



**Program Directory for
WebSphere Application Server V4.0
for z/OS and OS/390**

Version 4 Release 0 Modification 0

Program Number 5655-F31

for Use with
OS/390 Release 8 or higher and z/OS

CBPDO Level SMC0104
Service Level PUT0101

Document Date: April 2001

Note!

Before using this information and the product it supports, be sure to read the general information under “Notices” on page vii.

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1.0 Introduction

This program directory is intended for the system programmer responsible for program installation and maintenance. It contains information concerning the material and procedures associated with the installation of WebSphere Application Server V4.0 for z/OS and OS/390. You should read all of this program directory before installing the program and then keep it for future reference.

The program directory contains the following sections:

- 2.0, “Program Materials” on page 5 identifies the basic and optional program materials and documentation for WebSphere Application Server V4.0 for z/OS and OS/390.
- 3.0, “Program Support” on page 9 describes the IBM support available for WebSphere Application Server V4.0 for z/OS and OS/390.
- 4.0, “Program and Service Level Information” on page 11 lists the APARs (program level) and PTFs (service level) incorporated into WebSphere Application Server V4.0 for z/OS and OS/390.
- 5.0, “Installation Requirements and Considerations” on page 13 identifies the resources and considerations for installing and using WebSphere Application Server V4.0 for z/OS and OS/390.
- 6.0, “Installation Instructions” on page 27 provides detailed installation instructions for WebSphere Application Server V4.0 for z/OS and OS/390. It also describes the procedures for activating the functions of WebSphere Application Server V4.0 for z/OS and OS/390, or refers to appropriate publications.

Before installing WebSphere Application Server V4.0 for z/OS and OS/390, read 3.2, “Preventive Service Planning” on page 9. This section tells you how to find any updates to the information and procedures in this program directory.

Do not use this program directory if you are installing WebSphere Application Server V4.0 for z/OS and OS/390 with a SystemPac or ServerPac. When using these offerings, use the jobs and documentation supplied with the offering. This documentation may point you to specific sections of the program directory as required.

If you are installing WebSphere Application Server V4.0 for z/OS and OS/390 using the MVS Custom-Built Product Delivery Offering (CBPDO, 5751-CS3), a softcopy program directory is provided on the CBPDO tape which is identical to the printed copy shipped with your order. Your CBPDO contains a softcopy preventive service planning (PSP) upgrade for this product. All service and HOLDDATA for WebSphere Application Server V4.0 for z/OS and OS/390 are included on the CBPDO tape.

1.1 WebSphere Application Server V4.0 for z/OS and OS/390 Description

WebSphere Application Server V4.0 for z/OS and OS/390 is an e-business application deployment environment built on open standards-based technology. It is the cornerstone of WebSphere application offerings and services, providing support for Servlets, Java Server Pages (JSPs), and Enterprise Java Beans (EJB beans), in compliance with Java 2 Enterprise Edition (J2EE) specifications. This 4.0 version brings together Standard Edition and Enterprise Edition into a single product, providing a single offering. WebSphere Application Server V4.0 for z/OS and OS/390 continues to support connector access to CICS, IMS, and DB2, as well as support to connect among applications running on Web servers, CORBA application servers, and back-end systems such as DB2, CICS, and IMS. Included in this support is Java Developer's Kit (SDK) 1.3.0, which provides the base support for applications at the Java 2 API level.

Note: WebSphere Application Server V4.0 for z/OS and OS/390 can operationally co-exist with WebSphere Application Server for OS/390 V3.5 Standard Edition, as long as the HFS filesystems are mounted at unique mount points.

1.2 WebSphere Application Server V4.0 for z/OS and OS/390 FMIDs

WebSphere Application Server V4.0 for z/OS and OS/390 consists of the FMIDs listed in the table below. An explanation of the table headings is listed below.

Element Name	the name of the element
Level	the latest level of WebSphere Application Server in which the element changed. For non-exclusive elements, the equivalent level of the stand-alone product is listed in parentheses.
Excl	indicates whether the element is exclusive (available only in WebSphere Application Server V4.0 for z/OS and OS/390)
ALLOC	indicates whether the element has a sample allocate job
DDDEF	indicates whether the element has a sample job to define DDDEF entries
POST-I	indicates whether the element has any post-installation jobs
IVP	indicates whether the element has any installation verification procedure (IVP) jobs
MKDIR	indicates whether the element has any make directory jobs

Figure 1. WebSphere Application Server V4.0 for z/OS and OS/390 FMIDs

Element Name FMIDs	Level	E X C L	A L L O C	D D E F	P O S T - I	I V P	M K D I R
Application Server H28W400	V4R0M0	Y	Y	Y	Y	Y	Y
IBM Developer Kit for OS/390 Java™ 2 Technology Edition HJVA130	V3R5M0 (IBM Developer Kit for OS/390, Java 2 Technology Edition, 5655-D35)	N	Y	Y	N	N	Y

2.0 Program Materials

An IBM program is identified by a program number and a feature number. The program number for WebSphere Application Server V4.0 for z/OS and OS/390 is 5655-F31.

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

The program announcement material describes the features supported by WebSphere Application Server V4.0 for z/OS and OS/390. Ask your IBM representative for this information if you have not already received a copy.

2.1 Basic Machine-Readable Material

See Figure 1 on page 2 for the list of FMIDs available for WebSphere Application Server V4.0 for z/OS and OS/390, or see the *MVS CBPDO Memo to User's Extension* for a full list of FMIDs and detailed information on tape volumes and file format.

2.2 Optional Machine-Readable Material

No optional machine-readable materials are provided for WebSphere Application Server V4.0 for z/OS and OS/390.

2.3 Program Publications

The following sections identify the basic and optional publications for WebSphere Application Server V4.0 for z/OS and OS/390.

2.3.1 Basic Program Publications

Figure 2 identifies the basic unlicensed program publications for WebSphere Application Server V4.0 for z/OS and OS/390. These publications may be viewed online or downloaded for printing at <http://www.ibm.com/software/webservers/appserv/library.html>

<i>Figure 2 (Page 1 of 2). Basic Material: Unlicensed Publications</i>	
Publication Title	Form Number
<i>Building Business Solutions with WebSphere</i>	SC09-4432

<i>Figure 2 (Page 2 of 2). Basic Material: Unlicensed Publications</i>	
Publication Title	Form Number
<i>Getting Started with WebSphere Application Server</i>	SC09-4581
<i>Writing Enterprise Java Beans in WebSphere</i>	SC09-4431

Information about the IBM Developer Kit for OS/390 Java 2 Technology Edition product is available electronically at <http://www.s390.ibm.com/java>.

2.3.2 Optional Program Publications

Figure 3 identifies the optional unlicensed program publications for WebSphere Application Server V4.0 for z/OS and OS/390. These publications may be viewed online or downloaded for printing at <http://www.ibm.com/software/webserver/appserv/>

<i>Figure 3 (Page 1 of 2). Optional Material: Unlicensed Publications</i>		
Publication Title	Form Number	Feature Number
<i>WebSphere Application Server V4.0 for z/OS and OS/390: Licensed Program Specifications</i>	GA22-7845	
<i>WebSphere Application Server V4.0 for z/OS and OS/390: Installation and Customization</i>	GA22-7834	
<i>WebSphere Application Server V4.0 for z/OS and OS/390: Messages and Diagnosis</i>	GA22-7837	
<i>WebSphere Application Server V4.0 for z/OS and OS/390: Operations and Administration</i>	SA22-7835	
<i>WebSphere Application Server V4.0 for z/OS and OS/390: Assembling J2EE Applications</i>	SA22-7836	
<i>WebSphere Application Server V4.0 for z/OS and OS/390: Assembling CORBA Applications</i>	SA22-7848	
<i>WebSphere Application Server V4.0 for z/OS and OS/390: System Management User Interface</i>	SA22-7838	
<i>WebSphere Application Server V4.0 for z/OS and OS/390: System Management Scripting Application Programming Interface</i>	SA22-7839	
<i>WebSphere Application Server Component Broker Application Development Tools Guide</i>	SC09-4448	
<i>WebSphere Application Server Component Broker Programming Guide</i>	SC09-4442	
<i>WebSphere Application Server Component Broker Advanced Programming Guide</i>	SC09-4443	
<i>WebSphere Application Server Component Broker Programming Reference</i>	SC09-4588	

<i>Figure 3 (Page 2 of 2). Optional Material: Unlicensed Publications</i>		
Publication Title	Form Number	Feature Number
<i>WebSphere Application Server Component Broker Glossary</i>	SC09-4450	

2.4 Program Source Materials

No program source materials or viewable program listings are provided for WebSphere Application Server V4.0 for z/OS and OS/390.

2.5 Publications Useful During Installation

The publications listed in Figure 4 and Figure 5 on page 8 may be useful during the installation of WebSphere Application Server V4.0 for z/OS and OS/390. If you are installing WebSphere Application Server V4.0 onto an OS/390 system, refer to the publications in Figure 4. If you are installing WebSphere Application Server onto a z/OS system, refer to the publications in Figure 5 on page 8. To order copies for any of the listed publications, contact your IBM representative.

<i>Figure 4. OS/390 Publications Useful During Installation</i>	
Publication Title	Form Number
<i>OS/390 Information Roadmap</i>	GC28-1727
<i>OS/390 MVS JCL Reference</i>	GC28-1757
<i>OS/390 MVS System Codes</i>	GC28-1780
<i>OS/390 MVS System Messages, Vol 1 (ABA-ASA)</i>	GC28-1784
<i>OS/390 MVS System Messages, Vol 2 (ASB-EZM)</i>	GC28-1785
<i>OS/390 MVS System Messages, Vol 3 (GDE-IEB)</i>	GC28-1786
<i>OS/390 MVS System Messages, Vol 4 (IEC-IFD)</i>	GC28-1787
<i>OS/390 MVS System Messages, Vol 5 (IGD-IZP)</i>	GC28-1788
<i>OS/390 SMP/E Commands</i>	SC28-1805
<i>OS/390 SMP/E Messages and Codes</i>	SC28-1738
<i>OS/390 SMP/E Reference</i>	SC28-1806
<i>OS/390 SMP/E User's Guide</i>	SC28-1740
<i>OS/390 Planning for Installation</i>	GC28-1726
<i>OS/390 UNIX System Services Command Reference</i>	SC28-1892
<i>OS/390 UNIX System Services Planning</i>	SC28-1890

If you are installing WebSphere Application Server V4.0 for z/OS and OS/390 onto a z/OS system, the following publications may be useful.

Figure 5. z/OS Publications Useful During Installation

Publication Title	Form Number
<i>z/OS Information Roadmap</i>	SA22-7500
<i>z/OS MVS JCL Reference</i>	SA22-7597
<i>z/OS MVS System Codes</i>	SA22-7626
<i>z/OS MVS System Messages, Vol 1 (ABA-AOM)</i>	SA22-7631
<i>z/OS MVS System Messages, Vol 2 (ARC-ASA)</i>	SA22-7632
<i>z/OS MVS System Messages, Vol 3 (ASB-BPX)</i>	SA22-7633
<i>z/OS MVS System Messages, Vol 4 (CBD-DMO)</i>	SA22-7634
<i>z/OS MVS System Messages, Vol 5 (EDG-GFS)</i>	SA22-7635
<i>z/OS MVS System Messages, Vol 6 (GOS-IEA)</i>	SA22-7636
<i>z/OS MVS System Messages, Vol 7 (IEB-IEE)</i>	SA22-7637
<i>z/OS MVS System Messages, Vol 8 (IEF-IGD)</i>	SA22-7638
<i>z/OS MVS System Messages, Vol 9 (IGF-IWM)</i>	SA22-7639
<i>z/OS MVS System Messages, Vol 10 (IXC-IZP)</i>	SA22-7640
<i>z/OS SMP/E Commands</i>	SA22-7771
<i>z/OS SMP/E Messages, Codes, and Diagnosis</i>	GA22-7770
<i>z/OS SMP/E Reference</i>	SA22-7772
<i>z/OS SMP/E User's Guide</i>	SA22-7773
<i>z/OS Planning for Installation</i>	GA22-7504
<i>z/OS UNIX System Services Command Reference</i>	SA22-7802
<i>z/OS UNIX System Services Planning</i>	GA22-7800

3.0 Program Support

This section describes the IBM support available for WebSphere Application Server V4.0 for z/OS and OS/390.

3.1 Program Services

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

3.2 Preventive Service Planning

Before installing WebSphere Application Server V4.0 for z/OS and OS/390, you should review the current Preventive Service Planning (PSP) information. If you obtained WebSphere Application Server V4.0 for z/OS and OS/390 as part of a CBPDO, there is HOLDDATA and PSP information included on the CBPDO tape.

If the CBPDO is more than two weeks old when you install it, you should contact the IBM Support Center or use S/390 SoftwareXcel to obtain the current "PSP Bucket".

PSP Buckets are identified by UPGRADEs, which specify product levels, and SUBSETs, which specify the FMIDs for a product level. The UPGRADE and SUBSET values for WebSphere Application Server V4.0 for z/OS and OS/390 are:

Figure 6. PSP Upgrade and Subset ID

UPGRADE	SUBSET	Description
WASAS400	WAS400	Application Server
WASAS400	JAVA	IBM Developer Kit for OS/390 Java 2 Technology Edition

3.3 Statement of Support Procedures

Report any difficulties you have using this program to your IBM Support Center. If an APAR is required, the Support Center will provide the address to which any needed documentation can be sent.

Figure 7 identifies the component IDs (COMPID) for WebSphere Application Server V4.0 for z/OS and OS/390.

Figure 7. Component IDs

FMID	COMPID	Component Name	RETAIN Release
H28W400	5655A9800	WebSphere Application Server V4.0	400
H28W400	5655A9801	Application Server	400
HJVA130	5648C9800	IBM Developer Kit for OS/390 Java 2 Technology Edition (JAVA 2(1.3) Common)	130
HJVA130	5648C9801	IBM Developer Kit for OS/390 Java 2 Technology Edition (JAVA SDK for OS/390)	130

4.0 Program and Service Level Information

This section identifies the program and any relevant service levels of WebSphere Application Server V4.0 for z/OS and OS/390. The program level refers to the APAR fixes incorporated into the program. The service level refers to the PTFs integrated.

4.1 Program Level Information

The following APAR fixes against previous releases of elements contained in WebSphere Application Server V4.0 for z/OS and OS/390 have been incorporated into this version. They are listed by FMID.

- **FMID H28W400 (Application Server)**

OW44233 OW44381 OW44382 OW44383 OW44455 OW44456 OW44463 OW44609
OW44610 OW44629 OW44630 OW44639 OW44640 OW44709 OW44799 OW44849
OW44885 OW45227 OW45367 OW45386 OW45496 OW45510 OW45543 OW45779
OW45816 OW45822 OW45845 OW45936 OW46201 OW46211 OW46423 OW46425
OW46469 OW46612 OW46625 OW46668 OW46934 OW46956 OW46958 OW47037
OW47069 OW47145 OW47110 OW47298 PQ38770 PQ38895 PQ39215 PQ39897
PQ39844 PQ39848 PQ39936 PQ40030 PQ40125 PQ40245 PQ40315 PQ40361
PQ40375 PQ40377 PQ40378 PQ40527 PQ40530 PQ40655 PQ40710 PQ40801
PQ40870 PQ41019 PQ41169 PQ41419 PQ41427 PQ41492 PQ41672 PQ42869
PQ43240 PQ44247 PQ44428 PQ44741 PQ44770 PQ44825 PQ44850 PQ44966
PQ45003

The following APARs, which were reported on previous releases and closed FIN, have been included in this release.

OW45800 OW45815 OW45964 OW46004 OW46629 OW46650 OW46701 OW46746
OW46934 OW47008 OW47540

- **FMID HJVA130 (IBM Developer Kit for OS/390 Java 2 Technology Edition)**

No APARs have been incorporated at this time.

4.2 Service Level Information

No PTFs against this version of WebSphere Application Server V4.0 for z/OS and OS/390 have been incorporated into the product tape.

5.0 Installation Requirements and Considerations

The following sections identify the system requirements for installing and activating WebSphere Application Server V4.0 for z/OS and OS/390. The following terminology is used:

- *Driving system*: the system used to install the program.
- *Target system*: the system on which the program is installed.

In many cases, the same system can be used as both a driving system and a target system. However, you may want to set up a clone of your system to use as a target system by making a separate IPL-able copy of the running system. The clone should include copies of all system libraries that SMP/E updates, copies of the SMP/E CSI data sets that describe the system libraries, and your PARMLIB and PROCLIB.

Some cases where two systems should be used include the following:

- When installing a new level of a product that is already installed, the new product will delete the old one. By installing onto a separate target system, you can test the new product while still keeping the old one in production.
- When installing a product that shares libraries or load modules with other products, the installation can disrupt the other products. Installing onto a test system or clone will allow you to assess these impacts without disrupting your production system.

Note: If your SMPLTS data set is currently a PDS, you must allocate a new PDSE, copy your existing SMPLTS into it, then change the SMPLTS DDDEF entry to indicate the new PDSE data set. For more information, see Figure 13 on page 20.

5.1 Driving System Requirements

This section describes the environment of the driving system required to install WebSphere Application Server V4.0 for z/OS and OS/390.

5.1.1 Machine Requirements

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

5.1.2 Programming Requirements

Program Number	Product Name and Minimum VRM/Service Level
5647-A01	OS/390 SMP/E Version 2 Release 7 or higher
5647-A01	OS/390 Version 2 Release 7 or higher and the fix for APAR OW43502

Notes:

1. UNIX must be up in full function mode on your driving system so that the utilities are available for the Shell Script support.
2. Before installing WebSphere Application Server V4.0 for z/OS and OS/390, you must ensure that the target system's HFS is available (OMVS active and the target file systems mounted) for processing.
3. If you are installing WebSphere Application Server V4.0 for z/OS and OS/390 into non-SMS-managed PDSEs, you need to install the following maintenance on the driving and/or target system where the non-SMS-managed PDSEs reside:
 - OS/390 DFSMS R5
 - UW65974
 - UW62253
 - UW64190
 - UW65985
 - UW66947
 - UW66208
 - UW67511
 - BCP
 - UW66027 (Release 7)
 - UW66028 (Release 8 and Release 9)
 - OS/390 TSO/E Release 7 and higher
 - UW66144
 - OS/390 ISPF
 - UW66120 (Release 7)
 - UW66121 (Release 8)
 - SMP/E Release 7 and higher
 - UR52136
4. An SMP/E utility entry for the binder is required. You can specify any of these program names in the UTILITY entry: IEWBLINK, HEWL, IEWL, LINKEDIT, or HEWLH096. (The linkage editor which uses the names HEWLKED, HEWLF064, IEWLF440, IEWLF880, and IEWLF128 cannot be used.)
5. The following installation jobs must be run under a userid with UID(0), or with a userid with read access to the BPX.SUPERUSER resource in the RACF facility class. The installation userid must also have read access to the facility class resource BPX.FILEATTR.PROGCTL. This requirement is stated in the sample job comments.
 - AJVISMKD
 - BBOISMKD

A userid with access to BPX.FILEATTR.PROGCTL is required because the program control bits are set by default for the IBM Developer Kit for OS/390 Java 2 Technology Edition directory /usr/lpp/java/IBM/J1.3/bin.

5.2 Target System Requirements

This section describes the environment of the target system required to install and use WebSphere Application Server V4.0 for z/OS and OS/390.

5.2.1 Machine Requirements

WebSphere Application Server V4.0 for z/OS and OS/390 will run on any hardware that supports the OS/390 operating system (V2 R8 and later) and the z/OS operating system. However, due to changes introduced in SDK 1.3.0, 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 higher systems.

For similar reasons, such applications currently running on a WebSphere Application Server for OS/390 V3.02 Standard Edition server will face performance degradation if moved to a V4.0 server running on a machine without binary floating point hardware. A hardware upgrade is highly recommended prior to moving these applications to V4.0.

5.2.2 Programming Requirements

5.2.2.1 Mandatory Requisites

A mandatory requisite is defined as a product that is required without exception; this product either **will not install** or **will not function** unless this requisite is met. This includes products that are specified as REQs or PREs.

Note: PTFs listed in bold in Figure 9 on page 16 are not included in the SMP/E logic on the product tape and need to be ordered and installed separately.

Figure 9. Mandatory Requisites

Program Number	Product Name and Minimum VRM/Service Level
Any one of the following:	
5647-A01	OS/390 R8 or higher with APARs/PTFs: UQ28424, UQ29258, UQ29752, UQ30918, UQ31101, UQ33619, UQ33690, UQ35424, UQ39549, UQ41698, UQ41430, UQ43858, UQ44332, UQ45854, UQ46558, UQ46969, UQ49014, UW57102, UW58950, UW63449, UW63511, UW64467, UW65196, UW65457, UW66020, UW66059, UW66279, UW66426, UW66499, UW66631, UW66643, UW66944, UW67545, UW67580, UW67863, UW69103, UW69379, UW70547, UW71574, UW72071, UW72074, UW72077, UW72080, UW72127, UW72789, UW72914, UW73004, UW73407, UW73816, UW74572, OW45238, OW47045
5647-A01	OS/390 R9 or higher with APARs/PTFs: UQ28424, UQ35424, UQ41431, UQ41699, UQ43859, UQ44333, UQ45855, UQ46558, UQ46970, UQ49014, UW58950, UW65196, UW66059, UW66279, UW66280, UW66499, UW66643, UW66944, UW66945, UW67545, UW67547, UW67580, UW67581, UW67863, UW67865, UW69103, UW69105, UW70549, UW71574, UW72076, UW72079, UW72789, UW72918, UW73004, UW73407, UW74573, OW45238, OW47045
5647-A01	OS/390 R10 or higher with APARs/PTFs: UQ43857, UQ45856, UQ46971, UQ49015, UW70444, UW70548, UW71651, UW71902, UW72075, UW72078, UW73408, UW73722, UW74449, OW45238, OW47045
Any one of the following:	
5647-A01	OS/390 R8 or higher Security Server with APARs/PTFs: UW63511, UW64467, UW65457, UW66426, UW69379, UW71574, UW76075, UW76456
5647-A01	OS/390 R9 or higher Security Server with APARs/PTFs: UW63511, UW64467, UW65457, UW66426, UW69379, UW71574, UW76075, UW76456
5647-A01	OS/390 R10 or higher Security Server with APARs/PTFs: UW71575, UW76076, UW76457
And the following:	
5655-DB2	DB2 Version 7.1 or higher with Data Sharing for Sysplex with APARs/PTFs: UQ50308, PQ44534, PQ45186

Note: If you plan to run multiple levels of DB2 in a data sharing environment (for example, 7.1 and 6.1 or 7.1 and 5.1), there are coexistence PTFs that need to be installed. Please consult the DB2 publications or support for the specific APARs to install.

5.2.2.2 Functional Requisites

A functional requisite is defined as a product that is **not** required for the successful installation of this product or for the basic function of the product, but **is** needed at run time for a specific function of this product to work. This includes products that are specified as IF REQs.

Note: PTFs listed in bold are not included in the SMP/E logic on the product tape and need to be ordered and installed separately.

<i>Figure 10. Functional Requisites</i>		
Program Number	Product Name and Minimum VRM/Service Level	Function
5647-A01	OS/390 Release 8 or higher IBM HTTP Server with PTF UQ33469	Serving HTTP Requests
5647-A01	OS/390 V2R8 (or higher) SecureWay Communications Server IP or a functionally equivalent product	Java networking classes
5647-A01	OS/390 V2R8 (or higher) SecureWay Communications Server X/Windows feature or a functionally equivalent product with X/Windows (X11R6) feature	Java windowing support
5647-A01	OS/390 R8 or higher Security Server (RACF) with APAR OW46859.	EJB Roles support
5647-A01	OS/390 R8 or higher C/C++ with PTFs: UQ25762, UQ30331, UQ38764, UQ38765, UQ90002	WebSphere Business Application
5647-A01	OS/390 R8 DCE User Data Privacy DES feature	Component Broker Quality of Protection level of confidentiality
5647-147	CICS V1 R3	Component Broker Business Application (if using CICS/PAA)
5655-158	IMS V6 R1 with PTFs: UQ22097, UQ23685, UQ30721, UQ32135, UQ35463, UQ35464, UQ39673, UQ42049	Component Broker Business Application (if using IMS/PAA)
5655-D35	IBM Developer Kit for OS/390 Java™ 2 Technology Edition (included with this product) with PTF UQ49441	Base Java support, plus CORBA ORB support

5.2.2.3 Toleration/Coexistence Requisites

A toleration/coexistence requisite is defined as a product or service which must be present on a sharing system. These systems can be other systems in a multisystem environment (not necessarily sysplex), a shared DASD environment (such as test and production), or systems that reuse the same DASD at different time intervals.

WebSphere Application Server V4.0 for z/OS and OS/390 has no toleration/coexistence requisites.

5.2.2.4 Incompatibility (Negative) Requisites

A negative requisite identifies products which must *not* be installed on the same system as this product.

WebSphere Application Server V4.0 for z/OS and OS/390 has no negative requisites.

5.2.3 DASD Storage Requirements

WebSphere Application Server V4.0 for z/OS and OS/390 libraries can reside on any DASD device supported by OS/390 or z/OS. Space requirements are given here in 3390 tracks.

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

<i>Figure 11. Total DASD Space Required by WebSphere Application Server V4.0 for z/OS and OS/390</i>	
Library Type	Total Space Required (3390 tracks)
Target	8850
Distribution	11475
HFS	5940

Notes:

1. IBM recommends use of system-determined block sizes for efficient DASD utilization for all non-RECFM U data sets. For RECFM U data sets, IBM recommends a block size of 32760, which is the most efficient from a performance and DASD utilization perspective.
2. Abbreviations used for the data set type are:
 - U** Unique data set, allocated by this product and used only by this product. In order to determine the correct storage needed for this data set, this table provides all required information; no other tables (or program directories) need to be referenced for the data set size.
 - S** Shared data set, allocated by this product and used by this product and others. In order to determine the correct storage needed for this data set, the storage size given in this table needs to be added to other tables (perhaps in other program directories). If the data set

already exists, it must have enough free space to accommodate the storage size given in this table.

- E** Existing shared data set, used by this product and others. This data set is NOT allocated by this product. In order to determine the correct storage needed for this data set, the storage size given in this table needs to be added to other tables (perhaps in other program directories). This existing data set must have enough free space to accommodate the storage size given in this table.

If you currently have a previous version of WebSphere Application Server V4.0 installed in these libraries, the installation of this release will delete the old one and reclaim the space used by the old release and any service that had been installed. You can determine whether or not these libraries have enough space by deleting the old release with a dummy function, compressing the libraries, and comparing the space requirements with the free space in the libraries.

For more information on the names and sizes of the required data sets, please refer to 6.2.3, "Define Target and Distribution Libraries for WebSphere Application Server V4.0 for z/OS and OS/390" on page 30.

3. Abbreviations used for the HFS Path type are:

- N** New path, created by this product.
- P** Previously existing path, created by another product.

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

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

5. All target libraries listed have the following attributes:

- The data set may be SMS-managed.
- It is not required for the data set to be SMS-managed.
- The data set may be in the LPA.
- It is not required for the data set to be in the LPA.
- The data set may be in the LNKLIST.
- It is not required for the data set to be AFP-authorized.
- It is not required for the data set to reside on the IPL volume.
- The values in the "Member Type" column are not necessarily the actual SMP/E element types identified in the SMPMCS.

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

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

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

Library DDNAME	T Y P E	O R G	R E C F M	L R E C L	No. of 3390 Trks	No. of DIR Blks
SMPWRK2	E	PDS	FB	80	30	10
SMPWRK3	E	PDS	FB	80	7500	100
SMPWRK4	E	PDS	FB	80	40	10
SMPWRK6	E	PDS	FB	80	1500	100
SYSUT1	U	SEQ	--	--	20000	0
SYSUT2	U	SEQ	--	--	30	0
SYSUT3	U	SEQ	--	--	30	0
SYSUT4	U	SEQ	--	--	30	0

The following table provides an estimate of the storage needed in the SMP/E data sets for WebSphere Application Server V4.0 for z/OS and OS/390. The estimates must be added to those of any other programs and service being installed to determine the total additional storage requirements.

The SMPLTS data set must be a PDSE. If your existing SMPLTS is a PDS, you will need to allocate a new PDSE, copy your existing SMPLTS into it, then change the SMPLTS DDEF entry to indicate the new PDSE data set.

Figure 13. Storage Requirements for SMP/E Data Sets

Library DDNAME	T Y P E	O R G	R E C F M	L R E C L	No. of 3390 Trks	No. of DIR Blks
SMPLTS	S	PDSE	U	0	6535	-
SMPMTS	S	PDS	FB	80	15	80
SMPPTS	S	PDS	FB	80	4000	80
Note: The 3390 track space requirement for the SMPPTS is for each PTF shipped with Application Server.						
SMPSCDS	S	PDS	FB	80	15	80
SMPSTS	S	PDS	FB	80	15	80

The following figures describe the target and distribution libraries and HFS paths required to install WebSphere Application Server V4.0 for z/OS and OS/390. The storage requirements of WebSphere Application Server V4.0 for z/OS and OS/390 must be added to the storage required by other programs having data in the same library or path.

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

Figure 14. Storage Requirements for WebSphere Application Server V4.0 for z/OS and OS/390 Target Libraries

Library DDNAME	Member Type	Target Volume	T Y P E	O R G	R E C F M	L R E C L	No. of 3390 Trks	No. of DIR Blks
SAJVSMP1	Sample	TVOL2	U	PDS	FB	80	3	2
SBBOCLIB	Clist	TVOL1	U	PDS	FB	80	5	20
SBBODBRM	DATA	TVOL1	U	PDS	FB	80	15	5
SBBODSD	DATA	TVOL2	U	PDSE	FB	80	255	-
SBBOEXEC	EXEC	TVOL1	U	PDS	VB	255	5	5
SBBOJCL	Sample	TVOL2	U	PDS	FB	80	20	10
SBBOLD2	LMOD	TVOL1	U	PDSE	U	0	5	-
SBBOLOAD	LMOD	TVOL1	U	PDSE	U	0	7120	-
SBBOLPA	LMOD	TVOL1	U	PDSE	U	0	15	-
SBBOMIG	LMOD	TVOL1	U	PDSE	U	0	30	-
SBBOMLIB	Message	TVOL1	U	PDS	FB	80	5	20
SBBOMSG	Message	TVOL1	U	PDS	VB	255	5	5
SBBOPLIB	Panel	TVOL1	U	PDS	FB	80	5	20
SBBOSLIB	Skeleton	TVOL1	U	PDS	FB	80	5	20
SBBOULIB	LMOD	TVOL1	U	PDSE	U	0	1335	-
SEJSSAMP	Sample	TVOL2	U	PDS	FB	80	5	5
SEJSSDCK	Data	TVOL2	U	PDS	FB	80	10	5

Figure 15 (Page 1 of 2). WebSphere Application Server V4.0 for z/OS and OS/390 HFS Directories

DDNAME	TYPE	Path Name
SAJVHFSI	N	/usr/lpp/java/IBM
SBBOBIN	N	/usr/lpp/WebSphere/bin/IBM/
SBBOETC	N	/usr/lpp/WebSphere/samples/IBM/
SBBOEXP	N	/usr/lpp/WebSphere/lib/IBM/
SBBOINC	N	/usr/lpp/WebSphere/include/IBM/
SBBOLIB	N	/usr/lpp/WebSphere/lib/IBM/

Figure 15 (Page 2 of 2). WebSphere Application Server V4.0 for z/OS and OS/390 HFS Directories

DDNAME	TYPE	Path Name
SBBOMSGE	N	/usr/lpp/WebSphere/msg/en_US/IBM/
SBBOSAMP	N	/usr/lpp/WebSphere/samples/IBM/
SEJSBINW	N	/usr/lpp/WebSphere/WebServerPlugIn/bin/IBM/
SEJSCJHW	N	/usr/lpp/WebSphere/WebServerPlugIn/classes/javax/servlet/http/IBM/
SEJSCJSW	N	/usr/lpp/WebSphere/WebServerPlugIn/classes/javax/servlet/IBM/
SEJSHESW	N	/usr/lpp/WebSphere/WebServerPlugIn/hosts/default_host/examples/servlets/IBM/
SEJSHEWW	N	/usr/lpp/WebSphere/WebServerPlugIn/hosts/default_host/examples/web/IBM/
SEJSLIBW	N	/usr/lpp/WebSphere/WebServerPlugIn/lib/IBM/
SEJSMMSG	N	/usr/lpp/WebSphere/WebServerPlugIn/msg/IBM/
SEJSPROW	N	/usr/lpp/WebSphere/WebServerPlugIn/properties/IBM/
SEJSPRWW	N	/usr/lpp/WebSphere/WebServerPlugIn/properties/com/ibm/websphere/IBM/

Figure 16 (Page 1 of 2). Storage Requirements for WebSphere Application Server V4.0 for z/OS and OS/390 Distribution Libraries

Library DDNAME	T Y P E	O R G	R E C F M	L R E C L	No. of 3390 Trks	No. of DIR Blks
AAJVSMP1	U	PDS	FB	80	3	2
AAJVS390	U	PDS	VB	256	1772	2
ABBOCLIB	U	PDS	FB	80	5	20
ABBODBRM	U	PDS	FB	80	5	5
ABBOEXEC	U	PDS	VB	255	5	5
ABBOEXP	U	PDS	FB	80	310	10
ABBOINC	U	PDS	VB	255	1750	15
ABBOJAR	U	PDS	VB	255	750	5
ABBOJCL	U	PDS	FB	80	25	10
ABBOMLIB	U	PDS	FB	80	5	20
ABBOMSG	U	PDS	VB	255	5	5
ABBOOBJ	U	PDSE	U	0	6740	-
ABBOPLIB	U	PDS	FB	80	5	20
ABBOSAMP	U	PDS	VB	255	90	15
ABBOSLIB	U	PDS	FB	80	5	20

Figure 16 (Page 2 of 2). Storage Requirements for WebSphere Application Server V4.0 for z/OS and OS/390 Distribution Libraries

Library DDNAME	T Y P E	O R G	R E C F M	L R E C L	No. of 3390 Trks	No. of DIR Blks
AEJSEMOD	U	PDSE	U	0	45	-
AEJSHFS	U	PDS	VB	1024	270	15
AEJSSAMP	U	PDS	FB	80	10	5

WebSphere Application Server V4.0 for z/OS and OS/390 will require additional space for data sets, HFS files, and DB/2 tables used by customer applications. Space requirements will vary with the application.

5.3 FMIDs Deleted

Installing WebSphere Application Server V4.0 for z/OS and OS/390 may result in the deletion of other FMIDs. To see what FMIDs will be deleted, examine the ++VER statement in the product's SMPMCS.

If you do not wish to delete these FMIDs at this time, you must install WebSphere Application Server V4.0 for z/OS and OS/390 into separate SMP/E target and distribution zones.

Note: These FMIDs will not automatically be deleted from the Global Zone. Consult the SMP/E manuals for instructions on how to do this.

5.4 Special Considerations

5.4.1 Application Server Special Considerations

WebSphere Application Server Version 4.0 for OS/390 and z/OS provides Managed Object Framework (MOFW) and J2EE development support, and is a functional successor to the **Component Broker** component in WebSphere Application Server V3.02 Enterprise Edition. The new Application Server will also provide support for a native J2EE server that is capable of hosting both Enterprise Java Beans and Web Applications.

In order to access Web Applications deployed into a WebSphere V4.0 J2EE server, the administrator must configure an IBM HTTP Server for OS/390. The IBM HTTP Server must exist in the same sysplex as the WebSphere V4.0 J2EE Server containing the Web Applications that are to be accessed. The WebSphere Application Server V4.0 product provides a GO Web Server API (GWAPI) plug-in routine which contains the logic to route HTTP requests to the appropriate WebSphere Application Server within the sysplex.

Note: WebSphere Application Server V4.0 for OS/390 and z/OS is able to co-exist on the same operating system image as WebSphere Application Server V3.02 Standard Edition for OS/390

and/or WebSphere Application Server V3.5 Standard Edition for OS/390. This implies that installations that have existing production Web applications need not disrupt these configurations in order to deploy a WebSphere V4.0 Application Server.

Two important considerations for co-existence with older releases are the SMP/E environment and the product mount point. WebSphere Application Server V4.0 for OS/390 and z/OS, if installed into an existing zone, will delete previous versions of the WebSphere Application Server. WebSphere Application Server V4.0 also uses the same mount point as the V3.5 Standard Edition and V3.02 Standard Edition versions of the code. **It is recommended that prior to removing WebSphere Application Server V3.02 and/or V3.5 Standard Edition that the installation first install a WebSphere Application Server V4.0 and become familiar with its operational characteristics.**

This means two things for the installer. First, a separate SMP/E environment should be used as described 6.0, "Installation Instructions" on page 27. In the installation procedure there is the option of using the service `-PathPrefix-` to add levels to the beginning of your directory path. We recommend using unique `-PathPrefix-` values for each release when maintaining multiple releases of WebSphere Application Server to avoid confusion when APPLYing maintenance. The DDDEFs in the SMP/E environments may have to be updated to reflect which version will be serviced using the respective environments.

Secondly, when two releases are to co-exist, they can't both use the supplied IBM default mount point, `/usr/lpp/WebSphere`. You may change the mount point of either version but there are fewer changes involved with changing the earlier release and using the default for the new release, due to an increased number of references to the mount point in the new release.

WebSphere Application Server V4.0 for OS/390 and z/OS provides upgraded support for Web applications. In some cases, changes to the application code will be required in order to deploy them in a WebSphere Application Server V4.0 environment. Changes required to the application code are described in *WebSphere Application Server V4.0 for z/OS and OS/390: Assembling J2EE Applications*, SA22-7836.

5.4.2 IBM Developer Kit for OS/390 Java 2 Technology Edition Special Considerations

The Software Development Kit (SDK) 1.3.0 included with WebSphere Application Server V4.0 for z/OS and OS/390 is identical to the version contained in the following products:

- IBM Developer Kit for OS/390 Java 2 Technology Edition (5655-D35)
- WebSphere Application Server for OS/390 V3.5 Standard Edition (5655-F31)

Customers with these products can continue to use the SDK already installed, as long as any SDK maintenance required for WebSphere Application Server V4.0 is also installed. Alternatively, customers may wish to install the SDK shipped with WebSphere Application Server V4.0, and discontinue maintenance and use of the previously-installed copy of SDK 1.3.0.

Older Java levels, including those contained in:

- Java for OS/390 V1R1M8 (5655-A46)
- WebSphere Application Server for OS/390 V3.02 (5655-A98)

cannot be used to run WebSphere Application Server V4.0 applications. Also, Java applications written to use older versions of Java may not run properly with the SDK contained in WebSphere Application Server V4.0. Information on incompatibilities between SDK 1.1 and SDK 1.3.0 can be found on the Web at <http://www.s390.ibm.com/java/Changes.html>

Customers must determine whether existing applications require the older Java level(s), and may wish to install the SDK contained in WebSphere Application Server V4.0 at a different mount point, such as `java13/usr/lpp/java`, instead of `/usr/lpp/java`. If this is done, customers must ensure that the proper mount point changes are made to installation batch jobs, cataloged procedures, shell scripts and configuration files for WebSphere Application Server V4.0.

Alternatively, customers may wish to move the older Java to a different mount point, and proceed with the installation of SDK 1.3.0 at `/usr/lpp/java`.

6.0 Installation Instructions

This section describes the installation method, and the step-by-step procedures to install and activate the functions of WebSphere Application Server V4.0 for z/OS and OS/390.

Please note the following:

- WebSphere Application Server V4.0 for z/OS and OS/390 should be installed into a separate SMP/E zone from OS/390 or z/OS. IBM strongly recommends that the product be installed in a new set of SMP/E zones and libraries. This includes SMP/E target and distribution zones, as well as the HFS data set. Consult the SMP/E manuals for instructions on creating and initializing the SMPCSI and the SMP/E control data sets.
- Sample jobs have been provided to help perform some or all of the installation tasks. The SMP/E jobs assume that all DDDEF entries required for SMP/E execution have been defined in the appropriate zones.
- The SMP/E dialogs may be used instead of the sample jobs to accomplish the SMP/E installation steps.

If IBM Developer Kit for OS/390 Java 2 Technology Edition is already installed on your system, please refer to 6.1, “Installing WebSphere Application Server V4.0 for z/OS and OS/390 When Java Has Already Been Installed” for actions that should be performed before continuing with 6.2, “Installing WebSphere Application Server V4.0 for z/OS and OS/390” on page 28. If IBM Developer Kit for OS/390 Java 2 Technology Edition is **not** already installed on your system, please refer to 6.2, “Installing WebSphere Application Server V4.0 for z/OS and OS/390” on page 28 for the installation procedures for WebSphere Application Server V4.0 for z/OS and OS/390.

6.1 Installing WebSphere Application Server V4.0 for z/OS and OS/390 When Java Has Already Been Installed

The Java FMID HJVA130 included as part of WebSphere Application Server V4.0 for z/OS and OS/390 is identical to the version available separately as IBM Developer Kit for OS/390 Java™ 2 Technology Edition (5655-D35). Your base OS/390 or z/OS system may already have a version of IBM Developer Kit for OS/390 Java 2 Technology Edition installed. If so, this version may be at an earlier or later maintenance level than the Java shipped as part of WebSphere Application Server V4.0 for z/OS and OS/390.

Whether installed as a stand-alone product or as part of WebSphere Application Server V4.0 for z/OS and OS/390, IBM Developer Kit for OS/390 Java 2 Technology Edition is normally installed into /usr/lpp/java/IBM. Because the Java product does not provide a sample allocation job to create a special HFS for the Java directory, it is possible that subsequent installation or maintenance of Java, whether applied to the operating system (OS/390 or z/OS) or WebSphere Application Server V4.0 for z/OS and OS/390 SMP zones, may have unintended results.

To guarantee that the IBM Developer Kit for OS/390 Java 2 Technology Edition installed as part of WebSphere Application Server V4.0 for z/OS and OS/390 is correctly positioned on your system, the following actions are recommended:

1. Allocate a special HFS data set to contain the Java directories that will be created as part of the WebSphere Application Server V4.0 for z/OS and OS/390 installation.
2. During the installation of WebSphere Application Server V4.0 for z/OS and OS/390, mount this HFS data set at a service mount point such as /service/usr/lpp/java.
3. When installation is complete, remount the HFS at mount point /usr/lpp/java. This will render previously installed versions of IBM Developer Kit for OS/390 Java 2 Technology Edition at this mount point unavailable.
4. When WebSphere Application Server V4.0 for z/OS and OS/390 installation is complete and has been tested, ensure that maintenance is not performed on previously installed versions of IBM Developer Kit for OS/390 Java 2 Technology Edition. If maintenance must be performed on these versions, make sure that the maintenance is **not** applied to the HFS directories and data sets installed as part of WebSphere Application Server V4.0 for z/OS and OS/390.

6.2 Installing WebSphere Application Server V4.0 for z/OS and OS/390

6.2.1 Create a Cross-Zone Set

WebSphere Application Server V4.0 for z/OS and OS/390 should be installed into a different zone from OS/390 or z/OS.

There are different methods that can be used for cross-zone processing. A zone group can be defined and added to the install jobs, or the XZGROUP operand can be used. XZGROUP(value) contains a list of ZONESETs or zones that are used to establish the zone group. Each value in the list must be a valid ZONESET or zone name. XZGROUP(value) would be added to the install jobs instead of adding the XZREQCHK operand to one or more ZONESETs.

The operand XZREQ provides a method for a user to more easily install cross-zone requisites. SMP/E identifies the cross-zone requisites needed in the set-to zone by reading CIFREQ data in the secondary zones of the zone group in effect for the current APPLY/ACCEPT commands. Any CIFREQ data that is for FMIDs installed or being installed in the set-to zone that are not yet in the set-to zone causes the required SYSMODs to become candidates for installation. If the FORFMID operand is also used, the FMID specified on the CIFREQ must match one of the FMIDs specified on the FORFMID operand for the SYSMOD to become a candidate.

By adding the new XZREQ operand, the CIFREQ SYSMODs are installed automatically into the set-to zone. However, XZREQ does not install the CIFREQs in the other cross-dependent zones. An APPLY XZREQ needs to be performed against the other zones in order to synchronize service.

Note: If SYSMODs being installed into the set-to zone have requirements against the other cross-zones, that service must be APPLY'd to those zones before installation can be completed into the set-to zone.

For more information on this operand, refer to *OS/390 SMP/E Commands*, SC28-1805. See Figure 17 for an example of how to set up the ZONEINDEX, ZONESET, and XZREQCHK for use during the APPLY/ACCEPT. See Figure 21 on page 38 for an example of the APPLY using the XZREQ operand.

```
//ZINDEX JOB (Job parameters)
//SMPE EXEC PGM=GIMSMP
//STEPLIB DD (If needed for SMP/E)
//SYSPRINT DD SYSOUT=*
//SMPCSI DD DSN=was.global.csi,DISP=SHR
//SMPCNTL DD *
SET BDY(GLOBAL) .
UCLIN .
ADD GLOBALZONE ZONEINDEX(
  (os390t,os390.target.csi,TARGET)
  (jes2tgt,jes2.target.csi,TARGET)
  (jes3tgt,jes3.target.csi,TARGET)
  (pptgt,pgmprod.target.csi,TARGET)
  (db2tgt,db2.target.csi,TARGET)
  (imstgt,ims.target.csi,TARGET)
  (cicstgt,cics.target.csi, TARGET)) .
ADD ZONESET(XZONE)
ZONE(wast,
  os390t,
  jes2tgt,
  jes3tgt,
  pptgt,
  cicstgt,
  db2tgt,
  imstgt)
XZREQCHK(YES) .
ENDUCL.
/*
```

Figure 17. Sample Job to Add XZREQCHK(YES) to a ZONESET Entry

Required Updates

1. Update the job parameters.
2. Update the STEPLIB DD statement (if necessary for your system).
3. Replace the CSI name on the SMPCSI DD statement with your CSI name.
4. Update cross-dependency zones and CSI names.

Successful processing issues a return code of 0.

6.2.2 RECEIVE WebSphere Application Server V4.0 for z/OS and OS/390

RECEIVE FMIDs and service for the WebSphere Application Server V4.0 for z/OS and OS/390 elements by running the RCVPDO job. For more information, refer to *MVS CBPDO Memo to User Extension* included with the CBPDO.

The CBPDO contains all non-integrated PTFs for every WebSphere Application Server V4.0 for z/OS and OS/390 FMID. (Cumulative service is included in CBPDO orders, so there is no separate cumulative service tape.) Depending on the options selected when you ordered the CBPDO, your order may contain service for other products in your profile or for just the WebSphere Application Server V4.0 for z/OS and OS/390 FMIDs. As a result, maintenance may be delivered that is already APPLY'd and ACCEPT'd.

Successful RECEIVE processing issues a return code of 0.

6.2.3 Define Target and Distribution Libraries for WebSphere Application Server V4.0 for z/OS and OS/390

Sample jobs to allocate the target and distribution libraries, set up HFS directories, and create DDDEF entries for the WebSphere Application Server V4.0 for z/OS and OS/390 elements have been provided. After RECEIVE processing, the jobs can be found in the SMPTLIB data sets. Copy the sample jobs to a work data set and customize them. For specific instructions on customizing, see the comments in the sample jobs.

Figure 18 lists the locations of the sample ALLOCATE, MKDIR, and DDDEF jobs for WebSphere Application Server V4.0 for z/OS and OS/390.

<i>Figure 18 (Page 1 of 2). Sample Installation Jobs</i>			
Job Name	Job Type	Description	RELFILE
AJVALLOC	ALLOCATE	Sample job to allocate target and distribution libraries for IBM Developer Kit for OS/390 Java 2 Technology Edition	IBM.HJVA130.F2
BBOALLOC	ALLOCATE	Sample job to allocate target and distribution libraries for Application Server	IBM.H28W400.F1
AJVISMKD	MKDIR	Sample job to invoke the supplied AJVMKDIR EXEC to allocate HFS paths for IBM Developer Kit for OS/390 Java 2 Technology Edition	IBM.HJVA130.F2
BBOISMKD	MKDIR	Sample job to invoke the supplied BBOMKDIR EXEC to allocate HFS paths for Application Server	IBM.H28W400.F1
AJVDDDEF	DDDEF	Sample job to define SMP/E DDDEFs for IBM Developer Kit for OS/390 Java 2 Technology Edition	IBM.HJVA130.F2

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

Job Name	Job Type	Description	RELFILE
BBODDDEF	DDDEF	Sample job to define SMP/E DDDEFs for Application Server	IBM.H28W400.F1

Submit the customized AJVALLOC and BBOALLOC jobs. Although you can modify the jobs to install into your root HFS, IBM strongly suggests that you allocate a new HFS for this product. You should receive a return code of 0. Check the allocation and deallocation messages to be certain the data sets were allocated and catalogued correctly.

6.2.4 Set Up HFS Directories for WebSphere Application Server V4.0 for z/OS and OS/390

At this time, you need to make the HFS data sets which will contain the HFS target directories available to install WebSphere Application Server V4.0 for z/OS and OS/390. (Remember, although you can install WebSphere Application Server V4.0 for z/OS and OS/390 into your existing root HFS data set, IBM strongly recommends that they be separate.) There are two HFS data sets which are required for WebSphere Application Server V4.0 for z/OS and OS/390. For Application Server, sample job BBOALLOC, which you ran in the previous section, allocated the Application Server HFS data sets. For IBM Developer Kit for OS/390 Java 2 Technology Edition, the following sample job must be run to allocate the IBM Developer Kit for OS/390 Java 2 Technology Edition HFS data set:

```

//ALLCHFS JOB <Job parameters>          *
//*                                       *
//* THIS JCL WILL ALLOCATE AN HFS FOR THE JAVA PRODUCT *
//*                                       *
//* CAUTION: THIS IS NEITHER A JCL PROCEDURE NOR A COMPLETE*
//* JOB. BEFORE USING THIS JOB STEP, YOU WILL HAVE TO MAKE *
//* THE FOLLOWING MODIFICATIONS:          *
//*                                       *
//* 1) CHANGE THE JOB PARAMETERS TO MEET YOUR SYSTEM *
//*    REQUIREMENTS.                      *
//*                                       *
//* 2) ENSURE YOU EXECUTE THIS JOB FROM A USERID THAT IS *
//*    UID=0 OR IS PERMITTED TO THE 'BPX.SUPERUSER' *
//*    FACILITY CLASS.                    *
//*                                       *
//* 3) CHANGE THE VALUE OF rootdsn TO THE NAME OF THE HFS *
//*    DATA SET FOR JAVA ("OMVS.JAVA.HFS" is the default) *
//*                                       *
//* 4) THE rootprim VARIABLE CONTAINS THE PRIMARY *
//*    ALLOCATION SIZE FOR THE ROOT HFS. THE DEFAULT OF *
//*    350 IS CALCULATED TO WORK FOR BOTH 3380 AND 3390 *
//*    DASD.                               *
//*                                       *
//* 5) THE rootseco VARIABLE CONTAINS THE SECONDARY *
//*    ALLOCATION SIZE FOR THE ROOT HFS. THE DEFAULT *
//*    15 IS CALCULATED TO WORK FOR BOTH 3380 AND 3390 *
//*    DASD.                               *
//*                                       *
//* 6) CHANGE storclas TO A VALID STORAGE CLASS, IF NEEDED,*
//*    BASED ON YOUR ACS ROUTINES.        *
//*                                       *
//* 7) CHANGE mgmtclas TO A VALID MANAGEMENT CLASS, IF *
//*    NEEDED, BASED ON YOUR ACS ROUTINES. *
//*                                       *
//* 8) CHANGE dataclas TO A VALID DATA CLASS, IF NEEDED,*
//*    BASED ON YOUR ACS ROUTINES.        *

```

Figure 19 (Part 1 of 2). Sample Allocate Job for Java HFS

```

//*
//* 9) THIS JOB SHOULD END WITH RC=0. IF NOT, PLEASE
//* CHECK OS/390 UNIX MESSAGES AND CODES BOOK TO CORRECT
//* THE PROBLEM AND RESUBMIT THIS JOB.
//*
//* Step ALLOCH creates the HFS for Java
//*
//*
//*****
//*****
//* THE FOLLOWING PROC IS USED TO ALLOCATE THE HFS
//*****
//*
//ALLOCHFS PROC ROOTDSN=,
//          ROOTPRIM=,
//          ROOTSECO=,
//          STORCLAS=,
//          MGMTCLAS=,
//          DATACLAS=
//*
//ALLOCH1 EXEC PGM=IEFBR14
//*
//HFSDS DD DSN=&ROOTDSN,
//        DISP=(,CATLG),
//        STORCLAS=&STORCLAS,
//        MGMTCLAS=&MGMTCLAS,
//        DATACLAS=&DATACLAS,
//        SPACE=(CYL,(&ROOTPRIM,&ROOTSECO,1)),
//        DSNTYPE=HFS
//*
//ENDALLOC PEND
//*****
//* ALLOCATE HFS DATA SET
//*****
//*
//ALLOCH EXEC ALLOCHFS,
//  ROOTDSN=OMVS.JAVA.HFS, * OMVS.JAVA.HFS IS THE DEFAULT
//  ROOTPRIM=350,          * 350 PRIMARY CYLS. IS THE DEFAULT
//  ROOTSECO=15,          * 15 SECONDARY CYLS. IS THE DEFAULT
//  STORCLAS=storclas,   * NO DEFAULT; STORAGE CLASS
//  MGMTCLAS=mgmtclas,   * NO DEFAULT; MANAGEMENT CLASS
//  DATACLAS=dataclas   * NO DEFAULT; DATA CLASS
/*

```

Figure 19 (Part 2 of 2). Sample Allocate Job for Java HFS

Important!

During the creation of the mount points and the mounting of the HFS data sets, the convention `-PathPrefix-/usr/lpp/mount point` is used. `-PathPrefix-` allows you to specify a service directory on your driving system. It is assumed that you will be mounting the WebSphere Application Server V4.0 for z/OS and OS/390 HFS data sets under a service directory which already contains the `/usr` and `/usr/lpp` directories. If this is not the case, you must create the `/usr` and `/usr/lpp` directories manually under your `-PathPrefix-` directory **prior** to running the IBM Developer Kit for OS/390 Java 2 Technology Edition sample commands.

If you have allocated the optional HFS data sets for WebSphere Application Server V4.0 for z/OS and OS/390, you must make them available on your driving system for installation. For IBM Developer Kit for OS/390 Java 2 Technology Edition, use the following sample commands to create the mount point and mount the IBM Developer Kit for OS/390 Java 2 Technology Edition HFS data set:

- From the Unix shell:

```
mkdir -PathPrefix-/usr/lpp/java/IBM
```

- From TSO:

```
MOUNT FILESYSTEM('your.java.hfs')  
MOUNTPOINT('-PathPrefix-/usr/lpp/java/IBM') TYPE(HFS) MODE(RDWR)
```

Important!

If you are installing onto a system which contains a previous level of WebSphere Application Server, you need to make some decisions regarding mount points. WebSphere Application Server 3.02 SE and 3.5 SE default to the same mount point as WebSphere Application Server V4.0 for z/OS and OS/390. If you are migrating from an earlier release you should run both versions while you migrate from the previous version to WebSphere Application Server V4.0 for z/OS and OS/390. That means that you must change the service and production mount points of one of the releases. If this is your situation, read the discussion of options in Appendix A, “HFS Considerations for Co-Existent Versions” on page 45 before submitting the next sample job.

Run the customized sample jobs AJVISMKD and BBOISMKD, listed in Figure 18 on page 30, from a userid that is UID(0) or which has read access to the BPX.SUPERUSER resource in the RACF facility class. You will receive a return code of 0 for each step, if it is successful.

Once the customized sample jobs AJVISMKD and BBOISMKD, provided in Figure 18 on page 30 have been run and before continuing with the installation of WebSphere Application Server V4.0 for z/OS and OS/390, you must verify the following:

1. You have allocated two HFS data sets for WebSphere Application Server V4.0 for z/OS and OS/390 - one for each element (Application Server and IBM Developer Kit for OS/390 Java 2 Technology Edition).

2. You have defined a mount point for each of the two HFS data sets (for instance: -PathPrefix-/usr/lpp/WebSphere and -PathPrefix-/usr/lpp/java).
3. You have mounted the two HFS data sets, one for each element (Application Server and IBM Developer Kit for OS/390 Java 2 Technology Edition), to your driving system.

After you have verified the above items, continue with the installation in defining the DDDEFS for WebSphere Application Server V4.0 for z/OS and OS/390.

6.2.5 Define DDDEFS for WebSphere Application Server V4.0 for z/OS and OS/390

Run the customized sample jobs AJVDDDEF and BBODDDEF to create SMP/E DDDEFS for target and distribution data sets. You should receive a return code of 0. If any of the DDDEF entries exist, you will get a non-zero return code. Check the output to see what caused the non-zero return code.

Figure 18 on page 30 lists the locations of the sample jobs.

6.2.6 SMP/E CALLLIBS Processing and Side Decks Processing

WebSphere Application Server V4.0 for z/OS and OS/390 uses the CALLLIBS function provided in SMP/E and definition side decks to resolve external references during installation. When WebSphere Application Server V4.0 for z/OS and OS/390 is installed, ensure that DDDEFS exist for the following libraries in the WebSphere WebSphere Application Server V4.0 target zone:

- Application Server
 - CSSLIB (OS/390 callable services)
 - SCEECPP (OS/390 Language Environment)
 - SCEELKED (OS/390 Language Environment)
 - SCEELKEX (OS/390 Language Environment)
 - SCEEOBJ (OS/390 Language Environment)
 - SCEESPC (OS/390 Language Environment)
 - SCLBSID (OS/390 C/C++ IBM Open Class Library)
 - SIMWSA (OS/390 HTTP Server)

The DDDEFS should point to the appropriate data sets used by the target OS/390 or z/OS system; that is, the version of OS/390 or z/OS on which Application Server will be run, if different from that of the system being used to install the product.

- IBM Developer Kit for OS/390 Java 2 Technology Edition
 - No CALLLIBS are used

Notes:

1. The DDDEFs above are used only to resolve the link-edit for WebSphere Application Server V4.0 for z/OS and OS/390 using CALLLIBS. These data sets are not updated during the installation of WebSphere Application Server V4.0 for z/OS and OS/390.
2. SCEERUN must be in either the LNKLIST or STEPLIB of the APPLY jobs for the installation to be successful.

WebSphere Application Server V4.0 for z/OS and OS/390 installation does not require a DDDEF for SYSLIB; however, SMP/E apply processing expects to find one. If necessary, create DDDEFs for SMPMTS and SYS1.MACLIB, and create a SYSLIB DDDEF that points to a concatenation of these two data sets. See *OS/390 SMP/E Reference* for more information about the SYSLIB concatenation.

6.2.7 Perform SMP/E APPLY CHECK for WebSphere Application Server V4.0 for z/OS and OS/390 FMIDs and Service

Run an APPLY CHECK to identify any requisite service and additional holds—for example, HOLDSYS(DOC,EC)—that might need to be resolved before APPLY processing. Resolve any holds and receive any requisite service identified by the APPLY CHECK before the next step.

Figure 20 shows a sample APPLY CHECK for WebSphere Application Server V4.0 for z/OS and OS/390.

```
//CHECK JOB <job parameters>
//STEP1 EXEC PGM=GIMSMP,REGION=0M,TIME=NOLIMIT
//STEPLIB DD (if needed for SMP/E)
//SMPCSI DD DSN=was.global.csi,DISP=SHR
//SMPCNTL DD *
  SET BOUNDARY(targetzone)
  OPTIONS(OS390OPT) .
  APPLY CHECK XZREQ
  FORFMID(HJVA130, H28W400)
  SELECT(HJVA130, H28W400)
  GROUPEXTEND(NOAPARS,NOUSERMODS)
  BYPASS(HOLDSYSTEM) .
/*
```

Figure 20. SMP/E APPLY CHECK

Required Updates

1. Update the job parameters.
2. Update the STEPLIB DD statement (if necessary for your system).
3. Replace the CSI name on the SMPCSI DD statement with your CSI name.
4. Update targetzone to your target zone name.

Expected Return Codes and Messages:

If cross-zone requisites encounter problems, the following messages may be issued:

- “GIM35925I CROSS-ZONE REQUISITE SYSMOD aaaaaaa REQUIRED IN ZONE bbbbbbb WAS MISSING.”

Where

aaaaaaa -- SYSMOD ID

bbbbbbb -- zone name that needs the cross-zone requisite

If service containing ++**HOLD** is being installed, then RC=4 and the following messages will be issued:

- “GIM42001W THE FOLLOWING CONDITIONS FOR SYSMOD aaaaaaa WERE NOT SATISFIED, BUT WERE IGNORED BECAUSE THE BYPASS OPERAND WAS SPECIFIED. PROCESSING CONTINUES.”

where aaaaaaa--SYSMOD ID

- “GIM35966I SYSTEM HOLD aaaaaaa ORIGINATED BY SYSMOD bbbbbbb WAS BYPASSED.”

where: aaaaaaa--system hold reason ID and bbbbbbb--SYSMOD ID

Otherwise RC=0

Notes:

1. The XZREQ operand only needs to be specified when cross-zone processing is required. If this operand is specified when there is no zone group set up, the following message will be received, which is acceptable:
 - “GIM50810W THE XZREQ OPERAND WAS SPECIFIED ON THE APPLY COMMAND BUT SINCE NO ZONES WERE APPLICABLE FOR CROSS-ZONE REQUISITE CHECKING, THE XZREQ OPERAND WILL BE IGNORED.”

6.2.8 Perform SMP/E APPLY for WebSphere Application Server V4.0 for z/OS and OS/390 FMIDs and Service

Once all exceptions reported by the APPLY CHECK have been resolved, run the SMP/E APPLY step to install the WebSphere Application Server V4.0 for z/OS and OS/390 products. This job must be run under a userid with either UID(0), or with a userid with read access to the BPX.SUPERUSER and BPX.FILEATTR.PROGCTL resource in the RACF facility class. **In addition, you must remove the LISTPRIV parameter from your GLOBAL zone linkedit utility in your SMP/E CSI.**

Note: Using NOLIST in the SMP/E UTILITY entry for the binder will allow APPLY processing to complete faster, as well as reduce the amount of output generated by more than half (without using NOLIST, approximately 10 million lines of output are created).

Figure 21 shows a sample APPLY for the WebSphere Application Server V4.0 for z/OS and OS/390 functions, plus RECEIVED PTFs for these functions.

```
//APPLY JOB <job parameters>
//STEP1 EXEC PGM=GIMSMP,REGION=0M,TIME=NOLIMIT
//STEPLIB DD (if needed for SMP/E)
//SMPCSI DD DSN=was.global.csi,DISP=SHR
//SMPCNTL DD *
    SET BOUNDARY(targetzone)
    OPTIONS(OS390OPT) .
    APPLY XZREQ
    FORFMID(HJVA130, H28W400)
    SELECT(HJVA130, H28W400)
    GROUPEXTEND(NOAPARS,NOUSERMODS)
    BYPASS(HOLDSYSTEM) .
/*
```

Figure 21. SMP/E APPLY

Required Updates

1. Update the job parameters.
2. Update the STEPLIB DD statement (if necessary for your system).
3. Replace the CSI name on the SMPCSI DD statement with your CSI name.
4. Update targetzone to your target zone name.

Expected Return Codes and Messages:

If service containing ++**HOLD** is being installed, then RC=4 and the following messages will be issued:

- “GIM42001W THE FOLLOWING CONDITIONS FOR SYSMOD aaaaaaa WERE NOT SATISFIED, BUT WERE IGNORED BECAUSE THE BYPASS OPERAND WAS SPECIFIED. PROCESSING CONTINUES.”

where aaaaaaa--SYSMOD ID

- “GIM35966I SYSTEM HOLD aaaaaaa ORIGINATED BY SYSMOD bbbbbbb WAS BYPASSED.”
where: aaaaaaa--system hold reason ID and bbbbbbb--SYSMOD ID

Otherwise RC=0

6.2.9 Do Post-APPLY Work for WebSphere Application Server V4.0 for z/OS and OS/390

Once you have successfully SMP/E APPLY'd the WebSphere Application Server V4.0 for z/OS and OS/390 elements, you must perform the post-APPLY activities. Post-APPLY work for WebSphere Application Server V4.0 for z/OS and OS/390 must be run from your **driving** system unless otherwise specified.

6.2.9.1 Verify HFS Data Sets Are Correctly Mounted

Before proceeding with post-install activities, unmount the two WebSphere Application Server V4.0 for z/OS and OS/390 HFS file systems and remount them in read-only mode at their production locations. The following TSO commands can be used:

```
UNMOUNT FILESYSTEM('your.java.hfs')
UNMOUNT FILESYSTEM('your.was.hfs')

MOUNT FILESYSTEM('your.java.hfs') MOUNTPOINT('/usr/lpp/java/IBM') TYPE(HFS) MODE(RDWR)
MOUNT FILESYSTEM('your.was.hfs') MOUNTPOINT('/usr/lpp/WebSphere') TYPE(HFS) MODE(RDWR)
```

Make sure both HFS data sets are correctly mounted before proceeding with the next steps.

6.2.9.2 Application Server Post-Install Job

For detailed information on post-installation jobs for Application Server, refer to chapter 3, “Installing and customizing your first run time” in *WebSphere for OS/390 V4.0 Enterprise Edition Installation and Customization*, GA22-7331.

6.2.9.3 IBM Developer Kit for OS/390 Java 2 Technology Edition Post-Install Job

With IBM Developer Kit for OS/390 Java 2 Technology Edition, a shell script is automatically run by SMP/E to explode the archive file into its subdirectories and files, under directory /usr/lpp/java/IBM, after the archive file has been installed during SMP/E APPLY processing. The post-install job AJVISTAR that was provided in Java for OS/390 is not provided because the shell script processing eliminates the requirement for users to run the post-install job.

With IBM Developer Kit for OS/390 Java 2 Technology Edition, the archive file provided has the program control bits set on all files in the following directories:

- /usr/lpp/java/IBM/J1.3/bin
- /usr/lpp/java/IBM/J1.3/bin/classic

These directories contain executables such as the "java" command. During shell script processing, the program control bits will be preserved when the archive file is exploded into its subdirectories and files. This eliminates the requirement for users to set the program control bits for the above directories.

6.2.10 Installation Verification Procedures for WebSphere Application Server V4.0 for z/OS and OS/390

6.2.10.1 Application Server Installation Verification Procedures

For detailed information on the installation verification procedures for Application Server, refer to chapter 3, "Installing and customizing your first run time" in *WebSphere Application Server V4.0 for z/OS and OS/390: Installation and Customization*, GA22-7834.

6.2.10.2 IBM Developer Kit for OS/390 Java 2 Technology Edition Installation Verification Procedures

There are no installation verification procedures for IBM Developer Kit for OS/390 Java 2 Technology Edition.

6.2.11 Perform SMP/E ACCEPT CHECK for WebSphere Application Server V4.0 for z/OS and OS/390 FMIDs and Service

Run an ACCEPT CHECK to identify any requisite service and additional holds—for example, HOLDSYS(DOC,EC)—that may need to be resolved before ACCEPT processing. Resolve any holds, and RECEIVE and APPLY any requisite service identified by ACCEPT CHECK before the next step.

Figure 22 on page 41 shows a sample ACCEPT CHECK for WebSphere Application Server V4.0 for z/OS and OS/390.

```

//CHECK JOB <job parameters>
//STEP1 EXEC PGM=GIMSMP,REGION=0M,TIME=NOLIMIT
//STEPLIB DD (if needed for SMP/E)
//SMPCSI DD DSN=was.global.csi,DISP=SHR
//SMPCNTL DD *
    SET BOUNDARY(dlibzone)
    OPTIONS(OS390OPT) .
    ACCEPT CHECK
    FORFMID(HJVA130, H28W400)
    SELECT(HJVA130, H28W400)
    GROUPEXTEND(NOAPARS,NOUSERMODS)
    BYPASS(HOLDSYS) .
/*

```

Figure 22. SMP/E ACCEPT CHECK

Required Updates

1. Update the job parameters.
2. Update the STEPLIB DD statement (if necessary for your system).
3. Replace the CSI name on the SMPCSI DD statement with your CSI name.
4. Update dlibzone to your dlib zone name.

Expected Return Codes and Messages:

If service containing ++**HOLD** is being installed, then RC=4 and the following messages will be issued:

- “GIM42001W THE FOLLOWING CONDITIONS FOR SYSMOD aaaaaaa WERE NOT SATISFIED, BUT WERE IGNORED BECAUSE THE BYPASS OPERAND WAS SPECIFIED. PROCESSING CONTINUES.”
where aaaaaaa--SYSMOD ID
- “GIM35966I SYSTEM HOLD aaaaaaa ORIGINATED BY SYSMOD bbbbbbb WAS BYPASSED.”
where: aaaaaaa--system hold reason ID and bbbbbbb--SYSMOD ID

Otherwise RC=0

6.2.12 Perform SMP/E ACCEPT for WebSphere Application Server V4.0 for z/OS and OS/390 FMIDs and Service

Figure 23 on page 42 shows a sample ACCEPT for WebSphere Application Server V4.0 for z/OS and OS/390.

```

//ACCEPT JOB <job parameters>
//STEP1 EXEC PGM=GIMSMP,REGION=0M,TIME=NOLIMIT
//STEPLIB DD (if needed for SMP/E)
//SMPCSI DD DSN=was.global.csi,DISP=SHR
//SMPCNTL DD *
  SET BOUNDARY(dlibzone)
  OPTIONS(OS390OPT) .
  ACCEPT
  FORFMID(HJVA130, H28W400)
  SELECT(HJVA130, H28W400)
  GROUPEXTEND(NOAPARS,NOUSERMODS)
  BYPASS(HOLDSYS) .
/*

```

Figure 23. SMP/E ACCEPT

Required Updates

1. Update the job parameters.
2. Update the STEPLIB DD statement (if necessary for your system).
3. Replace the CSI name on the SMPCSI DD statement with your CSI name.
4. Update dlibzone to your dlib zone name.

Expected Return Codes and Messages:

If service containing ++**HOLD** is being installed, then RC=4 and the following messages will be issued:

- “GIM42001W THE FOLLOWING CONDITIONS FOR SYSMOD aaaaaaa WERE NOT SATISFIED, BUT WERE IGNORED BECAUSE THE BYPASS OPERAND WAS SPECIFIED. PROCESSING CONTINUES.”
where aaaaaaa--SYSMOD ID
- “GIM35966I SYSTEM HOLD aaaaaaa ORIGINATED BY SYSMOD bbbbbbb WAS BYPASSED.”
where: aaaaaaa--system hold reason ID and bbbbbbb--SYSMOD ID

Otherwise RC=0

6.3 Activating WebSphere Application Server V4.0 for z/OS and OS/390

6.3.1 Verify HFS Data Sets Are Correctly Mounted

Before proceeding with activation, mount the two WebSphere Application Server V4.0 for z/OS and OS/390 HFS data sets in read-only mode at their production locations. The following TSO commands can be used:

```
MOUNT FILESYSTEM('your.java.hfs') MOUNTPOINT('/usr/lpp/java/IBM') TYPE(HFS) MODE(READ)
MOUNT FILESYSTEM('your.was.hfs') MOUNTPOINT('/usr/lpp/WebSphere') TYPE(HFS) MODE(READ)
```

You will probably want to add these mounts to your BPXPRMxx members in parmlib to ensure that these data sets are always mounted. If, at a later date, you need to perform service on the WebSphere Application Server V4.0 for z/OS and OS/390 products, temporarily unmount the HFS data sets, mount both data sets at the service (-pathprefix-) mount point you created for installation, and apply the service. Then unmount both data sets from the service mount point, and remount them at the production mount points given above.

6.3.2 Activating Application Server

WebSphere for OS/390 V4.0 Enterprise Edition Component Broker Installation and Customization, GA22-7834, contains the step-by-step procedures to activate the functions of Application Server.

6.3.3 Activating IBM Developer Kit for OS/390 Java 2 Technology Edition

There are no further actions to perform to activate IBM Developer Kit for OS/390 Java 2 Technology Edition other than the actions documented in the program directory.

6.3.3.1 Update the Environment Path

IBM Developer Kit for OS/390 Java 2 Technology Edition is invoked as a command under the UNIX System Services shell. The path environment variable must be updated to point to the Java executables so that the command will be found. This can be done with the following shell command:

```
export PATH=/usr/lpp/java/IBM/J1.3/bin:$PATH
```

The export command references the default path into which IBM Developer Kit for OS/390 Java 2 Technology Edition was installed. If you changed the default path, change the export command accordingly.

Alternatively, you can add the IBM Developer Kit for OS/390 Java 2 Technology Edition path to the system path variable contained in `/etc/profile`.

Once the path environment variable has been set, you can enter the following shell commands:

```
java
```

```
java -version
```

IBM Developer Kit for OS/390 Java 2 Technology Edition is successfully installed if the `java` command responds with a summary of available options and the version option responds with the current version of the IBM Developer Kit for OS/390 Java 2 Technology Edition code.

6.3.4 Using the Just-In-Time Compiler

IBM Developer Kit for OS/390 Java 2 Technology Edition contains a Just-In-Time (JIT) compiler built specifically for OS/390. The JIT compiler provides execution time improvements over the interpreter. By default, the JIT compiler is activated, but can be deactivated by setting an environment variable.

To deactivate usage of the JIT, issue the following shell command prior to invoking Java:

```
export JAVA_COMPILER=
```

To activate usage of the JIT after it has been deactivated, issue the following shell command prior to invoking Java:

```
unset JAVA_COMPILER
```

Note that the environment variable names and values are case sensitive and should be entered exactly as shown.

6.3.5 Using Windowing Support

To use the Java Windowing Support (AWT), the X/Windows feature of TCP/IP must be installed on the OS/390 or z/OS host. Your workstation must also have the appropriate X/Windows server software to communicate with the host.

The `DISPLAY` environment variable must be set to the IP address or name of the X server (the workstation) on which the window is to be displayed. For example,

```
export DISPLAY=myhost.hursley.ibm.com:0.0
```

defines `myhost.hursley.ibm.com` as the workstation running the X server.

The `DISPLAY` variable must be set prior to invoking Java.

6.3.6 Audio Support

Audio is not supported when running applets. An applet that attempts to use audio will function, but no audio will be produced.

For general information about running Java applications and compiling Java source, visit the Web site: <http://www.ibm.com/java>.

Appendix A. HFS Considerations for Co-Existent Versions

Customers who have previously installed WebSphere Application Server V3.02 or WebSphere Application Server V3.5 on their systems may already have an HFS mounted at `/usr/lpp/WebSphere`, the default mount point for WebSphere Application Server V4.0 for z/OS and OS/390. As noted in 5.4.1, “Application Server Special Considerations” on page 23, it is recommended that you do not remove these products until you have migrated any existing applications to the new level of the WebSphere Application Server.

Because the `/usr/lpp/WebSphere` mount point occurs in many more places in WebSphere Application Server V4.0 for z/OS and OS/390 installation jobs and customization files than earlier releases, it is recommended that you move the previous WebSphere Application Server HFS to another mount point before installing the WebSphere Application Server V4.0 for z/OS and OS/390. This can be done as follows.

- Locate and backup all `httpd.conf` and `was.conf` files used on your target system(s).
- Shut down all HTTP servers on the target system(s).
- Create a new version-specific mount point, such as `/usr/lpp/WebSphere302` or `/usr/lpp/WebSphere350`, and mount your existing WebSphere Application Server HFS at this new mount point.
- Update all `httpd.conf` and `was.conf` files to use the new mount point.
- Restart the HTTP servers on the target system(s) and verify that they work correctly.
- Update any BPXPRMxx parmlib members to mount the old WebSphere Application server at the version-specific mount point.
- Update any cron jobs, shell scripts or other code that refers to the `/usr/lpp/WebSphere` mount point.
- Update product service procedures to ensure service is applied to the appropriate HFS. This includes changing the service mount point so that it is unique, and updating the DDDEFs in the SMP/E environment in which the older version is installed. We recommend using unique `-PathPrefix-` values to separate the service trees.

Once this has been done on all target systems, the `/usr/lpp/WebSphere` mount point will be available for reuse. Installation and customization of WebSphere Application Server V4.0 for z/OS and OS/390 may continue using the default service mount point and production mount point.

Alternatively, if it is not possible to move the older version of WebSphere Application Server to a different mount point, you will need to install WebSphere Application Server V4.0 for z/OS and OS/390 at a mount point other than the default. This can be done as follows:

- Create a unique service mount point and production mount point for WebSphere Application Server V4.0 for z/OS and OS/390. We recommend using a `-PathPrefix-` to make the service path unique. Otherwise, you would have to update sample BBOISKMD with the new path name. For a production path, you may want to choose some other path, such as `/usr/lpp/WebSphere40`.
- Modify the BBODDDEF sample to create the proper DDDEFs. This is simple if you use the `-PathPrefix-` method.

- SMP/E install WebSphere Application Server V4.0 for z/OS and OS/390.
- Mount your HFS at the version-specific production mount point.
- During customization of WebSphere Application Server V4.0 for z/OS and OS/390, change all references to /usr/lpp/WebSphere to the new version-specific mount point. These references occur in customization batch jobs, configuration files and shell scripts. You may wish to temporarily unmount your older version of HFS during customization of WebSphere Application Server V4.0 for z/OS and OS/390 to prevent accidental access to the older version of HFS.

Reader's Comments

Program Directory for WebSphere Application Server V4.0 for z/OS and OS/390 Service Level PUT0101

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