now uses a new address space, called the control region adjunct (CRA), to attach to service integration buses for messaging.

<i>Improved Customization Dialog menus</i>	The Customization Dialog main menus have been reorganized for clarity. They now show the configuration options more clearly and the product data set panel has been updated to simplify setup.
<i>Changed product installation root</i>	The default product directory is now /usr/lpp/zWebSphere/V6R0. Since rolling warm starts can occur across modification level boundaries, the modification level is no longer part of the product directory name.
<i>Removed use of static application environments</i>	The Workload Management dynamic application environment SPE (APAR OW54622, included in z/OS Version 1.5 and above) is a prerequisite for Version 6.0 running under z/OS Version 1.4. You no longer need to set up or update static application environments in WLM.
<i>Included code for clients in the product HFS</i>	Additional downloadable clients and plug-ins are now installed in the product HFS. Both 32-bit and 64-bit application clients are included.
<i>Enlarged product HFS</i>	Because of the addition of client code, the product HFS has grown significantly. If you have a 3390-3 DASD device, you will no longer be able to house the entire product HFS on a single DASD volume. The Program Directory contains instructions for creating a secondary product HFS to hold the downloadable clients and plug-ins.
<i>Installing WebSphere Application Server clients</i>	A client application processes on a distributed client machine and a host WebSphere Application Server system. A client might provide the GUI, but process data on the host, for example. The Clients installation wizard installs environments for running client applications on the client machine. Some environments perform all necessary handshaking and protocol. <i>Thin</i> client environments require client applications to have their own protocols for such things as JNDI lookups.
<i>Improved installation documentation</i>	New installation documentation on the product disc helps you retrieve relevant information. For an overview of the installation section, see Chapter 2, "Overview and new features for installing an application serving environment," on page 3.

Packaging

This topic describes the family of WebSphere Application Server products.

The WebSphere software platform for e-business starts with a foundation that is formed from Web application serving and integration. IBM WebSphere Application Server software provides the core software to deploy, integrate, and manage your e-business applications.

WebSphere Application Server software supports custom-built applications that are either based on integrated WebSphere software platform products or on other third-party products. Such applications can range from dynamic Web presentations to sophisticated transaction processing systems.

IBM WebSphere Application Server - Express, WebSphere Application Server, and WebSphere Application Server Network Deployment are incrementally related. As you scale up your e-business demand, you can also scale up your e-business capability by moving from one product to the next.

IBM WebSphere Application Server for z/OS is a full-function version of the Network Deployment product. WebSphere Application Server for z/OS can support e-business on any scale.

The Express product is the entry point for a single distributed environment machine. The base Application Server product differs from the Express product in licensing and tooling support. The Network Deployment product and the WebSphere Application Server for z/OS product include all of the Application Server functionality of the other two products and also offer multiple-machine hosting and centralized management through a deployment manager process.

The management interface for all WebSphere Application Server product offerings includes a scripting interface and the administrative console, which is a Web application.

The scripting interface and the administrative console of the deployment manager are enhanced for managing all of the Application Servers in a distributed network cell. From the single point of control of the deployment manager, you can define servers, Web server processes, and clusters. You can start and stop servers and cluster members and deploy applications anywhere in the cell.

Product offerings for Version 6

IBM WebSphere Application Server products provide a next-generation application server on an industry-standard foundation. Each product addresses a distinct set of scenarios and needs. WebSphere Application Server, Version 6 includes the following product offerings:

- WebSphere Application Server - Express
- WebSphere Application Server
- WebSphere Application Server Network Deployment
- WebSphere Application Server for z/OS

WebSphere Application Server - Express

This product offering addresses the basic programming and run-time needs of desktop developers and single-server production scenarios. The run-time environment addresses standards-based programming for Web and component-based programming, as well as Web services.

The administration model for this offering is a single-server environment without clustering, and without centralized administration of multiple server instances.

The Express product package includes the Rational Web Developer tool, which is a fully integrated development environment (IDE). Rational Web Developer is an enhanced version of the WebSphere Studio Site Developer in Version 5. The Express package also includes the Application Server Toolkit.

Installing the Express product offering on the same machine as the Rational Web Developer is not necessary. The IDE contains a replica of the Version 6 Application Server as a test environment.

WebSphere Application Server

This product offering addresses the basic programming and run-time needs of desktop developers and single-server production scenarios. The run-time environment addresses standards-based programming for Web and component-based programming, as well as Web services.

The administration model is a single-server environment without clustering, and without centralized administration of multiple server instances.

The development environment offering is the Application Server Toolkit and a trial version of the Rational Application Developer product. The Rational Application Developer is an enhanced version of the WebSphere Studio Application Developer in Version 5.

WebSphere Application Server Network Deployment

This product offering addresses WebSphere Application Server processes that run in multiple-server production scenarios. The Network Deployment product can create:

- Deployment managers

The deployment manager provides centralized administration of managed Application Server nodes and custom nodes as a single cell. The deployment manager provides basic clustering and caching support, including failover support and workload balancing. Use the Edge components in the Network Deployment package to further extend the environment with sophisticated caching, load balancing, and enhanced security functions.

- Application Servers

The Application Server in the Network Deployment product can run in a deployment manager cell as a managed node or on its own as a stand-alone Application Server.

- Custom nodes

A custom node is an empty node until you add it to the deployment manager cell for customization. Use the administrative console of the deployment manager to create servers and clusters on the custom managed node. Consider the custom node as a production-ready shell, ready for customization to contain your production-level servers and applications.

WebSphere Application Server for z/OS

This product offering addresses WebSphere Application Server processes that run in multiple-server production scenarios in a UNIX space in z/OS regions. WebSphere Application Server for z/OS can create:

- Deployment managers

The deployment manager provides centralized administration of federated application server nodes and managed nodes as a single cell. The deployment manager provides basic clustering and caching support, including failover support and workload balancing.

- Application servers

The application server in WebSphere Application Server for z/OS can run in a deployment manager cell as a federated node or on its own as a stand-alone application server.

- Managed nodes

A managed node is an empty node until you add it to the deployment manager cell for customization. Use the administrative console of the deployment manager to create servers and clusters on the managed node. Consider the managed node as a production-ready shell, ready for customization to contain your production-level servers and applications.

Installation: Resources for learning

Use the following links to find relevant supplemental information about installation and customization. The information resides on IBM and non-IBM Internet sites, whose sponsors control the technical accuracy of the information.

These links are provided for convenience. Often, the information is not specific to the IBM WebSphere Application Server product, but is useful all or in part for understanding the product. When possible, links are provided to technical papers and Redbooks that supplement the broad coverage of the release documentation with in-depth examinations of particular product areas.

One important link is:

How to buy WebSphere Application Server software

(http://www.ibm.com/software/info/ecatalog/en_US/products/U105789N42720B65.html)

This IBM Web site describes pricing and technical details. If you have already purchased the software, view links to additional information about:

- Planning, business scenarios, and IT architecture
- Programming instructions and examples
- Programming specifications
- Administration
- Support

Planning, business scenarios, and IT architecture

- IBM WebSphere Application Server supported hardware, software, and APIs (<http://www.ibm.com/software/webservers/appserv/doc/latest/prereq.html>)

The official site for determining product prerequisites for hardware, software and APIs for all WebSphere Application Server products.

- IBM developerWorks WebSphere (<http://www7b.software.ibm.com/wsdd/>)

The home of technical information for developers working with WebSphere products. You can download WebSphere software, take a fast path to developerWorks zones, such as VisualAge Java or WebSphere Application Server, learn about WebSphere products through a newcomers page, tutorials, technology previews, training, and Redbooks, get answers to questions about WebSphere products, and join the WebSphere community, where you can keep up with the latest developments and technical papers.

- IBM WebSphere Application Server library and information centers Web site (<http://www.ibm.com/software/webservers/appserv/infocenter.html>)

The IBM WebSphere Application Server Library Web site contains links to all WebSphere Application Server information centers, for all versions. It also lets you access each information center in your native language.

- IBM WebSphere Application Server home page (<http://www.ibm.com/software/webservers/appserv/>)

The IBM WebSphere Application Server home page contains useful information, including support links and downloads for fixes, APARs, tools, and trials.

- IBM WebSphere software platform home page (<http://www.ibm.com/websphere>)

The IBM WebSphere software platform home page introduces WebSphere products and describes how companies can easily transform to an e-business, with software that can grow as fast as the business it supports.

- Information center for WebSphere Application Server Edge components (<http://www.ibm.com/software/webservers/appserv/ecinfocenter.html>)

The information center for WebSphere Application Server Edge components contains complete documentation for the Caching Proxy and the Load Balancer in these PDF online books, *WebSphere Application Server Concepts, Planning, and Installation for Edge Components*, *WebSphere Application Server Caching Proxy Administration Guide*, *WebSphere Application Server Load Balancer Administration Guide*, and *WebSphere Application Server Programming Guide for Edge Components*.

- developerWorks: IBM Patterns for e-business (<http://www.ibm.com/developerworks/patterns/index.html>)

The IBM developerWorks site is the source for IBM patterns for e-business, a set of tested, reusable intellectual assets that you can use to design and implement your e-business network and architecture.

- The User centered design (UCD) for different project types, part 2 (<http://www.ibm.com/developerworks/library/us-ucd2/index.html?dwzone=usability>)

This Web page is the latest of two articles that describes design activities that IBM scientists have found most useful in various types of projects. This article defines user interface design elements, including the design prototype, use case model, and design specification document.

Programming instructions and examples

- IBM developerWorks (<http://www.ibm.com/developerworks/>)

IBM developerWorks contains many excellent resources for developers, including tutorials on Web development-related topics. There is an excellent tutorial on the JDBC API.

- IBM Redbooks (<http://www.redbooks.ibm.com/>)

The IBM Redbooks site contains many documents that are related to WebSphere Application Server.

Programming specifications

- J2EE information (<http://java.sun.com>)

For more information about J2EE specifications, visit the Sun site.

Administration

- Best Practices Zone on developerWorks (<http://www-106.ibm.com/developerworks/websphere/zones/bp/>)

The WebSphere Best Practices Zone is a collection of best practices for administering WebSphere Application Server. Over time, the zone is intended to grow to include best practices for using other WebSphere software products, and to cover more topics. Use the feedback mechanism to submit your best practice suggestions.

- The IBM Glossary of Computing Terms (<http://www.ibm.com/ibm/terminology/goc/gocmain.htm>)

This glossary defines technical terms used in many IBM products. It is not a comprehensive resource of all IBM computing terms. This resource is provided for information purposes only and is updated periodically. IBM takes no responsibility for the accuracy of the information it contains.

Support

- Ten Steps to Getting Support for WebSphere Application Server (http://www7b.boulder.ibm.com/wsdd/support/appserver_support.html)

If you are new to a product, you might have difficulty finding all the information you need. And if you come across a problem, where do you go for help? Whether you are a new user looking for introductory information, or an experienced user looking for a workaround for a specific defect, you can benefit immediately from extensive Web-based support from IBM. You can download fix packs, search on keywords, look up FAQs, Hints and Tips, and so forth. Always use this Web resource before contacting IBM Support directly.

- WebSphere Application Server Support page (<http://www-3.ibm.com/software/webservers/appserv/support.html>)

Take advantage of the Web-based Support and Service resources from IBM to quickly find answers to your technical questions. You can easily access this extensive Web-based support through the IBM Software Support portal at URL <http://www-3.ibm.com/software/support/> and search by product category, or by product name. For example, if you are experiencing problems specific to WebSphere Application Server, click **WebSphere Application Server** in the product list. The WebSphere Application Server Support page displays.

- IBM e-server Support: Fix Central (<https://techsupport.services.ibm.com/server/aix.fdc>)

A Web facility for downloading fixes for the AIX operating system and the OS/400 operating system.

- Adobe Acrobat Web site (<http://www.adobe.com/products/acrobat/readstep2.html>)

This Adobe Web site offers a free download of the Adobe Acrobat Reader product.

Chapter 3. Task overview: installing

This topic describes the process of installing and configuring WebSphere Application Server for z/OS Version 6.0.1.

This topic introduces the context of installing and customizing IBM WebSphere Application Server for z/OS, Version 6.0.1, including the tasks you need to perform before and after installing. The product is provided in both U.S. English and Japanese.

To create a complete, customized WebSphere Application Server for z/OS application serving environment, you need to install the product code, prepare the z/OS operating system and subsystems, run the Customization Dialog, follow the customized instructions and run the jobs from the Dialog, and bring up your server(s).

Note: See “Building a practice WebSphere Application Server for z/OS cell” on page 58 for steps you can follow to set up a practice version of WebSphere Application Server for z/OS if you want to just get the feel for it or see the basics.

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

1. Plan data set names and layout for product code installation, as described in Chapter 4, “Planning for installation,” on page 17.
2. Install WebSphere Application Server for z/OS, as described in Chapter 5, “Installing the product and additional software,” on page 21. You must first load the WebSphere Application Server for z/OS code onto your system, using SMP/E or a preloaded product offering, before you make it usable through customization.
3. Prepare your z/OS target systems to run WebSphere Application Server for z/OS, as described in Chapter 6, “Preparing the base operating system,” on page 25.
4. Choose your application serving environment and decide on its initial characteristics, as described in Chapter 7, “Planning for product configuration,” on page 37.
5. Configure WebSphere Application Server for z/OS, as described in Chapter 8, “Configuring the product after installation,” on page 91. Once you have the WebSphere Application Server for z/OS code installed on your system, you are ready to make it your own by customizing it.
6. To create additional application serving environments, repeat the steps in Chapter 7, “Planning for product configuration,” on page 37 and Chapter 8, “Configuring the product after installation,” on page 91.
7. Tune for performance. For best performance on any platform, see Tuning the application serving environment in the *Tuning* PDF book.

You are ready to deploy and run applications using the WebSphere Application Server for z/OS product.

Hardware and software requirements

WebSphere Application Server for z/OS Version 6.0.1 requires z/OS or z/OS.e Version 1 Release 4 or later, and runs on any hardware that supports the required operating system software.

For detailed hardware and software requirements for installing WebSphere Application Server for z/OS Version 6.0.1, see “Driving system requirements” on page 12.

For detailed hardware and software requirements for customizing and running WebSphere Application Server for z/OS Version 6.0.1 application serving environments, see “Target system requirements” on page 12.

Driving system requirements

This topic describes prerequisites for installing WebSphere Application Server for z/OS Version 6.0.1.

Hardware requirements

The hardware requirements for this product are any hardware that supports z/OS Version 1 Release 4 or above. However, there are significant performance advantages for those applications doing floating point arithmetic if the machine has binary floating point hardware, such as S/390 Parallel Enterprise Server-Generation 5 and later systems.

You should plan on three 3390-3 DASD volumes (or equivalent storage) for the product target and distribution libraries and the product HFS, and an additional 3390-3 DASD volume (or equivalent storage) for CustomPac dialogs and work data sets (if you install using a ServerPac or SystemPac) or for SMP/E work data sets and refile storage (if you install using a Custom-Build Product Delivery Offering).

Software requirements

The z/OS system used to install WebSphere Application Server for z/OS Version 6.0.1 must run the following software. Consult the Program Directory and PSP bucket for any additional required corrective service not listed here.

- z/OS Version 1 Release 4 or above, or z/OS/e Version 1 Release 4 or above, with fixes for Language Environment APAR PQ982905 and SMP/E APAR IR54653.
- z/OS UNIX System Services (z/OS UNIX) with a hierarchical file system (HFS). For details, see *z/OS UNIX System Services Planning*.
- IBM Developer Kit for OS/390 Java 2 Technology Edition Version 1.1 or another Java Software Development Kit (level 1.2 or above) is required to provide the jar command used during SMP/E APPLY processing. You must mount the Java SDK HFS during APPLY processing and ensure that the directory containing the jar command is in the PATH of the user ID used to perform the SMP/E APPLY.

Target system requirements

This topic describes prerequisites for configuring and running WebSphere Application Server for z/OS Version 6.0.1 application serving environments.

Hardware requirements

The hardware requirements for this product are any hardware that supports z/OS Version 1 Release 4 or above. However, there are significant performance advantages for those applications doing floating point arithmetic if the machine has binary floating point hardware, such as S/390 Parallel Enterprise Server-Generation 5 and later systems.

The LPAR in which the WebSphere Application Server for z/OS runtime and initial application servers run requires a minimum of 512 MB of real storage. You may need to increase the real storage size depending on the size and number of application servers you deploy. In addition, you may want to increase your JES spool space if you use WebSphere Application Server for z/OS tracing options to the SYSPRINT DD dataset.

In addition to the DASD volumes use to hold the product code and HFS, you will need additional DASD storage to hold configuration data for application serving environments. The amount of storage depends on the number of environments and the size and complexity of the applications being deployed.

WebSphere Application Server for z/OS is a heavy user of auxiliary storage. You may wish to add additional paging volume(s) before configuring application serving environments.

Software requirements

You must install, enable, and configure the following z/OS elements, features, and components on each z/OS target system. Consult the Program Directory and PSP bucket for any additional required corrective service not listed here.

All of the z/OS sources referenced are available at this Web site:

<http://www.ibm.com/servers/eserver/zseries/zos/bkserv/>

- z/OS (or z/OS.e) Version 1 Release 4, configured as a sysplex (in the case of a single z/OS system, as a monoplex). For details, see *z/OS MVS Setting Up a Sysplex*.
- z/OS UNIX System Services (z/OS UNIX) with a hierarchical file system (HFS). For details, see *z/OS UNIX System Services Planning*.
- eNetwork Communications Server (TCP/IP) or equivalent. In this manual, we refer to eNetwork Communications Server, but you may substitute an equivalent product. For details, see *z/OS Communications Server: IP Migration*.
- Workload management (WLM) set up in goal mode. For details, see *z/OS MVS Planning: Workload Management*.
- Resource recovery services (RRS). For details, see *z/OS MVS Programming: Resource Recovery*.
- System logger. For details, see *z/OS MVS Setting up a Sysplex*.
- A security product such as z/OS Security Server (RACF). In this manual we refer to Security Server in examples, but you may substitute an equivalent security product. For details, see *z/OS Security Server RACF Migration*.

Additional software may be required to support particular product functions.

Table 1. Software requirements for optional functions

If you plan to use . . .	Then you need . . .	Notes . . .
WebSphere Application Server for z/OS IMS Connect V8 support	IMS/TM 6.1.0	
WebSphere Application Server for z/OS CICS Transaction Gateway 5.0.1 support	CICS/TS 1.3	
DB2	DB2 V7.1	DB2 is no longer a prerequisite for WebSphere Application Server for z/OS, though some functions may still require it. For example, session persistence requires an existing database. Check your individual configuration.
DB2 SQLJ in J2EE application components	DB2 V7.1 PTF UQ59527	DB2 is no longer a prerequisite for WebSphere Application Server for z/OS, though some functions may still require it. For example, session persistence requires an existing database. Check your individual configuration.
Connectors	WebSphere Application Server for z/OS supports any resource adapter that is designed to use the 1.0 level of the J2EE Connector Architecture (JCA). Install the listed IBM connectors if you want to access your IMS or CICS legacy data. For details on how to define and install a specific connector, see the documentation for that particular connector product.	

Table 1. Software requirements for optional functions (continued)

If you plan to use . . .	Then you need . . .	Notes . . .
	For the CICS Transaction Gateway ECI connector: <ul style="list-style-type: none"> • CICS Transaction Gateway V5.0.1 • CICS Transaction Server V1.3 • WebSphere Studio Application Developer IE V5.0 	
	For the IMS Connector for Java: <ul style="list-style-type: none"> • IMS Connect for z/OS V2.1 • IMS V8 • WebSphere Studio Application Developer IE V5.0.1 	
	For the IMS JDBC Connector: <ul style="list-style-type: none"> • IMS V8 	

Determining your skill needs

In assembling your project team, you should consider the skills you need to implement WebSphere Application Server for z/OS. This topic discusses the recommended skill set necessary to support the following configurations:

- Basic configurations
- Production environments

Documentation to support the z/OS skills described in this article can be found at this Web site: z/OS Internet Library (<http://www.ibm.com/servers/eserver/zseries/zos/bkserv/>)

For basic configurations:

Below are the recommended skills necessary to support a basic configuration:

- z/OS UNIX System Services and the hierarchical file system (HFS) - to set up a functional HFS and UNIX environment
- eNetwork Communications Server (TCP/IP) or equivalent - to configure connectivity for WebSphere Application Server for z/OS clients and servers
- Resource recovery services (RRS) - to implement resource recovery services and to support two-phase commit transactions
- Security Server (RACF), or the security product you use - to authenticate WebSphere Application Server for z/OS clients and servers, and authorize access to resources
- Secure Sockets Layer (SSL) - to enable security, if desired (recommended)
- SMP/E and JCL
- System logger - to set up logstreams for RRS and the WebSphere Application Server for z/OS error log
- Webserver - to support HTTP clients, if desired
- Workload management (WLM)
- Java and WebSphere Application Server tooling - to support application development and deployment

Depending on the needs of the applications you deploy, you may also need skills to configure the resource managers your applications require. Such skills might include CICS, DB2, IMS, and MQ.

For production environments:

As you move your system toward a production environment, you need to have the following system skills available:

- Automatic restart management (ARM)
- System Automation, if you have it installed, or whichever automation you prefer to use

- Sysplex, if you plan to use WebSphere Application Server for z/OS in a cell that spans systems
- Sysplex Distributor (part of eNetwork Communications Server), if you plan to create a high availability environment
- RMF or other performance measurement systems

Steps for creating your implementation plan

We assume you have a z/OS system on which you will implement WebSphere Application Server for z/OS.

To get started, plan to build your initial WebSphere Application Server for z/OS application serving environment servers on one system, then replicate them on other systems as you expand into a cell. This procedure guides you through initial planning and implementation of WebSphere Application Server for z/OS on a monoplex. Then it guides you through setting up your application development and client environments. Finally, the procedure guides you through planning for optional advanced system configurations.

Perform the following steps to implement your plan, checking off each item as you complete it:

1. Determine the skills you need. See “Determining your skill needs” on page 14 for more information.
2. Determine WebSphere Application Server for z/OS system requirements. See “Hardware and software requirements” on page 11 for more information.
3. Understand security options and prepare for securing your system. See the *Securing applications and their environment* PDF book for more information.
4. Implement Workload Management in goal mode, if necessary, on each z/OS system. See “Preparing workload management (WLM)” on page 34 for more information.
5. Implement Resource Recovery Services (if not all ready implemented) on each z/OS system. See “Preparing Resource Recovery Services” on page 31 for more information.
6. Plan for your performance and monitoring systems. See Contents of this section: Tuning performance and Contents of this section: Monitoring, both in the *Tuning* PDF book, for more information.
7. Plan and define your problem diagnosis procedures. See “Planning for problem diagnosis” on page 89 for more information.
8. Consider automatic restart management before you install WebSphere Application Server for z/OS. See “Automatic restart management” on page 85 for more information.
9. Plan your product data set and HFS naming conventions. See Chapter 4, “Planning for installation,” on page 17 for more information.
10. Install the WebSphere Application Server for z/OS product. See Chapter 5, “Installing the product and additional software,” on page 21 for more information.
11. Prepare your z/OS target systems to run WebSphere Application Server for z/OS. See Chapter 6, “Preparing the base operating system,” on page 25 for more information.
12. Learn about configuring application serving environments. See Chapter 7, “Planning for product configuration,” on page 37 for more information.
13. Set up a simple stand-alone application server to verify system readiness and gain experience with a basic application serving environment. See “Building a practice WebSphere Application Server for z/OS cell” on page 58 for more information.
14. Plan and define your system backup procedures. See Backing up the WebSphere Application Server for z/OS system in the *Administering applications and their environment* PDF book for more information.
15. Plan and define your software service procedures.
16. (Optional) Plan for testing and production systems. See Testing and production phases in the *Setting up the application serving environment* PDF book for more information.

17. Plan and configure your desired application serving environments. See Chapter 7, “Planning for product configuration,” on page 37 and Chapter 8, “Configuring the product after installation,” on page 91.
18. (Optional) Implement automation controls and set up automatic restart management for WebSphere Application Server for z/OS. See “Automatic restart management” on page 85 for more information.
19. Enable global security (strongly recommended). See Securing applications and their environments in the *Securing applications and their environment* PDF book for more information.
20. Develop and deploy applications. See Contents of this section: Developing and deploying applications in the *Developing and deploying applications* PDF book for more information.
21. Review WebSphere Application Server for z/OS requirements for application development and client environments.
22. (Optional) Implement Sysplex Distributor and set up a high availability environment. See Setting up a high availability environment in the *Setting up the application serving environment* PDF book for more information.
23. (Optional) Expand your application serving environments as needed.
24. Tune system performance. See Tuning the z/OS operating system and Contents of this section: Tuning performance, both in the *Tuning* PDF book, for more information.

Once you have identified the elements you wish to incorporate in your implementation plan, you are ready to install and configure the product.

Chapter 4. Planning for installation

Use this task to prepare to install WebSphere Application Server for z/OS product code.

Print and review “Steps for creating your implementation plan” on page 15. Assemble a team of people to install and configure the product. Be sure that the team has the skills needed to plan, install, and configure WebSphere Application Server for z/OS. See “Determining your skill needs” on page 14 for more information.

You must completely install the product code for WebSphere Application Server for z/OS before you can set up an application serving environment. Obtain product code from IBM in one of the following formats:

- An **IBM ServerPac or SystemPac**, which consists of loadable product libraries and corresponding SMP/E data sets. A ServerPac or SystemPac contains program libraries with integrated maintenance for one or more products, which include a base operating system, such as z/OS, if desired. Program library data sets are loaded to disk as part of the ServerPac or SystemPac installation. After installation, perform maintenance with SMP/E.
- An **IBM Custom-Build Product Delivery Option (CBPDO)**, which consists of SMP/E refiles. A CBPDO contains SMP/E refiles and maintenance for one or more products. Install each product using SMP/E commands (APPLY / ACCEPT) or the corresponding panels. After installation, perform maintenance with SMP/E.

Perform the tasks in this section before you install the WebSphere Application Server for z/OS product code. By planning your product code placement and naming, you can ease future product maintenance and migration tasks.

1. Make sure the z/OS system on which you will install WebSphere Application Server for z/OS meets the hardware and software requirements. See “Driving system requirements” on page 12 for more information.
2. Identify the software delivery option you will use. To review your product delivery options, see <http://www.ibm.com/servers/eserver/zseries/software/swinfo/os390.htm>. See “Using an IBM SystemPac or ServerPac” on page 21 or “Using an IBM Custom-Build Product Delivery Offering” on page 22 for more information.
3. Learn about WebSphere Application Server product data sets, and plan a naming convention. See “Planning for product data sets” for more information.
4. Learn about WebSphere Application Server product directories, and plan a mount point convention. See “Planning for product HFS directories” on page 20 for more information.
5. Review “Installation: Resources for learning” on page 8 for reference information you may need during installation.

When you have finished the planning process, you are ready to begin installing the product. See Chapter 5, “Installing the product and additional software,” on page 21.

Planning for product data sets

This document describes the WebSphere Application Server for z/OS product data sets and recommends a product data set naming convention.

WebSphere Application Server for z/OS product code resides in MVS partitioned data sets (which contain the product data sets) and MVS hierarchical file system directories (which contain the product directory and its subdirectories). The default high-level qualifier for the product data sets is BBO.

Note: In this and subsequent articles, “was_hlq” is used to represent the high-level data set name qualifier for a particular set of WebSphere Application Server for z/OS product data sets.

Product data set contents

The WebSphere Application Server for z/OS product data sets are divided into target data sets (used during product customization and execution) and distribution libraries (used to "back off" maintenance if necessary).

The WebSphere Application Server for z/OS target libraries are as follows:

was_hlq.SBBOCLIB

REXX scripts used by the Customization Dialog

was_hlq.SBBODSD

Side decks

was_hlq.SBBOEXEC

CLIST scripts

was_hlq.SBBOJCL

JCL for installation jobs

was_hlq.SBBOLD2

Load modules which must NOT be placed in LPA; may be in link list

was_hlq.SBBOLOAD

Load modules which may be placed in LPA or link list

was_hlq.SBBOLPA

Load modules which must be in LPA or loaded in ECSA by the location service daemon

was_hlq.SBBOMAC

Assembler macros

was_hlq.SBBOMIG

Load modules for use with IPCS dump formatting

was_hlq.SBBOMJPN

Customization Dialog message library (Japanese)

was_hlq.SBBOMLIB

Customization Dialog message library (English)

was_hlq.SBBOMSG

Message translation skeletons

was_hlq.SBBOPJPN

Customization Dialog panel library (Japanese)

was_hlq.SBBOPLIB

Customization Dialog panel library (English)

was_hlq.SBBOSLB2

Customization Dialog skeleton library of variable-length record files

was_hlq.SBBOSLIB

Customization Dialog skeleton library of fixed length, LRECL=80 files

The WebSphere Application Server for z/OS distribution libraries are as follows:

was_hlq.ABBOANT

HFS files

was_hlq.ABBOCLIB

REXX scripts used by the Customization Dialog

was_hlq.ABBOEBCD

HFS files (EBCDIC)

was_hlq.ABBOEXEC

CLISTS used by the Customization Dialog

was_hlq.ABBOEXP

Export files

was_hlq.ABBOINC

Include files

was_hlq.ABBOJAR

JAR files

was_hlq.ABBOJCL

JCL for installation jobs

was_hlq.ABBOMAC

Assembler macros

was_hlq.ABBOMJPN

Customization Dialog message library (Japanese)

was_hlq.ABBOMLIB

Customization Dialog message library (English)

was_hlq.ABBOMSG

Message translation skeletons

was_hlq.ABBOOBJ

Object modules for load module creation

was_hlq.ABBOPJPN

Customization Dialog panel library (Japanese)

was_hlq.ABBOPLIB

Customization Dialog panel library (English)

was_hlq.ABBOSLB2

Customization Dialog skeleton library of variable-length record files

was_hlq.ABBOSLIB

Customization Dialog skeleton library of fixed length, LRECL=80 files

See WebSphere Application Server for z/OS: Program Directory (GI11-2825) for allocation information about each target library and distribution library. Updates to this information are included in the Preventive Service Planning (PSP) bucket for each release of WebSphere Application Server for z/OS.

Product data set naming restrictions

The IBM ServerPac and SystemPac and the IBM Custom-Build Product Delivery Option allow you to rename product data sets during installation. In addition, the IBM ServerPac and SystemPac allow you to merge members from similar target libraries into a single data set. However, keep in mind the following:

- You should not merge SBBOLD2 with any other load module library.
- The Customization Dialog script library (SBBOCLIB), message libraries (SBBOMSG and SBOJPN), panel libraries (SBBOPLIB or SBBOPJPN, and skeleton libraries (SBBOSLIB and SBBOSLIB) are allocated directly by the Customization Dialog startup exec. You should not merge these libraries with any other ISPF libraries, and they should all have the same high level qualifier as the SBBOEXEC data set which contains the Customization Dialog startup exec.
- Ensure that the Customization Dialog data sets are cataloged.

Product data set naming convention

As noted above, certain WebSphere Application Server for z/OS data sets must have the same high level data set name qualifier in order for the product to function correctly. Product maintenance and migration is easier if all product data sets have the same high level qualifier.

On the other hand, in order to continue to run WebSphere Application Server for z/OS while applying maintenance, you must have at least two copies of the product data sets: one for the running application execution environment and one to which service is applied.

We recommend you choose a middle level qualifier for each separate release and maintenance level of WebSphere Application Server for z/OS. This middle level qualifier could reflect a very simple test/production distinction, such as with "BBO.V6PROD.*" or "BBO.V6TEST.*", or could include specific service level information, such as with "WAS.W600102.*" or "WAS.W600103.*".

There are many places where you must specify the product data set names, so, to avoid undue confusion, use the simplest data set naming scheme that accomplishes your maintenance goals.

Planning for product HFS directories

WebSphere Application Server for z/OS product code resides in MVS partitioned data sets (the product data sets) and MVS hierarchical file system directories (the product directory and its subdirectories). This document describes the WebSphere Application Server for z/OS product directory.

Product directory

All WebSphere Application Server for z/OS product HFS files reside in the product directory and its subdirectories. The default product directory name is /usr/lpp/zWebSphere/V6R0. Throughout the product and documentation, SMPE_ROOT is used to represent the fully-qualified path name of the WebSphere Application Server for z/OS product directory.

The product directory and all its subdirectories should reside in the same Hierarchical File System (HFS) or zSeries File System (ZFS) data set. This data set can be the same as the z/OS root or version data set, which is not recommended, or a separate data set used just for WebSphere Application Server for z/OS. The install jobs and program directory assume that such a separate data set is allocated, and refer to it as washlq.SBBOHFS where "was_hlq" represents the product data set name high level qualifier(s).

Product directory and configuration directory

Each WebSphere Application Server for z/OS application serving environment (stand-alone application server node, or Network Deployment cell) has configuration files in one or more WebSphere configuration directories. These configuration directories contain symbolic links to files in the product directory.

Chapter 5. Installing the product and additional software

Use this task to install WebSphere Application Server for z/OS product code.

Complete the steps in Chapter 4, “Planning for installation,” on page 17.

The product code for WebSphere Application Server for z/OS is installed using either an IBM ServerPac/SystemPac or an IBM Custom-Built Product Delivery Option (CBPDO). This section of the Information Center provides guidance on using these two vehicles to install the WebSphere Application Server for z/OS product.

Perform the tasks in this section to install the WebSphere Application Server for z/OS product code.

1. Order an IBM ServerPac/SystemPac or IBM CBPDO which contains the WebSphere Application Server for z/OS product.
2. Follow the instructions for the delivery vehicle you choose:
 - “Using an IBM SystemPac or ServerPac”
 - “Using an IBM Custom-Build Product Delivery Offering” on page 22
3. File the installation materials for late use during product maintenance.
4. (Optional) Download Web server plug-ins and WebSphere Application Clients from the WebSphere Application Server for z/OS product HFS to your Web server or workstation as appropriate. See “Downloading archive images from the z/OS platform to a distributed platform” on page 22 for more information.

When you have finished the install process, you are ready to prepare your target system(s) for WebSphere Application Server for z/OS. See Chapter 6, “Preparing the base operating system,” on page 25 for more information.

Using an IBM SystemPac or ServerPac

An IBM CustomPac (SystemPac, ServerPac or ProductPac) is a set of preloaded product data sets bundled with an IBM dialog which is used to load the data sets to disk and perform initial customization. In general, SMP/E work is not required during installation of a CustomPac offering. Instead, SMP/E data sets that correspond to the CustomPac service level are loaded onto the disk along with the product data sets. You can still use SMP/E to install preventive and corrective service after CustomPac installation.

If you use an IBM SystemPac or ServerPac, follow the instructions in the copy of *ServerPac: Installing your Order* that ships with your SystemPac or ServerPac.

See *ServerPac: Using the Installation Dialog (SA22-7815)* for information about the ISPF dialog used to install a SystemPac or ServerPac.

Notes:

- Be sure to choose a product data set naming convention that allows you to keep and maintain at least two copies of product libraries for maintenance purposes.
- If you are installing from a driving system, make sure the maintenance level of the target system meets requirements for WebSphere Application Server for z/OS.
- When installation is complete, make sure the product data sets are available to your z/OS target system(s) and the product code HFS is mounted at /usr/lpp/zWebSphere/V6R0 or a similar mount point of your choice on each target system.

For further information, see the following:

- eSupport Web site at http://www.ibm.com/software/webservers/appserv/zos_os390/support/
- PSP buckets

- IBM Software Support Center.

Using an IBM Custom-Build Product Delivery Offering

An IBM Custom-Build Product Delivery Offering (CBPDO) is a set of product tapes for one or more IBM software products that is bundled with cumulative service. Install the products and service on your system using SMP/E.

If you use CBPDO, follow the instructions in the copy of *WebSphere Application Server for z/OS 6.0.1 Program Directory* that ships with your order.

Notes:

- Be sure to choose a product data set naming convention that allows you to keep and maintain at least two copies of product libraries for maintenance purposes.
- If you are installing from a driving system, make sure the maintenance level of the target system meets requirements for WebSphere Application Server for z/OS.
- When installation is complete, make sure the product data sets are available to your z/OS target system(s) and the product code HFS is mounted at /usr/lpp/zWebSphere/V6R0 or a similar mount point of your choice on each target system.

For further information, see the following:

- eSupport Web site at http://www.ibm.com/software/webserver/appserv/zos_os390/support/
- PSP buckets
- IBM Software Support Center.

Downloading archive images from the z/OS platform to a distributed platform

Before you begin:

The product tape for the WebSphere Application Server product that runs on z/OS includes image archives for the following functions that can be run on a distributed platform:

- WebSphere Application Clients for distributed platforms supported by the WebSphere Application Server Version 6 products.
- The Data Direct Java Database Connectivity (JDBC) drivers for Microsoft Windows platforms.

To set up either of these functions on a distributed platform workstation:

1. Create a directory on the Web server where you want to install the image archive files for WebSphere Application Client or Data Direct Java Database Connectivity (JDBC) drivers for Microsoft Windows platforms.
2. For example, on the z/OS HFS containing the WebSphere Application Server product, locate the WebSphere Application Client image archive files.

The image archives for each supported platform are contained in the following directory on the HFS.

```
usr/lpp/zWebSphere/V6R0/downloads2...  
.../<platform>  
  /zdownloads.inst.cd.image.part1.for_<platform>.<archive-ending(s)>  
  /zdownloads.inst.cd.image.part2.for_<platform>.<archive-ending(s)>
```

There are two install image archives for each supported platform. Each pair of install images archives includes that includes the WebSphere Application Client archive files for that platform. The install image archives also contain the Data Direct Java Database Connectivity (JDBC) drivers for Microsoft Windows platforms.

Both install image archives must be downloaded to the same directory on the distributed platform.

3. Use FTP or some other process to download the two image archives to the distributed platform. These files are in binary format and must be downloaded in that format.
4. Archive and expand both of the files into the directory you created in Step 1.

See Installing Application Client for WebSphere Application Server

(http://publib.boulder.ibm.com/infocenter/ws60help/index.jsp?topic=/com.ibm.websphere.nd.doc/info/ae/ae/tcli_installclient) for a description of how to install the Application Client on the distributed platform.

Chapter 6. Preparing the base operating system

Use this task to prepare your z/OS target systems for WebSphere Application Server for z/OS.

- Complete the steps in Chapter 5, “Installing the product and additional software,” on page 21.
- Identify the z/OS systems on which you plan to run WebSphere Application Server for z/OS.

The WebSphere Application Server for z/OS product makes extensive use of the underlying z/OS operating system services for security, reliability, and performance.

After you install the WebSphere Application Server for z/OS product code, perform the tasks in this section to prepare your z/OS target systems to run WebSphere Application Server for z/OS.

Note: Target systems are the systems on which WebSphere Application Server for z/OS will actually execute. The driving system, on which the WebSphere Application Server for z/OS product code installation is performed, may or may not also be a target system.

1. Identify the first z/OS target system on which you plan to create a WebSphere Application Server for z/OS application serving environment.
2. Print off a copy of Appendix A, “Checklist: Preparing the base operating system,” on page 189. Use this worksheet to identify which of the following steps have been completed for the target system and record information you will need during product configuration.
3. Prepare z/OS operating system settings. See Chapter 6, “Preparing the base operating system” for detailed instructions.
4. Prepare z/OS sysplex settings. See “Preparing the sysplex” on page 29 for detailed instructions.
5. Prepare the z/OS job entry subsystem (JES2 or JES3). See “Preparing JES2 or JES3” on page 30 for detailed instructions.
6. Identify TCP/IP resources you wish to use and prepare your network. See “Preparing TCP/IP” on page 33 for more information.
7. Set up Resource Recovery Services (RRS). See “Preparing Resource Recovery Services” on page 31 for more information.
8. Set up your SAF-compliant security package. See “Preparing the security server (RACF)” on page 32 if you will use the z/OS Security Server. If you will use another SAF-compliant security product, consult the product’s manufacturer for assistance.
9. Set up Workload Management (WLM). See “Preparing workload management (WLM)” on page 34.
10. Repeat these steps for each z/OS target system on which you plan to run WebSphere Application Server for z/OS.
11. Keep the worksheets you filled out as you will need some of the information you recorded on them during product configuration.

When you have completed this task for each z/OS target system, you are ready to plan your WebSphere Application Server for z/OS application serving environments on these target systems. See Chapter 7, “Planning for product configuration,” on page 37 for more information.

Preparing z/OS

Follow these steps to prepare your z/OS operating system to run WebSphere Application Server for z/OS.

1. Make sure that all software prerequisites listed in “Target system requirements” on page 12 are met.
2. Make sure that the Unix System Services environment is active and that the BPXPRMxx settings in effect meet or exceed the following minimum values:

MATHREADS: 10000
MAXTHREADTASKS: 5000
MAXFILEPROC: 10000
MAXSOCKETS (AF_INET domain): 12000

3. Make sure the /tmp directory has at least 20 megabytes of free space.

WebSphere Application Server for z/OS makes extensive use of the /tmp directory.

You can use the `df -kP /tmp` shell command to show the number of available 1K blocks in the /tmp directory HFS. Divide the number of available 1K blocks by 1024 to determine the number of megabytes of free space.

If your /tmp directory resides in a permanent read-write HFS, use the `confighfs` command in /usr/lpp/dfsms/bin to extend it as necessary. For example, the following command will add an additional 10 MB of space to the HFS in which /tmp resides:

```
/usr/lpp/dfsms/bin/confighfs -x 10m /tmp
```

If your /tmp directory resides in a Temporary File System (TFS), modify the MOUNT statement in BPXPRMxx that defines it to add additional space. For example, to define a 20 MB TFS and mount it at /tmp, use the following MOUNT command:

```
MOUNT FILESYSTEM('/TMP) TYPE(TFS) MOUNTPOINT('/tmp') PARM('-s 20')
```

Note: If you do not specify a space ('-s') value, then the undesirably small default of 1 megabyte will be used.

4. Determine the full data set names of the following system data sets used by WebSphere Application Server for z/OS:

SCEERUN

Language Environment run-time library

SCEERUN2

Language Environment run-time library

SGSKLOAD

System SSL run-time library

Also determine if these data sets are in the system link pack area (LPA) or link list. Record this information on the worksheet.

Note: In z/OS Release 6 and above, the SGSKLOAD library no longer exists; its members are dispersed throughout other system libraries. If you are configuring WebSphere Application Server for z/OS on a collection of z/OS systems with some systems at z/OS Release 5 and below and others at z/OS Release 6 and above, you may need to manually edit some of the cataloged procedures created by the customization process. See "WebSphere cataloged procedures" for more information.

5. Ensure all the following data sets are APF-authorized:

- cee_hlq.SCEERUN
- cee_hlq.SCEERUN2
- gsk_hlq.SGSKLOAD (on all systems at z/OS Version 1 Release 5 and below)
- was_hlq.SBBOLPA
- was_hlq.SBBOLOAD
- was_hlq.SBBOLD2

6. Decide whether to run WebSphere Application Server for z/OS V6.0.1 from the system link pack area and link list or from STEPLIB. See "Link pack area, Link list and STEPLIB" on page 27 for more information.

7. Make sure any IEFUSI or JES2/JES3 exits on your system do not restrict WebSphere Application Server for z/OS address spaces to an address space size of less than 512 MB. Each WebSphere

Application Server for z/OS address space should have a region size of at least 512 MB. All WebSphere Application Server for z/OS cataloged procedures are shipped with a default of REGION=0M.

8. Make sure the TSO segment default region size for WebSphere Application Server for z/OS installer and administrator TSO user IDs is at least 128 MB.

Link pack area, Link list and STEPLIB

By placing load module data sets in the link pack area and system link list, you can obtain improved MVS system performance and some virtual storage savings.

Product data sets

You can place only one set of WebSphere Application Server for z/OS load modules (any release) in the link pack area and link list because the same load module names are used across releases. For each application serving environment, the Customization Dialog specifies whether the environment's product data sets are already in the LPA and link list, or require loading from STEPLIB.

If load modules for a previous version of WebSphere Application Server for z/OS are in the system link pack area and link list, you must run WebSphere Application Server for z/OS Version 6.0.1 from STEPLIB. If no previous version is in the system link pack area and link list, then you can choose a set of WebSphere Application Server for z/OS Version 6.0.1 product libraries and place them in the link pack area and link list.

Recommendations:

- Choose the WebSphere Application Server for z/OS Version 6.0.1 product data sets that your production application serving environment will use.
- Plan to load SBBOLPA and SBBLOAD into the system link pack area. This will require approximately 8K of common storage below the 16M line and between 20M and 40M of extended common storage.
- Plan to load SBBOLD2 into the system link list. You can not place this data set in the link pack area.

System data sets

If possible, place the SCEERUN, SCEERUN2 and SGSKLOAD system data sets in the system link pack area.

The SGSKLOAD data set is removed in z/OS Version 1 Release 6, and its load modules are moved to other system data sets.

- If you place the SGSKLOAD data set in the system link pack area on pre-z/OS Version 1 Release 6 systems, you can share WebSphere Application Server cataloged procedures between z/OS systems, regardless of the presence of SGSKLOAD.
- If you choose to not place SGSKLOAD in LPA on your pre-z/OS Version 1 Release systems, you will need to make separate copies of application server cataloged procedures to run at z/OS Version 1 Release 6 and above, and remove the STEPLIB DD statement for SGSKLOAD in those copies.

STEPLIB statement in setupCmdLine.sh

Each WebSphere Application Server for z/OS node home directory uses a setupCmdLine.sh shell script to set environment variables during the execution of administrative scripts. One of the functions of this shell script is to set the STEPLIB variable, which provides STEPLIB capability when running an HFS executable file.

During initial node configuration, the Customization Dialog sets the value of the STEPLIB variable in setupCmdLine.sh to the same list of data sets as the STEPLIB concatenation in the node's cataloged procedures. You may need to update this shell script (which resides in WAS_HOME/bin for each node) for a variety of reasons. Update the shell script if you:

- change which WebSphere Application Server for z/OS product code level is in the system link pack area and link list.
- apply maintenance and need to change which WebSphere Application Server for z/OS product code level a cell is using.

Note: All nodes in a cell on the same system must use the same product code level.

- need to add additional STEPLIB data sets. (For example, for DB2 or CICS interfaces.)

To update STEPLIB in setupCmdLine.sh, edit the copy of the script in each affected WAS_HOME/bin directory and find lines like the following:

```
STEPLIB='WAS.V60.TEST.SBBOLD2':$STEPLIB
STEPLIB='WAS.V60.TEST.SBBOLOAD':$STEPLIB
STEPLIB='WAS.V60.TEST.SBBOLPA':$STEPLIB
export STEPLIB
```

Add or remove lines from this concatenation as needed. Be sure to update each node's setupCmdLine.sh script, including the one for the deployment manager.

Switching between LPA/LNKLST and STEPLIB

If you decide to move a particular level of WebSphere Application Server for z/OS Version 6.0.1 product code (previously run from STEPLIB) into the system link pack area and link list, perform the following steps:

1. Identify the application serving environments making use of these product libraries. (That is, the ones that have cataloged procedure STEPLIB statements for these particular SBBOLPA, SBBOLOAD and SBBOLD2 data sets.)
2. Make sure no other version of WebSphere Application Server for z/OS is in either the link pack area or link list.
3. Place SBBOLPA in the link pack area. Place SBBOLOAD in either the link pack area or link list, and place SBBOLD2 in the link list.
4. Edit all WebSphere Application Server for z/OS cataloged procedures that use these data sets, removing SBBOLPA, SBBOLOAD and SBBOLD2 from any STEPLIB in which they appear. In the cataloged procedures generated by the Customization Dialog, the proclib members that will require editing are the INCLUDE JCL members that have names ending in "Z".
5. For each of the application serving environments that use these data sets, remove SBBOLOAD and SBBOLD2 from the STEPLIB statement in the WAS_HOME/bin/setupCmdLine.sh script in each WebSphere Application Server home directory.

If you no longer wish to run a particular level of WebSphere Application Server for z/OS Version 6.0.1 product code (formerly in LPA / link list) from STEPLIB instead, perform the following steps:

1. Identify the application serving environments that make use of these product libraries. (That is, the ones that do not have cataloged procedure STEPLIB statements for SBBOLPA, SBBOLOAD and SBBOLD2.)
2. Edit all WebSphere Application Server for z/OS cataloged procedures for these application serving environments, as follows. In the cataloged procedures generated by the Customization Dialog, the proclib members that will require editing are the INCLUDE JCL members that have names ending in "Z".
 - a. Add SBBOLPA, SBBOLOAD and SBBOLD2 to the STEPLIB concatenation in all location service daemon cataloged procedures.

- b. Add SBBLOAD and SBBOLD2 to the STEPLIB concatenation in all controller and servant cataloged procedures.
3. For each of the affected application serving environments, add SBBLOAD and SBBOLD2 to the STEPLIB statement in the WAS_HOME/bin/setupCmdLine.sh script in each WebSphere Application Server home directory.
4. Modify IPL procedures so that the WebSphere Application Server for z/OS V6.0.1 data sets are no longer in the system link pack area and link list.
5. Ensure that you continue to load a copy of the BBORTSS5 load module (release independent) into the system link pack area. You can load this module from any Version 5.x or Version 6.0.1 SBBOLPA data set.

Preparing the sysplex

WebSphere Application Server for z/OS uses a number of z/OS sysplex services. Therefore, each target system used to run WebSphere Application Server for z/OS must be either a monoplex (single system sysplex) or a member of a sysplex. For more information, see *z/OS MVS Setting Up a Sysplex* (SA22-7625).

Connect systems in a sysplex with channel-to-channel (CTC) communications or through a coupling facility, which is a special logical partition used to share data between sysplex members. Couple data sets on DASD are also used for sysplex coordination.

WebSphere Application Server for z/OS uses the System Logger, an MVS component that allows applications to log data in a sysplex, to log error and trace information and provide XA transaction logging. The System logger creates and manages log streams, which are written first to a coupling facility or local in-memory buffer, then transferred to log data sets on DASD for longer term access. Log streams that are written to local buffers rather than to a coupling facility are called DASD-only log streams.

Follow these steps to prepare your system for a sysplex.

1. Determine if your z/OS target system is already configured as a sysplex.
 - a. If so, continue on to the next step.
 - b. If not, follow the instructions in *z/OS MVS Setting Up a Sysplex* (SA22-7625) to configure it as a monoplex. Record the sysplex name for later use.
2. Determine if System Logger is already in use on your system.
 - a. If so, continue on to the next step.
 - b. If not, follow the instructions in the section "Preparing to Use System Logger Applications" in *z/OS MVS Setting Up a Sysplex* (SA22-7625).
3. Decide whether WebSphere Application Server for z/OS log streams should reside in a coupling facility or local in-memory buffers. Record the SMS data class, SMS storage class and data set name prefix to be used for log data sets. If WebSphere Application Server for z/OS logstreams will reside in a coupling facility, choose the structure name to be used.

Updating the CFRM policy

As stated in the BBOSSINS instructions generated by the ISPF Customization Dialog, you must "Update the CFRM Policy ... prior to using log streams that have been indicated as CF-resident." These log streams include the WebSphere Application Server for z/OS error log and RRS logs. Here is a step-by-step process for updating the CFRM policy.

1. Find the active policy by issuing the command `D XCF,POL`. You will get output similar to this partial example:

```

-D XCF,POL
IXC364I 10.57.49 DISPLAY XCF 061
TYPE: ARM
POLICY NOT STARTED
TYPE: CFRM
POLNAME: POLCF1N1
STARTED: 03/14/2003 11:32:22
LAST UPDATED: 03/14/2003 11:31:52
. . .

```

Note: Do not make any changes to the active policy--you will create a new one later.

- List the existing CFRM policies with the following utility:

```

//STEP1 EXEC PGM=IXCMIAPU
//SYSPPRINT DD SYSOUT=*
//SYSABEND DD SYSOUT=*
//SYSIN DD * DATA TYPE(CFRM) REPORT(YES)
/*

```

- Modify the SYSPPRINT from the previous job, which currently lists all the policies and has embedded page headings, so you can use it to define a new policy in the next job. Follow these steps to gain a usable SYSPPRINT:
 - Extract the definitions for the ACTIVE policy only.
 - Delete the heading lines.
 - Add the new structure definition using the BROWCFRM member of the target CNTL data set as a model.
 - Copy the new structure definition into a FB-LRECL(80) data set that you will use as SYSIN for the following job.
- Create or update the new policy. Use a utility such as the following:

```

//STEP20 EXEC PGM=IXCMIAPU
//SYSPPRINT DD SYSOUT=*
//SYSABEND DD SYSOUT=*
//SYSIN DD *
DATA TYPE(CFRM) REPORT(YES)
DEFINE POLICY NAME(NEWPOLC) REPLACE(YES)
CF NAME(CF1LPAR) DUMPSPACE(5000) PARTITION(0E) CPCID(00)
TYPE(009672) MFG(IBM) PLANT(02) SEQUENCE(000000051205)
CF NAME(CF2LPAR) DUMPSPACE(5000) PARTITION(0F) CPCID(00)
TYPE(009672) MFG(IBM) PLANT(02) SEQUENCE(000000051205)
STRUCTURE NAME(CTS130_DFHLOG) SIZE(24000) INITSIZE(12000)
REBUILDPERCENT(15) PREFLIST(CF1LPAR, CF2LPAR)
. . .
<== Insert your new structure here

```

Where "NEWPOLC" is the name of the new policy.

- Switch CFRM to the new policy. Use a command such as the following:

```
SETXCF START,POLICY,TYPE=CFRM,POLNAME=NEWPOLC
```

Preparing JES2 or JES3

WebSphere Application Server for z/OS uses job entry subsystem (JES2/JES3) services like any other MVS application. Follow these steps to prepare your system for JES.

- Identify the cataloged procedure library or libraries (proclibs) that you will use to hold cataloged procedures for WebSphere Application Server for z/OS. You may need to use separate proclibs for each system in a sysplex.
- If your system uses JES2 EXIT06 or JES3 IATUX03 to control specification of the REGION= value on JOB or EXEC statements, make sure that this control is relaxed for WebSphere Application Server for z/OS address spaces.

3. If you plan to send WebSphere Application Server for z/OS trace output to the JES spool, make sure you have adequate spool space available. WebSphere Application Server for z/OS address spaces can produce a large number of trace records when tracing is activated.

Preparing Resource Recovery Services

WebSphere Application Server for z/OS uses Resource Recovery Services (RRS) to support two-phase transaction commit. RRS must be up and running before WebSphere Application Server for z/OS servers are started. See *z/OS MVS Programming: Resource Recovery* (SA22-7616) for more information.

Normally, all systems in a sysplex shared a common set of RRS logs for syncpoint processing. If you wish to associate specific systems in a sysplex for syncpoint processing, you can specify a log group, which is a group of systems within a sysplex that share an RRS workload, name when you start RRS. The default log group name is the sysplex name. If you specify a different log group name when you start RRS, it will coordinate syncpoint processing with all systems in the sysplex that use the same RRS log group name.

Resource recovery services logstreams

RRS uses five log streams that are shared by the systems in the log group. Every MVS image that runs RRS needs access to the coupling facility and the DASD on which are defined the system logger log streams for its log group.

Note: You can define RRS log streams as coupling facility log streams or as DASD-only log streams.

If using coupling facility log streams, the RRS images on different systems in a sysplex run independently but share log streams to keep track of the work. If a system fails, an instance of RRS on a different system in the sysplex can use the shared logs to take over the failed system's work.

Use DASD-only log streams only in either single system sysplexes with one RRS image or a sysplex in which information should not be shared among RRS images.

The following list summarizes the RRS logs. In the list, *lgrname* is the log group name. The default log group name is the sysplex name.

ATR.lgrname.ARCHIVE

Information about completed URs. This log stream is recommended but optional.

ATR.lgrname.RM.DATA

Information about the resource managers using RRS services.

ATR.lgrname.MAIN.UR

The state of active URs. RRS periodically moves this information into the RRS delayed UR state log when UR completion is delayed.

ATR.lgrname.DELAYED.UR

The state of active URs when UR completion is delayed.

ATR.lgrname.RESTART

Information about incomplete URs needed during restart. This information enables a functioning RRS instance to take over incomplete work left over from an RRS instance that failed.

In a multiple-system sysplex, RRS log streams should normally reside in a coupling facility.

All RRS transaction logging for WebSphere Application Server for z/OS will occur solely in the DELAYED.UR log stream. You may still configure your MAIN.UR log stream so it can handle a production workload, in case you deploy a new container or the WebSphere Application Server for z/OS infrastructure changes. WebSphere Application Server for z/OS has no significant impact on the RM.DATA or RESTART logs.

Use the following steps to configure RRS.

1. Copy the RRS cataloged procedure, ATRRRS, from SYS1.SAMPLIB to SYS1.PROCLIB (or another proclib in the MSTJCLxx concatenation), and rename it RRS. If desired, you can set the log group name (GNAME) in the RRS cataloged procedure to a specific value. However, if you will share the ATRRRS proc among several systems, you might prefer to set the log group name at RRS startup or use a system variable in IEASYMxx to set each system's RRS log group name.
2. Establish the dispatching priority of the RRS address space. The best way to control RRS's dispatching priority is through the workload manager (WLM). IBM recommends that you put RRS in the SYSSTC service class. The service class you choose must give RRS a dispatching priority greater than or equal to the dispatching priority of applications and resource managers that use RRS. SYSSTC will usually accomplish this. For information about system-provided service classes, see *z/OS MVS Planning: Workload Management (SA22-7602)*.
3. Define RRS as a subsystem. Place the following statement in an active IEFSSNxx parmlib member:
SUBSYS SUBNAME(RRS)
Place this statement after the statement that defines the primary subsystem. The subsystem name (RRS) must match the name of the RRS cataloged procedure. For more information about IEFSSNxx, see *z/OS MVS Initialization and Tuning Reference (SA22-7592)*.

Note: RRS does not support dynamic subsystem definition, so you can not use the SETSSI ADD,SUBNAME=RRS command to define RRS as a subsystem. Even though this command will appear to succeed, subsequent attempts to start RRS will fail.

4. Set up the RRS logstreams. For your convenience, the "Configure stand-alone application server" task in the Customization Dialog creates sample job BBORRSLs to allocate the RRS logstreams.
5. Start RRS, if applicable. To start RRS with a specific log group name "lgname", enter the following MVS console command:
START RRS,GNAME=lgname
6. Stop RRS, if applicable. To stop RRS, enter the following MVS console command:
SETRRS CANCEL

For more information on setting up and running RRS, see *z/OS MVS Programming: Resource Recovery (SA22-7616)*.

Preparing the security server (RACF)

WebSphere Application Server for z/OS uses a SAF-compliant security product for operating system security interfaces. The WebSphere Application Server for z/OS documentation assumes the use of z/OS Security Server (RACF). If you use another security product, consult the vendor for more information.

All z/OS systems in a sysplex must have access to consistent security information--shared RACF database or equivalent. If a shared security database is not used, you are responsible for ensuring that all WebSphere Application Server for z/OS security definitions are in effect on all systems in the sysplex.

1. Determine which RACF databases provide security information on your z/OS system(s). If any WebSphere Application Server for z/OS cell will run on z/OS systems that have no shared RACF database, make plans to guarantee security database consistency for WebSphere Application Server for z/OS user IDs and privileges.
2. WebSphere Application Server for z/OS requires list-of-groups (GRPLIST) checking. See *z/OS Security Server RACF Security Administrators Guide* for information about turning on GRPLIST support.

Preparing TCP/IP

WebSphere Application Server for z/OS follows the CORBA standard, Internet Inter-ORB Protocol (IIOP), for communications. Accordingly, you must consider changes to your TCP/IP network and modify the TCP/IP configuration.

This section provides background information about changes you will need to make to your Domain Name Server (DNS) and TCP/IP. The actual steps to perform are in the customized instructions of the Customization Dialog.

Consider the following tips for your TCP/IP network on z/OS.

- **You can get started with a simple Domain Name Server (DNS) name server and a single z/OS image, but you should design your initial configuration with growth in mind.**

You may, for instance, intend to expand your business applications beyond the monoplex to a full sysplex configuration for performance reasons or to prevent a single point of failure. Several considerations come to bear here.

Several DNS implementations and network router implementations allow the use of a generic location service daemon IP name while dynamically routing network traffic to like-configured servers. If you intend to expand your system beyond a monoplex, it might be worthwhile to use one of these implementations from the start. Non-round-robin DNS name servers limit your ability to expand without retrofitting a name server that allows dynamic network traffic routing.

Recommendation: If you are running in a sysplex, set up your TCP/IP network with Sysplex Distributor. This makes use of dynamic virtual IP addresses (DVIPAs), which increase availability and aid in workload balancing.

Beyond Sysplex Distributor, you have your choice of the following DNS and router implementations on or off z/OS:

- Non-round-robin DNS name servers.
- Round robin DNS name servers.
- Network routers, such as the IBM Load Balancer. (In previous releases, IBM Load Balancer was known as Network Dispatcher.)

- **Select the location service daemon IP name.**

For your stand-alone application server, choose the host name of the server under which you are running. For your deployment manager, choose a generic IP name that can resolve to any or all of the systems where location service daemons run.

You must define the location service daemon host IP name during installation and customization. Use the location service daemon IP name you chose.

Note: The administrative console has a location service daemon configuration page on which you set location service daemon variables.

- **Select the port for the location service daemon server.**

If you change the location service daemon port number, you can access existing objects after you recycle all your servers. You cannot, however, access the following:

- Any object handles your application stored to disk
- Any object references your application stored in the persistent contexts of the name space.

If you install WebSphere Application Server for z/OS V on a system that already contains WebSphere Application Server V4.0.1 for z/OS and OS/390, double-check your current location service daemon port value (default for WebSphere Application Server V4.0.1 for z/OS and OS/390 is 5555).

- **Set location service daemon port numbers and IP addresses.**

These are initially set in the Customization Dialog, but you can subsequently change them in the Administrative Console. Access the location service daemon configuration page through the Administrative Console navigation bar (on the left side of screen) under System Administration. If you need to use the Internet Inter-ORB Protocol (IIOP) through a firewall, ensure that your firewall supports IIOP.

When recovering a server somewhere other than its configured system, ensure that the same port is not already in use on the system on which it is recovering. If it is, configure the server with a unique port to avoid a conflict.

If comparing WebSphere Application Server for z/OS V and WebSphere Application Server V for other platforms, realize that only WebSphere Application Server for z/OS V has an ORB SSL port.

HTTP and HTTPS ports are found in individual servers under the Web container transports, which are in the administrative console as 'additional properties' on the Web container configuration page (which is off the server configuration page).

Watch for HTTP transport port conflicts if you previously installed WebSphere Application Server V4.0.1 for z/OS and OS/390.

Ensure you set up the following port assignments (along with those in the z/OS port assignments chart) on servers that require them in the administrative console:

- ORB port
- ORB SSL port
- Web container transport port
- Web container transport SSL port

See the administrative console and the InfoCenter for more information on the WebSphere variables and how to set their values.

You define ports differently depending on whether they are for the first server or subsequent servers. The first server you create is defined, along with its ports, through the Customization Dialog. You have the ability to explicitly specify the ports as you define the server. Subsequent servers and their ports are defined through the administrative console. This means that you define the server first and the ports are automatically assigned. Then, once defined, you can inspect and change the port definitions through the administrative console.

- **Some ports, such as the ORB SSL port and the server startup status port, are obtained dynamically.**
- **Other TCP/IP-related activities include setting up NFS, Web server and Kerberos, which are all optional.**
- **If you use the DNS on z/OS, you may wish to change the refresh timer interval (-t value) associated with the named location service daemon.**

The -t value specifies the time (nn, in seconds) between refreshes of cell names and addresses and of the weights associated with those names and addresses. The default is sixty seconds. Reducing the -t value will shorten the lapse time required to register the location service daemon IP name with the DNS, but will also increase DNS processing overhead. In our testing, we used an interval of 10 seconds.

If you use the z/OS DNS, you have to set a location service daemon variable. Do this by setting WebSphere Variable at cell level:

```
daemon_wlmable=1
```

Note: You can perform this for only one cell in a sysplex at a time.

For details, see *z/OS Communications Server: IP Configuration Reference*.

Preparing workload management (WLM)

WebSphere Application Server for z/OS uses the workload management (WLM) function of z/OS to start and manage servers in response to workload activity. WebSphere Application Server for z/OS requires that z/OS Workload Management run in goal mode. If your z/OS system is running WLM in compatibility mode, follow the instructions in *z/OS Planning: Workload Management (SA22-7602)* to implement goal mode before proceeding with WebSphere Application Server for z/OS customization.

Each J2EE application server in a WebSphere Application Server for z/OS cell uses WLM to start servants as WLM application environments. Thus, each application server must associate with a WLM application

environment name. The "Cluster transition name" in the WebSphere Application Server for z/OS configuration is used as the WLM application environment name.

WebSphere Application Server for z/OS makes use of dynamic WLM application environments when available. (The WLM service that added dynamic application environments is a prerequisite for WebSphere Application Server for z/OS Version 6.0.1.) Therefore, you do not need to use the WLM ISPF panels to manually create application environments for WebSphere Application Server for z/OS.

Chapter 7. Planning for product configuration

This task helps you plan WebSphere Application Server for z/OS application serving environments for your z/OS target systems.

- Complete the steps in Chapter 5, “Installing the product and additional software,” on page 21 and Chapter 6, “Preparing the base operating system,” on page 25.
- Read the section “Understanding WebSphere Application Server for z/OS terminology” on page 38.
- If you already have any release of WebSphere Application Server for z/OS running on your z/OS target system, review Coexisting in the *Migrating, coexisting, and interoperating* PDF book.

WebSphere Application Server for z/OS uses “application serving environments” to provide its functions. Configuring these application serving environments after product installation requires a fair amount of planning and coordination. If you have not previously configured WebSphere Application Server for z/OS, we recommend that you configure a “practice” stand-alone application server using the default options, then proceed to configure your actual desired product configuration.

Perform the tasks in this section to choose an application serving environment configuration and plan the necessary details for configuration.

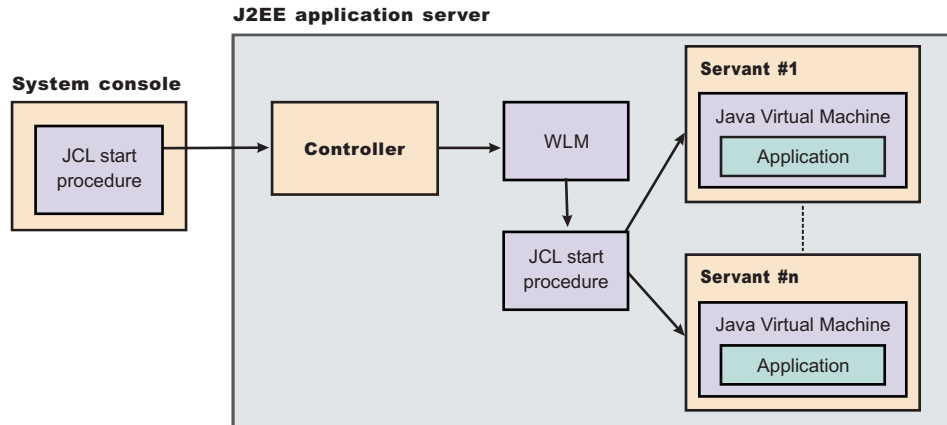
1. Decide whether to set up a stand-alone application server or a Network Deployment cell. See “Choosing between a stand-alone or Network Deployment configuration” on page 40 for more information.
2. If you are creating a new stand-alone application server or Network Deployment cell, decide whether or not to create a new security domain for this cell.
 - If you decide to use a new security domain, complete the steps in “Planning a security domain” on page 55.
 - If you decide to use an existing security domain, locate the corresponding worksheet you filled out from Appendix B, “Customization Dialog worksheet: Security domain,” on page 191 and use it in the following planning steps.
3. (Optional) If you have never set up a WebSphere Application Server for z/OS application serving environment before, follow the steps in “Building a practice WebSphere Application Server for z/OS cell” on page 58 to gain experience in configuring and working with an application serving environment.
4. Follow the directions for the type of application serving environment you wish to configure:
 - “Planning for a stand-alone application server cell” on page 60
 - “Planning for a Network Deployment cell” on page 70.
 - “Planning for a new managed node in a Network Deployment cell” on page 77
 - “Planning to federate a stand-alone server into a Network Deployment cell” on page 83

Use the worksheet included with each option to record your planning decisions and additional configuration information.

When you have completed the planning worksheet for the configuration you have selected, you are ready to configure the application serving environment. See Chapter 8, “Configuring the product after installation,” on page 91 for information.

Understanding WebSphere Application Server for z/OS terminology

In WebSphere Application Server for z/OS, the functional component on which applications run is called a *server*. Servers comprise address spaces that actually run code.



Within each server are two kinds of address spaces: controllers and servants. A *controller* runs system authorized programs and manages tasks, such as communication, for the server. Each server has one controller that you start with a JCL start procedure when you enter the appropriate start command on the MVS console.

A *servant* is the address space in which the JVM resides. It runs unauthorized programs such as business applications. Depending on the workload, a server has one or more servants running at a time. When work builds up, WLM dynamically starts additional servants to meet the demand.

Note: The location service daemon and node agent are specialized servers and have no servants. The control region adjunct (not shown in the diagrams) is a specialized servant that interfaces with the new service integration buses to provide messaging services.

Here is a quick breakdown of the different server types on your system:

Unmanaged (stand-alone) application server

The application server that was set up during stand-alone configuration that hosts your J2EE applications.

Managed (Network Deployment) application server

The application server set up during Network Deployment configuration that hosts your J2EE applications.

Location service daemon

A server which is the initial point of contact for client requests in either configuration.

JMS server

Hosts the JMS function in the WebSphere Application Server for z/OS, which controls the MQ broker and queue manager in either configuration. The JMS server no longer exists as in previous versions of WebSphere Application Server for z/OS. Its function has been replaced with new service integration buses.

Deployment manager

A specialized application server that hosts the administrative console application (it hosts only administrative applications) and provides cell-level administrative function in a Network Deployment configuration. The administrative console application administers servers (grouped into nodes) on many different systems. The deployment manager is the sole occupant of its own

node structure which does not need a node agent because there are no application servers in the node, and a cell may have only one deployment manager.

Note: The version of the administrative console application that runs in the deployment manager is designed to manage multinode environments, whereas the version in the stand-alone application server is for single node environments only.

Node agent

Provides node-level administrative function in a Network Deployment configuration.

Note: Every element of the configuration (servers, clusters, nodes and cells) has both a long and short name:

- The "Server name" is the server long name used in the HFS path and the principal name by which the server is known to WebSphere Application Server for z/OS. It is used to identify the server through the administrative console and scripting. It is a mixed case name and greater than 8 characters in length.
- The "Server short name" is the platform-specific native alias and the principal name by which the server is known to z/OS. It is used to identify the server to underlying z/OS facilities, such as the Security Server, JES, WLM and ARM. For example, the server short name is used as the MVS JOBNAME.
- The "Cluster short name" is used as the WLM application environment name.

A *cluster* is a *logical grouping* of like-configured servers. Clusters exist to promote scalability and availability; workload balancing occurs across the servers in a cluster. Clusters allow you to partition workloads into separate servers while still referring to them as a single unit. Clustering is typically applied to a multinode cell, where each node is configured on a separate system and the cluster has a member (server) on each node. Client requests are distributed among the cluster members based on workload manager decisions.

Note: If you intend for your cluster to span multiple systems in a sysplex, you might need to set up a shared HFS. See Considerations for clustered servers and stateful session beans in the *Setting up the application serving environment* PDF book for a list of conditions that would make a shared HFS necessary.

A node contains servers which may be part of a cluster. The cluster may span nodes as long as all involved nodes are in the same cell.

Here is a quick breakdown of clusters, nodes and cells:

cluster

A logical collection of like-configured application servers that provides performance, reliability and administration advantages.

- A cluster can span nodes and systems within the same cell.
- Clusters are not a layer in the cell/node/server hierarchy. Instead, they are a way of grouping servers that host the same applications within a cell.

A cluster can span nodes and systems within the same cell.

node

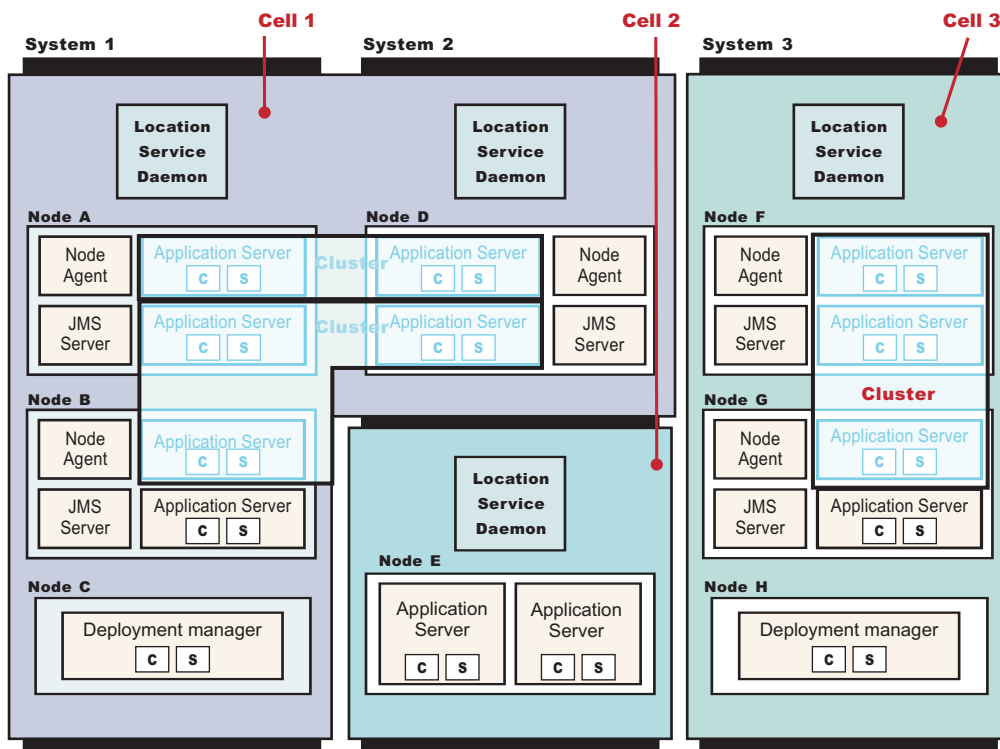
A logical collection of servers on a particular z/OS system in the cell.

- The cell to which a node belongs can span several systems, but the node must remain within a single z/OS system.
- A z/OS system can contain multiple WebSphere Application Server for z/OS nodes, belonging to the same or different cells.
- A stand-alone WebSphere Application Server for z/OS cell consists of a single node. Due to administrative constraints, this node should have only a single application server in it.
- A network deployment cell consists of a deployment manager node, which is responsible for cell-wide administrative tasks, and any number of managed nodes. Each managed node contains a node agent, which handles communication with the cell's deployment manager, and any number of application servers.

- cell** A logical collection of WebSphere Application Server for z/OS nodes which are administered together. The cell is the largest unit of organization.
- All nodes that comprise a cell must reside on systems in the same sysplex or on the same z/OS monoplex.
 - A z/OS sysplex or monoplex can contain multiple WebSphere Application Server for z/OS cells.
 - Different cells may have nodes on the same systems, though a given node can be a member of only one cell.
 - There are two kinds of WebSphere Application Server for z/OS cells: stand-alone application server cells, and Network Deployment cells.

To help you understand the interaction between servers, clusters, nodes and cells, here is a diagram depicting various configurations you can set up in your Network Deployment sysplex:

WebSphere for z/OS: Possible configurations in a sysplex



Cells 1 and 3 in the illustration depict Network Deployment configuration cells. Cell 2 is a stand-alone configuration cell.

Choosing between a stand-alone or Network Deployment configuration

Presented is a table that contains specifics on the differences between a WebSphere Application Server for z/OS stand-alone cell and Network Deployment cell.

	Stand-alone cell	Network deployment cell
Configuration:	Set up each stand-alone server node through the ISPF Customization Dialog. Set up additional servers within the node through the Administrative Console or scripting.	Set up each deployment manager node through the ISPF Customization Dialog. Add stand-alone server nodes to the deployment manager cell through the ISPF Customization Dialog.

	Stand-alone cell	Network deployment cell
Address spaces:	Min: four (location service daemon, controller, servant, control region adjunct)	Min: seven (location service daemon, application server controller, application server servant, application server control region adjunct, deployment manager controller, deployment manager servant, node agent)
	Max: Limited only by resources.	Max: Limited only by resources.
Administrative isolation:	Each stand-alone server node is a separate administrative domain.	All nodes in the cell are in the same administrative domain.
Operational isolation:	You may start and stop servers independently. Each server has an independent, unshared JNDI namespace.	You may start and stop servers independently. The JNDI namespace is shared among all servers in the cell.
Application servers allowed to have multiple servants?	Only if the Administration application is not present	Yes
Clustering available?	No	Yes

Planning an application server naming convention

This topic identifies the names you must define during WebSphere Application Server for z/OS configuration and provides a recommended naming convention.

Each WebSphere Application Server for z/OS cell, node, server, and cluster must have both a long name and a short name.

- Long names are the principal names by which cells, nodes, servers and clusters are known to WebSphere Application Server for z/OS. These are the names used in scripting and the administrative console. Long names may be up to 50 characters long and include mixed case characters.
- Short names are specific to the z/OS implementation of WebSphere Application Server and are the principal names by which cells, nodes, servers and clusters are known to z/OS. (Note that z/OS has an eight-character limit on many operating system interface values.) Short names must be one to eight characters long, use only uppercase alphabetic, numeric and national characters, and may not begin with a numeric character.

Note: The national character "\$," allowed in other z/OS contexts, is not allowed in WebSphere Application Server for z/OS short names.

While it is possible to assign names to WebSphere Application Server for z/OS objects on an ad-hoc basis, it is safer and more efficient to assign names in an orderly fashion.

Note: The WebSphere Application Server for z/OS customization process provides default values for all these names. We recommend that you use these default names only when building a "practice" application server configuration.

The recommended naming convention given here is based on the one given in the IBM Washington Systems Center white paper, "Sample WebSphere for z/OS ND Configuration." Find this document on the Web at <http://www.ibm.com/support/techdocs--search> for document number WP100367 under the category "White Papers."

Assumptions

A stand-alone application server is very simple. It has a basic cell and node structure with a single application server on a single z/OS system. (Actually, it is possible to add additional application servers to a stand-alone node, but you can not manage them from the administrative console. This makes such a configuration unwieldy.)

A Network Deployment cell includes a deployment manager (a node of its own), together with any number of application server nodes. Each application server node contains a node agent and any number of application servers. The deployment manager may reside on the same z/OS system as one of the application server nodes or on a z/OS system of its own.

- **The recommended naming convention assumes that there is only one node per cell on a given z/OS system.** This is not really a functional limitation because having multiple nodes from the same cell on the same z/OS system does not provide any better administrative separation, and only slightly more reliability, than having a single node, while incurring additional overhead.
- **The recommended naming convention allows you to cluster any application server.** Creation of a cluster begins with either an existing application server which is then cloned or a newly-defined application server which is then cloned. The cloning process adds new, identical application servers on other application server nodes in the cell. To use the recommended naming convention, follow these steps:
 1. Select a two character cell identifier "cc" for the WebSphere Application Server for z/OS cell you plan to create.
 2. Select a single character system identifier "x" for each z/OS system that will support some part of the cell.
 3. Select a two-digit system identifier "nn" for each application server you create. Use a different value of "nn" for each application server in the cell. (This will allow clustering of any application server later on.) Use "01" for a stand-alone application server.

Cell long name and short name

Each WebSphere Application Server for z/OS cell, whether a stand-alone application server or a Network Deployment cell, must have a long name and a short name. The cell long name is arbitrary, but the cell short name must be unique in each configuration HFS.

Recommendations:

- Set the cell short name to "ccCELL", in uppercase. (For example, "AZCELL.")
- Set the cell long name to be the same as the cell short name, but lowercase. (For example, "azcell.")

Node long name and short name

Each WebSphere Application Server for z/OS node must have a long name and a short name. A stand-alone application server has just one node, though it keeps its node name if it is federated into a Network Deployment cell. A Network deployment cell has a deployment manager node and a number of application server nodes.

Note: As noted above, we assume that a cell has only one application server node on each z/OS system.

The node long name and short name must be unique within the cell. The node short name of a stand-alone application server intended for federation into a Network Deployment cell should also be unique within the Network Deployment cell.

Recommendations:

For a deployment manager node:

- Set the node short name to "ccDMGR", in uppercase. (For example, "AZDMGR.")
- Set the node long name to be the same as the node short name, but lowercase. (For example, "azdmgr.")

For an application server node:

- Set the node short name to "ccNODEx", where "x" is the system identifier. (For example, "AZNODEA.")
- Set the node long name to be the same as the node short name, but lowercase. (For example, "aznodea.")

Server long name and short name

Each WebSphere Application Server for z/OS server must have a long name and a short name.

The server long name and short name must each be unique within the node and should not exist in any other node to which you may clone this server to form a cluster. In the Customization Dialog, server short names are limited to seven characters.

Recommendations:

For a deployment manager server:

- Set the server short name to "ccDMGR", in uppercase. (For example, "AZDMGR.")
- The server long name is "dmgr" (unchangeable).

For a node agent:

- Set the server short name to "ccAGNTx". (For example, "AZAGNTA.")
- The server long name is "nodeagent" (unchangeable).

For an application server node:

- Set the server short name to "ccSRnnx", where "nn" is the server identifier and "x" is the system identifier. (For example, "AZSR01A.")
- Set the node long name to be the same as the node short name, but lowercase. (For example, "azsr01a.")

Jobnames

Each server controller, servant and control region adjunct (CRA) has an MVS jobname, set by the Customization Dialog:

- The controller jobname is the same as the server short name. (For example, "AZSR01A.")
- The servant jobname is the server short name, with an "S" appended. (For example, "AZSR01AS.")
- The control region adjunct jobname is the server short name, with an "A" appended. (For example, "AZSR01AA.")

You can not change these values in the Customization Dialog. This is also why the Dialog limits server short names to seven characters--to allow room for the final character that differentiates a servant or CRA from the controller.

It is possible to change any server jobname using the administrative console. Because of this, for example, it is possible to change server short names to be eight characters long. However, this would require you to make corresponding changes to RACF profiles and so on.

The location service daemon

The location service daemon is a special server with no servant or CRA. Each cell must have one location service daemon running on each z/OS system on which the cell is configured. If a server is started and finds that its location service daemon is not running, it starts the location service daemon before continuing its processing.

A location service daemon has a jobname, which is also used as its server short name.

Note: A location service daemon has no server long name.

All location service daemons in a cell use the same jobname.

A stand-alone application server, like any cell, has a location service daemon of its own. However, when the stand-alone application server is federated into a Network Deployment cell, the newly-created application server node in the Network Deployment cell uses its own location service daemon--one with the same jobname and TCP/IP ports as the deployment manager's location service daemon--and the location service daemon originally used by the stand-alone application server is abandoned.

Recommendations:

- For a Network Deployment cell, set the location service daemon jobname to "ccDEMn". (For example, "AZDEMn.")
- For a stand-alone application server, set the location service daemon jobname to "ccDEMnmm", where "mm" is chosen to make the location service daemon jobname unique on the z/OS system.

Cluster transition name

Each controller that has servants uses Workload Management (WLM) to start the servants. To do this, it needs a WLM application environment name.

- For an unclustered application server (or deployment manager), the cluster transition name is used as the WLM application environment name.
- When a cluster is created, it is assigned a cluster short name. If the cluster is based on an existing initial server, then the cluster short name is set to the server's cluster transition name. If the cluster is based on a new initial server, then the cluster short name is set to BBOC00n, where "n" is a number incremented as needed to maintain uniqueness in the cell. The cluster short name is used as the WLM application environment name for all servers in the cluster.

Therefore, the cluster transition name is used as the WLM application environment name for a stand-alone application server, for the same server after it is federated (or created from scratch, unclustered) in a Network Deployment cell, or for an entire server cluster based on the original server.

When you assign a cluster transition name to a server, it must be unique in the cell.

Recommendations:

- For a deployment manager, set the cluster transition name to "ccDMGR". This is the same as the server short name.
- For an application server, set the cluster transition name to "ccSRnn". (For example, "AZSR01.") This is the same as the server short name without the system identifier.

Note: This also illustrates why a different two-digit server identifier is used for each server. Suppose you had two servers AZSR01A and AZSR01B. If you create a cluster based on AZSR01A and want to extend it to the B system, the obvious server name choice is AZSR01B - which is

already taken. But if the servers are named AZSR01A and AZSR02B, then you can cluster either and extend the cluster to the other system without conflict. The respective cluster short names would be AZSR01 and AZSR02.

Planning a configuration HFS

This topic describes the planning decisions you need to make when setting up a WebSphere Application Server for z/OS configuration HFS.

Cell, node and server settings, as well as deployed applications, are stored in the WebSphere Application Server for z/OS configuration directory or WebSphere Application Server for z/OS configuration HFS.

Note: You can also use a zFS file system for the configuration directory.

The following sections present various elements with inherent decisions to make when setting up your WebSphere Application Server for z/OS configuration HFS, as well as give you the information to best make those decisions based on the needs of your planned configuration.

Each node needs a home directory

Every WebSphere Application Server for z/OS node, whether a stand-alone application server, deployment manager, managed application server node, or location service daemon, requires a read/write home directory, sometimes referred to as its WAS_HOME. A WebSphere Application Server for z/OS configuration HFS is a file system or directory that contains one or more of these home directories.

This is the structure of a WebSphere Application Server for z/OS configuration HFS, mounted at /WebSphere/V6R0. It contains a WebSphere Application Server home directory for a single application server named BBOS001, with a cell and a node both named SYSA.

```
/WebSphere/V6R0
  /AppServer
    /bin
    /classes
    /java
    /lib
    /logs
    /profiles
    /temp
    ...
  /Daemon
    /config
      /SYSA
        SYSA.SYSA.BB0DMNB -> /WebSphere/V6R0/Daemon/config/SYSA/SYSA/BB0DMNB
        SYSA.SYSA.BBOS001 -> /WebSphere/V6R0/AppServer/profiles/default/config/cells/SYSA/
                               nodes/SYSA/servers/server1
        SYSA.SYSA.BBOS001.HOME -> /WebSphere/V6R0/AppServer
```

The WebSphere Application Server home directory for BBOS001 is named AppServer. It contains directories with complete configuration information for the SYSA node and the BBOS001 server.

The /Daemon directory contains configuration information for location service daemons defined to nodes in this configuration HFS.

Note: The /Daemon/config subdirectory is subdivided by cell name. As long as the cells have different short names, the location service daemon information for each is kept separate.

The daemon home directory has the fixed WebSphere Application Server home name "*Daemon*".

Symbolic links are used to access startup parameters

In addition to the WebSphere Application Server home directories themselves, the configuration HFS contains a multipart symbolic link for each server, which points to the startup parameters for the server. The symbolic link is named *cell_short_name.node_short_name.server_short_name*.

The sample configuration HFS above contains a symbolic link SYSA.SYSA.BBOS001 to start the BBOS001 application server, and a symbolic link SYSA.SYSA.BBOS001 to start the location service daemon. The symbolic link is specified in the ENV parameter on the START command when the server or location service daemon is started from the MVS console:

```
START procname,JOBNAME=BBOS001,ENV=SYSA.SYSA.BBOS001
```

Each symbolic link points to the subdirectory where the server's was.env file resides. This file contains the information required to start the server.

Note: During post-install processing, described below, the server JCL needs to specify the WebSphere Application Server home directory itself, rather than the location of the was.env file. This is the purpose of the SYSA.SYS.BBOS001.HOME symbolic link, shown above.

Sharing the configuration HFS between cells

Two or more WebSphere Application Server for z/OS cells (stand-alone application server, Network Deployment, or both) can share a WebSphere Application Server for z/OS configuration HFS, provided the following:

- All cells using the configuration HFS must be set up using the same security domain. In particular, each must have the same administrator user ID and configuration group.
- The cells must have distinct cell short names.
- Each node must have its own WAS_HOME directory that is not shared with any other node or cell.

As noted above, you may share the daemon home directory (/Daemon) between cells, as it has subdirectories farther down for each cell in the configuration HFS.

Note: Beware that sharing a configuration HFS between cells increases the likelihood that problems with one cell may cause problems with other cells in the same configurations HFS.

Sharing the configuration HFS between systems

Two or more z/OS systems can share a configuration HFS, provided the z/OS systems have a shared sysplex and the configuration HFS is mounted R/W. All updates are made by the z/OS system that "owns" the mount point. For a Network Deployment cell, this is generally the z/OS system on which the cell deployment manager is configured.

Choosing a WebSphere Application Server for z/OS configuration HFS mount point

The choice of WebSphere Application Server for z/OS configuration HFS mount points depends on your z/OS system layout, the nature of the application serving environment(s) involved, and the relative importance of several factors: ease of setup, ease of maintenance, performance, recoverability, and the need for continuous availability.

In a single z/OS system:

If you run WebSphere Application Server for z/OS on a single z/OS system, you have a wide range of choices for a z/OS configuration HFS mount point. You may wish to put several stand-alone application servers in a single configuration HFS with a separate configuration HFS for a production server or for a

Network Deployment cell. Using separate configuration HFS data sets improves performance and reliability, while using a shared configuration HFS reduces the number of application server cataloged procedures you need.

For example, you might have one configuration HFS with your development, test and quality assurance servers, all in the same security domain:

```
/WebSphere/V6_test
  /DevServer    - home to stand-alone server DVCELL, with server DVSR01A
  /TestServer1  - home to stand-alone server cell T1CELL, with server T1SR01A
  /TestServer2  - home to stand-alone server cell T2CELL, with server T2SR01A
  /QAServer     - home to Network Deployment cell QACELL, with deployment manager QADMGR and
                  server QVSR01A
```

and a separate configuration HFS for your production cell:

```
/WebSphere/V6_prod
  /CorpServer1  - home to Network Deployment cell CSCCELL, with deployment manager CSDMGR and
                  server CSSR01A
```

In a multi-system z/OS sysplex with no shared HFS:

In a multi-system sysplex with no shared HFS, each z/OS system must have its own configuration HFS data set(s). For stand-alone application servers and for Network Deployment cells that do not span systems, the options are the same as for a single z/OS system.

For Network Deployment cells that span systems:

Here you have two options:

- You can use a different mount point for the cell's configuration HFS data set(s) on each system. This allows you to move nodes easily between systems (for example, if a system becomes inoperative or is being upgraded), since each mount point is unused on the other systems in the sysplex, allowing you to mount the failed system's configuration HFS data sets on an alternate system in the sysplex.

For example, on system LPAR1 you might have a configuration HFS for one part of a cell:

```
/var/WebSphere/V6config1
  /DeploymentManager - home to deployment manager F1DMGR in cell F1CELL
  /AppServer1       - home to node F1NODEA and servers F1SR01A and F1SR02A
```

with a second configuration HFS on LPAR2:

```
/var/WebSphere/V6_config2
  /AppServer2       - home to node F1NODEB and servers F1SR02B (clustered) and F1SR03B
```

This setup has the advantage that you can move the deployment manager and node F1NODEA to LPAR2, or move node F1NODEB to LPAR1. The disadvantage of this configuration is that F1NODEA and F1NODEB will require separate sets of cataloged procedures.

- Or you can use the same mount point for all configuration HFS data sets in a particular cell. This allows you to use common cataloged procedures and make the systems look very similar.

Using the same cell setup as above, node LPAR1 would have one configuration HFS:

```
/var/WebSphere/V6F1
  /DeploymentManager - home to deployment manager F1DMGR in cell F1CELL
  /AppServer1       - home to node F1NODEA and servers F1SR01A and F1SR02A
```

and LPAR2 would have a separate HFS at the same mount point:

```
/var/WebSphere/V6F2
  /AppServer2       - home to node F1NODEB and servers F1SR02B (clustered) and F1SR03B
```

However, relocation of either LPAR's node(s) to the other system would require merging a copy of one configuration HFS into the other.

In a multi-system z/OS sysplex with a shared HFS:

If your sysplex has a shared HFS, you can simply mount a large configuration HFS for the entire cell. When using the Customization Dialog, specify the common configuration HFS mount point on each system. As noted above, you should update the configuration HFS from the z/OS system hosting the deployment manager. Performance will depend on the frequency of configuration changes, and ensure you devote extra effort to tuning if this option is chosen.

Alternatively, you can mount a separate configuration HFS on each system, perhaps using the system-specific HFS mounted at /&SYSNAME on each system:

```
/LPAR1/WebSphere/V6F1
    /DeploymentManager - home to deployment manager F1DMGR in cell F1CELL
    /AppServer1        - home to node F1NODEA and servers F1SR01A and F1SR02A

/LPAR2/WebSphere/V6F1
    /AppServer2        - home to node F1NODEB and servers F1SR02B (clustered) and F1SR03B
```

Each system (LPAR1 and LPAR2) mounts its own configuration HFS on its system-specific mount point. When using the Customization Dialog, specify the following:

- Specify /LPAR1/WebSphere/V6F1 on LPAR1.
- Specify /LPAR2/WebSphere/V6F1 on LPAR2.

Performance is better with this option than with a shared sysplex, and, depending on choice of mount point, it may be possible to mount a configuration HFS temporarily on the other LPAR if the original owner is down. You can make cataloged procedures system-specific or use &SYSNAME to select the configuration HFS mount point.

If you really wish to use the same apparent mount point for all configuration HFS data sets(s), you can use symbolic links to redirect a common mount point to a different HFS on each system:

- In -s \$SYSNAME/WebSphere WebSphere
- Mount LPAR1's configuration HFS at /LPAR1/WebSphere/V6F1.
- Mount LPAR2's configuration HFS at /LPAR2/WebSphere/V6F1.

If this is done correctly, you can specify a configuration mount point of /WebSphere/V6F1 for each system in the Customization Dialog and still enjoy the benefits of system-specific customization HFS data sets. However, when this setup is used, it is **not** possible to easily move configuration HFS data sets from one system to another. All nodes expect to find their data in /WebSphere/V6F1, and you can mount only one configuration HFS at this mount point on each system.

Recommendations:

- On a single z/OS system:
 - Create a configuration HFS at /WebSphere/V6R0 and use it to create a "practice" stand-alone server. Place home directories for additional non-production stand-alone application servers in the same configuration HFS.
 - Create a separate configuration HFS at /WebSphere/V6R0_<cell_short_name> for each product stand-alone server or Network Deployment cell.
- On a multisystem sysplex with no shared HFS, follow the recommendations above for a single z/OS system. This will allow you to use common cataloged procedures for each cell. Establish separate mount points on each system for any cell that you may need to recover on an alternate system in the sysplex.
- On a multisystem sysplex with a shared HFS, use a shared configuration HFS when performance is not an issue or when a shared HFS is required to support specific WebSphere Application Server for z/OS functions. Use non-shared configuration HFS data sets when performance is an issue, or when you must avoid a single point of failure.

Choosing WebSphere Application Server home directory names

The WebSphere Application Server home directory is always relative to the configuration HFS in which it resides. Thus, in the Customization Dialog, you choose the configuration HFS mount point on one panel and fill in just the single directory name for the home directory on another. But when instructions direct you to go to the WAS_HOME directory for a server, they are referring to the entire path name, configuration HFS and home directory name combined. (For example, /WebSphere/V6R0/AppServer.)

You can choose any name you want for a home directory, as long as it is unique in the configuration HFS. If you are creating a stand-alone application server or new managed server node to federate into a Network Deployment cell, be sure to choose one that is not in use in the Network Deployment cell's configuration HFS.

If you have one node per system, you may wish to use some form of the node name or system name. Alternatively, you may use "DeploymentManager" for the deployment manager and "AppServern" for each application server node.

Relationship between the configuration HFS and the product HFS

The configuration HFS contains a large number of symbolic links to files in the product HFS (/usr/lpp/zWebSphere/V6R0 by default). This allows the server processes, administrator and clients to access a consistent WebSphere Application Server for z/OS code base.

Note that these symbolic links are set up when the WebSphere Application Server home directory is created, and are very difficult to change. Therefore, systems that require high availability should keep a separate copy of the WebSphere Application Server for z/OS product HFS and product data sets for each maintenance or service level in use (test, assurance, production, etc.) to allow system maintenance, and use intermediate symbolic links to connect each configuration HFS with its product HFS.

For more information on setting up a WebSphere Application Server for z/OS configuration that allows you to apply maintenance non-disruptively to a cell, see the Washington Systems Center white paper "Planning for Test, Production and Maintenance." Find this document on the Web at <http://www.ibm.com/techdocs> by searching for document number WP1000396 under the category "White Papers."

When a WebSphere Application Server for z/OS node is started, the service level of the configuration is compared against the service level of the product HFS. If the configuration HFS service level is higher than that of the product HFS (probably meaning that an old product HFS is mounted), the node's servers will terminate with an error message. If the configuration HFS service level is lower than that of the product HFS (meaning that service has been applied to the product code base since the node was last started), a task called the post-installer checks for any actions that you need to perform on the configuration HFS to keep it up to date. For more information about the post-installer, see Chapter 9, "Applying product maintenance," on page 167.

Planning for cataloged procedures

Each WebSphere Application Server for z/OS server uses a JCL cataloged procedure. These procedures are all fairly similar and consist of a main cataloged procedure and an INCLUDE member that contains DD statements. Here are sample cataloged procedure library members for a controller, as generated by the Customization Dialog:

Procedure library member BBO6ASR:

```

//BBO6ASR PROC ENV=,Z=BBO6ASRZ
// SET ROOT='/WebSphere/V6R0'
//BBOSR EXEC PGM=BBOSR,REGION=0M,TIME=NOLIMIT,
// PARM='TRAP(ON,NOSP1E),ENVAR("_EDC_UMASK_DFLT=007") /'
//BBOENV DD PATH='&ROOT/&ENV/was.env'
// INCLUDE MEMBER=&Z

```

Procedure library member BBO6ASRZ:

```

/**
/** Output DDs
/**
//CEEDUMP DD SYSOUT=*,SPIN=UNALLOC,FREE=CLOSE
//SYSOUT DD SYSOUT=*,SPIN=UNALLOC,FREE=CLOSE
//SYSPRINT DD SYSOUT=*,SPIN=UNALLOC,FREE=CLOSE
/**
/**StepLib Setup
/**
//STEPLIB DD DISP=SHR,DSN=WAS.V60.SBBOLD2
// DD DISP=SHR,DSN=WAS.V60.SBBOLOAD

```

The PGM= parameter on the EXEC statement in the cataloged procedure specifies the type of WebSphere Application Server for z/OS server. The types are as follows:

- BBOCTL (controller)
- BBOSR (servant)
- BBOCRA (adjunct process)
- BBODAEMN (location service daemon)

The BBOENV DD statement points to the was.env (startup parameter) file for the server. The path to this file consists of the configuration HFS directory name (hard-coded using the ROOT JCL variable) and the symbolic link for this particular server, which is specified at startup using the ENV= parameter.

The INCLUDE statement in the main cataloged procedure causes the incorporation of all JCL statements from the INCLUDE member (in this case, BBO6ASRZ). By convention, the INCLUDE member's name consists of the name of the main cataloged procedure with the letter "Z" appended to the end. The INCLUDE member provides common DD statements for the started task.

The STEPLIB DD statement for the location service daemon determines the WebSphere Application Server for z/OS code base intended for use. If the location service daemon finds the SBBOLPA modules in its STEPLIB concatenation, it loads them into common storage. If the modules are not found in STEPLIB, then the location service daemon checks for their presence in the system link pack area.

Note: If the modules are found in neither location, the location service daemon reports an error and terminates.

Once the modules are located (and, if necessary, loaded), the location service daemon holds a vector table of load module addresses that the rest of the cell's servers will use.

All other servers for the location service daemon's cell on the same z/OS system must use the same product code base as the location service daemon:

- Each server STEPLIB DD statement (in the INCLUDE JCL member) should have the same WebSphere Application Server for z/OS data sets as listed in the location service daemon's STEPLIB DD statement.

Note: The server STEPLIB DD concatenation may also include additional DD statements for CICS or DB2 libraries and so on.

- Each server's home directory must point to a product HFS that matches the service level of the location service daemon's WebSphere Application Server for z/OS load modules.

The controller cataloged procedure includes some additional statements before the EXEC statement that invokes BBOCTL. These are used to invoke the post installer program that applies any needed maintenance to the configuration HFS and its home directories when service is applied to the product HFS and load modules.

The following sections describe the cataloged procedures required for each configuration, provide a recommended naming convention, and explain how the SAF user ID for each server is determined.

Cataloged procedures for stand-alone application servers

A stand-alone application server uses five cataloged procedures, with corresponding INCLUDE JCL members for each:

- Controller cataloged procedure
- Servant cataloged procedure
- Adjunct process cataloged procedure
- Location service daemon cataloged procedure

You can use the same cataloged procedures for different stand-alone servers IF the configuration HFS and product code level (including STEPLIB) are the same for both servers. The Customization Dialog will overwrite identically-named proclib members if identical names are chosen or if customization jobs and files are regenerated. Therefore, if you have a local STEPLIB or make other changes to the procedures, make sure they are reapplied after you use the Customization Dialog.

Cataloged procedures for Network Deployment cells

A Network Deployment cell uses the following cataloged procedures, with corresponding INCLUDE JCL members for each:

For the deployment manager:

- Deployment manager controller cataloged procedure
- Deployment manager servant cataloged procedure

For each application server node:

- Application server controller cataloged procedure (also used for the node agent)
- Application server servant cataloged procedure

For the location service daemon (one per z/OS system):

- Location service daemon controller cataloged procedure
- Location service daemon servant cataloged procedure

The application server servant cataloged procedure is the only one likely to require modification, in order to place libraries (CICS, DB2, and so on) in the STEPLIB concatenation.

You can use the same cataloged procedures for several nodes in a Network Deployment cell, or even for several cells, IF the configuration HFS and product code level (including STEPLIB) are the same for both servers. The Customization Dialog will overwrite identically-named proclib members if identical names are chosen or if customization jobs and files are regenerated. Therefore, if you have a local STEPLIB or make other changes to the procedures, make sure they are reapplied after you use the Customization Dialog.

A recommended cataloged procedure naming convention

Use a consistent naming convention for your WebSphere Application Server for z/OS cataloged procedures. The procedure name should distinguish between WebSphere Application Server for z/OS

version, configuration HFS, and which data sets are listed in STEPLIB. Limit cataloged procedure names to seven characters to allow the Customization Dialog to create INCLUDE JCL member names by appending the letter "Z."

For example, the following convention works for either a stand-alone application server or Network Deployment cell, where "cc" is a two-character cell identifier:

Deployment manager controller	cc6DCR
Deployment manager servant	cc6DSR
Location service daemon controller	cc6DMN
Location service daemon servant	cc6DMN
Application server controller	cc6ACR
Application server servant	cc6ASR

If you require separate cataloged procedures for nodes on different systems in a sysplex (for example, if they need independently-settable STEPLIB statements to allow for a non-disruptive restart), either place the location service daemon and application server procedures in system-specific proclibs, or append a one-character system identifier to the cataloged procedure names for the location service daemon and application servers.

Assigning user IDs to WebSphere Application Server for z/OS address spaces

If you use z/OS Security Server (RACF) as your SAF-compliant security system on z/OS, then STARTED class profiles are used to assign started task user IDs to each WebSphere Application Server for z/OS server. These STARTED profiles are set up by the Customization Dialog batch jobs. Update these STARTED profiles as needed to place servers you create yourself under the appropriate user IDs.

Controllers (deployment manager, location service daemon, node agent or applications server controller) are started using a console START command that you issue either from the MVS console or internally. For these servers, the STARTED profile name that is checked is of the form procname.jobname.

Whenever it creates a cataloged procedure, the Customization Dialog also creates a STARTED profile that associates all controllers using that cataloged procedure with the appropriate controller user ID and configuration group. Therefore, if you set up a stand-alone application server with default names, the Customization Dialog would create the following STARTED profiles for controllers:

- RDEFINE STARTED BB06ACR.* STDATA(USER(ASCR1) GROUP(WSCFG1) TRACE(YES)
- RDEFINE STARTED BB06DMN.* STDATA(USER(WSDMNCR1) GROUP(WSCFG1) TRACE(YES)

Note: TRACE(YES) writes message IRR812I to the MVS console whenever the profile is used.

Servant regions (application server servants and adjunct processes) are started using Workload Manager (WLM). For these servers, the STARTED profile name that is checked is of the form jobname.jobname.

Unfortunately, there is no way to assign all servers using a particular servant cataloged procedure to a servant user ID. Therefore, the Customization Dialog creates both a generic STARTED profile for servants, based on the jobname prefix BBO, and a specific STARTED profile for any servant whose jobname does not begin with BBO, that assign their servants to the servant user ID, and a specific STARTED profile for the adjunct process that assigns it to the CRA user ID. If default names are chosen, the following servant STARTED profiles are created for a stand-alone application server:

- RDEFINE STARTED BBO*.* STDATA(USER(ASSR1) GROUP(WSCFG1) TRACE(YES)

Note: There is no specific application servant profile because the server name BBOS001S is "caught" by this profile.

- RDEFINE STARTED BBOS001A.* STDATA(USER(ASCRA1) GROUP(WSCFG1) TRACE(YES)

When you choose cataloged procedure names, make sure the appropriate STARTED profile is in place to map the server to its appropriate SAF user ID. Use the RACF ISPF panels or the RLIST STARTED command to display the STARTED profiles.

If you use another SAF-compliant security system, contact the security server vendor for WebSphere Application Server for z/OS setup information.

Cataloged procedure for the administrative asynchronous task

The asynchronous administrative task also requires a cataloged procedure. This very simply cataloged procedure does not include a STEPLIB or configuration HFS pointer. However, since it must run under a specific user ID and group associated with the security domain of the cell for which it runs, you must choose a different cataloged procedure name for each security domain or cell.

Recommendation:

Name the administrative asynchronous task cataloged procedure "cc6SH," where "cc" is a two-character cell identifier.

Planning a TCP/IP port convention

This article lists the default server values for WebSphere Application Server for z/OS V6.0.1.

z/OS port assignments

The following table lists the default port assignments for z/OS.

Port	Stand-alone location service daemon	Stand-alone application server	ND location service daemon	ND application server	Node agent	Deployment manager
HTTP		9080		9080		9060
HTTP/S		9443		9443		9043
Bootstrap		2809		9810	2809	9809
ORB	5655	2809	5755	9810	2809	9809
ORB SSL	5656	0	5756	0	0	0
SOAP/JMX		8880		8880	9360	8879
Node Discovery					7272	
Node Multi-cast Discovery					5000	
Cell Discovery						7277
Service Integration		7276				
Service Integration Secure		7286				
Service Integration MQ Interoperability		5558				

Port	Stand-alone location service daemon	Stand-alone application server	ND location service daemon	ND application server	Node agent	Deployment manager
Service Integration MQ Interoperability Secure		5578				
High Availability Manager Communcations		9353			9354	9352

Location service daemon ports

Stand-alone application server node location service daemons are considered temporary. The ports assigned to a stand-alone application server node's location service daemon are used only until that node is federated. It is advisable to set aside a couple of ports to serve as "interim ports" for the stand-alone application server node location service daemon. The "permanent" location service daemon ports are the ones assigned to the deployment manager. Those same ports are copied to location service daemons created when a stand-alone application server node on another MVS image is federated into the deployment manager cell.

Node agent ports

There is a node agent per MVS image on which the cell spans. One design option calls for all node agents to have the exact same ports so the Sysplex Distributor is able to balance the traffic between the two. The node agent is created when the BBOWADDN customized job is run.

Server clusters

A server cluster is a grouping of two or more servers into a one logical server. A cluster is created through the Administrative Console. Servers within a cluster are called "cluster members." Servers ("members") within a cluster start out being clones of one another. When it comes to the TCP ports for the members in a cluster, the Administrative Console allows you during the creation of the cluster to specify if you want the HTTP ports to be unique or the same. The other ports -- bootstrap, DRS, ORB, ORB SSL and SOAP -- will be made unique by the application server.

For complex configurations with multiple members in a cluster it is advisable to make the members be as nearly identical to one another as possible, including the TCP ports. Therefore, when planning it is recommended a range of ports be allocated for a cluster with the intention to make certain all members of that cluster were given the same set of ports. Because WebSphere will automatically generate unique DRS, ORB, ORB SSL and SOAP ports for the second cluster member, it is necessary to go back in and re-map the ports back to the ports set aside for the server cluster

Note: When a "vertical cluster", two members on the same MVS image, is the potential configuration, you will need to consider port sharing by two members of the same cluster on the same MVS image.

Planning a security domain

A security domain definition in z/OS provides WebSphere Application Server for z/OS with a set of cell-wide z/OS Security Server (RACF) security definitions.

Note: The cells involved may be stand-alone application server cells, Network Deployment cells, or both.

A security domain definition includes the following:

- Common definitions for administrative users and groups
- X509 Digital Certificate Authorities, to ensure SSL communication
- SAF groups to which servers belong
- Authorization profiles.

You can use multiple security domains to isolate WebSphere Application Server for z/OS cells from one another within a sysplex. For example, you should create separate security domains for cells that require different groups of users to have administrative authority.

If you plan to use SAF to control access to J2EE roles via the EJBROLE class, you may wish to define a security domain identifier as part of the security domain definition. This prefixes role names with the security domain identifier, allowing use of the EJBROLE profiles TEST.Manager and PROD.Manager to control access to the Manager role on two different cells. The two cells are one with security domain identifier TEST and the other with security domain identifier PROD.

1. Print a copy of Appendix B, "Customization Dialog worksheet: Security domain," on page 191.
2. Fill out the worksheet as described in "Customization Dialog variables: Security domain."
3. Save the worksheet for use during security domain customization.

Customization Dialog variables: Security domain

This article lists definitions for the terms you will come across in the WebSphere Application Server for z/OS Customization Dialog.

Note: If you are setting up a "practice" stand-alone application server, choose the default values wherever possible.

Security domain identifier

If you wish to distinguish between APPL or EJBROLE profiles based on security domain name, set "Use security domain identifier in RACF definitions" to "Y" and provide a one to eight character alphanumeric security domain name.

Internally, this sets "SecurityDomainType" to the string "cellQualified". All servers in the cell will append the security domain name you specify to the application-specific J2EE role name to create the SAF EJBROLE profile marked for checking.

Note: The security domain name is not used, however, if role checking is performed using WebSphere Application Server for z/OS bindings.

The security domain name is also used as the APPL profile name and inserted into the profile name used for CBIND checks. The RACF jobs that the Customization Dialog generates create and authorize the appropriate RACF profiles for the created nodes and servers.

If you do not wish to use a security domain identifier, set "Use security domain identifier in RACF definitions" to "N".

Cell-wide user IDs and groups

The first part of setting up a security domain is to choose the cell-wide user IDs and group names. Each name should contain one to eight alphanumeric characters with an alphabetic first character.

Note: You can also use national characters (#, \$ and @) , but these are better avoided as they can lead to compatibility problems later on.

Each user ID will also require a UNIX System Services UID number, and each group will require a UNIX System Services GID number:

- UID values must be unique numeric values between 1 and 2,147,483,637. Do not use a UID value of 0.
- GID values must be unique numeric values between 1 and 2,147,483,637.

Although you can set up several cells using a single security domain definition, you should not share user IDs and groups between separate security domains.

Choose names and UID values for the following SAF user IDs, and enter them on the worksheet:

WebSphere Application Server Administrator

This user ID is the initial WebSphere Application Server administrator and also owns most of the cell's files in the configuration HFS. It must have the WebSphere Application Server configuration group (below) as its default UNIX System Services group. Certain customization batch jobs must be run under this user ID.

WebSphere Application Server Asynchronous Administration Task

This user ID is used to run asynchronous administration operations procedure. It must be a member of the WebSphere Application Server configuration group.

WebSphere Application Server Unauthenticated User

This user ID is associated with unauthenticated client requests. It is sometimes referred to as the "guest" user ID. It should be given the RESTRICTED attribute in RACF, to prevent it from inheriting UACC-based access privileges, and it must be a member of the WebSphere Application Server unauthenticated user group (below).

Choose names and GID values for the following SAF groups, and enter them on the worksheet:

WebSphere Application Server Configuration Group

This is the default group name for the WebSphere Application Server administrator user ID and all server user IDs. This is the group owner for most files in the configuration HFS, so access to this group should be limited.

WebSphere Application Server Unauthenticated User Group

This is the default group name for the WebSphere Application Server unauthenticated user ID. You can place additional unauthenticated user in this group.

WebSphere Application Server Servant Group

Connect all servant user IDs to this group. You can use it to assign subsystem permissions, such as DB2 authorizations, to all servants in the security domain.

User registry

WebSphere Application Server for z/OS can use a SAF-based ("local OS"), LDAP or custom registry. Select "Y" if you wish for the customization process to prepare the RACF definitions for the local OS security registry. Select "N" if you plan to instead use an LDAP or custom user registry.

SSL customization

If you plan to enable Global Security at some point, as is recommended, fill in the following SSL values:

Certificate Authority Keylabel

The name of the keylabel that identifies the certificate authority (CA) to be used in generating server certificates.

Generate Certificate Authority (CA) certificate

Select "Y" to generate a new CA certificate. Select "N" to have an existing CA certificate generate server certificates.

Expiration date for CA authority

The expiration date used for any X509 Certificate Authority certificates, as well as the expiration date for the personal certificates generated for WebSphere Application Server for z/OS servers. You must specify this even if you selected "N" for "Generate Certificate Authority (CA) certificate."

Default RACF keyring name

The default name given to the RACF key ring used by WebSphere Application Server for z/OS. The key ring names created for repertoires are all the same within a cell.

Enable SSL on location service daemon

Select "Y" if you wish to support secure communications using Inter-ORB Request Protocol (IIOP) to the location service daemon using SSL. If you specify "Y", a RACF key ring will be generated for the location service daemon to use.

Additional z/OS security customization options**Default RACF realm name**

This is a SAF setting used to identify a particular RACF (or compliant) database; all systems sharing a single RACF database have the same RACF realm name. The CSIV2 Local OS registry uses the default RACF realm name (if one is set) or the location service daemon IP name as the WebSphere security realm name.

If you wish to set or change the default RACF realm name, set "Generate a default RACF realm name" to "Y" and enter the RACF realm name to be set. The Customization Dialog jobs will set the RACF realm name on each z/OS system where they are run.

Use SAF EJBROLE profiles to enforce J2EE roles

Select "Y" to indicate the use of SAF EJBROLE profiles, rather than WebSphere Application Server for z/OS bindings created during application deployment, for authorization of J2EE and WebSphere Application Server for z/OS administrator roles. The value specified here has no effect until WebSphere Application Server for z/OS global security is enabled.

When this variable is set to "Y", the RACF jobs generated by the Customization Dialog will set up EJBROLE profiles required for WebSphere Application Server for z/OS run time administration and naming. In addition, the local OS registry is set to use SAF authorization by default when global security is enabled. (Using SAF authorization with LDAP or custom user registries requires both a change in the user registry SAF authorization setting, and the installation of JAAS system login pluggable identity mapping modules to map WebSphere Application Server for z/OS principals to SAF user IDs.)

When SAF EJBROLE profiles are used, it is the WebSphere Application Server for z/OS administrator's responsibility to ensure that SAF EJBROLE profiles are defined, and a system administrator's responsibility to complete user-to-role mapping.

Enable SAF authorization using LTPA or ICSF login tokens

Specify "Y" to enable the WebSphere Application Server for z/OS servant to authenticate users to the SAF registry without providing a password or SAF-specific authenticator. This is required when:

- WebSphere Application Server for z/OS security is enabled
- Local OS is the active registry

and either:

- ICSF or LTPA is the authentication mechanism **OR**
- A Trust Association Interceptor is in use.

Setting this value to "Y" permits the WebSphere Application Server for z/OS servant runtime (an unauthorized application) to log on to z/OS with a z/OS userid but no z/OS authenticator. This is required to establish a z/OS userid via the verification of a WebSphere Application Server for z/OS login token verification or Trust Association Interceptor.

Note: Easing some traditional z/OS system restrictions places additional responsibility on the WebSphere Application Server for z/OS administrator to ensure that installed applications do not contain malicious code. You can use Java 2 security to minimize this exposure.

Building a practice WebSphere Application Server for z/OS cell

Use this task to practice configuring WebSphere Application Server for z/OS. If you are installing the product for the first time without migration from an earlier version, it is helpful to install a practice application serving environment in order to learn the customization process.

Note the following tips when you install your practice runtime:

- Be careful when typing and following the instructions in the customization.
- Note the user ID requirements in the generated instructions. If your user IDs are not configured correctly, the jobs may not run successfully.
- Keep track of each step so you do not skip or repeat any steps.
- Examine each job output (not only the return code) to confirm that everything is configured correctly. Sometimes the return code indicates no problems, but the job output contains errors. For a proper configuration, you should have no errors in your job output unless the instructions specifically contain instruction about errors in the job output.

You should install a practice runtime when you instal WebSphere Application Server on z/OS for the first time and you want to learn the steps to install and customize.

1. Print a copy of the Appendix B, "Customization Dialog worksheet: Security domain," on page 191 and fill it out, using "Customization Dialog variables: Security domain" on page 55 as a guide. When filling out the worksheet, use default values wherever possible.

Note: Make sure that the user ID names, group names, and UID/GID values you specify are not already in use on your z/OS system.

2. Print a copy of the Appendix C, "Customization Dialog worksheet: Stand-alone application server cell," on page 193 and fill it out, using "Customization Dialog variables: Stand-alone application server cell" on page 60 as a guide.

Note: Make sure that the user ID names, group names, UID/GID values, and TCP/IP port numbers you specify are not already in use on your z/OS system.

3. Read the articles in "Using the Customization Dialog" on page 91.
4. Start the Customization Dialog and follow the steps in "Creating a security domain" on page 97. View and follow the generated instructions, which involve executing the BBOSBRAJ and BBOSBRAK jobs.

Note: Be sure to save your security domain variables and record the name of the saved variable data set on the security domain worksheet.

5. Follow the steps in "Creating a stand-alone application server cell" on page 104. View and follow the generated instructions, which tell you how to:
 - Perform the manual configuration updates in the generated stand-alone application server instructions. These steps affect parts of your system that are usually controlled. These are changes that your systems programmer responsible for this z/OS system should review.

- Create your log streams and data sets. The first four jobs (BBOMSGC - BBOWCTR) are straightforward system programming tasks.
- Update your server-specific security definitions. The next two jobs (BBOCBRAJ and BBOCBRAK) generate and then issue the RACF commands necessary to define the users, groups, profiles, and permissions for the WebSphere Application Server for z/OS runtime servers.
- Submit the BBOCBRAK job, or take it and the BBOCBRAJ job to your security administrator for approval. Your security administrator should issue those commands or submit the supplied jobstreams. If your installation has a different profile structure, you may have to modify the RACF commands generated by these execs to suit your particular needs.

Note: Your installation must have "list of groups" on for these commands to work because the servers must be connected to the WebSphere Application Server for z/OS administrator group.

- Create the configuration HFS and WebSphere Application Server for z/OS home directory for your server. Jobs BBOWCHFS and BBOWHFS (run at this point) and job BBOWWPFA (see below) run BPXBATCH shell scripts to define, customize, and load data into the configuration HFS and manipulate the ownership and permission attributes. For this reason, you must run these jobs under a user ID with UID=0.
- Create cataloged procedures for the server and, optionally, for RRS and component trace.
- Set up the runtime (configuration) HFS for the new application server. The BBOWWPFA job may run for some time. The BBOWHFS2 job cleans up the configuration HFS and makes sure all file ownerships are correct.
- Start the new stand-alone application server and run the Install Verification Test (IVT).

Note:

- After you get the application server up and successfully run the IVT, you may want to change the built-in administrators defined for WebSphere Application Server for z/OS, or at least change their passwords. If you do not want the user IDs assigned to started tasks used to sign on or submit jobs, make the user IDs protected by adding the keywords "NOPASSWORD" and "NOOIDCARD" to the user's RACF profile.
- If you have some other security product such as Top Secret or ACF2 instead of RACF, contact your security system vendor for the appropriate security system command(s) needed to configure WebSphere Application Server for z/OS. You may need to contact the vendor for the latest maintenance and guidance on WebSphere Application Server for z/OS customization.

6. Troubleshoot any problems you encounter while customizing your application server.

If you encounter problems while customizing your application server, review the steps you have performed--especially regarding such things as specific user IDs under which jobs must be run. Check all job output for any error messages you may have missed. See Chapter 10, "Troubleshooting installation and configuration," on page 173 for additional advice.

Watch out for these common mistakes:

- Navigating the configuration HFS with a UID of "0" can alter files or their ownership and permission attributes, making them inaccessible to the WebSphere Application Server for z/OS runtime servers and administrators. To avoid this problem, use the WebSphere Application Server for z/OS administrator user ID.
- If you decide to change any of the customized variables after you submit any of these jobs, do not make manual modifications to the generated jobstreams or data. Cancel the installation and start over by regenerating all the jobstreams and start over from the BBOMCFG job.

After you have successfully followed the instructions, you will have set up a WebSphere Application Server for z/OS stand-alone application server. See "Working with your new server" on page 123 for more information.

Read the concept articles under Chapter 7, “Planning for product configuration,” on page 37 and plan one or more application serving environments that fit your system environment and business needs.

In order to save space on your system or clean up your data sets, or any number of other reasons, you may wish to delete the practice application server you just set up. Follow these steps to delete it from your system:

1. Stop the server.
2. Unmount and delete the configuration HFS.
3. Delete the cataloged procedures.
4. Remove any TCP/IP port reservations for the practice application server.
5. Delete the RACF user IDs, groups and profiles you have created, unless you use the same security domain for a different WebSphere Application Server for z/OS cell.

Planning for a stand-alone application server cell

Decide on the security domain you plan to use for this cell and complete the Appendix B, “Customization Dialog worksheet: Security domain,” on page 191.

A stand-alone application server cell is the simplest WebSphere Application Server for z/OS configuration on which you can deploy and run applications. A stand-alone application server cell includes the following:

- A basic cell and node configuration
- A location service daemon
- An application server that runs the administrative console application. You can deploy and run additional applications on this server.

You cannot add additional servants to an application server running the stand-alone version of the administrative console application. You can define additional application servers in the stand-alone cell, but you cannot control them using the administrative console. For more complicated or robust WebSphere Application Server for z/OS application-serving environments, the Network Deployment cell configuration is recommended.

If you have never configured a WebSphere Application Server for z/OS cell, try “Building a practice WebSphere Application Server for z/OS cell” on page 58 first.

1. Print a copy of Appendix C, “Customization Dialog worksheet: Stand-alone application server cell,” on page 193.
2. Fill out the worksheet as described in “Customization Dialog variables: Stand-alone application server cell.”
3. Save the worksheet for use during stand-alone application server customization.

Customization Dialog variables: Stand-alone application server cell

This article lists definitions for the terms you will come across in the WebSphere Application Server for z/OS Customization Dialog.

The WebSphere Application Server for z/OS runtime requires four stand-alone cell servers: application server, deployment manager, node agent, location service daemon. The panels corresponding to the following tables set up the names, network configuration, start procedures, and user IDs for a stand-alone server.

Recommendation: Use the IBM default names the first time you install WebSphere Application Server for z/OS to make the installation instructions easier to follow.

System Locations

This section identifies the target z/OS system on which you will configure the new stand-alone application server, along with system data set names.

System name

The system name for the target z/OS system on which you will configure WebSphere Application Server for z/OS.

Sysplex name

The sysplex name for the target z/OS system on which you will configure WebSphere Application Server for z/OS.

Tip: If you are not sure what the system name (&SYSNAME) and sysplex name (&SYSPLEX) are, use the console command D SYMBOLS on the target z/OS system to display them.

For the following, specify the fully qualified data set names without quotes.

Rule: You can specify up to 44 characters for the data set names.

PROCLIB

An existing procedure library where the WebSphere Application Server for z/OS cataloged procedures are added.

PARMLIB

An existing parameter library for system definitions to support WebSphere Application Server for z/OS. This data set must be in the parmlib concatenation for the target z/OS system.

SYSEXEC

A variable-block (RECFM=VB, LRECL=255) data set into which the customization process places REXX EXECs to be called from TSO, such as the WebSphere Application Server for z/OS error log browser, BBORBLOG. You must allocate this data set and concatenate it as part of the SYSEXEC DD allocation in your installation-wide TSO logon PROC or allocation exec.

If your existing SYSEXEC DD data set concatenation consists of fixed-blocked (RECFM=FB) data sets, you must make a copy of the hlq.DATA data set (produced by the Customization Dialog) after the customization process is complete, and place the copy in the SYSEXEC concatenation.

If you do not specify a data set name, the customization process does not place any REXX EXECs in any data set.

WebSphere Application Server for z/OS product data sets

Specify the following WebSphere Application Server for z/OS libraries so they can be accessed by the customized jobstreams the Dialog produces. These data sets must be cataloged. See “Planning for product data sets” on page 17 for more information.

Run WebSphere Application Server from STEPLIB (Y/N)?

Specifies whether to load WebSphere Application Server for z/OS load modules from STEPLIB (“Y”) or from the link pack area and link list (“N”). See “Link pack area, Link list and STEPLIB” on page 27 for more information.

Note: Do not specify “N” if you have another instance of WebSphere Application Server for z/OS (Version 4 or above) in the system link pack area or link list.

SBBOLPA

WebSphere Application Server for z/OS load module library. It has modules that should go into LPA or the location service daemon STEPLIB.

SBBOLOAD

WebSphere Application Server for z/OS load module library. It has members that should go into the link list or LPA, or into STEPLIB.

SBBOLD2

WebSphere Application Server for z/OS load module library that you installed through SMP/E. It has members that should go into the link list, or into STEPLIB. **DO NOT** place them in LPA.

SBBOEXEC

WebSphere Application Server for z/OS CLIST library.

SBBOMSG

SBBOMSG WebSphere Application Server for z/OS message skeletons for language translation.

Additional system data sets

Specify the following Language Environment and WebSphere Application Server for z/OS data sets and whether they should ("Y") or should not ("N") load from STEPLIB. "N" indicates the generated JCL will contain STEPLIB statements for these data sets. Refer to your z/OS SMP/E installation for the location of these data sets listed by their DD Name.

SCEERUN

Language Environment run-time load module library.

SCEERUN2

Language Environment run-time load module library.

SGSKLOAD

System SSL load module library. This data set does not exist in z/OS Version 1 Release 6 and above. See "Link pack area, Link list and STEPLIB" on page 27 for the effects of this change. Leave the data set name blank if **ALL** z/OS target systems are at z/OS Version 1 Release 6 or above.

WebSphere Application Server for z/OS product directory**WebSphere Application Server product directory**

The name of the directory where WebSphere Application Server for z/OS files reside after installation. See "Planning for product HFS directories" on page 20 for more information.

WebSphere configuration HFS

This section defines the WebSphere configuration HFS that you will use for the stand-alone application server. See "Planning a configuration HFS" on page 45 for more information.

Mount point

Read/write HFS directory mount point where application data and environment files are written. The customization process creates this mount point, if it does not already exist.

Name Hierarchical File System data set you will create and mount at the above mount point.

Rule: You can specify up to 44 characters for the data set name.

Volume, or '*' for SMS

Specify either the DASD volume serial number to contain the above data set or "*" to let SMS select a volume. Using "*" requires that SMS automatic class selection (ACS) routines be in place to select the volume. If you do not have SMS set up to handle data set allocation automatically, list the volume explicitly.

Primary allocation in cylinders

Initial size allocation in cylinders for the above data set.

Recommendation: The minimum suggested size is 250 cylinders (3390).

Secondary allocation in cylinders

Size of each secondary extent in cylinders.

Recommendation: The minimum suggested size is 100 cylinders.

WebSphere error logstream

This section defines the System Logger logstream you will use for WebSphere Application Server for z/OS error logging if TRACEBUFFLOC=BUFFER. Having the error log in the log stream is optional. By default, the error log is written to JES SYSOUT.

Name Name of the WebSphere error log stream you will create.

Rules:

- The name must be 26 or fewer characters.
- Do NOT put quotes around the name.

Data class

An existing DFSMS data class for the log stream data set allocation. Applicable only if you use SMS.

Storage class

An existing DFSMS storage class for allocation of the DASD staging data set for this log stream. Applicable only if you use SMS.

HLQ for data sets

The high-level qualifier for the log stream data set name and staging data set name that you will create.

Is log stream CF resident (YIN)

If you want the log stream to be created on a coupling facility, specify "Y". If on DASD, specify "N".

If yes, specify structure name

If using the coupling facility, specify the coupling facility structure to be used for the log stream.

Rule: The name can be 1 to 16 characters, including alphanumeric characters, national characters, and an underscore, where the first character is uppercase alphabetic.

If no, specify: log stream size

Specifies the size, in 4K blocks, of the log stream DASD data sets for the log stream being defined.

If no, specify: staging size

Specifies the size, in 4K blocks, of the DASD staging data set for the log stream being defined.

RRS setup (if not done previously)

If you do not have the RRS log streams set up, the Customization Dialog will create the jobs you can use to set up the log streams. See "Preparing Resource Recovery Services" on page 31 for more information.

Group name

Specify the XCF group name.

Recommendation: Use your cell name.

Data class

Specify an existing DFSMS Data Class for the log stream data set allocation. Applicable only if you use SMS.

Storage class

An existing DFSMS storage class for allocation of the DASD staging data set for this log stream. Applicable only if you use SMS.

HLQ for data sets

The high-level qualifier for your log stream data set name and staging data set name.

Is log stream CF resident (YIN)

If the log stream is to be created on a coupling facility, specify "Y". If on DASD, specify "N".

Create RRS PROC (YIN)

If you answer "Y", the Dialog copies the ATRRRS cataloged procedure into SYS1.PROCLIB so that RRS can be started.

If you already have RRS set up, specify "N".

Component Trace

WebSphere Application Server for z/OS uses component trace (CTRACE) to capture and to display trace data in trace data sets. WebSphere Application Server for z/OS identifies itself to CTRACE with the "cell short name."

Procedure name

This is the CTRACE external writer start procedure to be created. It is identified in the WebSphere Application Server for z/OS CTRACE member (CTIBBOxx) in PARMLIB.

Rule: The name must be one to seven characters.

User ID

RACF user ID to be created and associated with the CTRACE external writer start procedure.

Group The name of an existing RACF group you will associate with this user.

Recommendation: Use the "default started task" RACF group for your target z/OS system.

Name Specify a fully qualified data set name, such as WAS390.CTRACE1, for the data set to be created. The default includes the system name of the system on which the Customization Dialog is running.

Rules:

- You can specify up to 44 characters for the data set name.
- Do not use quotes.

Volume, or "*" for SMS

Specify either the DASD volume serial number containing the above data set or "*" to let DFSMSHsm select a volume. Using "*" requires SMS. Using "*" requires that SMS automatic class selection (ACS) routines be in place to select the volume. If you do not have SMS set up to handle data set allocation automatically, list the volume explicitly.

Primary space in cylinders

The primary space for the trace data set.

Secondary space in cylinders

The secondary space for the trace data set.

Trace Parmlib member suffix

Value that is appended to CTIBBO to form the member name for the Trace Parmlib member.

WebSphere transaction XA partner log

This section specifies whether the transaction XA partner log resides in the configuration HFS or in a logstream. This log is used for recovery of XA resources.

Use Log stream (YIN)

Indicates whether the XA partner log is located in the file system or in a logstream. Choose "N" to put the partner log in the file system.

Note: If you choose "Y" to use logger, you must continue with the rest of the variables on this panel. However, if you choose "N" to put the partner log in the file system, no further modification is required on this panel, and the XA logs will be written to the file system at the default location (WAS_HOME/recoveryLogs), or at the value of \$STRANLOG_ROOT.

Name HLQ

Name that becomes the first qualifier in the name of the log stream.

The remainder of the logstream name consists of the server short name, followed by an M or D (short for Main and Delayed streams). For example, if the HLQ is HLQ and server name is BB0S001, the stream names would be HLQ.BB0S001.M and HLQ.BB0S001.D. As stated above, it is important that you select the HLQ carefully to ensure that two servers are not using the same stream. If you have two servers named BB0S001 in two cells, the streams will overlap if they both use the same HLQ.

Note: No two servers may have the same log stream name. If you plan for your installation to have more than one server with the same short name, you must choose a different HLQ for each server.

Rule: The name can be one to eight characters.

Data class

An existing DFSMS data class for the log stream data set allocation. Specify this if your installation requires you to allocate log streams in a particular data class. Applicable only if you use SMS.

Storage class

An existing DFSMS storage class for allocation of the DASD staging data set for this log stream. Specify this if your installation requires you to allocate log streams in a particular storage class. Applicable only if you use SMS.

HLQ for data sets

High-level qualifier that becomes both the HLQ for the DASD offload data sets produced when the log stream becomes full and the HLQ for the log stream data sets themselves, if they are using a DASD-only log stream.

Rule: The HLQ can be one to eight characters.

Is log stream CF resident (YIN)

If you want to create the log stream on a coupling facility, specify "Y". If on DASD, specify "N".

If yes, specify structure name

If using the coupling facility (CF), specify the coupling facility structure to be used for the log stream.

Rule: The name can be 1 to 16 characters, including alphanumeric characters, national characters, and an underscore, where the first character is uppercase alphabetic.

If no, specify: logstream size

Specifies the size, in 4K blocks, of the log stream DASD data sets for the log stream being defined. Specifying "1" indicates 4096 bytes of storage. It is recommended that you make the DASD logstream the same size as your RRS (Resource Recovery Services) main and delayed logstreams.

If no, specify: staging size

Specifies the size, in 4K blocks, of the DASD staging data set for the log stream being defined. Specifying "1" indicates 4096 bytes of storage.

Server customization**WebSphere Application Server home directory**

Directory in which the application server configuration resides. See "Planning a configuration HFS" on page 45 for more information.

Note: You can alter only the portion after the configuration HFS mount point.

Cell name (short)

Name that identifies the cell to certain WebSphere Application Server for z/OS-exploited z/OS facilities. (For example, SAF.)

Rules:

- Name must be eight or fewer characters and all uppercase.
- Name must be unique among all other cells in the sysplex.

Cell name (long)

Primary external identification of this WebSphere Application Server for z/OS cell. This name identifies the cell as displayed through the administrative console.

Note: If you intend to ever add this stand-alone server node to a Network Deployment cell, ensure that the stand-alone server cell name is different from the Network Deployment cell name.

Rules:

- Name must be 50 or fewer characters and can be of mixed case.
- Name must be unique among all other cells in the sysplex.

Node name (short)

Name that identifies the node to certain WebSphere Application Server for z/OS-exploited z/OS facilities. (For example, SAF.)

Rules:

- Name must be eight or fewer characters and all uppercase.
- Name must be unique within the cell.

Node name (long)

Primary external identification of this WebSphere Application Server for z/OS node. This name identifies the node as displayed through the administrative console.

Note: If you intend to ever add this stand-alone server node to a deployment manager cell, ensure that the stand-alone server node name is not the same as that of any existing node in the Network Deployment cell.

Rules:

- Name must be 50 or fewer characters and can be of mixed case.
- Name must be unique within the cell.
- The application server must be defined on its own node; no other server may exist on the same node as the application server.

Server name (short)

This value identifies the server to certain WebSphere Application Server for z/OS- exploited z/OS facilities. (For example, SAF.)

Note: The server short name is used as the server JOBNAME.

Rule: Name must usually contain seven or fewer all-uppercase characters. If you wish to instead specify eight characters, you must follow the steps outlined in *Converting a 7-character server short name to 8 characters* in the *Setting up the application serving environment* PDF book.

Note: When you define a server, its server short name receives a default prefix of BBO* and a corresponding RACF BBO* profile is created. During installation, if you change the server short name to use a prefix other than BBO*, you must create your own non-default RACF profile using the non-default prefix. See RACF server class profiles in the *Securing applications and their environment* PDF book for information on creating your own RACF profile and Understanding System Authorization Facility profile names generated by the Customization Dialog in the *Securing applications and their environment* PDF book for information on how the Customization Dialog manages SAF profiles.

Server name (long)

Name of the application server and the primary external identification of this WebSphere Application Server for z/OS server. This name identifies the server as displayed through the administrative console.

Rule: Name must be 50 or fewer characters and can be of mixed case.

Cluster transition name

WLM APPLENV (WLM application environment) name for this server.

Note: If this server is converted into a clustered server, this name becomes the cluster short name. The cluster short name is the WLM APPLENV name for all servers that are part of the same cluster. See “Planning for cataloged procedures” on page 49 for more information.

Rule: Name must be eight or fewer characters and all uppercase.

Admin asynch operations procedure name

Specifies the JCL procedure name of a started task that is launched via the START command by node agents and/or application servers to perform certain asynchronous administrative operations (such as node synchronization) and add and remove a node. See “Planning for cataloged procedures” on page 49 for more information.

Install samples? (Y/N)

Specify whether you do (“Y”) or do not (“N”) wish to install the WebSphere Application Server for z/OS sample applications (the Samples Gallery).

Note: These applications are not supported in a Network Deployment cell.

Server address space information

This section defines the cataloged procedures and associated user IDs for the server regions. See “Planning for cataloged procedures” on page 49 for more information.

Rule: In the following, unless specified otherwise, names must be eight or fewer characters.

Note: If you wish to specify jobnames with eight instead of seven characters, you must follow the steps outlined in Converting a 7-character server short name to 8 characters in the *Setting up the application serving environment* PDF book.

Controller Information

Jobname

The jobname, specified in the MVS START command JOBNAME parameter, associated with the application server controller. This is the same as the server short name and you can not change it through the Customization Dialog.

Procedure name

Name of member in your procedure library to start the application server controller.

Rule: Name must be seven or fewer characters.

User ID

The user ID associated with the application server controller.

Note: If you are using a non-IBM security system, the user ID may have to match the procedure name. Please refer to your security system’s documentation.

UID The user identifier associated with this user ID.

Rule: UIDs must be unique numbers, between 1 and 2,147,483,647, within the system.

Servant Information

Jobname

The jobname used by WLM to start the application server servant. This is set to the server short name, followed by the letter “S”, and you can not changed it through the Customization Dialog.

Procedure name

Name of member in your procedure library to start the application server servant.

Rule: Name must be seven or fewer characters.

User ID

The user ID associated with the application server servant.

Note: If you are using a non-IBM security system, the user ID may have to match the procedure name. Please refer to your security system’s documentation.

UID The user identifier associated with this user ID.

Rule: UIDs must be unique numbers, between 1 and 2,147,483,647, within the system.

Control Region Adjunct

Jobname

The jobname used by WLM to start the application server control region adjunct. This is set to the server short name, followed by the letter “A”, and you can not changed it through the Customization Dialog.

Procedure name

Name of the member in your procedure library that starts the control region adjunct.

Rule: Name must be seven or fewer characters.

User ID

The user ID associated with the control region adjunct.

Note: If you use a non-IBM security system, the user ID may have to match the procedure name. Please refer to your security system's documentation for more information.

UID The user identifier associated with this user ID.

Rule: UIDs must be unique numbers, between 1 and 2,147,483,647, within the system.

Server TCP/IP information

Rule: In the following, unless specified otherwise, names must be eight or fewer characters.

Node host name

IP name or address of the system on which the server is configured. This value is used by other WebSphere Application Server for z/OS functions to connect to this server.

Note: The node host name must always resolve to an IP stack on the system where the application server runs. The node host name cannot be a DVIPA or a DNS name that, in any other way, causes the direction of requests to more than one system.

SOAP JMX Connector port

Port number for the JMX HTTP connection to this server based on the SOAP protocol. JMX is used for remote administrative functions, such as invoking scripts through wsadmin.sh.

Rule: Value cannot be 0.

DRS Client Address port

Port address for access to the server's data replication service. This is important for configurations that define replication groups.

Rule: Value cannot be 0.

ORB Listener host name

IP address on which the server's ORB listens for incoming IIOp requests. The default is "*", which instructs the ORB to listen on all available IP addresses.

ORB port

Port for IIOp requests which acts as the bootstrap port for this server and also as the port through which the ORB accepts IIOp requests.

Rule: Value cannot be 0.

ORB SSL port

Port for secure IIOp requests. The default is "0", which allows the system to choose this port.

HTTP transport host name

IP address on which the server's Web container should listen for incoming HTTP requests. The default is "*", which instructs the Web container to listen on all available IP addresses.

Note: The "transport host name" becomes the "hostname" in the virtualhosts.xml file, which makes setting a specific IP address here less than ideal because, if you do so, you are restricting yourself to that IP address until you go into the administrative console and add another virtual host.

HTTP port

Port for HTTP requests.

Rule: Value cannot be 0.

HTTP SSL port

Port for secure HTTP requests.

Rule: Value cannot be 0.

Service Integration port

Service Integration Secure port

Service Integration MQ Interoperability port

Service Integration MQ Interoperability Secure port

High Availability Manager

High Availability Manager Host

Host name for the High Availability manager. This host name must resolve to a single IP address--it can not be a multihomed host.

High availability manager communication port

Port on which the High Availability Manager listens.

Location service daemon

The location service daemon is the initial point of client contact in WebSphere Application Server for z/OS. The server contains the CORBA-based location service agent, which places sessions in a cell. All RMI/IIOP IORs (for example, for enterprise beans) establish connections to the location service daemon first, then forward them to the target application server.

Daemon home directory

Directory in which the location service daemon resides. This is set to the configuration HFS mount point/Daemon and cannot be changed.

Daemon jobname

Specifies the jobname of the location service daemon, specified in the JOBNAME parameter of the MVS start command used to start the location service daemon.

Caution: When configuring a second cell, ensure you change the daemon jobname from the default or value you used for the first cell.

Note: A server automatically starts the location service daemon if it is not already running.

Procedure name

Name of the member in your procedure library to start the location service daemon.

Rule: Name must be seven or fewer characters.

User ID

The user ID associated with the location service daemon.

UID The user identifier associated with this user ID.

Rule: UIDs must be unique numbers, between 1 and 2,147,483,647, within the system.

IP Name

The fully qualified IP name, registered with the Domain Name Server (DNS), that the location service daemon uses. The default is your node host name.

Note:

- In a sysplex, you should consider using a virtual IP address (VIPA) for the location service daemon IP name.
- Select the IP name for the location service daemon carefully. You can choose any name you want, but, once chosen, it is difficult to change, even in the middle of customization.

Port The port number on which the location service daemon listens.

Note: Select the port number for the location service daemon carefully. You can choose any value you want, but, once chosen, it is difficult to change, even in the middle of customization.

SSL Port

The port number on which the location service daemon listens for SSL connections.

Register daemon with WLM DNS

If you use the WLM DNS (connection optimization), you must select "Y" to register your location service daemon with it. Otherwise, select "N."

Note: Only one location service daemon per LPAR can register its domain name with WLM DNS. If you have multiple cells in the same LPAR and register one location service daemon and then a second, the second will fail to start.

Schedule database

This section defines an (optional) DB2 database that the scheduler daemon may use.

SBPXEXEC

The data set name of the Unix System Services SBPXEXEC data set on your z/OS system.

DB2 RUNLIB Location

The data set name of the DB2 RUNLIB data set.

DB2 Subsystem Name

The subsystem name (1-4 characters) of the DB2 region to be used for creating the scheduler database.

Plan Name

The plan name to be used in creating the scheduler database.

Scheduler Database Name

The DB2 database name for the scheduler database.

Storage Group Name

The DB2 storage group name to be used for creating scheduler database tables.

Tablespace Name

The DB2 tablespace name to be created for the schedule database.

Table Prefix

The table prefix to be used for the scheduler database tables.

Security Domain Configuration

These panels display values you previously set in the "Configure security domain" option--you can not change any of the values here. If you do wish to make changes, you must go back to the main Dialog panel and run through the "Configure security domain" option again.

Planning for a Network Deployment cell

Decide on the security domain you plan to use for this cell and complete the Appendix B, "Customization Dialog worksheet: Security domain," on page 191.

A Network Deployment cell is a full-function WebSphere Application Server for z/OS configuration on which you can deploy and run applications. A Network Deployment cell includes the following:

- A cell configuration.
- A deployment manager that runs the administrative console application.
- One or more nodes (one is recommended) on each z/OS target system hosting portions of the cell. Each node consists of a node agent and some number of application servers.
- A single location service daemon on each z/OS system.
- An application server that runs the administrative console application. You can deploy and run additional applications on this server.

This part of the configuration process creates the initial cell configuration, the deployment manager, and a location service daemon for the z/OS system on which the deployment manager runs. Once the Network Deployment cell is created, add application server nodes by creating and federating new managed nodes, or by federating stand-alone application server nodes into the Network Deployment cell.

When configuring your deployment manager node, keep the following in mind:

- When allocating target data sets for this option, it is possible, though not recommended, to use the same target data sets that you used for the stand-alone application server node. The jobnames for each configuration are very close to one another, and, if you use the same target data sets, you may find it difficult to keep the two sets of jobs separate. Therefore, it is better to create a new set of target data sets and keep the two sets of jobs separate from one another.

- If possible, set up your HFSs such that the root HFS is shared among all processors and the deployment manager's configuration is in a configuration HFS on a system-generic mount point.

Note: This configuration scenario is the best for certain tasks, such as starting the deployment manager on another system, that you may wish to perform later on.

1. Print a copy of Appendix D, "Customization Dialog worksheet: Network Deployment cell," on page 199.
2. Fill out the worksheet as described in "Customization Dialog variables: Network Deployment cell."
3. Save the worksheet for use during Network Deployment cell customization.

Customization Dialog variables: Network Deployment cell

This article lists definitions for the terms you will come across in the WebSphere Application Server for z/OS Customization Dialog.

System Locations

This section identifies the target z/OS system on which you will configure the deployment manager for the Network Deployment cell, along with system data set names.

System name

The system name for the target z/OS system on which you will configure WebSphere Application Server for z/OS.

Sysplex name

The sysplex name for the target z/OS system on which you will configure WebSphere Application Server for z/OS.

Tip: If you are not sure what the system name (&SYSNAME) and sysplex name (&SYSPLEX) are, use the console command D SYMBOLS on the target z/OS system to display them.

For the following, specify the fully qualified data set names without quotes.

Rule: You can specify up to 44 characters for the data set names.

PROCLIB

An existing procedure library where the WebSphere Application Server for z/OS cataloged procedures are added.

PARMLIB

An existing parameter library for system definitions to support WebSphere Application Server for z/OS. This data set must be in the parmlib concatenation for the target z/OS system.

SYSEXEC

A variable-block (RECFM=VB, LRECL=255) data set into which the customization process places REXX EXECs to be called from TSO, such as the WebSphere Application Server for z/OS error log browser, BBORBLOG. You must allocate this data set and concatenate it as part of the SYSEXEC DD allocation in your installation-wide TSO logon PROC or allocation exec.

If your existing SYSEXEC DD data set concatenation consists of fixed-blocked (RECFM=FB) data sets, you must make a copy of the hlq.DATA data set (produced by the Customization Dialog) after the customization process is complete, and place the copy in the SYSEXEC concatenation.

If you do not specify a data set name, the customization process does not place any REXX EXECs in any data set.

WebSphere Application Server for z/OS product data sets

Specify the following WebSphere Application Server for z/OS libraries so they can be accessed by the customized jobstreams the Dialog produces. These data sets must be cataloged. See "Planning for product data sets" on page 17 for more information.

Run WebSphere Application Server from STEPLIB (Y/N)?

Specifies whether to load WebSphere Application Server for z/OS load modules from STEPLIB ("Y") or from the link pack area and link list ("N"). See "Link pack area, Link list and STEPLIB" on page 27 for more information.

Note: Do not specify "N" if you have another instance of WebSphere Application Server for z/OS (Version 4 or above) in the system link pack area or link list.

SBBOLPA

WebSphere Application Server for z/OS load module library. It has modules that should go into LPA or the location service daemon STEPLIB.

SBBLOAD

WebSphere Application Server for z/OS load module library. It has members that should go into the link list or LPA, or into STEPLIB.

SBBOLD2

WebSphere Application Server for z/OS load module library that you installed through SMP/E. It has members that should go into the link list, or into STEPLIB. **DO NOT** place them in LPA.

SBBOEXEC

WebSphere Application Server for z/OS CLIST library.

SBBOMSG

SBBOMSG WebSphere Application Server for z/OS message skeletons for language translation.

Additional system data sets

Specify the following Language Environment and WebSphere Application Server for z/OS data sets and whether they should ("Y") or should not ("N") load from STEPLIB. "N" indicates the generated JCL will contain STEPLIB statements for these data sets. Refer to your z/OS SMP/E installation for the location of these data sets listed by their DD Name.

SCEERUN

Language Environment run-time load module library.

SCEERUN2

Language Environment run-time load module library.

SGSKLOAD

System SSL load module library. This data set does not exist in z/OS Version 1 Release 6 and above. See "Link pack area, Link list and STEPLIB" on page 27 for the effects of this change. Leave the data set name blank if **ALL** z/OS target systems are at z/OS Version 1 Release 6 or above.

WebSphere Application Server for z/OS product directory**WebSphere Application Server product directory**

The name of the directory where WebSphere Application Server for z/OS files reside after installation. See "Planning for product HFS directories" on page 20 for more information.

WebSphere configuration HFS

This section defines the WebSphere configuration HFS that you will use for the deployment manager. See "Planning a configuration HFS" on page 45 for more information.

Mount point

Read/write HFS directory mount point where application data and environment files are written. The customization process creates this mount point, if it does not already exist.

Name Hierarchical File System data set you will create and mount at the above mount point.

Rule: You can specify up to 44 characters for the data set name.

Volume, or '*' for SMS

Specify either the DASD volume serial number to contain the above data set or "*" to let SMS

select a volume. Using "*" requires that SMS automatic class selection (ACS) routines be in place to select the volume. If you do not have SMS set up to handle data set allocation automatically, list the volume explicitly.

Primary allocation in cylinders

Initial size allocation in cylinders for the above data set.

Recommendation: The minimum suggested size is 250 cylinders (3390).

Secondary allocation in cylinders

Size of each secondary extent in cylinders.

Recommendation: The minimum suggested size is 100 cylinders.

Server customization

During this customization task, you will create a cell configuration, a deployment manager node and server, and a location service daemon. The panels corresponding to the following tables set up the names, network configuration, start procedures, and user IDs for a deployment manager server.

Rule: In the following, unless specified otherwise, names must be eight or fewer characters.

WebSphere Application Server home directory

Directory in which the deployment manager resides. See "Planning a configuration HFS" on page 45 for more information.

Note: You can alter only the portion after the configuration HFS mount point.

Cell name (short)

Name that identifies the cell to certain WebSphere Application Server for z/OS-exploited z/OS facilities. (For example, SAF.)

Rules:

- Name must be eight or fewer characters and all uppercase.
- Name must be unique among all other cells in the sysplex.

Cell name (long)

Primary external identification of this WebSphere Application Server for z/OS cell. This name identifies the cell as displayed through the administrative console.

Rules:

- Name must be 50 or fewer characters and can be of mixed case.
- Name must be unique among all other cells in the sysplex.

Node name (short)

Name that identifies the deployment manager node to certain WebSphere Application Server for z/OS-exploited z/OS facilities. (For example, SAF.)

Rules:

- Name must be eight or fewer characters and all uppercase.
- Name must be unique within the cell.

Node name (long)

Primary external identification of this WebSphere Application Server for z/OS deployment manager node. This name identifies the node as displayed through the administrative console. The deployment manager has a fixed node name (long) of "dmgr".

Rules:

- Name must be 50 or fewer characters and can be of mixed case.
- Name must be unique within the cell.

Server name (short)

This value identifies the deployment manager server to certain WebSphere Application Server for z/OS- exploited z/OS facilities. (For example, SAF.)

Note: The server short name is used as the server JOBNAME.

Rule: Name must usually contain seven or fewer all-uppercase characters. If you wish to instead specify eight characters, you must follow the steps outlined in *Converting a 7-character server short name to 8 characters* in the *Setting up the application serving environment* PDF book.

Note: When you define a server, its server short name receives a default prefix of BBO* and a corresponding RACF BBO* profile is created. During installation, if you change the server short name to use a prefix other than BBO*, you must create your own non-default RACF profile using the non-default prefix. See RACF server class profiles in the *Securing applications and their environment* PDF book for information on creating your own RACF profile and Understanding System Authorization Facility profile names generated by the Customization Dialog in the *Securing applications and their environment* PDF book for information on how the Customization Dialog manages SAF profiles.

Server name (long)

Name of the application server and the primary external identification of this WebSphere Application Server for z/OS server. This name identifies the server as displayed through the administrative console.

Rule: Name must be 50 or fewer characters and can be of mixed case.

Cluster transition name

WLM APPLENV name for this server.

Note: The deployment manager is not clusterable, so this value never actually becomes the cluster short name of this server's cluster. However, like an application server, the deployment manager still needs an APPLENV, so the cluster transition name is used for this purpose.

Rule: Name must be eight or fewer characters and all uppercase.

Deployment manager definitions

Rule: In the following, unless specified otherwise, names must be eight or fewer characters.

Note: The RACF profiles you created during the construction of the stand-alone Application Server node will also work for the deployment manager. Also, the STARTED profiles are generic enough to cover any MVS jobname starting with AZ*.

Controller Information

Jobname

The jobname, specified in the MVS START command JOBNAME parameter, associated with the deployment manager controller. This is the same as the server short name and you can not change it through the Customization Dialog.

Procedure name

Name of member in your procedure library to start the deployment manager controller.

Rule: Name must be seven or fewer characters.

User ID

The user ID associated with the deployment manager controller.

Note: If you are using a non-IBM security system, the user ID may have to match the procedure name. Please refer to your security system's documentation.

UID

The user identifier associated with this user ID.

Rule: UIDs must be unique numbers, between 1 and 2,147,483,647, within the system.

Servant Information

Jobname

The jobname used by WLM to start the deployment manager servant. This is set to the server short name, followed by the letter "S", and you can not changed it through the Customization Dialog.

Procedure name

Name of member in your procedure library to start the deployment manager servant.

Rule: Name must be seven or fewer characters.

User ID

The user ID associated with the deployment manager servant.

Note: If you are using a non-IBM security system, the user ID may have to match the procedure name. Please refer to your security system's documentation.

UID The user identifier associated with this user ID.

Rule: UIDs must be unique numbers, between 1 and 2,147,483,647, within the system.

Deployment manager TCP/IP information

Rule: In the following, unless specified otherwise, names must be eight or fewer characters.

Note: You must change all the port values from those used by the stand-alone Application Server.

Node host name

IP name or address of the system on which the server is configured. This value is used by other WebSphere Application Server for z/OS functions to connect to this server.

Note: The node host name must always resolve to an IP stack on the system where the application server runs. (You can either have multiple IP stacks on a given MVS image and have the deployment manager and stand-alone application server tied to separate host names, or you can associate them with the same node host name.) The node host name cannot be a DVIPA or a DNS name that, in any other way, causes the direction of requests to more than one system.

SOAP JMX Connector port

Port number for the JMX HTTP connection to this server based on the SOAP protocol. JMX is used for remote administrative functions, such as invoking scripts through wsadmin.sh.

Rule: Value cannot be 0.

Cell Discovery Address port

Port number used by node agents to connect to this deployment manager server.

DRS Client Address port

Port address for access to the server's data replication service. This is important for configurations that define replication groups.

Rule: Value cannot be 0.

ORB Listener host name

IP address on which the server's ORB listens for incoming IIOp requests. The default is "*", which instructs the ORB to listen on all available IP addresses.

ORB port

Port for IIOp requests which acts as the bootstrap port for this server and also as the port through which the ORB accepts IIOp requests.

Rule: Value cannot be 0.

ORB SSL port

Port for secure IIOp requests. The default is "0", which allows the system to choose this port.

HTTP transport host name

IP address on which the server's Web container should listen for incoming HTTP requests. The default is "*", which instructs the Web container to listen on all available IP addresses.

Note: The "transport host name" becomes the "hostname" in the virtualhosts.xml file, which makes setting a specific IP address here less than ideal because, if you do so, you are restricting yourself to that IP address until you go into the administrative console and add another virtual host.

HTTP port

Port for HTTP requests.

Rule: Value cannot be 0.

HTTP SSL port

Port for secure HTTP requests.

Rule: Value cannot be 0.

High Availability Manager Host

Host name for the High Availability manager. This host name must resolve to a single IP address--it can not be a multihomed host.

High availability manager communication port

Port on which the High Availability Manager listens.

Location service daemon

The location service daemon is the initial point of client contact in WebSphere Application Server for z/OS. The server contains the CORBA-based location service agent, which places sessions in a cell. All RMI/IIOP IORs (for example, for enterprise beans) establish connections to the location service daemon first, then forward them to the target application server.

Daemon home directory

Directory in which the location service daemon resides. This is set to the configuration HFS mount point/Daemon and cannot be changed.

Daemon jobname

Specifies the jobname of the location service daemon, specified in the JOBNAME parameter of the MVS start command used to start the location service daemon.

Note: The same daemon jobname is used on all z/OS systems hosting the cell. Therefore, this name is generic and has no system indicator. When the deployment manager's controller started, its location service daemon was started automatically using this particular daemon jobname value.

Caution: When configuring a second cell, ensure you change the daemon jobname from the default or value you used for the first cell.

Note: A server automatically starts the location service daemon if it is not already running.

Procedure name

Name of the member in your procedure library to start the location service daemon.

Rule: Name must be seven or fewer characters.

User ID

The user ID associated with the location service daemon.

UID

The user identifier associated with this user ID.

Rule: UIDs must be unique numbers, between 1 and 2,147,483,647, within the system.

IP Name

The fully qualified IP name, registered with the Domain Name Server (DNS), that the location service daemon uses.

Adhere to the following regarding your location service daemon IP name:

- It must be unique in the sysplex.
- It must not have the same value as any one system's node host name. (You may use the host name of the LPAR.)
- It should be a name that can be used in conjunction with a routing service that distributes requests among nodes in the cell (i.e. systems in the sysplex).

- It should be a virtual IP address (VIPA) if you are operating in a sysplex.

Note:

- IBM recommends you use z/OS Sysplex Distributor via a "Dynamic Virtual IP address" (DVIPA). See related sections in the Information Center for more information.
- Select the IP name for the location service daemon carefully. You can choose any name you want, but, once chosen, it is difficult to change, even in the middle of customization.

Port The port number on which the location service daemon listens.

Note: Select the port number for the location service daemon carefully. You can choose any name you want, but, once chosen, it is difficult to change, even in the middle of customization.

SSL port

The port number on which the location service daemon listens for SSL connections.

Register daemon with WLM DNS

If you use the WLM DNS (connection optimization), you must select "Y" to register your location service daemon with it. Otherwise, select "N."

Note: Only one location service daemon per LPAR can register its domain name with WLM DNS. If you have multiple cells in the same LPAR and register one location service daemon and then a second, the second will fail to start.

Security Domain Configuration

These panels display values you previously set in the "Configure security domain" option--you can not change any of the values here. If you do wish to make changes, you must go back to the main Dialog panel and run through the "Configure security domain" option again.

Planning for a new managed node in a Network Deployment cell

You must have configured a Network Deployment cell and deployment manager.

Create a new managed node in a Network Deployment cell in order to add application servers to the cell.

Note: This alternative to federating an existing stand-alone application server node was added in WebSphere Application Server for z/OS Version 6.0.1.

This part of the configuration process creates an application server node structure, a node agent (for node administration) and a location service daemon, if one does not already exist, for the chosen z/OS system. This may be the same z/OS system on which the deployment manager was configured, or a different z/OS system in the same sysplex. Once the managed node is created and federated into the Network Deployment cell, add application servers using the administrative console or scripting. You can use the configuration HFS and user IDs created for the managed server node for the application servers in the node as well.

1. Print a copy of Appendix E, "Customization Dialog worksheet: Managed node," on page 203.
2. Fill out the worksheet as described in "Customization Dialog variables: Managed node."
3. Save the worksheet for use during managed node customization.

Customization Dialog variables: Managed node

This article lists definitions for the terms you will come across in the WebSphere Application Server for z/OS Customization Dialog.

System Locations

This section identifies the target z/OS system on which you will configure the new stand-alone application server, along with system data set names.

System name

The system name for the target z/OS system on which you will configure WebSphere Application Server for z/OS.

Sysplex name

The sysplex name for the target z/OS system on which you will configure WebSphere Application Server for z/OS.

Tip: If you are not sure what the system name (&SYSNAME) and sysplex name (&SYSPLEX) are, use the console command D SYMBOLS on the target z/OS system to display them.

For the following, specify the fully qualified data set names without quotes.

Rule: You can specify up to 44 characters for the data set names.

PROCLIB

An existing procedure library where the WebSphere Application Server for z/OS cataloged procedures are added.

PARMLIB

An existing parameter library for system definitions to support WebSphere Application Server for z/OS. This data set must be in the parmlib concatenation for the target z/OS system.

SYSEXEC

A variable-block (RECFM=VB, LRECL=255) data set into which the customization process places REXX EXECs to be called from TSO, such as the WebSphere Application Server for z/OS error log browser, BBORBLOG. You must allocate this data set and concatenate it as part of the SYSEXEC DD allocation in your installation-wide TSO logon PROC or allocation exec.

If your existing SYSEXEC DD data set concatenation consists of fixed-blocked (RECFM=FB) data sets, you must make a copy of the hlq.DATA data set (produced by the Customization Dialog) after the customization process is complete, and place the copy in the SYSEXEC concatenation.

If you do not specify a data set name, the customization process does not place any REXX EXECs in any data set.

WebSphere Application Server for z/OS product data sets

Specify the following WebSphere Application Server for z/OS libraries so they can be accessed by the customized jobstreams the Dialog produces. These data sets must be cataloged. See “Planning for product data sets” on page 17 for more information.

Run WebSphere Application Server from STEPLIB (Y/N)?

Specifies whether to load WebSphere Application Server for z/OS load modules from STEPLIB (“Y”) or from the link pack area and link list (“N”). See “Link pack area, Link list and STEPLIB” on page 27 for more information.

Note: Do not specify “N” if you have another instance of WebSphere Application Server for z/OS (Version 4 or above) in the system link pack area or link list.

SBBOLPA

WebSphere Application Server for z/OS load module library. It has modules that should go into LPA or the location service daemon STEPLIB.

SBBOLOAD

WebSphere Application Server for z/OS load module library. It has members that should go into the link list or LPA, or into STEPLIB.

SBBOLD2

WebSphere Application Server for z/OS load module library that you installed through SMP/E. It has members that should go into the link list, or into STEPLIB. **DO NOT** place them in LPA.

SBBOEXEC

WebSphere Application Server for z/OS CLIST library.

SBBOMSG

SBBOMSG WebSphere Application Server for z/OS message skeletons for language translation.

Additional system data sets

Specify the following Language Environment and WebSphere Application Server for z/OS data sets and whether they should ("Y") or should not ("N") load from STEPLIB. "N" indicates the generated JCL will contain STEPLIB statements for these data sets. Refer to your z/OS SMP/E installation for the location of these data sets listed by their DD Name.

SCEERUN

Language Environment run-time load module library.

SCEERUN2

Language Environment run-time load module library.

SGSKLOAD

System SSL load module library. This data set does not exist in z/OS Version 1 Release 6 and above. See "Link pack area, Link list and STEPLIB" on page 27 for the effects of this change. Leave the data set name blank if **ALL** z/OS target systems are at z/OS Version 1 Release 6 or above.

WebSphere Application Server for z/OS product directory**WebSphere Application Server product directory**

The name of the directory where WebSphere Application Server for z/OS files reside after installation. See "Planning for product HFS directories" on page 20 for more information.

WebSphere configuration HFS

This section defines the WebSphere configuration HFS that you will use for the new managed node. See "Planning a configuration HFS" on page 45 for more information.

Mount point

Read/write HFS directory mount point where application data and environment files are written. The customization process creates this mount point, if it does not already exist.

Name Hierarchical File System data set you will create and mount at the above mount point.

Rule: You can specify up to 44 characters for the data set name.

Volume, or '*' for SMS

Specify either the DASD volume serial number to contain the above data set or "*" to let SMS select a volume. Using "*" requires that SMS automatic class selection (ACS) routines be in place to select the volume. If you do not have SMS set up to handle data set allocation automatically, list the volume explicitly.

Primary allocation in cylinders

Initial size allocation in cylinders for the above data set.

Recommendation: The minimum suggested size is 250 cylinders (3390).

Secondary allocation in cylinders

Size of each secondary extent in cylinders.

Recommendation: The minimum suggested size is 100 cylinders.

Server customization

During this customization task, you will create a (temporary) cell configuration, a node configuration, and a (temporary) location service daemon.

Note: The cell configuration and location service daemon are temporary because they are replaced shortly after creation when the new managed node is federated.

The panels corresponding to the following tables set up the names, network configuration, start procedures, and user IDs for the future node agent and application server(s).

WebSphere Application Server home directory

Directory in which the node's home directories will reside. See "Planning a configuration HFS" on page 45 for more information.

Note: You can alter only the portion after the configuration HFS mount point.

Cell name (short)

Name that identifies the cell to certain WebSphere Application Server for z/OS-exploited z/OS facilities. (For example, SAF.) This name is used only until the managed node is federated into the Network Deployment cell.

Rules:

- Name must be eight or fewer characters and all uppercase.
- Name must be unique among all other cells in the sysplex.

Cell name (long)

Primary external identification of this WebSphere Application Server for z/OS cell. This name identifies the cell as displayed through the administrative console. This name is used only until the managed node is federated into the Network Deployment cell.

Rules:

- Name must be 50 or fewer characters and can be of mixed case.
- Name must be unique among all other cells in the sysplex.

Node name (short)

Name that identifies the node to certain WebSphere Application Server for z/OS-exploited z/OS facilities. (For example, SAF.) This name is **NOT** temporary, and will become the short name of the managed node in the Network Deployment cell. Choose a name that is unique in the Network Deployment cell.

Rules:

- Name must be eight or fewer characters and all uppercase.
- Name must be unique within the cell.

Node name (long)

Primary external identification of this WebSphere Application Server for z/OS node. This name identifies the node as displayed through the administrative console. This name is **NOT** temporary, and will become the short name of the managed node in the Network Deployment cell. Choose a name that is unique in the Network Deployment cell.

Rules:

- Name must be 50 or fewer characters and can be of mixed case.
- Name must be unique within the cell.

Admin asynch operations procedure name

Specifies the JCL procedure name of a started task that is launched via the START command by node agents and/or application servers to perform certain asynchronous administrative operations (such as node synchronization) and add and remove a node. See "Planning for cataloged procedures" on page 49 for more information.

Server address space information

This section defines the cataloged procedures and associated user IDs for the node agent created during federation. You can also use these definitions for application servers created in the node using the administrative console or scripting. See "Planning for cataloged procedures" on page 49 for more information.

Rule: In the following, unless specified otherwise, names must be eight or fewer characters.

Controller Information

Procedure name

Name of member in your procedure library to start the node agent. It can also be used for application controllers in the node.

Rule: Name must be seven or fewer characters.

User ID

The user ID associated with the node agent. It can also be used as for application server controllers in the node.

UID The user identifier associated with this user ID.

Rule: UIDs must be unique numbers, between 1 and 2,147,483,647, within the system.

Servant Information**Procedure name**

Name of member in your procedure library to start the application server servants in the node. This procedure is not used by the node agent.

Rule: Name must be seven or fewer characters.

User ID

The user ID associated with the application servants in the node. This user ID is not used by the node agent.

UID The user identifier associated with this user ID.

Rule: UIDs must be unique numbers, between 1 and 2,147,483,647, within the system.

Control Region Adjunct**Procedure name**

Name of member in your procedure library to start application server control region adjuncts in the node. This procedure is not used by the node agent.

Rule: Name must be seven or fewer characters.

User ID

The user ID associated with application server control region adjuncts in the node. This user ID is not used by the node agent.

UID The user identifier associated with this user ID.

Rule: UIDs must be unique numbers, between 1 and 2,147,483,647, within the system.

Location service daemon

The location service daemon is the initial point of client contact in WebSphere Application Server for z/OS. The server contains the CORBA-based location service agent, which places sessions in a cell. All RMI/IIOP IORs (for example, for enterprise beans) establish connections to the location service daemon first, then forward them to the target application server.

The location service daemon here is temporary and exists only until the managed node is federated into the Network Deployment cell.

Daemon home directory

Directory in which the location service daemon resides. This is set to the configuration HFS mount point/Daemon and cannot be changed.

Daemon jobname

Specifies the jobname of the location service daemon, specified in the JOBNAME parameter of the MVS start command used to start the location service daemon.

Caution: When configuring a new managed node, ensure that this name is different from the daemon jobname for the Network Deployment cell into which you will federate the managed node.

Note: A server automatically starts the location service daemon if it is not already running.

Procedure name

Name of the member in your procedure library to start the location service daemon.

Rule: Name must be seven or fewer characters.

User ID

The user ID associated with the location service daemon.

UID The user identifier associated with this user ID.

Rule: UIDs must be unique numbers, between 1 and 2,147,483,647, within the system.

Federation variables**WebSphere Application Server home directory**

The home directory that will pass to the addnode.sh command for federation. This is the same as the node home directory and cannot be changed here.

Node host name

The TCP/IP node name of the deployment manager for the Network Deployment cell.

JMX SOAP port

The JMX SOAP port of the deployment manager for the Network Deployment cell.

Deployment manager security is enabled

Specify "Y" if global security is enabled on the Network Deployment cell and the deployment manager.

User ID

A user ID with full administrative privileges for the Network Deployment cell. Set to the security domain administrator ID.

Node group name

The node group into which the node will be placed. Specify DefaultNodeGroup if the node is in the same sysplex as the deployment manager. See Node group in the *Setting up the application serving environment* PDF book for more information.

Node agent server name (short)

Name of the node agent server. This is the server's jobname, as specified in the MVS START command JOBNAME parameter. This value identifies the server to certain WebSphere Application Server for z/OS-exploited z/OS facilities (for example, SAF).

Rule: Name must usually contain seven or fewer all-uppercase characters. If you wish to instead specify eight characters, you must follow the steps outlined in *Converting a 7 character server short name to 8 characters for the deployment manager in the Setting up the application serving environment* PDF book.

Node agent server name (long)

Name of the node agent and the primary external identification of the nodeagent server. This name identifies the server as displayed through the administrative console . The node agent server long name is set to the fixed value "nodeagent".

Rule: Name must be 50 or fewer characters and can be of mixed case.

High Availability Manager Host

Node agent host name for the High Availability manager. This host name must resolve to a single IP address--it can not be a multihomed host.

Security Domain Configuration

These panels display values you previously set in the "Configure security domain" option--you can not change any of the values here. If you do wish to make changes, you must go back to the main Dialog panel and run through the "Configure security domain" option again.

Planning to federate a stand-alone server into a Network Deployment cell

You must have configured a Network Deployment cell (and deployment manager) and a stand-alone application server. The two must have a common security domain and reside within the same z/OS sysplex.

Federate an existing stand-alone application server node into a Network Deployment cell in order to add application servers to the cell.

Note: The alternative method, the creation and federation of a managed application server node, was added in WebSphere Application Server for z/OS Version 6.0.1.

The cell structure and location service daemon for the stand-alone application server are discarded. The stand-alone application server node and its application server(s) become a new node in the Network Deployment cell. The stand-alone application server's configuration HFS and home directory stay in use, but are modified to reflect the new cell name. New symbolic links for use during server startup are added.

1. Print a copy of Appendix F, "Customization Dialog worksheet: Federated application server node," on page 207.
2. Fill out the worksheet as described in "Customization Dialog variables: Federated application server node."
3. Save the worksheet for use during federated application server node customization.

Customization Dialog variables: Federated application server node

This article lists definitions for the terms you will come across in the WebSphere Application Server for z/OS Customization Dialog.

Rules:

- In the following, unless specified otherwise, names must be eight or fewer characters.
- In some of the following, specifying "Y" (yes) tells the Dialog to define the profile or enable an option. Specifying "N" (no) tells the Dialog to not define the profile or enable the option.

WebSphere Application Server for z/OS home directory

WebSphere Application Server home directory

Directory in which the stand-alone application server configuration resides.

Note: Depending on the variables you loaded in the "Load customization variables" step, you may need to modify this value to reflect the correct directory.

Deployment Manager Access

Node host name

IP name or address of the system on which the deployment manager server is configured. This value, equivalent to "cell host" in `addNode.sh`, is used by other WebSphere Application Server for z/OS functions to connect to this server in order to federate the designated node into the deployment manager cell.

Note: The node host name must always resolve to an IP stack on the system where the deployment manager runs. The node host name cannot be a DVIPA or a DNS name that, in any other way, causes the direction of requests to more than one system.

JMX SOAP port

JMX (Java Management Extensions) SOAP (Simple Object Access Protocol) connector port that the add node request uses to connect to the deployment manager. It provides the federation process with knowledge of which deployment manager is the target of the federation.

Deployment manager security is enabled

Specify "Y" if global security is enabled on the Network Deployment cell and the deployment manager.

User ID

A user ID with full administrative privileges for the Network Deployment cell. This is set to the security domain administrator ID and cannot be changed.

Include Apps

Specify "Y" if you want to include applications with your deployment manager node. Enabling this option instructs the addNode program to include applications from the node, as it would remove them prior to federation otherwise. If the application already exists in the cell, a warning is printed and the application is not installed into the cell.

Note: You must use this option to migrate all the applications to the new cell. Federating the node to a cell using the addNode command does not merge any cell-level configuration information, including that from virtualHost.

Application server's ORB port

Port for IOP requests which acts as the bootstrap port for this server and also as the port through which the ORB accepts IOP requests. Port value cannot be 0.

Note: The add node operation creates the nodeagent administrative server with a default ORB port equivalent to the INS CosNaming default bootstrap port. Because this same port was previously used by the node's initial stand-alone server, the initial stand-alone server's ORB port must change to a new port value. The default value to which the Application Server's ORB port is set is 9810. If you configure multiple cells that intersect the same systems, use of the default value will cause a port conflict between these cells. This option helps you set the port number in case port 9810 was previously assigned.

Node group name

The node group into which the node will be placed. Specify DefaultNodeGroup if the node is in the same sysplex as the deployment manager. See Node group in the *Setting up the application serving environment* PDF book for more information.

Node Agent Definitions

As part of the federation process, a node agent is created. This special server administers the node and its servers on behalf of the deployment manager.

Server name (short)

Name of the node agent server. This is the server's jobname, as specified in the MVS START command JOBNAME parameter. This value identifies the server to certain WebSphere Application Server for z/OS-exploited z/OS facilities (for example, SAF).

Rule: Name must usually contain seven or fewer all-uppercase characters. If you wish to instead specify eight characters, you must follow the steps outlined in *Converting a 7-character server short name to 8 characters* in the *Setting up the application serving environment* PDF book.

Server name (long)

Name of the node agent and the primary external identification of the nodeagent server. This name identifies the server as displayed through the administrative console. The node agent server long name is set to the fixed value "nodeagent".

JMX SOAP Connector port

Port number for the JMX HTTP connection to this server based on the SOAP protocol. JMX is used for remote administrative functions and is invoked through scripts such as wsadmin.sh.

Rule: Value cannot be 0.

Node Discovery port

Defines the TCP/IP port to which the node agents listens for discovery requests that originate from the deployment manager.

Node Multicast Discovery port

Defines the multicast TCP/IP port to which the node agent listens for discovery requests that originate from its managed servers. This is a CLASS D address.

High availability manager communication port

Port on which the High Availability Manager listens.

ORB listener host name

IP address on which the server's ORB listens for incoming IIOp requests. The default is "*", which instructs the ORB to listen on all available IP addresses.

ORB port

Port for IIOp requests which acts as the bootstrap port for this server and also as the port through which the ORB accepts IIOp requests.

Rule: Value cannot be 0.

ORB SSL port

Port for secure IIOp requests. The default is "0", which allows the system to choose this port.

Service integration bus

Do you wish to federate service integration buses that exist on this node? (Y/N)

Planning for recovery

This article helps you plan for any recovery measures you may need to take.

1. Decide whether or not to implement automatic restart. See "Automatic restart management" for more information.
2. Review the recommendations for starting a deployment manager on a different MVS image. See "Starting a deployment manager on a different MVS image" on page 87 for more information.

Automatic restart management

If you have an application that is critical for your business, you need facilities to manage failures. z/OS provides rich automation interfaces, such as automatic restart management, that you can use to detect and recover from failures. Automatic restart management handles the restarting of servers when failures occur.

WebSphere Application Server for z/OS uses the z/OS Automatic Restart Management (ARM) to recover application servers. Each application server running on a z/OS system (including servers you create for your business applications) are automatically registered with an ARM group. Each registration uses a special element type called SYSCB, which ARM treats as restart level 3, assuring that RRS restarts before any application server.

Tips:

- If you have automatic restart management (ARM) enabled on your system, you may wish to disable ARM for the WebSphere Application Server for z/OS address spaces before you install and customize WebSphere Application Server for z/OS. During customization, job errors may cause unnecessary restarts of the WebSphere Application Server for z/OS address spaces. After installation and customization, consider enabling ARM.
- If you are ARM-enabled and you cancel or stop a server, it will restart in place using the `armrestart` command.
- It is a good idea to set up an ARM policy for your deployment manager and node agents.
- If you start the location service daemon on a system that already has one, it will terminate.
- Every other server will come up on a dynamic port unless the configuration has a fixed port. Therefore, the fixed ports must be unique in a sysplex.

- If you issue STOP, CANCEL, or MODIFY commands against server instances, be aware of how automatic restart management behaves regarding WebSphere Application Server for z/OS server instances:

Table 2. Behavior of automatic restart management regarding WebSphere Application Server for z/OS server instances

If you issue . . .	Automatic restart management will . . .
STOP <i>address_space</i>	not restart the address space
CANCEL <i>address_space</i>	not restart the address space
CANCEL <i>address_space</i> , ARMRESTART	restart the address space
MODIFY <i>address_space</i> , CANCEL	not restart the address space
MODIFY <i>address_space</i> , CANCEL,ARMRESTART	restart the address space

Activating automatic restart management

You must have access to the couple data set format utility, IXCL1DSU, in SYS1.MIGLIB. If you plan to modify the automatic restart management policy, you must have access to the administrative data utility, IXCMIAPU, also in SYS1.MIGLIB, and have UPDATE authorization to the RACF FACILITY class MVSADMIN.XCF.ARM. To start a policy, you must have READ authorization to the RACF FACILITY class MVSADMIN.XCF.ARM.

Though servers automatically register with automatic restart management, you must activate the arm component itself, which means you must:

1. Allocate an ARM couple data set
2. Start the automatic restart management policy

If automatic restart management is not active, WebSphere Application Server for z/OS issues an error message to the hardcopy log.

You are not required to change the automatic restart management policy. However, you will have to modify this policy if you want to create custom restart groups. For instance, it is not required or recommended that you start the node agent or deployment manager servers on another system. These servers will never have any transactional recovery to perform. Therefore, they should only be set up for restart-in-place. For complete information about how to modify the policies, see *z/OS MVS Setting Up a Sysplex, SA22-7625*.

The following procedure is intended to give you enough information to get automatic restart management running. Defining automatic restart management policies would require the z/OS manual mentioned above.

1. If you have not already formatted a couple data set for policies, do so now. For details, see *z/OS MVS Setting Up a Sysplex*
2. Submit the job to format the ARM couple data set.
3. Optional: Modify the automatic restart management policy. To get started, you do not need to modify the policy. If you do want to modify the automatic restart management policy, go to *z/OS MVS Setting Up a Sysplex*, and follow the instructions in that manual.
4. Issue the following operator commands to start the automatic restart management policy:


```
SETXCF COUPLE,TYPE=ARM,PCOUPLE=(dsname,vvvvvv)
SETXCF START,POLICY,TYPE=ARM
```

where

dsname

Is the data set name for the couple data set.

vvvvvv

Is the volume serial of the volume on which the couple data set resides.

You are done when the SETXCF commands complete successfully.

Changing automatic restart management policies

Because server instances register with the default restart group, when a system failure occurs, automatic restart management attempts to restart the entire default group on another system in the sysplex. If you want to create a restart group other than this default group, you must follow the following rules and restrictions that apply for z/OS automatic restart management policies. For more information about how to actually change these policies, see, *z/OS MVS Setting Up a Sysplex, SA22-7625*.

- To change the policy, you need to know the existing element names for the server instances and how to name new elements for additional instances. The element names for these server instances are formed by concatenating the cell short name and the servers specific short name.

For example, if you have a cell named PLEX1 and server named BBOS001, the ARM element name would be PLEX1BBOS001.

Since wildcard characters can be used in the ARM policy, it is possible to exclude an entire group of servers by using a common naming scheme within your cell.

For example, the following section of the ARM policy will prevent any node agents from starting, assuming each node agent in your cell has a name that adheres to the form BBONxxx:

```
RESTART_GROUP(WEBSPHERE)
ELEMENT(PLEX1BBON*)
RESTART_ATTEMPTS(0,150)
RESTART_TIMEOUT(600)
READY_TIMEOUT(1200)
TERMTYPE(ALLTERM)
RESTART_METHOD(BOTH,PERSIST)
```

This ARM policy will also prevent the node agent from restarting in-place. This specification can be modified by changing the RESTART_METHOD and TERMTYPE parameters. See *z/OS MVS Setting Up a Sysplex, SA22-7625* for more information.

- If you create a restart group, keep the following in the same restart group and set the restart order for the elements as indicated:
 1. RRS
 2. DB2 with IRLM, IMS, CICS, and other transaction or resource managers, if used by your application servers in the restart group
 3. Your server instances.

Either set up the location service daemon and node agent for restart-in-place or remove them from your ARM policy. Since WebSphere Application Server must be running on all systems that might be used to perform recovery, the application servers will use the location service daemon and node agent that are already running on the alternate system. If the location service daemon attempts to restart on the alternate system, it will fail. If the node agent restarts on the alternate system, it will have no recovery work to do.

Displaying the status of ARM-registered address spaces

Perform the following steps to use ARM to display the status of ARM registered address spaces (including the address spaces of server instances) in the WebSphere Application Server for z/OS environment:

1. Initialize all servers.
2. Display all registered address spaces (including the address spaces of server instances). Issue the following command:

```
d xcf,armstatus,detail
```

Starting a deployment manager on a different MVS image

This describes steps you must follow to start your deployment manager on an MVS image different from the one on which it was originally configured.

To start your deployment manager on a different system, your system must be running at the W502000 service level.

The ability to start your deployment manager on an MVS image different from the one on which it was originally configured is handy if your original system becomes unavailable, either through a planned outage or a system failure. This way, you can still start and stop applications, make configuration updates, utilize monitors that use the PMI interface, perform other control functions, and so on. Perform the following steps to start your deployment manager on a different MVS image and ensure that client requests will successfully find the deployment manager at its new location.

Note: This works only if the deployment manager on the original MVS image is down. WebSphere Application Server for z/OS allows only one copy of the deployment manager to run at one time for any given cell.

1. Ensure that the MVS image to which you are moving the deployment manager contains a node that is already part of the cell of the deployment manager you wish to move.
2. Ensure that the location service daemon on the MVS image to which you are moving the deployment manager is up and running before you move the deployment manager.
3. Set, in the Customization Dialog, your host names and ports appropriately:
 - Ensure that the host names and ports for the deployment manager are not specific to a particular system.
 - Ensure that you use a DVIPA generic host name, rather than a system-specific host name, for the "Node host name" value and an asterisk ("*") for both the "ORB Listener host name" and "HTTP Transport host name."

Note: After initial configuration, if necessary, you can change the "Node host name," "ORB Listener host name" and "HTTP Transport host name" values in the Administrative Console.

- Consider configuring a secondary DVIPA in case the system with the primary VIPA is down.
4. Ensure that Sysplex Distributor is enabled so that, regardless of where the DVIPA has moved, it automatically routes any inbound traffic to the deployment manager.
 5. Ensure that access to the PROCLIB is the same for both the original MVS image and the MVS image to which you wish to move the deployment manager.
 6. Start the deployment manager on the new system. There are three ways to accomplish this, depending on the configuration of your HFSs. Follow the scenario that matches your configuration.

Note: If you use "static" WLM ApplEnvs instead of Dynamic WLM Application Environments, do not specify the symbolic "&SYSNAME" for the node component of the ENV= string (<node_shortname> in the steps below).

Scenario 1: Root HFS is shared among all processors, deployment manager's configuration is in a configuration HFS on a system-generic mount point.

- a. Issue the start command for the deployment manager on the system on which you wish it to reside:

```
S <controller_procname>,JOBNAME=<jobname>,  
ENV=<cell_shortname>.<node_shortname>.<server_shortname>
```

Scenario 2: Root HFS is shared among all processors, deployment manager's configuration HFS is mounted under a system-specific directory.

Note: This is an undesirable scenario that you should try to avoid from the start of your system configuration. If you find yourself with this setup, however, follow these steps for the workaround.

- a. Create a symbolic link at the equivalent system-specific location on the target MVS image. The contents of the symbolic link should point back to the actual mount point, which means you should not use \$SYSNAME anywhere.

- b. Issue the start command for the deployment manager on the system on which you wish it to reside:

```
S <controller_procname>,JOBNAME=<jobname>,  
ENV=<cell_shortname>.<node_shortname>.<server_shortname>
```

Scenario 3: Root HFS is not shared among any processors, deployment manager's configuration HFS is mounted and accessible to only one system at a time.

- a. Unmount the configuration HFS from the original MVS image and remount it (at a mount point with the same name) on the new MVS image.
- b. Issue the start command for the deployment manager on the system on which you wish it to reside:

```
S <controller_procname>,JOBNAME=<jobname>,  
ENV=<cell_shortname>.<node_shortname>.<server_shortname>
```

You know you are done when your deployment manager is up and running on a different MVS image and you are able to use it to make configuration updates to your environment.

Planning for problem diagnosis

This section describes:

- Component trace
- Error log stream
- Dump data sets

Overview of problem diagnosis

WebSphere Application Server for z/OS uses component trace (CTRACE) to capture and display trace data in trace data sets. WebSphere Application Server for z/OS identifies itself to CTRACE with a dynamic component name determined by the short cell name. CTRACE allows you to:

- Merge multiple traces through the browse tool, including other components such as TCP/IP and z/OS UNIX.
- Write trace data to a data set rather than sysprint, keeping spool space free.
- Better manage system resources by allowing trace data to wrap or not wrap.
- Use CTRACE to funnel trace data from multiple address spaces to one data set, or have CTRACE send the trace data from each address space to separate data sets.
- Start and stop tracing without stopping and restarting WebSphere Application Server for z/OS address spaces.
- Use one or more data sets for capturing trace data, thus allowing you to manage I/O more effectively.

WebSphere Application Server for z/OS also has an error log stream that records error information when WebSphere Application Server for z/OS detects an unexpected condition or failure within its own code, such as:

- Assertion failures
- Unrecoverable error conditions
- Vital resource failures, such as memory
- Operating system exceptions
- Programming defects in WebSphere Application Server for z/OS code

Use the error log stream in conjunction with other facilities available to capture error or status information, such as an activity log, trace data, system logrec, and job log.

The WebSphere Application Server for z/OS error log stream is a system logger application. Because the error log stream uses the system logger, you can:

- Have error information written to a coupling facility log stream, which provides sysplex-wide error logging, or to a DASD-only log stream, which provides single system-only error logging.

Note: There is a significant performance penalty when using DASD-only error logging.

- Set up either a common log stream for all of WebSphere Application Server for z/OS or individual log streams servers. Local z/OS or OS/390 client ORBs can also log data in log streams. Because the system logger APIs are unauthorized, any application can use them. You should control access to the log streams through a security product such as RACF.

WebSphere Application Server for z/OS provides a REXX EXEC (BBORBLOG) that allows you to browse the error log stream. By default, the EXEC formats the error records to fit a 3270 display.

This topic describes the error log stream and how to set it up. Information about using the error log stream to diagnose problems is in the Troubleshooting section of the WebSphere Application Server information center. General information and guidance about the system logger is in *z/OS MVS Setting Up a Sysplex*.

Table 3. Finding WebSphere Application Server for z/OS Error Log Stream Information

What is your goal?	You should read:
Learn about the system logger and understand its requirements	<i>z/OS MVS Setting Up a Sysplex</i>
Learn about the WebSphere Application Server for z/OS error log stream	This topic
Size the coupling facility structure space needed for the WebSphere Application Server for z/OS error log stream	<i>z/OS MVS Setting Up a Sysplex</i>
Define the WebSphere Application Server for z/OS error log stream	“Using the Customization Dialog” on page 91
View the WebSphere Application Server for z/OS error log stream	The Troubleshooting section of the WebSphere Application Server information center
Learn about how Java applications can log messages and trace data in the error log stream	The Applications section of the WebSphere Application Server information center

For details about problem diagnosis, see the Troubleshooting section of the WebSphere Application Server information center.

Planning for Component Trace

To use CTRACE, you:

- Specify trace options for identifying trace data sets and connecting WebSphere Application Server for z/OS address spaces to the data sets in parmlib members.
- Update WebSphere Application Server for z/OS WebSphere variables to allow for initial trace parameters.
- Use IPCS-CTRACE to view the trace data because you cannot read the trace data in an ordinary editor.

Recommendation for dumps

Plan as you would normally for system dumps. Due to the size of WebSphere Application Server for z/OS address spaces, you may need to re-size your system dump data sets and use dynamic dump data sets.

Chapter 8. Configuring the product after installation

Use this task to configure WebSphere Application Server for z/OS application serving environments for your z/OS target systems.

- Choose a z/OS target system and complete the steps in Chapter 5, “Installing the product and additional software,” on page 21 and Chapter 6, “Preparing the base operating system,” on page 25.
- Choose a WebSphere Application Server for z/OS configuration (practice, stand-alone or Network Deployment cell) and complete the steps in Chapter 7, “Planning for product configuration,” on page 37.

Configuring a WebSphere Application Server for z/OS application serving environment consists of setting up the WebSphere Application Server for z/OS configuration directory for the environment, making any required changes to the z/OS target system that pertain to the particular application serving environment, and starting the new environment to verify the configuration. Configuring these application serving environments after product installation requires a fair amount of planning and coordination. If you have not previously configured WebSphere Application Server for z/OS, we recommend that you configure a “practice” stand-alone application server using the default options, then proceed to configure your actual desired product configuration. See “Building a practice WebSphere Application Server for z/OS cell” on page 58 for more information.

If you have already created a Network Deployment cell, follow the instructions in this section to expand the cell by creating a new managed node or federating an existing stand-alone application server node into the Network Deployment cell.

WebSphere Application Server for z/OS application serving environment nodes are created using the ISPF-based Customization Dialog. Once a node is configured and running, make further changes using the Web-based administrative console or scripting.

After you have installed the WebSphere Application Server for z/OS product, prepared your z/OS target system(s), and planned your new application serving environment, perform the tasks in this section to configure and start the application serving environment.

1. Review the use of the Customization Dialog. See “Using the Customization Dialog” for more information.
2. If this application serving environment uses a new security domain, create the security domain before proceeding. See “Creating a security domain” on page 97 for detailed instructions.
3. Follow the directions for the type of application serving environment you wish to configure:
 - “Creating a stand-alone application server cell” on page 104
 - “Creating a Network Deployment cell” on page 126
 - “Creating a managed server node” on page 142
 - “Federating a stand-alone application server into a Network Deployment cell” on page 157

Once your application serving environment is up and running, you can install and test applications. You may also wish to configure your Web servers to interact with WebSphere Application Server for z/OS.

See the Related Tasks section for additional tasks you can perform once your application serving environment is configured.

Using the Customization Dialog

This article provides general information on starting and using the Customization Dialog. See the instructions for each customization task for detailed directions on using the Customization Dialog to perform that particular task.

The WebSphere Application Server for z/OS Customization Dialog is an ISPF Dialog, running under TSO, that you use for the initial setup of WebSphere Application Server for z/OS cells and nodes. The Customization Dialog itself does not create the cells and nodes. Instead, it creates batch jobs, scripts and data files that you then use to perform WebSphere Application Server for z/OS customization tasks.

Note: In WebSphere Application Server for z/OS, you must use the Customization Dialog and the jobs it generates to create new cells and nodes. Once you have created a stand-alone application server or Network Deployment cell, however, you use the WebSphere Application Server for z/OS administrative console or scripting to administer it.

The Customization Dialog consists of a set of ISPF panels, file-tailoring skeletons, message libraries, CLISTs and REXX execs which are installed as part of the WebSphere Application Server for z/OS product. It is intended for use under TSO by a systems programmer or WebSphere Application Server for z/OS administrator who is familiar with the z/OS target system on which the resulting WebSphere Application Server for z/OS cells and nodes will run.

The Customization Dialog uses ISPF variables to hold the various values used to create WebSphere Application Server for z/OS customization jobs, scripts and files. See “Working with Customization Dialog variables” on page 94 for more information.

Follow these steps to perform most Customization Dialog customization and migration tasks:

Note: See Migrating product configurations in the *Migrating, coexisting, and interoperating* PDF book for information on the migration portion of the Customization Dialog.

1. Start the Customization Dialog. See “Starting the Customization Dialog” for instructions.
2. Choose a set of configuration data sets to hold the generated jobs and files for this task.
3. Set the Dialog variables to appropriate values. See “Working with Customization Dialog variables” on page 94 for instructions.
4. Generate the customized jobs, scripts and files based on the Dialog variable values you provided, and place them in the configuration data sets.
5. Move the configuration data sets to the z/OS system on which you will perform WebSphere Application Server for z/OS customization or migration tasks.
6. Follow the generated instructions in the .CNTL configuration data set to complete the customization or migration task.

Starting the Customization Dialog

Before you can start the Customization Dialog, you must install the WebSphere Application Server for z/OS product and make the product libraries available to the z/OS system on which the Customization Dialog will run. All product libraries should be cataloged. The Customization Dialog does not use the product directory (/usr/lpp/zWebSphere/V6R0 by default), but you must mount it and make it available before the Customization Dialog's generated jobs can run.

You will need the ability to log on to TSO from a real or emulated 3270-type terminal. Your logon display must support 3270 emulation and be set to a minimum of 32 rows by 80 columns (32 x 80) in order for the ISPF Customization Dialog to run.

- If your terminal has exactly 32 display rows, be sure to issue the PFSHOW OFF command in ISPF to hide PF key settings. These can overlay Customization Dialog input fields.
- If you have a 32-row display and use the ISPF split screen function, deselect “Always show split line” on the ISPF Settings panel and split the screen at the extreme top or bottom of the display. This prevents the split screen line from displaying and lines in the Customization Dialog from being obscured. Other uses of split screen will obscure lines in the Customization Dialog.

The following steps outline how to change your display size setting if you use the IBM Personal Communications Workstation program. Complete all the steps before you start your TSO session.

1. In the menu bar of the session window, select "Communication."
2. From the Communication window, select "Configure..."
3. In the window that appears, press the "Session Parameters..." button.
4. Use the pull-down menu to select a Screen Size setting between 32x80 and 62x160.
5. Press the "OK" button until you are back at the session window.

You will need a TSO user ID that has READ access to the WebSphere Application Server for z/OS product libraries.

Starting the Dialog: The BBOWSTRT command

To start the customization dialog, log on to TSO and invoke the BBOWSTRT exec from the SBBOCLIB product library using the following EXEC command.

Note: If you enter the command from TSO Option 6, just type in the command. If you enter the command on the ISPF command line, you must prefix it with "TSO".

```
EXEC 'was_h1q.SBBOCLIB(BBOWSTRT)' 'options'
```

where

was_h1q

is the data set name high level qualifier for your WebSphere Application Server for z/OS product libraries.

Note: The Dialog libraries (SBBOCLIB, SBBOPxxx, SBBOMxxx, SBBOSLIB and SBBOSLB2) must have the same data set name high level qualifier in order for the Customization Dialog to allocate the libraries correctly.

Be sure to use the was_h1q value that corresponds to the level of WebSphere Application Server for z/OS product code that you will use to run the resulting WebSphere Application Server for z/OS cell(s).

You can also specify the following options, separated by spaces and surrounded in a single set of quotes:

APPL(*value*)

Specifies the application name you intend to use. This provides for separate sets of Customization Dialog variables saved from one Customization Dialog session to the next. The default value is BBO6. See "Working with Customization Dialog variables" on page 94 for details.

LANG(*value*)

Specifies the national language you wish the Customization Dialog use. Specify "ENUS" for English or "JAPN" for Japanese. The default value is ENUS.

Note: Some messages will still appear in English even if you specify another national language using the LANG option.

PROD(*list*)

Specifies a list of WebSphere Application Server for z/OS add-on products which are also customized using the Dialog. The list should consist of one or more three-character product identifiers from the following table, separated by spaces. If you wish to not customize any add-on products, omit the PROD option.

BBZ	WebSphere Business Infrastructure
-----	-----------------------------------

PRODHLQ(*list*)

Specifies a list of high-level qualifiers for the WebSphere Application Server for z/OS add-on products

you specified with the PROD option. The list should consist of one high-level qualifier for each entry in the PROD list, given in the same order. If you wish to not customize any add-on products, omit the PRODHLQ option.

If you are starting the Dialog for the first time or using a new APPL value, you will first see a copyright screen. Press ENTER to continue.

You should then see the Customization Dialog main menu, similar to the following:

```
----- WebSphere Application Server for z/OS Customization -----  
Option ==>                               Appl: BB06
```

Use this dialog to create WebSphere Application Server for z/OS cells and nodes. Specify an option and press Enter.

- 1 Configure a security domain.
- 2 Create stand-alone application server nodes. You must complete Option 1 before starting this option.
- 3 Create Network Deployment cells and nodes. You must complete Option 1 before starting this option.
- 4 Migrate V5.x Nodes to V6 Nodes.

If you do not see the main menu, review the steps and requirements above.

Working with Customization Dialog variables

The WebSphere Application Server for z/OS Customization Dialog uses ISPF variables to store customization values. Although it is possible to re-enter these values every time you use the Customization Dialog, this process can be time-consuming and error-prone. The Customization Dialog provides two methods you can use to save Dialog variable values from one session to the next: ISPF variable pools and Customization Dialog save files.

ISPF variable pools

Variable pools are a feature of ISPF that allow the Dialog variables for one application to reside separate from those for other applications. Whenever you start the Dialog using the ISPSTART command, you can use the NEWAPPL option to assign a one to four character name to the application and its variable pool. Variable pool names must be one to four characters long and alphanumeric with a beginning alphabetic letter. The default variable pool name for the WebSphere Application Server for z/OS Version 6.0.1 Customization Dialog is BBO6.

When you exit ISPF normally, the current editor settings and Dialog variable values for each variable pool are saved in a pair of members in the user ID's ISPPROF (ISPF profile) data set. The data set name of the ISPPROF data set is usually something like userid.ISPF.ISPPROF, but it can vary from installation to installation. If saving setting for application xxxx, the editor settings are saved in member xxxxEDIT and the variable settings are saved in member xxxxPROF.

You can use the APPL option when starting the WebSphere Application Server for z/OS Customization Dialog to specify the application name (variable pool) you wish to use:

```
EXEC 'was_hlq.SBBOCLIB(BBOWSTR)' 'APPL(XXXX)'
```

Whenever you start the Customization Dialog for the first time with a particular application name, the product copyright page is displayed before the main menu appears. Each Customization Dialog task menu panel shows the application name in the upper right-hand corner, labelled "Appl:".

By using different application names, you can separate variable pools for different WebSphere Application Server for z/OS releases, target systems, or cells. Just be sure to specify the same APPL value whenever you start the Customization Dialog in order to work with a particular WebSphere Application Server for z/OS customization task. You should also use customization save files (described below) to provide long-term, more easily documented backup of customization variable values.

To delete all information from an ISPF variable pool, delete the xxxxEDIT and xxxxPROF members from the ISPPROF data set.

Note: Ensure when you do this that the ISPF application that uses the variable pool is not active.

If an ISPF Dialog such as the WebSphere Application Server for z/OS Customization Dialog terminates abnormally, the variable pool members in the ISPPROF data set will not be updated.

Customization Dialog save files

The Customization Dialog provides its own method for saving and reusing Dialog variable values. From most task menus, you can type S on the command line to save the current Dialog variables in a file, and type R on the command line to restore Dialog variables from a previously-created save file. These files are ordinary z/OS sequential files (RECFM=VB, LRECL=255) with one variable/value pair per line.

Because values in save files are explicitly saved and restored, you are somewhat less likely to use them accidentally when customizing a different cell than values stored in the ISPF profile. Also, you can use the save file name to identify the WebSphere Application Server for z/OS cell or node for which they are created, the WebSphere Application Server for z/OS version and release, and so on. You can use a Customization Dialog save file, together with the WebSphere Application Server for z/OS product files, to recreate the WebSphere Application Server for z/OS customization data sets (.CNTL and .DATA) at any time.

One save file that is particularly important is the security domain save file. You should save the security domain values during the creation of each WebSphere Application Server for z/OS security domain, and import them whenever you create a new stand-alone application server or Network Deployment cell in that security domain. Within the Dialog panels for cell creation, you can view the security domain settings but not change them. The panels have specific numbered options for saving the newly created security domain values and restoring them during cell creation, so you don't forget.

Once you have finishing setting customization variable values for a new stand-alone application server or Network deployment cell, save the variable values before proceeding with customization. This allows you to more easily restart the customization process if you discover you have made an error during customization. You can also import the appropriate saved values when performing tasks, such as federating a stand-alone application server or creating a new managed node, on an existing Network Deployment cell.

The following are some cautions you should take when working with Customization Dialog save files:

- Customization Dialog save files may contain unencrypted passwords and other sensitive information. Make sure that access to the save files is restricted.
- Save files created with the S command include the security domain variables as well. Thus, if you need to restore values from both a regular save file and a security domain save file, restore the security domain save file last.
- Do not edit Customization Dialog save files directly. Instead, restore them in a Customization Dialog session, make the appropriate changes, and resave the values.

You can also use Customization Dialog save files to check for typing errors and similar problems by sorting the save file on the columns containing the Dialog variable values. This can help detect typographic errors in product data set names, etc., and also detect ports or UNIX UID/GID values that are accidentally reused within a particular configuration.

The instructions for each configuration task provide guidance on restoring and saving Customization Dialog variable values.

Customization Dialog commands and function keys

The WebSphere Application Server for z/OS Customization Dialog uses only a small number of application-specific primary commands which are listed on the panels on which you can enter them. Of these, the most important are the S (Save) and R (RESTORE) commands for working with WebSphere Application Server for z/OS customization variable save files. See “Working with Customization Dialog variables” on page 94 for more information.

The following default function keys are used throughout the Customization Dialog:

PF1

Displays a help screen for the current panel.

Note: Within the help panels, slightly different PF key settings are used. Press PF1 from within any help panel for details.

PF2

Sets split screen mode. See “Starting the Customization Dialog” on page 92 for restrictions on split screen mode in the Customization Dialog.

PF3

Exits the current panel.

PF4

Exits the Customization Dialog.

PF7

Scrolls up.

PF8

Scrolls down.

PF9

Swaps screens in split screen mode.

PF10

Scrolls left.

PF11

Scrolls right.

PF12

Retrieves the previous command.

You may also find the following ISPF primary commands useful:

EPDF

Allows you to browse or edit a z/OS data set from the ISPF command line

MSGID

Turns the display of message identifiers on and off.

PANELID

Turns the display of panel names on and off.

PFSHOW OFF

Turns off the display of PF key settings.

Note: This is necessary when using a 32-row display.

PFSHOW ON

Turns on the display of PF key settings.

TSO

Executes a TSO command, CLIST or REXX command procedure from the command line.

ZKEYS

Allows you to display or change the current function key settings.

Creating a security domain

Perform this task to set up the operating system security prerequisites for a WebSphere Application Server for z/OS cell. This ensures that all servers in the cell are using the same operating system security definitions.

Install the WebSphere Application Server for z/OS product code and review the instructions for using the Customization Dialog. Have available a copy of the worksheet that you completed as part of “Planning a security domain” on page 55.

You must perform this task before configuring any application serving environment that uses the security domain. If a new WebSphere Application Server for z/OS cell or server on a z/OS system will use the exact same security domain definitions as an existing server or cell on the same z/OS system, you do not need to repeat this task.

You need to run the jobs generated as part of this task once per security database. If z/OS systems which do not share a RACF or other security database, you are responsible for making sure identical security definitions are in place for all WebSphere Application Server for z/OS user IDs, groups, and profiles. See “Preparing the security server (RACF)” on page 32 for more information.

1. Log on to TSO on the z/OS system on which you intend to configure the security domain. Use a user ID that has READ access to the WebSphere Application Server for z/OS product data sets.
2. Start the Customization Dialog. See “Starting the Customization Dialog” on page 92 for details.
3. Choose the configuration data sets in which you will store your customization jobs and data. See “Choosing configuration data sets” on page 98 for details.
4. Set the customization variables according to the values recorded on your security domain worksheet. See “Setting the customization variables: Security domain” on page 98 for details.
5. Save the security domain customization variables in a data set that you will use in later customization steps. See “Saving the security domain variables” on page 100 for details.
6. Create the customization jobs and files, based on the customization variable values you entered. See “Creating the customization jobs and files” on page 100 for details.
7. Follow the generated customization instructions. See “Following the generated customization instructions: Security domain” on page 102 for details, and a sample set of customization instructions.

You are done when you have successfully completed the steps in the generated instructions. The security domain is in place on the chosen z/OS system. If any z/OS systems that interoperate with or host your planned application serving environment do not share the security database you updated as part of this task, update the other systems’ security databases accordingly.

Note: In the case of SSL certificates, this may require transporting certificates created on the initially configured z/OS system to the other z/OS systems rather than creating new SSL certificates on each system.

Proceed with the configuration of the application serving environments that use this security domain.

Choosing configuration data sets

This article leads you through the "Allocate target data sets" option in the Customization Dialog.

You must start the Customization Dialog and select the "Configure a security domain" option.

Each option in the Customization Dialog saves customization jobs and files in a pair of customization data sets. While it is possible to reuse these data sets, it is safest to create separate data sets for each WebSphere Application Server for z/OS configuration. We recommend that you use the customization data set name prefix (sometimes referred to as "config_hlq") to indicate the version and release of WebSphere Application Server for z/OS, the task you are performing, and the cell (and, in some cases, the node name) you are configuring. For example, you might use the following data set name prefix for configuring a WebSphere Application Server for z/OS 6.0.1 security domain for cell PRODCELL:

SYSPROG1.WAS601.PRODCELL.SECD

Complete this task before generating the customization jobs and files.

1. On the main Dialog panel, type "1" in the *Option* field to select "Allocate target data sets".
2. Press Enter. **Result:** You see a panel that looks similar to the following:

```
----- WebSphere Application Server for z/OS Customization -----  
Option ==>
```

Allocate Target Data Sets

Specify a high level qualifier (HLQ) and press Enter to allocate the data sets to contain the generated jobs and instructions. You can specify multiple qualifiers (up to 39 characters).

High level qualifier: .CNTL
.DATA

The Dialog will display data set allocation panels. You can make changes to the default allocations, however you should not change the DCB characteristics of the data sets.

.CNTL - a PDS with fixed block 80-byte records to contain customization jobs.

.DATA - a PDS with variable length data to contain other data produced by the Customization Dialog.

3. Fill in your chosen configuration data set name prefix value (config_hlq). If the data sets "config_hlq.CNTL" and "config_hlq.DATA" do not exist, you will be prompted for data set allocation information. If the data sets already exist, a message will inform you that they will be reused.

The data sets "config_hlq.CNTL" and "config_hlq.DATA" are allocated and will store customization jobs and files. These data set names will also be saved along with the customization variables.

Setting the customization variables: Security domain

This article describes how to complete the "Define variables" option for a WebSphere Application Server for z/OS security domain.

You must start the Customization Dialog and select the 'Configure Security Domain' option. Have Appendix B, "Customization Dialog worksheet: Security domain," on page 191 completed and at hand.

1. On the 'Configure Security Domain' panel, type "2" in the *Option* field to select "Define variables" and press **Enter**.

- Fill in the security domain Define Variables panels using the following screen shots and tips as your guides. When you are done with each panel, press **Enter**.

Security Domain Define Variables Panel (1 of 2)

```
----- WebSphere Application Server for z/OS Customization -----
Option ==>
```

Security Domain Configuration (1 of 2)

Specify the following to customize the security domain to be selected when configuring one or more servers or cells, then press Enter to continue.

```
Use security domain identifier in RACF definitions: N
Security domain identifier.....:
```

```
WebSphere Application Server Configuration Group Information
Group....: WSCFG1      GID..: 2500
```

```
WebSphere Application Server Administrator Information
User ID..: WSADMIN    UID..: 2403
Password.: WSADMIN
```

```
Unauthenticated User Definitions for Base Servers
User ID..: WSGUEST    UID..: 2402
Group....: WSCLGP    GID..: 2502
```

```
WebSphere Application Server Asynchronous Administration Task
User ID..: WSADMSSH   UID..: 2504
```

```
WebSphere Application Server Servant Group Information
Group....: WSSR1     GID..: 2501
```

```
Configure for local OS security registry.....: Y
```

Tips:

- If you have selected SecurityDomainType = 'cell-qualified', then set 'Use security domain identifier in RACF definitions:' to 'Y', and enter your chosen security domain name on the next line. If you have selected SecurityDomainType = 'none', then set 'Use security domain identifier in RACF definitions:' to 'N'.
- Enter the user ID and UID value for each user ID on the security domain worksheet, and the group name and GID value for each group on the security domain worksheet.
- Set 'Configure for local OS security registry' to 'Y' if you intend to use RACF (or equivalent) as your WebSphere user registry; set it to 'N' if you plan to use LDAP or a custom user registry instead.

Security Domain Define Variables Panel (2 of 2)

```
----- WebSphere Application Server for z/OS Customization -----
Option ==>
```

Security Domain Configuration (2 of 2)

Specify the following to customize the security domain to be selected when configuring one or more servers or cells, then press Enter to continue.

SSL Customization

```
Certificate authority keylabel.....: WebSphereCA
Generate certificate authority (CA) certificate: Y
Expiration date for CA authority: 2010/12/31
Default RACF keyring name.....: WASKeyring
Enable SSL on location service daemon: N
```

Additional z/OS Security Customization Options

```
Generate default RACF realm name: N
Default RACF realm name ....: MCLXCF01

Use SAF EJBROLE profiles to enforce J2EE roles: N

Enable SAF authentication using LTPA or ICSF login tokens: Y
```

Saving the security domain variables

You must start the Customization Dialog and fill in the security domain variables.

The security domain settings are used in the customization of every WebSphere Application Server for z/OS cell. By saving the security domain variables, you create a saved security configuration that you can use consistently across all nodes in the cells you create for a given security domain.

Complete this task after setting the security domain variables and before moving on to later customization steps. If you encounter problems during customization and change the security domain variable values, be sure to re-save them.

Note: This procedure applies to only the "Configure a security domain" Dialog option. For information about saving variables for all the other Dialog options, see "Saving the cell variables" on page 131

1. On the Configure Security Domain panel, type "3" in the *Option* field to select "Save security domain variables" and press **Enter**. You will see a panel that looks similar to the following:

```
----- WebSphere Application Server for z/OS Customization -----
Option ==>
```

Save Security Domain Variables

Specify the name of a sequential data set to contain the security domain variables, then press Enter to continue. If the data set does not exist, the Dialog displays the Allocate New Data Set panel, with which you can allocate a data set.

Data set name:

2. Fill in the name of the sequential data set you will use to hold the security domain variable values. Choose a data set name that identifies the sysplex, cell or group of cells for which this security domain is defined. Enclose the data set name in single quotes. If the data set does not exist, you will be prompted for data set allocation information.
3. Record the name of the security domain variable data set on your security domain worksheet.

The security domain settings are saved in the data set you selected.

Creating the customization jobs and files

You must select configuration data sets to use and complete the process of defining variables for this task. See "Choosing configuration data sets" on page 98 and "Setting the customization variables: Security domain" on page 98 for more information.

The Customization Dialog creates customization batch jobs and data files, based on the variable values you specified in the Dialog. The batch jobs and data sets will be written to the config_hlq.CNTL and config_hlq.DATA configuration data sets that you created with the 'Allocate target data sets' option.

1. Ensure the configuration data sets are allocated and not in use.

Note: Editing a member in config_hlq.CNTL or config_hlq.DATA will cause this task to fail.

2. On the 'Configure Security Domain' panel, type "4" in the *Option* field to select "Generate customization jobs" and press **Enter**. You will have one of two results:

- **Result A:** If all variables are defined correctly, you see the 'Specify Job Cards' panel, which looks similar to this:

```
----- WebSphere Application Server for z/OS Customization -----
Option ==>
```

Generate Customization Jobs

This portion of the Customization Dialog generates the jobs you must run after you complete this Dialog process. You must complete the customization process before you generate the jobs with this step. If you have not done this, please return to that step.

Jobs and data files will get generated into data sets:

```
'hlq.CNTL'
'hlq.DATA'
```

If you wish to generate customization jobs using other data sets, then exit from this panel and select option 1 (Allocate target data sets).

All the jobs that will be tailored for you will need a job card. Please enter a valid job card for your installation below. The file tailoring process will update the jobname for you in all the generated jobs, so you need not be concerned with that portion of the job cards below. If continuations are needed, replace the comment cards with continuations.

Specify the job cards, then press Enter to continue.

```
//jobname JOB (ACCTNO,ROOM),'userid',CLASS=A,REGION=0M
//*
//*
//*
```

Note: Pay particular attention to the displayed target data sets. Make sure they are the ones you intend to use.

- **Result B:** If the variables are not defined correctly, you will see the 'Verification' panel. Decide whether the warnings or errors are serious enough to warrant returning to the "Define variables" option.

Note: If the return code is "8" or greater, return to the "Define variables" option and fix the uncovered problems. If you saved the variables previously, be sure to re-save them after making any updates.

3. Fill in the job card information, according to your installation requirements. For each job, the Dialog generates a jobname and the "JOB" keyword to match the member name of the PDS, but you specify the rest.

Note: If you need to run these jobs on a particular system in the sysplex (for example, JES2 MAS or JES3 complex), you should specify the necessary Scheduling Environment (SCHENV), JES2 JOBPARM, or JES3 //*MAIN statement at this time.

Example of a job card entry:

```
//jobname JOB 1234,USER1,NOTIFY=????,MSGCLASS=0,REGION=0M
//*          USER=SYSADM1,PASSWORD=SYSADM1
/*JOBPARM  SYSAFF=SYSB
```

Note: This example is useful for jobs that require a user ID other than that of the logged-on TSO user. (This is typically a user ID with UID=0.) In that case, you can just put a comma at the end of the first line, put in the correct user ID on the second line, then uncomment that second line.

You may wish to use RACF SUBMIT authority to avoid having to keep passwords in your configuration data sets.

4. Fix any errors. If there are errors anywhere, you will see the 'Error' panel. Press PF3 to exit the error panel, then enter the correct panel to fix the errors. Then return to the "Generate Customization Jobs"

option and pick up where you left off. If necessary, you can update the variables and rerun this option. The generation process will delete and re-tailor all the members.

Note: Compress the configuration data sets before you rerun this option.

You are done when all the jobs are generated. You may then move ahead to viewing the generated jobs. See “Following the generated customization instructions: Security domain” for more information.

Following the generated customization instructions: Security domain

You must generate the customization jobs and files for this task.

The Customization Dialog creates a set of instructions for each customization task. Follow these instructions to tailor and customize a security domain on your system.

Note: Do not attempt to fix a typo or make a change by modifying the generated output. Many of the variables are used in multiple members of the target data sets, so, if you do not change them all, you will run into problems that are very difficult to diagnose.

1. On the 'Configure Security Domain' panel, type "5" in the *Option* field to select "View instructions" and press **Enter**. ISPF Browse will open and you will see the BBOSDINS member of config_hlq.CNTL.
2. Read the instructions carefully, both to preview the customization process and to find any typographical or other errors you may have made while entering the customization variable values.
3. Follow the instructions as given. There are two ways to follow the directions:
 - Follow the instructions while remaining in ISPF Browse.
 - Record the data set name and member at the top of the screen and either print the instructions or use ISPF split screen and browse or edit the instructions while you follow them.
4. Fix any problems. If you encounter problems caused by your Customization Dialog values, modify your variables using the Dialog, regenerate the instructions, and restart the customization process.

Note: Remember that you cannot generate new customization jobs while either configuration data set is open!

You are done with this customization task when you have successfully followed the generated instructions.

Sample generated instructions: Security domain

This article presents a sample of what the Customization Dialog's generated instructions may look like. This is a sample only--you must use the instructions generated from your own variables when configuring your system.

Instructions for customizing a WebSphere for z/OS security domain.

The customization dialog has created jobs based on the information you provided. These instructions tell you how to modify the operating system and run the jobs to customize WebSphere for z/OS.

RULES:

1. If you created the target data sets (*.CNTL and *.DATA) on another (driving) system, you must copy them to the target system and give them the same data set names.
2. You must perform these instructions on your target system.
3. You will have saved the security domain definition values in a data set. These values will need to be loaded and used when creating a stand-alone application server or a Network

Deployment environment.

Running the customized jobs

The customization dialog built a number of batch jobs with the variables you supplied. You must run the jobs in the order listed below using user IDs with the appropriate authority.

The customization dialog for WebSphere for z/OS does not attempt to update configuration data for your base operating system or existing subsystems.

BEFORE YOU BEGIN: You must copy the target data sets (*.CNTL and *.DATA) to your target system and give them the same data set names, and you must be running on your target system.

Follow the table below, which lists in order the jobs you must submit and the commands you must enter. Special handling notes are included in the table. All jobs are members of

DATASET.CNTL.

Attention: After submitting each job, carefully check the output. Errors may exist even when all return codes are zero.

+-----+	
BBOSBRAJ	User ID requirement: Authority to update data set
+-----+	
Done:	DATASET.DATA.
By:	This job builds (but does not execute) the RACF commands for the WebSphere for z/OS security domain and places them into member BBOSBRAK of data set DATASET.DATA. Carefully review these definitions with your security administrator.
+-----+	
BBOSBRAK	User ID requirement: RACF special authority.
+-----+	
Done:	This job instantiates the security rules set up in the previous job by invoking RACF commands.
By:	RESULT: You may receive errors, such as INVALID USER messages, from this job because a user ID, group or profile is already defined. Make sure the existing user ID, group or profile has the same characteristics as the user ID, group or profile being created by BBOSBRAK. If not, then change the values in the customization dialog which are causing the conflict, regenerate the customization jobs, and restart the process.
+-----+	
-----	Activating the APPL class (optional)
+-----+	
Done:	The following APPL profile is created by BBOSBRAK with UACC(READ) and permitted to the unauthenticated user group WSCLGP:
+-----+	

CB390

By:

However, in order to make use of APPL profile security with WebSphere for z/OS, you must also activate the RACF APPL class globally with the command:

```
SETROPTS CLASSACT(APPL)
```

Consult with your site security administrator before issuing this command, as it affects all RACF-controlled applications that check the APPL class. See the WAS InfoCenter for more information on implementing security using APPL class profiles.

Creating a stand-alone application server cell

This article leads you through the tasks involved in setting up a WebSphere Application Server for z/OS stand-alone application server environment.

Ensure the security domain was successfully created on the z/OS target system for the new stand-alone application server. Have available a copy of the worksheet that you completed as a part of “Planning for a stand-alone application server cell” on page 60.

Follow the steps below to set up a new WebSphere Application Server for z/OS stand-alone application server cell.

Note: You need to complete these steps and have a stand-alone application server cell in place before you migrate your system. See Migrating product configurations in the *Migrating, coexisting, and interoperating* PDF book for further information on migration.

1. Log on to TSO on the z/OS system on which you intend to configure the stand-alone application server cell. Use a user ID that has READ access to the WebSphere Application Server for z/OS product data sets. You will also need access to a user ID with authority to make security system updates and a user ID with UID 0. (These can all be the same user ID.)
2. Start the Customization Dialog. See “Starting the Customization Dialog” on page 92 for details.
3. Choose the configuration data sets in which you will store your customization jobs and data. See “Choosing configuration data sets” on page 105 for details.
4. Load the security domain variables saved from the security domain you intend to use for this cell. See “Loading the security domain variables” on page 105 for details.
5. Set the customization variables according to the values recorded on your stand-alone application server worksheet. See “Setting the customization variables: Stand-alone application server cell” on page 106 for details.
6. (Optional but recommended.) Save the stand-alone application server customization variables in a data set. See “Saving the cell variables” on page 131 for details.
7. Create the customization jobs and files, based on the customization variable values you entered. See “Creating the customization jobs and files” on page 111 for details.
8. Follow the generated customization instructions. See “Following the generated customization instructions: Stand-alone application server cell” on page 113 for details, and a sample set of customization instructions.

You are done when you have successfully completed the steps in the generated instructions. The new stand-alone application server is up and running on the chosen z/OS system. See “Working with your new server” on page 123 for more information.

Deploy and test applications on your new stand-alone application server.

Loading the security domain variables

This article describes how to complete the "Load security domain variables" option for a WebSphere Application Server for z/OS stand-alone application server cell.

Create the security domain you will use for the new stand-alone application server node and know the name of the saved security domain configuration variable file that you recorded on the security domain worksheet.

The security domain settings are used in the customization of every WebSphere Application Server for z/OS cell. By loading the security domain variables at the start of node or cell creation, you ensure that the security domain configuration you use is consistent and matches the RACF definitions that have already been set as part of security domain configuration.

Complete this task as the first step in configuring a new stand-alone application server node. If you encounter problems during customization and change the security domain variable values, be sure to re-save them.

1. On the 'Create a stand-alone application server node' panel, type "1" in the *Option* field to select "Load security domain variables" and press **Enter**. You will see a panel that looks similar to the following:

```
----- WebSphere Application Server for z/OS Customization -----  
Option  ===>
```

```
Load Security Domain Variables
```

```
Specify the name of a data set containing the security domain variables,  
then press Enter to continue.
```

```
IBM-supplied defaults are in ''
```

```
Data set name:
```

```
If this data set is not cataloged, specify the volume.
```

```
Volume:
```

2. Fill in the name of the sequential data set you used to hold the security domain variable values and press **Enter**.

Note: Ensure you enclose the data set name in single quotes.
The security domain variables will load.

The security domain settings are loaded. You can display these variables, but not change them.

Choosing configuration data sets

This article leads you through the "Allocate target data sets" option in the Customization Dialog.

You must start the Customization Dialog and select the "Create stand-alone application server nodes" option.

Each option in the Customization Dialog saves customization jobs and files in a pair of customization data sets. While it is possible to reuse these data sets, it is safest to create separate data sets for each WebSphere Application Server for z/OS configuration. We recommend that you use the customization data

set name prefix (sometimes referred to as "config_hlq") to indicate the version and release of WebSphere Application Server for z/OS, the task you are performing, and the cell (and, in some cases, the node name) you are configuring.

For example, you might use the following data set name prefix for configuring a WebSphere Application Server for z/OS 6.0.1 stand-alone application server with cellname SYSA and servername BB6QA1:

```
SYSprog.WAS601.SYSA.BB6QA1.SAPPSRVR
```

Complete this task before generating the customization jobs and files.

1. On the main Dialog panel, type "2" in the *Option* field to select "Allocate target data sets".
2. Press Enter. **Result:** You see a panel that looks similar to the following:

```
----- WebSphere Application Server for z/OS Customization -----  
Option  ==>
```

Allocate Target Data Sets

Specify a high level qualifier (HLQ) and press Enter to allocate the data sets to contain the generated jobs and instructions. You can specify multiple qualifiers (up to 39 characters).

High level qualifier: .CNTL
.DATA

The Dialog will display data set allocation panels. You can make changes to the default allocations, however you should not change the DCB characteristics of the data sets.

.CNTL - a PDS with fixed block 80-byte records to contain customization jobs.

.DATA - a PDS with variable length data to contain other data produced by the Customization Dialog.

3. Fill in your chosen configuration data set name prefix value (config_hlq). If the data sets "config_hlq.CNTL" and "config_hlq.DATA" do not exist, you will be prompted for data set allocation information. If the data sets already exist, a message will inform you that they will be reused.

The data sets "config_hlq.CNTL" and "config_hlq.DATA" are allocated and will store customization jobs and files. These data set names will also be saved along with the customization variables.

Setting the customization variables: Stand-alone application server cell

This article describes how to complete the "Define variables" option for a WebSphere Application Server for z/OS stand-alone application server node.

You must start the Customization Dialog and select the 'Create stand-alone application server nodes' option. Have Appendix C, "Customization Dialog worksheet: Stand-alone application server cell," on page 193 completed and at hand.

1. On the 'Create stand-alone application server nodes' panel, type "3" in the *Option* field to select "Define variables" and press **Enter**.
2. On the 'Define Variables to Configure stand-alone application server Node' panel, type "1" in the *Option* field to select "System Locations (directories, HLQs, etc.)" and press **Enter**.
3. Fill in the System Locations panels using the following screen shots as your guides. When you are done with each panel, press **Enter**.

System Locations

```
----- WebSphere Application Server for z/OS Customization -----  
Option  ==>
```

System Locations (1 of 2)

Specify the following for the system on which you are installing WebSphere Application Server for z/OS, then press Enter to continue. For some data sets, specify "Y" if they are in STEPLIB.

System name.: AQTS Sysplex name : MCLXCF01

Full Names of Data Sets

PROCLIB: SYS1.PROCLIB
PARMLIB: SYS1.PARMLIB
SYSEXEC:

Run WebSphere Application Server from STEPLIB (Y/N)? Y

SBBOLPA.: BOSS.VICOM.W000170.SBBOLPA
SBBLOAD: BOSS.VICOM.W000170.SBBLOAD
SBBOLD2.: BOSS.VICOM.W000170.SBBOLD2
SBBOEXEC: BOSS.VICOM.W000170.SBBOEXEC
SBBOMSG.: BOSS.VICOM.W000170.SBBOMSG

Use STEPLIB?

SCEERUN.: CEE.SCEERUN N
SCEERUN2: CEE.SCEERUN2 N
SGSKLOAD: GSK.SGSKLOAD N

(leave SGSKLOAD blank if all systems are at z/OS 1.6 or above)

----- WebSphere Application Server for z/OS Customization -----
Option ==>

System Locations (2 of 2)

Specify the following for your customization, then press Enter to continue.

Locations of HFS Resident Components

WebSphere Application Server product directory:
/usr/lpp/zWebSphere/V6R0

- 4. On the 'Define Variables to Configure stand-alone application server Node' panel, type "2" in the Option field to select "System Environment Customization" and press Enter.
5. Fill in the System Environment Customization panels using the following screen shots as your guides. When you are done with each panel, press Enter.

System Environment Customization

----- WebSphere Application Server for z/OS Customization -----
Option ==>

System Environment Customization (1 of 4)

Specify the following to customize your system environment, then press Enter to continue.

WebSphere Application Server for z/OS Configuration HFS Information

Mount point....: /WebSphere/V6R0
Name.....: OMVS.WAS.CONFIG.HFS
Volume, or '*' for SMS.: *
Primary allocation in cylinders...: 250
Secondary allocation in cylinders.: 100

----- WebSphere Application Server for z/OS Customization -----
Option ==>

System Environment Customization (2 of 4)

Specify the following to customize your system environment, then

press Enter to continue.

WebSphere Error Log Stream Information

Name.....: WAS.ERROR.LOG
Data class: STANDARD
Storage class.....:
HLQ for data sets....: IXGLOGR

Is log stream CF resident (Y|N): Y

If yes, specify structure name.: WAS_STRUCT
If no, specify: log stream size: 3000
 staging size...: 3000

RRS Log Stream Information

Group name.....: MCLXCF01
Data class.....: STANDARD
Storage class.....:
HLQ for data sets....: IXGLOGR

Is log stream CF resident (Y|N): Y

Create RRS PROC (Y|N).....: Y

----- WebSphere Application Server for z/OS Customization -----
Option ==>

System Environment Customization (3 of 4)

Specify the following to customize your system environment, then
press Enter to continue.

CTRACE Writer Definitions

Procedure name: BBOWTR
User ID.....: STCRACF
Group.....: SYS1

Trace Data Set Information

Name.....: SYS1.AQTS.WAS390.CTRACE
Volume, or "*" for SMS.: *
Primary space in cylinders...: 10
Secondary space in cylinders.: 0

Trace Parmlib member suffix...: 60

----- WebSphere Application Server for z/OS Customization -----
Option ==>

System Environment Customization (4 of 4)

Specify the following to customize your server, then press Enter
to continue.

Logging Details for Transaction XA Partner Log

Use Log stream (Y|N): N

Log Stream Information

Name HLQ.....: WASTXA
Data class:
Storage class.....:
HLQ for data sets.....: IXGLOGR

Is log stream CF resident (Y|N): Y

If yes, specify structure name.: WAS_STRUCT
If no, specify: log stream size: 256
 staging size....: 256

6. On the 'Define Variables to Configure stand-alone application server Node' panel, type "3" in the *Option* field to select "Server Customization" and press **Enter**.
7. Fill in the Server Customization panels using the following screen shots as your guides. When you are done with each panel, press **Enter**.

Server Customization

```
----- WebSphere Application Server for z/OS Customization -----  
Option ==>
```

Server Customization (1 of 6)

Specify the following to customize your server, then press Enter to continue.

application server Definitions

WebSphere Application Server home directory:
 /WebSphere/V6R0
 / AppServer

Cell name (short).....: AQTS
Cell name (long).....: AQTS

Node name (short).....: AQTS
Node name (long).....: AQTS

Server name (short)....: BBOS001
Server name (long)....: server1

Cluster transition name: BB0C001

Admin asynch operations procedure name: BB0W6SH

Install samples? (Y/N): Y

```
----- WebSphere Application Server for z/OS Customization -----  
Option ==>
```

Server Customization (2 of 6)

Specify the following to customize your server, then press Enter to continue.

application server Definitions

Controller Information

Jobname.....: BBOS001
Procedure name: BB06ACR
User ID.....: ASCR1
UID.....: 2431

Servant Information

Jobname.....: BBOS001S
Procedure name: BB06ASR
User ID.....: ASSR1
UID.....: 2432

Control Region Adjunct

Jobname.....: BBOS001A
Procedure name: BB06CRA
User ID.....: ASCRA1
UID.....: 2433

----- WebSphere Application Server for z/OS Customization -----
Option ==>

Server Customization (3 of 6)

Specify the following to customize your server, then press Enter to continue.

application server Definitions

Node host name.....:

SOAP JMX Connector port.....: 8880

ORB Listener host name..: *

ORB port.....: 2809

ORB SSL port.....: 0

HTTP transport host name: *

HTTP port.....: 9080

HTTP SSL port.....: 9443

Service Integration port.....: 7276

Service Integration Secure port.....: 7286

Service Integration MQ Interoperability port.....: 5558

Service Integration MQ Interoperability Secure port: 5578

----- WebSphere Application Server for z/OS Customization -----
Option ==>

Server Customization (4 of 6)

Specify the following to customize your server, then press Enter to continue.

application server Definitions

Specify your High Availability Manager Host here. This MUST resolve to a single IP address; it can not be a multihomed host

High Availability Manager Host:

High Availability Manager Communication Port: 9353

----- WebSphere Application Server for z/OS Customization -----
Option ==>

Server Customization (5 of 6)

Specify the following to customize your server, then press Enter to continue.

Location Service Daemon Definitions

Daemon home directory:
/WebSphere/V6R0/Daemon

Daemon jobname: BBODMNB

Procedure name.: BB06DMN

User ID.....: WSDMNCR1

UID.....: 2411

```
IP name.....: sdf
Port.....: 5655
SSL port.....: 5656
```

```
Register daemon with WLM DNS: N
```

```
----- WebSphere Application Server for z/OS Customization -----
Option ==>
```

```
Server Customization (6 of 6)
```

```
(Note: This panel is optional if you are not configuring a
database for the Scheduler component)
```

```
Specify the following for the system on which you wish to
configure your Scheduler database, then press Enter to continue.
```

```
Full Names of Datasets
```

```
SBPXEXEC.....: SYS1.SBPXEXEC
DB2 RUNLIB Location: DB2HLQ.RUNLIB.LOAD
```

```
Scheduler Database Definitions
```

```
DB2 Subsystem Name.: DSN
Plan Name.....: DSNTIA81
```

```
Scheduler Database Name: SCHEDDB
```

```
Storage Group Name.....: SYSDEFLT
Tablespace Name.....: SCHEDTS
Table Prefix.....: TBLPREFIX
```

8. On the 'Define Variables to Configure stand-alone application server Node' panel, type "4" in the *Option* field to select "View Security Domain Configuration Panels" and press **Enter**. These panels display values you previously set in the "Configure security domain" option--you can not change any of the values here. If you do wish to make changes, you must go back to the main Dialog panel and run through the "Configure security domain" option again.

Creating the customization jobs and files

You must select configuration data sets to use and complete the process of defining variables for this task. See "Choosing configuration data sets" on page 105 and "Setting the customization variables: Stand-alone application server cell" on page 106 for more information.

The Customization Dialog creates customization batch jobs and data files, based on the variable values you specified in the Dialog. The batch jobs and data sets will be written to the config_hlq.CNTL and config_hlq.DATA configuration data sets that you created with the 'Allocate target data sets' option.

1. Ensure the configuration data sets are allocated and not in use.

Note: Editing a member in config_hlq.CNTL or config_hlq.DATA will cause this task to fail.

2. On the 'Create a stand-alone application server node' panel, type "4" in the *Option* field to select "Generate customization jobs" and press **Enter**. You will have one of two results:
 - **Result A:** If all variables are defined correctly, you see the 'Specify Job Cards' panel, which looks similar to this:

```
----- WebSphere Application Server for z/OS Customization -----
Option ==>
```

```
Generate Customization Jobs
```

```
This portion of the Customization Dialog generates the jobs you must
```

run after you complete this Dialog process. You must complete the customization process before you generate the jobs with this step. If you have not done this, please return to that step.

Jobs and data files will get generated into data sets:

```
'hlq.CNTL'  
'hlq.DATA'
```

If you wish to generate customization jobs using other data sets, then exit from this panel and select option 1 (Allocate target data sets).

All the jobs that will be tailored for you will need a job card. Please enter a valid job card for your installation below. The file tailoring process will update the jobname for you in all the generated jobs, so you need not be concerned with that portion of the job cards below. If continuations are needed, replace the comment cards with continuations.

Specify the job cards, then press Enter to continue.

```
//jobname JOB (ACCTNO,ROOM),'userid',CLASS=A,REGION=0M  
//*  
//*  
//*
```

Note: Pay particular attention to the displayed target data sets. Make sure they are the ones you intend to use.

- **Result B:** If the variables are not defined correctly, you will see the 'Verification' panel. Decide whether the warnings or errors are serious enough to warrant returning to the "Define variables" option.

Note: If the return code is "8" or greater, return to the "Define variables" option and fix the uncovered problems. If you saved the variables previously, be sure to re-save them after making any updates.

3. Fill in the job card information, according to your installation requirements. For each job, the Dialog generates a jobname and the "JOB" keyword to match the member name of the PDS, but you specify the rest.

Note: If you need to run these jobs on a particular system in the sysplex (for example, JES2 MAS or JES3 complex), you should specify the necessary Scheduling Environment (SCHENV), JES2 JOBPARM, or JES3 `//*MAIN` statement at this time.

Example of a job card entry:

```
//jobname JOB 1234,USER1,NOTIFY=????,MSGCLASS=0,REGION=0M  
//*          USER=SYSADM1,PASSWORD=SYSADM1  
/*JOBPARM  SYSAFF=SYSB
```

Note: This example is useful for jobs that require a user ID other than that of the logged-on TSO user. (This is typically a user ID with UID=0.) In that case, you can just put a comma at the end of the first line, put in the correct user ID on the second line, then uncomment that second line. You may wish to use RACF SUBMIT authority to avoid having to keep passwords in your configuration data sets.

4. Fix any errors. If there are errors anywhere, you will see the 'Error' panel. Press PF3 to exit the error panel, then enter the correct panel to fix the errors. Then return to the "Generate Customization Jobs" option and pick up where you left off. If necessary, you can update the variables and rerun this option. The generation process will delete and re-tailor all the members.

Note: Compress the configuration data sets before you rerun this option.

You are done when all the jobs are generated. You may then move ahead to viewing the generated jobs. See “Following the generated customization instructions: Stand-alone application server cell” for more information.

Following the generated customization instructions: Stand-alone application server cell

You must generate the customization jobs and files for this task.

The Customization Dialog creates a set of instructions for each customization task. Follow these instructions to tailor and customize a stand-alone application server node on your system.

Note: Do not attempt to fix a typo or make a change by modifying the generated output. Many of the variables are used in multiple members of the target data sets, so, if you do not change them all, you will run into problems that are very difficult to diagnose.

1. On the 'Create a stand-alone application server node' panel, type "5" in the *Option* field to select "View instructions" and press **Enter**. ISPF Browse will open and you will see the BBOSSINS member of config_hlq.CNTL.
2. Read the instructions carefully, both to preview the customization process and to find any typographical or other errors you may have made while entering the customization variable values.
3. Follow the instructions as given. There are two ways to follow the directions:
 - Follow the instructions while remaining in ISPF Browse.
 - Record the data set name and member at the top of the screen and either print the instructions or use ISPF split screen and browse or edit the instructions while you follow them.
4. Fix any problems. If you encounter problems caused by your Customization Dialog values, modify your variables using the Dialog, regenerate the instructions, and restart the customization process.

Note: Remember that you cannot generate new customization jobs while either configuration data set is open!

You are done with this customization task when you have successfully followed the generated instructions.

Sample generated instructions: Stand-alone application server cell

This article presents a sample of what the Customization Dialog's generated instructions may look like. This is a sample only--you must use the instructions generated from your own variables when configuring your system.

Instructions for customizing WebSphere for z/OS
for a stand-alone application server node.

The customization dialog has created jobs based on the information you provided. These instructions tell you how to modify the operating system and run the jobs to customize WebSphere for z/OS.

RULES:

1. If you created the target data sets (*.CNTL and *.DATA) on another (driving) system, you must copy them to the target system and give them the same data set names.
2. You must perform these instructions on your target system.

Doing manual configuration updates

The customization dialog for WebSphere for z/OS does not attempt to

update configuration data for your base operating system or existing subsystems. You must do the following manual steps prior to running the WebSphere for z/OS configuration jobs.

Perform these steps to do manual configuration updates:

1. Update the workload management application environment as follows.

ATTENTION: If you have already installed the WLM-DAE support PTF (APAR OW54622) on z/OS 1.4, or are running a higher level of z/OS, you may skip this step.

Using these parameters, run IWMARIN0 to create the BBOC001 application environment:

```
Appl Environment Name   BBOC001
Description             WebSphere for z/OS V6 servant
Subsystem type         CB
Procedure name         BB06ASR
Start parameters       JOBNAME=&IWMSSNM.S;
                       ENV=AQTS.AQTS.&IWMSSNM;
```

Limit on starting server address spaces for a subsystem instance:
Single address space per system

NOTE: For the start parameter string, you must continue typing with ENV on the same line as JOBNAME. We show the parameters on separate lines for aesthetics only.

For information about IWMARIN0, the ISPF dialog application for MVS workload management, see z/OS MVS Planning: Workload Management (SA22-7602).

For more information about workload management and WebSphere for z/OS, see related topics in the WebSphere for z/OS Information Center at http://www.ibm.com/software/webservers/appserv/zos_os390/library/.

-
2. Update BLSCUSER. Refer to member BBOIPCSP in

'DATASET.CNTL'

In order to use the IPCS support provided by the product, append the contents of this member to the BLSCUSER member in your IPCSPARM or system PARMLIB datasets.

-
3. Update SCHEDxx. Refer to member BBOSCHED in

'DATASET.CNTL'

In order to set the correct program properties for the WebSphere for z/OS run-time executables, append the contents of this member to the SCHEDxx member in your system PARMLIB concatenation.

Note: When you are finished, issue the command SET SCH=(xx,xx) to activate SCHEDxx and load a new program properties table.

-
4. Make sure the following data sets are APF-authorized:

```
BOSS.VICOM.W000170.SBBOLPA
BOSS.VICOM.W000170.SBBOLOAD
BOSS.VICOM.W000170.SBBOLD2
```



```
CEE.SCEERUN
CEE.SCEERUN2
GSK.SGSKLOAD
```

Add these datasets to your PROGxx or IEAAPFxx parmlib members, as appropriate, ensuring you specify the correct volsers.

-
5. If you want to collect the SMF120 records created by the run-time servers, update SMFPRMxx via the following:
 - a. Update the SYS or SUBSYS(STC,...) statement for started tasks to include the 120 record.
 - b. (Optional) You can specify designated subtypes 1-6.

EXAMPLE:

```
SUBSYS(STC,EXITS(IEFU29,IEFACTRT),INTERVAL(SMF,SYNC),
        TYPE(0,30,70:79,88,89,120,245))
        ---
```

For details on the SMF records, see related topics in the WebSphere for z/OS Information Center at http://www.ibm.com/software/webservers/appserv/zos_os390/library/

-
6. Update your active BPXPRMxx member to have the following WebSphere for z/OS configuration HFS:

OMVS.WAS.CONFIG.HFS

mounted at:

/WebSphere/V6R0

in read/write mode.

EXAMPLE:

```
MOUNT FILESYSTEM('OMVS.WAS.CONFIG.HFS')
MOUNTPOINT('/WebSphere/V6R0')
TYPE(HFS)
MODE(RDWR)
```

-
7. Update TCP/IP by reserving the following ports for WebSphere for z/OS:

SOAP JMX Connector port	- 8880
ORB port	- 2809
HTTP port	- 9080
HTTP SSL port	- 9443
High availability manager communication port	- 9353
Service Integration port	- 7276
Service Integration Secure port	- 7286
Service Integration MQ Interoperability port	- 5558
Service Integration MQ Interoperability Secure port	- 5578
Daemon IP port	- 5655
Daemon SSL port	- 5656

View member BBOTCPIP in

'DATASET.CNTL'

Add the contents of this member to the PORT section of the file referenced by the DD statement for the TCP/IP profile in the TCP/IP start procedure. Cut and paste from this member into the data set used by your installation.

ATTENTION: If another application has already reserved any of these ports for its own use, you must resolve the resulting conflict before you continue. If you update the WebSphere for z/OS customization dialog with new port specifications, be sure to regenerate the customization jobs, data, and instructions.

-
8. The WebSphere product libraries will be placed in STEPLIB as needed, rather than in the system link pack area and system link list.

SBBOLPA:

=====

The following data set will be placed in the STEPLIB concatenation for the location service daemon. The data set's load modules will be loaded in the MVS common storage area when the location service daemon is started. Make sure the target MVS system has at least 8MB free storage in extended CSA before starting the daemon.

BOSS.VICOM.W000170.SBBOLPA

SBBLOAD and SBBOLD2:

=====

The following data sets will be placed in the STEPLIB concatenation for the location service daemon, controller and servant regions, and in the setupCmdLine.sh script in the WebSphere Configuration HFS. You must not remove these STEPLIB statements.

BOSS.VICOM.W000170.SBBLOAD

BOSS.VICOM.W000170.SBBOLD2

BBORTSS5:

=====

The BBORTSS5 module is used by WebSphere Application Server V6 for component trace support. A copy of this module must be in the system link pack area in order for CTRACE to work correctly.

If a copy of BBORTSS5 (any release) is currently loaded into LPA, you need take no further action.

Otherwise, issue the following MVS console command to load BBORTSS5 into dynamic LPA:

```
SETPROG LPA,ADD,MODNAME=BBORTSS5,  
        DSNAME=BOSS.VICOM.W000170.SBBOLPA
```

Alternatively, you can place the following statement in a parmlib PROGxx member which is activated with the SET PROG= command after system IPL is complete:

```
LPA ADD MODNAME(BBORTSS5) DSNAME(BOSS.VICOM.W000170.SBBOLPA)
```

Make sure that the BBORTSS5 module is loaded into LPA after each system IPL.

9. Make sure the following Language Environment data set is in the system link list:

CEE.SCEERUN

10. Make sure the following Language Environment data set is in the system link list:

CEE.SCEERUN2

11. Make sure the following System SSL data set is in the system link pack area or the system link list on all MVS systems at or below z/OS Version 1.5:

GSK.SGSKLOAD

12. WebSphere for z/OS regions open a large number of files (more than 1024). Make sure your BPXPRMxx parmlib member(s) specify a value of MAXFILEPROC that is greater than or equal to 2000. Use the following MVS console command to see your current MAXFILEPROC setting:

D OMVS,OPTIONS

13. Update the CFRM Policy. Prior to using log streams that have been indicated as CF-resident, you must update the CFRM policy to define the structures to be used. Tailor member BBOWCFRM in the following data set to define the log streams:

'DATASET.CNTL'

Running the customized jobs

The customization dialog built a number of batch jobs with the variables you supplied. You must run the jobs in the order listed below using user IDs with the appropriate authority.

BEFORE YOU BEGIN: Complete the section above entitled "Doing manual configuration updates."

Follow the table below, which lists in order the jobs you must submit and the commands you must enter. Special handling notes are included in the table. All jobs are members of

DATASET.CNTL

Attention: After submitting each job, carefully check the output. Errors may exist even when all return codes are zero.

BBOMSGC	User ID requirement: Update authority for data set SYS1.MSGENU and/or SYS1.MSGJPN.
Done:	ATTENTION: This is optional unless you require message

By:	<p>translation.</p> <p>This job sets up MMS to translate messages for WebSphere for z/OS.</p> <p>There are two steps to update SYS1.MSGENU and SYS1.MSGJPN. Remove the unneeded step and change the target libraries, if necessary.</p>
BBOERRLG	User ID requirement: Authority to define a log stream.
Done:	<p>ATTENTION: If your installation already has a WebSphere for z/OS error log stream named the following, skip this step.</p> <p>WAS.ERROR.LOG</p>
By:	<p>This job defines the error log stream.</p> <p>The customization dialog supplied the required parameters on the define log stream command. Review and supply any options you require. For more information, see z/OS MVS Setting Up a Sysplex (SA22-7625).</p> <p>RESULT: Upon successful completion of this job, you will see the following message in SYSPRINT:</p> <p>IXG004I LOGR POLICY PROCESSING ENDED WITHOUT ERROR</p>
BBORRSL	User ID requirement: Authority to define a log stream.
Done:	<p>ATTENTION: If your installation already has Resource Recovery Services (RRS) active, skip this job. (To check if RRS is active, go to SDSF or the operator console and look for an address space named "ATRRRS").</p>
By:	<p>This job defines the RRS log streams.</p> <p>The RRS group name is, by default, the resource sharing group name.</p> <p>RESULT: Upon successful completion of this job, you will see the following message in SYSPRINT:</p> <p>IXG004I LOGR POLICY PROCESSING ENDED WITHOUT ERROR</p>
BBOWCTR	User ID requirement: Authority to allocate data set
Done:	<p>SYS1.AQTS.WAS390.CTRACE</p> <p>This job allocates the CTRACE data set used by</p>
By:	<p>BBOWTR</p> <p>ATTENTION: Skip this step if the CTRACE data set is already allocated.</p>
BBOCBRAJ	User ID requirement: Authority to update data set
Done:	DATASET.DATA
By:	<p>This job builds (but does not execute) the RACF commands for the WebSphere for z/OS run-time clusters and places them into member BBOWBRAK of data set</p>

	<p>DATASET.DATA</p> <p>Carefully review these definitions with your security administrator.</p>
BBOCBRAK	User ID requirement: RACF special authority.
Done:	This job executes the RACF commands set up in the previous job.
By:	<p>RESULT: You may receive errors, such as INVALID USER messages, from this job because a user ID, group or profile is already defined. Make sure the existing user ID, group or profile has the same characteristics as the user ID, group or profile being created by BBOCBRAK. If not, then change the values in the customization dialog which are causing the conflict, regenerate the customization jobs, and restart the process.</p>
-----	Check user ID authorizations.
Done:	Make sure the WSCFG1 group has read access to all WebSphere product data sets, as well as to CEE.SCEERUN
By:	<p>Make sure the following user IDs have read access to the resolver configuration file in use on your system. Depending on your IP setup, this file may be /etc/resolv.conf, SYS1.TCPPARMS(TCPDATA), or another data set.</p> <p>ASCR1 ASSR1</p> <p>See the z/OS eNetwork Communication Server IP Configuration manual for the resolver search order.</p> <p>Ensure the following user ID has read access to the data sets in your system parmlib concatenation:</p> <p>WSDMNCR1</p> <p>ATTENTION:</p> <p>If operator commands are protected by the z/OS security server at your installation, you must ensure that sufficient authority is given to WebSphere tasks to control operations.</p> <p>The application server Controller user ID (ASCR1), the application server Servant user id (ASSR1), and the Service Daemon user ID (WSDMNCR1) need the ability to perform operations on started tasks belonging to WebSphere Application Server for z/OS in the same cell (or security domain).</p> <p>The RACF commands to authorize these user IDs are not generated by the previous job (BBOCBRAJ). The following example commands show what needs to be done, substituting your profile names:</p> <pre> PERMIT START_profile_name CLASS(OPERCMS) ID (ASCR1 ASSR1 WSDMNCR1) ACCESS(UPDATE) </pre>

	<pre> PERMIT STOP_profile_name CLASS(OPERCMD5) ID (ASCR1 ASSR1 WSDMNCR1) ACCESS(UPDATE) PERMIT MODIFY_profile_name CLASS(OPERCMD5) ID (ASCR1 ASSR1 WSDMNCR1) ACCESS(UPDATE) PERMIT CANCEL_profile_name CLASS(OPERCMD5) ID (ASCR1 ASSR1 WSDMNCR1) ACCESS(UPDATE) PERMIT FORCE_profile_name CLASS(OPERCMD5) ID (ASCR1 ASSR1 WSDMNCR1) ACCESS(UPDATE) </pre>
BBOWCHFS	User ID requirement: UID=0 and authority to allocate
Done:	OMVS.WAS.CONFIG.HFS
	This job:
By:	<ul style="list-style-type: none"> o Creates a mount point directory /WebSphere/V6R0 o Allocates the configuration HFS OMVS.WAS.CONFIG.HFS and mounts it at the above mount point. <p>BEFORE YOU BEGIN: The BBOWCHFS job assumes your root HFS is mounted in read/write mode. If the root HFS is not in read/write mode, manually create the directory</p> <p>/WebSphere/V6R0</p> <p>and any needed higher directories, set file permissions to 775, and set the owning user ID and group to WSADMIN and WSCFG1 before running BBOWCHFS.</p> <p>EXAMPLE: If you plan to use /WebSphere/V6R0 as your directory, issue the following commands from within the OMVS shell:</p> <pre> mkdir -p -m 775 /WebSphere/V6R0 chown -R WSADMIN:WSCFG1 /WebSphere </pre>
BBOWHFSA	User ID requirement: UID=0.
Done:	This job populates the previously-created HFS.
By:	Upon completion, examine the job output. Success is indicated with a RC=0 in the job output.
BBOWCPY1	User ID requirement: update authority for:
Done:	SYS1.PROCLIB
By:	SYS1.PARMLIB

	<p>ATTENTION: This job modifies SYS1.PROCLIB. Because master subsystem address spaces like ATRRRS and BBOWTR must have their cataloged procedures in a PROCLIB listed in the master scheduler JCL, we copy members to SYS1.PROCLIB. You may have a private master subsystem PROCLIB to which you want to copy the members.</p> <p>This job copies the tailored start procedures, parameters, and EXECs to the run-time libraries.</p> <p>ATTENTION: Be aware that you may overlay existing members in the above data sets.</p>
BBOWPFA	User ID requirement: UID=0.
Done:	This job sets up the runtime HFS.
By:	Upon completion, examine the job output. Success is indicated by rc=0.
BBOWHFSB	User ID requirement: UID=0.
Done:	This job will complete the HFS initialization.
By:	Upon completion, examine the job output. Success is indicated with a RC=0 in the job output.
-----	If Resource Recovery Services (RRS) is not active, issue the following MVS command. (To check if RRS is active, go to SDSF or the operator console and see if "RRS" is listed as active).
Done:	
By:	<p>START ATRRRS,SUB=MSTR</p> <p>Note: You know you were successful if the following appears in the SYSLOG:</p> <p>ASA2011I RRS INITIALIZATION COMPLETE. COMPONENT ID=SCRSS</p>
-----	Issue the MVS command:
Done:	TRACE CT,WTRSTART=BBOWTR
By:	<p>This command starts the CTRACE writer used by WebSphere for z/OS.</p> <p>RESULT: Check the SYSLOG for the following:</p> <p>ITT110T INITIALIZATION OF CTRACE WRITER COMPLETE.</p>
-----	Start the application server
Done:	<p>Issue the MVS command</p> <p>START BBO6ACR,JOBNAME=BBOS001, ENV=AQTS.AQTS.BBOS001</p>
By:	This command starts the application server. Wait until the server is finished initializing before proceeding.

	<p>RESULT: The following message appears on the console and in the job log of</p> <p>BBOS001</p> <p>BB000019I INITIALIZATION COMPLETE FOR WEBSHERE FOR z/OS CONTROL PROCESS BBOS001</p>
BBOWIVT	User ID requirement: UID=0 or WSADMIN
Done:	<p>This job runs the IVT application. See related topics in the WebSphere for z/OS Information Center at http://www.ibm.com/software/webservers/appserv/zos_os390/library/</p> <p>for information about how to run this job.</p>
By:	
<p>The product is now configured and verified.</p> <p>To start the application server, issue the MVS command:</p> <pre>START BB06ACR,JOBNAME=BBOS001, ENV=AQTS.AQTS.BBOS001</pre> <p>To stop the application server, enter the MVS command:</p> <pre>STOP BB0DMNB</pre>	

Use the following jobs to configure a database for the Scheduler component. These are optional if you do not plan to use the Scheduler.

	On the z/OS machine that will host the database:
Done:	<ul style="list-style-type: none"> - Log on to the native z/OS environment. - If multiple DB2 systems are installed, then decide which subsystem you want to use. Note the subsystem. - Using the DB2 administration menu, create a new database (SCHEDDB, for example). Note the database name
By:	<ul style="list-style-type: none"> - Create a storage group (or use an existing one) and note the name - Decide which user ID will connect to the database from the remote machine running the product. Normally, for security reasons, this user ID is not the one you used to create the database. - Grant the user ID rights to access the database and storage group. The user ID must also have permission to create new tables for the database.
BBOCRTTS	User ID requirement: WSADMIN
Done:	This job creates the tablespaces in the Scheduler database
By:	
BBOCRTSC	User ID requirement: WSADMIN
Done:	This job creates the schema for the Scheduler database. This job assumes that BBOCRTTS has already been run to create the necessary tablespaces in the Scheduler database
By:	

BBODRPTS	User ID requirement: WSADMIN
Done:	This job drops the previously created Scheduler tablespaces. This job is customized to drop tablespaces which were created with the matching BBOCRPTS job
By:	
BBODRPSC	User ID requirement: WSADMIN
Done:	This job drops the previously created Scheduler schema. This job is customized to drop the schema which was created with the matching BBOCRPSC job
By:	

The following is a useful script that helps you define security controls for clusters. It is in data set

'DATASET.DATA'

BBOWBRAC	This is a sample exec you can modify to include installation-specific RACF controls. This exec defines all the user IDs and groups that are necessary and sufficient for installing WebSphere for z/OS.
Done:	
By:	Additionally, there are commented sections for other components that might be used (SSL, for example).

Working with your new server

Once you complete the customization instructions, you will have a WebSphere Application Server for z/OS stand-alone application server. The application server includes a (simple) cell and node structure. This article provides useful information for when you work with your new server.

Before starting your server

Make sure the WebSphere Application Server for z/OS product HFS and configuration HFS are mounted. If you chose to load the SBBOLPA (and possibly SBBLOAD) into the system link pack area, make sure these libraries are loaded into LPA before starting the server.

Starting the stand-alone application server

To start your stand-alone application server, issue the following MVS console command:

```
START server_proc, JOBNAME=server_name, ENV=cell_name.node_name.server_name
```

where:

- *server_proc* is the stand-alone application server controller cataloged procedure.
- *server_name* is the server short name.
- *node_name* is the node short name.
- *cell_name* is the cell short name.

For example, if you chose default values and your system is named MVSA, you would enter the following START command:

```
START BBO6ACR, JOBNAME=BBOS001, ENV=MVSA.MVSA.BBOS001
```

The START command brings up the controller. The controller starts the location service daemon, then uses WLM to start the servant. You should see a message like the following when the entire server is up and running:

```
BBOO0019I INITIALIZATION COMPLETE FOR WEBSHERE FOR z/OS CONTROL PROCESS
BBOS001
```

Accessing the server administrative console

Once the server is successfully started, access the administrative console by pointing a Web browser to the following URL:

```
http://hostname:http_port/ibm/console
```

where:

- *hostname* is the HTTP transport host name you specified during customization.

Note: If you specified '*' for the HTTP host name, this is actually the node host name.

- *http_port* is the HTTP port you specified during customization.

Note: The default HTTP port for the stand-alone application server is 9080.

Until global security is enabled, you will see a sign-on screen that asks you for a user ID but no password.

The user ID can be anything and is used only to provide basic tracking of changes. Be aware that, until you enable global security, anyone with a Web browser and access to the HTTP port can modify your application serving environment.

You can use the administrative console, scripting, or both to manage the application server and deploy and manage J2EE applications. See Learn about WebSphere applications in the *Administering applications and their environment* PDF book for more information.

Accessing the Samples Gallery

If you chose to install the sample applications, you can access them by pointing a Web browser to the following URL:

```
http://hostname:http_port/WSsamples/
```

where:

- *hostname* is the HTTP transport host name you specified during customization.

Note: If you specified '*' for the HTTP host name, this is actually the node host name.

- *http_port* is the HTTP port that you specified during customization.

Note: The default HTTP port for the stand-alone application server is 9080.

See Accessing the Samples (Samples Gallery) in the *Administering applications and their environment* PDF book for more information.

Stopping your stand-alone application server

The easiest way to stop the stand-alone application server is to stop the location service daemon. The location service daemon holds pointers to modules in common storage, and stopping it forces the rest of the cell to shut down. To stop the location service daemon, enter the following MVS console command:

STOP *daemon_jobname*

where *daemon_jobname* is the location service daemon jobname. The default location service daemon jobname for a stand-alone application server is BBODMNB.

Using the Installation Verification Test

You initially run the installation verification test (IVT), which verifies that WebSphere Application Server is configured correctly for your system, during ISPF customization of each of your systems. If you want to run the IVT at a time other than during initial customization, however, there are two methods from which you can choose.

Note: These options are available only if the user is running a stand-alone application server configuration.

Select either method to invoke the IVT:

- “Running the Installation Verification Test with a job”
- “Running the Installation Verification Test from a command line”

Running the Installation Verification Test with a job

The application server must be running.

Follow these steps to run the Installation Verification Test using the BBOWIVT job.

1. Verify that the application server is running.

Note: The IVT will end unsuccessfully if the server is not running.

2. Confirm that the ivtApp application is installed and started.
3. Submit the job BBOWIVT.

After initialization, the IVT runs its series of verification tests and reports pass or fail status for each in the messages generated by the BBOWIVT job. Once it finishes, check the results in the `install_root/logs/ivt.log` file.

Running the Installation Verification Test from a command line

The application server must be running.

Follow these steps to run the Installation Verification Test from a command line.

1. Verify that the application server is running.

Note: The IVT will end unsuccessfully if the application server is not running.

2. Confirm that the ivtApp application is installed and started.
3. From a command line, navigate to the `/WebSphere/V6R0/AppServer/bin` directory.
4. Issue the following command:

```
ivt.sh [-p port_number] [-host host_name]
```

where

- `-p port_number` is an optional argument that specifies your port number. If you do not specify a port number, the program will use the default port number value of 9080.
- `-host host_name` is an optional argument that specifies your host name. If you do not specify a host name, the program will use the host name value that is set in your TCP/IP hosts file.

Example:

```
/WebSphere/V6R0/AppServer/bin> ivt.sh -p 9090 -host myhost
```

The IVT will run, producing a series of verification tests and reporting pass or fail status in the messages generated by the BBOWIVT job. It will also log results to the `install_root\logs\ivt.log` file.

Note: After command line initialization, the IVT runs its series of verification tests and reports pass or fail status for each. Once it finishes, check the results in the `install_root/logs/ivt.log` file.

Creating a Network Deployment cell

This article leads you through the tasks involved in setting up a WebSphere Application Server for z/OS Network Deployment environment.

Ensure the security domain was successfully created on the z/OS target system(s) for the new Network Deployment cell. Have available a copy of the worksheet that you completed as a part of "Planning for a Network Deployment cell" on page 70.

Perform this task to set up a new WebSphere Application Server for z/OS Network Deployment cell. These steps will set up the cell and the deployment manager node.

1. Log on to TSO on the z/OS system on which you intend to configure the Network Deployment cell's deployment manager. Use a user ID that has READ access to the WebSphere Application Server for z/OS product data sets. You will also need access to a user ID with authority to make security system updates and a user ID with UID 0. (These can all be the same user ID.)
2. Start the Customization Dialog. See "Starting the Customization Dialog" on page 92 for details.
3. Choose the configuration data sets in which you will store your customization jobs and data. See "Choosing configuration data sets" on page 127 for details.
4. Load the security domain variables saved from the security domain you intend to use for this cell. See "Loading the security domain variables" for details.
5. Set the customization variables according to the values recorded on your Network Deployment cell worksheet. See "Setting the customization variables: Network Deployment cell" on page 128 for details.
6. Save the Network Deployment cell customization variables in a data set. See "Saving the cell variables" on page 131 for details. You will use these variables when creating managed nodes for the cell or federating stand-alone application servers into it.
7. Create the customization jobs and files, based on the customization variable values you entered. See "Creating the customization jobs and files" on page 132 for details.
8. Follow the generated customization instructions. See "Following the generated customization instructions: Network Deployment cell" on page 133 for details, and a sample set of customization instructions.

You are done when you have successfully completed the steps in the generated instructions. The new deployment manager is up and running on the chosen z/OS system. See "Working with your new deployment manager" on page 140 for more information.

Add application server nodes to your cell using one of two methods:

- Create a new managed node using the Customization Dialog and add application servers to it using the administrative console or scripting.
- Federate existing stand-alone application server(s) into your Network Deployment cell to create managed nodes with application servers.

Loading the security domain variables

This article describes how to complete the "Load security domain variables" option for a WebSphere Application Server for z/OS Network Deployment cell.

Create the security domain you will use for the new Network Deployment cell and know the name of the saved security domain configuration variable file that you recorded on the security domain worksheet.

The security domain settings are used in the customization of every WebSphere Application Server for z/OS cell. By loading the security domain variables at the start of node or cell creation, you ensure that the security domain configuration you use is consistent and matches the RACF definitions that have already been set as part of security domain configuration.

Complete this task as the first step in configuring a new Network Deployment cell. If you encounter problems during customization and change the security domain variable values, be sure to re-save them.

1. On the 'Configure Deployment Manager Node' panel, type "1" in the *Option* field to select "Load security domain variables" and press **Enter**. You will see a panel that looks similar to the following:

```
----- WebSphere Application Server for z/OS Customization -----  
Option ==>
```

Load Security Domain Variables

Specify the name of a data set containing the security domain variables,
then press Enter to continue.

IBM-supplied defaults are in ''

Data set name:

If this data set is not cataloged, specify the volume.

Volume:

2. Fill in the name of the sequential data set you used to hold the security domain variable values and press **Enter**.

Note: Ensure you enclose the data set name in single quotes.
The security domain variables will load.

The security domain settings are loaded. You can display these variables, but not change them.

Choosing configuration data sets

This article leads you through the "Allocate target data sets" option in the Customization Dialog.

You must start the Customization Dialog and select the "Create a Network Deployment cell" option.

Each option in the Customization Dialog saves customization jobs and files in a pair of customization data sets. While it is possible to reuse these data sets, it is safest to create separate data sets for each WebSphere Application Server for z/OS configuration. We recommend that you use the customization data set name prefix (sometimes referred to as "config_hlq") to indicate the version and release of WebSphere Application Server for z/OS, the task you are performing, and the cell (and, in some cases, the node name) you are configuring.

For example, you might use the following data set name prefix for configuring a WebSphere Application Server for z/OS 6.0.1 Network Deployment cell with cellname AZCELL:

```
SYSPROG.WAS601.AZCELL.NDCONFIG
```

Complete this task before generating the customization jobs and files.

1. On the main Dialog panel, type "2" in the *Option* field to select "Allocate target data sets".
2. Press Enter. **Result:** You see a panel that looks similar to the following:

```
----- WebSphere Application Server for z/OS Customization -----  
Option ==>
```

Allocate Target Data Sets

Specify a high level qualifier (HLQ) and press Enter to allocate the data sets to contain the generated jobs and instructions. You can specify multiple qualifiers (up to 39 characters).

High level qualifier: .CNTL
.DATA

The Dialog will display data set allocation panels. You can make changes to the default allocations, however you should not change the DCB characteristics of the data sets.

- .CNTL - a PDS with fixed block 80-byte records to contain customization jobs.
- .DATA - a PDS with variable length data to contain other data produced by the Customization Dialog.

3. Fill in your chosen configuration data set name prefix value (config_hlq). If the data sets "config_hlq.CNTL" and "config_hlq.DATA" do not exist, you will be prompted for data set allocation information. If the data sets already exist, a message will inform you that they will be reused.

The data sets "config_hlq.CNTL" and "config_hlq.DATA" are allocated and will store customization jobs and files. These data set names will also be saved along with the customization variables.

Setting the customization variables: Network Deployment cell

This article describes how to complete the "Define variables" option for a WebSphere Application Server for z/OS Network Deployment cell.

You must start the Customization Dialog and select the 'Create Network Deployment cells and nodes' option then the 'Create a Network Deployment cell' option. Have Appendix D, "Customization Dialog worksheet: Network Deployment cell," on page 199 completed and at hand.

1. On the 'Configure Deployment Manager Node' panel, type "3" in the *Option* field to select "Define variables" and press **Enter**.
2. On the 'Define Variables to Configure stand-alone application server Node' panel, type "1" in the *Option* field to select "System Locations (directories, HLQs, etc.)" and press **Enter**.
3. Fill in the System Locations panels using the following screen shots as your guides. When you are done with each panel, press **Enter**.

System Locations

```
----- WebSphere Application Server for z/OS Customization -----  
Option ==>
```

System Locations (1 of 2)

Specify the following for the system on which you are installing WebSphere Application Server for z/OS, then press Enter to continue.
For some data sets, specify "Y" if they are in STEPLIB.

System name.: AQTS Sysplex name : MCLXCF01

Full Names of Data Sets

PROCLIB: SYS1.PROCLIB
PARMLIB: SYS1.PARMLIB
SYSEXEC:

Run WebSphere Application Server from STEPLIB (Y/N)? Y
SBBOLPA.: BOSS.VICOM.W000170.SBBOLPA
SBBLOAD: BOSS.VICOM.W000170.SBBLOAD
SBBOLD2.: BOSS.VICOM.W000170.SBBOLD2


```
SBBOEXEC: BOSS.VICOM.W000170.SBBOEXEC
SBBOMSG.: BOSS.VICOM.W000170.SBBOMSG
```

```

Use STEPLIB?
SCEERUN.: CEE.SCEERUN                N
SCEERUN2: CEE.SCEERUN2              N
SGSKLOAD: GSK.SGSKLOAD              N
        (leave SGSKLOAD blank if all systems are at z/OS 1.6 or above)
```

```
----- WebSphere Application Server for z/OS Customization -----
Option ==>
```

System Locations (2 of 2)

Specify the following for your customization, then press Enter to continue.

Locations of HFS Resident Components

WebSphere Application Server product directory:
/usr/lpp/zWebSphere/V6R0

4. On the 'Define Variables to Configure Deployment Manager Node' panel, type "2" in the *Option* field to select "System Environment Customization" and press **Enter**.
5. Fill in the System Environment Customization panel using the following screen shot as your guide. When you are done, press **Enter**.

System Environment Customization

```
----- WebSphere Application Server for z/OS Customization -----
Option ==>
```

System Environment Customization (1 of 1)

Specify the following to customize your system environment, then press Enter to continue.

WebSphere Application Server for z/OS Configuration HFS Information

```
Mount point....: /WebSphere/V6R0
Name.....: OMVS.WAS.CONFIG.HFS
Volume, or '*' for SMS.: *
Primary allocation in cylinders...: 250
Secondary allocation in cylinders.: 100
```

6. On the 'Define Variables to Configure Deployment Manager Node' panel, type "3" in the *Option* field to select "Server Customization" and press **Enter**.
7. Fill in the Server Customization panels using the following screen shots as your guides. When you are done with each panel, press **Enter**.

Server Customization

```
----- WebSphere Application Server for z/OS Customization -----
Option ==>
```

Server Customization (1 of 4)

Specify the following to customize your server, then press Enter to continue.

Deployment Manager Definitions

WebSphere Application Server home directory:
/WebSphere/V6R0
/ DeploymentManager

```
Cell name (short).....: MCLXCF01
Cell name (long).....: MCLXCF01Network
```

Node name (short).....: MCLXCF01
Node name (long).....: MCLXCF01Manager

Server name (short)....: BBODMGR
Server name (long).....: dmgr

Cluster transition name: BBODMGR

----- WebSphere Application Server for z/OS Customization -----
Option ==>

Server Customization (2 of 4)

Specify the following to customize your server, then press Enter
to continue.

Deployment Manager Definitions

Controller Information

Jobname.....: BBODMGR
Procedure name: BB06DCR
User ID.....: DMCR1
UID.....: 2421

Servant Information

Jobname.....: BBODMGRS
Procedure name: BB06DSR
User ID.....: DMSR1
UID.....: 2422

----- WebSphere Application Server for z/OS Customization -----
Option ==>

Server Customization (3 of 4)

Specify the following to customize your server, the press Enter
to continue.

Deployment Manager Definitions

Node host name.....:

SOAP JMX connector port.....: 8879
Cell Discovery Address port.....: 7277
DRS CLIENT Address port.....: 7989

ORB Listener host name.: *

ORB port.....: 9809
ORB SSL port.....: 0

HTTP transport host name: *

HTTP port.....: 9060
HTTP SSL port.....: 9043

The High Availability Manager Host MUST resolve to a single
IP address. It can not be a multihomed host.

High Availability Manager Host:
High Availability Manager Communication Port: 9352

----- WebSphere Application Server for z/OS Customization -----
Option ==>

Server Customization (4 of 4)

Specify the following to customize your server, then press Enter to continue.

Location Service Daemon Definitions

Daemon home directory:
/WebSphere/V6R0/Daemon

Daemon jobname: BB0DMNC

Procedure name.: BB06DMN
User ID.....: WSDMNCR1
UID.....: 2411

IP name.....:
Port.....: 5755
SSL port.....: 5756

Register daemon with WLM DNS: N

8. On the 'Define Variables to Configure Deployment Manager Node' panel, type "4" in the *Option* field to select "View Security Domain Configuration Panels" and press **Enter**. These panels display values you previously set in the "Configure security domain" option--you can not change any of the values here. If you do wish to make changes, you must go back to the main Dialog panel and run through the "Configure security domain" option again.

Saving the cell variables

You must start the Customization Dialog and fill in the variables for the chosen task.

Saving your Network Deployment cell variables allows you to load the same consistent set of values when configuring a new managed node for the cell.

Complete this task after setting the variables for your chosen task. If you encounter problems during customization and change the variable values, be sure to re-save them.

Note: This procedure applies to all Dialog options except "Configure a security domain." For information about saving those variables, see "Saving the security domain variables" on page 100

1. On the main panel for your chosen task, type "S" in the *Option* field to select "Save customization variables" and press **Enter**. You will see a panel that looks similar to the following:

```
----- WebSphere Application Server for z/OS Customization -----  
Option ==>
```

Save Customization Variables

Specify the name of a sequential data set to contain the customization variables, then press Enter to continue. If the data set does not exist, the Dialog displays the Allocate New Data Set panel, with which you can allocate a data set.

Data set name:

2. Fill in the name of the sequential data set you will use to hold the variable values. Choose a data set name that identifies the sysplex, cell or group of cells affected by your chosen task. Enclose the data set name in single quotes. If the data set does not exist, you will be prompted for data set allocation information.
3. Record the name of the data set on the applicable worksheet.

The settings are saved in the data set you selected.

Creating the customization jobs and files

You must select configuration data sets to use and complete the process of defining variables for this task. See “Choosing configuration data sets” on page 127 and “Setting the customization variables: Network Deployment cell” on page 128 for more information.

The Customization Dialog creates customization batch jobs and data files, based on the variable values you specified in the Dialog. The batch jobs and data sets will be written to the config_hlq.CNTL and config_hlq.DATA configuration data sets that you created with the 'Allocate target data sets' option.

1. Ensure the configuration data sets are allocated and not in use.

Note: Editing a member in config_hlq.CNTL or config_hlq.DATA will cause this task to fail.

2. On the 'Configure Deployment Manager Node' panel, type "4" in the *Option* field to select "Generate customization jobs" and press **Enter**. You will have one of two results:

- **Result A:** If all variables are defined correctly, you see the 'Specify Job Cards' panel, which looks similar to this:

```
----- WebSphere Application Server for z/OS Customization -----  
Option ==>
```

Generate Customization Jobs

This portion of the Customization Dialog generates the jobs you must run after you complete this Dialog process. You must complete the customization process before you generate the jobs with this step. If you have not done this, please return to that step.

Jobs and data files will get generated into data sets:

```
'hlq.CNTL'  
'hlq.DATA'
```

If you wish to generate customization jobs using other data sets, then exit from this panel and select option 1 (Allocate target data sets).

All the jobs that will be tailored for you will need a job card. Please enter a valid job card for your installation below. The file tailoring process will update the jobname for you in all the generated jobs, so you need not be concerned with that portion of the job cards below. If continuations are needed, replace the comment cards with continuations.

Specify the job cards, then press Enter to continue.

```
//jobname JOB (ACCTNO,ROOM),'userid',CLASS=A,REGION=0M  
//*  
//*  
//*
```

Note: Pay particular attention to the displayed target data sets. Make sure they are the ones you intend to use.

- **Result B:** If the variables are not defined correctly, you will see the 'Verification' panel. Decide whether the warnings or errors are serious enough to warrant returning to the "Define variables" option.

Note: If the return code is "8" or greater, return to the "Define variables" option and fix the uncovered problems. If you saved the variables previously, be sure to re-save them after making any updates.

3. Fill in the job card information, according to your installation requirements. For each job, the Dialog generates a jobname and the "JOB" keyword to match the member name of the PDS, but you specify the rest.

Note: If you need to run these jobs on a particular system in the sysplex (for example, JES2 MAS or JES3 complex), you should specify the necessary Scheduling Environment (SCHENV), JES2 JOBPARM, or JES3 `//*MAIN` statement at this time.

Example of a job card entry:

```
//jobname JOB 1234,USER1,NOTIFY=????,MSGCLASS=0,REGION=0M
//*          USER=SYSADM1,PASSWORD=SYSADM1
/*JOBPARM  SYSAFF=SYSB
```

Note: This example is useful for jobs that require a user ID other than that of the logged-on TSO user. (This is typically a user ID with UID=0.) In that case, you can just put a comma at the end of the first line, put in the correct user ID on the second line, then uncomment that second line.

You may wish to use RACF SUBMIT authority to avoid having to keep passwords in your configuration data sets.

4. Fix any errors. If there are errors anywhere, you will see the 'Error' panel. Press PF3 to exit the error panel, then enter the correct panel to fix the errors. Then return to the "Generate Customization Jobs" option and pick up where you left off. If necessary, you can update the variables and rerun this option. The generation process will delete and re-tailor all the members.

Note: Compress the configuration data sets before you rerun this option.

You are done when all the jobs are generated. You may then move ahead to viewing the generated jobs. See "Following the generated customization instructions: Network Deployment cell" for more information.

Following the generated customization instructions: Network Deployment cell

You must generate the customization jobs and files for this task.

The Customization Dialog creates a set of instructions for each customization task. Follow these instructions to tailor and customize a Network Deployment cell on your system.

Note: Do not attempt to fix a typo or make a change by modifying the generated output. Many of the variables are used in multiple members of the target data sets, so, if you do not change them all, you will run into problems that are very difficult to diagnose.

1. On the 'Configure Deployment Manager Node' panel, type "5" in the *Option* field to select "View instructions" and press **Enter**. ISPF Browse will open and you will see the BBOCCINS member of config_hlq.CNTL.
2. Read the instructions carefully, both to preview the customization process and to find any typographical or other errors you may have made while entering the customization variable values.
3. Follow the instructions as given. There are two ways to follow the directions:
 - Follow the instructions while remaining in ISPF Browse.
 - Record the data set name and member at the top of the screen and either print the instructions or use ISPF split screen and browse or edit the instructions while you follow them.
4. Fix any problems. If you encounter problems caused by your Customization Dialog values, modify your variables using the Dialog, regenerate the instructions, and restart the customization process.

Note: Remember that you cannot generate new customization jobs while either configuration data set is open!

You are done with this customization task when you have successfully followed the generated instructions.

Sample generated instructions: Network Deployment cell

This article presents a sample of what the Customization Dialog's generated instructions may look like. This is a sample only--you must use the instructions generated from your own variables when configuring your system.

Instructions for customizing WebSphere for z/OS
for a Deployment Manager node.

The customization dialog has created jobs based on the information you provided. These instructions tell you how to modify the operating system and run the jobs to customize WebSphere for z/OS.

RULES:

1. If you created the target data sets (*.CNTL and *.DATA) on another (driving) system, you must copy them to the target system and give them the same data set names.
2. You must perform these instructions on your target system.

Doing manual configuration updates

The customization dialog for WebSphere for z/OS does not attempt to update configuration data for your base operating system or existing subsystems. You must do the following manual steps prior to running the WebSphere for z/OS configuration jobs.

Perform these steps to do manual configuration updates:

1. Update the workload management application environment as follows.

ATTENTION: If you have already installed the WLM-DAE support PTF (APAR OW54622) on z/OS 1.4, or are running a higher level of z/OS, you may skip this step.

Using these parameters, run IWMARIN0 to create the BBODMGR application environment:

```
Appl Environment Name   BBODMGR
Description             WebSphere for z/OS V6 servant
Subsystem type         CB
Procedure name         BB06DSR
Start parameters       JOBNAME=&IWMSSNM.S;
                       ENV=MCLXCF01.MCLXCF01.&IWMSSNM;
```

Limit on starting server address spaces for a subsystem instance:
Single address space per system

NOTE: For the start parameter string, you must continue typing with ENV on the same line as JOBNAME. We show the parameters on separate lines for aesthetics only.

For information about IWMARIN0, the ISPF dialog application for MVS workload management, see z/OS MVS Planning: Workload Management (SA22-7602).

For more information about workload management and WebSphere for z/OS, see related topics in the WebSphere for z/OS Information Center at http://www.ibm.com/software/webservers/appserv/zos_os390/library/.

-
2. Update your active BPXPRMxx member to have the following WebSphere for z/OS configuration HFS:

OMVS.WAS.CONFIG.HFS

mounted at:

/WebSphere/V6R0

in read/write mode.

EXAMPLE:

```
MOUNT FILESYSTEM('OMVS.WAS.CONFIG.HFS')
MOUNTPOINT('/WebSphere/V6R0')
TYPE(HFS)
MODE(RDWR)
```

-
3. Update TCP/IP by reserving the following ports for WebSphere for z/OS:

SOAP JMX Connector port	- 8879
CELL DISCOVERY ADDRESS port	- 7277
ORB port	- 9809
HTTP port	- 9060
HTTP SSL port	- 9043

High Availability Manager Communications port - 9352

Daemon IP port	- 5755
Daemon SSL port	- 5756

View member BBOTCPID in

'DATASET.CNTL'

Add the contents of this member to the PORT section of the file referenced by the DD statement for the TCP/IP profile in the TCP/IP start procedure. Cut and paste from this member into the data set used by your installation.

ATTENTION: If another application has already reserved any of these ports for its own use, you must resolve the resulting conflict before you continue. If you update the WebSphere for z/OS customization dialog with new port specifications, be sure to regenerate the customization jobs, data, and instructions.

-
4. The WebSphere product libraries will be placed in STEPLIB as needed, rather than in the system link pack area and system link list.

SBBOLPA:

=====

The following data set will be placed in the STEPLIB concatenation for the location service daemon. The data set's load modules will be loaded in the MVS common storage area when the location service daemon is started. Make sure the target MVS system has at least 8MB free storage in extended CSA before starting the daemon.

BOSS.VICOM.W000170.SBBOLPA

SBBLOAD and SBBOLD2:

=====

The following data sets will be placed in the STEPLIB concatenation

for the location service daemon, controller and servant regions, and in the setupCmdLine.sh script in the WebSphere Configuration HFS. You must not remove these STEPLIB statements.

```
BOSS.VICOM.W000170.SBBOLOAD
BOSS.VICOM.W000170.SBBOLD2
```

```
BBORTSS5:
=====
```

The BBORTSS5 module is used by WebSphere Application Server V6 for component trace support. A copy of this module must be in the system link pack area in order for CTRACE to work correctly.

If a copy of BBORTSS5 (any release) is currently loaded into LPA, you need take no further action.

Otherwise, issue the following MVS console command to load BBORTSS5 into dynamic LPA:

```
SETPROG LPA,ADD,MODNAME=BBORTSS5,
        DSNAME=BOSS.VICOM.W000170.SBBOLPA
```

Alternatively, you can place the following statement in a parmlib PROGxx member which is activated with the SET PROG= command after system IPL is complete:

```
LPA ADD MODNAME(BBORTSS5) DSNAME(BOSS.VICOM.W000170.SBBOLPA)
```

Make sure that the BBORTSS5 module is loaded into LPA after each system IPL.

-
5. Make sure the following Language Environment data set is in the system link list:

```
CEE.SCEERUN
```

-
6. Make sure the following Language Environment data set is in the system linklist:

```
CEE.SCEERUN2
```

-
7. Make sure the following System SSL data set is in the system link pack area or the system link list on all MVS systems at or below z/OS Version 1.5:

```
GSK.SGSKLOAD
```

-
8. WebSphere for z/OS regions open a large number of files (more than 1024). Make sure your BPXPRMxx parmlib member(s) specify a value of MAXFILEPROC that is greater than or equal to 2000. Use the following MVS console command to see your current MAXFILEPROC setting:

```
D OMVS,OPTIONS
```

9. Grant WSDMNCR1 read access to
 SYS1.PARMLIB
 and any other parmlibs that precede
 SYS1.PARMLIB
 in the parmlib concatenation of the LOADzz member in IPLPARM. Use
 the D IPLINFO command to determine which LOADzz member is current
 and where it resides.

Running the customized jobs

The customization dialog built a number of batch jobs with the variables you supplied. You must run the jobs in the order listed below using user IDs with the appropriate authority.

BEFORE YOU BEGIN: Complete the section above entitled "Doing manual configuration updates."

Follow the table below, which lists in order the jobs you must submit and the commands you must enter. Special handling notes are included in the table. All jobs are members of

DATASET.CNTL

Attention: After submitting each job, carefully check the output. Errors may exist even when all return codes are zero.

+-----+	+-----+
BBODBRAJ	User ID requirement: Authority to update data set
+-----+	+-----+
Done:	DATASET.DATA
By:	This job builds (but does not execute) the RACF commands for the WebSphere for z/OS run-time clusters and places them into member BBODBRAK of data set
	DATASET.DATA
	Carefully review these definitions with your security administrator.
+-----+	+-----+
BBODBRAK	User ID requirement: RACF special authority.
+-----+	+-----+
Done:	This job executes the RACF commands set up in the previous job.
By:	RESULT: You may receive errors, such as INVALID USER messages, from this job because a user ID, group or profile is already defined. Make sure the existing user ID, group or profile has the same characteristics as the user ID, group or profile being created by BBODBRAK. If not, then change the values in the customization dialog which are causing the conflict, regenerate the customization jobs, and restart the process.
	ATTENTION:
	If operator commands are protected by the z/OS security server at your installation, you must ensure that sufficient authority is given to WebSphere tasks to control operations.
	The Deployment Manager Location Service Daemon user ID, (WSDMNCR1), the Deployment Manager Controller user
+-----+	+-----+

ID (DMCR1), and the Deployment Manager Servant user ID (DMSR1) need the ability to perform operations on started tasks belonging to WebSphere Application Server for z/OS in the same cell (or security domain).

The RACF commands to authorize these user IDs are not generated by the previous job (BBODBRAJ). The following example commands show what needs to be done, substituting your profile names:

```
PERMIT START_profile_name CLASS(OPERCMD5)
      ID(WSDMNCR1 DMCR1 DMSR1)
      ACC(UPDATE)
```

```
PERMIT STOP_profile_name CLASS(OPERCMD5)
      ID(WSDMNCR1 DMCR1 DMSR1)
      ACC(UPDATE)
```

```
PERMIT MODIFY_profile_name CLASS(OPERCMD5)
      ID(WSDMNCR1 DMCR1 DMSR1)
      ACC(UPDATE)
```

```
PERMIT CANCEL_profile_name CLASS(OPERCMD5)
      ID(WSDMNCR1 DMCR1 DMSR1)
      ACC(UPDATE)
```

```
PERMIT FORCE_profile_name CLASS(OPERCMD5)
      ID(WSDMNCR1 DMCR1 DMSR1)
      ACC(UPDATE)
```

BBODCHFS | User ID requirement: UID=0 and authority to allocate

Done: | OMVS.WAS.CONFIG.HFS

ATTENTION: Skip this step if the mount point is already created, such as for the stand-alone application server

By: | This job:

- o Creates a mount point directory

/WebSphere/V6R0

- o Allocates the configuration HFS

OMVS.WAS.CONFIG.HFS

and mounts it at the above mount point.

BEFORE YOU BEGIN: The BBODCHFS job assumes your root HFS is mounted in read/write mode. If the root HFS is not in read/write mode, manually create the directory

/WebSphere/V6R0

and any needed higher directories. Set file permissions to 775 and set the owning user ID and group to WSADMIN and WSCFG1 before running BBODCHFS.

EXAMPLE: If you plan to use /WebSphere/V6R0 as your directory, issue the following commands from within the OMVS shell:

```
mkdir -p -m 775 /WebSphere/V6R0
chown -R WSADMIN:WSCFG1 /WebSphere
```

BBODHFSA	User ID requirement: UID=0.
Done:	This job populates the previously-created HFS.
By:	Upon completion, examine the job output. Success is indicated with a RC=0 in the job output.
BBODCPY1	User ID requirement: update authority for:
Done:	
By:	<p>SYS1.PROCLIB</p> <p>ATTENTION: This job modifies SYS1.PROCLIB. Because master subsystem address spaces like ATRRRS and BBOWTR must have their cataloged procedures in a PROCLIB listed in the master scheduler JCL, we copy members to SYS1.PROCLIB. You may have a private master subsystem PROCLIB to which you want to copy the members.</p> <p>This job copies the tailored start procedures, parameters, and EXECs to the run-time product libraries</p> <p>ATTENTION: Be aware that you may overlay existing members in the above data set.</p>
BBOWWPF	User ID requirement: UID=0.
Done:	This job sets up the runtime HFS.
By:	Upon completion, examine the job output. Success is indicated by rc=0.
BBODHFSB	User ID requirement: UID=0.
Done:	This job will complete the HFS initialization.
By:	Upon completion, examine the job output. Success is indicated with a RC=0 in the job output.
-----	If Resource Recovery Services (RRS) is not active, issue the following MVS command. (To check if RRS is active, go to SDSF or the operator console and see if "RRS" is listed as active).
Done:	
By:	<p>START ATRRRS,SUB=MSTR</p> <p>Note: You know you were successful if the following appears in the SYSLOG:</p> <p>ASA2011I RRS INITIALIZATION COMPLETE. COMPONENT ID=SCRSS</p>
-----	Start the Deployment Manager.
Done:	<p>Issue the MVS command</p> <p>START BBO6DCR,JOBNAME=BBODMGR, ENV=MCLXCF01.MCLXCF01.BBODMGR</p>

By:	<p>This command starts the Deployment Manager and also starts the location service daemon. Wait until the server is finished initializing before proceeding.</p> <p>RESULT: The following message appears on the console and in the job log of BBODMGR</p> <pre>BB000019I INITIALIZATION COMPLETE FOR WEBSHERE FOR z/OS CONTROL PROCESS BBODMGR</pre>
-----	--

The product is now configured for a Deployment Manager.

Note: If you want to federate a managed node or stand-alone Application Server node, you will need to run option 2 or 3 of the dialog, respectively.

To start the Deployment Manager, issue the following MVS command:

```
START BB06DCR,JOBNAME=BBODMGR,
ENV=MCLXCF01.MCLXCF01.BBODMGR
```

To stop the WebSphere for z/OS servers, enter the MVS command:

```
STOP BBODMNC
```

The following is a useful script that helps you define security controls. It is in data set

'DATASET.DATA'

BBODBRAC	<p>This is a sample exec that you may modify to include installation-specific RACF controls. This exec defines all the user IDs and groups that are necessary and sufficient for installing WebSphere for z/OS.</p>
Done:	
By:	<p>Additionally, there are commented sections for other components that might be used (SSL, for example).</p>

Working with your new deployment manager

Once you complete the customization instructions, you will have a WebSphere Application Server for z/OS Network Deployment cell. The Network Deployment cell consists of a deployment manager and a location service daemon. (To run J2EE applications, you must add application server nodes. See below for details.) This article provides useful information for working with your new Network Deployment cell.

Before starting your server

Make sure the WebSphere Application Server for z/OS product HFS and configuration HFS are mounted. If you chose to load the SBBOLPA (and possibly SBBOLOAD) into the system link pack area, make sure these libraries are loaded into LPA before starting the server.

Starting the deployment manager

To start your deployment manager, issue the following MVS console command:

```
START server_proc,JOBNAME=dmgr_name,ENV=cell_name.node_name.dmgr_name
```

where:

- *server_proc* is the deployment manager controller cataloged procedure.
- *dmgr_name* is the deployment manager short name.
- *node_name* is the deployment manager node short name.
- *cell_name* is the cell short name.

For example, if you chose default values and your system is named MVSA, you would enter the following START command:

```
START BB06DCR,JOBNAME=BB0DMGR,ENV=MVSA.MVSA.BB0DMGR
```

The START command brings up the deployment manager controller. The controller starts the location service daemon, then uses WLM to start the deployment manager servant. You should see a message like the following when the deployment manager is up and running:

```
BBOO0019I INITIALIZATION COMPLETE FOR WEBSHERE FOR z/OS CONTROL PROCESS  
BB0DMGR
```

Accessing the server administrative console

Once the deployment manager is successfully started, access the administrative console by pointing a Web browser to the following URL:

```
http://hostname:http_port/ibm/console
```

where:

- *hostname* is the deployment manager HTTP transport host name you specified during customization.

Note: If you specified '*' for the deployment manager HTTP host name, this is actually the deployment manager node host name.

- *http_port* is the deployment manager HTTP port you specified during customization.

Note: The default HTTP port for the deployment manager is 9060.

Until global security is enabled, you will see a sign-on screen that asks you for a user ID but no password.

The user ID can be anything and is used only to provide basic tracking of changes. Be aware that, until you enable global security, anyone with a Web browser and access to the HTTP port can modify your application serving environment.

You can use the administrative console, scripting, or both to manage the Network Deployment cell and deploy and manage J2EE applications. See *Learn about WebSphere applications in the Administering applications and their environment* PDF book for more information. Before you can deploy applications, however, you need to add application server nodes to your Network Deployment cell.

Adding application server nodes

Application server nodes (also called managed nodes) in a Network Deployment cell consist of a node agent and any number of application servers per node.

Note: Each z/OS system also needs one location service daemon for each stand-alone or Network Deployment cell hosted on the system.

Add an application server node to a Network Deployment cell using one of two methods:

- Create an (empty) managed node using the Customization Dialog. The new node can reside on the same or a different z/OS system as the deployment manager. The new managed node, consisting of just a node agent and perhaps a location service daemon, is federated into the Network Deployment cell. Once this is done, you can use the administrative console or scripting to add application servers and deploy and manage J2EE applications in the node. See “Planning for a new managed node in a Network Deployment cell” on page 77 for more information.
- Federate an existing stand-alone application server into the Network Deployment cell. The stand-alone server node becomes a managed node in the Network Deployment cell, along with any J2EE applications that have been deployed on it. See “Planning to federate a stand-alone server into a Network Deployment cell” on page 83 for more information.

Stopping your deployment manager

Use one of the following two methods to stop your deployment manager:

- Stop the location service daemon, which also stops the deployment manager and any of the cell’s managed nodes on the same z/OS system. The location service daemon holds pointers to modules in common storage, and stopping it forces the cell’s nodes on the same z/OS system as the location service daemon to shut down. To stop the location service daemon, enter the following MVS console command:

```
STOP daemon_jobname
```

where *daemon_jobname* is the location service daemon jobname. The default location service daemon jobname for a Network Deployment cell is BBODMNC.

Note: This is the easiest way to stop the deployment manager.

- Stop just the deployment manager, leaving the location service daemon and any managed nodes on the z/OS system still running. This works because the deployment manager is used to administer only the cell—it does not need to be up for J2EE applications in the cell to run. To stop the deployment manager, enter the following MVS console command:

```
STOP dmgr_name
```

where *dmgr_name* is the deployment manager short name. The default deployment manager short name is BBODMGR.

Creating a managed server node

This article leads you through the tasks involved in creating a WebSphere Application Server for z/OS managed server node.

Perform this task to create a new WebSphere Application Server for z/OS managed node.

1. Log on to TSO on the z/OS system on which you intend to configure the managed node. Use a user ID that has READ access to the WebSphere Application Server for z/OS product data sets. You will also need access to a user ID with authority to make security system updates and a user ID with UID 0. (These can all be the same user ID.)
2. Start the Customization Dialog. See “Starting the Customization Dialog” on page 92 for details.

3. Choose the configuration data sets in which you will store your customization jobs and data. See “Choosing configuration data sets” on page 144 for details.
4. Load the security domain variables saved from the security domain you intend to use for this cell. See “Loading the security domain variables” for details. (Optionally, you can use the L command to load the Network Deployment cell variables if you saved them during Network Deployment cell setup. Network Deployment cell variables include the security domain variables--you do not need to load both.)
5. Set the customization variables according to the values recorded on your managed node worksheet. See “Setting the customization variables: Managed node” on page 144 for details.
6. (Optional but recommended.) Save the managed node customization variables in a data set. See “Saving the cell variables” on page 131 for details.
7. Create the customization jobs and files, based on the customization variable values you entered. See “Creating the customization jobs and files” on page 148 for details.
8. Follow the generated customization instructions. See “Following the generated customization instructions: Managed node” on page 149 for details, and a sample set of customization instructions.

You are done when you have successfully completed the steps in the generated instructions. The new managed node is up and running on the chosen z/OS system. See “Working with your new managed server node” on page 155 for more information.

Loading the security domain variables

This article describes how to complete the “Load security domain variables” option for a WebSphere Application Server for z/OS managed node.

Create the security domain you will use for the new managed node and know the name of the saved security domain configuration variable file that you recorded on the security domain worksheet.

The security domain settings are used in the customization of every WebSphere Application Server for z/OS cell. By loading the security domain variables at the start of node or cell creation, you ensure that the security domain configuration you use is consistent and matches the RACF definitions that have already been set as part of security domain configuration.

Complete this task as the first step in configuring a new managed node. If you encounter problems during customization and change the security domain variable values, be sure to re-save them.

1. On the ‘Configure Managed Node’ panel, type “1” in the *Option* field to select “Load security domain variables” and press **Enter**. You will see a panel that looks similar to the following:

```
----- WebSphere Application Server for z/OS Customization -----
Option ==>
```

```
Load Security Domain Variables
```

```
Specify the name of a data set containing the security domain variables,
then press Enter to continue.
```

```
IBM-supplied defaults are in ''
```

```
Data set name:
```

```
If this data set is not cataloged, specify the volume.
```

```
Volume:
```

2. Fill in the name of the sequential data set you used to hold the security domain variable values and press **Enter**.

Note: Ensure you enclose the data set name in single quotes.
The security domain variables will load.

The security domain settings are loaded. You can display these variables, but not change them.

Choosing configuration data sets

This article leads you through the "Allocate target data sets" option in the Customization Dialog.

You must start the Customization Dialog and select the "Create an empty managed node and add it to an existing Network Deployment cell." option.

Each option in the Customization Dialog saves customization jobs and files in a pair of customization data sets. While it is possible to reuse these data sets, it is safest to create separate data sets for each WebSphere Application Server for z/OS configuration. We recommend that you use the customization data set name prefix (sometimes referred to as "config_hlq") to indicate the version and release of WebSphere Application Server for z/OS, the task you are performing, and the cell (and, in some cases, the node name) you are configuring. For example, you might use the following data set name prefix for configuring a WebSphere Application Server for z/OS 6.0.1 managed node named MA6N01 for cell MAINT1:

JULIA.WASV6R1.MAINT1.MA6N01.MANAGED

Complete this task before generating the customization jobs and files.

1. On the main Dialog panel, type "2" in the *Option* field to select "Allocate target data sets".
2. Press Enter. **Result:** You see a panel that looks similar to the following:

```
----- WebSphere Application Server for z/OS Customization -----  
Option ==>
```

Allocate Target Data Sets

Specify a high level qualifier (HLQ) and press Enter to allocate the data sets to contain the generated jobs and instructions. You can specify multiple qualifiers (up to 39 characters).

High level qualifier: .CNTL
.DATA

The Dialog will display data set allocation panels. You can make changes to the default allocations, however you should not change the DCB characteristics of the data sets.

.CNTL - a PDS with fixed block 80-byte records to contain customization jobs.

.DATA - a PDS with variable length data to contain other data produced by the Customization Dialog.

3. Fill in your chosen configuration data set name prefix value (config_hlq). If the data sets "config_hlq.CNTL" and "config_hlq.DATA" do not exist, you will be prompted for data set allocation information. If the data sets already exist, a message will inform you that they will be reused.

The data sets "config_hlq.CNTL" and "config_hlq.DATA" are allocated and will store customization jobs and files. These data set names will also be saved along with the customization variables.

Setting the customization variables: Managed node

This article describes how to complete the "Define variables" option for a WebSphere Application Server for z/OS managed node.

You must start the Customization Dialog and select the 'Create Network Deployment cells and nodes' option then the 'Create an empty managed node and add it to an existing Network Deployment cell' option. Have Appendix E, "Customization Dialog worksheet: Managed node," on page 203 completed and at hand.

1. On the 'Configure Managed Node' panel, type "3" in the *Option* field to select "Define variables" and press **Enter**.
2. On the 'Define Variables to Configure stand-alone application server Node' panel, type "1" in the *Option* field to select "System Locations (directories, HLQs, etc.)" and press **Enter**.
3. Fill in the System Locations panels using the following screen shots as your guides. When you are done with each panel, press **Enter**.

System Locations

```
----- WebSphere Application Server for z/OS Customization -----
Option ==>
```

System Locations (1 of 2)

Specify the following for the system on which you are installing WebSphere Application Server for z/OS, then press Enter to continue. For some data sets, specify "Y" if they are in STEPLIB.

System name.: AQTS Sysplex name : MCLXCF01

Full Names of Data Sets

PROCLIB: SYS1.PROCLIB
PARMLIB: SYS1.PARMLIB
SYSEXEC:

Run WebSphere Application Server from STEPLIB (Y/N)? Y

SBBOLPA.: BOSS.VICOM.W000170.SBBOLPA
SBBLOAD.: BOSS.VICOM.W000170.SBBLOAD
SBBOLD2.: BOSS.VICOM.W000170.SBBOLD2
SBBOEXEC: BOSS.VICOM.W000170.SBBOEXEC
SBBOMSG.: BOSS.VICOM.W000170.SBBOMSG

Use STEPLIB?

SCEERUN.: CEE.SCEERUN N
SCEERUN2: CEE.SCEERUN2 N
SGSKLOAD: GSK.SGSKLOAD N

(leave SGSKLOAD blank if all systems are at z/OS 1.6 or above)

```
----- WebSphere Application Server for z/OS Customization -----
Option ==>
```

System Locations (2 of 2)

Specify the following for your customization, then press Enter to continue.

Locations of HFS Resident Components

WebSphere Application Server product directory:
/usr/lpp/zWebSphere/V6R0

4. On the 'Define Variables to Configure Managed Node' panel, type "2" in the *Option* field to select "System Environment Customization" and press **Enter**.
5. Fill in the System Environment Customization panel using the following screen shot as your guide. When you are done, press **Enter**.

System Environment Customization

```
----- WebSphere Application Server for z/OS Customization -----
Option ==>
```

System Environment Customization (1 of 1)

Specify the following to customize your system environment, then press Enter to continue.

WebSphere Application Server for z/OS Configuration HFS Information

```
Mount point....: /WebSphere/V6R0
Name.....: OMVS.WAS.CONFIG.HFS
Volume, or '*' for SMS.: *
Primary allocation in cylinders...: 250
Secondary allocation in cylinders.: 100
```

6. On the 'Define Variables to Configure Managed Node' panel, type "3" in the *Option* field to select "Server Customization" and press **Enter**.
7. Fill in the Server Customization panels using the following screen shots as your guides. When you are done with each panel, press **Enter**.

Server Customization

```
----- WebSphere Application Server for z/OS Customization -----
Option ==>
```

Server Customization (1 of 4)

Specify the following to customize your node, then press Enter to continue.

Cell and Node Definitions

```
WebSphere Application Server home directory:
/WebSphere/V6R0
/ AppServer
```

Node Host Name: QWEQ

```
Cell name (short).....: AQTS
Cell name (long).....: AQTS
```

```
Node name (short).....: AQTS
Node name (long).....: AQTS
```

Admin asynch operations procedure name: BBOW6SH

```
----- WebSphere Application Server for z/OS Customization -----
Option ==>
```

Server Customization (2 of 4)

Specify the following to customize your node, then press Enter to continue.

Procedure Name Definitions

Controller Information

```
Procedure name: BB06ACR
User ID.....: ASCR1
UID.....: 2431
```

Servant Information

```
Procedure name: BB06ASR
User ID.....: ASSR1
UID.....: 2432
```

Control Region Adjunct

Procedure name: BB06CRA
User ID.....: ASCRA1
UID.....: 2433

----- WebSphere Application Server for z/OS Customization -----
Option ==>

Server Customization (3 of 4)

Specify the following to customize daemon definitions for your node, then press Enter to continue

Location Service Daemon Definitions

Daemon home directory:
/WebSphere/V6R0/Daemon

Daemon jobname: BB0DMNB

Procedure name.: BB06DMN
User ID.....: WSDMNCR1
UID.....: 2411

----- WebSphere Application Server for z/OS Customization -----
Option ==>

Server Customization (4 of 4)

Specify the following, which will be used in a job to federate your node into the specified Deployment Manager cell.

WebSphere Application Server home directory:
/WebSphere/V6R0
/ AppServer

Deployment Manager Access

Node host name.....:
JMX SOAP port.....: 8879
Deployment manager security is enabled: N
User ID.....: WSADMIN

Node group name.....: DefaultNodeGroup

Node Agent Definitions

Server name (short)...: BBON001
Server name (long)...: nodeagent
JMX SOAP connector port.....: 9360
Node Discovery port.....: 7272
Node Multicast Discovery port..: 5000

The High Availability Manager Host must not be multihomed

High Availability Manager Host:

High availability manager communication port: 9354

ORB listener host name...: *
ORB port.....: 2809
ORB SSL port.....: 0

8. On the 'Define Variables to Configure Managed Node' panel, type "4" in the *Option* field to select "View Security Domain Configuration Panels" and press **Enter**. These panels display values you previously set in the "Configure security domain" option--you can not change any of the values here. If you do wish to make changes, you must go back to the main Dialog panel and run through the "Configure security domain" option again.

Creating the customization jobs and files

You must select configuration data sets to use and complete the process of defining variables for this task. See “Choosing configuration data sets” on page 144 and “Setting the customization variables: Managed node” on page 144 for more information.

The Customization Dialog creates customization batch jobs and data files, based on the variable values you specified in the Dialog. The batch jobs and data sets will be written to the config_hlq.CNTL and config_hlq.DATA configuration data sets that you created with the 'Allocate target data sets' option.

1. Ensure the configuration data sets are allocated and not in use.

Note: Editing a member in config_hlq.CNTL or config_hlq.DATA will cause this task to fail.

2. On the 'Configure Managed Node' panel, type "4" in the *Option* field to select "Generate customization jobs" and press **Enter**. You will have one of two results:

- **Result A:** If all variables are defined correctly, you see the 'Specify Job Cards' panel, which looks similar to this:

```
----- WebSphere Application Server for z/OS Customization -----  
Option ==>
```

Generate Customization Jobs

This portion of the Customization Dialog generates the jobs you must run after you complete this Dialog process. You must complete the customization process before you generate the jobs with this step. If you have not done this, please return to that step.

Jobs and data files will get generated into data sets:

```
'hlq.CNTL'  
'hlq.DATA'
```

If you wish to generate customization jobs using other data sets, then exit from this panel and select option 1 (Allocate target data sets).

All the jobs that will be tailored for you will need a job card. Please enter a valid job card for your installation below. The file tailoring process will update the jobname for you in all the generated jobs, so you need not be concerned with that portion of the job cards below. If continuations are needed, replace the comment cards with continuations.

Specify the job cards, then press Enter to continue.

```
//jobname JOB (ACCTNO,ROOM),'userid',CLASS=A,REGION=0M  
//*  
//*  
//*
```

Note: Pay particular attention to the displayed target data sets. Make sure they are the ones you intend to use.

- **Result B:** If the variables are not defined correctly, you will see the 'Verification' panel. Decide whether the warnings or errors are serious enough to warrant returning to the "Define variables" option.

Note: If the return code is "8" or greater, return to the "Define variables" option and fix the uncovered problems. If you saved the variables previously, be sure to re-save them after making any updates.

3. Fill in the job card information, according to your installation requirements. For each job, the Dialog generates a jobname and the "JOB" keyword to match the member name of the PDS, but you specify the rest.

Note: If you need to run these jobs on a particular system in the sysplex (for example, JES2 MAS or JES3 complex), you should specify the necessary Scheduling Environment (SCHENV), JES2 JOBPARM, or JES3 `//*MAIN` statement at this time.

Example of a job card entry:

```
//jobname JOB 1234,USER1,NOTIFY=????,MSGCLASS=0,REGION=0M
//*          USER=SYSADM1,PASSWORD=SYSADM1
/*JOBPARM  SYSAFF=SYSB
```

Note: This example is useful for jobs that require a user ID other than that of the logged-on TSO user. (This is typically a user ID with UID=0.) In that case, you can just put a comma at the end of the first line, put in the correct user ID on the second line, then uncomment that second line.

You may wish to use RACF SUBMIT authority to avoid having to keep passwords in your configuration data sets.

4. Fix any errors. If there are errors anywhere, you will see the 'Error' panel. Press PF3 to exit the error panel, then enter the correct panel to fix the errors. Then return to the "Generate Customization Jobs" option and pick up where you left off. If necessary, you can update the variables and rerun this option. The generation process will delete and re-tailor all the members.

Note: Compress the configuration data sets before you rerun this option.

You are done when all the jobs are generated. You may then move ahead to viewing the generated jobs. See "Following the generated customization instructions: Managed node" for more information.

Following the generated customization instructions: Managed node

You must generate the customization jobs and files for this task.

The Customization Dialog creates a set of instructions for each customization task. Follow these instructions to tailor and customize a managed node on your system.

Note: Do not attempt to fix a typo or make a change by modifying the generated output. Many of the variables are used in multiple members of the target data sets, so, if you do not change them all, you will run into problems that are very difficult to diagnose.

1. On the 'Configure Managed Node' panel, type "5" in the *Option* field to select "View instructions" and press **Enter**. ISPF Browse will open and you will see the BBOMDINS member of config_hlq.CNTL.
2. Read the instructions carefully, both to preview the customization process and to find any typographical or other errors you may have made while entering the customization variable values.
3. Follow the instructions as given. There are two ways to follow the directions:
 - Follow the instructions while remaining in ISPF Browse.
 - Record the data set name and member at the top of the screen and either print the instructions or use ISPF split screen and browse or edit the instructions while you follow them.
4. Fix any problems. If you encounter problems caused by your Customization Dialog values, modify your variables using the Dialog, regenerate the instructions, and restart the customization process.

Note: Remember that you cannot generate new customization jobs while either configuration data set is open!

You are done with this customization task when you have successfully followed the generated instructions.

Sample generated instructions: Managed node

This article presents a sample of what the Customization Dialog's generated instructions may look like.

This is a sample only--you must use the instructions generated from your own variables when configuring your system.

Instructions for customizing WebSphere for z/OS
for a Managed node.

The customization dialog has created jobs based on the information you provided. These instructions tell you how to modify the operating system and run the jobs to customize WebSphere for z/OS.

RULES:

1. If you created the target data sets (*.CNTL and *.DATA) on another (driving) system, you must copy them to the target system and give them the same data set names.
2. You must perform these instructions on your target system.

Doing manual configuration updates

The customization dialog for WebSphere for z/OS does not attempt to update configuration data for your base operating system or existing subsystems. You must do the following manual steps prior to running the WebSphere for z/OS configuration jobs.

Perform these steps to do manual configuration updates:

1. Update the workload management application environment as follows.

ATTENTION: If you have already installed the WLM-DAE support PTF (APAR OW54622) on z/OS 1.4, or are running a higher level of z/OS, you may skip this step.

Using these parameters, run IWMARIN0 to create the <cluster_transition_name> application environment:

```
Appl Environment Name   <cluster_transition_name>
Description             WebSphere for z/OS V6 servant
Subsystem type          CB
Procedure name          BB06ASR
Start parameters        JOBNAME=&IWMSSNM.S; ,
                        ENV=AQTS.AQTS.&IWMSSNM;
```

Limit on starting server address spaces for a subsystem instance:
Single address space per system

NOTE: For the start parameter string, you must continue typing with ENV on the same line as JOBNAME. We show the parameters on separate lines for aesthetics only.

For information about IWMARIN0, the ISPF dialog application for MVS workload management, see z/OS MVS Planning: Workload Management (SA22-7602).

For more information about workload management and WebSphere for z/OS, see related topics in the WebSphere for z/OS Information Center at http://www.ibm.com/software/webservers/appserv/zos_os390/library/.

-
2. Update BLSCUSER. Refer to member BB0IPCSP in

'DATASET.CNTL'

In order to use the IPCS support provided by the product, append the contents of this member to the BLSCUSER member in your IPCSPARM or system PARMLIB datasets.

-
3. Update SCHEDxx. Refer to member BBOSCHED in

'DATASET.CNTL'

In order to set the correct program properties for the WebSphere for z/OS run-time executables, append the contents of this member to the SCHEDxx member in your system PARMLIB concatenation.

Note: When you are finished, issue the command SET SCH=(xx,xx) to activate SCHEDxx and load a new program properties table.

4. Make sure the following data sets are APF-authorized:

```
BOSS.VICOM.W000170.SBBOLPA
BOSS.VICOM.W000170.SBBLOAD
BOSS.VICOM.W000170.SBBOLD2
CEE.SCEERUN
CEE.SCEERUN2
GSK.SGSKLOAD
```

Add these datasets to your PROGxx or IEAAPFxx parmlib members, as appropriate, ensuring you specify the correct volsers.

5. If you want to collect the SMF120 records created by the run-time servers, update SMFPRMxx via the following:

- a. Update the SYS or SUBSYS(STC,...) statement for started tasks to include the 120 record.
- b. (Optional) You can specify designated subtypes 1-6.

EXAMPLE:

```
SUBSYS(STC,EXITS(IEFU29,IEFACTRT),INTERVAL(SMF,SYNC),
        TYPE(0,30,70:79,88,89,120,245))
---
```

For details on the SMF records, see related topics in the WebSphere for z/OS Information Center at http://www.ibm.com/software/webservers/appserv/zos_os390/library/

6. Update your active BPXPRMxx member to have the following WebSphere for z/OS configuration HFS:

OMVS.WAS.CONFIG.HFS

mounted at:

/WebSphere/V6R0

in read/write mode.

EXAMPLE:

```
MOUNT FILESYSTEM('OMVS.WAS.CONFIG.HFS')
MOUNTPOINT('/WebSphere/V6R0')
TYPE(HFS)
MODE(RDWR)
```

7. The WebSphere product libraries will be placed in STEPLIB as needed, rather than in the system link pack area and system link list.

SBBOLPA:

=====

The following data set will be placed in the STEPLIB concatenation for the location service daemon. The data set's load modules will be loaded in the MVS common storage area when the location service daemon is started. Make sure the target MVS system has at least 8MB free storage in extended CSA before starting the daemon.

BOSS.VICOM.W000170.SBBOLPA

SBBOLOAD and SBBOLD2:

=====

The following data sets will be placed in the STEPLIB concatenation for the location service daemon, controller and servant regions, and in the setupCmdLine.sh script in the WebSphere Configuration HFS. You must not remove these STEPLIB statements.

BOSS.VICOM.W000170.SBBOLOAD

BOSS.VICOM.W000170.SBBOLD2

BBORTSS5:

=====

The BBORTSS5 module is used by WebSphere Application Server V5 and V6 for component trace support. A copy of this module must be in the system link pack area in order for CTRACE to work correctly.

If a copy of BBORTSS5 (any release) is currently loaded into LPA, you need take no further action.

Otherwise, issue the following MVS console command to load BBORTSS5 into dynamic LPA:

```
SETPROG LPA,ADD,MODNAME=BBORTSS5,  
        DSNAME=BOSS.VICOM.W000170.SBBOLPA
```

Alternatively, you can place the following statement in a parmlib PROGxx member which is activated with the SET PROG= command after system IPL is complete:

```
LPA ADD MODNAME(BBORTSS5) DSNAME(BOSS.VICOM.W000170.SBBOLPA)
```

Make sure that the BBORTSS5 module is loaded into LPA after each system IPL.

8. Make sure the following Language Environment data set is in the system link list:

CEE.SCEERUN

9. Make sure the following Language Environment data set is in the system link list:

CEE.SCEERUN2

10. Make sure the following System SSL data set is in the system link pack area or the system link list on all MVS systems at or below z/OS Version 1.5:

GSK.SGSKLOAD

11. WebSphere for z/OS regions open a large number of files (more than 1024). Make sure your BPXPRMxx parmlib member(s) specify a value of MAXFILEPROC that is greater than or equal to 2000. Use the following MVS console command to see your current MAXFILEPROC setting:

D OMVS,OPTIONS

Running the customized jobs

The customization dialog built a number of batch jobs with the variables you supplied. You must run the jobs in the order listed below using user IDs with the appropriate authority.

BEFORE YOU BEGIN: Complete the section above entitled "Doing manual configuration updates."

Follow the table below, which lists in order the jobs you must submit and the commands you must enter. Special handling notes are included in the table. All jobs are members of

DATASET.CNTL

Attention: After submitting each job, carefully check the output. Errors may exist even when all return codes are zero.

BBOMSGC	User ID requirement: Update authority for data set SYS1.MSGENU and/or SYS1.MSGJPN.
Done:	ATTENTION: This is optional unless you require message translation.
By:	This job sets up MMS to translate messages for WebSphere for z/OS. There are two steps to update SYS1.MSGENU and SYS1.MSGJPN. Remove the unneeded step and change the target libraries, if necessary.
BBOWNMT	User ID requirement: UID=0 and authority to allocate
Done:	OMVS.WAS.CONFIG.HFS This job:
By:	o Creates a mount point directory /WebSphere/V6R0 o Allocates the configuration HFS OMVS.WAS.CONFIG.HFS and mounts it at the above mount point.

	<p>BEFORE YOU BEGIN: The BBOWMNMT job assumes your root HFS is mounted in read/write mode. If the root HFS is not in read/write mode, manually create the directory</p> <pre>/WebSphere/V6R0</pre> <p>and any needed higher directories, set file permissions to 775, and set the owning user ID and group to WSADMIN and WSCFG1 before running BBOWMNMT.</p> <p>EXAMPLE: If you plan to use /WebSphere/V6R0M0 as your directory, issue the following commands from within the OMVS shell:</p> <pre>mkdir -p -m 775 /WebSphere/V6R0M0 chown -R WSADMIN:WSCFG1 /WebSphere</pre>
BBOMHFA	User ID requirement: UID=0.
Done:	This job populates the previously-created HFS.
By:	Upon completion, examine the job output. Success is indicated with a RC=0 in the job output.
BBOWCPYM	User ID requirement: update authority for:
Done:	SYS1.PROCLIB
By:	<p>This job copies the tailored start procedures, parameters, and EXECs to the run-time libraries.</p> <p>ATTENTION: Be aware that you may overlay existing members in the above data sets.</p>
BBOWWPFM	User ID requirement: UID=0.
Done:	This job sets up the runtime HFS.
By:	Upon completion, examine the job output. Success is indicated by rc=0.
BBOMHFSB	User ID requirement: UID=0.
Done:	This job will complete the HFS initialization.
By:	Upon completion, examine the job output. Success is indicated with a RC=0 in the job output.
BBOWMNAN	User ID requirement: UID=0.
Done:	This job will federate your node into the specified Deployment Manager cell. Ensure that your Deployment Manager is running before submitting this job
By:	Upon completion, examine the job output. Success is indicated with a RC=0 in the job output.

```

+-----+
| ----- | Start the node agent server
+-----+
|         | Note: The node agent is automatically started by the node
|         | federation process. This step is information, for
|         | starting the node agent at other times.
|         |
|         | Issue the following MVS command to start your node agent
|         | server:
| Done:   |
|         |     START BB06ACR,JOBNAME=BBON001,
| By:    |     ENV=.AQTS.BBON001
|         |
|         | RESULT: The following message appears on the console and
|         | in the job log of BBON001.
|         |
|         |     BB000019I INITIALIZATION COMPLETE FOR WEBSHERE FOR
|         |     z/OS CONTROL PROCESS BBON001
+-----+
|         | The product is now configured. You may create and manage
|         | application servers in the node using the administrative console or
|         | scripting.
+-----+

```

Working with your new managed server node

Once you complete the customization instructions, you will have a WebSphere Application Server for z/OS application server node (managed node) in your Network Deployment cell, with the same node name and server name(s) as your old stand-alone application server.

Before starting your server

Make sure the WebSphere Application Server for z/OS product HFS and configuration HFS are mounted. If you chose to load the SBBOLPA (and possibly SBBOLOAD) into the system link pack area, make sure these libraries are loaded into LPA before starting the server.

Starting the node agent

To start your node agent, issue the following MVS console command:

```
START server_proc,JOBNAME=nodeagent_name,ENV=cell_name.node_name.nodeagent_name
```

where

- server_proc is the node agent cataloged procedure.
- nodeagent_name is the node agent short name.
- node_name is the node short name.
- cell_name is the cell short name.

For example, if you chose default values, your sysplex is named CELL1 and your system is named MVSA, you would enter the following START command:

```
START BB06ACR,JOBNAME=BBON001,ENV=CELL1.MVSA.BBON001
```

The START command brings up the node agent. The node agent starts the location service daemon (if one is not already running). You should see a message like the following when the node is up and running:

BBOO0019I INITIALIZATION COMPLETE FOR WEBSHERE FOR z/OS CONTROL PROCESS
BBON001

The node agent must be running in order for the deployment manager to administer the node.

Administering the node through the administrative console

If the deployment manager for the cell is up and running, access the administrative console by pointing a Web browser to the following URL:

```
http://hostname:http_port/ibm/console
```

where

- *hostname* is the deployment manager HTTP transport host name you specified during customization.

Note: If you specified '*' for the deployment manager HTTP host name, this is actually the deployment manager node host name.

- *http_port* is the deployment manager HTTP port you specified during customization.

Note: The default HTTP port for the deployment manager is 9060.

Until global security is enabled, you will see a sign-on screen that asks you for a user ID but no password.

The user ID can be anything and is used only to provide basic tracking of changes. Be aware that, until you enable global security, anyone with a Web browser and access to the HTTP port can modify your application serving environment.

You can use the administrative console, scripting, or both to manage the node and deploy and manage J2EE applications. See Learn about WebSphere applications in the *Administering applications and their environment* PDF book for more information. Before you can deploy applications, however, you need to add application servers to your managed node.

Adding application servers

Application servers can be added to the managed server node using the administrative console or scripting. Either of two methods can be used:

- Create a new application server directly using the administrative console or scripting. See Creating application servers in the *Setting up the application serving environment* PDF book for more information. You can use the controller, servant and CRA cataloged procedures and user IDs created during the managed node setup process for any application servers you create in the managed node.
- Cluster an existing application server in another node, using this managed node as a target. This will create a "cloned" copy of the application server being clustered in your new managed node. See Creating clusters in the *Setting up the application serving environment* PDF book for more information.

Starting application servers

To start one of your managed node's application servers, issue the following MVS console command:

```
START server_proc,JOBNAME=server_name,ENV=cell_name.node_name.server_name
```

where

- *server_proc* is the application server agent cataloged procedure (may be the same as the node agent cataloged procedure).
- *server_name* is the application server short name.

- node_name is the node short name.
- cell_name is the cell short name.

For example, if you chose the default procedure name, your sysplex is named CELL1, your node is named MVSA, and your server is named AZSR01A, you would enter the following START command:

```
START BB06ACR,JOBNAME=AZSR01A,ENV=CELL1.MVSA.AZSR01A
```

The START command brings up the application server controller. The controller starts the location service daemon (if one is not already running), and then uses WLM to start the control region adjunct and the servant(s). You should see a message like the following when the node is up and running:

```
BBOO0019I INITIALIZATION COMPLETE FOR WEBSPHERE FOR z/OS CONTROL PROCESS
AZSR01A
```

Stopping your managed node

Use one of the following two methods to stop your deployment manager:

- Stop the location service daemon, which also stops any of the cell's nodes on the same z/OS system. The location service daemon holds pointers to modules in common storage, and stopping it forces all cell members on the same z/OS system as the daemon to shut down. To stop the location service daemon, enter the following MVS console command:

```
STOP daemon_jobname
```

where daemon_jobname is the location service daemon jobname. The default location service daemon jobname for a Network Deployment cell is BBODMNC.

- Stop just the node agent and its application servers, leaving the location service daemon, the deployment manager (if present) and any other managed nodes on the z/OS system still running. To stop the node agent, enter the following MVS console command:

```
STOP nodeagent_name
```

where nodeagent_name is the node agent short name. The default deployment manager short name is BBON001.

Federating a stand-alone application server into a Network Deployment cell

This article leads you through the tasks involved in federating a WebSphere Application Server for z/OS stand-alone application server into a Network Deployment cell.

Perform this task to federate an existing WebSphere Application Server for z/OS stand-alone application server into a Network Deployment cell.

1. Log on to TSO on the z/OS system on which you intend to federate the server. Use a user ID that has READ access to the WebSphere Application Server for z/OS product data sets. You will also need access to a user ID with authority to make security system updates and a user ID with UID 0. (These can all be the same user ID.)
2. Start the Customization Dialog. See “Starting the Customization Dialog” on page 92 for details.
3. Choose the configuration data sets in which you will store your customization jobs and data. See “Choosing configuration data sets” on page 159 for details.
4. Load the security domain variables saved from the security domain you intend to use for this cell. See “Loading the security domain variables” on page 158 for details.
5. Set the customization variables according to the values recorded on your federated application server node worksheet. See “Setting the customization variables: Federated application server node” on page 159 for details.

6. (Optional but recommended.) Save the federated application server node customization variables in a data set. See “Saving the cell variables” on page 131 for details. You will use these variables when creating managed nodes for the cell or federating stand-alone application servers into it.
7. Create the customization jobs and files, based on the customization variable values you entered. See “Creating the customization jobs and files” on page 160 for details.
8. Follow the generated customization instructions. See “Following the generated customization instructions: Federated application server node” on page 162 for details, and a sample set of customization instructions.

You are done when you have successfully completed the steps in the generated instructions. The new federated application server node is up and running on the chosen z/OS system. See “Working with your new federated server node” on page 165 for more information.

Loading the security domain variables

This article describes how to complete the “Load security domain variables” option for a WebSphere Application Server for z/OS federated application server node.

Create the security domain you will use for the new federated application server node and know the name of the saved security domain configuration variable file that you recorded on the security domain worksheet.

The security domain settings are used in the customization of every WebSphere Application Server for z/OS cell. By loading the security domain variables at the start of node or cell creation, you ensure that the security domain configuration you use is consistent and matches the RACF definitions that have already been set as part of security domain configuration.

Complete this task as the first step in configuring a new federated application server node. If you encounter problems during customization and change the security domain variable values, be sure to re-save them.

1. On the ‘Federate stand-alone application server node’ panel, type “1” in the *Option* field to select “Load security domain variables” and press **Enter**. You will see a panel that looks similar to the following:

```
----- WebSphere Application Server for z/OS Customization -----
Option ==>
```

```
Load Security Domain Variables
```

```
Specify the name of a data set containing the security domain variables,
then press Enter to continue.
```

```
IBM-supplied defaults are in ''
```

```
Data set name:
```

```
If this data set is not cataloged, specify the volume.
```

```
Volume:
```

2. Fill in the name of the sequential data set you used to hold the security domain variable values and press **Enter**.

Note: Ensure you enclose the data set name in single quotes.
The security domain variables will load.

The security domain settings are loaded. You can display these variables, but not change them.

Choosing configuration data sets

This article leads you through the "Allocate target data sets" option in the Customization Dialog.

You must start the Customization Dialog and select the "Federate an existing stand-alone application server node into an existing Network Deployment cell" option.

Each option in the Customization Dialog saves customization jobs and files in a pair of customization data sets. While it is possible to reuse these data sets, it is safest to create separate data sets for each WebSphere Application Server for z/OS configuration. We recommend that you use the customization data set name prefix (sometimes referred to as "config_hlq") to indicate the version and release of WebSphere Application Server for z/OS, the task you are performing, and the cell (and, in some cases, the node name) you are configuring.

Complete this task before generating the customization jobs and files.

1. On the main Dialog panel, type "2" in the *Option* field to select "Allocate target data sets".
2. Press Enter. **Result:** You see a panel that looks similar to the following:

```
----- WebSphere Application Server for z/OS Customization -----  
Option ==>
```

Allocate Target Data Sets

Specify a high level qualifier (HLQ) and press Enter to allocate the data sets to contain the generated jobs and instructions. You can specify multiple qualifiers (up to 39 characters).

High level qualifier: .CNTL
.DATA

The Dialog will display data set allocation panels. You can make changes to the default allocations, however you should not change the DCB characteristics of the data sets.

.CNTL - a PDS with fixed block 80-byte records to contain customization jobs.

.DATA - a PDS with variable length data to contain other data produced by the Customization Dialog.

3. Fill in your chosen configuration data set name prefix value (config_hlq). If the data sets "config_hlq.CNTL" and "config_hlq.DATA" do not exist, you will be prompted for data set allocation information. If the data sets already exist, a message will inform you that they will be reused.

The data sets "config_hlq.CNTL" and "config_hlq.DATA" are allocated and will store customization jobs and files. These data set names will also be saved along with the customization variables.

Setting the customization variables: Federated application server node

This article describes how to complete the "Define variables" option for a WebSphere Application Server for z/OS federated node.

You must start the Customization Dialog and select the 'Create Network Deployment cells and nodes' option then the 'Federate an existing stand-alone application server node into an existing Network Deployment cell' option. Have Appendix F, "Customization Dialog worksheet: Federated application server node," on page 207 completed and at hand.

1. On the "Federate stand-alone application server Node" panel, type "3" in the *Option* field to select "Define variables" and press **Enter**.
2. Fill in the federate node Define Variables panel using the following screen shots as your guides. When you are done with each, press **Enter**.

Define Variables for Federate stand-alone application server Node (1 of 2)

```
----- WebSphere Application Server for z/OS Customization -----
Option ==>
```

Define Variables for Federate stand-alone application server Node (1 of 2)
Specify the following to customize your server, then press Enter
to continue.

```
WebSphere Application Server home directory:
  /WebSphere/V6R0
  / AppServer
Deployment Manager Access
Node host name.....:
JMX SOAP port.....: 8879
Deployment manager security is enabled: N
User ID.....: WSADMIN
```

```
Include Apps.....: Y
Application server's ORB port..: 9810
Node group name.....: DefaultNodeGroup
```

```
Node Agent Definitions
Server name (short)...: BBON001
Server name (long)...: nodeagent
JMX SOAP connector port.....: 9360
Node Discovery port.....: 7272
Node Multicast Discovery port..: 5000
High availability manager communication port: 9354
```

```
ORB listener host name...: *
ORB port.....: 2809
ORB SSL port.....: 0
```

Define Variables for Federate stand-alone application server Node (1 of 2)

```
----- WebSphere Application Server for z/OS Customization -----
Option ==>
```

Define Variables for Federate stand-alone application server Node (2 of 2)
Specify the following to customize your server, then press Enter
to continue.

```
Do you wish to federate service integration buses
that exist on this node?" (Y/N): N
```

Creating the customization jobs and files

You must select configuration data sets to use and complete the process of defining variables for this task. See “Choosing configuration data sets” on page 159 and “Setting the customization variables: Federated application server node” on page 159 for more information.

The Customization Dialog creates customization batch jobs and data files, based on the variable values you specified in the Dialog. The batch jobs and data sets will be written to the config_hlq.CNTL and config_hlq.DATA configuration data sets that you created with the 'Allocate target data sets' option.

1. Ensure the configuration data sets are allocated and not in use.

Note: Editing a member in config_hlq.CNTL or config_hlq.DATA will cause this task to fail.

2. On the 'Federate stand-alone application server Node' panel, type "4" in the *Option* field to select "Generate customization jobs" and press **Enter**. You will have one of two results:
 - **Result A:** If all variables are defined correctly, you see the 'Specify Job Cards' panel, which looks similar to this:

```
----- WebSphere Application Server for z/OS Customization -----
Option ==>
```

Generate Customization Jobs

This portion of the Customization Dialog generates the jobs you must run after you complete this Dialog process. You must complete the customization process before you generate the jobs with this step. If you have not done this, please return to that step.

Jobs and data files will get generated into data sets:

```
'hlq.CNTL'  
'hlq.DATA'
```

If you wish to generate customization jobs using other data sets, then exit from this panel and select option 1 (Allocate target data sets).

All the jobs that will be tailored for you will need a job card. Please enter a valid job card for your installation below. The file tailoring process will update the jobname for you in all the generated jobs, so you need not be concerned with that portion of the job cards below. If continuations are needed, replace the comment cards with continuations.

Specify the job cards, then press Enter to continue.

```
//jobname JOB (ACCTNO,ROOM),'userid',CLASS=A,REGION=0M  
//*  
//*  
//*
```

Note: Pay particular attention to the displayed target data sets. Make sure they are the ones you intend to use.

- **Result B:** If the variables are not defined correctly, you will see the 'Verification' panel. Decide whether the warnings or errors are serious enough to warrant returning to the "Define variables" option.

Note: If the return code is "8" or greater, return to the "Define variables" option and fix the uncovered problems. If you saved the variables previously, be sure to re-save them after making any updates.

3. Fill in the job card information, according to your installation requirements. For each job, the Dialog generates a jobname and the "JOB" keyword to match the member name of the PDS, but you specify the rest.

Note: If you need to run these jobs on a particular system in the sysplex (for example, JES2 MAS or JES3 complex), you should specify the necessary Scheduling Environment (SCHENV), JES2 JOBPARM, or JES3 /*MAIN statement at this time.

Example of a job card entry:

```
//jobname JOB 1234,USER1,NOTIFY=????,MSGCLASS=0,REGION=0M  
//*          USER=SYSADM1,PASSWORD=SYSADM1  
/*JOBPARM  SYSAFF=SYSB
```

Note: This example is useful for jobs that require a user ID other than that of the logged-on TSO user. (This is typically a user ID with UID=0.) In that case, you can just put a comma at the end of the first line, put in the correct user ID on the second line, then uncomment that second line. You may wish to use RACF SUBMIT authority to avoid having to keep passwords in your configuration data sets.

4. Fix any errors. If there are errors anywhere, you will see the 'Error' panel. Press PF3 to exit the error panel, then enter the correct panel to fix the errors. Then return to the "Generate Customization Jobs" option and pick up where you left off. If necessary, you can update the variables and rerun this option. The generation process will delete and re-tailor all the members.

Note: Compress the configuration data sets before you rerun this option.

You are done when all the jobs are generated. You may then move ahead to viewing the generated jobs. See “Following the generated customization instructions: Federated application server node” for more information.

Following the generated customization instructions: Federated application server node

You must generate the customization jobs and files for this task.

The Customization Dialog creates a set of instructions for each customization task. Follow these instructions to tailor and customize a federated node on your system.

Note: Do not attempt to fix a typo or make a change by modifying the generated output. Many of the variables are used in multiple members of the target data sets, so, if you do not change them all, you will run into problems that are very difficult to diagnose.

1. On the 'Federate stand-alone application server Node' panel, type "5" in the *Option* field to select "View instructions" and press **Enter**. ISPF Browse will open and you will see the BBOANINS member of config_hlq.CNTL.
2. Read the instructions carefully, both to preview the customization process and to find any typographical or other errors you may have made while entering the customization variable values.
3. Follow the instructions as given. There are two ways to follow the directions:
 - Follow the instructions while remaining in ISPF Browse.
 - Record the data set name and member at the top of the screen and either print the instructions or use ISPF split screen and browse or edit the instructions while you follow them.
4. Fix any problems. If you encounter problems caused by your Customization Dialog values, modify your variables using the Dialog, regenerate the instructions, and restart the customization process.

Note: Remember that you cannot generate new customization jobs while either configuration data set is open!

You are done with this customization task when you have successfully followed the generated instructions.

Sample generated instructions: Federated application server node

This article presents a sample of what the Customization Dialog's generated instructions may look like. This is a sample only--you must use the instructions generated from your own variables when configuring your system.

Instructions for customizing WebSphere for z/OS
for Federate stand-alone application server node.

The customization dialog has created jobs based on the information you provided. These instructions tell you how to modify the operating system and run the jobs to customize WebSphere for z/OS.

RULES:

1. If you created the target data sets (*.CNTL and *.DATA) on another (driving) system, you must copy them to the target system and give them the same data set names.
2. You must perform these instructions on your target system.
3. Update TCP/IP by reserving the following ports for WebSphere for z/OS:

SOAP JMX Connector port	- 9360
Node Discovery port	- 7272

Node Multicast Discovery Port - 5000
 Node Agent's ORB port - 2809
 High Availability Manager Communication port - 9354
 application server's ORB Port - 9810

View member BBOTCPA in

'DATASET.CNTL'.

Add the contents of this member to the PORT section of the file referenced by the DD statement for the TCP/IP profile in the TCP/IP start procedure. Cut and paste from this member into the data set used by your installation.

Note: The addNode process introduces a special utility server to the node. This utility server is called a nodeagent and exists to support administrative functions on the node. By default the nodeagent takes over ORB port 2809. Note on WebSphere z/OS the ORB port doubles as the INS CosNaming bootstrap port. By default, this port (2809) was assigned to the application server. Normally you want the nodeagent to be the INS CosNaming bootstrap point for the entire node, so that RMI/IIOP clients that do not override the INS CosNaming bootstrap defaults can locate within the namespace, EJBs installed on any server on that node. In order for the nodeagent to take over port 2809, the application server must be assigned a new ORB port. The default new ORB port for the application server is 9810. The nodeagent will take over a application server's ORB port if and only if the nodeagent's ORB port is equal to an application server's ORB port. You can specify the nodeagent's ORB port in the 'ORB port' field. You can specify the new ORB port for the application server in the 'Application Server's ORB Port' field.

ATTENTION: Skip this step if the ports are already defined in the TCP/IP profile.

4. You must first complete the customization of a stand-alone application server and the customization of a deployment manager server before starting these instructions. Also, ensure that the deployment manager server has been started before starting these instructions.

	User ID requirement: Authority to define a log stream.
Done:	NOTE: if you are not using logstream for transaction XA, you can skip this step.
By:	The process used to Federate an existing Application Server causes the user data of this application server to be changed.
	NOTE 2: STOP server prior to running BBOLOGSD. BBOLOGSD will fail if the server is active.
	Please run the following two jobs that were generated during stand-alone application server configuration:
	BBOLOGSD -- this will delete the logstreams that were allocated by BBOLOGSA earlier.
	BBOLOGSA -- this will create a new logstream with the application servers new user data.
	This is done so that IXGLOGR will not attempt to connect

	this new server to an old logstream which would produce an error.
BBOWADDN	User ID requirement: WSADMIN
Done:	Add the application server(s) associated with the stand-alone application server node to the deployment manager's cell.
By:	<p>ATTENTION: Before you run this job (BBOWADDN) to federate the stand-alone application server node, you must have started the stand-alone Application server that you are federating at least once so the applyPTF step runs. Otherwise, the BBOWADDN job will fail with an error such as:</p> <pre>java.lang.NullPointerException at com.ibm.ws.management.tools.NodeFederationUtility .createNDProductFile(NodeFederationUtility.java:1929)</pre> <p>Note: Run this job only once for each node that you federate, regardless of how many application servers the node contains.</p> <p>RESULT: Upon successful completion of this job, you will see the following message in SYSPRINT:</p> <pre>ADMU0003I: Node <nodename> has been successfully federated.</pre>
-----	Update the application server's WLM application environment.
Done:	ATTENTION: If you have already installed the WLM DAE APAR (APAR OW54622) on z/OS 1.4, or are running a higher level of z/OS, you may skip this step.
By:	<p>If you do not have this WLM DAE APAR, you will need to update your static WLM definitions for the application server(s) on the stand-alone application server node you just federated into a Network Deployment cell. This is because the WLM APPLENV definitions for each server includes a reference to the server's cell short name in the ENV parameter that is part of the start parameters in APPLENV definition. The ENV parameter is encoded as follows:</p> <pre>ENV=<CellShortName>.<NodeShortName>.<ServerShortName></pre> <p>After federating a stand-alone application server node into a Network Deployment cell, the cell identity of the stand-alone application server(s) changes from whatever it was to the cell identity of the Network Deployment cell. This means that you have to update the ENV parameter in the WLM APPLENV definition(s) for the server(s) on the newly federated node.</p> <p>To obtain the name(s) of the WLM application environments to be changed, access the WebSphere adminconsole application running on the deployment manager node by pointing a Web browser to the following address:</p> <pre>http://1234: 9060/admin</pre>

	<p>Select Servers, then application servers. For each application server, click on the server name, then scroll down to find the application server "short Name". Find and select the server's "Custom Properties". In the Custom Properties list, you will find a property named 'ClusterTransitionName', which is also the server's WLM application environment. Use the IWMARINO application under TSO to modify these WLM application environment(s) so that the ENV= field begins with the deployment manager cell name instead of the stand-alone server cell name. Install and apply the updated WLM service definition before continuing.</p>
-----	Start the node agent server
Done:	<p>Note: The node agent is automatically started by the node federation process. This step is information, for starting the node agent at other times.</p> <p>If your application server proc name is XXXXXXXX and your application server node name (short) is YYYYYYYY, issue the MVS command</p>
By:	<pre>START XXXXXXXX,JOBNAME=BBON001, ENV=.YYYYYYYY.BBON001</pre> <p>This command starts the node agent server.</p> <p>RESULT: The following message appears on the console and in the job log of BBON001.</p> <pre>BB000019I INITIALIZATION COMPLETE FOR WEBSHERE FOR z/OS CONTROL PROCESS BBON001.</pre>
-----	Start the application server (optional)
Done:	<p>Note: You must start the node agent before you start the application server, if the node agent has not already been started</p>
By:	<p>Example: If your application server proc name is XXXXXXXX, your application server node name (short) is YYYYYYYY, and your server short name is BBOS001, issue the MVS command</p> <pre>START XXXXXXXX,JOBNAME=BBOS001, ENV=.YYYYYYYY.BBOS001</pre> <p>This command starts the application server.</p> <p>RESULT: The following message appears on the console and in the job log of BBOS001.</p> <pre>BB000019I INITIALIZATION COMPLETE FOR WEBSHERE FOR z/OS CONTROL PROCESS BBOS001</pre>

Working with your new federated server node

Once you have successfully federated an application server node:

- Check the default host alias list and all other cell-level documents to see if any need to be added in support of the application(s) and application server(s) on the newly federated node. Cell-level documents are **NOT** automatically updated by the federation process.
- Remove the location service daemon port definitions for the stand-alone application server cell, since these are not used after federation.

Once these tasks are accomplished, a federated application server node is just like any other application server node. The primary difference is that it already has an application server, and applications, if they were federated as well. See “Working with your new server” on page 123 for further information.

Chapter 9. Applying product maintenance

Maintaining the stand-alone z/OS environment in addition to WebSphere Application Server can require an in-depth knowledge of applying service and the product service stream. This is especially important in a high yield production environment where availability is of the utmost importance. Therefore, planning service and knowing how to best apply service are essential skills.

Contact the IBM Software Support Center for information about preventive service planning (PSP) upgrades for WebSphere Application Server for z/OS. For more information about PSP upgrades, see *WebSphere Application Server for z/OS V5.0: Program Directory*. Although the *Program Directory* contains a list of required program temporary fixes (PTFs), the most current information is available from the IBM Software Support Center.

Use the following procedure whenever you wish to apply a new service release to your system.

1. Make copies of your product data sets and HFS structure.
2. Ensure your deployment manager node is at the same or a later service level than the application server nodes.
3. Apply the desired maintenance to the copies of your product data set and HFS structure.

Note: Notice if you receive WTOR message BBOO0286A when applying your service. This is significant because it means the service you installed contains defects that are not backwards-compatible and you must therefore run the `backoutPTF.sh` script if you want to backout the service later.

4. Stop the application servers and the WebSphere Application Server for z/OS location service daemon.
5. Stop CTRACE.
6. Switch to the newly-serviced WebSphere Application Server for z/OS product data sets. You can do this one of two ways:
 - a. Rename the new data sets to replace the old ones.
 - b. Recatalog the product data sets, if the names are identical, or change WebSphere Application Server for z/OS cataloged procedures to refer explicitly to the new data sets.

Note: If you use new data set names, you need to also handle program controls, so ensure you update the program control list.

Verify that the MVS link list and APF list refer to the newly-serviced data sets.

7. If the WebSphere Application Server for z/OS run-time is loaded into the link pack area, delete the old modules and load the new ones, or IPL the system to load the new modules into the LPA.
8. Verify that the newly-serviced HFS data sets are correctly mounted.
9. Perform any other migration actions as instructed in PTF or APAR cover letters.
10. Start the location service daemon and application servers.
11. Complete any necessary post-install tasks.

You can maintain service to clients when upgrading the host cluster of WebSphere Application Server for z/OS.

Applying a service level or restoring to the previous accepted service level

Service which is applied to the WebSphere Application Server for z/OS product data sets and product HFS occasionally requires corresponding changes to be made to the configuration HFS for existing application serving environments which configure at a lower service level. Most of these "post-maintenance" or "post-install" updates can be performed automatically. This is done by the post-installer.

The WebSphere Application Server for z/OS post-installer is a set of scripts that can be used to:

- Automatically detect and apply post-PTF service.
- Back out (uninstall) service from the configuration HFS when returning to an older service level.

The post-install process is performed at the node level and must run against each node's WebSphere Application Server home directory after maintenance is applied to the product data sets and HFS, and before the node is started. The post-install process can be performed:

- automatically, by leaving the configured JCL statements in the controller cataloged procedures that start the post-installer. A console message will be displayed whenever the post-install detects service to be applied. In some cases, some post-install steps may still have to be performed manually. The post-installer will detect these situations and refuse to start the server.
- manually. You can run the post-installer yourself against each node's WebSphere Application Server home directory, after installing maintenance and before starting the node(s).

For more information about the post-installer, and how to use it to apply or back out service to the configuration HFS, see

- "Post-install tasks to complete after using SMP/E to apply a new service level"
- "Post-install tasks to complete before using SMP/E to restore to the previous accepted service level" on page 170

Note: You may find it useful to set up a WLM rule to combat performance problems related to post-install. See Workload management (WLM) tuning tips for z/OS in the *Tuning* PDF book for more information.

Post-install tasks to complete after using SMP/E to apply a new service level

This topic describes post-install tasks you complete after applying a new service level.

The post-install functionality includes actions you perform the first time the server is restarted after you install service with SMP/E. This applies to WebSphere Application Server for z/OS as well as WebSphere Business Integration Server Foundation for z/OS. Depending on your system restrictions, you can choose to initialize post-install processing either automatically or manually.

Automatic mode, which is recommended, includes a new step that automatically launches the "applyPTF.sh" shell script in the server procedure. The applyPTF.sh script, which is located in your bin directory (\$WAS_HOME/bin, where \$WAS_HOME is the absolute path of the WebSphere run-time home directory), makes sure that any pending post-install actions are properly applied before starting the server.

Manual mode is necessary only if the automatic mode does not conform to your organization standards (for example, if multi-step procedures are not allowed), if there is something else in your configuration that prevents the applyPTF.sh shell script from running properly, or if you are applying a particular service release that requires manual intervention.

Post-install processing executes under the controller proc, so it executes with the identity assigned to that particular proc. While that identity has sufficient authority to perform most HFS file actions required on the WebSphere run-time home directory, you cannot assume it to have the appropriate authority for your applyPTF.sh shell script. Therefore, you cannot perform any post-install action that requires special authority by "inline" apply processing. You must manually perform any such apply processing in "batch" mode, running applyPTF.sh or the appropriate jobs from a user that has the needed authority to apply a particular action.

Note:

- When you launch the shell script from the server proc, it automatically runs in "inline" mode and can only apply service that qualifies as "inline."
- If batch service is delivered, you'll find the needed user authority noted in the service level documentation.

You can run the post installer either automatically or manually. Follow the set of steps below that applies to your circumstance.

1. Run the post installer automatically. It is recommended that you read the ++HOLD FOR ACTION instructions to determine if you need to run the post installer in batch mode.
 - a. Classify BPXBATCH using the WLM Workload Classification Rules for OMVS work. Use the started task jobnames to classify this work into the appropriate service class. This facilitates more efficient execution in automatic mode.
2. OR, run the post installer manually.
 - a. Edit your server control process procedures (for example, BBO5ACR) to remove the BPXBATCH step that invokes the applyPTF.sh script.
 - b. After rolling service to each system, run batch job BBOWAPLB for a stand-alone application server node or BBOWAPLD for a deployment manager node.

The post installer component enforces that certain actions are performed successfully and preconditions are met before applying service. Otherwise, warnings or error messages result. If you launched the applyPTF.sh script from the server proc, the output is appended to the file \$WAS_HOME/properties/service/logs/ applyPTF.out. If you ran applyPTF.sh manually from the shell, the output goes right to stdout (on the shell from where the applyPTF.sh script was run) and WTO messages are issued. In the latter case, no output is appended to the applyPTF.log log file.

Whenever actions are performed on the run-time home directory, a log file is kept. When warnings or errors occur, the absolute path to the log file is displayed so that you can examine the details of the problem. The following is a list of common errors that might occur when the post installer (applyPTF.sh) applies service. The errors will most likely appear in the form of error codes on the console on which applyPTF.sh was issued.

The post installer ran and determined that SMP/E restored the SMP/E home directory to a previous level of service than that at which the WebSphere run-time home directory is running.

This occurs if the you used SMP/E to restore to the previous accepted service level without first running the backoutPTF.sh shell script. The server will not start if it detects this condition, and post-install action halts without applying service.

The post installer issued a warning message while installing service.

The WebSphere Application Server for z/OS multi-product PTF post installer detected warnings that were issued during the application of post-install service for the product listed. The application of service was successful, but the warning messages should be examined. The warning messages are listed in the log file in the HFS file that is specified in the message.

The post installer incurred an error and stopped processing.

The WebSphere Application Server for z/OS multi-product PTF post installer encountered an error while installing service for the product indicated in the message. The details of the error are contained

in the HFS log file that is specified in the message. When this happens, review the log and correct the error. The servers will not be permitted to start until the error is corrected.

The post installer encountered warnings while applying service.

The WebSphere Application Server for z/OS multi-product PTF post installer detected warnings that were issued during the application of post-install service. The warnings may have been issued while post-install service was being applied for WebSphere Application Server for z/OS or any of the extension products that are installed. A BBOO0250W message should have already been issued for each product that encountered warnings when the post-install service was applied.

Reply with `Continue` to continue starting the application server. Reply with `Cancel` to cancel starting the application server. Because service has already been completed, the multi-product PTF post installer will not run again the next time the server is restarted.

Post-install tasks to complete before using SMP/E to restore to the previous accepted service level

This topic describes those post-install tasks you may need to complete before using SMP/E to restore to the previous accepted service level.

If you install service and then find that, for some reason or another, you need to revert to a previous release, you typically need only to use SMP/E to restore to the previous accepted service level. However, some service releases contain defects that are incompatible with previous releases of WebSphere Application Server for z/OS.

Note: You will know if you are applying a service level that contains backward-incompatible defects if you receive message BBOO0286A (WTOR message 286) when the post installer applies the service. The console will prompt you to accept the backward-incompatible change. If you decide to not accept the change, you must either use SMP/E to roll back to the previous level or follow the post-install backout plans described in “Post-install tasks to complete after using SMP/E to apply a new service level” on page 168.

When you restore to the previous accepted service release, you need to first “back off” any post-install actions containing backwards-incompatible defects that were applied during that service before using SMP/E to restore to the previous accepted service level. This topic describes the steps necessary to run the “backoutPTF.sh” shell script, which is located in your bin directory (\$WAS_HOME/bin, where \$WAS_HOME is the absolute path of the WebSphere run-time home directory) and which handles for you the backing out of applied post-install service.

1. Bring down those servers in the node for which you are doing backoff processing.
2. Launch the backoutPTF.sh script. You will need to specify the product and the committed service level to which you intend SMP/E to revert.

Example: This is an example of the command used to run the backoutPTF.sh shell script, run from the shell by a user with the proper authority. It prepares the WebSphere Application Server for z/OS run-time home directory to run at service level “W601000.”

```
backoutPTF.sh WebSphere W601000
```

Note:

- For WebSphere Application Server for z/OS only, the shell script uses service levels of the form “Wvrmxyy” (PTF), “AQxxxxx” (++)APAR), or UQxxxx (SMP/E service).
 - The shell script is case sensitive.
3. After using the backoutPTF.sh shell script, follow the normal SMP/E procedures for restoring to the previous accepted service level.

You know you are done when you are successfully back on the desired service level.

The following is a list of common errors that might occur when you use `backoutPTF.sh` to back out of service. The output goes right to `stdout` (on the shell from where the `applyPTF.sh` script was run).

A valid, currently installed PTF or APAR name and the target service level must be specified (case sensitive).

If a PTF or APAR isn't specified, then the "usage" of the command is printed.

Chapter 10. Troubleshooting installation and configuration

This topic describes troubleshooting the installation of the WebSphere Application Server Network Deployment product.

Use this topic after installing your WebSphere Application Server product.

The successful installation of the Network Deployment product is a two-part process:

- The first step is using the installation wizard to install a shared set of core product files.
- The second step is using the *Profile creation wizard* to create a *deployment manager profile*, an *application server profile*, or a *custom profile*.

If an installation is not successful, use this troubleshooting information to correct the problems.

The *install_root/logs/log.txt* file, the *install_root/logs/wasprofile/wasprofile_create_profile_name.log* file, and the *profiles_root/profile_name/logs/pctLog.txt* file record installation status.

The installer program records the following indicators of success in the logs:

- INSTCONFSUCCESS
- INSTCONFPARTIALSUCCESS
- INSTCONFFAILED

If the error happens early in the installation, look for the *log.txt* file in the system temporary area. The installation program copies the log from the temporary area to the *logs* directory at the end of the installation.

Perform the following procedure to troubleshoot an installation.

1. Check the installation log files for errors after installing:

During installation, a single entry in the *install_root/logs/log.txt* file points to the temporary log file, either *%TEMP%\log.txt* on Windows platforms, or */tmp/log.txt* on Linux and UNIX platforms. The installation program copies the file from the temporary directory to the *install_root/logs/log.txt* location at the end of the installation.

If the installation fails and the *install_root/logs/log.txt* has only this one pointer to the temporary directory, open the *log.txt* file in the temporary directory. The log might have clues to the installation failure. Uninstalling creates the *install_root/logs/uninstlog.txt* file.

Log more information when InstallShield for MultiPlatforms (ISMP) cannot start the Installation wizard.

Verify or troubleshoot the installation if the *install_root/logs/log.txt* file or the *profiles_install_root/profile_name/logs/pctLog.txt* file does not contain a record of any problems, but problems exist. If the *profiles_install_root/profile_name* directory exists, the *pctLog.txt* file is in the *logs* directory. If the error happens early in the installation, look for the logs in the system temporary area. The installation program copies the logs from the system temporary area to the *logs* directory at the end of the installation.

If the *profiles_install_root/profile_name* directory does not exist, the *pctLog.txt* file is in the *USER_HOME* directory and is named *.\$~pctLog.txt*. Issue the **env** command to display the *USER_HOME* directory on Linux and UNIX systems. See the environment variable settings on Windows system to display the value of the variable.

Certain events can prevent ISMP from starting the Installation wizard. Such an event is not enough disk space to launch the Installation wizard, for example. If your installation fails and there is no information in the installation logs, use the *-log* parameter to record entries for events that cause the ISMP program to fail to start the installation wizard. The syntax of the **install** command for logging such events is:

```

install -options fully_qualified_options_response_file_name
        -silent
        -log # !fully_qualified_log_file_name @ALL
install -options "/usr/IBM/WebSphere/silentFiles/myresponsefile.txt"
        -silent -log # !/usr/IBM/WebSphere/myOptionFiles/log.txt @ALL
install -options "/opt/IBM/WebSphere/silentFiles/myresponsefile.txt"
        -silent -log # !/opt/IBM/WebSphere/myOptionFiles/log.txt @ALL
install.exe -options "C:\IBM\WebSphere\silentFiles\myresponsefile.txt"
            -silent -log # !C:\IBM\WebSphere\silentFiles\log.txt @ALL

```

Attention:

The following examples show how to use the -log parameter when creating a deployment manager profile.

The command is in the *install_root/bin/ProfileCreator* directory. The name of the command varies per platform:

Log file names and locations

The following information shows the log files for all of the installable components on the product disc.

Log files for IBM HTTP Server

The following table shows the installation log locations when installing IBM HTTP Server V6.

Table 4. Installation log locations when installing IBM HTTP Server

Windows system log path name	Linux and UNIX operating system log path name
C:\Program Files\IBM HTTP Server\log.txt	
C:\Program Files\IBM HTTP Server\ihsv6_install.log	

Log files for Application Client for WebSphere Application Server

The following table shows the installation log locations when installing the application clients for Version 6.

Table 5. Installation log locations when installing the Application Clients for WebSphere Application Server

Windows system log path name	Linux and UNIX operating system log path name
------------------------------	---

Log files for WebSphere Application Server products: The following table shows the installation logs, content, and indicators of success and failure for WebSphere Application Server products for Version 6.

Table 6. Installation and profile creation logs for WebSphere Application Server products

Log	Content	Indicators
<i>install_root/logs/log.txt</i>	Logs all installation events	INSTCONFFAIL Total installation failure. INSTCONFSUCCESS Successful installation. INSTCONFPARTIALSUCCESS Installation errors occurred but the installation is still usable. Additional information identifies the errors.

Table 6. Installation and profile creation logs for WebSphere Application Server products (continued)

Log	Content	Indicators
<code>install_root/logs/wasprofile/wasprofile_create_profile_name.log</code>	<p>Traces all events that occur during the creation of the named profile</p> <ul style="list-style-type: none"> Created when using the Profile creation wizard or the wasprofile command 	<p>INSTCONFFAIL Total profile creation failure.</p> <p>INSTCONFSUCCESS Successful profile creation.</p> <p>INSTCONFPARTIALSUCCESS Profile creation errors occurred but the profile is still functional. Additional information identifies the errors.</p>
<code>install_root/logs/wasprofile/wasprofile_delete_profile_name.log</code>	<p>Traces all events that occur during the deletion of the named profile</p> <ul style="list-style-type: none"> Created when using the Profile creation wizard or the wasprofile command 	<p>INSTCONFFAIL Total profile deletion failure.</p> <p>INSTCONFSUCCESS Successful profile deletion.</p> <p>INSTCONFPARTIALSUCCESS Profile deletion errors occurred but the profile is still deleted. Additional information identifies the errors.</p>
<code>install_root/profiles/profile_name/logs/profile_creation</code>	<p>Traces all profile creation events that occur when using the Profile creation wizard</p>	<p>INSTCONFFAIL Total profile creation failure.</p> <p>INSTCONFSUCCESS Successful profile creation.</p> <p>INSTCONFPARTIALSUCCESS Profile creation errors occurred but the profile is still functional. Additional information identifies the errors.</p>

Description of the `wasprofile_create_profile_name.log` file

The `wasprofile_create_profile_name.log` file is an XML file that contains a record of the events that occur during the creation of the last profile.

In addition to the date tag at the beginning of the file, other tags of interest in the log files include the sequence tag, the level tag, the method tag, and the message tag:

- The sequence tag records the sequence of events that occur during the creation of the profile.
- The level tag is an early indicator of event status:

INFO Indicates a normal event.

WARNING

Indicates an event that occurred with errors that do not prevent the creation of the profile.

ERROR

Indicates an event that prevents the creation of the profile.

- The method tag indicates the name of the routine that recorded the event.
- The message tag describes the event and contains any data returned by the method.

The following stanza is an example of how an event is documented in each log file:

```
<record>
<date>2004-09-08T11:51:39</date>
<millis>1094658699225</millis>
<sequence>0</sequence>
<logger>com.ibm.ws.profile.WSProfile</logger>
<level>INFO</level>
<class>com.ibm.ws.profile.WSProfile</class>
```

```

<method>getRegistryFile</method>
<thread>10</thread>
<message>Returning registry file at:
  C:\NDV6\IBM\WebSphere\AppServer\properties\profileRegistry.xml
</message>
</record>

```

Log files created during the creation of the application server profile

In addition to the logs created within the core product files, the following logs are created in the *install_root/profiles/default/logs* directory when the Profile creation wizard or the **wasprofile** command creates an application server profile:

activity.log

Compiled activity log from various installation activities

amjrte_config.log

Tivoli Access Manager configuration log for its Java Runtime Environment

collect_metadata.log

Collects metadata information about managed objects in the system to evaluate and prevent potential installation conflicts

createDefaultServer.log

A log from wsadmin recording the creation of the server1 process in the default profile

createshortcutforprofile.log

Windows tool log for creating menu entries and shortcuts

defaultapp_config.log

JACL script log from configuring default application resources

defaultapp_deploy.log

Application DefaultApplication installation log

Node_name **Service.log**

Start and stop events for server1

filetransfer_config.log

Application filetransfer installation log

hamanager_config.log

Configuration log for the high availability application

ivt_config.log

Application ivtApp installation log

mejb_config.log

Application ManagementEJB installation log

pctLog.txt

Log created when using the Profile creation wizard to create a profile. This log is not created when using the **wasprofile** command directly.

query_config.log

Application Query installation log

samples_config.log

Configuration log for the PlantsByWebSphere Samples application

samples_install.log

Installation log for the SamplesGallery and PlantsByWebSphere Samples applications

scheduler.cal_config.log

Application SchedulerCalendars installation log

SIBDefineChains.log

Creation log for service integration bus endpoints, inbound channels and channel chains, outbound thread pool, and outbound channel and channel chains

SIBDeployRA.log

Deployment log for the service integration bus function

webui_config.log

Application administrative console installation log

The following logs are created in the *install_root/profiles/default/logs/server1* directory:

startServer.log

Log of start server events

stopServer.log

Log of stop server events

SystemErr.log

Record system errors

SystemOut.log

Log of all activity within the system

trace.log

Log of all traced events within the system

The following logs are created in the *install_root/profiles/default/logs/ffdc* directory:

server1_exception.log

First failure data capture log for server1 errors

server1_numeric_identifier.txt

Any first failure data capture logs

2. Verify that no files exist in the *install_root/classes* directory.

IBM Support sometimes queues work for customers and provides test or debugging fixes. A common location for the fixes is in the *install_root/classes* directory.

By default, the *install_root/classes* directory is picked up first in the WebSphere Application Server class path to let it override other classes.

Putting a fix in the directory lets you verify that the fix does indeed solve your problem. After verifying that the fix solves the problem, you are supposed to delete the fix from the *install_root/classes* directory to return the system to a working state.

If you do not remove such fixes from the *install_root/classes* directory, you can experience errors.

3. Uninstall the product, if possible, and reinstall after turning on tracing if the error logs do not contain enough information to determine the cause of the problem.
 - Report the stdout and stderr logs to the console window, by adding the `-is:javaconsole` parameter to the **install** command:
 - Capture additional information to a log of your choice with the `-is:log file_name` option.
 - Turn on additional installation logging by passing the `-W Setup.product.install.logAllEvents="true"` parameter to the **install** command:
4. If you have successfully created an application server profile, use the First steps console or the command line method to start the application server.
5. Verify whether the server starts and loads properly by looking for a running Java process and the *Open for e-business* message in the `SystemOut.log` and `SystemErr.log` files.

If no Java process exists or if the message does not appear, examine the same logs for any miscellaneous errors. Correct any errors and retry.

You can find the `SystemOut.log` and `SystemErr.log` files in the following platform-specific directory:

6. Use the First steps console or the command line method to stop the application server, if it is running, and to start the deployment manager if one exists.

To stop server1 from the command line:

If you enable security, specify the `-user` and the `-password` parameters of the command.

To start the deployment manager from the command line:

7. Verify that the server starts and loads properly by looking for a running Java process and the *Server dmgr open for e-business* message in the *install_root/profiles/profile_name/logs/server_name/SystemOut.log* file.

If no Java process exists or if the message does not appear, examine the same logs for any miscellaneous errors. Correct any errors and try again to start the deployment manager.

8. Refer to the plug-in configuration documentation, if you have installed plug-ins and the Web server does not come up properly.
9. Start the Snoop servlet to verify the ability of the Web server to retrieve an application from the Application Server.

Test your environment by starting your Application Server, your Web server, and using the snoop servlet with an IP address.

- a. Start the Application Server. In a Network Deployment environment, the Snoop servlet is available in the cell only if you included the DefaultApplication when adding the Application Server to the cell. The `-includeapps` option for the **addNode** command migrates the DefaultApplication to the cell. If the application is not present, skip this step.

Change directories to the *install_root/profiles/profile_name/bin* directory and run the **startServer** command:

- b. Start the IBM HTTP Server or the Web server that you are using.

Use a command window to change the directory to the IBM HTTP Server installed image, or to the installed image of your Web server. Issue the appropriate command to start the Web server, such as these commands for IBM HTTP Server:

To start the IBM HTTP Server from the command line:

Access the **apache** and **apachectl** commands in the *IBMHttpServer/bin* directory.

- c. Point your browser to `http://localhost:9080/snoop` to test the internal HTTP transport provided by the Application Server. Point your browser to `http://Host_name_of_Web_server_machine/snoop` to test the Web server plug-in.

The HTTP Transport port is 9080 by default and must be unique for every profile. The port is associated with a virtual host named `default_host`, which is configured to host the installed DefaultApplication and any installed Samples. The snoop servlet is part of the DefaultApplication. Change the port to match your actual HTTP Transport port.

- d. Verify that snoop is running.

Either Web address should display the Snoop Servlet - Request/Client Information page.

- e. **Remote IBM HTTP Server only:** Verify that the automatic propagation function can work on a remote IBM HTTP Server by using the following steps. This procedure is not necessary for local Web servers.

- 1) Create a user=`adminUser`, password=`adminPassword` in the *IHS_install_root/conf/admin.passwd* file. For example: `c:\ws\ihs60\bin\htpasswd -cb c:\ws\ihs60\conf\admin.passwd adminUser adminPassword`
- 2) Use the administrative console of the deployment manager or the Application Server to enter the User ID and password information that you created for the administrative user of IBM HTTP Server. Go to **Servers > Web server > Web_server_definition > Remote Web server administration**. Set the following values: admin Port=`8008`, User Id=`adminUser`, Password=`adminPassword`.
- 3) Set the correct read/write permissions for the `httpd.conf` file and the `plugin-cfg.xml` file. See the *IHS_install_root/logs/admin_error.log* file for more information.

Automatic propagation of the plug-in configuration file requires the IBM HTTP administrative server to be up and running. If you are managing an IBM HTTP Server using the WebSphere Application Server administrative console, the following error might display:

"Could not connect to IHS Administration server error"

Perform the following procedure to correct the error:

- 1) Verify that the IBM HTTP Server administration server is running.
 - 2) Verify that the Web server host name and the port that is defined in the WebSphere Application Server administrative console matches the IBM HTTP Server administration host name and port.
 - 3) Verify that the fire wall is not preventing you from accessing the IBM HTTP Server administration server from the WebSphere Application Server administrative console.
 - 4) Verify that the user ID and password that is specified in the WebSphere Application Server administrative console under remote managed, is created in the `admin.passwd` file, using the `htpasswd` command.
 - 5) If you are trying to connect securely, verify that you export the IBM HTTP Server administration server keydb personal certificate into the WebSphere Application Server key database as a signer certificate. This key database is specified by the `com.ibm.ssl.trustStore` directive in the `sas.client.props` file in the profile where your administrative console is running. This consideration is primarily for self-signed certificates.
 - 6) If you still have problems, check the IBM HTTP Server `admin_error.log` file and the WebSphere Application Server logs (`trace.log` file) to determine the cause of the problem.
10. Start the WebSphere Application Server administrative console.
- a. Start the application server.
 - b. Point your browser to `http://localhost:9060/ibm/console`.
The HTTP Admin port is 9060 by default and must be unique for the administrative console of each stand-alone application server. The port is associated with a virtual host named `admin_host`, which is configured to host the administrative console, which is installed by default as a system application. Change the port to match your actual HTTP Admin port.
If you have problems accessing the administrative console after installation, check the `installAdminConsole.log` file for a failure indication. Clean up the system temporary directory and reinstall the administrative console using the `wsadmin` scripting facility.
 - c. Type any ID and click **OK** at the administrative console window.
The server starts. The administrative console starts. You can access the administrative console through the browser. The administrative console accepts your login.
11. Federate the stand-alone application server into the cell. **To add the stand-alone application server into the cell:**
- **Deployment manager administrative console method:**
Click **System administration > Nodes > Add Node** and follow the wizard. The default SOAP port for the application server is 8880. You can use `localhost` as the value of the Host name field, if the application server is on the same machine.
 - **Command-line method assuming the SOAP port of the dmgr is 8879:**
If you enable security, specify the `-user` and the `-password` parameters of the command.
12. Verify that the application server was incorporated into the cell. The command window displays a sequence of messages when you issue the `addNode` command:
- ```
Tool information is being logged in file
 C:\Program Files\IBM\WebSphere\AppServer\profiles\Profile01\logs\addNode.log
Begin federation of node AppServer01 with Deployment Manager at
 localhost:8879.
Successfully connected to Deployment Manager Server: localhost:8879
Servers found in configuration:
Server name: server1
Stopping all server processes for node AppServer01
```

```
Creating node agent configuration for node: AppServer01
Reading configuration for node agent process: nodeagent
Adding node AppServer01 configuration to cell: AdvancedDeploymentCell
Performing configuration synchronization between node and cell.
Launching node agent process for node: AppServer01
Node agent launched. Waiting for initialization status.
Node agent initialization completed successfully. Process ID is: 3012
Node AppServer01 has been successfully federated.
```

The last message is an indicator of success. A second Java process is running, which is the nodeagent process. The `stdout.log` file and `stderr.log` file in the `node_name` directory each contain relevant messages.

### 13. Resolve any IP address caching problems.

By default, the Java 2 SDK caches the IP address for the domain name service (DNS) naming lookup. After resolving the host name successfully, the IP address stays in the cache. By default, the cache entry remains forever.

This default IP caching mechanism can cause problems, as described in the following problem scenarios.

#### **Problem scenario 1**

Suppose the application server at `host1.ibm.com` has an initial IP address of `1.2.3.4`. When a client at `host2.ibm.com` conducts a DNS lookup of `host1.ibm.com`, the client stores the `1.2.3.4` address in the cache. Subsequent DNS name lookups return the cached value, `1.2.3.4`.

The cached value is not a problem until the `host1.ibm.com` IP address changes, to `5.6.7.8`, for example. The client at `host2.ibm.com` does not retrieve the current IP address, but always retrieves the previous address from the cache.

If this scenario occurs, the client cannot reach `host1.ibm.com` unless you stop and restart the client process.

#### **Problem scenario 2**

Suppose the application server at `host1.ibm.com` has an initial IP address of `1.2.4.5`. Although the IP address of the application server does not change, a network outage can record an exception code as the IP address in the cache, where it remains until the client is restarted on a working network.

For example, if the client at `host2.ibm.com` disconnects from the network because of an unplugged cable, the disconnected lookup of the application server at `host1.ibm.com` fails. The failure causes the IBM Developer Kit to put the special exception code entry into the IP address cache.

Subsequent DNS name lookups return the exception code, which is `java.net.UnknownHostException`.

#### **IP address caching and WebSphere Application Server process discovery**

If you change the IP address of a federated WebSphere Application Server node, processes running in other nodes cannot contact the changed node until you stop and restart them.

If a deployment manager process starts on a disconnected node, it cannot communicate with cell member processes until you stop and restart the deployment manager process. For example, plugging in an unplugged network cable does not restore proper addresses in the IP cache until the deployment manager process is restarted.

#### **Using the IP address cache setting**

You can always stop and restart a deployment manager process to refresh its IP address cache. However, this process might be expensive or inappropriate.

The `networkaddress.cache.ttl` (public, JDK1.4) and `sun.net.inetaddr.ttl` (private, JDK1.3) parameters control IP caching. The value is an integer that specifies the number of seconds to cache IP addresses. The default value, `-1`, specifies to cache forever. A value of zero (0) is a specification to never cache.

Using a zero (0) value is not recommended for normal operation. If you do not anticipate network outages or changes in IP addresses, use the cache forever setting. The never caching setting introduces the potential for DNS spoofing attacks.

### For more information about the Java 2 SDK

The Java 2 SDK, Standard Edition 1.4 Web site at <http://java.sun.com/j2se/1.4/docs/guide/net/properties.html> describes the private sun.net.inetaddr.ttl property, which works in both Java 2 SDK, Standard Edition 1.3 (WebSphere Application Server V5.0.0, V5.0.1, and V5.0.2) and Java 2 SDK, Standard Edition 1.4 (WebSphere Application Server V5.1 and V6).

This procedure results in using some simple procedures to debug errors that might be occurring in the installation.

The “Troubleshooting installation problems” on page 186 contains more detailed debugging and reporting instructions. See Installation component troubleshooting tips in the *Troubleshooting and support* PDF book for more information about troubleshooting the installation.

For current information available from IBM Support on known problems and their resolution, see the IBM Support (<http://www.ibm.com/support/search.wss?rs=180&tc=SSEQTP&tc1=SSCVS24>) page.

IBM Support has documents that can save you time gathering the information that you need to resolve a problem. Before opening a PMR, see the IBM Support (<http://www-1.ibm.com/support/search.wss?rs=180&tc=SSEQTP&tc1=SSCVS24&q=mustgather>) page.

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## Ensuring problem avoidance

To implement WebSphere Application Server for z/OS, you must implement the necessary features, subsystems, and resources required for the run-time environment. This section provides checklists for tasks you should verify before running your WebSphere Application Server for z/OS system in order to prevent the most common errors encountered during the installation.

**Before you begin:** Perform the following steps to ensure problem avoidance, checking off each item as you complete it:

1. Plan to prepare your z/OS environment:

Table 7.

| Check off | Item                                                                                                                                                                                                                                                                                                                                                             |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           | Check that all the maintenance suggested in the PSP bucket WASAS500 subset WAS500 has been applied.<br><b>Note:</b> Follow the instructions at <a href="http://www.ibm.com/support/docview.wss?rs=404&amp;context=SS7K4U&amp;uid=swg21110456">http://www.ibm.com/support/docview.wss?rs=404&amp;context=SS7K4U&amp;uid=swg21110456</a> to access the PSP bucket. |
|           | Make certain your address space is large enough. Some WebSphere Application Server for z/OS servers must be able to get a 1GB virtual region to run any workload. Make sure that your installation exits (IEFUSI) do not limit the virtual region size. We recommend that you specify REGION=0M so as not to limit their size.                                   |
|           | Add another local page data set, two if your system does any paging of the WebSphere Application Server for z/OS server address spaces.                                                                                                                                                                                                                          |
|           |                                                                                                                                                                                                                                                                                                                                                                  |

2. Plan to prepare your DB2 subsystem (if you will use DB2):

Table 8.

| Check off | Item                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           | Increase the MAX USERS (CTHREAD) and MAX BATCH CONNECT (IDBACK) in your DB2 environment settings. Use the sample job in DSN710.SDSNSAMP(DSNTEJ6Z) to display the "ZPARMS" settings of the running system. (An alternative is to use the DB2 Control Center to display these parameters.)                                                                                                                                                                                                                                                                                                                                                                                    |
|           | Define at least 200 buffers to the DB2 BP32K buffer pool. Use this command to display the current bufferpool allocations: <code>-dis bpool(active)detail</code> . Verify JDBC 2.0 functionality. The JDBC IVT sample01 JAVA application does not exercise JDBC 2.0 drivers nor the RRS attach facility. A modified version that tests these functions can be found in the DB2 Conundrum whitepaper on Techdocs at <a href="http://www.ibm.com/support/techdocs/atsmastr.nsf/PubAllNum/WP100217">http://www.ibm.com/support/techdocs/atsmastr.nsf/PubAllNum/WP100217</a> (This will also verify that the DSNJDBC plan is bound correctly and that it matches the .ser file.) |
|           | Verify the level of DB2 code running on your system with the DSNTEJ6U sample job or run the DSNUTILB utility with the DIAGNOSE DISPLAY MEPL command. The module names, dates, and PTF number on the right of the report are in EBCDIC.                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|           | Make sure that any updates to the DB2 ERLY code are installed, and that you have IPLed your system to activate them.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|           | Check the JDBC service installed on your system. Use the following Java program to display the service level:<br><pre>export LIBPATH=/usr/lpp/db2/db2710/lib:\$LIBPATH&gt; java -cp /usr/lpp/db2/db2710/classes/db2j2classes.zip COM.ibm.db2os390.sqlj.util.DB2DriverInfo</pre> <p>The typical output message looks like this:<br/> DB2 for OS/390 SQLJ/JDBC Driver build version is:DB2 7.1 PQ54756</p>                                                                                                                                                                                                                                                                    |

3. Plan to verify your USS/HFS configuration:

Table 9.

| Check off | Item                                                                                                                                                                                                                                                                                                                         |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           | Specify enough threads, files, and processes in your BPXPRMxx member of parmlib. Here is a starting list if you don't have it set up yet: <ul style="list-style-type: none"> <li>• MAXTHREADS:10000</li> <li>• MAXTHREADTASKS:5000</li> <li>• MAXFILEPROC:10000</li> <li>• MAXSOCKETS in the AF_INET domain:12000</li> </ul> |
|           | If you have an exit that checks for valid accounting codes, you may need to specify an accounting value for spawned address spaces. Use the <code>_BPX_ACCT_DATA=</code> variable in the was.env file.                                                                                                                       |
|           | Ensure that the user ID associated with running the installation jobs that run the BPXBATCH shell scripts has an OMVS segment that directs PROGRAM('/bin/sh') to use the z/OS shell rather than the tcsh (C) shell (at '/bin/tcsh'). These particular shell scripts won't run from the tcsh shell.                           |

#### 4. Plan your SMP/E tasks:

Table 10.

| Check off | Item                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           | You can install WebSphere Application Server for z/OS into an SMP/E environment (SMP/E 3.1 or later) separate from the one you use for z/OS. This includes target and distribution zones, as well as HFS data sets. We recommend you use a separate environment, but you should enable the cross-zone checking so that any prerequisite service requirement can be checked between the WebSphere Application Server for z/OS and z/OS SMP/E zones. |
|           | Verify that the DDDEF for the LTS data set describes a PDSE format data set. This will avoid LINK-EDIT errors during the SMP/E processing.                                                                                                                                                                                                                                                                                                         |
|           | We strongly recommend that you carefully read <i>WebSphere Application Server for z/OS V5.0: Program Directory</i> . This is a very large product and you have to make sure that there is sufficient space in all target and temporary data sets for receive and apply processing.                                                                                                                                                                 |

---

#### 5. Plan your ISPF Dialog consideration:

Table 11.

| Check off | Item                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           | Do not use ISPF Dialog in Split Screen mode. It may happen that you don't see everything on one screen. Keep in mind that there might be parameter values outside of the visible portion of your screen and that this may cause some of the WebSphere Application Server for z/OS installation options to be set to default values, which may not be what you want.                                                                                                                               |
|           | Turn off PFSHOW on the ISPF Dialog screen. As with the split screen problem, there might be parameter values outside the visible portion of your screen, which may cause some of the WebSphere Application Server for z/OS installation options to be set to default values, which may not be what you want.                                                                                                                                                                                      |
|           | You need to use a screen size of at least 32 lines to be able to invoke ISPF Dialog.                                                                                                                                                                                                                                                                                                                                                                                                              |
|           | You might want to consider starting with new CNTL and DATA data sets as output of the "Generate the Jobs Stream" function. During this task, you get a large number of confirmation messages for every successful generated job. It is very easy to overlook an error message during this process. Unfortunately this sometimes causes the job generation process to stop without recreating all JCL. When you run the jobs you may run "old" JCL and this will result in unpredictable problems. |

---

#### 6. Plan to verify your WLM environment:

Table 12.

| Check off | Item                                                                    |
|-----------|-------------------------------------------------------------------------|
|           | Verify that WLM is running in goal mode with the D WLM,SYSTEMS command. |

---



7. Plan to check your TCP/IP configuration:

Table 13.

| Check off | Item                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           | <p>Telnet into UNIX Systems Services and issue these commands to verify that you can find your host name by IP address or IP host-name:</p> <ul style="list-style-type: none"> <li>• Get the local host name: hostname <ul style="list-style-type: none"> <li>– You will get a response such as: sc49.itso.ibm.com</li> <li>– Use the output from the hostname command for the following nslookup command.</li> </ul> </li> <li>• Get host address by name: nslookup sc49.itso.ibm.com <ul style="list-style-type: none"> <li>– You will get a response such as this: <pre>Server:sc49.itso.ibm.com Address:9.12.6.15 Name:sc49.itso.ibm.com Addresses:9.12.6.15</pre> <ul style="list-style-type: none"> <li>– Use the dotted IP address from this display for the following command.</li> </ul> </li> </ul> </li> <li>• Get host name by address: nslookup 9.12.6.15 <ul style="list-style-type: none"> <li>– You will get a response such as in the previous nslookup display.</li> </ul> </li> </ul> <p>There is also a small Java program, InetInfo.java, which you can run to verify the same TCP/IP configuration. See techdocs for the program at <a href="http://www.ibm.com/support/techdocs/atmastr.nsf/PubAllNum/TD100609">http://www.ibm.com/support/techdocs/atmastr.nsf/PubAllNum/TD100609</a>.</p> <p><b>Example:</b> This example shows you how to run the InetInfo Java code.</p> <pre>JAVA4 @SC42:/u/java4&gt;export PATH=/usr/lpp/java/IBM/J1.3/bin JAVA4 @SC42:/u/java4&gt;java InetInfo get Local Host IP Address:9.12.6.27 get Host Name By Address using 9.12.6.27 Host Name:wpsc42oe.itso.ibm.com get Host Address By Name using wpsc42oe.itso.ibm.com Host Address:9.12.6.27</pre> |
|           | <p>Issue the hometest command from TSO. It should show the correct TCP Host name, corresponding IP address(es), and HOME IP addresses. If it doesn't produce the correct results, then TCP/IP is not configured correctly.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|           | <p>If the fully qualified TCP/IP HostName is greater than 24 characters, then a DNS will be required. Otherwise, the /etc/hosts file can provide the naming lookup.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|           | <p>Verify that the DNS name you are using is definitive (authoritative) in your installation.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

8. Plan to verify that security is in place:

Table 14.

| Check off | Item                                                                                                                                                                                                                                                                                                                                                    |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           | <p>Check that the location service daemon has access to parmlib concatenation to retrieve CTRACE settings in the CTIBBOxx member.</p>                                                                                                                                                                                                                   |
|           | <p>Verify that all WebSphere Application Server for z/OS servers must have READ access to any data sets or files in their JCL procedures.</p>                                                                                                                                                                                                           |
|           | <p>Verify that your installation has the RACF list-of-groups turned on. (SETROPTS LIST will show you if turned on or off.) Without this list of groups turned on, an ID cannot belong to more than one group and ASSR1 associates with only WSSR1 instead of both WSSR1 and WSCFG1. Use the command SETROPTS GRPLIST to turn on the list of groups.</p> |
|           | <p>Define the profile BPX.SAFFASTPATH in the FACILITY class to enable SAF fastpath support.</p>                                                                                                                                                                                                                                                         |

Table 14. (continued)

| Check off | Item                                                                                                                                                                                                                                                                              |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           | If you do not load SBBOLoad into LPA, you must add it to the program control list in the RACF PROGRAM class. (With z/OS V1.2, you can use the FACILITY class profile BPX.DAEMON.HFCTL class. This will cause only HFS files to be checked for program control.)                   |
|           | Verify that the /usr/lpp/java/IBM/J1.3/lib HFS file permission bits are set up correctly to allow the read capability to other bits (644) and that /usr/lpp/java/IBM/J1.3/bin and /usr/lpp/java/IBM/J1.3/bin/classic with the execute permission bit on (755) and APF authorized. |
|           | Verify that the authorization bits for the WebSphere Application Server for z/OS HFS (default name is /usr/lpp/zWebSphere/V6R0) file are correctly set up for the WebSphere Application Server for z/OS configuration group.                                                      |

9. Plan your installation phases:

Table 15.

| Check off | Item                                                                                                                                                                                                                                 |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           | After any maintenance has been applied, verify that the code loaded in LPALIB or LNKLIST is synchronized with the code in the HFS. Check the location service daemon job log to verify that the correct maintenance level is in use. |

You are done when you have checked all the applicable items.

## Error when installing WebSphere Application Server for z/OS

**CEE3250C The system or user abend SCC3 R=00020001 was issued. From compile unit BBODBDLD at entry point BBODBDLD at compile unit offset +xxxxxxx at entryoffset +xxxxxxx at address xxxxxxxx**

This error occurs when SBBOLPA cannot be found in either LPA or STEPLIB. For example, you would see this error if SBBOLPA resides in the link list.

To resolve this problem, place SBBOLPA in LPA or STEPLIB when installing WebSphere Application Server for z/OS and OS/390.

For current information available from IBM Support on known problems and their resolution, see the IBM Support (<http://www-1.ibm.com/support/search/index.html>) page.

IBM Support has documents that can save you time gathering information needed to resolve this problem. Before opening a PMR, see the IBM Support (<http://www.ibm.com/support/search.wss?rs=180&tc=SSEQTP&tc1=SSCMPEP>) page.

## Handling workload management and server failures

During operations, if your application fails repeatedly, causing the application servants to terminate, workload management may terminate the application environment for the application. WebSphere Application Server for z/OS issues the following message if it tries to use a failed application environment: BB000075E Unable to schedule work. WLM application environment *applenv* has stopped.



You must fix the problem with your application, then restart the application environment with the RESUME option on the VARY WLM command.

Perform these steps to check and start the workload management application environment.

**Note:** The dynamic application environment commands apply only if you are running z/OS V1.2 or above with the WLM-DAE support PTF (APAR OW54622). See the assembling applications information in the Information Center for more information.

1. Display the application environment. To do so, issue

```
d wlm,applenv=*
```

for static application environments or

```
d wlm,dynappl=*
```

for dynamic application environments.

2. Start the application environment. To do so, issue

```
v wlm,applenv=environment_name,resume
```

for static application environments (where **environment\_name** is the application environment name) or

```
v wlm,dynappl=applenv,resume
```

for dynamic application environments.

You know you are done when a re-display of the application environment shows it is available.

---

## Troubleshooting installation problems

Select the problem that you are having with the WebSphere Application Server installation:

- I get an “Error when installing WebSphere Application Server for z/OS” on page 185.
- The Installation completes but the administrative console does not start in the *Troubleshooting and support* PDF book.

For current information available from IBM Support on known problems and their resolution, see the IBM Support (<http://www.ibm.com/support/search.wss?rs=180&tc=SSEQTP&tc1=SSCVS24>) page.

IBM Support has documents that can save you time gathering information needed to resolve this problem. Before opening a PMR, see the IBM Support (<http://www-1.ibm.com/support/search.wss?rs=180&tc=SSEQTP&tc1=SSCVS24&q=mustgather>) page.

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## Post-installation notes on the error log

After installation is complete, use the administrative console to change the log stream name or create new log stream names for servers or servants.

**Note:**

- A server’s error log stream setting overrides the general WebSphere Application Server for z/OS setting, and a servant setting overrides a server setting. Thus, you can set up general error logging, but direct error logging for servers or servants to specific log streams.
- If you create a new log stream name through the administrative console, you must configure a new log stream on z/OS and, if using the coupling facility, define a corresponding new coupling facility log stream.
- If you changed an existing log stream, or created a new one, you probably need to restart WebSphere Application Server for z/OS. When the name of a log stream is changed through the Administrative Console, in most cases a restart of WebSphere Application Server for z/OS is

required before the change becomes effective. The only case when the change takes effect automatically is when the log stream name is changed for a server along with other changes that cause the server to be restarted.

If you want WebSphere Application Server for z/OS messages that occur during execution of a z/OS client to be recorded in an error log stream, code the `client_ras_logstreamname` WebSphere variable in its environment file, then initialize the client. For more information about `client_ras_logstreamname` and the related variable `ras_log_logstreamName`, see the WebSphere variables in the administrative console or the information center.

Our RACF samples `BBOWBRAC` and `BBODBRAC` give `UPDATE` authority to the run-time control and servant user IDs for the log stream you created (they require that you supply a log stream name). After installation and customization, if you want to grant access to the log stream:

- For each server identity that writes to the log stream (or client identity, if you allow clients to write to the error log stream), assign `UPDATE` access to the log stream.
- For each user who browses the error log stream, assign `READ` access.

Follow the sample RACF commands in `BBOWBRAC` or `BBODBRAC`.



## Appendix A. Checklist: Preparing the base operating system

Print out this worksheet and use it when collecting information about the z/OS system on which you plan to implement WebSphere Application Server for z/OS Version 6.0.1. Check off each item as you complete it.

Date: \_\_\_\_\_

System name: \_\_\_\_\_

Sysplex name: \_\_\_\_\_

### Preparing z/OS

- \_\_\_\_\_ Target system hardware and software requirements, including required maintenance in Preventive Service Planning (PSP) bucket, are met.
- \_\_\_\_\_ UNIX System Services is active with minimum required BPXPRMxx values or better.
- \_\_\_\_\_ The /tmp directory has at least 20 MB of free space.
- \_\_\_\_\_ The full data set names of required system data sets are specified:

| Item     | Data set name | In LPA or link list? |
|----------|---------------|----------------------|
| SCEERUN  |               |                      |
| SCEERUN2 |               |                      |
| SGSKLOAD |               |                      |

- \_\_\_\_\_ System exits (IEFUSI) are specified to not restrict WebSphere Application Server for z/OS address spaces to less than 512 MB.
- \_\_\_\_\_ The TSO segment default region size for WebSphere Application Server for z/OS installer and administrator TSO user IDs is at least 128 MB.

### Preparing the sysplex

- \_\_\_\_\_ The target system is configured as a monoplex or into a multisystem sysplex. (Record sysplex name above.)
- \_\_\_\_\_ System Logger is configured:

|                                                                                        |  |
|----------------------------------------------------------------------------------------|--|
| Should the application servers reside in a coupling facility or DASD-only log streams? |  |
| If a coupling facility, specify the structure name                                     |  |
| SMS data class (for log data sets)                                                     |  |
| SMS storage class (for log data sets)                                                  |  |

### Preparing JES or JES3

- \_\_\_\_\_ The system proclib for application server cataloged procedure is specified:

|                                                           |  |
|-----------------------------------------------------------|--|
| System proclib for application server cataloged procedure |  |
|-----------------------------------------------------------|--|

- \_\_\_\_\_ JES2 exit EXIT06 or JES3 exit IATUX03 are specified to not prevent use of REGION= value on JOB or EXEC statements for WebSphere Application Server for z/OS address spaces.
- \_\_\_\_\_ Spool space is added, if necessary.

### Preparing Resource Recovery Services

- \_\_\_\_\_ The RRS cataloged procedure is present in system proclib:

|                 |  |
|-----------------|--|
| Procedure name: |  |
|-----------------|--|

- \_\_\_\_\_ The RRS dispatching priority is set using SYSSTC or other means.
- \_\_\_\_\_ RRS is defined as a subsystem name in IEFSSN00.

**Note:** The subsystem name must match the cataloged procedure name.

- \_\_\_\_\_ The RRS log streams are set up.
- \_\_\_\_\_ RRS starts successfully.

### Preparing Security Server (RACF)

- \_\_\_\_\_ If multiple security databases are in use, a plan is in place to provide database consistency.
- \_\_\_\_\_ List-of-groups (GRPLIST) support is active.

### Preparing Workload Management

- \_\_\_\_\_ Workload management is in GOAL mode.

# Appendix B. Customization Dialog worksheet: Security domain

Date: \_\_\_\_\_

Purpose of this security domain:

Sysplex(es) on which you will use this security domain:

Print out this worksheet and use it when collecting information about the WebSphere Application Server for z/OS Version 6.0.1 Customization Dialog variables. The variables and defaults are provided, along with spaces for you to fill in your own value for each.

## Security Domain Identifier

| Item                                               | Default | Your value |
|----------------------------------------------------|---------|------------|
| Use security domain identifier in RACF definitions | N       |            |
| Security domain identifier                         | (blank) |            |

## Cell-wide user IDs and groups

| WebSphere Application Server Configuration Group Information  |         |  |
|---------------------------------------------------------------|---------|--|
| Group                                                         | WSCFG1  |  |
| GID                                                           | 2500    |  |
| WebSphere Application Server Administrator Information        |         |  |
| User ID                                                       | WSADMIN |  |
| UID                                                           | 2403    |  |
| Password                                                      | WSADMIN |  |
| Unauthenticated User Definitions for Stand-alone Servers      |         |  |
| User ID                                                       | WSGUEST |  |
| UID                                                           | 2402    |  |
| Group                                                         | WSCLGP  |  |
| GID                                                           | 2502    |  |
| WebSphere Application Server Asynchronous Administration Task |         |  |
| User ID                                                       | WSADMSH |  |
| UID                                                           | 2504    |  |
| WebSphere Application Server Servant Group Information        |         |  |
| Group                                                         | WSSR1   |  |
| GID                                                           | 2501    |  |

## User registry

|                                          |   |  |
|------------------------------------------|---|--|
| Configure for local OS security registry | Y |  |
|------------------------------------------|---|--|

## SSL customization

|                                                 |             |  |
|-------------------------------------------------|-------------|--|
| Certificate Authority keylabel                  | WebSphereCA |  |
| Generate Certificate Authority (CA) certificate | Y           |  |
| Expiration date for CA authority                | 2010/12/31  |  |
| Default RACF keyring name                       | WASKeyring  |  |
| Enable SSL on location service daemon           | N           |  |

## Additional z/OS security customization options

|                                                           |                    |  |
|-----------------------------------------------------------|--------------------|--|
| Generate default RACF realm name                          | N                  |  |
| Default RACF realm name                                   | <i>sysplexname</i> |  |
| Use SAF EJBROLE profiles to enforce J2EE roles            | N                  |  |
| Enable SAF authentication using LTPA or ICSF login tokens | Y                  |  |

Name of security domain configuration variable data set:

---



# Appendix C. Customization Dialog worksheet: Stand-alone application server cell

Date: \_\_\_\_\_

Purpose of this stand-alone application server:

\_\_\_\_\_

System name: \_\_\_\_\_

Sysplex name: \_\_\_\_\_

Print out this worksheet and use it when collecting information about the WebSphere Application Server for z/OS Version 6.0.1 Customization Dialog variables. The variables and defaults are provided, along with spaces for you to fill in your own value for each.

## System Locations

| Item    | Default      | Your value |
|---------|--------------|------------|
| PROCLIB | SYS1.PROCLIB |            |
| PARMLIB | SYS1.PARMLIB |            |
| SYSEXEC | (blank)      |            |

## WebSphere Application Server for z/OS product data sets

|                                                      |                          |  |
|------------------------------------------------------|--------------------------|--|
| Run WebSphere Application Server from STEPLIB (Y/N)? | Y                        |  |
| SBBOLPA                                              | <i>was_hlq</i> .SBBOLPA  |  |
| SBBOLOAD                                             | <i>was_hlq</i> .SBBOLOAD |  |
| SBBOLD2                                              | <i>was_hlq</i> .SBBOLD2  |  |
| SBBOEXEC                                             | <i>was_hlq</i> .SBBOEXEC |  |
| SBBOMSG                                              | <i>was_hlq</i> .SBBOMSG  |  |

## Additional system data sets

|              |              |  |
|--------------|--------------|--|
| SCEERUN      | CEE.SCEERUN  |  |
| Use STEPLIB? | N            |  |
| SCEERUN2     | CEE.SCEERUN2 |  |
| Use STEPLIB? | N            |  |
| SGSKLOAD     | GSK.SGSKLOAD |  |
| Use STEPLIB? | N            |  |

## WebSphere Application Server for z/OS product directory

|                                                |                          |  |
|------------------------------------------------|--------------------------|--|
| WebSphere Application Server product directory | /usr/lpp/zWebSphere/V6R0 |  |
|------------------------------------------------|--------------------------|--|

### WebSphere configuration HFS

|                                   |                     |  |
|-----------------------------------|---------------------|--|
| Mount point                       | /WebSphere/V6R0     |  |
| Name                              | OMVS.WAS.CONFIG.HFS |  |
| Volume, or '*' for SMS            | *                   |  |
| Primary allocation in cylinders   | 250                 |  |
| Secondary allocation in cylinders | 100                 |  |

### WebSphere error logstream

|                                 |               |  |
|---------------------------------|---------------|--|
| Name                            | WAS.ERROR.LOG |  |
| Data class                      | STANDARD      |  |
| Storage class                   | (blank)       |  |
| HLQ for data sets               | IXGLOGR       |  |
| Is log stream CF resident (YIN) | Y             |  |
| If yes, specify structure name  | WAS_STRUCT    |  |
| If no, specify:                 |               |  |
| log stream size                 | 3000          |  |
| staging size                    | 3000          |  |

### RRS setup (if not done previously)

|                                 |                |  |
|---------------------------------|----------------|--|
| Group name                      | <i>sysplex</i> |  |
| Data class                      | STANDARD       |  |
| Storage class                   | (blank)        |  |
| HLQ for data sets               | IXGLOGR        |  |
| Is log stream CF resident (YIN) | Y              |  |
| Create RRS PROC (YIN)           | Y              |  |

### Component Trace

|                              |                                            |  |
|------------------------------|--------------------------------------------|--|
| Procedure name               | BBOWTR                                     |  |
| User ID                      | STCRACF                                    |  |
| Group                        | SYS1                                       |  |
| Name                         | SYS1. <i>systemname</i> .<br>WAS390.CTRACE |  |
| Volume, or "*" for SMS       | *                                          |  |
| Primary space in cylinders   | 10                                         |  |
| Secondary space in cylinders | 0                                          |  |
| Trace Parmlib member suffix  | 60                                         |  |

### WebSphere transaction XA partner log

|                                 |            |  |
|---------------------------------|------------|--|
| Use log stream (YIN)            | N          |  |
| Name HLQ                        | HLQ        |  |
| Data class                      | STANDARD   |  |
| Storage class                   | (blank)    |  |
| HLQ for data sets               | IXGLOGR    |  |
| Is log stream CF resident (YIN) | Y          |  |
| If yes, specify structure name  | WAS_STRUCT |  |
| If no, specify: log stream size | 3000       |  |
| If no, specify: staging size    | 3000       |  |

### Server customization

|                                             |                                   |  |
|---------------------------------------------|-----------------------------------|--|
| WebSphere Application Server home directory | <i>configmountpoint/AppServer</i> |  |
| Cell name (short)                           | <i>sysplexname</i>                |  |
| Cell name (long)                            | <i>sysplexname</i>                |  |
| Node name (short)                           | <i>systemname</i>                 |  |
| Node name (long)                            | <i>systemname</i>                 |  |
| Server name (short)                         | BBOS001                           |  |
| Server name (long)                          | server1                           |  |
| Cluster transition name                     | BBOC001                           |  |
| Admin asynch operations procedure name      | BBOW6SH                           |  |
| Install samples? (Y/N)                      | Y                                 |  |

### Server address space information

|                               |                         |                 |
|-------------------------------|-------------------------|-----------------|
| <b>Controller Information</b> |                         |                 |
| Jobname                       | <i>servershortname</i>  | (cannot change) |
| Procedure name                | BBO6ACR                 |                 |
| User ID                       | ASCR1                   |                 |
| UID                           | 2431                    |                 |
| <b>Servant Information</b>    |                         |                 |
| Jobname                       | <i>servershortnameS</i> | (cannot change) |
| Procedure name                | BBO6ASR                 |                 |
| User ID                       | ASSR1                   |                 |
| UID                           | 2432                    |                 |
| <b>Control Region Adjunct</b> |                         |                 |
| Jobname                       | <i>servershortnameA</i> | (cannot change) |
| Procedure name                | BBO6CRA                 |                 |
| User ID                       | ASCRA1                  |                 |

|     |      |  |
|-----|------|--|
| UID | 2433 |  |
|-----|------|--|

### Server TCP/IP information

|                                                     |         |  |
|-----------------------------------------------------|---------|--|
| Node host name                                      | (blank) |  |
| SOAP JMX Connector port                             | 8880    |  |
| DRS Client Address port                             | 7873    |  |
| ORB Listener host name                              | *       |  |
| ORB port                                            | 2809    |  |
| ORB SSL port                                        | 0       |  |
| HTTP transport host name                            | *       |  |
| HTTP port                                           | 9080    |  |
| HTTP SSL port                                       | 9443    |  |
| Service Integration port                            | 7276    |  |
| Service Integration Secure port                     | 7286    |  |
| Service Integration MQ Interoperability port        | 5558    |  |
| Service Integration MQ Interoperability Secure port | 5578    |  |

### High Availability Manager

|                                              |         |  |
|----------------------------------------------|---------|--|
| High Availability Manager Host               | (blank) |  |
| High Availability Manager Communication Port | 9353    |  |

### Location service daemon

|                              |                                |                 |
|------------------------------|--------------------------------|-----------------|
| Daemon home directory        | <i>configmountpoint/Daemon</i> | (cannot change) |
| Daemon jobname               | BBODMNB                        |                 |
| Procedure name               | BBO6DMN                        |                 |
| User ID                      | WSDMNCR1                       |                 |
| UID                          | 2411                           |                 |
| IP name                      | <i>nodehostname</i>            |                 |
| Port                         | 5655                           |                 |
| SSL Port                     | 5656                           |                 |
| Register daemon with WLM DNS | N                              |                 |

### Schedule database

|                         |                    |  |
|-------------------------|--------------------|--|
| SBPXEXEC                | SYS1.SBPXEXEC      |  |
| DB2 RUNLIB Location     | DB2HLQ.RUNLIB.LOAD |  |
| DB2 Subsystem Name      | DSN                |  |
| Plan Name               | DSNTIA81           |  |
| Scheduler Database Name | SCHEDDB            |  |

|                    |           |  |
|--------------------|-----------|--|
| Storage Group Name | SYSDEFLT  |  |
| Tablespace Name    | SCHEDTS   |  |
| Table Prefix       | TBLPREFIX |  |

### Security Domain Configuration

These panels display values you previously set in the "Configure security domain" option--you can not change any of the values here. If you do wish to make changes, you must go back to the main Dialog panel and run through the "Configure security domain" option again.

Name of stand-alone application server configuration variable data set:

---



# Appendix D. Customization Dialog worksheet: Network Deployment cell

Date: \_\_\_\_\_

Purpose of this Network Deployment cell:

\_\_\_\_\_

System name: \_\_\_\_\_

Sysplex name: \_\_\_\_\_

Print out this worksheet and use it when collecting information about the WebSphere Application Server for z/OS Version 6.0.1 Customization Dialog variables. The variables and defaults are provided, along with spaces for you to fill in your own value for each.

## System Locations

| Item    | Default      | Your value |
|---------|--------------|------------|
| PROCLIB | SYS1.PROCLIB |            |
| PARMLIB | SYS1.PARMLIB |            |
| SYSEXEC | (blank)      |            |

## WebSphere Application Server for z/OS product data sets

|                                                      |                          |  |
|------------------------------------------------------|--------------------------|--|
| Run WebSphere Application Server from STEPLIB (Y/N)? | Y                        |  |
| SBBOLPA                                              | <i>was_hlq</i> .SBBOLPA  |  |
| SBBLOAD                                              | <i>was_hlq</i> .SBBLOAD  |  |
| SBBOLD2                                              | <i>was_hlq</i> .SBBOLD2  |  |
| SBBOEXEC                                             | <i>was_hlq</i> .SBBOEXEC |  |
| SBBOMSG                                              | <i>was_hlq</i> .SBBOMSG  |  |

## Additional system data sets

|              |              |  |
|--------------|--------------|--|
| SCEERUN      | CEE.SCEERUN  |  |
| Use STEPLIB? | N            |  |
| SCEERUN2     | CEE.SCEERUN2 |  |
| Use STEPLIB? | N            |  |
| SGSKLOAD     | GSK.SGSKLOAD |  |
| Use STEPLIB? | N            |  |

## WebSphere Application Server for z/OS product directory

|                                                |                          |  |
|------------------------------------------------|--------------------------|--|
| WebSphere Application Server product directory | /usr/lpp/zWebSphere/V6R0 |  |
|------------------------------------------------|--------------------------|--|

## WebSphere configuration HFS

|                                   |                     |  |
|-----------------------------------|---------------------|--|
| Mount point                       | /WebSphere/V6R0     |  |
| Name                              | OMVS.WAS.CONFIG.HFS |  |
| Volume, or '*' for SMS            | *                   |  |
| Primary allocation in cylinders   | 250                 |  |
| Secondary allocation in cylinders | 100                 |  |

## Server customization

|                                             |                                           |                 |
|---------------------------------------------|-------------------------------------------|-----------------|
| WebSphere Application Server home directory | <i>configmountpoint/DeploymentManager</i> |                 |
| Cell name (short)                           | <i>sysplexname</i>                        |                 |
| Cell name (long)                            | <i>sysplexnameNetwork</i>                 |                 |
| Node name (short)                           | <i>systemname</i>                         |                 |
| Node name (long)                            | <i>systemnameManager</i>                  |                 |
| Server name (short)                         | BBODMGR                                   |                 |
| Server name (long)                          | dmgr                                      | (cannot change) |
| Cluster transition name                     | BBODMGR                                   |                 |

## Deployment manager definitions

| Controller Information |                                    |                 |
|------------------------|------------------------------------|-----------------|
| Jobname                | <i>deploymentmanagershortname</i>  | (cannot change) |
| Procedure name         | BBO6DCR                            |                 |
| User ID                | DMCR1                              |                 |
| UID                    | 2421                               |                 |
| Servant Information    |                                    |                 |
| Jobname                | <i>deploymentmanagershortnameS</i> | (cannot change) |
| Procedure name         | BBO6DSR                            |                 |
| User ID                | DMSR1                              |                 |
| UID                    | 2422                               |                 |

## Deployment manager TCP/IP information

|                             |         |  |
|-----------------------------|---------|--|
| Node host name              | (blank) |  |
| SOAP JMX connector port     | 8879    |  |
| Cell Discovery Address port | 7277    |  |
| DRS Client Address port     | 7989    |  |
| ORB Listener host name      | *       |  |
| ORB port                    | 9809    |  |
| ORB SSL port                | 0       |  |
| HTTP transport host name    | *       |  |



|                                              |         |  |
|----------------------------------------------|---------|--|
| HTTP port                                    | 9060    |  |
| HTTP SSL port                                | 9043    |  |
| High Availability Manager Host               | (blank) |  |
| High availability manager communication port | 9352    |  |

### Location service daemon

|                              |                                |                 |
|------------------------------|--------------------------------|-----------------|
| Daemon home directory        | <i>configmountpoint/Daemon</i> | (cannot change) |
| Daemon jobname               | BBODMNC                        |                 |
| Procedure name               | BBO6DMN                        |                 |
| User ID                      | WSDMNCR1                       |                 |
| UID                          | 2411                           |                 |
| IP name                      | (blank)                        |                 |
| Port                         | 5755                           |                 |
| SSL port                     | 5756                           |                 |
| Register daemon with WLM DNS | N                              |                 |

### Security Domain Configuration

These panels display values you previously set in the "Configure security domain" option--you can not change any of the values here. If you do wish to make changes, you must go back to the main Dialog panel and run through the "Configure security domain" option again.

Name of Network Deployment cell configuration variable data set:

---



# Appendix E. Customization Dialog worksheet: Managed node

Date: \_\_\_\_\_

Purpose of this managed node:

\_\_\_\_\_

System name: \_\_\_\_\_

Sysplex name: \_\_\_\_\_

Print out this worksheet and use it when collecting information about the WebSphere Application Server for z/OS Version 6.0.1 Customization Dialog variables. The variables and defaults are provided, along with spaces for you to fill in your own value for each.

## System Locations

| Item    | Default      | Your value |
|---------|--------------|------------|
| PROCLIB | SYS1.PROCLIB |            |
| PARMLIB | SYS1.PARMLIB |            |
| SYSEXEC | (blank)      |            |

## WebSphere Application Server for z/OS product data sets

|                                                      |                          |  |
|------------------------------------------------------|--------------------------|--|
| Run WebSphere Application Server from STEPLIB (Y/N)? | Y                        |  |
| SBBOLPA                                              | <i>was_hlq</i> .SBBOLPA  |  |
| SBBOLOAD                                             | <i>was_hlq</i> .SBBOLOAD |  |
| SBBOLD2                                              | <i>was_hlq</i> .SBBOLD2  |  |
| SBBOEXEC                                             | <i>was_hlq</i> .SBBOEXEC |  |
| SBBOMSG                                              | <i>was_hlq</i> .SBBOMSG  |  |

## Additional system data sets

|              |              |  |
|--------------|--------------|--|
| SCEERUN      | CEE.SCEERUN  |  |
| Use STEPLIB? | N            |  |
| SCEERUN2     | CEE.SCEERUN2 |  |
| Use STEPLIB? | N            |  |
| SGSKLOAD     | GSK.SGSKLOAD |  |
| Use STEPLIB? | N            |  |

## WebSphere Application Server for z/OS product directory

|                                                |                          |  |
|------------------------------------------------|--------------------------|--|
| WebSphere Application Server product directory | /usr/lpp/zWebSphere/V6R0 |  |
|------------------------------------------------|--------------------------|--|

## WebSphere configuration HFS

|             |                 |  |
|-------------|-----------------|--|
| Mount point | /WebSphere/V6R0 |  |
|-------------|-----------------|--|

|                                   |                     |  |
|-----------------------------------|---------------------|--|
| Name                              | OMVS.WAS.CONFIG.HFS |  |
| Volume, or '*' for SMS            | *                   |  |
| Primary allocation in cylinders   | 250                 |  |
| Secondary allocation in cylinders | 100                 |  |

### Server customization

|                                             |                           |  |
|---------------------------------------------|---------------------------|--|
| WebSphere Application Server home directory | /WebSphere/V6R0/AppServer |  |
| Node host name                              | QWEQ                      |  |
| Cell name (short)                           | <i>sysplexname</i>        |  |
| Cell name (long)                            | <i>sysplexname</i>        |  |
| Node name (short)                           | <i>systemname</i>         |  |
| Node name (long)                            | <i>systemname</i>         |  |
| Admin asynch operations procedure name      | BBOW6SH                   |  |

### Server address space information

|                               |         |  |
|-------------------------------|---------|--|
| <b>Controller Information</b> |         |  |
| Procedure name                | BBO6ACR |  |
| User ID                       | ASCR1   |  |
| UID                           | 2431    |  |
| <b>Servant Information</b>    |         |  |
| Procedure name                | BBO6ASR |  |
| User ID                       | ASSR1   |  |
| UID                           | 2432    |  |
| <b>Control Region Adjunct</b> |         |  |
| Procedure name                | BBO6CRA |  |
| User ID                       | CRA1    |  |
| UID                           | 2433    |  |

### Location service daemon

|                       |                        |                 |
|-----------------------|------------------------|-----------------|
| Daemon home directory | /WebSphere/V6R0/Daemon | (cannot change) |
| Daemon jobname        | BBODMNB                |                 |
| Procedure name        | BBO6DMN                |                 |
| User ID               | WSDMNCR1               |                 |
| UID                   | 2411                   |                 |

### Federation variables

|                                             |                           |                 |
|---------------------------------------------|---------------------------|-----------------|
| WebSphere Application Server home directory | /WebSphere/V6R0/AppServer | (cannot change) |
| <b>Deployment Manager Access</b>            |                           |                 |

|                                        |                  |                 |
|----------------------------------------|------------------|-----------------|
| Node host name                         | (blank)          |                 |
| JMX SOAP port                          | 8879             |                 |
| Deployment manager security is enabled | N                |                 |
| User ID                                | WSADMIN          | (cannot change) |
| Node group name                        | DefaultNodeGroup |                 |
| <b>Node Agent Definitions</b>          |                  |                 |
| Server name (short)                    | BBON001          |                 |
| Server name (long)                     | nodeagent        | (cannot change) |
| High Availability Manager Host         | (blank)          |                 |

### Security Domain Configuration

These panels display values you previously set in the "Configure security domain" option--you can not change any of the values here. If you do wish to make changes, you must go back to the main Dialog panel and run through the "Configure security domain" option again.

Name of managed node configuration variable data set:

---



# Appendix F. Customization Dialog worksheet: Federated application server node

Date: \_\_\_\_\_

Purpose of this federated node:

\_\_\_\_\_

Print out this worksheet and use it when collecting information about the WebSphere Application Server for z/OS Version 6.0.1 Customization Dialog variables. The variables and defaults are provided, along with spaces for you to fill in your own value for each.

## WebSphere Application Server for z/OS home directory

| Item                                        | Default                   | Your value |
|---------------------------------------------|---------------------------|------------|
| WebSphere Application Server home directory | /WebSphere/V6R0/AppServer |            |

## Deployment Manager Access

|                                        |                  |                 |
|----------------------------------------|------------------|-----------------|
| Node host name                         | (blank)          |                 |
| JMX SOAP port                          | 8879             |                 |
| Deployment manager security is enabled | N                |                 |
| User ID                                | WSADMIN          | (cannot change) |
| Include Apps                           | Y                |                 |
| Application server's ORB port          | 9810             |                 |
| Node group name                        | DefaultNodeGroup |                 |

## Node Agent Definitions

|                                              |           |                 |
|----------------------------------------------|-----------|-----------------|
| Server name (short)                          | BBON001   |                 |
| Server name (long)                           | nodeagent | (cannot change) |
| JMX SOAP Connector port                      | 9360      |                 |
| Node Discovery port                          | 7272      |                 |
| Node Multicast Discovery port                | 5000      |                 |
| High availability manager communication port | 9355      |                 |
| ORB listener host name                       | *         |                 |
| ORB port                                     | 2809      |                 |
| ORB SSL port                                 | 0         |                 |

## Service integration bus

|                                                                                  |   |  |
|----------------------------------------------------------------------------------|---|--|
| Do you wish to federate service integration buses that exist on this node? (Y/N) | N |  |
|----------------------------------------------------------------------------------|---|--|

Name of federated node configuration variable data set:

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