Program Directory

For CBPDO Installation and ServerPac Reference

z/OS

Version 3 Release 1

Program Number 5655-ZOS

CBPDO Level SMC2111

Service Level 2102

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Note

Before using this information and the product it supports, be sure to read the general information under “Notices” on page 317.

This program directory (Document Date: September 2023) applies to the elements of z/OS 3.1, program number 5655-ZOS.

FMIDs	System Name
(z/OS® Element Base and Feature FMIDs are listed in Figure 1 on page 2)	z/OS 3.1

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How to send your comments to IBM®

Exclusive elements of z/OS 3.1 (Service Level 2102)

When you send comments to IBM, you grant IBM a nonexclusive right to use or distribute your comments in any way it believes appropriate without incurring any obligation to you.

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For each of the topics below indicate your satisfaction level by circling your choice from the rating scale. If a statement does not apply, circle N.

RATING SCALE

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

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

What order media was this product received?

__ CBPDO
__ ServerPac
__ Other

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

__ Yes
__ No

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

__ Yes
__ No

If yes, how many years? __

If you have any comments to make about your ratings above, or any other aspect of the product installation, list them below:

_____

_____

_____

_____

_____

Thank you for your participation.

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- Your name and address
- Your email address
- Your telephone or fax number
- The publication title and order number
- The topic and page number related to your comment
- The text of your comment

1.0 What is in this Program Directory?

This Program Directory addresses the installation of z/OS 3.1. See *z/OS Planning for Installation* for planning information on z/OS 3.1. See *z/OS Upgrade Workflow* for information on upgrading to z/OS 3.1.

This Program Directory is intended for the system programmer who is responsible for installing the z/OS 3.1 elements using the CBPDO delivery option. If you are deploying z/OS 3.1 with ServerPac z/OSMF Portable Software Instance, you may refer to guidance provided by content solution web site https://www.ibm.com/support/z-content-solutions/serverpac-install-zosmf/.

Attention z/OS 3.1 Users

Review the z/OS Licensed Product Specification, which is available for download from the z/OS Internet Library: https://www.ibm.com/servers/resourcelink/svc00100.nsf/pages/zosInternetLibrary

The CBPDO installation of z/OS 3.1 should occur in separate stages, called **waves**. Each wave consists of multiple SMP/E steps that are documented later in this Program Directory. **All waves must be completed entirely.**

1. Wave 0 installs the FMIDs required for the driving system including HLASM, SMP/E and the Program Management Binder. This wave is documented in 7.0, “Installation Instructions for Wave 0 FMIDs” on page 47.
2. Wave 1 installs the core set of FMIDs in z/OS. This wave is documented in 8.0, “Installation Instructions for Wave 1 and Wave 2 FMIDs” on page 67.
3. Wave 2 installs the SDSF and JES2 elements. This wave is documented in 8.0, “Installation Instructions for Wave 1 and Wave 2 FMIDs” on page 67.

Note: Wave 2 can also be combined with Wave 1. Wave 2, however, cannot occur before Wave 1.

The *Program Directory* expanded on the “wave” concept and further documented the installation of *all* elements into **ripples**. These ripples take into consideration element dependencies and natural installation separation points. The ripples give an overall installation scenario that includes every element in order to expedite the CBPDO installation path.

1.1 z/OS 3.1 FMIDs documented in this Program Directory

Installation instructions for all z/OS elements are included in this Program Directory. No other program directories are required.

The z/OS 3.1 FMIDs can be found in 6.5.3, “Elements in each Wave, Ripple, and FMIDSET” on page 35. Some elements documented in this Program Directory are also available as separately-orderable products. Information for these separately-orderable products, such as target and distribution libraries, is integrated in this Program Directory. Therefore, the separate program directories are not necessary.

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This z/OS Program Directory has been updated to include the installation instructions for the z/OS priced feature IBM z/OS Change Tracker. IBM z/OS Change Tracker is shipped in FMID HCYG100 (base, English) and FMID JCYG10J (Japanese).

This z/OS Program Directory has been updated to include the installation instructions for the XML Toolkit for z/OS added in z/OS 3.1. XML Toolkit for z/OS is shipped in FMID HXML1B0.

1.1.1 z/OS 3.1 Summary Table of Elements and Features

Figure 1 lists all elements and features in z/OS 3.1, describes some of their characteristics, and identifies which ones have various installation-related jobs. The table uses the following headings.

Element or Feature
Name and FMID of the z/OS 3.1 base element or optional feature. If language FMIDs are listed with an element or feature in Figure 1, those FMIDs are included in unpriced language features that are orderable with z/OS.

Level Latest OS/390 or z/OS level in which the element or feature changed (added to OS/390 or z/OS or updated). For non-exclusive elements and features, the equivalent level of the stand-alone product is listed in parenthesis.

Type One of the following values for each element or feature:

- Base, for base elements
- Priced Feature, for priced optional features
- No Charge Feature, for unpriced optional features

Excl Indicates if the element or feature is exclusive (available **only** within z/OS, not also as a separately-orderable product). **Y** for Yes; **N** for No.

Dynam Indicates if the element or feature supports dynamic enablement (**Y** or **N**).

Ripple Logical set of elements that are installed within a wave.

Alloc Indicates if the element or feature has a sample allocate job (**Y** or **N**). Allocations for dependent elements are done by the base FMID, unless otherwise noted.

DDDEF Indicates if the element or feature has a sample job to define DDDEF entries (**Y** or **N**).

Post-I Indicates if the element or feature has any post-installation jobs (**Y** or **N**). Note that customization tasks are **not** considered post-installation jobs in this table.

IVP Indicates if the element or feature has any installation verification procedure (IVP) jobs (**Y** or **N**).

Note: Some elements listed in Figure 1 provide sample jobs to create the file system directories. For more information about these sample jobs and elements, see Figure 20 on page 53, Figure 29 on page 88, and 8.3.4, “Set up File System Directories for Wave 2” on page 117.

Figure 1 (Page 1 of 7). z/OS Base Elements and Optional Features

Element or Feature FMIDs	Level	Type	EXCL	Dynam	Ripple	Alloc	DDDEF	Post-I	IVP
Alternate Library for REXX HWJ9143 JWJ9144 (Japanese)	z/OS V1R9	Base	N	N	Wave 1D	Y	Y	Y	N
Base Control Program (BCP) HBB77E0 JBB77EJ (Japanese)	z/OS 3.1	Base	Y	Y	Wave 1A Wave 1AL	Y	Y	Y	Y
HAL47C0 (IBM z/OS Authorized Code Scanner)	z/OS V2R4	Priced Feature			Wave 1A				
JAL47DJ (z/OS Authorized Code Scanner Japanese)	z/OS V2R5				Wave 1AL	Y	Y	N	N
HWT0500 (Web Toolkit)	z/OS V2R5		Y	N	Wave 1A	N	N	N	N
HUN77E0 (BCP - Support for Unicode) JUN77EJ (Support for Unicode Japanese)	z/OS 3.1	Base	Y	N	Wave 1A Wave 1AL	Y	Y	N	N
HPM77E0 (Program Management Binder)	z/OS 3.1				Wave 0	Y	Y	N	N
HPV77E0 (BCP - Capacity Provisioning)	z/OS 3.1		Y	N	Wave 1E	N	Y	N	N
IOCP HIO1106	z/OS 3.1		Y	N	Wave 1B	N	N	N	N
Common Information Model (CIM) HPG77E0	z/OS 3.1	Base	Y	N	Wave 1E	Y	Y	N	Y

Figure 1 (Page 2 of 7). z/OS Base Elements and Optional Features

Element or Feature FMIDs	Level	Type	EXCL	Dynam	Ripple	AllIoc	DDDEF	Post-I	IVP
Communications Server IP Services HIP6310 (Base)	z/OS 3.1	Base	Y	Y	Wave 1A	Y	Y	Y	Y
JIP631X (XWindows X11R4)					Wave 1A	N	N	N	N
Communications Server SNA Services HVT6310					Wave 1A	N	N	N	N
Note: 1. IP is the current name for the Communications Server component that supports secure TCP/IP networking. In support of dynamic enablement, the old name TCP/IP is still being used in parmlib member IFAPRDxx.									
Cryptographic Services Integrated Cryptographic Service Facility (ICSF) HCR77E0	z/OS 3.1	Base	Y	N	Wave 1A	Y	Y	N	N
Cryptographic Services PKI Services HKY77E0	z/OS 3.1				Wave 1D	Y	Y	Y	N
System SSL HCPT510 JCPT51J (System SSL Japanese)	z/OS 3.1				Wave 1A Wave 1AL	Y	Y	N	N
DFSMSdfp HDZ3310 (Base) JDZ331K (Japanese)	z/OS 3.1	Base	Y	N	Wave 1B	Y Y	Y Y	N N	Y N
DFSMSdss see DFSMSdfp	z/OS 3.1	Priced Feature	Y	Y	Wave 1B	N	N	Y	N
DFSMStvs see DFSMSdfp	z/OS 3.1	Base	Y	Y	Wave 1B	N	N	Y	N
DFSMShsm see DFSMSdfp	z/OS 3.1	Priced Feature	Y	Y	Wave 1B	N	N	N	Y
DFSMSrmm see DFSMSdfp	z/OS 3.1	Priced Feature	Y	Y	Wave 1B	N	N	N	Y

Figure 1 (Page 3 of 7). z/OS Base Elements and Optional Features

Element or Feature FMIDs	Level	Type	EXCL	Dynam	Ripple	Alloc	DDDEF	Post-I	IVP
DFSORT HSM1310 (Resident, Non-resident, Locale)	z/OS 3.1	Priced Feature	Y	Y	Wave 1F	Y	Y	N	Y
Note: DFSORT panels are no longer provided.									
EREP EER3500	z/OS V1R7 (V3R5)	Base	N	N	Wave 1C	N	N	N	N
ESCON Director Support HSWF100	OS/390 R1 (MVS/ESA V5)	Base	Y	N	Wave 1C	N	N	N	N
FFST™ HFST101	OS/390 R2 (V1R2)	Base	Y	N	Wave 1C	N	N	Y	Y
GDDM HGD3200 JGD3219 (English) JGD3227 (Japanese)	OS/390 R2 (V3R2)	Base	N	N	Wave 1C	Y	Y	N	Y
GDDM-PGF HGD3201	OS/390 R2 (V2R1.3)	Priced Feature	Y	Y	Wave 1C	N	N	N	Y
GDDM-REXX See GDDM	OS/390 R2 (V3R2)	Priced Feature	N	Y	Wave 1C	N	N	N	Y
HCD HCS77E0 (Base, English) JCS77EJ (Japanese)	z/OS 3.1	Base	Y	N	Wave 1B	Y	Y	N	Y
HCM HCM1J10	z/OS 3.1	Priced Feature	Y	Y	Wave 1F	Y	Y	N	N
HLASM HMQ4160	z/OS V1R10 (HLASM V1R6)	Base	N	N	Wave 0	Y	Y	N	Y
HLASM Toolkit JMQ416A	z/OS V1R10 (HLASM V1R6)	Priced Feature	N	Y	Wave 1F	Y	Y	N	Y
IBM HTTP Server - Powered by Apache HHAP90P	z/OS V2R2	Base	Y	N	Wave 1G	Y	Y	N	N
Future Function HKCZ300	z/OS 3.1	Base	Y	N	Wave 1F	Y	Y	N	N

Figure 1 (Page 4 of 7). z/OS Base Elements and Optional Features

Element or Feature FMIDs	Level	Type	EXCL	Dynam	Ripple	Alloc	DDDEF	Post-I	IVP
IBM TDS HRSL510 (IBM Tivoli Directory Server for z/OS Base) JRSL51J (IBM Tivoli Directory Server for z/OS JPN)	z/OS 3.1	Base	Y	N	Wave 1A Wave 1AL	Y	Y	N	N
IBM z/OS Change Tracker HCYG100 (base, English) JCYG10J (Japanese)	z/OS V2R5	Priced Feature	Y	Y	Wave 1F	Y	Y	N	Y
IBM z/OS Liberty Embedded HWLPEM0	z/OS V2R3	Base	Y	N	Wave 1G	Y	Y	N	N
IBM z/OS Management Facility HSMA310 (z/OSMF Core Functions) HSMA311 (z/OSMF ISPF) HSMA312 (z/OSMF Resource Monitoring) HSMA313 (z/OSMF WLM) HSMA314 (z/OSMF Software Management) HSMA315 (z/OSMF Incident Log) HSMA316 (z/OSMF Capacity Provisioning) HSMA317 (z/OSMF Workflow) HSMA31A (z/OSMF Network Configuration Assistant) HSMA31E (z/OSMF zERT Network Analyzer)	z/OS 3.1	Base	Y	N	Wave 1G	Y	Y	N	N
ICKDSF EDU1H01 FDU1H07 FDU1H08 (English panels) FDU1H09 (Japanese panels)	z990 Compatibility Support (V1R17)	Base	N	N	Wave 1C	Y	Y	N	Y

Figure 1 (Page 5 of 7). z/OS Base Elements and Optional Features

Element or Feature FMIDs	Level	Type	EXCL	Dynam	Ripple	Alloc	DDDEF	Post-I	IVP
Infoprint Server HMOS705 (IP PrintWay basic mode) JMOS7J5 (Japanese) HNET7D0 (NetSpool) JNET7DJ (Japanese) HOPI7D0 (Print Interface) JOPI7DJ (Japanese)	z/OS V1R2 z/OS V2R5 z/OS V2R5	Priced Feature	Y	Y	Wave 1G	Y	Y	N	Y
Integrated Security Services Network Authentication Service HSWK510 JSWK51J (Japanese)	z/OS 3.1	Base	Y	N	Wave 1A Wave 1AL	Y	Y	N	N
ISPF HIF83A2 JIF83A4 (Japanese) JIF83A6 (Upper Case English)	z/OS 3.1	Base	Y	N	Wave 1A Wave 1AL	Y	Y	N	Y
JES2 HJE77E0 JJE77EJ (Japanese)	z/OS 3.1	Base	Y	N	Wave 2	Y	Y	Y	N
Language Environment HLE77E0 JLE77EJ (Japanese)	z/OS 3.1	Base	Y	N	Wave 1A Wave 1AL	Y	Y	N	Y
Metal C Runtime Library HSD7780	z/OS V1R13	Base	Y	N	Wave 1A	Y	Y	N	N
MICR/OCR EMI2220	OS/390 R1 (MVS/XA)	Base	Y	N	Wave 1C	N	N	N	N
Network File System HDZ331N (NFS) JDZ331J (NFS Japanese)	z/OS 3.1	Base	Y	N	Wave 1G	Y	Y	N	Y
IBM Z Deep Neural Network Library (zDNN) HZAI310	z/OS 3.1	Base	Y	N	Wave 1G	N	N	N	N
OpenSSH for z/OS HOS3310	z/OS 3.1	Base	Y	N	Wave 1C	N	Y	N	N

Figure 1 (Page 6 of 7). z/OS Base Elements and Optional Features

Element or Feature FMIDs	Level	Type	EXCL	Dynam	Ripple	AllIoc	DDDEF	Post-I	IVP
Restricted Use Common Service Area (RUCSA) HBB77E0	z/OS 3.1	Priced Feature	Y	Y	Wave 1A	N	N	N	N
RMF HRM77E0 JRM77EJ (Japanese)	z/OS 3.1	Priced Feature	Y	Y	Wave 1E	Y	Y	N	Y
Runtime Library Extensions HTV77C0 JTV77CJ (Japanese)	z/OS V2R4	Base	Y	N	Wave 1E	Y	Y	N	Y
SDSF HQX77E0	z/OS 3.1	Priced Feature	Y	Y	Wave 2	Y	Y	Y	N
Security Server (RACF) HRF77E0 JRF77EJ (Japanese)	z/OS 3.1	Priced Feature	Y	Y	Wave 1D	Y	Y	N	N
SMP/E HMP1K00 JMP1K11 (Japanese)	z/OS V2R4 (V3R7)	Base	Y	N	Wave 0	Y	Y	N	N
TIOC ETI1106	OS/390 R1 (MVS V5)	Base	Y	N	Wave 1A	N	N	N	N
TSO/E HTE77E0 JTE77EE (Information Center Facility and English) JTE77EJ (Japanese)	z/OS 3.1	Base	Y	N	Wave 1C	Y	Y	Y	N
XL C/C++ HLB77C0 (XL C/C++ Base) JLB77CJ (XL C/C++ Japanese)	z/OS V2R4	Priced Feature	Y	Y	Wave 1E	Y	Y	N	Y
H24P111 (Host Performance Analyzer) J24P112 (Japanese)	OS/390 R4	Priced Feature	Y	Y	Wave 1E	Y	Y	N	Y
XML Toolkit for z/OS HXML1B0	z/OS 3.1 (V1.11.0)	Base	Y	N	Wave 1G	Y	Y	N	N
z/OS Advanced Data Gatherer HRG77E0	z/OS 3.1	Priced Feature	Y	Y	Wave 1C	N	N	N	N

Figure 1 (Page 7 of 7). z/OS Base Elements and Optional Features

Element or Feature FMIDs	Level	Type	EXCL	Dynam	Ripple	Alloc	DDDEF	Post-I	IVP
z/OS Container Extensions HZDC7C0	z/OS V2R4	Base	Y	N	Wave 1G	Y	Y	N	N
z/OS Data Gatherer HRG77E0	z/OS 3.1	Base	Y	N	Wave 1C	Y	Y	N	Y
z/OS File System HZFS510 JZFS51J (Japanese)	z/OS 3.1	Base	Y	N	Wave 1G	Y	Y	N	N
z/OS Font Collection HFNT140 HFNT14J (Chinese, Japanese, Korean)	z/OS V2R5	Base	Y	N	Wave 1G	Y	Y	N	N
z/OS Security Level 3		No Charge Feature			Wave 1D				
System SSL Security Level 3 JCPT511	z/OS 3.1		Y	N		N	N	N	N
Network Authentication Service Security Level 3 JSWK511	z/OS 3.1		Y	N		N	N	N	N
IBM TDS Security Level 3 JRSL511	z/OS 3.1		Y	N		N	N	N	N
Communications Server Security Level 3 JIP631K	z/OS 3.1		Y	N	Wave 1AL	N	N	N	N
z/OS UNIX System Services HOT77E0 (Application Services) JOT77EJ (Japanese)	z/OS 3.1	Base	Y	N	Wave 1B	Y	Y	N	N
zEnterprise Data Compression (zEDC)	z/OS V2R1	Priced feature	Y	Y	Wave 1B	N	N	N	N
z/OS Host - 3270 Workstation File Send/Receive HFX1112	OS/390 R2 (V1R1.1)	Base	N	N	Wave 1C	N	N	Y	N

1.2 How to use this Program Directory

This Program Directory contains information about the material and procedures associated with the installation of the z/OS 3.1 elements and optional features (see Figure 1 on page 2). You should keep this document for future reference. Before taking any action, you should read the sections that apply to the elements and features you want to install. This Program Directory contains the following sections:

- 2.0, "Program Materials" on page 13 identifies the basic and optional program materials and documentation for z/OS 3.1.
- 3.0, "Program Support" on page 15 describes the IBM support available for z/OS 3.1.
- 4.0, "Program and Service Level Information" on page 21 lists the APARs (program level) and PTFs (service level) incorporated into z/OS 3.1.
- 5.0, "Installation Requirements and Considerations" on page 27 identifies the resources and considerations for installing and using z/OS 3.1.
- 6.0, "Preparing the Installation Path" on page 31 provides detailed information for planning and preparing installation paths.
- 7.0, "Installation Instructions for Wave 0 FMIDs" on page 47 provides detailed installation instructions for Wave 0 FMIDs, which must be available on the driving system for the subsequent installation of Wave 1 and Wave 2 elements. It also refers to publications that describe how to activate the functions of z/OS 3.1.
- 8.0, "Installation Instructions for Wave 1 and Wave 2 FMIDs" on page 67 provides detailed installation instructions for all Wave 1 FMIDs and Wave 2 FMIDs. It also refers to publications that describe how to activate the functions of z/OS 3.1.
- Appendix A, "Component IDs for Elements in z/OS 3.1" on page 247 lists the component IDs of the z/OS 3.1.
- Appendix B, "APARs Incorporated into Elements of z/OS 3.1" on page 259 lists the integrated APARs for the z/OS 3.1 elements.
- Appendix C, "DASD Storage Requirements Tables" on page 275 describes the space requirements for the z/OS 3.1 data sets.
- Appendix D, "Additional Cleanup Jobs for z/OS 3.1" on page 315 describes how to do Global Zone Cleanup for Deleted FMIDs.

See *z/OS Upgrade Workflow* for information on what libraries and paths are changed for a particular z/OS release, or library names before z/OS 3.1 or in z/OS 3.1.

Before installing z/OS 3.1, read 3.2, "Preventive Service Planning (PSP)" on page 15. This section tells you how to find any updates to the information and procedures in this Program Directory.

If you are installing z/OS 3.1 with ServerPac, use *ServerPac: Installing Your Order*, which was shipped with your ServerPac to install z/OS 3.1. That book might refer to specific sections of this Program Directory for information that applies to the ServerPac installation path.

If you are installing z/OS 3.1 using the MVS™ Custom-Built Product Delivery Offering (CBPDO) (5751-CS3), you will receive a PDF file of the Program Directory from either an internet delivery or from a DVD shipped with physical media delivery. A hard copy version is not provided. However, you can print a

copy of the Program Directory, either by downloading the PDF file from the internet or by unloading it from the DVD.

2.0 Program Materials

An IBM program is identified by a program number and a feature number. The program number for z/OS 3.1 is 5655-ZOS.

The program announcement material describes the features supported by z/OS 3.1. If you have not already received a copy, ask your IBM marketing representative for this information.

The following sections identify:

- The basic program materials available with this program.
- Publications useful during installation.

2.1 Basic Machine-Readable Material

Basic Machine-Readable Materials are materials that are supplied under the base license and feature number, and are required for the use of the product.

You will receive all z/OS 3.1 FMIDs (whether ordered or not) except for the following:

- FMIDs for languages not ordered.
- FMIDs for export regulated features not ordered.
- FMIDs for no charge features.

See the *MVS CBPDO Memo to Users Extension* for a full list of FMIDs and for detailed information on file format.

2.2 Program Publications

For the titles of all the publications associated with z/OS 3.1, see *z/OS Information Roadmap*.

2.3 Program Source Materials

No program viewable program listings (View Program Listings) are provided for z/OS 3.1.

2.4 Publications Useful During Installation

For element-specific installation manuals, refer to *z/OS Information Roadmap*. To obtain copies of the publications referred to in this program directory, contact your IBM representative or visit the z/OS Internet Library at: https://www.ibm.com/servers/resourcelink/svc00100.nsf/pages/zosInternetLibrary

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3.0 Program Support

This section describes the IBM support available for z/OS 3.1.

3.1 Program Services

Contact your IBM marketing and sales representatives for specific information about available program services.

3.2 Preventive Service Planning (PSP)

Before installing z/OS 3.1, make sure that you have reviewed the current Preventive Service Planning (PSP) information. Review the PSP Bucket for general information, installation documentation, and the cross product Dependencies sections. For the recommended service section, instead of reviewing the PSP Bucket, it is recommended you use the IBM.ProductInstall-RequiredService fix category in SMP/E to ensure you have all the recommended service installed. Use the FIXCAT(IBM.ProductInstall-RequiredService) operand on the APPLY CHECK command. See Figure 24, SMP/E APPLY CHECK (All Wave 0 FMIDs and Service for z/OS 3.1) for a sample APPLY command.

If you obtained z/OS 3.1 as part of a CBPDO, HOLDDATA is included on the CBPDO. If the CBPDO for z/OS 3.1 is more than two weeks old when you install it, you need to obtain the current PSP (PSP Bucket).

To obtain the current PSP information, enhanced HOLDDATA, and other information related to z/OS software support, go to the following URL:

`https://www.ibm.com/support/pages/ibmsearch`

The elements in Figure 2 are included in the **ZOS31** UPGRADE. The entries in Figure 3 on page 18 are in alphabetic order based on the Element column. For descriptions of the FMIDs in the table, see 1.1.1, “z/OS 3.1 Summary Table of Elements and Features” on page 2.

Figure 2 (Page 1 of 4). PSP Bucket Information for z/OS 3.1 Elements in ZOS31 UPGRADE

Element	ZOS31 PSP Subset	FMIDs Included
General information	ZOSGEN	General information

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Figure 2 (Page 2 of 4). PSP Bucket Information for z/OS 3.1 Elements in ZOS31 UPGRADE

Element	ZOS31 PSP Subset	FMIDs Included
BCP	BCP	HBB77E0 JBB77EJ HAL47C0 JAL47DJ HIO1106 HWT0500
BCP - Capacity Provisioning	CAPPROV	HPV77E0
BCP Program Management Binder	PMBINDER	HPM77E0
BCP - Support for Unicode Base BCP - Support for Unicode JPN	UNICODE	HUN77E0 JUN77EJ
CIM	CIM	HPG77E0
Communications Server IP	CSIP	HIP6310 JIP631K JIP631X
Communications Server for z/OS SNA Services	CSSNA	HVT6310
Cryptographic Services Integrated Cryptographic Service Facility	ICSF77D2	HCR77E0
Cryptographic Services PKI Services	PKISERV	HKY77E0
Cryptographic Services System SSL	SSL	HCPT510 JCPT51J
DFSMS	DFSMS	HDZ3310 JDZ331K
DFSORT	DFSORT	HSM1310
ESCON Director	ESCONDIR	HSWF100
HCD	HCD	HCS77E0 JCS77EJ
HCM	HCM	HCM1J10
IBM HTTP Server - Powered by Apache	ZOSIHSA	HHAP90P
Future Function	-	HKCZ300
IBM TDS	LDAP	HRSL510 JRSL51J
IBM z/OS Change Tracker	ZOSCHTRK	HCYG100 JCYG10J
IBM z/OS Liberty Embedded	ZOSWLPEM	HWLPEM0

Figure 2 (Page 3 of 4). PSP Bucket Information for z/OS 3.1 Elements in ZOS31 UPGRADE

Element	ZOS31 PSP Subset	FMIDs Included
IBM z/OS Management Facility	ZOSMF	HSMA310 HSMA311 HSMA312 HSMA313 HSMA314 HSMA315 HSMA316 HSMA317 HSMA31A HSMA31E
Infoprint Server	INFOPRINT	HMOS705 JMOS7J5 HOPI7D0 JOPI7DJ HNET7D0 JNET7DJ
Integrated Security Services Network Authentication Service	NAPS	HSWK510 JSWK51J
ISPF	ISPF	HIF83A2 JIF83A4 JIF83A6
JES2	JES2	HJE77E0 JJE77EJ
Language Environment	LANGENV	HLE77E0 JLE77EJ
Metal C Runtime Library	METALC	HSD7780
MICR/OCR	MICROCR	EMI2220
Network File System	NFS	HDZ331N JDZ331J
OpenSSH for z/OS	ZOSOSSH	HOS3310
RMF	RMF	HRM77E0 JRM77EJ
Runtime Library Extensions	ZOSCCPP	HTV77C0 JTV77CJ
SDSF	SDSF	HQX77E0
Security Server RACF	RACF®	HRF77E0 JRF77EJ
SMP/E	SMPE	HMP1K00 JMP1K11

Figure 2 (Page 4 of 4). PSP Bucket Information for z/OS 3.1 Elements in ZOS31 UPGRADE

Element	ZOS31 PSP Subset	FMIDs Included
TSO/E	TSOE	HTE77E0 JTE77EE JTE77EJ
XL C/C++	ZOSCCPP	HLB77C0 JLB77CJ
XML Toolkit for z/OS	XML	HXML1B0
z/OS Container Extensions	ZOSCX	HZDC7C0
z/OS Data Gatherer	ZDG	HRG77E0
z/OS File System	zFS	HZFS510 JZFS51J
z/OS Font Collection	ZOSFONTS	HFNT140 HFNT14J
z/OS Security Level 3	SSL NAPS LDAP	JCPT511 JSWK511 JRSL511
z/OS UNIX System Services	UNIXSS	HOT77E0 JOT77EJ
z/OS Host - 3270 Workstation File Send/Receive	3270PC	HFX1112
IBM Z Deep Neural Network Library (zDNN)	ZAI	HZAI310

3.3 Additional PSP Information

Figure 3 lists the PSP UPGRADEs and associated FMIDs that are NOT included in the z/OS 3.1 UPGRADE. These subsets are usually the associated FMIDs. To determine the subset name(s), see the respective UPGRADEs.

Figure 3 (Page 1 of 2). PSP Bucket Information Described Outside of z/OS 3.1 UPGRADE

Element	PSP UPGRADE	Associated FMIDs
Alternate Library for REXX	REXXCOMPR140	HWJ9143 JWJ9144
C/C++ Host Performance Analyzer (The FMIDs are the subset names.)	HOSTPA	H24P111 J24P112
Device Support Facility (ICKDSF)	ICKDSF017	EDU1H01 FDU1H07 FDU1H08 FDU1H09

Figure 3 (Page 2 of 2). PSP Bucket Information Described Outside of z/OS 3.1 UPGRADE

Element	PSP UPGRADE	Associated FMIDs
EREP	EREP350	EER3500
FFST	FFST120	HFST101
GDDM	GDDM320	HGD3200 JGD3219 JGD3227
GDDM-PGF	GDDM320	HGD3201
HLASM	HLASM160	HMQ4160
HLASM Toolkit	HLASM160	JMQ416A
TIOC	TIOC106	ETI1106

3.4 Statement of Support Procedures

Report any difficulties you have using this program to the IBM Support Center. If an APAR is required, the Support Center will provide the address to which any accompanying documentation can be sent. The component IDs (COMP IDs) of z/OS 3.1 are listed in Appendix A, “Component IDs for Elements in z/OS 3.1” on page 247.

4.0 Program and Service Level Information

This section identifies the program and service levels of z/OS 3.1. The **program level** refers to the APAR fixes incorporated into the products. The **service level** refers to the PTFs incorporated.

The recommended CBPDO installation procedure will APPLY all service that has been through the z/OS 3.1 integration test (SOURCEID ZOS31 for z/OS 3.1) for which a report has been produced (these reports come out quarterly), all HIPERs and all PTFs that fix PE PTFs. On a release boundary, the z/OS 3.1 integration test system's service level is brought up to the designated PUT level of the ServerPac for that release. RSU (Recommended Service Upgrade) service is applied on top of the PUT service (again to the designated ServerPac levels). Finally, corrective service is applied as needed to the integration test system. The ZOSV2Rn SOURCEID identifies all this service.

Note that the service level of each FMID that is listed in this Program Directory only shows service that has been integrated into the FMID, not what has been integrated into ServerPac nor what would be installed with CBPDO. Service level documentation and experience information from the Integration Test perspective can be found in the zPET Team Blog located at https://www.ibm.com/developerworks/community/groups/community/zpet.

4.1 Program Level Information

APAR fixes against the root products (last previous level prior to being included in z/OS 3.1) or prior levels of z/OS 3.1 elements that have been incorporated into this release are listed in Appendix B, “APARs Incorporated into Elements of z/OS 3.1” on page 259.

4.2 Service Level Information

Figure 4 lists the service level of each FMID. The SMC*yyww* and PUT*yymm* levels identify the APAR service cutoff levels which have been incorporated into the FMIDs.

- SMC*yyww* identifies the service level in terms of CBPDO cycles, where *yy* is the year and *ww* is the CBPDO week. For example, 0842 is the forty-second CBPDO week in 2008.
- PUT*yymm* identifies the monthly service level in terms of ESO cycles (formerly PUTs), where *yy* is the year and *mm* is the ending month of the ESO cycle. For example, 0809 is service through September 2008.

If the z/OS 3.1 elements are installed with the instructions and samples provided in this Program Directory, they will include service that has been integration tested as well as the HIPERs and PE fixes up to the time z/OS 3.1 was ordered. Therefore, the service level of the FMIDs after you have installed z/OS 3.1 will be higher than what is listed and will depend on when it was ordered.

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Figure 4 (Page 1 of 4). FMIDs and Service Levels

Element / Feature	FMIDs and Service Levels
Alternate Library for REXX	• HWJ9143 (SMC0330 / PUT0306) • JWJ9144 (SMC0330 / PUT0306)
BCP	• HBB77E0 (SMC2108 / PUT2102) • JBB77EJ (SMC2108 / PUT2102) • HAL47C0 (initial release) • JAL47DJ (initial release) • HWT0500 (SMC2111 / PUT2102) • HUN77E0 (SMC2109 / PUT2102) • JUN77EJ (SMC2109 / PUT2102) • HPV77E0 (SMC2310 / PUT2303) • HPM77E0 (SMC2110 / PUT2102) • HIO1106 (SMC2045 / PUT2010)
Common Information Model (CIM)	• HPG77E0 (SMC1910 / PUT1902)
Communications Server	• IP – HIP6310 (SMC2110 / PUT2102) – JIP631X (SMC2110 / PUT2102) – JIP631K (SMC2110 / PUT2102) • SNA – HVT6310 (SMC2110 / PUT2102)
Cryptographic Services	• Cryptographic Services ICSF – HCR77E0 (SMC2111 / PUT2103) • Cryptographic Services PKI Services – HKY77E0 (SMC2110 / PUT2102) • System SSL – HCPT510 (SMC2109 / PUT2102) – JCPT51J (SMC2109 / PUT2102)
DFSMS	• HDZ3310 (SMC2111 / PUT2102) • JDZ331K (SMC2111 / PUT2102)
DFSORT	• HSM1310 (SMC2111 / PUT2102)
EREP	• EER3500 (SMC0504 / PUT0501)
ESCON Director Support	• HSWF100
FFST	• HFST101
GDDM	• HGD3200 (SMC9606 / PUT9601) • JGD3219 (SMC9606 / PUT9601) • JGD3227 (SMC9606 / PUT9601)
GDDM PGF	• HGD3201 (SMC9606 / PUT9601)
HCD	• HCS77E0 (SMC2310 / PUT2303) • JCS77EJ (SMC2310 / PUT2303)
HCM	• HCM1J10 (SMC2108 / PUT2102)
HLASM	• HMQ4160 (SMC0814 / PUT0803)

Figure 4 (Page 2 of 4). FMIDs and Service Levels

Element / Feature	FMIDs and Service Levels
HLASM Toolkit	• JMQ416A (SMC0814 / PUT0803)
IBM HTTP Server - Powered by Apache	• HHAP90P (SMC1512 / PUT1502)
Future Function	• HKCZ300
IBM TDS	• HRSL510 (SMC1909 / PUT1902) • JRSL51J (SMC1909 / PUT1902)
IBM z/OS Change Tracker	• HCYG100 • JCYG10J
IBM z/OS Liberty Embedded	• HWLPEM0 (SMC1710 / PUT1702)
IBM z/OS Management Facility	• HSMA310 (SMC2109 / PUT2102) • HSMA311 (SMC2109 / PUT2102) • HSMA312 (SMC2032 / PUT2008) • HSMA313 (SMC2109 / PUT2102) • HSMA314 (SMC2109 / PUT2102) • HSMA315 (SMC2109 / PUT2102) • HSMA316 (SMC2109 / PUT2102) • HSMA317 (SMC2109 / PUT2102) • HSMA31A (SMC2108 / PUT2102) • HSMA31E (SMC2108 / PUT2102)
ICKDSF	• EDU1H01 (ICKDSF) (SMC0241 / PUT0209) • FDU1H07 (ISMF Base) (SMC0241 / PUT0209) • FDU1H08 (ISMF Eng) (SMC0241 / PUT0209) • FDU1H09 (ISMF Jpn) (SMC0241 / PUT0209)
Infoprint Server	• IP PrintWay basic mode – HMOS705 (SMC0117 / PUT0104) – JMOS7J5 (SMC0117 / PUT0104) • NetSpool – HNET7D0 (SMC2107 / PUT2102) – JNET7DJ (SMC2107 / PUT2102) • Print Interface – HOPI7D0 (SMC2107 / PUT2102) – JOPI7DJ (SMC2107 / PUT2102)
Integrated Security Services	• Network Authentication Service – HSWK510 (SMC2109 / PUT2102) – JSWK51J (SMC2109 / PUT2102)
ISPF	• HIF83A2 (SMC2110 / PUT2102) • JIF83A4 (SMC2110 / PUT2102) • JIF83A6 (SMC2110 / PUT2102)
JES2	• HJE77E0 (SMC2109 / PUT2102) • JJE77EJ (SMC2109 / PUT2102)

Figure 4 (Page 3 of 4). FMIDs and Service Levels

Element / Feature	FMIDs and Service Levels
Language Environment	• HLE77E0 (SMC2108 / PUT2102) • JLE77EJ (SMC2108 / PUT2102)
Metal C Runtime Library	• HSD7780 (SMC1108 / PUT1102)
MICR/OCR 2.2.0	• EMI2220
Network File System	• HDZ331N (SMC2110 / PUT2102) • JDZ331J (SMC2110 / PUT2102)
OpenSSH for z/OS	• HOS3310 (SMC1910 / PUT1902)
RMF	• HRM77E0 (SMC2109 / PUT2102) • JRM77EJ (SMC2109 / PUT2102)
Runtime Library Extensions	• HTV77C0 (SMC2006 / PUT2006) • JTV77CJ (SMC2006 / PUT2006)
SDSF	• HQX77E0 (SMC2109 / PUT2102)
Security Server	• RACF – HRF77E0 (SMC2109 / PUT2102) – JRF77EJ (SMC2109 / PUT2102)
SMP/E	• HMP1K00 (SMC1909 / PUT1902) • JMP1K11 (SMC1905 / PUT1901)
TIOC	• ETI1106
TSO/E	• HTE77E0 (SMC2109 / PUT2102) • JTE77EE (SMC2109 / PUT2102) • JTE77EJ (SMC2109 / PUT2102)
XL C/C++	• HLB77C0 (SMC2006 / PUT2006) • JLB77CJ (SMC2006 / PUT2006) • H24P111 • J24P112
XML Toolkit for z/OS	• HXML1B0 (SMC2015 / PUT2004)
z/OS Container Extensions	• HZDC7C0 (initial release)
z/OS Data Gatherer	• HRG77E0 (SMC2310 / PUT2303)
z/OS File System	• HZFS510 (SCM2109 / PUT2102) • JZFS51J (SCM2109 / PUT2102)
z/OS Font Collection	• HFNT140 (SMC2103 / PUT2101) • HFNT14J (SMC2106 / PUT2102)
z/OS Security Level 3	• IBM TDS Security Level 3 – JRSL511 (SMC1909 / PUT1902) • Network Authentication Service Security Level 3 – JSWK511 (SMC2109 / PUT2102) • System SSL Security Level 3 – JCPT511 (SMC2109 / PUT2102)

Figure 4 (Page 4 of 4). FMIDs and Service Levels

Element / Feature	FMIDs and Service Levels
z/OS UNIX System Services	• Application Services – HOT77E0 (SMC1910 / PUT1902) – JOT77EJ (SMC1910 / PUT1902)
z/OS Host - 3270 Workstation File Send/Receive	• HFX1112

The SMP/E installation logic for elements in z/OS 3.1 is contained in the SMPMCS files in the CBPDO order. These files are loaded to the SMPPTS data set when an SMP/E RECEIVE is done for z/OS 3.1. You may browse or print the installation logic files using TSO/E, ISPF, or IEBGENER (or IEBPTPCH).

See the *MVS CBPDO Memo to Users Extension* for detailed information on the service level of the unintegrated service provided in the CBPDO. If you received this product as part of a CBPDO, PTFs not incorporated into this release are provided in the CBPDO.

5.0 Installation Requirements and Considerations

The following section describes the DASD storage requirements considerations. For information about driving system and target system requirements, see *z/OS Planning for Installation*.

5.1 Driving System Requirements

For details on the driving system requirements of z/OS 3.1, see *z/OS Planning for Installation*.

5.2 Target System Requirements

For details on the target system requirements of z/OS 3.1, see *z/OS Planning for Installation*.

5.3 FMIDs Deleted

Installing z/OS 3.1 will result in the deletion of other FMIDs. To see what FMIDs will be deleted, examine the ++ VER statement in the product's SMPMCS.

The SMP/E Modification Control Statements (SMPMCS) for z/OS 3.1 are contained in the SMPMCS file. The SMPMCS for each FMID in the product will be loaded to the SMPPTS data set, with a member name matching the FMID, when the FMID is SMP/E RECEIVEd. You may browse or print these members using TSO/E, ISPF, or IEBGENER (or IEBPTPCH).

5.3.1 SMP/E JCLIN

The JCLIN for z/OS 3.1 is contained in the RELFILEs. These files will be loaded to disk by SMP/E when the product is SMP/E RECEIVEd. You may browse or print these files using TSO/E, ISPF, or IEBGENER (or IEBPTPCH).

To find out which RELFILE contains the JCLIN, consult the SMPMCS logic.

5.4 DASD Storage Requirements

z/OS 3.1 libraries can reside on all supported DASD types.

The space requirements shown in Appendix C, “DASD Storage Requirements Tables” on page 275 are for:

- All z/OS 3.1 base elements
- All optional features that can coexist
- All corresponding national language FMIDs

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Data sets for national language FMIDs not ordered may be empty or require less space than documented. These data sets are identified by "N" in the notes column of the data set size tables. z/OS 3.1 installation requires a 3390 device with at least 50,085 tracks (3,339 cylinders) defined. To help assure sufficient space for later service installation, IBM recommends a minimum volume size of at least 65,535 tracks (4,369 cylinders).

5.4.1 Total DASD Storage Requirements

The total space required for all the target data sets listed in Figure 79 on page 281, when allocated at the recommended block sizes, is:

- 11467 cylinders on a 3390 device

The total space required for all the distribution data sets listed in Figure 80 on page 295, when allocated at the recommended block sizes, is:

- 20458 cylinders on a 3390 device

The total space required on a 3390 device for the ROOT zFS file system is listed below.

The space required for the root file system shown below does not include the space required for the z/OS Font Collection, IBM z/OS Liberty Embedded, or z/OS Container Extensions since these elements are installed in separate file systems.

zFS 5555 cylinders primary and 550 cylinders secondary

Note: 5555 3390 cylinders is approaching the zFS 4GB limit which is when Extended Addressability is necessary. As of z/OS V2.1 you can specify Extended Addressability for a zFS that is neither extended-format nor SMS-managed. You might want to plan to use zFS data set Extended Addressability to allow for future growth in this data set, should you wish to exceed 4GB. See z/OS DFSMS Using Data Sets and z/OS DFSMS Access Method Services Commands for more information on zFS data sets using Extended Addressability.

z/OS Font Collection is installed into the file system. The total space required for the root file system shown above does not include the space required to install element z/OS Font Collection. When z/OS Font Collection FMIDs HFNT140 and HFNT14J are installed, the approximate amount of space required in the file system is 2795 cylinders on a 3390 DASD.

Due to the amount of space required in the file system when installing the z/OS Font Collection element, it is recommended that a separate file system be allocated, mounted, and used for the installation of the element. Sample job FNTZFSAL is provided by the element to allocate and mount a separate zFS to be used for the installation of the element.

The following elements are installed into the root file system.

- IBM HTTP Server - Powered by Apache is installed under /usr/lpp/ihsa_zos directory.
- Future Function is installed under /usr/lpp/kc4z directory.
- IBM z/OS Management Facility is installed under /usr/lpp/zosmf directory.

- OpenSSH for z/OS is installed under /usr/lib/ssh directory.
- XML Toolkit for z/OS is installed under /usr/lpp/ixm directory.

IBM z/OS Liberty Embedded is installed in the file system. The total space required for the root file system shown above does not include the space required to install IBM z/OS Liberty Embedded element. It is recommended that IBM z/OS Liberty Embedded be installed in a separate file system due to the space requirements. The approximate space required is 2400 cylinders which includes additional space to accommodate the installation of future service. Sample job BBLZFS is provided in FMID HWLPEM0 to allocate, format and mount a separate ZFS that will be used for the installation of IBM z/OS Liberty Embedded element. The BBLZFS sample job contains a space allocation that is sufficient to install FMID HWLPEM0 and accommodate future growth due to the installation of service. Copy, edit and run the sample job BBLZFS to allocate, format and mount the separate file system before installing IBM z/OS Liberty Embedded.

z/OS Container Extensions is installed in the file system. It is recommended that IBM z/OS Container Extensions be installed in a separate file system due to the space requirements. The approximate space required is 5250 cylinders which includes additional space to accommodate the installation of future service. Sample job AZDISALC is provided in FMID HZDC7C0 to allocate, format and mount a separate ZFS that will be used for the installation of the z/OS Container Extensions element. Copy, edit and run the sample job AZDISALC in 'prefix.HZDC7C0.F2' to allocate, format and mount the separate file system before installing z/OS Container Extensions. The 'prefix' is the high-level qualifier specified as the DSPREFIX value used during the SMP/E RECEIVE.

The total space required for the zFS mounted at the `/etc` directory is approximately:

- 50 cylinders primary; 10 cylinders secondary on a 3390 device

For the CIM element, a separate file system is created and mounted at mountpoint /var/wbem.

The total space required on a 3390 device for zFS is listed below.

zFS 165 cylinders primary; 16 cylinders secondary

See *z/OS Common Information Model User's Guide*, for more information about creating and mounting a file system at `/var/wbem`.

For Predictive Failure Analysis, a separate file system is created and mounted at mountpoint the /var/pfa. The total space required on a 3390 device is listed below.

zFS 300 cylinders primary; 50 cylinders secondary

See z/OS Problem Management for more information about creating and mounting a file system at /var/pfa

Note: The zFS sizes listed in this section are applicable to z/OS 3.1 only (that is, the FMIDs documented in this Program Directory). If you plan to install additional products into the ROOT file system of z/OS 3.1, you will need to add their space requirements of zFS into the above sizes.

The total space required for all the SMP/E data sets listed in Figure 74 on page 276 is:

- 64 cylinders on a 3390 device

The total space required for all the SMPTLIB data sets is:

- 18090 cylinders on a 3390 device

SMPTLIB Considerations

** The size of the SMPTLIB data set reflects the total space requirements for all FMIDs (changed and unchanged elements) for z/OS 3.1.

6.0 Preparing the Installation Path

The following steps are required to prepare your system for the installation of the z/OS 3.1 CBPDO. Detailed instructions for each step are provided in the indicated sections.

Figure 5. Checklist for Preparing the Installation Path

Check Box	Section, Step Description	Your Notes
□	6.2, “Step 1: Separating File System Data Sets for z/OS 3.1”	
□	6.3, “Step 2: Cloning File System Data Sets” on page 32	
□	6.4, “Step 3: Back Up Your Clone System” on page 33	
□	6.5, “Step 4: Decide which FMIDs to Install” on page 33	
□	6.6, “Step 5: Review Library Restructure/Renaming Notes” on page 42	
□	6.7, “Step 6: Review General Installation Notes” on page 43	

6.1 Overview for the Clone of Your System

The following sections describe the procedures that need to be completed to create a clone of your system. Before you clone your system, make sure your file system data sets are separated. Use these steps to separate the file system data sets and clone your system.

6.2 Step 1: Separating File System Data Sets for z/OS 3.1

It is required that your file system contains separate file system data sets for /etc, /var, /tmp and /dev directories on the system from which you are migrating. If the file system is contained within one data set, separate file system data sets must be created and the contents moved to the new file system data sets. If this is not done, the BPXISMKD job will fail with a return code of 12.

The BPXISMKD job converts the /var, /tmp, and /dev directories into symbolic links which allows the root file system to be shared in a sysplex environment. These changes (creating separate file system data sets and running the BPXISMKD job), must be done whether you plan to share the root file system in a sysplex or not. For more information on sharing the root file system in a sysplex or how the root file system works in a non-sysplex environment, refer to *z/OS UNIX System Services Planning*.

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6.3 Step 2: Cloning File System Data Sets

Make a **clone**, which is a separate IPLable copy, of your running system. The clone must include copies of all system libraries that SMP/E updates, including the file system data sets, copies of the SMP/E CSI data sets that describe the system libraries, and your PARMLIB and PROCLIB data sets.

Note: The order in which the waves and ripples are executed in the following pages assume a cloned system is being used. If a cloned system is not being used, the order of the ripples in Wave 1 will have to be changed. See 6.5.2, “Installation Ripple Exceptions” on page 35 for more details.

The clone becomes your target system. The system on which the installation jobs are processed is your driving system. All of the changes made to the system during your installation will be made against the clone system, not the driving system. Refer to *z/OS Planning for Installation* for instructions on how to clone a system.

Note: Ensure the following tasks are completed before proceeding:

- The entire set of file system data sets are cloned. See 5.4.1, “Total DASD Storage Requirements” on page 28 for the new size of the root file system in this release.
- z/OS V2R5 and later z/OS releases do not support the HFS file system type and any HFS file systems must be converted to zFS file systems either before the system clone or during the cloning process.
- The DDDEF entries in the cloned SMP/E CSI have been updated to reference the proper file system paths for the cloned file system for your target system installation.

6.3.1 Using High Level Assembler, Program Management Binder, and SMP/E for Subsequent z/OS 3.1 Installs

You must use the current release level of High Level Assembler, Program Management Binder, and SMP/E which are shipped with z/OS 3.1 to install z/OS 3.1 Wave 1 and Wave 2 elements. Therefore, you must first install SMP/E, the Program Management Binder, and High Level Assembler as part of Wave 0.

SMP/E resides in the target system's MIGLIB library. High Level Assembler resides in the target system's SASMMOD1 library. Program Management Binder resides in the target system's MIGLIB library as well as other libraries. The Program Management Binder does still require SCEERUN for execution. You need to have SCEERUN and SCEERUN2 in the LNKLST.

Note: Be sure the target system's MIGLIB and SASMMOD1 libraries are APF-authorized. For information on authorizing the libraries, see *z/OS MVS Initialization and Tuning Reference*.

If you choose not to use STEPLIB to access the target system's MIGLIB or SASMMOD1 data sets, you must:

- Install the current level of High Level Assembler, the Program Management Binder and SMP/E which are shipped in z/OS 3.1 on your target system.
- Make two clones of that target system. One is to be used as your new driving system. The other is to be used as your target system.

6.4 Step 3: Back Up Your Clone System

After testing your clone system to ensure that it IPLs, back up your clone system to tape or DASD. **Make sure you have a backup of your clone system.**

Also consider making a backup:

- After the APPLY step succeeds in each wave.
- After the ACCEPT step succeeds in each wave.
- After a successful IPL.
- At later stages in converting your system (after completing significant parts of the work and before starting new parts of the work).

6.5 Step 4: Decide which FMIDs to Install

The elements of z/OS 3.1 are integrated into a single package with compatible service levels. Therefore, IBM expects that customers will migrate all elements of z/OS 3.1 at the same time.

Note that you must install, with few exceptions, the entire z/OS product. For more details on the exceptions, see *z/OS Planning for Installation*, section "Choosing the z/OS base and optional features".

The elements that need to be installed depend on the elements that are already installed on the target system. If an element currently exists on the target system and it has not changed between the version on the target system and this new release, it is not necessary to install the element. If it is not on the target system or it has changed, the element must be installed.

The CBPDO installation of z/OS 3.1 should occur in separate stages, which are called **waves**. There are three waves, each one consisting of multiple SMP/E steps that are documented in this Program Directory.

- Wave 0, during which elements that must be available on the driving system for the subsequent installation of Wave 1 and Wave 2 elements are installed.
- Wave 1, during which the core set of z/OS elements such as BCP, Language Environment, Communications Server IP Services and SNA Services, DFSMS, z/OS UNIX System Services, ISPF, and TSO/E are installed. Some of these core set elements are required to install other FMIDs.
- Wave 2, during which the JES2 and SDSF elements are installed.

z/OS adapts the wave installation concept, and breaks down the installation of all z/OS elements into ripples. Ripples take into consideration of natural installation separation points, such as element requisites and dependencies for SMP/E CALLLIBs. Some ripples are a subset of a wave and some are an entire wave. In this z/OS release, the waves and their corresponding ripples are:

- Wave 0 (entire ripple)
- Wave 1
  - Wave 1A
  - Wave 1AL
  - Wave 1B

  - Wave 1C
  - Wave 1D
  - Wave 1E
  - Wave 1F
  - Wave 1G
- Wave 2 (entire ripple)

The ripples give an overall installation scenario that includes every element in order to expedite the CBPDO installation path. Therefore, **the ripples must be processed in the order specified, with all FMIDs in a ripple installed.**

Refer to 6.5.3, "Elements in each Wave, Ripple, and FMIDSET" on page 35 to find out which elements are contained in each ripple and the last release in which an element was changed.

Note: Wave 2 is independent of Wave 1. Wave 2 can be combined with Wave 1; however, Wave 2 cannot occur before Wave 1.

6.5.1 Understanding SMP/E Zone Requirements

IBM recommends that you install all of z/OS 3.1 (all base elements and all optional features) into one SMP/E target zone and one SMP/E distribution zone with the following exceptions:

- Language Environment must not be installed into a target or distribution zone that contains the stand-alone products VS COBOL II or OS/VS COBOL. Language Environment contains element names that are used in VS COBOL II and OS/VS COBOL. Attempting to install into the same SMP/E zone renders both Language Environment and the COBOL products unusable.

  However, you can install Language Environment into the same target and distribution zones as any of the following products:
  - IBM C/370™ Library Version 2
  - OS PL/I Library Version 1
  - OS PL/I Library Version 2
  - VS FORTRAN

  Do not attempt to install Language Environment into the same data sets as any of the following products. Language Environment contains parts and aliases. Attempting to install into the same data sets renders both Language Environment and these products unusable.
  - IBM C/370 Library Version 1
  - IBM C/370 Library Version 2
  - OS PL/I Library Version 1
  - OS PL/I Library Version 2
  - OS/VS COBOL
  - VS COBOL II
  - VS FORTRAN

Stand-alone products that install into z/OS 3.1 load modules (or install into libraries that can not be concatenated, such as SYS1.NUCLEUS) should also be kept in the same zones as z/OS.

IBM requires that you install all the elements into the same target zone.

6.5.2 Installation Ripple Exceptions

Before you install Wave 0, Wave 1, and Wave 2 elements, you must ensure that the "cloned" file system data sets are available on your driving system. Because some of the Wave 0 elements, such as SMP/E and Program Management Binder, and some of the Wave 1 elements contain SMP/E VER DELETE statements for the prior levels that include FMIDs which are installed in the file system, installation of these elements attempts to access the root file system to DELETE the prior FMIDs if they were installed. Because FMIDs that are installed in the cloned file system will be deleted by SMP/E ++VER DELETE processing during Wave 0, Wave 1 and Wave 2 installation, you must ensure that the cloned file system is available (the z/OS UNIX kernel active in full function mode and the file systems mounted) for SMP/E processing during Wave 0, Wave 1, and Wave 2. There are no additional requirements for Wave 2; see *z/OS Planning for Installation* for details.

6.5.2.1 Installing into Empty SMP/E Zones

You are required to install z/OS 3.1 CBPDO into zones which contain the full release of z/OS from which you are migrating. This requirement is due to the sharing of load modules between waves, the need to have SMP/E find those load modules in Wave 0, and the dependencies on the driving system requirements which determine the wave order.

6.5.3 Elements in each Wave, Ripple, and FMIDSET

You must install the latest level of SMP/E, HLASM, and Program Management Binder in Wave 0 before you install all the other waves and ripples. Therefore, you can make sure that the latest level of SMP/E, HLASM, and Program Management Binder is used during the installation of the remaining waves and ripples.

Figure 6 on page 36 through Figure 15 on page 42 contain the elements to be installed during each wave and ripple of the z/OS 3.1 installation. You should create an FMIDSET for each ripple containing the elements listed in the corresponding table.

You will receive sample JCL in the data set member RIMLIB(FMIDSET) that creates FMIDSETs for the installation of z/OS 3.1. FMIDSET(WAVE0, WAVE1A, WAVE1AL, WAVE1B,...WAVE2) are set up for all elements for the specific ripple.

For the FMIDSETs (WAVE0, WAVE1A, WAVE1AL, WAVE1B,...WAVE2) created in Step 1 of the sample FMIDSET job, edit the ripple FMIDSETs to remove any FMIDs you may already have on your system.

By default, language features and z/OS Security Level 3 (which are both optional unpriced features), are commented-out in , Step 1. Therefore, if you ordered a language or z/OS Security Level 3, you must uncomment their respective entries from Step 1 of the sample FMIDSET job.

For the FMIDSETs created in Step 2 of the sample FMIDSET job, you will also need to uncomment any languages you have ordered. This ensures that any service for the languages is installed. Similarly, if you ordered the z/OS Security Level 3 feature, you also must uncomment that entry to install service.

FMIDSET(ZV31W1A, ZV31W1AL, ZV31W1B,...ZV31W2) are set up to include all elements (new, changed, and unchanged). These FMIDSETs will be used for applying and accepting service as documented later in this program directory. Edit these FMIDSETs to uncomment the languages you ordered and comment out the FMIDs for features that you did not order. Successful execution of the FMIDSET sample job will produce a condition code of zero.

To determine which elements you need to install, refer to Figure 6 through Figure 15 on page 42 and check the **Level** column for the release in which an element was last changed.

- If the column begins with OS/390, that element changed in an OS/390 release.
- If the column begins with OS/390 but also has a version, release and modification in parentheses, that element changed in an OS/390 release but is non-exclusive. The level of the equivalent stand-alone product is in parenthesis. If you already have these FMIDs installed, you do **not** need to reinstall them; they should be removed from the FMIDSETs WAVE0, WAVE1A, through WAVE2 in the FMIDSET job.
- If the column begins with z/OS, that element changed in a z/OS release.
- If the column does NOT begin with OS/390 or z/OS, that element has not changed in OS/390 (all OS/390 releases have the same level) or z/OS, and it is the same level as the equivalent stand-alone product. The level of the equivalent stand-alone product is in the Level column. If you already have these FMIDs installed, you do NOT need to reinstall them (they should be removed from the FMIDSETs WAVE0, WAVE1A, through WAVE2 in the FMIDSET job).

The FMIDs listed in the Figure 6 through Figure 15 on page 42 are for the elements documented in this program directory. To present a full z/OS 3.1 view of the ripples, every element is listed.

6.5.3.1 Elements in Wave 0

As Figure 6 shows, FMIDSET Wave 0 contains the z/OS 3.1 elements that must be installed on the target system so they can be used for subsequent installations of Wave 1 and Wave 2 elements. This includes SMP/E, HLASM, and Program Management Binder.

Figure 6. Elements in FMIDSET Wave 0

Element	FMID(s)	Level
SMP/E	HMP1K00 JMP1K11 (Japanese)	z/OS V2R4 (V3R7)
HLASM	HMQ4160	z/OS V1R10 (V1R6)
Program Management Binder	HPM77E0	z/OS 3.1

6.5.3.2 Elements in Wave 1A

FMIDSET Wave 1A contains the elements that use SMP/E CALLLIB: BCP, Support for Unicode, Communications Server IP Services, Communications Server for z/OS SNA Services, Cryptographic Services ICSF, Cryptographic Services System SSL, IBM Tivoli® Directory Server for z/OS, Integrated Security Services Network Authentication Service, ISPF, Language Environment, Metal C Runtime Library, TIOC and z/OS Web Enablement Toolkit.

Figure 7. Elements in FMIDSET Wave 1A

Element	FMID(s)	Level
BCP	HBB77E0 HAL47C0 HWT0500 HUN77E0 (Support for Unicode)	z/OS 3.1 z/OS V2R4 z/OS V2R5 z/OS 3.1
Communications Server IP Services	HIP6310 JIP631X (XWindows X11R4)	z/OS 3.1
Communications Server for z/OS SNA Services	HVT6310	z/OS 3.1
Cryptographic Services	HCR77E0 (ICSF) HCPT510 (System SSL)	z/OS 3.1
IBM Tivoli Directory Server (IBM TDS)	HRSL510	z/OS 3.1
Integrated Security Services	HSWK510 (Network Authentication Service Base)	z/OS 3.1
ISPF	HIF83A2	z/OS 3.1
Language Environment	HLE77E0	z/OS 3.1
Metal C Runtime Library	HSD7780	z/OS V1R13
TIOC	ETI1106	MVS 3.8 Base

6.5.3.3 Elements in Wave 1AL

Figure 8 lists the elements that are installed as part of Wave 1AL. FMIDSET WAVE1AL includes the language FMIDs for Wave 1A elements, along with the Communications Server Security Level 3 FMID.

Figure 8 (Page 1 of 2). Elements in FMIDSET Wave 1AL

Element	FMID(s)	Level
BCP	JBB77EJ (Japanese) JUN77EJ (Unicode Japanese) JAL47DJ (z/OS Authorized Code Scanner JPN)	z/OS 3.1 z/OS 3.1 z/OS V2R5

Figure 8 (Page 2 of 2). Elements in FMIDSET Wave 1AL		
Element	**FMID(s)**	**Level**
z/OS Security Level 3 - Communications Server	JIP631K (Security Level 3)	z/OS 3.1
Note: FMID JIP631K is export restricted.		
Cryptographic Services	JCPT51J (System SSL Japanese)	z/OS 3.1
IBM Tivoli Directory Server (IBM TDS)	JRSL51J (Japanese)	z/OS 3.1
Integrated Security Services	JSWK51J (Japanese)	z/OS 3.1
ISPF	JIF83A4 (Japanese) JIF83A6 (Upper Case English)	z/OS 3.1
Language Environment	JLE77EJ (Japanese)	z/OS 3.1

6.5.3.4 Elements in Wave 1B

FMIDSET Wave 1B, summarized in Figure 9, includes FMIDs of DFSMS, HCD, IOCP, and z/OS UNIX System Services.

Figure 9. Elements in FMIDSET Wave 1B		
Element	**FMID(s)**	**Level**
BCP	HIO1106 (IOCP)	z/OS 3.1
DFSMS	HDZ3310 JDZ331K (Japanese)	z/OS 3.1
HCD	HCS77E0 (Base and English) JCS77EJ (Japanese)	z/OS 3.1
z/OS UNIX System Services	HOT77E0 (Application Services) JOT77EJ (Japanese)	z/OS 3.1

6.5.3.5 Elements in Wave 1C

Figure 10 summarizes FMIDSET Wave 1C, which contains the following elements: EREP, ESCON Director, FFST, GDDM, GDDM-PGF, ICKDSF, MICR/OCR, OpenSSH for z/OS, z/OS Data Gatherer, z/OS Host - 3270 Workstation File Send/Receive, and TSO/E.

Figure 10 (Page 1 of 2). Elements in FMIDSET Wave 1C		
Element	**FMID(s)**	**Level**
EREP	EER3500	V3R5
ESCON Director	HSWF100	MVS/ESA V5

Figure 10 (Page 2 of 2). Elements in FMIDSET Wave 1C		
Element	**FMID(s)**	**Level**
FFST	HFST101	OS/390 R2 (V1R2)
GDDM	HGD3200 JGD3219 (English) JGD3227 (Japanese)	OS/390 R2 (V3R2)
GDDM-PGF	HGD3201	OS/390 R2 (V2R1.3)
ICKDSF (V1R17)	EDU1H01 FDU1H07 (ISMF Base) FDU1H08 (ISMF English Panels) FDU1H09 (ISMF Japanese Panels)	z990 Compatibility Support
MICR/OCR	EMI2220	MVS/XA level
OpenSSH for z/OS	HOS3310	z/OS 3.1
TSO/E	HTE77E0 JTE77EE (Information Center Facility and English) JTE77EJ (Japanese)	z/OS 3.1
Note: The English feature of TSO/E is required if you install the JPN feature.		
z/OS Data Gatherer	HRG77E0	z/OS 3.1
z/OS Host - 3270 Workstation File Send/Receive	HFX1112	OS/390 R2 (V1R1.1)

6.5.3.6 Elements in Wave 1D

Figure 11 summarizes FMIDSET Wave 1D, which contains the following elements: Alternate Library for REXX, Cryptographic Services, Integrated Security Services, Security Server (RACF), and z/OS Security Level 3.

Figure 11 (Page 1 of 2). Elements in FMIDSET Wave 1D		
Element	**FMID(s)**	**Level**
Alternate Library for REXX	HWJ9143 JWJ9144 (Japanese)	z/OS V1R9
Cryptographic Services	HKY77E0 (PKI Services)	z/OS 3.1
Security Server (RACF)	HRF77E0 JRF77EJ (Japanese)	z/OS 3.1

Figure 11 (Page 2 of 2). Elements in FMIDSET Wave 1D		
Element	**FMID(s)**	**Level**
z/OS Security Level 3	JCPT511 (System SSL Security Level 3) JSWK511 (Network Authentication Service Security Level 3) JRSL511 (IBM TDS Security Level 3)	z/OS 3.1 z/OS 3.1 z/OS 3.1
Note: FMIDs JCPT511, JSWK511, and JRSL511 are export restricted.		

6.5.3.7 Elements in Wave 1E

As Figure 12 shows, FMIDSET Wave 1E contains BCP - Capacity Provisioning, Common Information Model (CIM), RMF, Runtime Library Extensions, and XL C/C++.

Figure 12. Elements in FMIDSET Wave 1E		
Element	**FMID(s)**	**Level**
BCP - Capacity Provisioning	HPV77E0	z/OS 3.1
Common Information Model (CIM)	HPG77E0	z/OS 3.1
RMF	HRM77E0 JRM77EJ (Japanese)	z/OS 3.1
Note: RMF Data Gatherer and Reporter is split into separate FMIDs in z/OS V2R5.		
Runtime Library Extensions	HTV77C0 JTV77CJ (Japanese)	z/OS V2R4
XL C/C++	H24P111 (Host Performance Analyzer) J24P112 (Japanese Messages) HLB77C0 (XL C/C++ Base) JLB77CJ (XL C/C++ Japanese)	OS/390 2.4 z/OS V2R4

6.5.3.8 Elements in Wave 1F

FMIDSET Wave 1F contains DFSORT, HCM, HLASM Toolkit, Future Function, and IBM z/OS Change Tracker. Figure 13 summarizes the contents of this wave.

Figure 13 (Page 1 of 2). Elements in FMIDSET Wave 1F		
Element	**FMID(s)**	**Level**
DFSORT	HSM1310	z/OS 3.1
HCM	HCM1J10	z/OS 3.1
HLASM Toolkit	JMQ416A	z/OS V1R10 (V1R6)
Future Function	HKCZ300	z/OS 3.1

Figure 13 (Page 2 of 2). Elements in FMIDSET Wave 1F		
Element	**FMID(s)**	**Level**
IBM z/OS Change Tracker	HCYG100 (base, English) JCYG10J (Japanese)	z/OS V2R5

6.5.3.9 Elements in Wave 1G

As Figure 14 shows, IBM HTTP Server - Powered by Apache, Infoprint Server, Network File System, z/OS Container Extensions, z/OS File System, z/OS Font Collection, z/OS Management Facility, and IBM z/OS Liberty Embedded.

Figure 14 (Page 1 of 2). Elements in FMIDSET Wave 1G		
Element	**FMID(s)**	**Level**
IBM HTTP Server - Powered by Apache	HHAP90P	z/OS V2R2
IBM z/OS Liberty Embedded	HWLPEM0	z/OS V2R3
IBM z/OS Management Facility	HSMA310 (z/OSMF Core Functions) HSMA311 (z/OSMF ISPF) HSMA312 (z/OSMF Resource Monitoring) HSMA313 (z/OSMF WLM) HSMA314 (z/OSMF Software Management) HSMA315 (z/OSMF Incident Log) HSMA316 (z/OSMF Capacity Provisioning) HSMA317 (z/OSMF Workflow) HSMA31A (z/OSMF Network Configuration Assistant) HSMA31E (z/OSMF zERT Network Analyzer)	z/OS 3.1
Infoprint Server	HOPI7D0 (Print Interface Base) JOPI7DJ (Japanese) HNET7D0 (NetSpool Base) JNET7DJ (Japanese) HMOS705 (IP PrintWay basic mode) JMOS7J5 (Japanese)	z/OS V2R5 z/OS V1R2
Network File System	HDZ331N JDZ331J (Japanese)	z/OS 3.1
XML Toolkit for z/OS	HXML1B0	z/OS 3.1 (V1.11.0)
z/OS Container Extensions	HZDC7C0	z/OS V2R4
z/OS File System	HZFS510 JZFS51J (Japanese)	z/OS 3.1

Figure 14 (Page 2 of 2). Elements in FMIDSET Wave 1G		
Element	**FMID(s)**	**Level**
z/OS Font Collection	HFNT140 HFNT14J (Chinese, Japanese, Korean)	z/OS V2R5
Note: Beginning in z/OS V2R4, Base z/OS order for English does not include DBCS feature.		
IBM Z Deep Neural Network Library (zDNN)	HZAI310	z/OS 3.1

6.5.3.10 Elements in Wave 2

Wave 2 contains the JES2 and SDSF elements, which are listed in Figure 15.

Figure 15. Elements in FMIDSET Wave 2		
Element	**FMID(s)**	**Level**
JES2	HJE77E0 JJE77EJ (Japanese)	z/OS 3.1
SDSF	HQX77E0	z/OS 3.1
Note: 1. SDSF Japanese feature has been discontinued as of z/OS V2R3 and will not be shipped. 2. If you are installing z/OS 3.1 on a z/OS V2R4 or higher target system, be sure to install the SDSF element and the JES2 element in the same SMP/E installation step because z/OS 3.1 SDSF only assembles with z/OS 3.1 JES2.		

6.6 Step 5: Review Library Restructure/Renaming Notes

Some elements have restructured the libraries in previous releases. You should determine if these restructures will affect your environment. Refer to *z/OS Upgrade Workflow* for a list of all the deleted data sets and paths, and new data sets and paths. Refer to this deliverable for information on what libraries and paths are changed for a particular z/OS release.

If you are installing an element, and at least one of the following is true:

- The middle-level qualifier of the data sets has been removed.
- You wish to change the high-level qualifier of an existing library.
- The RECFM of a data set has changed.

IBM recommends that you do the following:

1. Perform the dummy function delete of the element.
2. Delete the old libraries.
3. Allocate new libraries using the sample jobs provided.

4. Update the DDDEFs using the sample jobs provided.
5. Follow the rest of the instructions in the appropriate installation chapters.

6.7 Step 6: Review General Installation Notes

This section describes the general information and messages that you receive during APPLY CHECK, APPLY, ACCEPT CHECK, and ACCEPT processing of the z/OS 3.1 elements.

For the DDDEF sample jobs being provided, if the DDDEFs have never been defined, you can use either the REP or ADD parameter. The REP parameter replaces the CSI entry if it exists or adds it if it does not exist. If, however, the DDDEFs have already been defined and need to be replaced, you must use the REP parameter. If you use the ADD parameter to attempt to replace an existing entry, the job will fail.

If the target and distribution data sets that correspond to the DDDEFs will be cataloged, the UNIT and VOLUME parameters can be deleted from the DDDEF sample jobs.

To receive the full benefit of the SMP/E Causer SYSMOD Summary Report, the following should **not** be bypassed on the APPLY and ACCEPT CHECK: ID, IFREQ, PRE, and REQ. This is because the SMP/E root cause analysis only identifies the cause of **ERRORS** and not **WARNINGS**.

Enhanced HOLDDATA introduced ERROR HOLDs against FMIDs for HIPER APARS. Prior to installing, you should ensure you have the latest Enhanced HOLDDATA, which is available at the following URL: http://service.software.ibm.com/holdata/390holddata.html

The FMID(s) should be installed regardless of the status of unresolved HIPERs; however, the software should not be deployed until the unresolved HIPERs have been analyzed to determine applicability.

There are two methods to complete an FMID installation where ++HOLDs for HIPERs exist for the FMID(s) being installed:

1. To ensure that all critical service is installed with the FMID(s), add the SOURCEIDs of PRP, and HIPER to the APPLY command. There maybe PE or HIPER APARs that do not have resolving PTFs available yet. You need to analyze the symptom flags to determine if you want to BYPASS the specific ERROR HOLDs and continue the FMID installation.

   This method requires more initial research, but will provide resolution for all HIPERs that have fixes available and are not in a PE chain. There may still be unresolved PEs or HIPERs which will require the use of BYPASS.

2. To install the FMID(s) as it would have been installed prior to Enhanced HOLDDATA, you can add a BYPASS(HOLDCLASS(HIPER)) operand to the APPLY command. This will allow the FMID to be installed even though there are HIPER ERROR HOLDs against it. Note that not all ERROR HOLDs were bypassed; only the HIPER ERROR HOLDs. After the FMID(s) are installed, the SMP/E REPORT ERRSYSMODS command should be run to identify any missing HIPER maintenance.

   The sample APPLY jobs shown throughout this program directory include BYPASS(HOLDCLASS(HIPER)) on the APPLY command to bypass the HIPER ERROR HOLDs.

This method is the quicker of the two, but requires subsequent review of the REPORT ERRSYSMODS to investigate any HIPERs.

If you bypass any HOLDs during the installation of the FMID(s) because fixing PTFs were not yet available you can use the APAR Status Tracking (AST) function of ServiceLink or the APAR Tracking function of ResourceLink to be notified when the fixing PTF is available.

GROUPEXTEND indicates that all requisite SYSMODs are to be applied and accepted. The requisite SYSMODs may be applicable to other functions. In the SMP/E examples throughout this program directory, GROUPEXTEND will not include APARs or USERMODs. If you want it to, then remove the keywords NOAPARS and NOUSERMODS.

During an APPLY/ACCEPT CHECK and APPLY/ACCEPT, SMP/E Element Status can appear as APPLIED/ACCEPTED or NOT SEL in the 'Element Summary Report'.

- When Element Status indicates APPLIED/ACCEPTED with NOT SEL, the NOT SEL status can be ignored.
- Any Element Status showing ONLY a NOT SEL should be investigated.
- **Notes on APPLY CHECK and APPLY processing**

  If USERMODs are regressed, you will see the following message, which is acceptable:

  ```
  GIM44502W CHANGES FOR THE FOLLOWING USERMODS WILL BE LOST
  BECAUSE THE ASSOCIATED FUNCTION SYSMOD HAS BEEN DELETED
  ```

  Depending on what your USERMOD does during APPLY CHECK processing, you may want to SMP/E RESTORE your USERMODs before installing the function sysmod and then APPLY them afterwards, or perform an SMP/E APPLY concurrently with the function sysmod.

  If the optional dummy function delete was not performed, normal SMP/E APPLY processing of the z/OS 3.1 FMIDs will delete the previous releases. However, the total installation time will be decreased if you run the optional dummy delete job. If you do not run the dummy delete job, then several load modules will be link-edited multiple times. The first link-edit will remove the previous release and can produce the following program binder messages, which can be ignored:

  ```
  IEW2230S  IEW2454W  IEW2470E  IEW2471E  IEW2480W  IEW2612E
  IEW2648E  IEW2650I  IEW2677S
  ```

  For those elements using SMP/E CALLLIBs, warning messages are issued when the load modules are link-edited. For example, the following warning messages are acceptable:

  ```
  IEW2454W SYMBOL xxxxxxxx UNRESOLVED. NO AUTOCALL(NCAL) SPECIFIED.

  IEW2480W EXTERNAL SYMBOL xxxxxxxx OF TYPE LD WAS ALREADY DEFINED
  AS A SYMBOL OF TYPE LD IN SECTION csectname.

  IEW2482W THE ORIGINAL DEFINITION WAS IN A MODULE IDENTIFIED BY
  DDNAME SMPnnnnn. THE DUPLICATE DEFINITION IS IN SECTION xxxxxxx
  IN A MODULE IDENTIFIED BY DDNAME SMPnnnnn.
  ```

```
IEW2609W 5104 SECTION xxxxxxxx USABILITY ATTRIBUTE OF
NON-REUSABLE CONFLICTS WITH REQUESTED USABILITY OF REENTRANT.
```

During APPLY CHECK and APPLY processing, the following message may be issued if BYPASS was specified (*aaaaaaa* is the sysmod ID). This message, and the resulting return code of 4, is acceptable.

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

Note: You must investigate and resolve any “requisites” or “holds” that were not satisfied before continuing with the install.

During APPLY CHECK and APPLY processing for some elements, such as BCP, message GIM69138W will appear in the SMP/E output when a load module does not exist in a library and the install logic of an FMID contains a ++DELETE statement for a load module:

```
GIM69138W LMOD xxxxxxx WAS NOT DELETED FROM LIBRARY yyyyyy BY
SYSMOD sssssss BECAUSE xxxxxxx DOES NOT EXIST IN LIBRARY yyyyyy.
```

In the preceding message, *xxxxxxx* is the load module name, *yyyyyy* is the library name, and *sssssss* is the SYSMOD name.

- **Notes on ACCEPT CHECK and ACCEPT processing**

  IBM recommends that you set the ACCJCLIN indicator in the DLIB zone. This causes all inline JCLIN to be saved in the distribution zone at ACCEPT time. For more information about the ACCJCLIN indicator, see the description of inline JCLIN in the ACCEPT command in *z/OS SMP/E Commands*.

  Any requisite service identified by the ACCEPT CHECK should be RECEIVEd and APPLYed before the next step.

  During SMP/E ACCEPT processing, load modules are installed into the distribution libraries. During the link-edits into these distribution libraries, message IEW0461 or IEW2454W may be issued several times. These messages are acceptable because the distribution libraries are not executable and the unresolved external references will not affect the executable system libraries.

  During ACCEPT CHECK and ACCEPT processing, the following message may be issued if BYPASS was specified (*aaaaaaa* is the sysmod ID). This message, and the resulting return code of 4, is acceptable.

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

  Note: You must investigate and resolve any “requisites” or “holds” that were not satisfied before continuing with the install.
- LINK LMODS CALLLIBS is not required to be run after the installation is finished. Because the CALLable services are upwardly compatible, there is no need to re-link.
- The sample jobs are shown using REGION=0M. A region value equal to 0K or 0M gives the job all the storage available below and above 16 megabytes. Be aware that this can affect the performance of other jobs running in the system. If you do not choose to run with a region size of 0M, refer to *z/OS SMP/E Reference* for more information on how to determine region sizes.

- TIME=NOLIMIT is specified on the samples because the jobs take a long time to execute.

6.7.1 SMP/E CALLLIBs Processing

z/OS 3.1 uses the CALLLIBS function that is provided in SMP/E to resolve external references during installation. Before z/OS 3.1 is installed, ensure that DDDEFs exist for the following libraries:

- CEE.SCEEBND2
- CEE.SCEECPP
- CEE.SCEELIB
- CEE.SCEELKED
- CEE.SCEELKEX
- CEE.SCEEOBJ
- CEE.SCEESPC
- CICS.SDFHLOAD
- CSF.SCSFMOD1
- CSF.SCSFSTUB
- EUVF.SEUVFLIB
- SYS1.CSSLIB
- SYS1.SFOMOBJ
- TCPIP.SEZACMTX

7.0 Installation Instructions for Wave 0 FMIDs

This chapter describes how to install the Wave 0 elements in z/OS 3.1.

- For instructions on installing all of the FMIDs in Wave 1, including the FMIDs that are installed into the file system, and instructions about installing JES2 and SDSF in Wave 2, see 8.0, “Installation Instructions for Wave 1 and Wave 2 FMIDs” on page 67.

z/OS is installed using the SMP/E RECEIVE, APPLY, and ACCEPT commands. For details on SMP/E, refer to the appropriate SMP/E books.

Note: This chapter uses sample JCL to illustrate installation steps. You can also use the SMP/E dialogs instead of JCL.

The following steps are required to install the Wave 0 FMIDs. Instructions for each step are provided on the indicated pages.

Figure 16. Checklist for Wave 0 Installation

Check Box	Activity	Section, Step Description	Your Notes
□	RECEIVE	7.1, “Step 1: RECEIVE the Wave 0 elements” on page 48	
□	Prepare	7.2, “Step 2: Prepare to Install Wave 0” on page 49	
□	Run Optional Delete Jobs	7.2.1, “Run optional delete jobs for Wave 0 elements” on page 50	
□	Allocate Libraries	7.2.2, “Allocate Target and Distribution Libraries for Wave 0 elements” on page 52	
□	zFS Directories	7.2.3, “Create File System Directories for Wave 0” on page 53	
□	Define DDDEFs	7.2.4, “Define DDDEFs for Wave 0 elements” on page 53	
□	APPLYs	7.3, “Step 3: APPLY Wave 0” on page 54	
		7.3.1, “Create a cross-zone set” on page 54	
		7.3.2.1, “Do an SMP/E APPLY CHECK for Wave 0 FMIDs and Service” on page 56	
		7.3.2.2, “Do an SMP/E APPLY for Wave 0 FMIDs and Service” on page 58	
□	Customize Wave 0	7.4, “Step 4: Wave 0 Customization” on page 60	

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7.1 Step 1: RECEIVE the Wave 0 elements

You must use the current level of SMP/E, Program Management Binder, and High Level Assembler that is included with z/OS 3.1 to install z/OS 3.1 Wave 1 and Wave 2 elements. Therefore, you must receive the Wave 0 elements FMIDs by using the SELECT and FORFMID operands to limit SMP/E processing at this time if the levels of the Wave 0 elements FMIDs that are installed on the z/OS target system are not the same level as the Wave 0 elements in z/OS 3.1. After you install the Wave 0 FMIDs, you can use SMP/E to update the Global zone to improve RECEIVE processing (see note 5 on page 64) and receive the FMIDs and service for the rest of z/OS elements (see 8.1.5, "RECEIVE the rest of the CBPDO" on page 78). See *z/OS SMP/E Commands* for more information about the changes to SMP/E RECEIVE processing.

7.1.1 RECEIVE Wave 0 FMIDs and Service

Select which z/OS 3.1 Wave 0 FMIDs to RECEIVE by removing the FMIDs that have previously been RECEIVEd or that have not been ordered from the sample RECEIVE job shown in Figure 17 on page 49.

Required Updates

1. Update the *job parameters*.
2. Replace the CSI name on the SMPCSI DD statement with your CSI name.
3. Replace *vvvvvv* on the SMPPTFIN and SMPHOLD DD statement with the correct VOLSER.

```
//RECWAVE0 JOB <job parameters>
//STEP1   EXEC PGM=GIMSMP,REGION=0M,TIME=NOLIMIT
//SMPCSI  DD DSN=zos31.global.csi,DISP=SHR
//SMPPTFIN DD DSN=SMPMCS,
//            UNIT=(TAPE,,DEFER),
//            VOL=SER=vvvvvv,
//            LABEL=(5,SL),
//            DISP=(SHR,KEEP)
//SMPHOLD  DD DSN=HOLDDATA,
//            UNIT=(TAPE,,DEFER),
//            VOL=SER=vvvvvv,
//            LABEL=(3,SL),
//            DISP=(SHR,KEEP)
//SMPCNTL DD *
  SET BOUNDARY(GLOBAL).
  RECEIVE SELECT (
                HMP1K00,   /* see NOTE 1 below */
                JMP1K11,  /* see NOTE 2 below */
                HMQ4160, /* see NOTE 1 below */
                HPM77E0
                )
          SYSMODS
          HOLDDATA
          FORFMID (
                HMP1K00,
                JMP1K11,  /* see NOTE 2 below */
                HMQ4160,
                HPM77E0
                ).
/*
```

Figure 17. SMP/E RECEIVE (All Wave 0 FMIDs and Service for z/OS)

Notes:

1. If High Level Assembler (HLASM) or SMP/E has been previously installed, remove HLASM FMID HMQ4160 or SMP/E FMID HMP1K00 from the SELECT operand.
2. If the Japanese feature is not ordered, remove FMID JMP1K11 from the SELECT and FORFMID parameters.

Successful receive processing returns a condition code of 0.

7.2 Step 2: Prepare to Install Wave 0

This step describes the preparation work required before doing the APPLY of Wave 0.

Required Planning Tasks Check List

__ Before installing Wave 0, complete the planning tasks for choosing the software installation method - using CBPDO, preparing the driving system for CBPDO, and preparing the target system which are described in *z/OS Planning for Installation*.

__ Clone your system, as described in 6.1, “Overview for the Clone of Your System” on page 31.

__ Check the PSP buckets, as described in 3.2, “Preventive Service Planning (PSP)” on page 15.

__ Ensure that your system meets the requirements for hardware, software, and coexistence considerations described in *z/OS Planning for Installation*.

__ Install the required driving system software listed in *z/OS Planning for Installation* for Wave 0. If you do not have a system that meets these requirements, do one of the following:

- Consider using a ServerPac.
- Upgrade your existing system.
- Obtain a Customized Offerings Driver (5751-COD).

To install Wave 0, you must install from a user ID that has a UID of 0 or has read access to the BPX.SUPERUSER resource in the RACF FACILITY class. This user ID must have read access to FACILITY class resources `BPX.FILEATTR.APF`, `BPX.FILEATTR.PROGCTL`, and `BPX.FILEATTR.SHARELIB`. Alternatively, you could use a generic profile for these resources, such as `BPX.FILEATTR.*`.

7.2.1 Run optional delete jobs for Wave 0 elements

Before installing Wave 0 elements, you may consider dummy function deleting prior levels of elements to decrease installation runtime. You can create a dummy function delete job by using the sample job shown in Figure 18 on page 51 to delete the elements. To run this job, you must make the following updates to the sample:

1. Update the *job parameters*.
2. Change `zos31.global.csi` name to your CSI name on the SMPCSI DD statement.
3. Change *#fmid1* to the prior level of the element's base FMID.
4. Change *#fmid2* to the prior level of the element's feature FMID. If there is no feature FMID for the element, then remove *#fmid2*. If there is more than one feature FMID, then you will have to add the additional FMIDs to this list.
5. Change *#tzone* to your TARGET ZONE name.
6. Change *#dzone* to your DLIB ZONE name.

```
//DDELETE JOB <job parameters>
//STEP1 EXEC PGM=GIMSMP,REGION=0M,TIME=NOLIMIT
//SMPCSI DD DISP=SHR,DSN=zos31.global.csi
//SMPHOLD DD DUMMY
//SMPCNTL DD *
 SET BDY(GLOBAL) OPTIONS(ZOSOPT).
 RECEIVE S(DM0FMID).
/*
//SMPPTFIN DD *
++FUNCTION (DM0FMID) REWORK(2020060).
++VER(Z038)
   DELETE(#fmid1,#fmid2).
/*
//STEP2 EXEC PGM=GIMSMP,REGION=0M,TIME=NOLIMIT,COND=(4,LT)
//SMPCSI DD DISP=SHR,DSN=zos31.global.csi
//SMPCNTL DD *
  SET BDY(#tzone) OPTIONS(ZOSOPT).
  APPLY S(DM0FMID) REDO.
/*
//STEP3 EXEC PGM=GIMSMP,REGION=0M,TIME=NOLIMIT,COND=(4,LT)
//SMPCSI DD DISP=SHR,DSN=zos31.global.csi
//SMPCNTL DD *
  SET BDY(#dzone) OPTIONS(ZOSOPT).
  ACCEPT S(DM0FMID) REDO.
/*
//STEP4 EXEC PGM=GIMSMP,REGION=0M,TIME=NOLIMIT,COND=(4,LT)
//SMPCSI DD DISP=SHR,DSN=zos31.global.csi
//SMPCNTL DD *
  SET BDY(#tzone) .
  UCLIN .
   DEL SYSMOD(#fmid1) .
   DEL SYSMOD(#fmid2) .
   DEL SYSMOD(DM0FMID) .
  ENDUCL  .
  SET BDY(#dzone) .
  UCLIN .
   DEL SYSMOD(#fmid1) .
   DEL SYSMOD(#fmid2) .
   DEL SYSMOD(DM0FMID) .
  ENDUCL  .
  SET BDY(GLOBAL).
  REJECT HOLDDATA NOFMID      /* Reject SYSMODs, HOLDDATA  */
       DELETEFMID             /* for the deleted functions.*/
       (DM0FMID #fmid1 #fmid2).
```

Figure 18. Sample Dummy Delete Job

7.2.2 Allocate Target and Distribution Libraries for Wave 0 elements

Since it is expected that you are installing on a clone of your system, as stated in 6.1, "Overview for the Clone of Your System" on page 31, many data sets should already exist. Verify that your target and distribution libraries contain enough space, as described in Appendix C, "DASD Storage Requirements Tables" on page 275. Sample jobs to allocate the target and distribution libraries for some elements have been provided. See Appendix C, "DASD Storage Requirements Tables" on page 275 for information on new libraries introduced in this release.

Copy the sample jobs to a work data set and customize them if you need to perform these tasks.

The samples specify the storage requirements using average block lengths. BLKSIZE=0 indicates that system-determined block sizes are being used. For example, the sizes might look like this:

```
SPACE=(8800,(135,27,6)),
DCB=(RECFM=FB,LRECL=80,BLKSIZE=0).
```

Do not confuse the SPACE=8800 (average block length) parameter with the BLKSIZE=0 (block size) parameter. If you would like to change the block size to something other than the system-determined block size, you can change the BLKSIZE parameter. Do not change the SPACE parameter. You can either use the storage allocations that are provided, or convert them to cylinder or track allocations.

If these elements have already been installed, the JCL for the jobs needs to be modified to remove or comment out the DD statements for the pre-existing libraries, or the job will fail. For more information on modifying JCL, see *z/OS MVS JCL Reference*.

Run these jobs after the elements have been RECEIVEd.

After the jobs are submitted, you should get a condition code of 0. Check the allocation/deallocation messages to be certain the data sets were allocated and cataloged properly.

Figure 19 lists the locations of the sample jobs. Be sure to read the note following the table before running the sample jobs. The following fields are represented in this table:

Job Name Indicates the name of the job that is to be run.
Job Type Indicates the type of job that is to be run.
Description Contains the element name for which the job is to be run.
SMPTLIB Data Set Identifies the location of the sample job.

Figure 19 (Page 1 of 2). Wave 0 Allocate Sample Installation Jobs

Job Name	Job Type	Description	SMPTLIB Data Set
ASMWALOC	ALLOCATE	HLASM	'prefix.HMQ4160.F1'
GIMALLC	ALLOCATE	SMP/E	'prefix.HMP1K00.F1'

Figure 19 (Page 2 of 2). Wave 0 Allocate Sample Installation Jobs

Job Name	Job Type	Description	SMPTLIB Data Set
IEWISALC	ALLOCATE	Program Management Binder	'prefix.HPM77E0.F1'

Note: 'prefix' is the high-level qualifier specified as the DSPREFIX value in the SMPTLIB DDDEF or the OPTIONS entry of the global zone.

7.2.3 Create File System Directories for Wave 0

You need to create the file system directories for Wave 0 elements before installing the Wave 0 FMIDs, if the directories do not exist. These directories are created by running the sample jobs listed in Figure 20. It is assumed that you have cloned the entire set of file system data sets, as described in 6.3, “Step 2: Cloning File System Data Sets” on page 32, and that the clone is your target system. The cloned file system data sets for the target system must be mounted to the driving system before running the sample job listed below.

The following fields are represented in this table:

Job Name Indicates the name of the job that is to be run.
Job Type Indicates the type of job that is to be run.
Description Contains the element name for which the job is to be run.
SMPTLIB Data Set Identifies the location of the sample job.

Figure 20. Wave 0 Define Directories Sample Installation Jobs

Job Name	Job Type	Description	SMPTLIB Data Set
GIMISMKD	MKDIR	SMP/E	'prefix.HMP1K00.F1'

Note:

1. The 'prefix' is the high-level qualifier value specified as the DSPREFIX value in the SMPTLIB DDDEF or the OPTIONS entry of the global zone.
2. Be careful when modifying the samples because path names are case sensitive.
3. After the above job is run, the expected return code is 0.

7.2.4 Define DDDEFs for Wave 0 elements

Verify that your target and distribution libraries have the corresponding DDDEF entries in the SMP/E CSI as listed in Figure 79 on page 281 and Figure 80 on page 295 for z/OS 3.1. Sample jobs to define DDDEF entries for wave 0 elements have been provided.

If the DDDEF entries for the Wave 0 elements do not exist in the SMP/E CSI, copy the sample jobs to a work data set and customize them. DDDEFs must be defined in the target and distribution zones. For instructions on customizing the sample jobs see the comments in the sample jobs.

Run the jobs after the elements have been RECEIVEd.

If any of the DDDEF entries already exist, you will get a non-zero condition code. Check the output to see what caused the non-zero condition code.

Figure 21 lists the locations of the sample jobs. Be sure to read the notes following the table before running the sample jobs. The following fields are represented in this table:

Job Name Contains the name of the sample job to be run.
Job Type Indicates the type of job that is to be run.
Description Contains the element name for which the job is to be run.
SMPTLIB Data Set Identifies the location of the sample job.

Figure 21. Wave 0 DDDEF Sample Installation Jobs

Job Name	Job Type	Description	SMPTLIB Data Set
ASMWDDEF	DDDEF	HLASM	'prefix.HMQ4160.F1'
GIMDDDEF	DDDEF	SMP/E	'prefix.HMP1K00.F1'
IEWISDDD	DDDEF	Program Management Binder	'prefix.HPM77E0.F1'

Note: 'prefix' is the high-level qualifier value specified as the DSPREFIX value in the SMPTLIB DDDEF or the OPTIONS entry of the global zone.

7.3 Step 3: APPLY Wave 0

This section describes step 3 of wave 0.

7.3.1 Create a cross-zone set

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.

In OS/390 Release 3, SMP/E introduced the operand, XZREQ, which 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 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 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 *z/OS SMP/E Commands*. See Figure 22 on page 56 for an example of how to set up the ZONEINDEX, ZONESET, and XZREQCHK for use during the APPLY/ACCEPT; see Figure 32 on page 102 for an example of the APPLY using the XZREQ operand.

Required Updates

1. Update the *job parameters*.
2. Replace the CSI name on the SMPCSI DD statement with your CSI name.
3. Update cross dependency zones and CSI names.

Successful processing returns a condition code of 0.

```
//ZINDEX   JOB (job parameters)
//SMPE     EXEC PGM=GIMSMP
//SYSPRINT DD SYSOUT=*
//SMPCSI   DD DSN=zos31.global.csi,DISP=SHR
//SMPCNTL  DD *
  SET BDY(GLOBAL) .
    UCLIN .
      ADD GLOBALZONE ZONEINDEX(
        (jes2tgt,jes2.target.csi,TARGET)
        (pptgt,pgmprod.target.csi,TARGET)
        (db2tgt,db2.target.csi,TARGET)
        (imstgt,ims.target.csi,TARGET)
        (cicstgt,cics.target.csi, TARGET)
        (jes2dlb,jes2.dlib.csi,DLIB)
        (ppdlib,pgmprod.dlib.csi,DLIB)
        (cicsdlb,cics.dlib.csi,DLIB)
        (db2dlib,db2.dlib.csi,DLIB)
        (imsdlib,ims.dlib.csi,DLIB)) .
      ADD ZONESET(XZONE)
        ZONE(jes2tgt,
             pptgt,
             cicstgt,
             db2tgt,
             imstgt,
             jes2dlb,
             ppdlib,
             cicsdlb,
             db2dlib,
             imsdlib)
       XZREQCHK(YES) .
    ENDUCL.
/*
```

Figure 22. Sample Job to Add XZREQCHK(YES) to a ZONESET Entry

7.3.2 Select which z/OS 3.1 Wave 0 FMIDs to install

Select which z/OS 3.1 Wave 0 FMIDs to install by removing the FMIDs that have been previously installed or that have not been ordered from the sample APPLY CHECK job shown in Figure 23 on page 57.

7.3.2.1 Do an SMP/E APPLY CHECK for Wave 0 FMIDs and Service

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

See Figure 23 on page 57 for a sample APPLY CHECK of all FMIDs and service for Wave 0.

```
//CHECK JOB <job parameters>
//STEP1 EXEC PGM=GIMSMP,REGION=0M,TIME=NOLIMIT
//SMPCSI DD DSN=zos31.global.csi,DISP=SHR
//SMPCNTL DD *
  SET BOUNDARY(targetzone) .
  APPLY CHECK XZREQ
   FORFMID(HMP1K00,
           JMP1K11,             /* see Note 2 below */
           HMQ4160,
           HPM77E0)
   SELECT(HMP1K00,               /* see Note 1 below */
          JMP1K11,              /* see Note 2 below */
          HMQ4160,             /* see Note 1 below */
          HPM77E0)
   GROUPEXTEND(NOAPARS,NOUSERMODS)
   SOURCEID(ZOS31,RSU*)
   FIXCAT(IBM.ProductInstall-RequiredService)
   BYPASS(HOLDSYSTEM,
   HOLDUSER,HOLDCLASS(UCLREL,ERREL,HIPER)) .
/*
```

Figure 23. SMP/E APPLY CHECK (All Wave 0 FMIDs and Service for z/OS 3.1)

Notes:

1. If High Level Assembler (HLASM) or SMP/E has been previously installed, remove HLASM FMID HMQ4160 or SMP/E FMID HMP1K00 from the SELECT operand.
2. If the Japanese feature is not ordered, remove FMID JMP1K11 from the SELECT and FORFMID parameters.
3. HLASM Toolkit is included in Wave 1 elements in this program directory. If you plan to use HLASM Toolkit before you do the APPLY for Wave 1 FMIDs, install FMID JMQ416A during Wave 0 by adding FMID JMQ416A to the FORFMID and SELECT operands in the APPLY CHECK job for Wave 0 FMIDs. To install FMID JMQ416A during Wave 0, you must also run the SMP/E RECEIVE command against FMID JMQ416A before running the APPLY CHECK job for Wave 0 FMIDs.

Required Updates

1. Update the *job parameters*.
2. Replace the CSI name on the SMPCSI DD statement with your CSI name.
3. Update *targetzone* to your target zone name.
4. 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 messages will be received, which are 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.

GIM20501I APPLY PROCESSING IS COMPLETE. THE HIGHEST RETURN
CODE WAS 04.
```

Note that if you BYPASS(HOLDCLASS(HIPER)), you should run the SMP/E REPORT ERRSYSMODS command to identify missing HIPER HOLDs before putting your system into production.

If you do not BYPASS(HOLDCLASS(HIPER)), the FMIDs may not be installed if any of the HIPER maintenance is unavailable.

Any messages other than those stated in 6.7, “Step 6: Review General Installation Notes” on page 43, and in the following section, need to be investigated.

Successful APPLY CHECK processing returns a condition code of 0 or 4.

7.3.2.1.1 Messages expected during Binder APPLY CHECK: During the APPLY CHECK of the Binder, the following messages may be received and are acceptable if they are the only reasons for the condition code 4.

```
GIM61903W LMOD xxxxxxxx WAS NOT DELETED BY SYSMOD
HPM77E0 BECAUSE IT IS NOT IN THE target ZONE.
```

In the message text, *xxxxxxxx* will be one of the following LMODs:

```
AKJLKL01  AMBLIST  HEWLD  HEWLKED  IEWBFDAT  IEWBIND
IEWBLINK  IEWBXEP
```

7.3.2.2 Do an SMP/E APPLY for Wave 0 FMIDs and Service

Be certain that all the exception conditions have been satisfied before adding a BYPASS(HOLDSYSTEM) during the SMP/E APPLY step. See Figure 24 on page 59 for a sample APPLY of all FMIDs and service for Wave 0.

```
//APPLY JOB <job parameters>
//STEP1 EXEC PGM=GIMSMP,REGION=0M,TIME=NOLIMIT
//SMPCSI DD DSN=zos31.global.csi,DISP=SHR
//SMPCNTL DD *
  SET BOUNDARY(targetzone).
  APPLY XZREQ
   FORFMID(HMP1K00,
           JMP1K11,         /* see NOTE 2 below */
           HMQ4160,
           HPM77E0)
   SELECT(HMP1K00,           /* see Note 1 below */
           JMP1K11,         /* see NOTE 2 below */
           HMQ4160,        /* see NOTE 1 below */
           HPM77E0)
   GROUPEXTEND(NOAPARS,NOUSERMODS)
   SOURCEID(ZOS31,RSU*)
   FIXCAT(IBM.ProductInstall-RequiredService)
   BYPASS(HOLDSYSTEM,
   HOLDUSER,HOLDCLASS(UCLREL,ERREL,HIPER)) .
/*
```

Figure 24. SMP/E APPLY (All Wave 0 FMIDs and Service for z/OS 3.1)

Required Updates

1. Update the *job parameters*.
2. Replace the CSI name on the SMPCSI DD statement with your CSI name.
3. Update *targetzone* to your target zone name.
4. 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 messages will be received, which are 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.

   GIM20501I APPLY PROCESSING IS COMPLETE. THE HIGHEST RETURN
   CODE WAS 04.
   ```

Note that if you BYPASS(HOLDCLASS(HIPER)), you should run the SMP/E REPORT ERRSYSMODS command to identify missing HIPER HOLDs before putting your system into production.

If you do not BYPASS(HOLDCLASS(HIPER)), the FMIDs may not be installed if any of the HIPER maintenance is unavailable.

Notes:

1. If High Level Assembler (HLASM) or SMP/E has been previously installed, remove HLASM FMID HMQ4160 or SMP/E FMID HMP1K00 from the SELECT operand.
2. If the Japanese feature is not ordered, remove FMID JMP1K11 from the SELECT and FORFMID parameters.
3. HLASM Toolkit is included in Wave 1 elements in this program directory. If you plan to use HLASM Toolkit before you do the APPLY for Wave 1 FMIDs and you have included FMID JMQ416A in the APPLY CHECK job for Wave 0 FMIDs, you must add FMID JMQ416A to the FORFMID and SELECT operands in the APPLY job for Wave 0 FMIDs.

Any messages other than those stated in 6.7, “Step 6: Review General Installation Notes” on page 43, and in the following section, need to be investigated.

Successful APPLY processing returns a condition code of 0 or 4.

After the APPLY of Wave 0, proceed with the customization of Wave 0.

7.3.2.2.1 Additional messages expected during Wave 0 APPLY

This section describes additional messages you may receive during the Wave 0 APPLY.

7.3.2.2.1.1 Messages expected during Binder APPLY: During the APPLY of the Binder, the following messages may be received and are acceptable if they are the only reasons for the condition code 4.

```
GIM61903W LMOD xxxxxxxx WAS NOT DELETED BY SYSMOD
HPM77E0 BECAUSE IT IS NOT IN THE target ZONE.
```

In the message text, *xxxxxxxx* will be one of the following LMODs. If these are the only cause of the condition code 4, it is acceptable.

```
AKJLKL01  AMBLIST  HEWLD    HEWLKED  IEWBFDAT  IEWBIND
IEWBLINK  IEWBXEP
```

7.4 Step 4: Wave 0 Customization

This step describes the actions to be performed for customizing the Wave 0 elements.

7.4.1 High Level Assembler

Refer to *HLASM Installation and Customization Guide* for more information and instructions on High Level Assembler customization.

You can customize any of the following items for High Level Assembler:

- Customize user exits.
- Change default OPTIONs and DDNAMEs.

- Place High Level Assembler into Link Pack Area.

7.4.2 SMP/E Customization

The following sections describe the steps needed to customize the installation of SMP/E.

7.4.2.1 Update SMP/E Entries

The SYSLIB concatenation for APPLY processing for the rest of z/OS 3.1 should begin with your SMPMTS, MACLIB, and MODGEN data sets. If you have other products installed, you can include other data sets later in the SYSLIB concatenation. Refer to the following list for the complete SYSLIB concatenation in the target zone for z/OS 3.1.

Target zone SYSLIB concatenation

- SMPMTS
- MACLIB
- MODGEN
- SISTMAC1 (for Communications Server for z/OS SNA Services)
- SICEUSER (for DFSORT)
- SISFMAC (for SDSF)
- SASMMAC1 (for High Level Assembler)
- SASMSAM1 (for High Level Assembler)
- SCEEMAC (for Language Environment)
- SEZACMAC (for Communications Server IP Services)

You will need to add the JES libraries to your concatenation.

- For JES2 systems at the z/OS level, you should add SHASMAC.

Distribution zone SYSLIB concatenation

The SYSLIB concatenation for ACCEPT processing must begin with your AMACLIB and AMODGEN data sets. If you have other products installed, you can include other data sets later in the SYSLIB concatenation. See the following list for the complete SYSLIB concatenation in the distribution zone for z/OS 3.1.

1. AMACLIB
2. AMODGEN
3. AISTMAC1 (for Communications Server for z/OS SNA Services)
4. AEPWSRC1 (for FFST)
5. AICEUSER (for DFSORT)
6. AISFMAC (for SDSF)
7. AASMMAC1 (for High Level Assembler)
8. ACEESRC1 (for Language Environment)
9. AIGZSRC1 (for Language Environment)
10. AAFHSRC1 (for Language Environment)
11. AEDCSRC6 (for Language Environment)

12. AEZAMAC1 (for Communications Server IP Services)
13. AEZAMAC2 (for Communications Server IP Services)
14. AEZAMAC3 (for Communications Server IP Services)
15. ATSOMAC

You will need to add the JES libraries to your concatenation.

- For JES2 systems at the z/OS level, you should add AHASMAC.

OPTIONS and UTILITY entries

The OPTIONS and UTILITY entries in your global zone must be set correctly. Choose among the following:

- Define new entries as shown in Figure 25 on page 63.
- Update existing entries.
- Use an existing entry with the same values shown.

The following entries must be defined to SMP/E. The following values are not the default values, so ensure that they are being used. For the other utility entries, the defaults are acceptable. Verify that defaults are being used by the utilities that are not listed.

- A UTILITY entry for binder.

  Make sure that the program HEWLH096 (or another entry name that invokes the binder) is specified with appropriate parameters and has a maximum acceptable condition code of 04. HEWLH096 points to the Program Management Binder.

  Notes:

  1. The utility entry **must** point to the binder, HEWLH096.
  2. The maximum acceptable link edit return code is 4 for z/OS 3.1.
  3. Do not make the RC=4 unless all products in the zone have a maximum return code of 4.

- An OPTIONS entry that identifies the UTILITY entries to be used.

  Make sure that you include ASM and LKED subentries.

Figure 25 on page 63 shows a sample job adding the OPTIONS entry named ZOSOPT. ZOSOPT replaces OS390OPT, MVSXAOPT and ESAOPT, which were described in prior OS/390 and MVS releases. You should verify that this change is made in any RECOVERY, CLEANUP, or GENERAL OPTIONS entries. You can use either this job or the SMP/E administration dialog.

All sample SMP/E jobs shown in this program directory or supplied in relfiles assume that all data sets required for SMP/E processing are defined in DDDEFs in the appropriate zones. Refer to *z/OS SMP/E Commands* for information on which data sets are required for each SMP/E command and how to define them in DDDEFs. Sample jobs are supplied to define DDDEFs for many of the target and distribution data sets for this product.

```
//OPTIONS JOB <job parameters>
//STEP1   EXEC PGM=GIMSMP
//STEPLIB DD DSN=SYS1.MIGLIB,DISP=SHR,
//         UNIT=SYSALLDA,VOL=SER=v31vol1
//        DD DSN=ASM.SASMMOD1,DISP=SHR,
//         UNIT=SYSALLDA,VOL=SER=v31vol1
//SMPCSI DD DSN=zos31.global.csi,DISP=SHR
//SMPCNTL DD *
  SET BOUNDARY(GLOBAL) .
  UCLIN .
  ADD UTILITY(HEWLH096)
      NAME(HEWLH096)
      PARM(LET,NCAL,XREF)                  /* see note 1 */
      PRINT(SYSPRINT)                     /* see note 2 */
      RC(4) .
  ADD UTILITY(ASMA90)
      NAME(ASMA90)
      PARM(GOFF,LIST(133),DECK,NOOBJECT,OPTABLE(UNI))
                                     /* See note 10   */
      PRINT(ASMPRINT)                /* See note 11   */
      RC(0).                         /* See note 3    */
  ADD UTILITY(COPY)
     NAME(IEBCOPY)
     PARM(WORK=2M)                   /* see note 12 */
     PRINT(SYSPRINT)
     RC(0).
  ADD OPTIONS(ZOSOPT)                /* see note 4 */
      ASM(ASMA90)
      LKED(HEWLH096)
      COPY(COPY)                     /* see note 13 */
      DSSPACE(6200,1500,2600)
      RECZGRP(                       /* see note 5 */
         jes2dlb,
         ppdlib,
         cicsdlb,
         db2dlib,
         imsdlib)
      MSGFILTER(YES)                 /* see note 6 */
      MSGWIDTH(80)                   /* see note 7 */
      RETRYDDN(ALL)  .               /* see notes 8 and 9 */
  ENDUCL .
/*
```

Figure 25. Updating Entries in the Global Zone

Successful return code of this job is 0. If any of the above utilities or options already exist, then you will receive a return code of 4 which is acceptable.

Required Updates

1. Update the *job parameters*.
2. Update the v31vol1 with the volume serial number for the MIGLIB and SASMMOD1 libraries that are the targets of the Wave 0 installation. This will allow you to access the z/OS 3.1 level of the Wave 0 elements using the STEPLIB DD statements.
3. Replace the CSI name on the SMPCSI DD statement with your CSI name.

Notes:

1. IBM recommends LET,NCAL,XREF parameters for the Binder, although these are not default values. When you use the binder, use the defaults and do not specify the SIZE parameter.

   When the Program Management Binder stores a program object (PO) in a PDSE, the lowest program management (PM) format that will support the request is used by default. Earlier levels of the binder and program loader do not support new PM formats.

   The COMPAT option should be specified if you need to ensure that a program object can be loaded and executed on a specific lower level of the operating system or if you wish to explicitly request functionality that is available only in a later program object version than the default. The COMPAT option is specified as COMPAT=MIN (the default), or COMPAT=CURRENT or COMPAT=*xxx*, where *xxx* is the PM level corresponding to the lowest level system on which the program object can be loaded or the latest PO level. For information on valid values for the Compat option, see *z/OS MVS Program Management: User's Guide and Reference* and *z/OS MVS Program Management: Advanced Facilities*.
2. To exploit the multitasking capability of SMP/E, ensure the ddname that is to contain output from the link edit utility is defined in a DDDEF entry which points to a SYSOUT class. SMP/E's default ddname for utility output is SYSPRINT, but it can be changed using the PRINT subentry of the LKED UTILITY entry.
3. A return code of 0 is expected for all assemblies of z/OS 3.1 when the default parameters are used. If you modify the parameters, you may affect the maximum return code you receive for assemblies.
4. Do not specify PEMAX, but allow SMP/E to use its default value.
5. The improved RECEIVE processing of SMP/E prevents SMP/E from receiving a PTF if that PTF has already been accepted and purged from the global zone and SMPPTS data set. To do this, you need to tell SMP/E what zones to check when determining if a PTF has already been accepted.

   During RECEIVE processing, with all of the distribution zones specified in the RECEIVE Zone Group subentry, SMP/E will check each of the zones specified first before receiving a PTF. If that PTF is accepted in any of the specified zones, the PTF will not be received again. The zones may be specified in two ways:

   - The RECEIVE Zone Group (RECZGRP) and RECEIVE Exclude Zone Group (RECEXZGRP) subentries in an OPTIONS entry
   - Using the ZONEGROUP operand on the RECEIVE command.

The OPTIONS subentries allow you to set a policy and specify the list of zones once. This list is then used for all future RECEIVE processing whenever the OPTIONS entry is active.

6. MSGFILTER(YES) indicates the SMP/E messages written to SMPOUT should be filtered during APPLY, ACCEPT, and RESTORE processing. When SMP/E filters the messages, most non-critical informational messages are not written to SMPOUT. The result is less output to read through if you have to investigate an SMP/E operation. MSGFILTER(NO) is the default.
7. MSGWIDTH(80) will format SMP/E messages to an 80 character width. MSGWIDTH(120) is the default and will format the messages to a 120 character width.
8. You may specify RETRYDDN(ALL) to compress out-of-space libraries and to retry processing after an x37 abend. If you use this option, ensure that the DDDEFs for the target and distribution data sets that will be used for the installation of the product are not pointing to production data sets.
9. SMP/E compacts the SYSMOD (PTF) data within the SMPPTS data set to reduce its size. COMPACT(YES) is the default. If you do not want compaction, add COMPACT(NO) to the OPTIONS entry.
10. The ASMA90 DECK and NOOBJECT options must always be specified. For JES2 modules in FMID HJE77E0 to assemble correctly, options GOFF and LIST(133) are required.
11. Because the ASMA90 option LIST(133) is specified, you must complete either one of the following steps:
    - Specify a unique output file for the assembler using the print operand "PRINT(ASMPRINT))" and create a DDDEF in your target and DLIB zones for ASMPRINT specifying SYSOUT; for example

      ```
      ADD DDDEF(ASMPRINT) SYSOUT(*).
      ```

    - Or, add the following JCL DD card to the APPLY jobs:

      ```
      //SYSPRINT DD SYSOUT=*,LRECL=133,RECFM=FBA
      ```

12. In the global zone options, the utility entry for IEBCOPY must have the parameter WORK=2M specified. If the parameter is not specified, the SMP/E RECEIVE step will fail for some z/OS 3.1 FMIDs.
13. COPY(COPY) indicates that SMP/E will use the utility IEBCOPY.

For more information on SMP/E customization, see *z/OS SMP/E Reference*.

8.0 Installation Instructions for Wave 1 and Wave 2 FMIDs

This chapter describes how to install the Wave 1 and Wave 2 elements in z/OS 3.1, including the elements which are installed into the file system.

In z/OS 3.1, the CBPDO driving system requirements are as follows:

- For the Wave 1 and Wave 2 elements installation, the driving system must be z/OS V2R3 or later, with z/OS UNIX active in full function mode.
- For the Wave 1 and Wave 2 elements installation, the BCP Program Management Binder, SMP/E, and the High Level Assembler from Wave 0 must be available on the driving system.
- For the Wave 1 and Wave 2 elements installation, a Java Runtime Environment using IBM 31-bit SDK for z/OS Java Technology Edition V8.0 or higher (5655-DGG), or IBM 64-bit SDK for z/OS Java Technology Edition V8.0 or higher (5655-DGH) must be available on the driving system.
- You must install z/OS 3.1 into zFS file systems, so make sure that zFS is configured and active on the driving system.

This release of z/OS 3.1 is installed using the SMP/E RECEIVE, APPLY, and ACCEPT commands. For details on SMP/E, refer to the appropriate SMP/E books.

Notes:

1. To complete the tasks in Wave 1, the following is required:
   a. UID(0) or READ access to the BPX.SUPERUSER resource in the FACILITY class
   b. READ access to the BPX.FILEATTR.APF, BPX.FILEATTR.PROGCTL, and BPX.FILEATTR.SHARELIB resources in the FACILITY class (for example by giving READ access to the BPX.FILEATTR.* generic profile in the FACILITY class).
   c. The following user ID and group IDs need to be defined in your security database:

      Group IDs: uucpg, TTY

      User IDs: uucp
2. This chapter uses sample JCL to illustrate installation steps. You can copy these examples or use the SMP/E dialogs to generate the JCL and SMP/E control statements needed to complete the installation.

Figure 26 lists the required steps to install the Wave 1 and Wave 2 FMIDs. Instructions for each step are provided on the indicated sections.

Figure 26 (Page 1 of 5). Checklist for Wave 1 and Wave 2 Installation

Check Box	Activity	Section, Step Description	Your Notes
□	Prepare	8.1, “Step 1: Prepare to install Wave 1” on page 71	

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Figure 26 (Page 2 of 5). Checklist for Wave 1 and Wave 2 Installation

Check Box	Activity	Section, Step Description	Your Notes
		8.1.1, “Set up User and Group IDs Required for Installation” on page 72	
		8.1.3, “Driving system with an active root file system” on page 77	
		8.1.4, “Rename user-defined security label beginning with 'SYS' if it exists” on page 78	
□	Receive the rest of the CBPDO	8.1.5, “RECEIVE the rest of the CBPDO” on page 78	
□	Run Required and Optional Delete Jobs	8.1.6, “Run required and optional Delete Jobs” on page 79	
□	Allocate Libraries	8.1.7, “Allocate target and distribution libraries for Wave 1 elements” on page 83	
□	Create file system directories	8.1.8, “Create file system directories for Wave 1” on page 88	
□	Define DDDEFs	8.1.9, “Define DDDEFs for Wave 1 Elements” on page 92	
□		8.1.10.1, “Migration actions” on page 96	
□	APPLY	8.2, “Step 2: APPLY Wave 1” on page 97	
□	FMIDs to Install	8.2.1, “Select which z/OS Wave 1 FMIDs to install” on page 97	
□	Apply Check Wave 1	8.2.2, “Do an SMP/E APPLY CHECK for Wave 1 FMIDs and service” on page 97	
□	Apply Wave 1	8.2.2.9, “Do an SMP/E APPLY for Wave 1 FMIDs and Service” on page 102	
□	Prepare	8.3.1, “ Prepare to install Wave 2” on page 114	
□	Run the Optional Delete Jobs	8.3.2, “Run the Optional Delete Jobs for Wave 2” on page 115	
□	Allocate Libraries	8.3.3, “Allocate Target and Distribution Libraries for Wave 2 Elements” on page 116	
□	Set up File System Directories	8.3.4, “Set up File System Directories for Wave 2” on page 117	
□	Define DDDEFs	8.3.5, “Define DDDEFs for Wave 2 Elements” on page 117	

Figure 26 (Page 3 of 5). Checklist for Wave 1 and Wave 2 Installation

Check Box	Activity	Section, Step Description	Your Notes
□		8.3.6, “Set High Level Assembler Option for JES2” on page 118	
□	Apply Check Wave 2	8.3.7.1, “Do an SMP/E APPLY CHECK for Wave 2” on page 118	
□	Apply Wave 2	8.3.7.2, “Do an SMP/E APPLY for Wave 2” on page 120	
□	Post-APPLY	8.4, “Step 4: Do Post-APPLY work for Wave 1 and Wave 2” on page 122	
	CNLDEFCL CNLCOMP	8.4.1.1, “Compile MMS Data Sets” on page 123	
	EZAIMSCZ	8.4.1.2, “Run Post-APPLY for Communications Server IP Services” on page 123	
	EPW12011	8.4.3.1, “Run Post-APPLY Link-Edit for FFST” on page 124	
	ICQPOST1 ICQPOST2	8.4.3.2, “Run Post-APPLY for TSO/E Information Center Facility (when appropriate)” on page 124	
	IKYCVSAM	8.4.4.1, “Run Cryptographic Services PKI Services job” on page 125	
	CLNCRSZ	8.4.9.1, “Run SMP/E REPORT CROSSZONE (Target Zone)” on page 126	
□	Customize	8.5, “Step 5: Customize Wave 1 and Wave 2” on page 126	
	DFSMSdss Actions	8.5.1.2, “Complete DFSMSdss actions” on page 126	
	IPL Text	8.5.1.3, “Write new IPL TEXT” on page 127	
	IODF	8.5.1.4, “Create and update your IODF” on page 128	
	PARMLIB	8.5.2, “PARMLIB member considerations” on page 128	
	PROCLIB	8.5.3, “PROCLIB member considerations” on page 145	
	ISPF Setup	8.5.4, “z/OS 3.1 ISPF setup considerations” on page 149	
	Element Customize	8.5.5, “Element customization” on page 155	
		8.5.5.1, “RACF security considerations” on page 156	
		8.5.5.2, “z/OS UNIX System Services customization considerations” on page 156	

Figure 26 (Page 4 of 5). Checklist for Wave 1 and Wave 2 Installation

Check Box	Activity	Section, Step Description	Your Notes
		8.5.5.3, “Customization considerations for Wave 1A” on page 157	
		8.5.5.4, “Customization considerations for Wave 1B” on page 166	
		8.5.5.5, “Customization considerations for Wave 1C” on page 168	
		8.5.5.6, “Customization considerations for Wave 1D” on page 170	
		8.5.5.7, “Customization considerations for Wave 1E” on page 172	
		8.5.5.8, “Customization considerations for Wave 1F” on page 173	
		8.5.5.9, “Customization considerations for Wave 1G” on page 177	
		8.5.5.10, “ Customization for Wave 2” on page 182	
□	Verify Installation	8.6, “Step 6: Verify installation of Wave 0, Wave 1 and Wave 2” on page 183	
	IPL	8.6.1, “IPL the z/OS system” on page 183	
	IVPs	8.6.2, “Verify installation of z/OS 3.1 Wave 0, Wave 1 and Wave 2 FMIDs” on page 186	
		8.6.2.1, “IVP jobs for Wave 0” on page 188	
		8.6.3, “IVP jobs for Wave 1A” on page 191	
		8.6.4, “IVP jobs for Wave 1B” on page 195	
		8.6.5, “IVP jobs for Wave 1C” on page 211	
		8.6.6, “IVP jobs for Wave 1D” on page 219	
		8.6.7, “IVP jobs for Wave 1E” on page 219	
		8.6.8, “IVP jobs for Wave 1F” on page 221	
		8.6.9, “IVP jobs for Wave 1G” on page 227	
		8.6.10.1, “Run the installation verification procedure for SDSF” on page 232	
□	ACCEPT	8.7, “Step 7: ACCEPT Wave 0, Wave 1 and Wave 2” on page 232	
		8.7.2, “Do an SMP/E ACCEPT CHECK for Wave 0 and Wave 1 FMIDs and Service” on page 233	

Figure 26 (Page 5 of 5). Checklist for Wave 1 and Wave 2 Installation

Check Box	Activity	Section, Step Description	Your Notes
		8.7.3, “Do an SMP/E ACCEPT for Wave 0 and Wave 1 FMIDs and service” on page 237	
		8.7.4, “Do an SMP/E ACCEPT CHECK for Wave 2” on page 242	
		8.7.5, “Do an SMP/E ACCEPT for Wave 2” on page 244	
□	CLEAN UP	8.8, “Step 8: Clean up after Wave 1 and Wave 2” on page 245	

8.1 Step 1: Prepare to install Wave 1

This step describes the preparation work required before doing the APPLY. All examples follow the recommended installation sequence of installing the first wave ripples, comprised of the z/OS 3.1 FMIDs that are installed into the file system, as well as the z/OS 3.1 FMIDs that are not installed into the file system. Service for all other FMIDs that were installed will be upgraded in the same APPLY step using SOURCEID names.

Required Planning Tasks Checklist

__ Before installing z/OS 3.1 Wave 1 FMIDs, complete the following planning tasks for choosing the software installation method; these are described in *z/OS Planning for Installation*:

- Using CBPDO
- Preparing the driving system for CBPDO
- Preparing the target system

__ Clone your system, as described in 6.1, “Overview for the Clone of Your System” on page 31.

__ Check the PSP buckets, as described in 3.2, “Preventive Service Planning (PSP)” on page 15.

__ To install Wave 1, the OMVS address space **must be active in full function mode** on the driving system. For driving system first wave requirements, see *z/OS Planning for Installation*.

__ To install Wave 1, you must install from a user ID that has a UID of 0 or has read access to the BPX.SUPERUSER resource in the RACF FACILITY class. This user ID must have a home directory of ('/'), a program name of (`'/bin/sh'`), and needs read access to FACILITY class resources BPX.FILEATTR.APF, BPX.FILEATTR.PROGCTL, and BPX.FILEATTR.SHARELIB (or BPX.FILEATTR.* if you choose to use a generic profile for these resources).

In addition, the installation of this product requires that certain user and group IDs be defined in your security database. They are Group IDs: TTY and UUCPG and user ID: UUCP. For details, see 8.1.1, “Set up User and Group IDs Required for Installation” on page 72 and the following:

- *z/OS UNIX System Services Planning*
- *z/OS Security Server RACF Security Administrator's Guide*
- *z/OS Security Server RACF Command Language Reference*

__ Ensure that your system meets the requirements for hardware, software, and coexistence considerations described in *z/OS Planning for Installation*.

__ Install the required driving system software listed in *z/OS Planning for Installation*. If you do not have a system that meets these requirements, do one of the following:

- Consider using a ServerPac.
- Upgrade your existing system.
- Obtain a Customized Offerings Driver (5751-COD).

8.1.1 Set up User and Group IDs Required for Installation

To install Wave 1, you must install from a user ID that equals 0 or has read access to the BPX.SUPERUSER resource in the RACF facility class. This user ID must have a home directory of ('/'), a program name of ("'/bin/sh'"), and needs read access to facility class resources BPX.FILEATTR.APF, BPX.FILEATTR.SHARELIB, and BPX.FILEATTR.PROGCTL (or BPX.FILEATTR.* if you choose to use a generic name for these resources).

In addition, the installation of this product also requires that certain user ID and group IDs be defined in your security database. They are:

Group IDs: UUCPG, TTY

User IDs: UUCP

Note that these user and group IDs were first introduced as part of product customization in OS/390 release 4. **As of z/OS V1R4, they are required for the installation of the product.**

We highly recommend that you define them as uppercase IDs for ease of use and manageability.

On most UNIX systems, you use lowercase IDs. With z/OS UNIX, typically, you use uppercase user IDs and group names in your security database. However, if these names conflict with your current naming conventions in your security database at your installation, you can use lowercase, mixed case or alternate names by creating and activating a User ID alias table. This table will associate alias names with uppercase z/OS user ID and group names. Use of this table does degrade performance slightly. The more names that you define, the greater the performance degradation. Hence, installations are encouraged to continue using uppercase-only user IDs and group names in their security databases.

The GID and UID values assigned to these IDs cannot be used by any other ID. They must be unique.

Assigning the same GID to multiple groups is not recommended. If you assign the same GID to multiple groups, control at an individual group level is lost, because the GID is used in z/OS UNIX security checks. RACF groups that have the same GID assignment are treated as a single group during the z/OS UNIX security checks, thus allowing the sharing of resources between groups possibly unintentionally.

Likewise, assigning the same UID to multiple user IDs is also not recommended. The sharing of UIDs allows each user access to all of the resources associated with the other users of that shared UID. The shared access includes not only z/OS UNIX resources such as files, but also includes the possibility that one user could access z/OS resources of the other user that are normally considered to be outside the scope of z/OS UNIX.

The required user ID and group names must then be duplicated in all of your security databases including the same UID and GID values in the OMVS segment.

This will ease the transporting of file system data sets from test systems to production systems. For example, the group name 'TTY' on System 1 **must** have the same GID value on System 2 and System 3.

The following sections describe how to define these IDs to RACF. (If you are using an equivalent security product, refer to that product's documentation.) All the RACF commands are issued by a TSO/E user ID with RACF SPECIAL authority. Three procedures are described:

- If you use uppercase group and user IDs
- If you use mixed-case group and user IDs
- If you have problems using names UUCP, UUCPG and TTY

If you use uppercase group and user IDs:

RACF users can use the sample BPXISEC1 in SAMPLIB or the following commands.

1. Define the TTY group, where 2 is an example of a unique group ID on your system.

   ```
   ADDGROUP TTY OMVS(GID(2))
   ```

   Do not connect users to this group. This is the same group that is specified on the TTYGROUP statement in the BPXPRMxx PARMLIB member on your target system.

2. Define the UUCPG group, where 8765 is an example of a unique group ID on your system.

   ```
   ADDGROUP UUCPG OMVS(GID(8765))
   ```

3. Define the UUCP user ID, where 123456 is an example of a unique account number and 396 is an example of a unique z/OS UNIX UID; do not use UID(0).

   ```
   ADDUSER UUCP DFLTGRP(UUCPG) PASSWORD(xxxxxxx)
   TSO(ACCTNUM(123456) PROC(TSOPROC) SIZE(5000)) OMVS(UID(396)
   HOME('/usr/spool/UUCPpublic') PROGRAM('/bin/sh'))
   ```

Again, note that your security database images MUST be synchronized. This means that the user ID and group names need to have the same unique UID and GID values on all of your driving, test, and production system images.

If synchronizing your databases is not possible for these entries at this time, you will need to continue to run the FOMISCHO job against each of your systems after the installation of this product. However, this is not the recommended method and should be avoided.

If you use mixed-case group and user IDs:

If you need to use mixed-case or lowercase group and user names on your system and the groups (UUCPG, TTY) and user (UUCP) do not conflict with existing names, you can follow the steps for uppercase IDs listed previously.

It is not necessary to add the lowercase or mixed-case names to your alias table, mapping them to uppercase. Using the alias table impacts performance and increases systems management and complexity. When lowercase or mixed-case names are not found in the alias table, or there is no table active, they are folded to uppercase.

If you have problems using names UUCP, UUCPG and TTY:

If names such as UUCP, UUCPG, and TTY are not allowed on your system (or if they conflict with existing names), the following are the RACF commands to define the group and user IDs:

1. To define a group ID instead of 'TTY' group, issue the following command, where 2 is an example of a unique group ID on your system, and XXTTY is replaced by a 1-to 8-character group ID of your choice.

   ```
   ADDGROUP XXTTY OMVS(GID(2))
   ```

Do not connect users to this group. This would be the same group name to be specified in the TTYGROUP statement in the BPXPRMxx PARMLIB member on your target system.

2. To define a group, instead of 'UUCPG' group, issue the following, where `8765` is an example of a unique group ID on your system, and `XXUUCPG` is replaced by a 1-to 8-character group name of your choice.

   ```
   ADDGROUP XXUUCPG OMVS(GID(8765))
   ```

3. To define a UUCP user ID, issue the following, where `396` is an example of a unique z/OS UNIX UID (do not use an UID of 0) and `XXUUCP` is replaced by a user ID of your choice.

   ```
   ADDUSER XXUUCP DFLTGRP(XXUUCPG) PASSWORD(xxxxxxx)
   TSO(ACCTNUM(123456) PROC(TSOPROC) SIZE(5000)) OMVS(UID(396)
   HOME'/usr/spool/UUCPpublic')PROGRAM('/bin/sh'))
   ```

   This is a normal user ID that owns all the UUCP files and directories. You should use this user ID when editing configuration files or performing other administrative tasks.

4. Set up a User ID alias table.

   Note that using the alias table causes poorer performance and increases systems management costs and complexity.

   If you do not have a user ID alias table defined, you will need to create one. This must be done first on your driving system and then on any system image using this product. The recommended pathname of the user ID alias table is /etc/tablename. This fits in with the IBM strategy to place all customized data in the /etc directory. This table is specified by the USERIDALIASTABLE keyword in the BPXPRMxx PARMLIB member.

   The user ID name alias table must be protected from update by non-privileged users; therefore, only users with superuser authority should be given update access to it. All users should be given read access to the file.

   Your user ID alias table will need to contain your MVS chosen names and the associated required names.

   In the User ID alias table, your chosen MVS user ID and group names must be located in columns 1-8 and the associated aliases must be located on the same line in columns 10-17.

   - groups
     XXTTY TTY
     XXUUCPG UUCPG
   - user IDs
     XXUUCP UUCP

5. Activate the user ID alias table.

   If you are already using the user ID alias table, new database queries will yield the new alias if the user ID performing the query has read/execute access to the userid/group name alias table. The table is checked every 15 minutes and refreshed if it has been changed. If a change needs to be activated sooner, you can use the SETOMVS or SET OMVS command.

If you are not already using the user ID alias table, you can use the SET OMVS operator command to activate it now (/etc/tablename is the name of your user ID alias table).

```
SET OMVS USERIDALIASTABLE=/etc/tablename
```

You can also use the SETOMVS operator command. See *z/OS MVS System Commands* for a complete description of the SET OMVS and SETOMVS commands.

6. Update your BPXPRMxx PARMLIB member specifying the USERIDALIASTABLE to make this change permanent for your next IPL.
7. Perform these tasks on all of your driving, test, and production system images.

Again, note that these required user ID and group names should be synchronized in all of your security databases including the same UID and GID values in the OMVS segment. This will certainly ease the transporting of file system data sets from test systems to production systems.

If synchronizing your databases is not possible for these entries at this time, you will need to continue to run the FOMISCHO job against each of your systems after the installation of this product. However, this is not the recommended method and should be avoided.

For more details, see the following:

- *z/OS UNIX System Services Planning*.
- *z/OS MVS System Commands*.
- *z/OS Security Server RACF Security Administrator's Guide*.
- *z/OS Security Server RACF Command Language Reference*.

8.1.2 Root file system size changes in z/OS 3.1

Refer to 5.4.1, “Total DASD Storage Requirements” on page 28 for the total space required for the root file system. You can also refer to the sample BPXISZFS for space required in the ZFS root. The sample jobs will reside in 'prefix.HBB77E0.F6' after the SMP/E RECEIVE step is complete. The 'prefix' is the high-level qualifier specified as the DSPREFIX value in the SMPTLIB DDDEF or the OPTIONS entry of the global zone.

It is recommended that the z/OS Container Extensions element be installed in a separate file system due to the space requirements. For information on the space required for the file system for this element, refer to 5.4.1, “Total DASD Storage Requirements” on page 28.

If you plan to install z/OS Font Collection element in a separate file system, refer to the sample job FNTZFSAL provided in FMID HFNT140 for the space requirements. If you plan to install z/OS Font Collection in the root file system, you must increase the space specified for the root file system in the BPXISZFS job to allow for the installation of z/OS Font Collection in the root file system.

8.1.3 Driving system with an active root file system

TO INSTALL WAVE 1, YOU MUST HAVE OMVS ACTIVE IN FULL FUNCTION MODE on your driving system (have a root file system) and complete the following activities:

1. Update the target system's BPXPRMxx PARMLIB member with the following statements:

   ```
   ROOT   FILESYSTEM('root_FS_data_set')
          TYPE(xxx)  MODE(RDWR)

   MOUNT  FILESYSTEM('etc_FS_data_set')
          MOUNTPOINT('/etc')
          TYPE(xxx)  MODE(RDWR)
   ```

   Update 'root_FS_data_set' and 'etc_FS_data_set' with the names of your root file system and /etc file system in which you will install z/OS 3.1. When you install z/OS 3.1 in a root zFS data set and zFS data set mounted at the /etc directory, specify TYPE(ZFS) on the root and mount statements shown above.

   Update the BPXPRMxx PARMLIB member to add a mount statement for the separate file system in which z/OS Container Extensions element is planned to be installed.

   The z/OS Font Collection element may be installed in the root file system or installed in a separate file system mounted at the appropriate mountpoint. If you plan to install the z/OS Font Collection, you may decide to allocate a separate file system for z/OS Font Collection due to the amount of space required in the file system. If you plan to install z/OS Font Collection in a separate file system, ensure that the BPXPRMxx PARMLIB member is updated to add a mount statement for the file system in which z/OS Font Collection is being installed.

   As of z/OS V2R2, there were 4 new elements added to the product. They are IBM HTTP Server - Powered by Apache, Future Function, OpenSSH for z/OS, and IBM z/OS Management Facility. These elements are installed into the root file system.

2. Ensure that the size of the root file system meets the DASD storage requirements prior to installing the Wave 1 elements. Refer to 5.4.1, “Total DASD Storage Requirements” on page 28 for the total space required for the root file system.

   When installing the z/OS Container Extensions element in a separate file system, ensure that the file system for z/OS Container Extensions is allocated and mounted at the appropriate required mountpoint on the driving system before installing the element in Wave 1G.

   If you plan to install the z/OS Font Collection element in a separate file system, not the root file system, ensure that the separate file system has been allocated and mounted at the appropriate required mountpoint on the driving system before installing z/OS Font Collection in Wave 1G.

3. It is recommended that element IBM z/OS Liberty Embedded be installed in a separate file system due to the space requirements. If you install IBM z/OS Liberty Embedded in a separate file system, you must allocate and mount the separate file system at the recommended mountpoint on the driving system before installing the element in Wave 1G. Refer to sample job BBLZFS provided in FMID HWLPEM0 for the recommended size of the file system required to install FMID HWLPEM0 and future service, and the recommended mountpoint. Ensure that the BPXPRMxx PARMLIB member is

updated to add a mount statement for the file system in which IBM z/OS Liberty Embedded is being installed.

4. If you have /etc and /var as symbolic links, run BPXISETD to convert the /etc and /var symbolic links to directories (see 8.6.1.2, “BPXISETS and BPXISETD” on page 184). Ensure your target system's /etc file system data set is mounted to the driving system. You may choose to have /var mounted on your driving system.
5. Install and customize the z/OS 3.1 Wave 1 and Wave 2 elements.
6. Run BPXISETS to convert the /etc and /var directories to a symbolic link (see 8.6.1.2, “BPXISETS and BPXISETD” on page 184).
7. IPL the target system using the BPXPRMxx parmlib tailored in step 1. z/OS UNIX will come up automatically with the Wave 1 root file system and /etc file system. When you install z/OS 3.1 into zFS file systems, ensure you have activated zFS on the target system before you IPL with the zFS file systems. For information on zFS considerations, see *z/OS File System Administration*.
8. Run the Wave 1 and Wave 2 IVPs.

8.1.4 Rename user-defined security label beginning with 'SYS' if it exists

Do not have any user-defined security labels that begin with 'SYS'. If you do, you must first rename it and then update every profile that uses this security label to specify the new user defined security label name.

Note: SYSHIGH, SYSLOW, SYSNONE, and SYSMULTI are special RACF-generated security labels that are not to be renamed.

8.1.4.1 z/OS File System installation considerations

1. z/OS File System (zFS) Support

   zFS is a z/OS UNIX file system that can be used in other file system types. zFS file systems can be mounted for local access by z/OS UNIX applications. More information about zFS support can be found in *z/OS File System Administration*.

The z/OS File System requires a z/OS UNIX environment. A security facility, such as RACF, is also required.

8.1.5 RECEIVE the rest of the CBPDO

RECEIVE FMIDs and service for the z/OS 3.1 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 z/OS 3.1 FMID. (Cumulative service is included in CBPDO orders, so there is no separate cumulative service tape.) As a result, maintenance may be delivered that is already APPLYed and ACCEPTed. If you did not add the ZOSOPT option, as shown in Figure 25 on page 63, a mass RECEIVE will re-RECEIVE this service and will require a large SMPPTS

data set. You must actually USE the option in order to avoid re-RECEIVING the service. In addition, the OS/390 R5 or later level of SMP/E will compact the data within the SMPPTS during RECEIVE processing, thus saving space.

8.1.6 Run required and optional Delete Jobs

Special Notes for All Delete Jobs

IBM requires running the delete jobs according to the ripple order, not deleting all changing elements at once. For example, if you are installing Wave 1A, delete only the Wave 1A elements and continue with the APPLY of these elements. Once the Wave 1A installation is complete continue with the installation of the Wave 1B elements. For the ripple order, see 6.5.3, “Elements in each Wave, Ripple, and FMIDSET” on page 35. **Failure to follow these install procedures will result in APPLY errors in Waves 1A and 1B (BCP and DFSMS elements).**

Note: The following sections describing the delete jobs are in alphabetical order, **NOT** ripple order.

If elements are withdrawn and there are no superseding functions, normal SMP/E APPLY/ACCEPT processing will not delete the obsolete elements. In this case, you must run a delete job to remove them. A sample job, CLNOS390, is provided in FMID HBB77E0 to delete the withdrawn elements from z/OS; see 8.1.6.1, “Run the required Delete Job to remove obsolete elements” for more information.

Normal SMP/E APPLY/ACCEPT processing of SMP/E base functions, such as BCP, deletes the previous releases (if the optional "dummy" function delete was not performed). However, there are times when running the optional delete job is recommended. Run the optional delete job in order to:

- Decrease the installation running time for some elements.
- Decrease the amount of storage required by SMP/E for APPLY and ACCEPT processing. If your install fails for storage reasons, and you have not run the optional delete job for the elements in the wave or ripples, you should run the optional delete job to reduce SMP/E's storage requirements.
- Delete the prior levels of an element if the current FMID does not delete them during the installation.
- Simplify the installation if the new FMID requires a library restructure. Refer to *z/OS Upgrade Workflow* for further information on library restructuring.

8.1.6.1 Run the required Delete Job to remove obsolete elements

Sample JCL and instructions are provided in member CLNOS390 of SMPTLIB, 'prefix.HBB77E0.F6' to remove the withdrawn elements that are not part of z/OS 3.1.

Note: Figure 27 shows withdrawn elements in z/OS 3.1. If you are migrating from z/OS V2R4, or z/OS V2R5, you must run CLNOS390 job to remove the obsolete elements. See *z/OS Upgrade Workflow* for the complete list of obsolete libraries, DDDEFs and paths.

Figure 27 (Page 1 of 2). Withdrawn Elements from z/OS

Element Name	Withdrawn In
BDT HBD6602	z/OS 3.1
BDT File-to-File JBD6201	z/OS 3.1
BDT SNA NJE JBD6202	z/OS 3.1
BookManager Read and NLS HBKM300 JBKM310 (English) JBKM311 (Dutch) JBKM312 (French) JBKM313 (German) JBKM314 (Spanish) JBKM315 (Italian) JBKM316 (Brazilian Portuguese) JBKM317 (Canadian French) JBKM318 (Danish)	z/OS V2R4
Cryptographic Services Open Cryptographic Services Facility Base HCRY740	z/OS V2R5
DFS/SMB H0H2410 J0H241J	z/OS V2R4
GDDM NLS JGD3220 (Brazilian Portuguese) JGD3221 (Simplified Chinese) JGD3222 (Danish) JGD3223 (French) JGD3224 (German) JGD3225 (Korean) JGD3226 (Italian) JGD3228 (Norwegian) JGD3229 (Canadian French) JGD3230 (Spanish) JGD3231 (Traditional Chinese) JGD3232 (Swedish)	z/OS V2R4
Integrated Security Services Enterprise Identity Mapping HIT7750	z/OS V2R5
Integrated Security Services OCEP HRO7740	z/OS V2R5
ISPF NLS JIF7R11 (Swiss German) JIF7R15 (German)	z/OS V2R4

Figure 27 (Page 2 of 2). Withdrawn Elements from z/OS

Element Name	Withdrawn In
JES3 HJS77D0	z/OS 3.1
HKCZ120	z/OS 3.1
Library Server HBKQ400	z/OS V2R4
OSA/SF H0GI400	z/OS V2R4
SMP/E - Planning/Migration Assistant (PMA) HBCNC00 HBCND0B JBCND1B	z/OS V2R4
z/OS Security Level 3 OCSF JCRY741	z/OS V2R5

To run the job, perform the following functions:

- Copy the sample job from member CLNOS390 of the SMPTLIB, 'prefix.HBB77E0.F6'. The SMPTLIB is created during RECEIVE processing. Its high-level qualifier (prefix) is the value specified as the DSPREFIX in the SMPTLIB DDDEF or the OPTIONS entry of the global zone.
- Run the sample job after modifying it to meet your system's requirements.
- During the RECEIVE of DELZOS1 and DELZOS2, you will receive the message `GIM39701W SYSMOD DELZOS1n HAS NO ELEMENTS.`, where n (1 and/or 2) is the dummy function delete sysmods. This is acceptable.

After completing the dummy function delete and installing z/OS 3.1, you must do the following:

- Remove the unused DDDEFs from the CSI.
- Remove the unused (empty) data sets.
- Remove the obsolete paths from the file system.

There are seven sample jobs provided to perform the above tasks. Copy these jobs from SMPTLIB, 'prefix.HBB77E0.F6', and update the jobs as required for your installation before running the jobs. See the sample jobs for instructions.

- CLNBKMGR is the cleanup job for BookManager READ base and NLS FMIDs.
- CLNBDT is the cleanup job for Bulk Data Transfer (BDT) including File-to-File and SNA NJE FMIDs.
- CLNCRSRV is the cleanup job for Cryptographic Services - OCSF.
- CLNISEIM is the cleanup job for Integrated Security Services - EIM.
- CLNJES3 is the cleanup job for JES3(Job Entry Subsystem 3).
- CLNHKCZ is the cleanup job for HKCZ120.
- CLNLBSRV is the cleanup job for Library Server.
- CLNOSASF is the cleanup job for OSA/SF.

For GDDM NLS, there are no obsolete data sets to remove because the NLS FMIDs shared libraries and DDDEFs with the base and English FMIDs.

For Integrated Security Services OCEP, there are no obsolete data sets or paths to remove because it installs into the same libraries, paths and DDDEFs that are used by Cryptographic Services OCSF and removed by the new CLNCRSRV sample job.

See *z/OS Upgrade Workflow* for more information on the obsolete data sets and the paths.

8.1.6.2 Run the optional Delete Job for BCP before Wave 1A

Sample JCL that can be used to delete BCP functions is provided in member CLNDELFN of the SMPTLIB, 'prefix.HBB77E0.F6'. This sample JCL contains a dummy function, DM1FMID, that can be used to delete functions replaced by the z/OS 3.1 level of BCP. This will delete prior levels of the BCP (including National Language features), as well as the z/OS UNIX Kernel. During SMP/E processing, the functions deleted by DM1FMID (and all dependent functions) are removed from the target and distribution zones.

The sample job does not include previous versions of all exclusive z/OS 3.1 elements. Previous versions of exclusive z/OS elements are deleted when their z/OS levels are applied.

To run the job:

1. Copy the delete job from member CLNDELFN of the SMPTLIB, 'prefix.HBB77E0.F6'. The SMPTLIB is created during RECEIVE processing. Its high-level qualifier (prefix) is the value specified as the DSPREFIX in the SMPTLIB DDDEF or the OPTIONS entry of the global zone.
2. Run the sample job after modifying it to meet your system's requirements. The REDO option is specified in the sample job in case you have run a version of this job to delete a prior level of BCP.
3. During the RECEIVE of DM1FMID, you will receive the message “GIM39701W SYSMOD DM1FMID HAS NO ELEMENTS.” This is acceptable.
4. During the APPLY of DM1FMID, you will receive these messages from SMP/E and the binder:

   GIM23903 GIM50601 IEW2400I IEW2648E IEW2677S IEW2230S
   IEW2454W IEW2470E IEW2650I

These messages are expected when applying this dummy function, which leaves modules in a non-executable condition. These messages can be ignored because APPLYing the BCP function will rebuild the modules properly.

Successful processing of DM1FMID returns a condition code of 4.

8.1.6.3 Run the optional Delete Job for DFSMS after Wave 1A but before Wave 1B

Sample JCL that can be used to delete DFSMS functions is provided in member DFPCLNUP of the SMPTLIB, 'prefix.HDZ3310.F1'. This sample JCL contains a dummy function, DEL4SMS, that can be used to delete functions replaced by the current level of DFSMS. This will delete prior levels of the DFSMS (including National Language features). During SMP/E processing, the functions deleted by DEL4SMS (and all dependent functions) are removed from the target and distribution zones. Note that if you plan to run the sample job to delete DFSMS, ensure that the job is run after Wave 1A. Otherwise, errors will occur during Wave 1A APPLY processing because BCP and DFSMS elements share some load modules.

To run the job:

1. Copy the delete job from member DFPCLNUP of the SMPTLIB, 'prefix.HDZ3310.F1'. The SMPTLIB is created during RECEIVE processing. Its high-level qualifier (prefix) is the value specified as the DSPREFIX in the SMPTLIB DDDEF or the OPTIONS entry of the global zone.
2. Run the sample job after modifying it to meet your system's requirements.
3. During the RECEIVE of DEL4SMS, you will receive the message `GIM39701W SYSMOD DEL4SMS HAS NO ELEMENTS`. This is acceptable.

Successful processing of DEL4SMS returns a condition code of 4.

8.1.6.4 Run the optional Delete Job for other elements

Before installing FMIDs associated with a ripple, you might consider dummy function deleting prior levels of elements to decrease installation runtime. You can create a dummy function delete job that is modeled after Figure 18 on page 51 to delete other elements. For example, if you are renaming any libraries without changing the DDDEF name, you should perform the optional delete job.

8.1.7 Allocate target and distribution libraries for Wave 1 elements

Since it is expected that you are installing on a clone of your system, as stated in 6.1, “Overview for the Clone of Your System” on page 31, many data sets should already exist. Verify your target and distribution libraries contain enough space as described in Appendix C, “DASD Storage Requirements Tables” on page 275. If needed, sample jobs to allocate the target and distribution libraries for some elements have been provided.

You can access the sample installation jobs by performing an SMP/E RECEIVE and then copying the jobs from the relfiles to a work data set for editing and submission. See Figure 28 on page 84 Wave 1 Allocate Sample Installation Jobs to find the appropriate relfile data sets.

Copy the sample jobs to a work data set and customize them.

The samples specify the storage requirements using average block lengths. BLKSIZE=0 indicates that system-determined block sizes are being used. For example, the sizes might look like this:

```
SPACE=(8800,(135,27,6)),
DCB=(RECFM=FB,LRECL=80,BLKSIZE=0).
```

Do not confuse the SPACE=8800 (average block length) parameter with the BLKSIZE=0 (block size) parameter. If you would like to change the block size to something other than the system-determined block size, you can change the BLKSIZE parameter. Do not change the SPACE parameter. You can use the storage allocations as they are, or convert them to cylinder or track allocations.

If these elements have been installed previously, the JCL for the jobs needs to be modified to remove or comment out the DD statements for the pre-existing libraries, or the job will fail. See Appendix C, “DASD Storage Requirements Tables” on page 275 for information on new libraries introduced in this release.

For specific instructions to customize, see the comments in the sample jobs. See *z/OS MVS JCL Reference* for more information on modifying JCL.

Run these jobs after the elements have been RECEIVEd.

After the jobs are submitted, you should get a condition code of 0. Check the allocation/deallocation messages to be certain the data sets were allocated and cataloged properly.

Figure 28 lists the locations of the sample jobs. Be sure to read all of the notes following the table before running the sample jobs. The notes shown in the table are applicable to the elements shown in the rows above each note to clarify it. The table is in alphabetical order based on the **Description** column. The following fields are represented in this table:

Job Name It contains the name of the sample job to be run.
Job Type This field indicates the type of job that is to be run.
Description It contains the element name for which the job is to be run.
RELFILE This field identifies the location of the sample job.

Figure 28 (Page 1 of 3). Wave 1 Allocate Sample Installation Jobs

Job Name	Job Type	Description	RELFILE
EAGKALC	ALLOCATE	Alternate Library for REXX	'prefix.HWJ9143.F1'
BPXISALC	ALLOCATE	BCP (Selected BCP component libraries only)	'prefix.HBB77E0.F6'
Note: See note 4 on page 87.			
BPNPALC	ALLOCATE	z/OS Authorized Code Scanner JPN	'prefix.JAL47DJ.F2'
CUNJUALC	ALLOCATE	BCP Base-Support for Unicode	'prefix.HUN77E0.F1'
CTVJALL	ALLOCATE	C/C++ Host Performance Analyzer	'prefix.H24P111.F1'

Figure 28 (Page 2 of 3). Wave 1 Allocate Sample Installation Jobs

Job Name	Job Type	Description	RELFILE
CFZALLOC	ALLOCATE	Common Information Model (CIM)	'prefix.HPG77E0.F1'
EZACSALC	ALLOCATE	Communications Server	'prefix.HIP6310.F1'
CSFALLOC	ALLOCATE	Cryptographic Services ICSF	'prefix.HCR77E0.F1'
Note: See note 5 on page 87.			
IKYALLOC	ALLOCATE	Cryptographic Services PKI Services	'prefix.HKY77E0.F1'
GSKISALC	ALLOCATE	Cryptographic Services System SSL	'prefix.HCPT510.F1'
DFPALLOC	ALLOCATE	DFSMS	'prefix.HDZ3310.F1'
DGTALLOC	ALLOCATE	DFSMS Japanese	'prefix.JDZ331K.F2'
Note: See note 6 on page 87.			
ICEALLOC	ALLOCATE	DFSORT	'prefix.HSM1310.F1'
EPW12003	ALLOCATE	FFST	'prefix.HFST101.F4'
IEFGDDMA	ALLOCATE	GDDM (includes GDDM-PGF)	'prefix.HBB77E0.F6'
CBDSALLC	ALLOCATE	HCD	'prefix.HCS77E0.F2'
EEQHCALC	ALLOCATE	HCM	'prefix.HCM1J10.F1'
ASMWTALC	ALLOCATE	HLASM Toolkit	'prefix.JMQ416A.F1'
HAPALLO3	ALLOCATE	IBM HTTP Server - Powered by Apache	'prefix.HHAP90P.F1'
HKC00ALC	ALLOCATE	Future Function	'prefix.HKCZ300.F1'
GLDISALC	ALLOCATE	IBM Tivoli Directory Server for z/OS Base	'prefix.HRSL510.F1'
CYGALLOC	ALLOCATE	IBM z/OS Change Tracker (base and Japanese)	'prefix.HCYG100.F1'
BBLALLOC	ALLOCATE	IBM z/OS Liberty Embedded	'prefix.HWLPEM0.F1'
Note: See note 11 on page 87.			
BBLZFS	ZFSALLOC	sample ZFS allocate job	'prefix.HWLPEM0.F1'
IZUISALC	ALLOCATE	IBM z/OS Management Facility	'prefix.HSMA310.F3'
ICKALLOC	ALLOCATE	ICKDSF	'prefix.EDU1H01.F3'
Note: See note 8 on page 87.			

Figure 28 (Page 3 of 3). Wave 1 Allocate Sample Installation Jobs

Job Name	Job Type	Description	RELFILE
ICKALLKG	ALLOCATE	ICKDSF Japanese	'prefix.FDU1H09.F2'
AOPALLOC	ALLOCATE	Infoprint Server	'prefix.HOPI7D0.F1'
EUVFSALC	ALLOCATE	Integrated Security Services Network Authentication Service	'prefix.HSWK510.F1'
ISPALLOC	ALLOCATE	ISPF Base, SCLM & English	'prefix.HIF83A2.F1'
ISPALJPN	ALLOCATE	ISPF Japanese	'prefix.JIF83A4.F1'
ISPALENP	ALLOCATE	ISPF Upper Case English	'prefix.JIF83A6.F1'
CEEISALC	ALLOCATE	Language Environment	'prefix.HLE77E0.F1'
CCRALLOC	ALLOCATE	Metal C Runtime Library	'prefix.HSD7780.F4'
GFSALLOC	ALLOCATE	Network File System	'prefix.HDZ331N.F1'
ERB00ALC	ALLOCATE	RMF (Base and Japanese)	'prefix.HRM77E0.F3'
CLB3JALL	ALLOCATE	Runtime Library Extensions	'prefix.HTV77C0.F1'
IRRALLOC	ALLOCATE	Security Server RACF	'prefix.HRF77E0.F1'
IKJBALL	ALLOCATE	TSO/E	'prefix.HTE77E0.F3'
CCNJALOC	ALLOCATE	XL C/C++	'prefix.HLB77C0.F1'
Note: See note 9 on page 87.			
IXMBALLC	ALLOCATE	XML Toolkit for z/OS	'prefix.HXML1B0.F1'
AZDISALC	ALLOCATE	z/OS Container Extensions	'prefix.HZDC7C0.F2'
Note: See note 12 on page 88.			
GRB00ALC	ALLOCATE	z/OS Data Gatherer	'prefix.HRG77E0.F2'
IOEIZALC	ALLOCATE	z/OS File System	'prefix.HZFS510.F1'
FNTALLOC	ALLOCATE	z/OS Font Collection	'prefix.HFNT140.F1'
Note: See note 10 on page 87.			

Notes:

1. The 'prefix' is the high-level qualifier specified as the DSPREFIX value in the SMPTLIB DDDEF or the OPTIONS entry of the global zone.
2. For all elements shown in Figure 28 on page 84, if you specify a volume for any data set in the allocate job, you must also specify the same volume in the corresponding DDDEF entry in the DDDEF job (see Figure 30 on page 92).
3. The following Wave 1 elements are documented in this Program Directory but do not supply sample allocate jobs:

Most BCP components and BCP Japanese feature
Communications Server for z/OS SNA Services
Communications Server X11R4 XWindows
EREP
ESCON Director Support
HCD Japanese
IBM Tivoli Directory Server for z/OS Japanese
IOCP
MICR/OCR
OpenSSH for z/OS
TIOC
z/OS File System Japanese
z/OS Security Level 3
z/OS Host - 3270 Workstation File Send/Receive

4. For BCP, if BCP Japanese FMID is ordered, ensure that TSO/E Japanese libraries are allocated by running IKJBALL and that BCP National Language features installed into the shared libraries with TSO/E National Language features.
5. The Cryptographic Services ICSF libraries contain parts and aliases which provide for successful link edit of Cryptographic Services ICSF load modules for customers who do not have CICS® installed. Since these libraries contain aliases provided by CICS, customers who install both Cryptographic Services ICSF and CICS should install the products into separate target and distribution data sets.

   As of z/OS V2R3, Cryptographic Services ICSF added a new library SCSFSTUB.
6. Special Note for DFSMS Japanese

   DFSMS Japanese and ICKDSF Japanese both share library DGTPKLB. If you ordered both of these, run sample job ICKALLKG before attempting to install DFSMS Japanese. Appendix C, “DASD Storage Requirements Tables” on page 275 describes the space requirements for DGTPKLB.
7. The following element languages do not supply sample allocate jobs. Their allocation statements are in the base FMID jobs, and need to be uncommented to become active.

   - Infoprint Server Japanese
   - TSO/E Japanese
   - z/OS File System Japanese
8. Sample job, ICKALLOC, incorrectly allocates SYS1.LINKLIB and SYS1.SAMPLIB. These data sets already exist.
9. As of z/OS V2R3, the XL C/C++ element added new target data sets SCCNM12 and SCCNN12, and distribution libraries ACCNSR6 and ACCNSR7.
10. As of z/OS V2R3, the sizes of several data sets that are required for the installation of the z/OS Font Collection element have significantly increased. Before installing the element, review the space requirements for the element's data sets in the sample allocate job and run the sample allocate job to re-allocate data sets if necessary.
11. IBM z/OS Liberty Embedded was introduced in z/OS V2R3.

12. z/OS Container Extensions was introduced in z/OS V2R4. You must run the sample job provided by the element to allocate the required distribution library before installing the element if you are migrating from z/OS V2R3.
13. IBM z/OS Change Tracker was introduced after the GA of z/OS V2R5. You must run the sample job provided by the element to allocate the required target and distribution libraries before installing the priced feature.
14. XML Toolkit for z/OS is added to z/OS 3.1. You must run the sample job provided by the element to allocate the required target and distribution libraries before installing XML Toolkit for z/OS.

8.1.8 Create file system directories for Wave 1

At this time, you need to create the file system directories that are required to install the Wave 1 elements if the directories do not already exist in the target file system. For the files that install into the file system, the target libraries are directories. These directories are created by running the sample jobs listed in Figure 29. For new directories introduced in the current release, see C.6, "File System for z/OS 3.1" on page 308. These jobs may also create or delete symbolic links in some cases. Ensure that you run the BPXISMKD job before running the rest of the sample jobs. It is important that you refer to 6.2, "Step 1: Separating File System Data Sets for z/OS 3.1" on page 31 prior to running the BPXISMKD job.

Note: It is assumed that you have cloned the entire set of file system data sets as described in 6.3, "Step 2: Cloning File System Data Sets" on page 32 and that the clone is your target system. Before running the mkdir jobs, ensure the cloned file system data sets mounted on the /tmp and /dev directories are unmounted. After unmounting, verify these directories are empty. Also, ensure that the clone of /etc is mounted, so that necessary /etc changes can be made by the mkdir jobs. If /etc and /var are symbolic links, run BPXISETD to convert them back to a directory to mount them (see 8.6.1.2, "BPXISETS and BPXISETD" on page 184).

The table is in alphabetical order based on the **Description** column. The following fields are represented in this table:

Job Name It contains the name of the sample job to be run.
Job Type This field indicates the type of job that is to be run.
Description It contains the element name for which the job is to be run.
RELFILE This field identifies the location of the sample job.

Figure 29 (Page 1 of 3). Wave 1 Define Directories Sample Installation Jobs

Job Name	Job Type	Description	RELFILE
BPXISMKD	MKDIR	BCP	'prefix.HBB77E0.F6'
Note: See note 7 on page 91.			
CPOISMKD	MKDIR	BCP - Capacity Provisioning	'prefix.HPV77E0.F2'
CFZISMKD	MKDIR	Common Information Model (CIM)	'prefix.HPG77E0.F1'
EZAISMKD	MKDIR	Communications Server IP	'prefix.HIP6310.F1'

Figure 29 (Page 2 of 3). Wave 1 Define Directories Sample Installation Jobs

Job Name	Job Type	Description	RELFILE
CSFISMKD	MKDIR	Cryptographic Services ICSF	'prefix.HCR77E0.F1'
IKYISMKD	MKDIR	Cryptographic Services PKI Services	'prefix.HKY77E0.F1'
GSKISMKD	MKDIR	Cryptographic Services System SSL	'prefix.HCPT510.F1'
DFPISMKD	MKDIR	DFSMS	'prefix.HDZ3310.F1'
HAPISMK3	MKDIR	IBM HTTP Server - Powered by Apache	'prefix.HHAP90P.F1'
HKCISMKD	MKDIR	Future Function	'prefix.HKCZ300.F1'
GLDISMKD	MKDIR	IBM Tivoli Directory Server for z/OS Base	'prefix.HRSL510.F1'
CYGISMKD	MKDIR	IBM z/OS Change Tracker (base)	'prefix.HCYG100.F1'
Note: See note 9 on page 92.			
BBLISMKD	MKDIR	IBM z/OS Liberty Embedded	'prefix.HWLPEM0.F1'
Note: See note 6 on page 91.			
IZUISMKD	MKDIR	IBM z/OS Management Facility	'prefix.HSMA310.F3'
AOPISMKD	MKDIR	Infoprint Server	'prefix.HOPI7D0.F1'
EUVFSMKD	MKDIR	Integrated Security Services Network Authentication Service	'prefix.HSWK510.F1'
ISPISMKD	MKDIR	ISPF	'prefix.HIF83A2.F1'
CEEISMKD	MKDIR	Language Environment	'prefix.HLE77E0.F1'
GFSISMKD	MKDIR	Network File System	'prefix.HDZ331N.F1'
FOTISMKD	MKDIR	OpenSSH for z/OS	'prefix.HOS3310.F1'
ERBISMKD	MKDIR	RMF™	'prefix.HRM77E0.F3'
GRBISMKD	MKDIR	z/OS Data Gatherer	'prefix.HRG77E0.F2'
CLBISMKD	MKDIR	Runtime Library Extensions	'prefix.HTV77C0.F1
CCNISMKD	MKDIR	XL C/C++	'prefix.HLB77C0.F1'
IXMBISMD	MKDIR	XML Toolkit for z/OS	'prefix.HXML1B0.F1'
AZDISMKD	MKDIR	z/OS Container Extensions	'prefix.HZDC7C0.F2'
Note: See note 8 on page 91.			
IOEIZMKD	MKDIR	z/OS File System	'prefix.HZFS510.F1'
FNTISMKD	MKDIR	z/OS Font Collection	'prefix.HFNT140.F1'
Note: See note 5 on page 91.			

Notes:

1. The 'prefix' is the high-level qualifier value specified as the DSPREFIX value in the SMPTLIB DDDEF or the OPTIONS entry of the global zone.
2. Be careful when modifying the samples because path names are case sensitive.
3. After the jobs are submitted, you will get a return code of 0. Check the held output to ensure the directories and symbolic links were created properly.

   Return values, such as RC, RETVAL, ERRNO, and ERRNOJR, are documented in *z/OS UNIX System Services Messages and Codes*.

   If any of the jobs end with RC=0 but get the following message, it is acceptable. These messages are produced while deleting symlinks known to be obsolete, usually during migration from a previous release.

   ```
   Deleted obsolete symlink {symlinkname}
                            {sympath1}
   ```

   If any of the jobs end with RC=0 or RC=4 but get any of the following messages, it is acceptable. These messages are produced while deleting symlinks known to be obsolete, usually during migration from a previous release.

   ```
   Unlink not performed {symlinkname}
   Symlink exists, but does not name the obsolete path.
   existing link:   {sympath1}
   obsolete link:   {sympath2}

   Unlink not performed.
   Linkname {symlinkname} exists,
            but does not have the obsolete path
   existing path: {sympath1}
   obsolete path: {sympath2}

   Verified that the following symlinks
   do not point to paths known to be obsolete.
   No action take.
   Linkname {symlinkname}
   existing path: {sympath1}
   obsolete path: {sympath2}
   ```

   If you recognize the existing path as one that was modified manually, then the symlink should be deleted manually before attempting to SMP/E APPLY the product. ("Modified Manually" refers to actions outside the documented install process; it does not refer to normal configuration/customization tasks.)

   If you do not recognize the existing pathname, then it is probably already correct; the message can be ignored. Closer examination of the symlink is only necessary if the APPLY fails with the following message:

```
LINK-EDIT PROCESSING FOR SYSMOD {} FAILED
IEW2820E DF30 EXISTING SYMBOLIC LINK
  { symlinkname }
DOES NOT MATCH SYMPATH.
```

If any of the jobs end with RC=12, due to the following message, this indicates a symlink an element expected was not created.

```
The symlink defined by {pathname}
already exists, but names a different file.
```

This can be caused by:

- modification of the symlink by the customer, or
- replacement of the symlink by a file or directory by the customer.

  Check for documented migration actions, and clean up any customer modified symlinks before resubmitting the job. If the symlink or file is for customer modified data, verify the accuracy of the modified symlink against the shipped one. Often the shipped symlink points to a default file in a read-only usr/lpp/ directory, while the customer modified one will not.

4. Dependent FMIDs that are installed into the file system and not listed in Figure 29 on page 88 use directories created by their base FMIDs.
5. If you plan to install z/OS Font Collection in a separate file system, allocate and mount the file system to the driving system before running the sample job FNTISMKD to define the directories. Sample job FNTZFSAL is provided to allocate a zFS for z/OS Font Collection. The job resides in 'prefix.HFNT140.F1' after SMP/E RECEIVE processing is complete. Refer to the sample job for information on allocating and mounting a file system for z/OS Font Collection.
6. IBM z/OS Liberty Embedded was a new element introduced in z/OS V2R3 and installed in the file system. It is recommended that the element be installed in a separate file system due to space requirements.
7. There is a new directory added in z/OS 3.1 BCP FMID. You must run the BPXISMKD job to create the new directory before installation. The installation of FMID HZAI310 requires that the BPXISMKD job be run to create a new directory in the file system. You must run the BPXISMKD job to create the new directory in the file system before installing FMID HZAI310.
8. A new element z/OS Container Extensions was introduced in z/OS V2R4 and installs into the file system. It is recommended that the element be installed in a separate file system due to space requirements. If you are migrating from z/OS V2R3, you must allocate and mount the separate file system at the recommended mountpoint shown in sample job AZDISALC. Sample job AZDISALC is provided in FMID HZDC7C0, in 'prefix.HZDC7C0.F2' after SMP/E RECEIVE processing is complete, then run the AZDISMKD sample job to create the required directories before installing z/OS Container Extensions.
9. New priced feature, IBM z/OS Change Tracker, was introduced after the GA of z/OS V2R5 and installs into the file system. This new priced feature will install into the z/OS version root file system. You must run the CYGISMKD job to create the new directories before installation.

10. XML Toolkit for z/OS is added to z/OS 3.1 and it is installed into the file system. This XML Toolkit for z/OS will be installed into the z/OS version root file system. You must run the IXMBISMD job to create the new directories before installation.

8.1.9 Define DDDEFs for Wave 1 Elements

Verify your target and distribution libraries have the DDDEF entries listed in Figure 79 on page 281 and Figure 80 on page 295 for z/OS 3.1. Sample jobs to define DDDEF entries for most elements have been provided.

Some of the elements in Wave 1 share DDDEFs. See the notes following Figure 30 for information about elements that share DDDEFs.

Copy the sample jobs to a work data set and customize them. DDDEFs must be defined in the target and distribution zones. For specific instructions to customize, see the comments in the sample jobs.

Run the jobs after the elements have been RECEIVEd.

If any of the DDDEF entries already exist, you will get a non-zero condition code. Check the output to see what caused the non-zero condition code.

Figure 30 lists the locations of the sample jobs. Be sure to read all the notes following the table before running the sample jobs.

In the sample allocate jobs, you may notice only one variable for the distribution volume. If you want to add more variables, you may do so.

Figure 30 lists entries in alphabetical order, based on the **Description** column. The following fields are represented.

Job Name It contains the name of the sample job to be run.
Job Type This field indicates the type of job that is to be run.
Description It contains the element name for which the job is to be run.
RELFILE This field contains the location of the sample job.

Figure 30 (Page 1 of 3). Wave 1 DDDEF Sample Installation Jobs

Job Name	Job Type	Description	RELFILE
EAGKDDEF	DDDEF	Alternate Library for REXX	'prefix.HWJ9143.F1'
BPXISDDD	DDDEF	BCP (Selected BCP component libraries only)	'prefix.HBB77E0.F6'
Note: See note 6 on page 95 and 11 on page 96.			
BPNPDDD	DDDEF	z/OS Authorized Code Scanner JPN	'prefix.JAL47DJ.F2'

Figure 30 (Page 2 of 3). Wave 1 DDDEF Sample Installation Jobs

Job Name	Job Type	Description	RELFILE
CUNJUDDF	DDDEF	BCP Base-Support for Unicode	'prefix.HUN77E0.F1'
CPODDDEF	DDDEF	BCP - Capacity Provisioning	'prefix.HPV77E0.F2'
CTVJDDF	DDDEF	C/C++ Host Performance Analyzer	'prefix.H24P111.F1'
CFZDDDEF	DDDEF	Common Information Model (CIM)	'prefix.HPG77E0.F1'
EZACSDDF	DDDEF	Communications Server	'prefix.HIP6310.F1'
CSFDDDEF	DDDEF	Cryptographic Services ICSF	'prefix.HCR77E0.F1'
Note: See note 7 on page 95.			
IKYDDDEF	DDDEF	Cryptographic Services PKI Services	'prefix.HKY77E0.F1'
GSKISDDD	DDDEF	Cryptographic Services System SSL	'prefix.HCPT510.F1'
DFPDDDEF	DDDEF	DFSMS	'prefix.HDZ3310.F1'
DGTDDDEF	DDDEF	DFSMS Japanese	'prefix.JDZ331K.F2'
Note: See note 8 on page 95.			
ICEDDDEF	DDDEF	DFSORT	'prefix.HSM1310.F1'
EPW12004	DDDEF	FFST	'prefix.HFST101.F4'
IEFGDDMD	DDDEF	GDDM (includes GDDM-PGF)	'prefix.HBB77E0.F6'
CBDSDDDF	DDDEF	HCD	'prefix.HCS77E0.F2'
EEQHCDDF	DDDEF	HCM	'prefix.HCM1J10.F1'
ASMWTDDF	DDDEF	HLASM Toolkit	'prefix.JMQ416A.F1'
HAPDDDE3	DDDEF	IBM HTTP Server - Powered by Apache	'prefix.HHAP90P.F1'
HKC00DDF	DDDEF	Future Function	'prefix.HKCZ300.F1'
GLDISDDD	DDDEF	IBM Tivoli Directory Server for z/OS Base	'prefix.HRSL510.F1'
CYGDDDEF	DDDEF	IBM z/OS Change Tracker (base and Japanese)	'prefix.HCYG100.F1'
BBLDDDEF	DDDEF	IBM z/OS Liberty Embedded	'prefix.HWLPEM0.F1'
Note: See note 9 on page 95.			
IZUISDDD	DDDEF	IBM z/OS Management Facility	'prefix.HSMA310.F3'
ICKDDDEF	DDDEF	ICKDSF	'prefix.EDU1H01.F3'
ICKDDDKG	DDDEF	ICKDSF Japanese	'prefix.FDU1H09.F2'

Figure 30 (Page 3 of 3). Wave 1 DDDEF Sample Installation Jobs

Job Name	Job Type	Description	RELFILE
AOPDDDEF	DDDEF	Infoprint Server	'prefix.HOPI7D0.F1'
EUVFSDDD	DDDEF	Integrated Security Services Network Authentication Service	'prefix.HSWK510.F1'
ISPDDDEF	DDDEF	ISPF Base	'prefix.HIF83A2.F1'
ISPDDJPN	DDDEF	ISPF Japanese	'prefix.JIF83A4.F1'
ISPDDENP	DDDEF	ISPF Upper Case English	'prefix.JIF83A6.F1'
CEEISDDD	DDDEF	Language Environment	'prefix.HLE77E0.F1'
CCRDDDEF	DDDEF	Metal C Runtime Library	'prefix.HSD7780.F4'
GFSDDDEF	DDDEF	Network File System	'prefix.HDZ331N.F1'
FOTISDDF	DDDEF	OpenSSH for z/OS	'prefix.HOS3310.F1'
ERB00DDF	DDDEF	RMF (Base and Japanese)	'prefix.HRM77E0.F3'
CLB3JDDF	DDDEF	Runtime Library Extensions	'prefix.HTV77C0.F1'
IRRDDDEF	DDDEF	Security Server RACF	'prefix.HRF77E0.F1'
IKJBDDD	DDDEF	TSO/E	'prefix.HTE77E0.F3'
CCNJDDDF	DDDEF	XL C/C++	'prefix.HLB77C0.F1'
IXMBDDDF	DDDEF	XML Toolkit for z/OS	'prefix.HXML1B0.F1'
AZDISDDD	DDDEF	z/OS Container Extensions	'prefix.HZDC7C0.F2'
Note: See note 10 on page 96.			
GRB00DDF	DDDEF	z/OS Data Gatherer	'prefix.HRG77E0.F2'
IOEIZDDD	DDDEF	z/OS File System	'prefix.HZFS510.F1'
FNTDDDEF	DDDEF	z/OS Font Collection	'prefix.HFNT140.F1'

Notes:

1. The 'prefix' is the high-level qualifier value specified as the DSPREFIX value in the SMPTLIB DDDEF or the OPTIONS entry of the global zone.
2. Be careful when creating DDDEFs or modifying the samples because path names are case-sensitive.
3. For all elements in the above table, if you specify a volume for any data set in the DDDEF job, you must also specify the same volume in the corresponding allocate entry in the allocate job (see Figure 28 on page 84).
4. The following Wave 1 elements that are documented in this program directory do not supply sample DDDEF jobs:

   Most BCP components and BCP Japanese feature
   Communications Server for z/OS SNA Services
   Communications Server X-Windows X11R4

EREP
ESCON Director Support
HCD Japanese
IOCP
MICR/OCR
TIOC
z/OS Security Level 3 System SSL Security Level 3
z/OS Host - 3270 Workstation File Send/Receive

5. The following elements do not supply sample DDDEF jobs. Their DDDEFs are in the base FMID jobs and need to be uncommented to become active.
   - TSO/E Japanese
   - z/OS File System Japanese
6. If BCP Japanese FMID is ordered, ensure that the DDDEFs of TSO/E Japanese libraries are defined by running IKJBDDD since the BCP National Language features are installed into the shared libraries with TSO/E National Languages.
7. The Cryptographic Services ICSF libraries contain parts and aliases that provide for successful link edit of Cryptographic Services ICSF load modules for customers who do not have CICS installed. Since these libraries contain aliases provided by CICS, customers who install both Cryptographic Services ICSF and CICS should install the products into separate target and distribution data sets.

   As of z/OS V2R3, Cryptographic Services ICSF added a new library SCSFSTUB.
8. Special Note for DFSMS Japanese.

   If DFSMS Japanese and ICKDSF Japanese are ordered, ensure that the DDDEFs of ICKDSF Japanese are defined by running ICKDDDKG so that the DFSMS Japanese feature can install into the shared libraries of ICKDSF Japanese.
9. IBM z/OS Liberty Embedded was introduced in z/OS V2R3.
10. z/OS Container Extensions was introduced in z/OS V2R4. If you are migrating from z/OS V2R3, you must run sample job AZDISDDD to create the required DDDEF entries in the SMP/E CSI before installing z/OS Container Extensions.
11. Before installing FMID HZAI310, you must run job BPXISDDD to create a new DDDEF entry that is required.
12. IBM z/OS Change Tracker was introduced after the z/OS V2R5 GA. You must run sample job CYGDDDEF to create the required DDDEF entries in the SMP/E CSI before installing IBM z/OS Change Tracker.
13. XML Toolkit for z/OS is added to z/OS 3.1. You must run sample job IXMBDDDF to create the required DDDEF entries in the SMP/E CSI before installing XML Toolkit for z/OS.

8.1.10 Pre-APPLY Actions

Before running APPLY of Wave 1, ensure that you have completed the required delete jobs documented in 8.1.6, “Run required and optional Delete Jobs” on page 79.

8.1.10.1 Migration actions

See *z/OS Upgrade Workflow* for more information about the required migration actions.

- Commands copied from CMDLIB to LPALIB

  SMP/E will be unable to maintain and apply product and service updates to commands which you copy from CMDLIB to LPALIB, unless you first identify the residency change to SMP/E. Therefore, IBM does not recommend that you copy commands from CMDLIB to LPALIB. If your installation feels it is necessary to place commands into LPALIB to achieve better runtime performance and you have previously copied the commands from CMDLIB to LPALIB, you must do one of the following:
  - Delete the old copies from LPALIB.
  - Replace with the new version of the commands.

  Because it is necessary to manually update LPALIB if you have copied your commands from CMDLIB to LPALIB, you may instead want to MLPA the commands, or add SYS1.CMDLIB to the LPA list rather than physically copying commands to LPALIB. If you choose to add CMDLIB to the LPA list, you must also add it to the APF list.
- Modified Modules and User Exits

  Installation of z/OS 3.1 elements may replace modified modules or User Exits that you may have changed during prior installations of the elements. To ensure that you do not lose these modified modules or User Exits, you may wish to save a copy of them prior to doing the APPLY.

8.2 Step 2: APPLY Wave 1

The current level of SMP/E, the BCP Program Management Binder, and the High Level Assembler, which are shipped with z/OS 3.1, must be installed first onto the target system. After these elements have been installed in Wave 0, be sure that the appropriate STEPLIB DD statements have been added to your install procedures. This is necessary because the level of SMP/E, BCP Program Management Binder, and the High Level Assembler, which are shipped with z/OS 3.1, will be used to install the elements in Wave 1. See 6.3.1, “Using High Level Assembler, Program Management Binder, and SMP/E for Subsequent z/OS 3.1 Installs” on page 32 for more information. If SMP/E dialogs will be used, the SMP/E libraries need to be concatenated when establishing the ISPF environment. See 8.5.4, “z/OS 3.1 ISPF setup considerations” on page 149 to identify the appropriate DD statements and the SMP/E libraries that need to be concatenated.

8.2.1 Select which z/OS Wave 1 FMIDs to install

Select which z/OS Wave 1 FMIDs to install by choosing the appropriate FMIDSETs that were defined in 6.5.3, “Elements in each Wave, Ripple, and FMIDSET” on page 35. The sample SMP/E job in this chapter shows the FMIDSETs being installed one at a time. Each job will be repeated for each ripple by changing WAVE1*n* to WAVE1A, WAVE1AL, WAVE1B, WAVE1C, and so forth. If desired, multiple ripples can be combined, but they must be run in order.

8.2.2 Do an SMP/E APPLY CHECK for Wave 1 FMIDs and service

Before you proceed with the APPLY CHECK for Wave 1, you must complete all data set allocations, DDDEFs, and file system directories for all the Wave 1 elements. This step is necessary because some elements share data sets, file system paths, and DDDEFs.

Run an APPLY CHECK to identify any requisite service and additional holds (for example, HOLDSYS(DOC,EC)) that may 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 31 on page 98 shows a sample APPLY CHECK for the functions specified in the SELECT operand, plus received PTFs that are applicable only to the FMIDs listed in the FORFMID.

```
//CHECK JOB <job parameters>
//STEP1 EXEC PGM=GIMSMP,REGION=0M,TIME=NOLIMIT
//STEPLIB DD DSN=SYS1.MIGLIB,DISP=SHR,
//         UNIT=SYSALLDA,VOL=SER=v31vol1
//        DD DSN=ASM.SASMMOD1,DISP=SHR,
//         UNIT=SYSALLDA,VOL=SER=v31vol1
//SMPCSI DD DSN=zos31.global.csi,DISP=SHR
//SMPCNTL DD *
  SET BOUNDARY(targetzone)
      OPTIONS(ZOSOPT) .
  APPLY CHECK  XZREQ
      FORFMID(ZV31W1n)
      SELECT(WAVE1n)
      GROUPEXTEND(NOAPARS,NOUSERMODS)
      SOURCEID(ZOS31,RSU*)
      FIXCAT(IBM.ProductInstall-RequiredService)
      BYPASS(HOLDSYSTEM,HOLDUSER,
             HOLDCLASS(UCLREL,ERREL,HIPER)) .
/*
```

Figure 31. SMP/E APPLY CHECK (All FMIDs and Service for z/OS Wave 1)

Note: ZOSOPT is now the option name for z/OS.

Required Updates

1. Update the *job parameters*.
2. Update the v31vol1 with the volume serial number for the MIGLIB and SASMMOD1 libraries that are the targets of the Wave 0 installation. This will allow you to access the z/OS 3.1 level of the Wave 0 elements using the STEPLIB DD statements.
3. Replace the CSI name on the SMPCSI DD statement with your CSI name.
4. Update targetzone to your target zone name.
5. Update WAVE1n so that n is A, AL, B, C, D, E, F, or G.
6. Update ZV31W1n so that n is A, AL, B, C, D, E, F, or G. This FMIDSET includes FMIDs for all elements within the specific ripple.
7. The XZREQ operand only needs to be specified when cross-zone processing is required.

Notes:

1. Adding the FMIDSET(ZV31W1n) in the FORFMID operand ensures the PTF service for all FMIDs (new, changed, and unchanged) will get applied at the same time as the ripple for the new FMIDs is installed.
2. The Program Management Binder requires SCEERUN for execution. If SCEERUN is not in your LNKLST or LPALST, you must add the appropriate STEPLIB DD statement to any JCL and procedures (for example, SMP/E proc) which invoke the binder for successful processing, such as conversion of LONGNAMEs to SHORTNAMEs.

Investigate any messages other than those in 6.7, “Step 6: Review General Installation Notes” on page 43 or those listed in the following sections.

Note: 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 messages will be received, which are 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.

GIM20501I APPLY PROCESSING IS COMPLETE. THE HIGHEST RETURN
CODE WAS 04.
```

8.2.2.1 Additional messages expected during Wave 1A APPLY CHECK

Successful APPLY CHECK processing of Wave 1A returns a condition code of 4.

8.2.2.1.1 Messages expected during BCP APPLY CHECK

The following messages may be seen and are acceptable during BCP APPLY CHECK processing. Successful APPLY CHECK processing returns a condition code of 4. Because of these messages, and

the resulting condition code, SMP/E produces one of the following messages for every load module that was link-edited in the same utility invocation:

- GIM61903W LMOD *xxxxxxxx* WAS NOT DELETED BY SYSMOD HBB77E0 BECAUSE IT IS NOT IN THE target ZONE, where *xxxxxxx* will be one of the load modules:

  AMDPRFMT ANTKINIT ATBINPVT IEAIPL04 IEANUC11 IEFITJT
  IEFW21SD IWMO2CMD

- GIM23913W LINK-EDIT PROCESSING FOR SYSMOD HBB77E0 WAS SUCCESSFUL FOR MODULE *xxxxxxxx* IN LMOD *xxxxxxxx* IN THE *xxxxxxxx* LIBRARY. THE RETURN CODE WAS 04. DATE *yy.ddd* -- TIME *hh:mm:ss* -- SEQUENCE NUMBER *nnnnnn* -- SYSPRINT FILE *xxxxxxxx*.
- GIM23903W LINK-EDIT PROCESSING FOR SYSMOD HBB77E0 WAS SUCCESSFUL FOR MODULE *xxxxxxxx* IN LMOD *xxxxxxxx* IN THE *xxxxxxxx* LIBRARY. THE RETURN CODE WAS 04. DATE *yy.ddd* -- TIME *hh:mm:ss* -- SEQUENCE NUMBER *nnnnnn*.

8.2.2.1.2 Messages expected during Communications Server IP Services APPLY CHECK

During the APPLY CHECK of Communications Server IP Services, the following messages are received and are acceptable. Successful APPLY CHECK processing returns a condition code of 4.

```
GIM61903W LMOD xxxxxxxx WAS NOT DELETED BY SYSMOD HIP6310
BECAUSE IT IS NOT IN THE target ZONE.
```

In the message, *xxxxxxx* will be one of the following modules:

```
EZAADMLR  EZAFTSRV  EZAPPRT   EZAPPSST  GXDEMO1   GXDEMO2
GXDEMO3   GXDEMO4   GXDEMO4A  GXDEMO5   GXDEMO6
```

8.2.2.2 Additional messages expected during Wave 1AL APPLY CHECK

Successful APPLY CHECK processing of Wave 1AL returns a condition code of 0 or 4.

8.2.2.3 Additional messages expected during Wave 1B APPLY CHECK

Successful APPLY CHECK processing of Wave 1B returns a condition code of 4.

8.2.2.4 Additional messages expected during Wave 1C APPLY CHECK

Successful APPLY CHECK processing of Wave 1C returns a condition code of 4.

8.2.2.4.1 Messages expected during EREP APPLY CHECK

You may receive the following messages:

```
GIM61903W ALIAS IFCC9221 WAS NOT DELETED BY SYSMOD EER3500
BECAUSE IT IS NOT IN THE target ZONE.

GIM61903W LMOD IFCILG04 WAS NOT DELETED BY SYSMOD EER3500
BECAUSE IT IS NOT IN THE target ZONE.
```

8.2.2.4.2 Messages expected during TSO/E APPLY CHECK

You might receive the following message, which is acceptable. In the message, *xxxxxxxx* will be one of the following load modules for SYSMOD HTE77E0:

IGC0006A IKJEFT02 IKJEFT09 IKJEGDRP IRXAPPC TEST

```
GIM61903W LMOD xxxxxxxx WAS NOT DELETED BY SYSMOD HTE77E0
BECAUSE IT IS NOT IN THE target ZONE.
```

You might receive the following message, which is acceptable. In the message, *xxxxxxx* is the following aliases for SYSMOD HTE77E0:

```
GENTRANS IKJEFLIA IKJEGCAL IKJEGDEL IKJEGDRP IKJEGFRE
IKJEGGET IKJEGLOD IKJEGRUN TSOENV
```

```
GIM61903W ALIAS xxxxxxx WAS NOT DELETED BY SYSMOD
HTE77E0 BECAUSE IT IS NOT IN THE target ZONE.
```

Successful APPLY CHECK processing returns a condition code of 4.

8.2.2.5 Additional messages expected during Wave 1D APPLY CHECK

Successful APPLY CHECK processing of Wave 1D returns a condition code of 0. However, if any of the warning messages shown in 6.7, “Step 6: Review General Installation Notes” on page 43 are received in the SMP/E output, then a return code of 4 is expected and is acceptable.

8.2.2.6 Additional messages expected during Wave 1E APPLY CHECK

Successful APPLY CHECK processing of Wave 1E returns a condition code of 0.

8.2.2.7 Additional messages expected during Wave 1F APPLY CHECK

Successful APPLY CHECK processing returns a condition code of 0.

8.2.2.8 Additional messages expected during Wave 1G APPLY CHECK

Successful APPLY CHECK processing of Wave 1G returns a condition code of 0 or 4.

8.2.2.8.1 Messages expected during Network File System Apply Check

During the APPLY CHECK of Network File System, the following message might be received. This is acceptable if it is the only cause of the return code 4.

```
GIM61903W LMOD yyyyyyyy WAS NOT DELETED BY SYSMOD HDZ331N
BECAUSE yyyyyyyy IS NOT IN THE target ZONE
```

In the message text, *yyyyyyyy* will be one of the following modules and *target* is the name of the target zone.

```
GFSAMAIN  GFSCMAIN  GFSATCPL  GFSATPNL  GFSATPRL  GFSAXOUT
GFSAXPRT  GFSAXSRB  GFSAXTIN  GFSAHFST  GFSALEGT  GFSAXEPL
```

8.2.2.8.2 Messages expected during XML Toolkit for z/OS Apply Check

You will receive a return code of 0 if this job runs correctly.

8.2.2.8.3 Messages expected during z/OS File System Apply Check

During the APPLY CHECK of z/OS File System, you may receive the following message, where *yyyyyy* is HZFS510 and *xxxxxxx* is one of the following modules:

For HZFS510 IOEZM004, IOEZM006, IOEZM007

```
GIM61903W LMOD xxxxxxxx WAS NOT DELETED BY SYSMOD yyyyyy
BECAUSE IT IS NOT IN THE target ZONE
```

These messages are acceptable if they are the only cause of the return code 4.

8.2.2.9 Do an SMP/E APPLY for Wave 1 FMIDs and Service:

If you have bypassed a HOLDsystem for MSGSKEL, see 8.4.1.1, “Compile MMS Data Sets” on page 123, for information about how to compile the MVS Message Service skeleton files after a successful APPLY. Be certain that all the exception conditions have been satisfied before adding other conditions to the BYPASS(HOLDSYSTEM(MSGSKEL)) during the SMP/E APPLY step.

Figure 32 on page 102 shows a sample APPLY for the functions specified in the SELECT operand, plus received PTFs that are applicable only to the FMIDs listed in the FORFMID.

```
//APPLY JOB <job parameters>
//STEP1 EXEC PGM=GIMSMP,REGION=0M,TIME=NOLIMIT
//STEPLIB DD DSN=SYS1.MIGLIB,DISP=SHR,
//         UNIT=SYSALLDA,VOL=SER=v31vol1
//        DD DSN=ASM.SASMMOD1,DISP=SHR,
//         UNIT=SYSALLDA,VOL=SER=v31vol1
//SMPCSI DD DSN=zos31.global.csi,DISP=SHR
//SMPCNTL DD *
  SET BOUNDARY(targetzone)
      OPTIONS(ZOSOPT) .
  APPLY  XZREQ
      FORFMID(ZV31W1n)
      SELECT(WAVE1n)
      GROUPEXTEND(NOAPARS,NOUSERMODS)
      SOURCEID(ZOS31,RSU*)
      FIXCAT(IBM.ProductInstall-RequiredService)
      BYPASS(HOLDSYSTEM,HOLDUSER,
             HOLDCLASS(UCLREL,ERREL,HIPER))
      COMPRESS(ALL) .
/*
```

Figure 32. SMP/E APPLY (All FMIDs and Service for z/OS 3.1 Wave 1)

Note: ZOSOPT is now the option name for z/OS.

Required Updates

1. Update the *job parameters*, as needed.
2. Update the v31vol1 with the volume serial number for the MIGLIB and the SASMMOD1 libraries which were the targets of the Wave 0 installation. This will allow you to access the z/OS 3.1 level of the Wave 0 elements using the STEPLIB DD statements.
3. Replace the CSI name on the SMPCSI DD statement with your CSI name.
4. Update *targetzone* to your target zone name.
5. Update WAVE1*n* so that *n* is A, AL, B, C, D, E, F, or G.
6. Update ZV31W1n so that n is A, AL, B, C, D, E, F, or G. This FMIDSET includes FMIDs for all elements within the specific ripple.
7. The XZREQ operand only needs to be specified when cross-zone processing is required.

Notes:

1. Adding the FMIDSET(ZV31W1n) in the FORFMID operand ensures the PTF service for all FMIDs (new, changed, and unchanged) will get applied at the same time as the ripple for the new FMIDs is installed.

Note that if you BYPASS(HOLDCLASS(HIPER)), you should run the SMP/E REPORT ERRSYSMODS command to identify missing HIPER HOLDs before putting your system into production.

If you do not BYPASS(HOLDCLASS(HIPER)), the FMIDs may not be installed if any of the HIPER maintenance is unavailable.

Any messages other than in 6.7, "Step 6: Review General Installation Notes" on page 43, or those listed in the following sections need to be investigated.

Note: 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 messages will be received, which are 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.

GIM20501I APPLY PROCESSING IS COMPLETE. THE HIGHEST RETURN
CODE WAS 04.
```

8.2.2.10 Additional messages expected during Wave 1A APPLY

Scenario: During a CBPDO installation of z/OS 3.1, if the bind of IEANUC01 fails with the following message produced, the SMP/E APPLY might fail for HBB77E0, HDZ3310, HIP6310, and HFST101.

```
IEW2353E SECTION section CONTAINS INVALID DATA.
ERROR CODE IS 250013
```

Cause: The z/OS 3.1 level of the Program Management Binder was not used for APPLY. The reason could either be the MIGLIB library of z/OS 3.1 was not STEPLIBed to in the SMP/E APPLY step, or be the MIGLIB library was not APF authorized.

Resolution: Add STEPLIB for the MIGLIB library in which the z/OS 3.1 level of the Program Management Binder is installed to the SMP/E APPLY job, as shown in Figure 32 on page 102. Ensure that the MIGLIB library is APF-authorized; then, rerun the SMP/E APPLY job.

8.2.2.10.1 Messages expected during BCP APPLY

In addition to the general messages listed in 6.7, "Step 6: Review General Installation Notes" on page 43, the following messages might be received during the APPLY of BCP. Message GIM23913W will be received in the SMP/E output for each load module in the NUCLEUS library. These messages are acceptable if they are the only reasons for the condition code 4.

- GIM61903W LMOD *xxxxxxxx* WAS NOT DELETED BY SYSMOD HBB77E0 BECAUSE IT IS NOT IN THE target ZONE, where *xxxxxxx* is any of the following modules:

  AMDPRFMT ATBINPVT IEAIPL04 IEANUC11 IEFITJT IEFW21SD IWMO2CMD

- GIM23913W LINK-EDIT PROCESSING FOR SYSMOD HBB77E0 WAS SUCCESSFUL FOR MODULE *mmmmmmm* IN LMOD nnnnnnnn IN THE NUCLEUS LIBRARY. THE RETURN CODE WAS 04. DATE *yy.ddd* -- TIME *hh:mm:ss* -- SEQUENCE NUMBER *nnnnnn* -- SYSPRINT FILE *xxxxxxxx*.
- GIM23903W LINK-EDIT PROCESSING FOR SYSMOD HBB77E0 WAS SUCCESSFUL FOR MODULE *xxxxxxxx* IN LMOD *xxxxxxxx* IN THE *xxxxxxxx* LIBRARY. THE RETURN CODE WAS 04. DATE *yy.ddd* -- TIME *hh:mm:ss* -- SEQUENCE NUMBER *nnnnnn*.

8.2.2.10.2 Messages expected during Communications Server IP Services APPLY

During the APPLY of Communications Server IP Services, the following messages are received:

- GIM61903W LMOD xxxxxxxx WAS NOT DELETED BY SYSMOD HIP6310 BECAUSE IT IS NOT IN THE target ZONE, where *xxxxxxx* will be one of the following modules:

  EZAADMLR EZAFTSRV EZAPPRT EZAPPSST GXDEMO1 GXDEMO2
  GXDEMO3 GXDEMO4 GXDEMO4A GXDEMO5 GXDEMO6

During the APPLY of HIP6310, the following messages are expected:

IEW2646W 4B07 ESD RMODE(24) CONFLICTS WITH USER-SPECIFIED
RMODE(ANY) FOR *xxxxxxxx*.

IEW2651W 511C ESD AMODE 24 CONFLICTS WITH USER-SPECIFIED AMODE
31 FOR ENTRY POINT *xxxxxxxx*.

IEW2646W 4A07 ESD RMODE(24) CONFLICTS WITH
USER-SPECIFIED RMODE(ANY) FOR SECTION *xxxxxxxx*.

For message IEW2646W, *xxxxxxxx* is the CSECT name. For message IEW2651W, *xxxxxxxx* is the entry point name.

The APPLY step will complete with a condition code of 0004. Program Binder message IEW2454 will be received for the load modules listed in the following data sets:

TCPIP.SEZACMTX

EZABB001 EZAAE016 EZAAD04C EZAAD065 EZAAE03Q
EZABB00Z EZACA00U EZAAE00T EZABB006 EZAAE03V
EZAAD04D EZAAD0PR EZAFTPMM EZABB012 EZACA00W
EZAAE00U EZABB00A EZAAE01D EZAAD04E EZAAD0PS
EZAFTPMT EZABB04J EZACA00Z EZABBWLD EZABB00B
EZAAE029 EZAAD04F EZAAD0PT EZBCRSTK EZBIEFTM
EZACA016 EZAAE01H EZABB00F EZAAE04A EZAAD04K
EZAAD0PW EZBPAREV EZBIEGTM EZACA019 EZAMSGW
EZABB00L EZAAD00V EZAAD04L EZAAD0B5 EZBTTSRT
EZBMSGMI EZAAA002 EZACA015 EZABB00R EZAAD00W
EZAAD04M EZAAD0BU EZAADHTN EZBWTOCR EZAAE061

```
EZAAE02A EZABB00T EZAAD00X EZAAD04V EZAAD0XE
EZABB002 EZBWTODM EZAAE006 EZAAE046 EZABB00U
EZAAD00Z EZAAD0OY EZAXTI   EZABB005 EZACA001
EZAAE007 EZAAE047 EZABB011 EZAAD01L EZAAD0OZ
EZABB00H EZABB00C EZACA00K EZAAE008 EZAAE050
EZACA00M EZAAD028 EZAAD0P0 EZBPAINT EZABB04C
EZACA00L EZAAE00C EZAAD0YW EZAAE060 EZAMSGLC
EZAAD0P1 EZAAE05I EZABB00O EZACA00Q EZAAE00G
EZAAD02E EZAAE00D EZAAD0XH EZAAD0P2 EZAAE00L
EZABB00Q EZACA00R EZAAE00R EZAMSGP  EZAAE00K
EZAAD04A EZAAD0P3 EZABB04D EZABB00X EZACA00S
EZAAE00S EZAAD0PV
```

TCPIP.SEZADPIL

```
EZAAD0OX  EZAAD0W3  EZAAD064
```

TCPIP.SEZARPCL

```
EZAAD0O9 EZAAD0OM EZAAD0PH EZAAD0ZO EZAAD0QA EZAAD0PY
EZAAD0QE EZAAD0OA EZAAD0ON EZAAD0PI EZAAD0BL EZAAD0QB
EZAAD0Q5 EZAAD0QF EZAAD0OJ EZAAD0OO EZAAD0PJ EZAAD0Q7
EZAAD0QG EZAAD0Q6 EZAAD0QH EZAAD0OK EZAAD04I EZAAD07Z
EZAAD0Q8 EZAAD0QI EZAAD0EB EZAAD0QJ EZAAD0OL EZAAD04J
EZAAD080 EZAAD0Q9 EZAAD013 EZAAD0QD
```

TCPIP.SEZALIBN

```
EZAAD0TM EZAAD0U4 EZAAD0UA EZAAD0V8 EZAAD0VB EZAAD0VJ
EZAAD0VS EZAAD0TN EZAAD0U5 EZAAD0UG EZAAD0V9 EZAAD0VF
EZAAD0VP EZAAD0U1 EZAAD0U9 EZAAD0UH EZAAD0VA EZAAD0VH
EZAAD0VQ
```

TCPIP.SEZALOAD

```
EZAESITE  EZAIMSLN  EZAMSGS   EZAPSMPL  EZATSITE  EZAVXLAT
```

TCPIP.SEZATCP

```
EZACIC07
```

Because of these messages, and the resulting condition code, SMP/E produces one of the following messages for every load module that was link-edited in the same utility invocation:

```
GIM23903W LINK-EDIT PROCESSING FOR SYSMOD HIP6310 WAS SUCCESSFUL
FOR MODULE xxxxxxxx IN LMOD xxxxxxxx IN THE xxxxxxx LIBRARY. THE
RETURN CODE WAS 04. DATE yy.ddd - TIME hh:mm:ss -
SEQUENCE NUMBER nnnnnn."

GIM23913W LINK-EDIT PROCESSING FOR SYSMOD HIP6310 WAS SUCCESSFUL
FOR MODULE xxxxxxxx IN LMOD xxxxxxxx IN THE xxxxxxxx LIBRARY.  THE
RETURN CODE WAS 04.  DATE yy.ddd -- TIME hh:mm:ss --
SEQUENCE NUMBER nnnnnn -- SYSPRINT FILE xxxxxxxx.
```

The following MAC and MOD entries in the Communications Server IP Services FMID are superseded by the same part entries in feature FMIDs. Therefore, these MAC and MOD entries might be flagged as "NOT SEL" during the APPLY.

MAC EZACDIRB
MAC EZAODIRB
MOD EZACXADE
MOD EZACXAEN
MOD EZACX3DE
MOD EZACX3EN
MOD EZACX3FR
MOD EZACX3HD
MOD EZACX3HE
MOD EZACX3IK
MOD EZAPX3CC
MOD EZBISXGM
MOD EZBISXES

8.2.2.10.3 Messages expected during Communications Server XWindows X11R4 Feature APPLY

Because the Language Environment routines are not linked during the link-edit of Communications Server X11R4 XWindows, Program Binder message IEW2454 will be received for each load module in the following data sets:

- *TCPIP*.SEZAOLDX
- *TCPIP*.SEZAXAWL
- *TCPIP*.SEZAXMLB
- *TCPIP*.SEZAXTLB
- *TCPIP*.SEZAX11L

Because of these messages, and the resulting condition code, SMP/E produces one of the following messages for every load module that was link-edited in the same utility invocation. If these are the only cause of the condition code 4, it is acceptable.

```
GIM23903W LINK-EDIT PROCESSING FOR SYSMOD JIP631X WAS SUCCESSFUL
FOR MODULE xxxxxxxx IN LMOD xxxxxxxx IN THE xxxxxx LIBRARY.  THE
RETURN CODE WAS 04. DATE yy.ddd - TIME hh:mm:ss
SEQUENCE NUMBER nnnnnn.

GIM23913W LINK-EDIT PROCESSING FOR SYSMOD JIP631X WAS SUCCESSFUL
FOR MODULE xxxxxxxx IN LMOD xxxxxxxx IN THE xxxxxxxx LIBRARY.  THE
RETURN CODE WAS 04.  DATE yy.ddd -- TIME hh:mm:ss --
SEQUENCE NUMBER nnnnnn --."
```

During the APPLY of JIP631X you may receive the following message:

```
IEW2609W SECTION section name USABILITY ATTRIBUTE OF
usability-option CONFLICTS WITH REQUESTED USABILITY
OF usability-option.
```

8.2.2.10.4 Messages expected during Communications Server SNA Services APPLY

During the installation of SNA Services, you may receive message GIM23903W or GIM23913W for the load modules for HVT6310 that are installed into the following libraries: LPALIB, LINKLIB, MIGLIB, SISTCLIB, VTAMLIB.

```
GIM23903W LINK-EDIT PROCESSING FOR SYSMOD sysmod WAS SUCCESSFUL FOR
MODULE modname IN LMOD loadmod IN THE library LIBRARY. THE RETURN
CODE WAS 04. DATE yy.ddd - TIME hh:mm:ss - SEQUENCE
NUMBER seqno.

GIM23913I LINK-EDIT PROCESSING FOR SYSMOD sysmod WAS SUCCESSFUL FOR
MODULE modname IN LMOD loadmod IN THE library LIBRARY. THE RETURN
CODE WAS 04. DATE yy.ddd TIME hh:mm:ss SEQUENCE
NUMBER seqno SYSPRINT FILE sysprint.
```

8.2.2.10.4.1 Warning messages: During the installation of Communications Server for z/OS SNA Services, you may receive the following message during the apply:

```
IEW2609W SECTION section name USABILITY ATTRIBUTE OF
         usability-option CONFLICTS WITH REQUESTED
         USABILITY OF usability-option

IEW2646W ESD RMODE(24) CONFLICTS WITH USER-SPECIFIED
         RMODE(ANY) FOR SECTION ISTxxxxx.

IEW2651W ESD AMODE 24 CONFLICTS WITH USER-SPECIFIED
         AMODE 31 FOR ENTRY POINT ISTxxxxx.

IEW2660W RESULTANT AMODE(24) AND USER-SPECIFIED
         RMODE(ANY) ARE INCOMPATIBLE FOR ISTxxxxx.
         AMODE HAS BEEN CHANGED TO (31).
```

These messages can be ignored. If they are the only cause of the condition code 4, it is acceptable.

8.2.2.10.5 Messages expected during ISPF APPLY

During the installation of ISPF, you might receive one of the following messages. For LMOD IGC0009C, the modules can be ISPSC93, ISPSC93Q, and ISPSC93X. For LMOD IGC0009D, the module can be ISPSC94. If these are the only cause of the condition code 4, it is acceptable.

```
GIM23903W LINK-EDIT PROCESSING FOR SYSMOD xxxxxxx WAS SUCCESSFUL
FOR MODULE xxxxxxxx IN LMOD xxxxxxxx IN THE xxxxxx LIBRARY.  THE
RETURN CODE WAS 04. DATE yy.ddd - TIME hh:mm:ss
SEQUENCE NUMBER nnnnnn.

GIM23913W LINK-EDIT PROCESSING FOR SYSMOD xxxxxxx WAS SUCCESSFUL
FOR MODULE xxxxxxxx IN LMOD xxxxxxxx IN THE xxxxxxxx LIBRARY.  THE
RETURN CODE WAS 04.  DATE yy.ddd -- TIME hh:mm:ss --
SEQUENCE NUMBER xxxxxx --.
```

8.2.2.10.6 Messages expected during Metal C Runtime Library APPLY

Messages from Metal C have the following format, where *xxxxxxxx* is one of the following symbols.

```
IEW2454W 9203 SYMBOL xxxxxxxx UNRESOLVED. NO AUTOCALL (NCAL) SPECIFIED.
```

```
@@INTNAN  @@NANINT  @@PHLOAT  @@PHLOUT  ABS
ATOL      b_ecvt_i  b_fcvt_i  b_fecvt   b_ffcvt
b_fgcvt   b_fgecvt  b_gcvt_i  b_gecvt   b_lecvt
b_lfcvt   b_lgcvt   b_lgecvt  bintlg10  deci754
frstg31   frstg64   ISALPHA   ISUPPER   ISXDIGIT
i754nanp  i754pnan  i754type  STRTOLL   STRTOULL
```

During the APPLY of Metal C Runtime Library, the following messages are expected:

```
GIM23913W  LINK-EDIT PROCESSING FOR SYSMOD HSD7780 WAS SUCCESSFUL
FOR MODULE modname IN LMOD loadmod IN THE SCCR6BND LIBRARY. THE
RETURN CODE WAS 04. DATE yy.ddd - TIME hh:mm:ss - SEQUENCE NUMBER
seqno - SYSPRINT FILE sysprint.

GIM23913W  LINK-EDIT PROCESSING FOR SYSMOD HSD7780 WAS SUCCESSFUL
FOR MODULE modname IN LMOD loadmod IN THE SCCR3BND LIBRARY. THE
RETURN CODE WAS 04. DATE yy.ddd - TIME hh:mm:ss - SEQUENCE NUMBER
seqno - SYSPRINT FILE.
```

8.2.2.11 Additional messages expected during Wave 1AL APPLY

Successful APPLY processing of Wave 1AL returns a condition code of 0 or 4. If the XZREQ operand was specified on the APPLY command but there were no applicable zones, message GIM50810W will be issued during APPLY processing and a condition code of 4 is expected.

8.2.2.12 Additional messages expected during Wave 1B APPLY

Successful APPLY processing of Wave 1B returns a condition code of 4.

8.2.2.12.1 Messages expected during DFSMS APPLY

During the APPLY of DFSMS you may receive the following messages.

```
GIM63201I    ALIAS DWW1RPCP WAS DELETED FROM THE LPALIB
             LIBRARY BY SYSMOD HDZ3310.

GIM63201I    ALIAS DWW1RARR WAS DELETED FROM THE LPALIB
             LIBRARY BY SYSMOD HDZ3310.

GIM63201I    ALIAS IDABLARR WAS DELETED FROM THE LPALIB
             LIBRARY BY SYSMOD HDZ3310.

GIM63201I    ALIAS IDABLVBB WAS DELETED FROM THE LPALIB
             LIBRARY BY SYSMOD HDZ3310.

GIM63201I    LMOD IDA019BL WAS DELETED FROM THE LPALIB
```

```
            LIBRARY BY SYSMOD HDZ3310.

GIM23903W LINK-EDIT PROCESSING FOR SYSMOD HDZ3310 WAS SUCCESSFUL FOR
MODULE xxxxxxxx IN LMOD xxxxxxxx IN THE xxxxxxxx LIBRARY.
THE RETURN CODE WAS 04.  DATE yy.ddd -- TIME hh:mm:ss--
SEQUENCE NUMBER nnnnnn.

GIM23913W LINK-EDIT PROCESSING FOR SYSMOD xxxxxxx
WAS SUCCESSFUL FOR MODULE xxxxxxxx  IN LMOD xxxxxxxx
IN THE xxxxxxxx  LIBRARY. THE RETURN CODE WAS 04.
DATE yy.ddd - TIME hh:mm:ss-
SEQUENCE NUMBER xxxxxx-
```

SMP/E produces one of the preceding messages for every load module that was link-edited in the same utility invocation.

The following unresolved external references may be encountered during the apply of DFSMS.

Messages from the Binder have the following format:

```
IEW2454W 9203 SYMBOL xxxxxxxx UNRESOLVED. NO AUTOCALL (NCAL) SPECIFIED.
```

In the message, *xxxxxxxx* will be one of the following items:

```
EMODVOL1 HASPXSUB IDACAT13 IDAOCEA1 IDAOCEA2 IDA0192G
IDA0192P IEFAB4DC IFG0EX0A IFG0RR0B IFG0RR0G IFG0RR0H
IFG0SIOA IFG019EV IFG019RC IFG0190P IFG0191X IFG0192A
IFG0192F IFG0192I IFG0192Y IFG0193C IFG0193G IFG0194A
IFG0194F IFG0194J IFG0194K IFG0195A IFG0195B IFG0195T
IFG0196V IFG0198N IFG0199B IFG020EV IFG0200N IFG0200P
IFG0200S IFG0200T IFG0200U IFG0200V IFG0200W IFG0201A
IFG0202E IFG0202L IFG0204A IFG0204J IFG0209B IFG0230P
IFG0231P IFG0231T IFG0232Z IFG0234J IFG0239B IFG055ZZ
IFG0550P IFG0550Y IFG0551L IFG0552B IFG0552P IFG0552X
IFG0553B IFG0553F IFG0554A IFG0554J IFG0554K IFG0554L
IFG0554P IFG0554T IFG0555J IFG0555T IFG0556B IFG0557A
IFG0559B IFG0559C IGC0101I IGC01020 IGGDAP01 IGGDYXCS
IGGPRE00 IGGVRF00 IGG019EK IGG019JD IGG019SI IGG0190A
IGG0191A IGG0191C IGG0191G IGG0191L IGG0191Q IGG0191R
IGG01911 IGG0193A IGG0193B IGG0193M IGG0193Y IGG01930
IGG01935 IGG01946 IGG0196M IGG0196R IGG0196S IGG0197A
IGG0197C IGG0197L IGG0197N IGG0197V IGG0198B IGG0199F
IGG020FC IGG020T1 IGG020T2 IGG0200P IGG0201A IGG0201D
IGG0201P IGG0201W IGG0201Z IGG0202A IGG0202D IGG0202I
IGG02028 IGG02029 IGG0203A IGG0203B IGG0203M IGG0203Y
IGG0203Z IGG02030 IGG02035 IGG02046 IGG0206M IGG0213Z
IGG029DM IGG032DB IGG0325A IGG0325H IGG0325Z IGG055V1
IGG0550P IGG0553A IGG0553F IGG0553J IGWFARC0 IGWFTRFE
IGWFTROC IHJ019SI ISTOCMDC NSLCTRLO NSLEHDRI NSLEHDRO
NSLETRLI NSLETRLO NSLOHDRI NSLOHDRO OMODVOL1 READPSWD
SECLOADA
```

IEW2455W 9205 SYMBOL *xxxxxxxx* UNRESOLVED. NOCALL OR NEVERCALL SPECIFIED.

In the message, *xxxxxxxx* will be one of the following items:

IFG0198N

The following messages may be ignored if the Binder was used to APPLY DFSMS. If these are the only cause of the condition code 4, it is acceptable.

- IEW2651W 511C ESD AMODE 24 CONFLICTS WITH USER-SPECIFIED AMODE 31 FOR ENTRY POINT *xxxxxxxx*, where *xxxxxxxx* is one of the following items:

  ```
  ABA       ADRRELVL  ARCABAMA  CBRICONN  CBROPDDT  CBROPMLT
  CBRTRFMT  IGX00024
  ```

- IEW2651W 511C ESD AMODE 31 CONFLICTS WITH USER-SPECIFIED AMODE 24 FOR ENTRY POINT *xxxxxxxx*, where *xxxxxxxx* are:

  ```
  ARCFAIL  ARCFAIL2  ARCGIVER
  ```

- IEW2646W 4B07 ESD RMODE(24) CONFLICTS WITH USER-SPECIFIED RMODE (ANY) FOR SECTION *xxxxxxxx*, where *xxxxxxxx* is one of the following:

  ```
  $PRIV000010 ARCASTAI ARCAZMGS ARCAZMGT ARCAZMSG ARCCBS
  ARCCBSLB    ARCCOPYX ARCCOP78 ARCCPCDT ARCCPYPT ARCCSTAI
  ARCDECDH    ARCDSTAI ARCDTOBJ ARCDTSRC ARCENCDH ARCESD
  ARCESDLB    ARCESTAE ARCESTAI ARCETOBJ ARCETSRC ARCGCPU
  ARCGSTAI    ARCLANIT ARCLANLB ARCMINST ARCMSTAI ARCNC
  ARCPCABK    ARCPCADS ARCPCADV ARCPCARV ARCPCAUD ARCPCAUT
  ARCPCBEG    ARCPCDEF ARCPCDIS ARCPCDLV ARCPCEBV ARCPCEMD
  ARCPCFC     ARCPCFVL ARCPCHLD ARCPCLMC ARCPCLRU ARCPCMIG
  ARCPCOIF    ARCPCON  ARCPCPAT ARCPCRCY ARCPCRES ARCPCRPT
  ARCPCRST    ARCPCRTN ARCPCSET ARCPCSTP ARCPCSTR ARCPCSWI
  ARCPCUDS    ARCPDA   ARCPPL   ARCPPL1  ARCPPL2  ARCPUFC
  ARCSELTV    ARCTVPRM ARCTVSV  ARCUCADS ARCXSTAI ARCYSCAN
  ARCYSTAI    ARCZPVLD CBRHCLDL CBRHCLLU CBRHCLMK CBRHTBSV
  CBRKHLI     CBROPDDT CBROPMLT CBRTRDEF CBRTRFMT CBRTRRCD
  CBRTRSSM    DSNHLI   IGDACTPT IGDACTTT IGX00024 OAMUTPCL
  OSREQPCL    XSDTABLE
  ```

- IEW2635I 4B34 THREE BYTE ADCON IN SECTION ARCRPDS AT OFFSET *nnnnnnnn* IN CLASS B_TEXT WITH RMODE=ANY CANNOT BE RELOCATED.
- IEW2635I 4B34 THREE BYTE ADCON IN SECTION GDEMCBOP AT OFFSET *nnnnnnnn* IN CLASS B_TEXT WITH RMODE=ANY CANNOT BE RELOCATED.
- IEW2635I 4B34 THREE BYTE ADCON IN SECTION GSLEXT30 AT OFFSET *nnnnnnnn* IN CLASS B_TEXT WITH RMODE=ANY CANNOT BE RELOCATED.

8.2.2.13 Additional messages expected during Wave 1C APPLY

Successful APPLY processing of Wave 1C returns a condition code of 4.

8.2.2.13.1 Messages expected during EREP APPLY

You may receive the following messages.

```
GIM61903W ALIAS IFCC9221 WAS NOT DELETED BY SYSMOD EER3500
BECAUSE IT IS NOT IN THE target ZONE.

GIM61903W LMOD IFCILG04 WAS NOT DELETED BY SYSMOD EER3500
BECAUSE IT IS NOT IN THE target ZONE.
```

8.2.2.13.2 Messages expected during TSO/E APPLY

During the installation of TSO/E, you will receive the following messages which are acceptable if they are the only cause of condition code 4.

- GIM61903W LMOD *xxxxxxxx* WAS NOT DELETED BY SYSMOD HTE77E0 BECAUSE IT IS NOT IN THE target ZONE, where *xxxxxxx* will be one of the following modules

  IGC0006A IKJEFT02 IKJEFT09 IKJEGDRP IRXAPPC TEST

- GIM61903W ALIAS *xxxxxxxx* WAS NOT DELETED BY SYSMOD HTE77E0 BECAUSE *xxxxxxxx* IS NOT IN THE target ZONE, where *xxxxxxx* will be one of the following ALIASs:

  GENTRANS IKJEFLIA IKJEGDRP IKJEGRUN IKJEGCAL IKJEGLOD
  IKJEGGET IKJEGFRE IKJEGDEL TSOENV

- IEW2454W SYMBOL *xxxxxxxx* UNRESOLVED. NO AUTOCALL (NCAL) SPECIFIED., where *xxxxxxxx* is a symbol associated with one of the following load modules:

  ADFMDOLD ADFMDFLT ADFMDF01 IKJEFLA CHSFVMPC IGC0009C
  IGC0009D

- IEW2635I 4B34 THREE BYTE ADCON IN SECTION IKJEGEND AT OFFSET *nnnnnnnn* IN B_TEXT WITH RMODE=ANY CANNOT BE RELOCATED
- IEW2635I 4B34 THREE BYTE ADCON IN SECTION IKJEFTP1 AT OFFSET *nnnnnnnn* IN B_TEXT WITH RMODE=ANY CANNOT BE RELOCATED
- IEW2609W 5104 SECTION ADFMSEND USABILITY ATTRIBUTE OF REENTRANT CONFLICTS WITH REQUESTED USABILITY OF REFRESHABLE.
- IEW2609W 5104 SECTION IKJSONRW USABILITY ATTRIBUTE OF REENTRANT CONFLICTS WITH REQUESTED USABILITY OF REFRESHABLE.
- IEW2609W 5104 SECTION IKJSONW2 USABILITY ATTRIBUTE OF REENTRANT CONFLICTS WITH REQUESTED USABILITY OF REFRESHABLE.
- IEW2609W 5104 SECTION IKTTMPX2 USABILITY ATTRIBUTE OF REENTRANT CONFLICTS WITH REQUESTED USABILITY OF REFRESHABLE.

Because of these messages, and the resulting condition code, SMP/E produces one of the following messages for every load module that was link-edited in the same utility invocation:

```
GIM23903W LINK-EDIT PROCESSING FOR SYSMOD xxxxxxx WAS SUCCESSFUL
FOR MODULE xxxxxxxx IN LMOD xxxxxxxx IN THE xxxxxx LIBRARY.
THE RETURN CODE WAS 04. DATE yy.ddd - TIME hh:mm:ss
SEQUENCE NUMBER nnnnnn.
```

```
GIM23913W LINK-EDIT PROCESSING FOR SYSMOD xxxxxxx WAS SUCCESSFUL
FOR MODULE xxxxxxxx IN LMOD xxxxxxxx IN THE xxxxxxxx LIBRARY.  THE
RETURN CODE WAS 04.  DATE yy.ddd -- TIME hh:mm:ss --
SEQUENCE NUMBER xxxxxx --.
```

8.2.2.14 Additional messages expected during Wave 1D APPLY

Successful APPLY processing of Wave 1D returns a condition code of 0 or 4. However, if you have any USERMODs installed, then you may see the following acceptable message:

```
GIM44502W CHANGES FOR THE FOLLOWING USERMODS WILL BE LOST BECAUSE
THE ASSOCIATED FUNCTION SYSMOD HAS BEEN DELETED.
```

8.2.2.15 Additional messages expected during Wave 1E APPLY: Successful APPLY processing of Wave 1E returns a condition code of 0 or 4. If the XZREQ operand was specified on the APPLY command but there were no applicable zones, message GIM50810W will issued during APPLY processing and a condition code of 4 is expected.

8.2.2.16 Additional messages expected during Wave 1F APPLY

Successful APPLY processing of Wave 1F returns a condition code of 4.

8.2.2.16.1 Messages expected during DFSORT APPLY

The following message can be ignored; any other messages should be investigated. The Binder produces this message during steps that store modules into target libraries:

```
IEW2635I 4B34 THREE BYTE ADCON IN SECTION ICEXPUB0 AT OFFSET
xxxxxxxx IN CLASS B_TEXT WITH RMODE=ANY CANNOT BE RELOCATED.
```

8.2.2.16.2 Messages expected during HLASM Toolkit APPLY

During the installation of HLASM Toolkit, you might receive the following messages; they are acceptable if they are the only cause of the condition code 4:

```
GIM23903W LINK-EDIT PROCESSING FOR SYSMOD JMQ416A WAS
SUCCESSFUL FOR MODULE xxxxxxxx IN LMOD xxxxxxx IN THE
SASMMOD2 LIBRARY.
THE RETURN CODE WAS 04. DATE yy.ddd - TIME hh:mm:ss
SEQUENCE NUMBER nnnnnn.

GIM23913W LINK-EDIT PROCESSING FOR SYSMOD JMQ416A WAS
SUCCESSFUL FOR MODULE xxxxxxxx IN LMOD xxxxxxxx IN THE
SASMMOD2 LIBRARY.
THE RETURN CODE WAS 04.  DATE yy.ddd -- TIME hh:mm:ss --
SEQUENCE NUMBER xxxxxx --.

IEW2609W 5104 SECTION xxxxxxx USABILITY ATTRIBUTE OF REUSABLE
CONFLICTS WITH REQUESTED USABILITY OF REFRESHABLE.
```

8.2.2.16.3 Messages expected during Future Function APPLY

The APPLY for IBM Knowledge Center for z/OS completes with an overall return code of 0.

8.2.2.16.4 Messages expected during IBM z/OS Change Tracker APPLY

The APPLY for IBM z/OS Change Tracker completes with an overall return code of 0.

8.2.2.17 Additional messages expected during Wave 1G APPLY

Successful APPLY processing of Wave 1G returns a condition code of 0 or 4. A return code of 4 is expected if any of the messages documented in the following sections are received during the APPLY.

8.2.2.17.1 Messages expected during Network File System APPLY

During the APPLY of Network File System, the following messages might be received. This is acceptable if it is the only cause of the return code 4.

```
GIM61903W LMOD yyyyyyyy WAS NOT DELETED BY SYSMOD HDZ331N
BECAUSE yyyyyyyy IS NOT IN THE xxxx ZONE
```

In the message text, *yyyyyyyy* will be one of the following modules and *xxxx* is the name of the target zone.

```
GFSAMAIN  GFSCMAIN  GFSATCPL  GFSATPNL  GFSATPRL  GFSAXOUT
GFSAXPRT  GFSAXSRB  GFSAXTIN  GFSAHFST  GFSALEGT  GFSAXEPL
```

8.2.2.17.2 Messages expected during XML Toolkit for z/OS APPLY

You will receive a return code of 0 if this job runs correctly.

8.2.2.17.3 Messages expected during z/OS Container Extensions for z/OS APPLY

The APPLY for z/OS Container Extensions completes with an overall return code of 0.

8.2.2.17.4 Messages expected during z/OS File System APPLY

During the APPLY for z/OS File System, the following messages might be received; they are acceptable if they are the only reasons for the condition code 4. In the message, *yyyyyy* is HZFS510 and *xxxxxxxx* is one of the following modules:

For HZFS510 IOEZM004, IOEZM006, IOEZM007

```
GIM61903W LMOD xxxxxxxx WAS NOT DELETED BY SYSMOD yyyyyy
BECAUSE IT IS NOT IN THE target ZONE
```

8.3 Step 3: Install Wave 2 Elements

You must install the level of JES2 and SDSF shipped in the current z/OS release before performing the IPL of the z/OS system. If you plan to use SDSF and JES2, install FMIDs HQX77E0, HJE77E0, and JJE77EJ (if ordered).

You can install JES2 and SDSF by using the SMP/E RECEIVE, APPLY, and ACCEPT commands. For details about SMP/E, see the appropriate SMP/E books.

Note: This section uses sample JCL to illustrate installation steps. You can use the SMP/E dialogs instead of JCL.

8.3.1 Prepare to install Wave 2

This step describes the preparation work required before doing the APPLY. All examples follow the recommended installation sequence.

Reminders before You Begin

Use the following list to be sure you have completed the required planning tasks:

__ If you are installing JES2 in a sysplex, ensure you understand the sysplex software and hardware requirements before installing JES2. See *z/OS Planning for Installation*, for more information.

__ If you are installing JES2 in a MAS configuration or a network environment, ensure you understand the coexistence considerations prior to installing JES2. See *z/OS Upgrade Workflow* for additional information.

__ Check the PSP bucket, as described in 3.2, “Preventive Service Planning (PSP)” on page 15.

__ Ensure your system meets the requirements for hardware, software, and coexistence considerations described in *z/OS Planning for Installation*.

__ See the description of fallback considerations in *z/OS Planning for Installation*.

__ Before you install SDSF in z/OS 3.1, ensure that the SYSLIB concatenation in the target zone has been updated to include the SDSF target library SISFMAC and the SYSLIB concatenation in the DLIB zone has been updated to include library AISFMAC. If the SYSLIB concatenation does not include these two libraries, the installation of SDSF will fail. See 7.4.2.1, “Update SMP/E Entries” on page 61 for information on target zone SYSLIB concatenation and distribution zone SYSLIB concatenation.

8.3.2 Run the Optional Delete Jobs for Wave 2

When you install the z/OS 3.1 Wave 2 elements, JES2 and SDSF, sample jobs are provided by each of these elements to delete the previous releases of these elements. Running the sample delete jobs for the Wave 2 elements is optional.

8.3.2.1 Run the Optional Delete Job for JES2:

A sample job, HASIDLFN, is provided to delete JES2 releases replaced by the z/OS 3.1 level of JES2. Member HASIDLFN can be found in 'prefix.HJE77E0.F1' (where the 'prefix' is the qualifier specified as the DSPREFIX in the SMP/E Options or the SMPTLIB DDDEF) after SMP/E RECEIVE processing is complete. Copy sample job HASIDLFN, update as required, and run the job. Running the sample delete job is optional. Normal SMP/E APPLY/ACCEPT processing of JES2 (FMID HJE77E0) deletes the previous releases of JES2 (if the optional "dummy" function delete was not performed).

Sample job HASIDLFN will RECEIVE, APPLY, and ACCEPT a function named DM1JES2. During SMP/E processing, the functions deleted by DM1JES2 (and all dependent functions) are removed from the target and distribution zones. After the APPLY and ACCEPT of function DM1JES2 has completed, the previous levels of the JES2 libraries will be empty. The sample job also contains commented steps UCLIN and REJECT. If these steps are uncommented, the job will clean up the CSI zone entries for DM1JES2 along with the entries for the deleted JES2 releases and any associated product HOLDDATA.

During RECEIVE processing of function DM1JES2, a condition code of 4 is expected along with the following message:

```
GIM39701W  SYSMOD DM1JES2 HAS NO ELEMENTS.
```

During APPLY processing of function DM1JES2, a return code of 4 is expected, along with the following messages if USERMOD ASMJES2 had been installed previously (*xxxxxxx* will be multiple module names)

```
GIM44502W  CHANGES FOR THE FOLLOWING USERMODS WILL BE LOST BECAUSE
           THE ASSOCIATED FUNCTION SYSMOD HAS BEEN DELETED.

GIM44601I  USERMOD ASMJES2 IN MOD xxxxxxx
```

8.3.2.2 Run the Optional Delete Job for SDSF:

Before you install SDSF, you might consider dummy function deleting the prior level of SDSF to decrease installation runtime. You can create a dummy function delete job modeled after HASIDLFN to delete SDSF.

8.3.3 Allocate Target and Distribution Libraries for Wave 2 Elements

Figure 33 on page 116 contains the sample jobs used to allocate and catalog the target and distribution libraries for JES2 and SDSF. To use a sample job, copy the job and customize it as required for your installation. The table contains the following fields.

Job Name Name of the sample job to be run.
Job Type Type of job that is to be run.
Description Element name for which the job is to be run.
RELFILE Identifies the location of the sample job.

Note: If you are installing on a clone of the system, many of these data sets should already exist.

Figure 33. Wave 2 Allocate Sample Installation Jobs

Job Name	Job Type	Description	RELFILE
HASIALC	ALLOCATE	JES2	'prefix.HJE77E0.F1'
ISFISALC	ALLOCATE	SDSF	'prefix.HQX77E0.F2'

Note:

- The 'prefix' is the qualifier specified as the DSPREFIX in the SMP/E Options or the SMPTLIB DDDEF.
- If you specify a volume for any data set in the allocate job, you must also specify the same volume in the corresponding DDDEF entry in the DDDEF job (see Figure 35 on page 117).

The sample job specifies the storage requirements in blocks. You can use the storage allocations as they are, or convert them to cylinder or track allocations. Refer to Appendix C, "DASD Storage Requirements Tables" on page 275 for the appropriate DASD storage requirements.

After the sample allocate jobs are run, verify the condition code is 0 and check the allocation messages to ensure all libraries were successfully allocated.

8.3.4 Set up File System Directories for Wave 2

You must create the required directories in the root file system for the target system before installing SDSF, if the directories required for installation of SDSF do not exist. You can create the directories by running the sample jobs listed in Figure 34 on page 117. The following fields are represented.

Job Name Name of the job that is to be run.
Job Type Type of job that is to be run.
Description Element name for which the job is to be run.
RELFILE Identifies the location of the sample job.

Figure 34. Wave 2 Define Directories Sample Installation Jobs

Job Name	Job Type	Description	RELFILE
ISFISMKD	MKDIR	SDSF	'prefix.HQX77E0.F2'

Notes:

1. The 'prefix' is the high-level qualifier value specified as the DSPREFIX value in the SMPTLIB DDDEF or the OPTIONS entry of the global zone.
2. After the above job is run, the expected return code is 0.

8.3.5 Define DDDEFs for Wave 2 Elements

Figure 35 on page 117 contains the sample jobs used to create the DDDEFs for the target and distribution data sets. To use a sample job, copy the job and customize it as required for your installation. You only need to run these jobs if any of the DDDEF entries do not exist. The following fields are represented.

Job Name Name of the sample job to be run.
Job Type Type of job that is to be run.
Description Element name for which the job is to be run.
RELFILE Location of the sample job.

Figure 35. Wave 2 DDDEF Sample Installation Jobs

Job Name	Job Type	Description	RELFILE
HASIDDEF	DDDEF	JES2	'prefix.HJE77E0.F1'
ISFISDDD	DDDEF	SDSF	'prefix.HQX77E0.F2'

Notes:

1. The 'prefix' is the qualifier specified as the DSPREFIX in the SMP/E Options or the SMPTLIB DDDEF.
2. For the elements in the above table, if you specify a volume for any dataset in the DDDEF job, you must also specify the same volume in the corresponding allocate entry in the allocate job (see Figure 33 on page 116).

If you are installing Wave 2 elements in target and distribution zones that contained a previously installed release, you must replace the existing DDDEF entries for the JES2 and SDSF libraries of previous releases with the DDDEF entries for the libraries of current release.

If you use sample job HASIDDEF or ISFISDDD to replace the existing DDDEF entries, you must change the ADD to REP in the sample job before running the job.

A condition code of 0 is expected if the DDDEF entries are successfully added to the SMP/E CSI when the sample jobs are run.

8.3.6 Set High Level Assembler Option for JES2

For JES2 to assemble correctly, set the SMP/E Global Utility ASMA90 options in the GLOBAL zone in the SMP/E CSI that is used for the installation of the z/OS release as follows:

- GOFF
- LIST(133)
- DECK
- NOOBJECT

In addition, you must do one of the following actions:

- Specify a unique output file using the print operand - for example, PRINT(ASMPRINT) - and create a DDDEF in the target and DLIB zones for ASMPRINT, specifying SYSOUT
- Add the following JCL DD card to the APPLY jobs:

```
//SYSPRINT DD SYSOUT=*,LRECL=133,RECFM=FBA
```

8.3.7 APPLY Wave 2

The following sections describe the steps needed to APPLY Wave 2.

8.3.7.1 Do an SMP/E APPLY CHECK for Wave 2: Run an APPLY CHECK to identify any requisite service, and additional holds (for example, HOLDSYS(DOC)), that may 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 36 on page 119 shows a sample APPLY CHECK for the functions specified in the SELECT operand, plus received PTFs that are applicable only to the FMIDs listed in the FORFMID.

```
//CHECK JOB <job parameters>
//STEP1 EXEC PGM=GIMSMP,REGION=0M,TIME=NOLIMIT
//STEPLIB DD DSN=SYS1.MIGLIB,DISP=SHR,
//         UNIT=SYSALLDA,VOL=SER=v31vol1
//        DD DSN=ASM.SASMMOD1,DISP=SHR,
//         UNIT=SYSALLDA,VOL=SER=v31vol1
//SMPCSI DD DSN=zos31.global.csi,DISP=SHR
//SMPCNTL DD *
  SET BOUNDARY(targetzone)
      OPTIONS(ZOSOPT) .
  APPLY CHECK  XZREQ
        FORFMID(HJE77E0,HQX77E0,
                JJE77EJ)  /* If not ordered, remove */
        SELECT(HJE77E0,HQX77E0,
                JJE77EJ)  /* If not ordered, remove */
  SOURCEID(ZOS31,RSU*)
  FIXCAT(IBM.ProductInstall-RequiredService)
  GROUPEXTEND(NOAPARS,NOUSERMODS)
  BYPASS(HOLDSYSTEM,HOLDUSER,
  HOLDCLASS(ERREL,UCLREL,HIPER)) .
/*
```

Figure 36. SMP/E APPLY CHECK for Wave 2 (all FMIDs and All Service)

Note: ZOSOPT is the option name for z/OS.

Required Updates

1. Update the job parameters.
2. Either remove the STEPLIB (if you are using the Wave 1 target system to install Wave 2) or update the v31vol1 with the volume serial number for the MIGLIB and the SASMMOD1 libraries which were the targets of the Wave 0 install. This will allow you to access the z/OS 3.1 level of the Wave 0 elements using the STEPLIB DD statements.
3. Replace the CSI name on the SMPCSI DD statement with your CSI name.
4. Update targetzone to your target zone name.
5. The XZREQ operand only needs to be specified when cross-zone processing is required.

Note that if you BYPASS(HOLDCLASS(HIPER)), you should run the SMP/E REPORT ERRSYSMODS command to identify missing HIPER HOLDs before putting your system into production.

If you do not BYPASS(HOLDCLASS(HIPER)), the FMIDs may not be installed if any of the HIPER maintenance is unavailable.

Any messages other than those listed in 6.7, “Step 6: Review General Installation Notes” on page 43 or listed below should be investigated.

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 messages will be received, which are 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.

GIM20501I APPLY PROCESSING IS COMPLETE.
THE HIGHEST RETURN CODE WAS 04.
```

Successful APPLY CHECK processing of JES2 and SDSF returns a condition code of 0.

8.3.7.2 Do an SMP/E APPLY for Wave 2:

Do not specify ASSEM on the APPLY command for JES2. The specification of ASSEM on the APPLY command can cause serviceability problems.

Be certain that all exception conditions have been satisfied before adding a BYPASS(HOLDSYSTEM) during the SMP/E APPLY step.

Figure 37 on page 121 shows a sample APPLY for the functions specified in the SELECT operand, plus received PTFs that are applicable only to the FMIDs listed in the FORFMID.

```
//APPLY JOB <job parameters>
//STEP1 EXEC PGM=GIMSMP,REGION=0M,TIME=NOLIMIT
//STEPLIB DD DSN=SYS1.MIGLIB,DISP=SHR,
//        UNIT=SYSALLDA,VOL=SER=v31vol1
//        DD DSN=ASM.SASMMOD1,DISP=SHR,
//         UNIT=SYSALLDA,VOL=SER=v31vol1
//SMPCSI DD DSN=zos31.global.csi,DISP=SHR
//SMPCNTL DD *
  SET BOUNDARY(targetzone)
      OPTIONS(ZOSOPT) .
  APPLY  XZREQ
        FORFMID(HJE77E0,HQX77E0,
                JJE77EJ)  /* If not ordered, remove */
        SELECT(HJE77E0,HQX77E0,
               JJE77EJ)   /* If not ordered, remove */
  SOURCEID(ZOS31,RSU*)
  FIXCAT(IBM.ProductInstall-RequiredService)
  BYPASS(HOLDSYSTEM,HOLDUSER,
  HOLDCLASS(ERREL,UCLREL,HIPER))
  GROUPEXTEND(NOAPARS,NOUSERMODS)
  COMPRESS(ALL) .
/*
```

Figure 37. SMP/E APPLY for Wave 2 (FMIDs and All Service)

Note: ZOSOPT is the option name for z/OS.

Required Updates

1. Update the job parameters.
2. Either remove the STEPLIB (if you are using the Wave 1 target system to install Wave 2) or update the v31vol1 with the volume serial number for the MIGLIB and the SASMMOD1 libraries which were the targets of the Wave 0 install. This will allow you to access the z/OS 3.1 level of the Wave 0 elements using the STEPLIB DD statements.
3. Replace the CSI name on the SMPCSI DD statement with your CSI name.
4. Update targetzone to your target zone name.
5. The XZREQ operand only needs to be specified when cross-zone processing is required.

Note that if you BYPASS(HOLDCLASS(HIPER)), you should run the SMP/E REPORT ERRSYSMODS command to identify missing HIPER HOLDs before putting your system into production.

If you do not BYPASS(HOLDCLASS(HIPER)), the FMIDs may not be installed if any of the HIPER maintenance is unavailable.

Any messages other than those listed in 6.7, “Step 6: Review General Installation Notes” on page 43 or those listed below should be investigated.

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 messages will be received, which are 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.

GIM20501I APPLY PROCESSING IS COMPLETE.
THE HIGHEST RETURN CODE WAS 04.
```

Successful APPLY processing of JES2 and SDSF returns a condition code of 0.

8.4 Step 4: Do Post-APPLY work for Wave 1 and Wave 2

Once you have successfully SMP/E APPLY'd all the Wave 1 elements and Wave 2 elements, you must perform the Post-APPLY activities. Post-APPLY work for Wave 1 and Wave 2 must be run from your **driving** system unless otherwise specified.

Post-APPLY jobs include:

- Wave 1A:
  - Compile MMS data sets
  - Run Post-Apply for Communications Server IP Services
- Wave 1B:
  - There are no Post-APPLY steps for Wave 1B FMIDs.
- Wave 1C:
  - Run Post-APPLY link-edit for FFST
  - Run TSO/E Information Center Facility Post-APPLY ICQPOST1 and ICQPOST2 (when appropriate)
- Wave 1D:

  Cryptographic Services PKI Services:
  - Run sample job to allocate VSAM datasets for runtime use.
  - Run sample REXX exec to define RACF user IDs and profiles.
- General:
  - Run sample job, CLNCRSZ, an SMP/E REPORT CROSSZONE

Note: IBM has verified that every product that is now part of z/OS and that supplies CALLLIB'd libraries is upwardly compatible. Therefore, a LINK LMODS CALLLIBS is not required.

8.4.1 Wave 1A Post-Installation jobs

8.4.1.1 Compile MMS Data Sets

After installing BCP, if you choose to use the MVS Message Service (MMS) the message files must be compiled into runtime message files. If you will be installing additional elements (such as TSO/E or JES2) into the message files, it is only necessary to compile these message files once. After the installation of the additional products or elements, compilation can begin.

For the MVS message service (MMS) to handle translated messages, your installation must use the MVS message compiler to format and install message files that contain English message skeletons and translated language message skeletons. The following summarizes the steps for providing translated messages:

- Verify the message files are correctly installed on your system.
- Allocate space for each runtime message file. Edit and run the job in member CNLDEFCL to allocate runtime message files. CNLDEFCL is supplied in your SAMPLIB library on the target system after APPLY processing has completed.
- Use the MVS message compiler to format the installation message file into a runtime message file. Edit and run the job in member CNLCOMP to compile and load the runtime message files. CNLCOMP is supplied in your SAMPLIB library on the target system after APPLY processing has completed.
- Create installation exit routines, if needed.
- Create or update the SYS1.PARMLIB members to initialize values for MMS:
  CNLLSTxx define the available languages for message translation. A sample CNLLSTXX is provided in the SYS1.SAMPLIB library.
  CNLcccxx define the date and time formats.
  CONSOLxx specify the CNLLSTxx member in effect for the system.
- Activate MMS.

See the description of how to activate MMS, creating installation exits, and how to handle translated messages in *z/OS MVS Planning: Operations*.

8.4.1.2 Run Post-APPLY for Communications Server IP Services

The following sections describe the post-apply steps for Communications Server IP Services.

8.4.1.2.1 Perform SMP/E LINK for IMS™ module

The Communications Server IP Services IMS sockets interface requires an IMS load module during link-edit. The APPLY for LMOD EZAIMSLN will receive a return code of 0004. After the APPLY, these modules are not executable. At this point, you are required to run a postlink job to make the Communications Server IP Services IMS module be fully resolved. This is accomplished by executing EZAIMSCZ, supplied in *TCPIP*.SEZAINST. The EZAIMSCZ job invokes the LINK function supplied with SMP/E.

EZAIMSCZ performs a cross-zone link-edit. Communications Server IP Services should not be installed into the same SMP/E zone as IMS. SMP/E tracks this cross-zone link and if subsequent IMS maintenance is applied, SMP/E can automatically maintain the affected Communications Server IP Services load modules. For the automatic maintenance to occur, the IMS global zone must contain

zoneindex subentries to the z/OS target and distribution zones and must have an options entry for ZOSOPT. The z/OS TARGETZONE XZLINK entry must be set to AUTOMATIC (it defaults to DEFERRED). See the *z/OS SMP/E Reference* for more information on XZLINK.

Before you submit EZAIMSCZ, your z/OS global zone containing Communications Server IP Services must contain zoneindex subentries for the target and distribution zones containing the IMS libraries. The index entries may be added using SMP/E interactive dialogs or by using JCL and SMP/E statements.

EZAIMSCZ may end with a condition code of 0004 caused by SMP/E warning message:

```
GIM69064W MODULE aaaaaa WILL BE LINK-EDITED
BUT ITS SERVICE LEVEL OR FMID IN THE DISTRIBUTION ZONE IS
DIFFERENT FROM THAT IN THE TARGET ZONE.
```

There are two possible solutions:

1. Investigate and solve the problem indicated by GIM69064.
2. Ignore the return code of 0004.

Complete the following steps:

- Create a ZONEINDEX in the z/OS global zone for the IMS target and distribution zones.
- Create a ZONEINDEX in the IMS global zone for the z/OS target and distribution zones.
- Submit the job and ensure you have a return code of 00.

8.4.2 Wave 1B Post-Installation jobs

There are no post-installation jobs for Wave 1B elements.

8.4.3 Wave 1C Post-Installation jobs

The following sections describe post-installation jobs for Wave 1C elements.

8.4.3.1 Run Post-APPLY Link-Edit for FFST

The Post-APPLY link-edit step might need to be run when maintenance is performed on FFST. Follow the specific instructions in the maintenance being installed. IEW2646W and IEW2651W messages may be generated indicating that there is a mismatch between the RMODE and AMODE values. This is not a problem and these messages can be ignored.

8.4.3.2 Run Post-APPLY for TSO/E Information Center Facility (when appropriate)

To use the Information Center function of TSO/E, you must allocate the data sets listed in Figure 38 on page 125 if they are not present on your system. The attributes for these data sets must conform to the attributes of your ISPF table libraries. The minimum space allocation for each data set is 221 blocks. You may want to allocate more space to allow room for future expansion.

The tables distributed with the Information Center Facility are copied to the data sets in Figure 38 on

page 125 by the ICQPOST1 and ICQPOST2 jobs. These jobs are supplied in your SAMPLIB library on the target system after APPLY processing has completed.

Figure 38. Information Center Facility Data Sets

Data Set	Description
ICQ.ICQABTAB	Course abstracts
ICQ.ICQGCTAB	User requests
ICQ.ICQAATAB	Names
ICQ.ICQANTAB	News
ICQ.ICQTLIB	User enrollment tables
ICQ.ICQAPTAB	Printer support
ICQ.ICQAMTAB	Administrator Application Manager tables
ICQ.ICQCMTAB	User Application Manager tables

Note: New Information Center Facility installations can execute ICQPOST1 and ICQPOST2 to distribute Information Center Facility parts to the appropriate execution libraries. If you are a previous user of the Information Center Facility, and you want to preserve customized data, do not execute the ICQPOST1 and ICQPOST2 jobs. These jobs replace tables that contain current Information Center Facility data for your installation.

8.4.4 Wave 1D Post-Installation jobs

The following section describes post-installation jobs for Wave 1D of the installation process.

8.4.4.1 Run Cryptographic Services PKI Services job

Run IKYCVSAM, the sample job to allocate VSAM data sets for runtime use. Sample job IKYCVSAM can be found in the SAMPLIB library after APPLY processing has completed.

8.4.5 Wave 1E Post-Installation jobs

There are no post-installation jobs for Wave 1E elements.

8.4.6 Wave 1F Post-Installation jobs

There are no post-installation jobs for Wave 1F elements.

8.4.7 Wave 1G Post-Installation jobs

There are no post-installation jobs for Wave 1G elements.

8.4.8 Wave 2 Post-Installation jobs

There are no post-installation jobs for Wave 2 elements.

8.4.9 Wave 1 and Wave 2 general Post-Installation jobs

The following sections describe post-installation jobs for Wave 1 and Wave 2.

8.4.9.1 Run SMP/E REPORT CROSSZONE (Target Zone)

If you did not use automatic cross-zone IFREQ checking when installing z/OS 3.1 Wave 1, you may run sample job CLNCRSZ, and see *z/OS SMP/E Commands*, for information on the SMP/E REPORT CROSSZONE command. For instructions on how to set up cross-zone processing, see 7.3.1, “Create a cross-zone set” on page 54.

8.5 Step 5: Customize Wave 1 and Wave 2

Once you have successfully SMP/E APPLY'd the Wave 1 and Wave 2 elements and performed the Post-APPLY work, you must customize these elements. Customization for Wave 1 and Wave 2 may be run from your **driving** system unless otherwise specified.

It is important that you have read the migration requirements documented in *z/OS Upgrade Workflow*.

8.5.1 Required setup

The following sections describe steps that are required to set up the system.

8.5.1.1 Reassemble stand-alone dump

When you install z/OS 3.1, you must reassemble the stand-alone dump program. For information on stand-alone dump, see *z/OS MVS Diagnosis: Tools and Service Aids*.

8.5.1.2 Complete DFSMSdss actions

If you are enabling DFSMSdss, ensure that the following tasks are completed.

If you intend to use the DFSMSdss stand-alone services, use the DFSMSdss BUILDSA function to build the IPLable stand-alone services core image. Perform this step after DFSMSdss is installed and accepted by SMP/E. Stand-alone services supports the following tape subsystems:

- 3494 Enterprise Automated Tape Library
- 3495 Enterprise Automated Tape Library
- 3590 Enterprise Tape Subsystem

Restriction: Stand-alone services does not allow you to create the core image on an SMS-managed volume.

Perform the following Migration Actions:

1. Prepare for stand-alone services by creating an IPLable core image with the BUILDSA command. You can specify the device (card reader,tape drive, or DASD volume) from which stand-alone services are IPLed. You also can specify the operator console to be used for stand-alone services.
2. Use RACF or another security product to protect the SYS1.ADR.SAIPLD.Vvolser data set and for the stand-alone services modules.
3. Make a backup copy of your system that can be restored by this function.

For the procedure, see the chapter in *z/OS DFSMSdss Storage Administration*, entitled "Managing Availability with DFSMSdss", specifically the section, "Backing up Volumes". For details, see *z/OS DFSMSdfp Storage Administration*.

8.5.1.3 Write new IPL TEXT

You must run IPLTEXT to write a new copy of the IPL text before IPLing your newly built z/OS system. When using the REFORMAT command with the IPLDD parameter to write IPL Text on a volume, if IPL Text already exists, message ICK21836D is issued which requires a reply before the existing text can be overlayed.

```
ICK21836D IPL TEXT EXISTS ON volid. REPLY U TO OVERLAY, ELSE T.
```

If you wish to suppress the message ICK21836D, you can specify the IPLTXTEXIST parameter with REFORMAT command.

```
//IPLTEXT  JOB <job parameters>
//*MESSAGE AUTHORIZE IPLTEXT UPDATE FOR volser(JES2 user)
//STP1   EXEC PGM=ICKDSF,REGION=0M
//SYSPRINT DD SYSOUT=*
//IVOL DD VOL=SER=volser,UNIT=SYSALLDA,DISP=SHR
//SAMPLIB DD DSN=SYS1.SAMPLIB(IPLRECS),DISP=SHR,UNIT=SYSALLDA,
//           VOL=SER=vvvvvv
//        DD DSN=SYS1.SAMPLIB(IEAIPL00),DISP=SHR,UNIT=SYSALLDA,
//           VOL=SER=vvvvvv
//SYSIN DD *
 REFORMAT DDNAME(IVOL) VERIFY(volser) IPLDD(SAMPLIB,OBJ) -
 BOOTSTRAP
/*
```

Figure 39. Sample JCL for Writing the IPL Text

Required Updates

1. Update the *job parameters*.
2. Replace *vvvvvv* to your volume.
3. Replace *volser* to your IPL volume.

8.5.1.4 Create and update your IODF

IODFs created on prior z/OS releases can be used to IPL z/OS 3.1. For more information on IODF compatibility and how to create an IODF, see *z/OS HCD User's Guide*. If you are migrating to HCD, have OEM processor definitions in your current IODF, and have not received instruction from your OEM vendor, you should contact your IBM account team for additional information from the HCD development group. This, however, only applies to OEM processors that have been defined in the IODF using a non-IBM processor type/model.

8.5.2 PARMLIB member considerations

After z/OS 3.1 is installed, you must tailor the system to meet your installation's needs. You will need to review, modify, and create entries in SYS1.PARMLIB, SYS1.PROCLIB, and SYS*n*.IPLPARM. Some functions of z/OS 3.1, such as APPC/MVS, require that you copy (and possibly modify) members from SYS1.SAMPLIB for use in other libraries.

z/OS provides the capability to concatenate up to ten additional data sets to SYS1.PARMLIB at IPL, creating a “logical PARMLIB.” A logical PARMLIB is a concatenation of parameter libraries that can be accessed through a set of system services. The concatenation is defined in the LOAD*xx* PARMLIB member at system initialization but can be changed later with a SET command. Programs that use these services can access PARMLIB members without being aware of which data sets actually comprise the concatenation. You can use separate PARMLIB data sets to isolate IBM-supplied and SMP/E-supported members from locally customized members. For information on PARMLIB concatenation, see *z/OS MVS Initialization and Tuning Reference*.

SMP/E installation places a number of members in the PARMLIB pointed to by the PARMLIB DDDEF in your target zone, or the PARMLIB DD statement in your SMP/E procedure. This PARMLIB data set is a copy of your production PARMLIB, as described in 6.1, “Overview for the Clone of Your System” on page 31. Before IPLing your production system, you must do one of the following:

1. Concatenate the PARMLIB referenced by the SMP/E DDDEF.
2. Copy the members that SMP/E installed into your production PARMLIB concatenation.
3. Update your existing members to reflect any needed changes.

The following is a complete list of PARMLIB members that were shipped with the exclusive element FMIDs when this program directory was written. It is possible that a PTF could add or change a PARMLIB member, so you should also check the Element Summary Report in your SMP/E APPLY output

for any new elements with a type of ++PARM to ensure that this list is complete when you perform your installation.

For a list of all samples used in PARMLIB and shipped in SYS1.SAMPLIB, refer to Figure 41 on page 130.

8.5.2.1 What is new for z/OS 3.1:

For a summary of PARMLIB changes in this release, see *z/OS MVS Initialization and Tuning Reference*.

8.5.2.2 z/OS 3.1 PARMLIB members:

Figure 40 on page 129 shows the SMP/E supported PARMLIB members that are installed directly into SYS1.PARMLIB.

Figure 40. PARMLIB Members Installed Directly in SYS1.PARMLIB

ADYSET00	ADYSET01	ADYSET02	ANTFTSO	ANTIMAIM	ANTMIN00
ANTPTSO	ANTXIN00	ANTXTSO	ASAIPCSP	ASBIPCSP	ATBIPCSP
AUTOR00	BHIIPCSP	BLSCECT	BLSCECTX	BPXIPCSP	CEAPRM00
CEEIPCSP	CLOCK00	CNLENU00	CNLJPN00	COFDLF00	COFIPCSP
COFVLF00	COUPLE00	CSFIPCSP	CTIAXR00	CTIBPX00	CTIBPX01
CTICBR00	CTICEA00	CTICSF00	CTIDMD00	CTIDMP00	CTIEZBTN
CTIEZB00	CTIGLZ00	CTIGRS00	CTIHWI00	CTIHZS00	CTIIDS00
CTIIEAVX	CTIIEFAL	CTIIKE00	CTIITT00	CTIJES01	CTIJES02
CTIJES03	CTIJES04	CTILOG00	CTINFC00	CTINFS00	CTINSS00
CTINTA00	CTIOPS00	CTIORA00	CTIRES00	CTIRSMSP	CTIRSM01
CTISMS00	CTIXCF00	CTIXES00	DIAG0000	DIAG01	DIAG02
ERBRMF00	ERBRMF01	ERBRMF02	ERBRMF03	ERBRMF04	ERBRMF05
EZAIPCSP					
GLZIPCSP	GPMSRV00	GRSCNF00	GRSRNL00	GTFPARM	GTZPRM00
GXLIPCSP	HASLIPCS	HZSPRM00	IARIPCSP	IAXIPCSP	IAZIPCSP
ICHIPCSP	IDAVDT00	IEAABD00	IEACMD00	IEADMP00	IEADMR00
IEAIPCSP	IEAOPT00	IEAPAK00	IEASLP00	IEAVIPCS	IEFIPCSA
IEFIPCSI	IEFIPCST	IEFOPZ01	IEFSSN00	IGWIPCSP	IPCSPR00
ISGIPCSP	IXCIPCSP	IXGIPCSP	IXLIPCSP	IXZIPCSP	

Attention

If you do not make necessary changes to SYS1.PARMLIB, SYS1.PROCLIB, and SYS*n*.IPLPARM, the system might not initialize or run successfully. For example:

- If you do not create a LOAD*xx* PARMLIB member, your system will not IPL.
- If the copies of BLSCECT and all the other IPCS PARMLIB members used on your production system are not current, IPCS might fail when you attempt to use it.

When you migrate to z/OS 3.1, you must complete certain actions before loading the initial program for the z/OS 3.1 target system. For a complete description of all changes needed for a migration, see *z/OS Upgrade Workflow*.

For information on PARMLIB members, see *z/OS MVS Initialization and Tuning Reference*.

Figure 41 on page 130 describes the PARMLIB updates that are recommended for z/OS 3.1. For additional information on PARMLIB considerations, see the individual elements' customization books and *z/OS MVS Initialization and Tuning Guide*. The PARMLIB members shown are for example only. Be sure to change the high-level qualifier of the data sets to match your installation.

Figure 41 (Page 1 of 11). PARMLIB Updates

PARMLIB Member	TEXT	Element Name
APPCPM*xx*	See SAMPLIB members APPCPMRX and APPCPMXX.	BCP
ASCHPM*xx*	See SAMPLIB members ASCHPMRX and ASCHPMXX.	BCP
AXR00	See SAMPLIB member AXR00.	BCP
BPXPRM*xx*	FILESYSTYPE TYPE(ZFS) ENTRYPOINT(IOEFSCM)	BCP (see note)
Notes: 1. The FILESYSTYPE statement allows you to mount a ZFS which is needed in Wave 1 and Wave 2.		
COFVLF*xx*	CLASS NAME(CSVLLA) EMAJ(LLA)	BCP
	CLASS NAME(IRRGTS) EMAJ(GTS) CLASS NAME(IRRGMAP) EMAJ(GMAP) CLASS NAME(IRRSMAP) EMAJ(SMAP) CLASS NAME(IRRUMAP) EMAJ(UMAP) CLASS NAME(IRRACEE) EMAJ(ACEE)	RACF (see note)
Note: The RACF sample is provided in member RACPARM of SAMPLIB.		

Figure 41 (Page 1 of 11). PARMLIB Updates

PARMLIB Member	TEXT	Element Name
COMMND*xx*	COM='S EPWFFST.FFST,SUB=MSTR'	FFST (see note 1)
	COM='S EZAZSSI,P=nodename'	Communications Server IP Services
	COM='S RMF.RMF,,,MEMBER(00)'	RMF
	COM='S SDSF'	SDSF (see note 2)
	COM='S ICEOPT,ICEPRM=xx' COM='S ICEOPT,ICEPRM=(x1,...,xn)'	DFSORT (see note 3)

Notes:

1. Start procedure FFSTPROC contains DD statements for SYSPRINT and SYSABEND that contain SYSOUT=A. If you want FFST to be started by the master scheduler, change the DD statements for SYSPRINT and SYSABEND so that they contain data set information.
2. Use the 'S SDSF' command to start the SDSF server whenever the system is IPLed. The SDSF server must be active on every system for which SDSF is to display data since z/OS V2R5.
3. You can use the 'S ICEOPT,ICEPRM=xx' command to activate an ICEPRMxx member that contains changes to the installation defaults of DFSORT. You can use the 'S ICEOPT,ICEPRM=(x1,...,xn)' command to activate multiple ICEPRMxx members that contain changes to the installation defaults of DFSORT. See *z/OS DFSORT Installation and Customization* for details.

CTI*xxxxx*	Default PARMLIB members provided: CTIAXR00, CTIBPX00, CTIBPX01, CTICEA00, CTIDMP00, CTIGRS00, CTIHWI00, CTIHZS00, CTIIEAVX, CTIIEFAL, CTIITT00, CTIJES01, CTIJES02, CTIJES03, CTIJES04, CTILOG00, CTIOPS00, CTIRSMSP, CTIRSM01, CTIXCF00, CTIXES00	BCP
	Default PARMLIB member provided: CTICBR00 CTISMS00	DFSMS
	Default PARMLIB members provided: CTIDMD00, CTIEZBTN, CTIEZB00, CTIIDS00, CTIIKE00, CTINSS00, CTINTA00, CTIORA00, CTIRES00	Communications Server IP Services
	Default PARMLIB members provided: CTINFC00 (for NFS Client), CTINFS00 (for NFS Server)	NFS
	Default PARMLIB members provided: CTICSF00	Cryptographic Services ICSF
CYGPARMS	Default PARMLIB member for IBM z/OS Change Tracker	IBM z/OS Change Tracker
ERBRMF*xx*	Default PARMLIB members provided: ERBRMF00, ERBRMF01, ERBRMF02, ERBRMF03, ERBRMF04, ERBRMF05	z/OS Data Gatherer
GPMSRV*xx*	Default PARMLIB member GPMSRV00 provided for RMF Distributed Data Server.	RMF
GTZPRM00	Recommended PARMLIB member GTZPRM00 provided for IBM Generic Tracker for z/OS	BCP

Figure 41 (Page 2 of 11). PARMLIB Updates

PARMLIB Member	TEXT	Element Name
HZSPRM00	Default PARMLIB member HZSPRM00 provided for IBM Health Checker for z/OS	BCP
*xxx*IPCSP	Default PARMLIB members: ASAIPCSP, ASBIPCSP, ATBIPCSP, BHIIPCSP, BPXIPCSP, COFIPCSP, GXLIPCSP, IARIPCSP, IAXIPCSP, IAZIPCSP, IEAIPCSP, IEAVIPCS, IEFIPCSA, IEFIPCSI, IEFIPCST, ISGIPCSP, IXCIPCSP, IXGIPCSP, IXLIPCSP, IXZIPCSP	BCP
	Default PARMLIB member: EZAIPCSP	Communications Server IP Services
	Default PARMLIB member: IGWIPCSP	DFSMS
	Default PARMLIB member: CSFIPCSP	Cryptographic Services ICSF
	Default PARMLIB member: HASLIPCS	JES2
	Default PARMLIB member: CEEIPCSP	Language Environment
	Default PARMLIB member: ICHIPCSP	RACF
	Copy member from SISFJCL: ISFIPCSP	SDSF
IEASYS*xx*	Update suffixes as required to specify updated PARMLIB members OMVS=xx. OMVS=xx specifies BPXPRMxx parmlib member.	z/OS UNIX System Services
Note: The OMVS parameter specifies the PARMLIB member or members to use to locate the PARMLIB statements to configure the z/OS UNIX System Services kernel.		
IECIOSxx	`MIH TIME=mm:ss,DEV=(dddd-dddd)`	Communications Server IP Services
Note: Update IECIOSxx with the ranges of addresses used on the Communication devices. For a description of the appropriate advice with respect to MIH, see *z/OS Communications Server: IP Configuration Reference*		

Figure 41 (Page 3 of 11). PARMLIB Updates

PARMLIB Member	TEXT	Element Name
IEFSSN*xx*	SUBSYS SUBNAME(JES2) PRIMARY(YES) START(YES) SUBSYS SUBNAME(IRLM) SUBSYS SUBNAME(JRLM)	BCP (see note 1)
	SUBSYS SUBNAME(SMS) INITRTN(IGDSSIIN) INITPARM('ID=xx,PROMPT=DISPLAY') SUBSYS SUBNAME(OAM1) INITRTN(CBRINIT)	DFSMS (see note 3) (see note 4)
	SUBSYS SUBNAME(FFST)	FFST
	SUBSYS SUBNAME(RACF) INITRTN(IRRSSI00) INITPARM('%,X')	RACF (see note 2)
	SUBSYS SUBNAME(TNF) SUBSYS SUBNAME(VMCF) or TNF VMCF	Communications Server IP Services

Notes:

1. The BCP member is provided in member IEFSSN00 of PARMLIB.
2. An additional RACF sample is provided in member RACPARM of SAMPLIB.
3. where xx refers to your IGDSMSxx member of PARMLIB. See *z/OS MVS Initialization and Tuning Reference* for more information about IEFSSNxx.
4. The OAM1 subsystem is used by OAM to store unstructured (object) data and is also used by OAM in support of system-managed tape.

Figure 41 (Page 4 of 11). PARMLIB Updates

PARMLIB Member	TEXT	Element Name
IFAPRD*xx*	To define the enablement policy for base elements and features. For details, see 8.5.2.3, "IFAPRDxx considerations" on page 140.	XL C/C++ DFSMSdss DFSMShsm DFSMSrmm DFSMStvs DFSORT GDDM-PGF (*) GDDM-REXX HCM HLASM Toolkit (*) Infoprint Server Communications Server IP Services Communications Server IP Services CICS Sockets Communications Server IP Services IMS Sockets IBM z/OS Change Tracker SDSF RMF Security Server RACF Restricted Use Common Service Area (RUCSA) zEnterprise Data Compression (zEDC) z/OS Advanced Data Gatherer

Notes:

- (*) indicates the element may register as a z/OS 3.1 feature or as a stand-alone product.
- Communications Server IP Services is the element name for TCP/IP, but the name entry for TCP/IP remains unchanged in the IFAPRDxx member.
- IFAPRD00 is built by CBPDO RIMLIB job ZOSREG.

IGDSMS*xx*	`SMS ACDS(sys1.xxx.ACDS)` `COMMDS(sys1.xxx.COMMDS)`	DFSMS (see note below)

Note: `sys1.xxx.ACDS` is the name of your Active Control Dataset and `sys1.xxx.COMMDS` is the name of your Communications data set. See *z/OS MVS Initialization and Tuning Reference* for more information about IGDSMSxx.

Figure 41 (Page 5 of 11). PARMLIB Updates

PARMLIB Member	TEXT	Element Name
IKJTSO*xx*	AUTHCMD NAMES(BINDDATA BDATA EXPORT EXP IMPORT IMP LISTD LISTDS LISTDATA LDATA PRINT REPRO RMM SETCACHE SETC SHCDS VERIFY VFY	DFSMS
	AD ADDSD AG ADDGROUP AU ADDUSER ALG ALTGROUP ALD ALTDSD ALU ALTUSER BLKUPD CO CONNECT DD DELDSD DG DELGROUP DU DELUSER IRRDPI00 LD LISTDSD LG LISTGRP LU LISTUSER RACDCERT RACLINK RACMAP RACPRIV RALT RALTER RDEF RDEFINE RDEL RDELETE RE REMOVE RL RLIST RVARY PASSWORD PW PHRASE PE PERMIT SETR SETROPTS SR SEARCH	RACF

Figure 41 (Page 6 of 11). PARMLIB Updates

PARMLIB Member	TEXT	Element Name
IKJTSO*xx* (continued)	LPQ LPR LPRM MODDVIPA MVPXDISP PING RSH TRACERTE	Communications Server IP Services
	ADYOPCMD CONSPROF LISTB LISTBC IKJPRMLB PARMLIB RACONVRT RECEIVE SE SEND SYNC TESTAUTH TESTA TRANSMIT XMIT)	TSO/E
	AUTHPGM NAMES(	
	AOPCMND	Infoprint Server
	CSFDAUTH CSFDPKDS	Cryptographic Services ICSF
	EDGAUD EDGBKUP EDGHSKP EDGRPTD EDGUPDT EDGUTIL	DFSMS RMM
	GIMSMP	SMP/E
	ICHDSM00 IRRDPI00 IRRUT100 IRRUT200 IRRUT400 IRRXUTI2	RACF
	IOEAGFMT IOEAGSLV IOEFSUTL IOEZADM)	z/OS File System (see note below)

Figure 41 (Page 7 of 11). PARMLIB Updates

PARMLIB Member	TEXT	Element Name
IKJTSO*xx* (continued)	AUTHTSF NAMES(	
	CSFDAUTH CSFDPKDS	Cryptographic Services ICSF
	EDGAUD EDGBKUP EDGHSKP EDGRPTD EDGUPDT EDGUTIL	DFSMS RMM
	GIMSMP	SMP/E
	ICQASLI0 IKJEFF76)	TSO/E
Note: The following updates specifically apply to the support listed below: **zFS** IOEAGSLV, IOEAGFMT, IOEFSUTL, IOEZADM		
Note: For more information on using IKJTSO*xx*, see *z/OS MVS Initialization and Tuning Reference*. See *z/OS MVS Initialization and Tuning Guide* for information on specifying HELP data sets in IKJTSO*xx*. The commands in the IKJTSO*xx* PARMLIB member should be modified as required for your installation. The entries shown in this table for the IKJTSO*xx* PARMLIB member are the recommended values at the time this program directory was written. For the latest information, refer to the sample IKJTSO00 member in SYS1.SAMPLIB after the product is installed.		
IRROPT*xx*	ALLOCATE FILE(SYSUT1) DATASET ('SYS1.SAMPLIB(IRRDPSDS)') IRRDPI00 UPDATE FREE FILE(SYSUT1)	RACF
ISFPRM*xx*	Copy members ISFPRM00, ISFPRM01 from SISFJCL.	SDSF
Note: By default, SDSF reads the ISFPRMxx members from SYS1.PARMLIB and any data set concatenated to PARMLIB. ISFPRM00 is the default unless overridden on the start command or changed in the JCL. You can use a different partitioned data set by adding it to the server JCL using ddname SDSFPARM. ISFPARMS support is removed in z/OS 3.1 and only the ISFPRMxx PARMLIB member format will be supported.		
IVTPRM00	Default PARMLIB member IVTPRM00 is provided. For details, see *z/OS Communications Server: New Function Summary*.	Communications Server for z/OS SNA Services
IZUPRM*xx*	See SAMPLIB member IZUPRM00	IBM z/OS Management Facility (z/OSMF)

Figure 41 (Page 8 of 11). PARMLIB Updates

PARMLIB Member	TEXT	Element Name
LNKLST*xx* or PROG*xx*	SYS1.CMDLIB	BCP, DFSMS, TSO/E
	CBC.SCCNCMP	XL C/C++ without Debug Tool
	CBC.SCLBDLL CBC.SCLBDLL2	Runtime Library Extensions
	SYS1.SICELINK	DFSORT
	SYS1.SEPWMOD2	FFST
	SYS1.SEPWMOD3	FFST
	GDDM.SADMMOD	GDDM
	ASM.SASMMOD1	HLASM
	TCPIP.SEZALOAD	Communications Server IP Services
	CYG.SCYGLNK	IBM z/OS Change Tracker
	ISP.SISPLOAD	ISPF
	SYS1.SHASLNKE SYS1.SHASMIG	JES2
	CEE.SCEERUN CEE.SCEERUN2	Language Environment
	REXX.SEAGALT	Alternate Library for REXX
	SYS1.SERBLNKE	RMF
	SYS1.SGRBLINK	z/OS Data Gatherer
	ISF.SISFLOAD	SDSF
	SYS1.DFQLLIB	ISMF
	SYS1.DGTLLIB	ISMF
	SYS1.SGIMLMD0	SMP/E
Notes: • If the LNKAUTH parameter in the IEASYS*xx* member of SYS1.PARMLIB does not specify LNKLST, you must add these data sets to the APF table to make them APF-authorized. See *z/OS MVS Initialization and Tuning Guide* for more information. • See 8.5.2.5, “LNKLSTxx considerations” on page 143.		
LOAD*xx*	For detailed information, see *z/OS MVS Initialization and Tuning Reference*.	BCP
Note: Parmlib symbolic preprocessor can be used to set up and validate the new LOAD*xx* PARMLIB member.		

Figure 41 (Page 9 of 11). PARMLIB Updates

PARMLIB Member	TEXT	Element Name
LPALST*xx*	SYS1.SICELPA SYS1.SORTLPA (see note 3)	DFSORT
	TCPIP.SEZALPA	Communications Server IP Services
	CYG.SCYGLPA	IBM z/OS Change Tracker
	ISP.SISPLPA	ISPF
	CEE.SCEELPA (see note 1)	Language Environment
	ISF.SISFLPA (see note 2) ISF.SISFLOAD	SDSF
	SYS1.SDWWDLPA	DFSMS
	SYS1.SGRBLPA	z/OS Data Gatherer

Notes:

1. CEE.SCEELPA should be added to LPALSTxx. See 8.5.2.5.1, “Making the Run-time library available” on page 143.
2. To execute SDSF from the link pack area (LPA) for improved performance, add ISF.SISFLOAD in your LPALST*xx* member in SYS1.PARMLIB.
3. To make DFSORT programs available on the system:
   - To make DFSORT resident, load the modules from SORTLPA into the link pack area (LPA) or dynamic LPA, and add SIEALNKE before the SICELINK to the link list.
   - To make DFSORT nonresident, add SIEALNKE before the SICELINK and SORTLPA (in this order) to the link list (this assumes SORTLPA is removed from the LPA list), or use a JOBLIB or STEPLIB for SIEALNKE, SICELINK and SORTLPA (in this order).

   If you want to make DFSORT SVC accessible at IPL, put SICELPA into the LPA or modified link pack area (MLPA).

Figure 41 (Page 10 of 11). PARMLIB Updates		
PARMLIB Member	**TEXT**	**Element Name**
PROG*xx* or IEAAPF*xx*	All LNKLST*xx* (or PROG*xx*) libraries. See item 3 on page 144 in 8.5.2.6, "PROGxx and IEAAPFxx considerations" on page 144.	All
	All STEPLIB or ISPLLIB libraries. See Figure 44 on page 149 for the appropriate data sets.	All
	CSF.SCSFMOD0	Cryptographic Services ICSF
	SYS1.SEPWMOD1	FFST
	TCPIP.SEZATCP TCPIP.SEZALNK2 TCPIP.SEZADSIL	Communications Server IP Services
	SYS1.SIEALNKE	All
	SYS1.SERBLNKE	RMF
	SYS1.SGRBLINK	z/OS Data Gatherer
	SYS1.VTAMLIB SYS1.SISTCLIB	Communications Server for z/OS SNA Services
	SYS1.NFSLIBE	Network File System
	ISF.SISFLOAD	SDSF
Note: See 8.5.2.6, "PROGxx and IEAAPFxx considerations" on page 144.		
SCHED*xx*	The default program properties table, IEFSDPPT, shipped by z/OS 3.1 BCP includes entries for all z/OS elements. Therefore, the SCHED*xx* entries that were previously required by elements are no longer required. See *z/OS MVS Initialization and Tuning Reference* for more details of the specific entries that are defaulted to.	

8.5.2.3 IFAPRDxx considerations:

With z/OS, products can use registration services to determine if they are enabled to run on a particular system. This requires the product be defined appropriately in the enablement policy for the system using the IFAPRD*xx* PARMLIB member.

Note: When the IFAPRD*xx* PARMLIB member is updated, an IPL is required for the Integrated Accelerator for zEDC device driver to recognize the enablement.

Customers must ensure the policy in IFAPRD*xx* enables only that which they are licensed. Use of (and enablement of) z/OS features is subject to the z/OS license terms and conditions and must be done with the knowledge of your asset manager according to the terms and conditions for z/OS. See the Usage Restriction section of the *z/OS Licensed Program Specifications* for additional license terms and conditions.

When you order an IBM product that packages priced optional features with the base product (such as z/OS), IBM supplies a tailored IFAPRD00 PARMLIB member that enables the product and any optional features ordered with the product. Thus, any feature ordered with the product is enabled during installation when you copy the contents of the tailored IFAPRD00 member to an active IFAPRD*xx* member and issue SET command or IPL. If you do not order a feature, it is shipped disabled but you can enable it later. *z/OS MVS Product Management* contains information on how to enable a z/OS feature and how to discontinue use of a feature.

Therefore, you must ensure IFAPRD*xx* is set up properly. CBPDO provides a job, ZOSREG, in the RIMLIB data set to place a tailored IFAPRD00 member into your SYS1.PARMLIB. If you ordered any optional features that use the register service, the STATE statement is set as ENABLED for you to use the product; otherwise the STATE is set as DISABLED. This job must be run before IPL, or the SET command be used if it has been run after the IPL, or some elements and features will not work. Furthermore, if you added any other products to your IFAPRD00 PARMLIB member and they are still applicable, you will need to make those changes to the member built by ZOSREG or use multiple IFAPRD*xx* members.

See *z/OS Planning for Installation* for additional information on enabling z/OS features.

IBM supplies you with a tailored IFAPRD00 parmlib member that has been customized for your order. You should use this IFAPRD00 parmlib member if you have determined from the above information that it is required for your environment.

8.5.2.4 BPXPRMxx updates:

z/OS provides the capability to dynamically add Physical File Systems to a UNIX System Services configuration. SETOMVS RESET=(yy) is a console command designed to be used with a subset of BPXPRMxx parmlib statements. FILESYSTYPE, SUBFILESYSTYPE, NETWORK, and system limits (such as MAXPROCSYS, etc.) can be changed dynamically by issuing SETOMVS RESET=(xx). An updated or new parmlib member, BPXPRMyy, can be concatenated with other parmlib members at initial IPL or through the SET OMVS=(xx,yy,...) command.

You must copy the sample BPXPRMxx member from SYS1.SAMPLIB to your PARMLIB, renaming it to fit your environment (BPXPRMxx). Then, create or update another PARMLIB member, BPXPRMyy, with the following information for elements z/OS UNIX System Services Application Services, Communications Server IP Services, z/OS File System, and Network File System. The BPXPRMyy member can then be added dynamically by issuing the SETOMVS RESET=(yy) command. Also, you will need to update your IEASYSxx PARMLIB member to contain the OMVS=(yy,xx,...) parameter for future IPLs. For more information, see *z/OS UNIX System Services Planning* and *z/OS MVS Initialization and Tuning Guide*.

```
MAXTHREADTASKS(500)
MAXTHREADS(500)
MAXPROCUSER(100)
FILESYSTYPE TYPE(UDS) ENTRYPOINT(BPXTUINT)
FILESYSTYPE TYPE(INET) ENTRYPOINT(EZBPFINI)
  STEPLIBLIST('etc/steplist')                    /* See Note 2 */
FILESYSTYPE TYPE(ZFS) ENTRYPOINT(IOEFSCM)
ASNAME(ZFS)                                      /* See Note 4 */
   NETWORK DOMAINNAME(AF_UNIX)
```

```
           DOMAINNUMBER(1)
           MAXSOCKETS(2000)
           TYPE(UDS)
   NETWORK DOMAINNAME(AF_INET)
           DOMAINNUMBER(2)
           MAXSOCKETS(64000)
           TYPE(INET)
   IPCSEMNSEMS(50)
   IPCSHMMPAGES(2048)
FILESYSTYPE TYPE(NFS) ENTRYPOINT(GFSCINIT)
   PARM(' ')
   ASNAME(GFSCPROC)
   ASNAME(GFSCPROC)
```

Notes:

1. The values listed in the previous figure are the minimum values needed to load the initial program.
2. `STEPLIBLIST('etc/steplib')` will need to be added under `FILESYSTYPE(INET) ENTRYPOINT(EZBPFINI)`.
3. For installation parameters, see *z/OS Network File System Guide and Reference*.
4. As of z/OS V2R2, this entry is required to run ZFS in its own address space. The ASNAME keyword can be left off to run ZFS in the OMVS address space. For more information, see *z/OS File System Administration*.
5. See *z/OS UNIX System Services Planning* for information about how to specify the appropriate MAXFILEPROC value in the BPXPRMxx PARMLIB member.

If you have more than one AF_NET transport providers on an MVS image, you must use the common INET, CINET. CINET is defined in BPXPRMxx to identify the use of the Common INET physical file system. For example, in the preceding created PARMLIB member, BPXPRMyy will need to be updated instead with the following information:

```
FILESYSTYPE TYPE (CINET) ENTRYPOINT(BPXTCINT)
    NETWORK DOMAINNAME(AF_INET)
        DOMAINNUMBER(2)
        MAXSOCKETS(64000)
        TYPE(CINET)
        INADDRANYPORT(4000)                          /* SEE NOTE */
        INADDRANYCOUNT(2000)                         /* SEE NOTE */
    SUBFILESYSTYPE NAME(tcpjob1)
                   TYPE(CINET)
                   ENTRYPOINT(EZBPFINI)
    SUBFILESYSTYPE NAME(tcpjob2)
                   TYPE(CINET)
                   ENTRYPOINT(EZBPFINI)
    SUBFILESYSTYPE NAME(tcpjob3)
                   TYPE(CINET)
                   ENTRYPOINT(EZBPFINI)
    SUBFILESYSTYPE NAME(STC1)
```

```
TYPE(CINET)
ENTRYPOINT(EZBPFINI)
```

Note: The INADDRANYPORT assignment is coordinated with similar PORT assignments in the PROFILE.TCPIP data set. For customizing the Communications Server IP Services file system statements, see *z/OS UNIX System Services Planning* and *z/OS MVS Initialization and Tuning Guide*.

8.5.2.5 LNKLSTxx considerations

1. In addition to the data sets you specify in LNKLSTxx or on LNKLST statements in PROGxx, the system automatically places these data sets at the beginning of the link list (unless overridden by a SYSLIB statement in PROGxx):

   - SYS1.LINKLIB
   - SYS1.MIGLIB
   - SYS1.CSSLIB
   - SYS1.SIEALNKE
   - SYS1.SIEAMIGE

   Note: As of z/OS V1R8, data sets SYS1.SIEALNKE and SYS1.SIEAMIGE MUST be cataloged to ensure that these data sets are located during IPL.

2. TCPIP.SEZALNK2 is optional but not recommended. The member in SEZALNK2 is reserved for the NCS administrator and is not copied to your existing LINKLIB data sets. The NCS administrator must have a separate TSO logon procedure, with SEZALNK2 added to the STEPLIB concatenation. SEZALNK2 must be RACF-protected so that unauthorized users are denied access. You must also APF authorize the SEZALNK2 library.

3. To make DFSORT programs available on the system, use either of the following procedures:

   - To make DFSORT resident, load the modules from SORTLPA into the link pack area (LPA) or dynamic LPA, and add SIEALNKE before the SICELINK to the link list.
   - To make DFSORT nonresident, add SIEALNKE before the SICELINK and SORTLPA (in this order) to the link list (this assumes SORTLPA is removed from the LPA list), or use a JOBLIB or STEPLIB for SIEALNKE, SICELINK and SORTLPA (in this order).

8.5.2.5.1 Making the Run-time library available

Many elements, features and functions of z/OS 3.1 require the run-time libraries provided by Language Environment. You need to have SCEERUN and SCEERUN2 in the LNKLST. Below lists the z/OS 3.1 elements, features and functions in Wave 1 that require Language Environment. The list was generated by analyzing which elements use the SMP/E CALLLIBS function to include Language Environment stubs and reviewing Post-APPLY link edit jobs supplied by elements.

Wave 1 elements that require Language Environment

- BCP
- BCP - Capacity Provisioning
- XL C/C++
- C/C++ Host Performance Analyzer

- Communications Server IP Services
- Communications Server for z/OS SNA Services
- Cryptographic Services
- Cryptographic Services ICSF
- DFSMS (Character Data Representation Architecture, CDRA)
- DFSORT Locale Processing
- HCD
- IBM HTTP Server Base
- Infoprint Server
- IBM TDS
- ISPF
- Network File System
- RMF
- Security Server (RACF)
- z/OS Security Level 3 System SSL Security Level 3
- z/OS UNIX System Services

8.5.2.5.1.1 z/OS Elements and Features Using STEPLIB for Language Environment

The following sections list the z/OS elements and features that use STEPLIB for Language Environment.

Network File System

Add SCEERUN to the startup procedures; shipped samples are

- GFSAPROC (server)
- GFSCPROC (client)

8.5.2.6 PROGxx and IEAAPFxx considerations

1. See *z/OS MVS Initialization and Tuning Guide* for information about using the PROGxx and IEAAPFxx PARMLIB members.
2. If the default for the LNKAUTH system parameter is taken (LNKAUTH=LNKLST) or is specified in IEASYS*xx*, or by the operator, libraries in the LNKLST concatenation are authorized when accessed as part of the LNKLST concatenation. However, if they are accessed outside the LNKLST concatenation (for example, through a STEPLIB) they will not be APF authorized unless they are specified in PROG*xx* or IEAAPF*xx*. Therefore, you must include any LNKLST libraries that are to be accessed outside the LNKLST in PROG*xx* or IEAAPFxx.
3. Except for concatenations opened during system initialization, an unauthorized library concatenated to any authorized libraries will cause the system to consider all the concatenated libraries to be **unauthorized**. Therefore, if one library in a concatenation must be APF authorized, you must include all libraries in that concatenation in PROG*xx*.

8.5.3 PROCLIB member considerations

This section describes the PROCLIB customization that must be performed for the Wave 1 and Wave 2 elements. PROCLIB customization consists of three steps:

1. Ensure the default PROCLIB members have been copied to your default PROCLIB to pick up the new and changed members.
2. Update individual sample members provided and ensure they are accessible to the system, as shown in Figure 42 on page 145.
3. Ensure entire libraries are accessible to the system, as shown in Figure 43 on page 148.

The following figure, shown in ripple order, describes the PROCLIB updates that are required for z/OS 3.1. Note that PARMLIB concatenation function has been incorporated into some sample procedures. **IBM recommends** you base your customized procedures on the IBM-supplied samples. For additional information on PROCLIB considerations, see the customization books for the particular element.

8.5.3.1 Copying default PROCLIB members:

After the PROCLIB updates are complete, the members listed in Figure 42 on page 145 must be made accessible to the system by copying them to a procedure library that is in your JES procedure library concatenation.

Figure 42 (Page 1 of 4). PROCLIB Member Updates

PROCLIB Member	Action to Take	Element Name
For BCP element		

Figure 42 (Page 1 of 4). PROCLIB Member Updates

PROCLIB Member	Action to Take	Element Name
APPC ASCH ASCHINT AVM AXRNN AXRPSTRT BLSJIPCS BLSJPRMI BPXAS BPXOINIT CEA DEALLOC DLF DUMPSRV GLZ GTF GTZ HIS HWISTART HZR HZSPROC IEESYSAS IEEVMPCR INIT IXGLOGRS LLA OMVS RDR RDR3200 RDR400 RMTGEN VLF XWTR	Ensure these procedures are correctly customized for your environment. They are provided in your PROCLIB data set.	BCP
For DFSMS element		

Figure 42 (Page 2 of 4). PROCLIB Member Updates

PROCLIB Member	Action to Take	Element Name
CDRAINIT CVAFTR DEVMAN DFM DFMX0001 DFM00 GDEAPDEF GDEAPPC GDEASCH GDELOGMD GDEPRTLU GDETPDEF IDAVDT IFGEDI IFGOCETR LINKS LOGROUTE	Ensure these procedures are correctly customized for your environment. Following members are included in PROCLIB: CVAFTR DEVMAN DFM IDAVDT IFGEDI IFGOCETR LINKS LOGROUTE Following members are included in SAMPLIB: CDRAINIT DFMX0001 DFM00 GDEAPDEF GDEAPPC GDEASCH GDELOGMD GDEPRTLU GDETPDEF	DFSMS
For HCD element		
CBDJCMPR CBDJIMPT CBDJIOCP CBDJRPTS CBDJXMIT CBDQAJSK CBDQDISP	Ensure these procedures are correctly customized for your environment. They are provided in your PROCLIB data set.	HCD
For Others		
CFZCIM	Procedure is provided in your PROCLIB data set. Update for your environment.	Common Information Model (CIM)
EZAZSSI	A sample member is provided in your SEZAINST library.	Communications Server IP Services
ICEOPT	The procedure is provided in your PROCLIB data set.	DFSORT
IOEP0004	These are SIOEPROC library members. The alias ZFS is provided to refer to IOEP0004. ZFS is the sample procedure for running ZFS. Ensure the alias is maintained and reflect local updates to these sample procedures.	z/OS File System
EPWFFST	Copy this procedure and update for your environment. Sample member is provided in your SEPWSRC2 library.	FFST

Figure 42 (Page 3 of 4). PROCLIB Member Updates

PROCLIB Member	Action to Take	Element Name
ASMAC ASMACL ASMACLG ASMACG	Change these procedures for your environment. Sample members are provided in your SASMSAM1 library. If the previous release of High Level Assembler has been used, users might have become accustomed to using the old procedure names of HLASMC, HLASMCG, HLASMCLG and HLASMCL. To make the transition from the previous release, in your SASMSAM1 library, these old procedure names appear as aliases for the sample supplied procedures.	High Level Assembler
ANFWPROC AOPDEMON AOPPRINT AOPSTART AOPSTAR2 AOPSTAT AOPSTOP AOPSTOP2 APIJPJCL	Procedures are provided in your PROCLIB data set. Update your environment, as described in *z/OS Infoprint Server Customization*.	Infoprint Server
DSSRV	DSSRV is an alias in the SGLDSAMP library.	IBM TDS Server
IZUANG1 IZUFPROC IZUINSTP IZUSVR1	Procedures are provided in your PROCLIB data set.	IBM z/OS Management Facility (z/OSMF)
GFSAPROC GFSCPROC	Update for your environment. These members are provided in your SAMPLIB library. GFSAPROC is a sample MVSNFS procedure, GFSCPROC is a sample MVSNFSC procedure.	Network File System
RACF	This supplied procedure may be updated. See member RACPROC in SAMPLIB.	RACF
RMFM3B GPMSERVE GPM4CIM	These supplied procedures may be updated, if you would like. See the comments provided in this member of your PROCLIB data set.	RMF
SDSF	Copy members ISF.SISFJCL(SDSF) and ISF.SISFJCL(SDSFAUX) to PROCLIB. As of V2R3, the SDSF and SDSFAUX address spaces are required when running SDSF.	SDSF
RMF RMFGAT	These supplied procedures may be updated, if you would like. See the comments provided in this member of your PROCLIB data set.	z/OS Data Gatherer

8.5.3.2 Ensuring that entire libraries are accessible: The following procedure libraries, which are shown in ripple order, must either be copied to SYS1.PROCLIB or be added to a PROCLIB concatenation accessible to JES. Customization considerations for these data sets are detailed after this figure.

Figure 43. PROCLIB Concatenation		
DDNAME	**Element**	**Note**
SIOEPROC	z/OS File System	Contains alias ZFS (see Figure 42 on page 145); ensure the alias is maintained.
SGLDSAMP	IBM Tivoli Directory Server for z/OS	This data set contains various LDAP procedures and sample jobs.
SCEEPROC	Language Environment	
SCCNPRC	XL C/C++	

8.5.3.3 Customize procedures for XL C/C++: You may customize the procedures provided by C/C++. For more information, see *z/OS XL C/C++ User's Guide*.

8.5.3.4 Customize Language Environment procedures: You may customize the procedures provided by Language Environment. For more information, see *z/OS Language Environment Customization*.

8.5.4 z/OS 3.1 ISPF setup considerations

Figure 44 on page 149 shows the data sets that must be concatenated to ISPF DDNAMEs in the logon procedure to use z/OS 3.1 functions. See Figure 45 on page 154 for Logon Proc using language libraries.

Figure 44 (Page 1 of 5). Logon PROC Updates		
DDNAME	**DDDEF**	**ELEMENT**
ISPLLIB	DFQLLIB DGTLLIB	DFSMS
	SCBDHENU	HCD
	SCYGLNK	IBM z/OS Change Tracker
	SGIMLMD0	SMP/E

Note:

- To avoid needing SYS1.NUCLEUS in your ISPLLIB, use the parameter UIM_LIBNAME in the HCD profile to point to the data set containing the UIMs and UDTs. If the keyword is omitted, SYS1.NUCLEUS is assumed. If UIM_LIBNAME=* is specified, HCD assumes the UIM data sets are part of the ISPLLIB or STEPLIB DDNAME.
- Data sets in the LNKLST*xx* or the LPALST*xx* should not be included in the ISPLLIB or STEPLIB DDNAME.

Figure 44 (Page 1 of 5). Logon PROC Updates

DDNAME	DDDEF	ELEMENT
ISPMLIB	SBLSMSG0 SBPXMENU	BCP
	DGTMLIB DFQMLIB SEDGMENU	DFSMS
	SADMMSG	GDDM
	SCBDMENU	HCD
	SEZAMENU	Communications Server IP Services
	SCSFMSG0	Cryptographic Services ICSF
	SCYGMENU	IBM z/OS Change Tracker
	SCYGMJPN	IBM z/OS Change Tracker Japanese
	SAOPMENU	Infoprint Server
	SISPMENU	ISPF
	SERBMENU	RMF
	SISFMLIB	SDSF
	HRFMSG	Security Server (RACF)
	SGIMMENU	SMP/E
	ICQMLIB	TSO/E

Note: SDSF SISFMLIB needs to be allocated in ISPMLIB concatenation to display the "Copyright Box" since z/OS V2R3.

Figure 44 (Page 2 of 5). Logon PROC Updates

DDNAME	DDDEF	ELEMENT
ISPPLIB	SBLSPNL0 SBPXPENU	BCP BCP (z/OS UNIX)
	DFQPLIB DGTPLIB SEDGPENU	DFSMS
	SEPWPENU	FFST
	SADMPNL	GDDM
	SCBDPENU	HCD
	SEZAPENU	Communications Server IP Services
	SCSFPNL0	Cryptographic Services ICSF
	SCYGPENU	IBM z/OS Change Tracker
	SCYGPJPN	IBM z/OS Change Tracker Japanese
	SAOPPENU	Infoprint Server
	SISPPENU	ISPF
	SHASPNL0	JES2
	SERBPENU	RMF
	SISFPLIB	SDSF
	HRFPANL	Security Server (RACF)
	SGIMPENU	SMP/E
	ICQPLIB	TSO/E
ISPSLIB	SBLSKEL0	BCP
	DGTSLIB	DFSMS
	SCSFSKL0	Cryptographic Services ICSF
	SCYGSKL	IBM z/OS Change Tracker
	SISPSLIB	ISPF
	SISPSENU	ISPF
	SISFSLIB	SDSF
	HRFSKEL	Security Server (RACF)
	SGIMSENU	SMP/E
	ICQSLIB	TSO/E

Figure 44 (Page 3 of 5). Logon PROC Updates

DDNAME	DDDEF	ELEMENT
ISPTLIB	SBLSTBL0 SBPXTENU	BCP BCP (z/OS UNIX)
	DGTTLIB	DFSMS
	SCBDTENU	HCD
	SCSFTLIB	Cryptographic Services ICSF
	SEZAPENU	Communications Server IP Services
	SISPTENU	ISPF
	SERBT SERBTENU	RMF
	SISFTLIB	SDSF
	SGIMTENU SMPTABL	SMP/E
	ICQTLIB	TSO/E
Note: SMPTABL is required for SMP/E in the ISPF concatenation, but does not have a DDDEF. For more information on how to allocate the SMPTABL, see 8.5.4.1, “SMP/E customization considerations for ISPF” on page 155.		
SYSEXEC	SBPXEXEC	BCP (z/OS UNIX)
	SEZAEXEC	Communications Server
	SEDGEXE1	DFSMS
	SIOEEXEC	z/OS File System
	SEPWSRC1	FFST
	SAOPEXEC	Infoprint Server
	SISPEXEC	ISPF
	SISFEXEC	SDSF
	SGLDEXEC	IBM TDS Server

Notes:

1. Ensure all libraries in the SYSEXEC concatenation have the same record format.
2. The libraries in SYSEXEC could be put in the SYSPROC DD instead.

Figure 44 (Page 4 of 5). Logon PROC Updates

DDNAME	DDDEF	ELEMENT
SYSHELP	HELP	BCP, DFSMS, z/OS UNIX System Services, RMF, TSO/E, Communications Server IP
	SISPHELP	ISPF
	SISFHELP	SDSF
	HELPENP	TSO/E
Notes: 1. z/OS V2R4 is the last release to support the RACF TSO help commands. Beginning in z/OS V2R5, RACF HELP panels will no longer be shipped.		
SYSPROC	SBLSCLI0	BCP
	SCCNUTL	XL C/C++
	DGTCLIB	DFSMS
	SEPWCENU	FFST
	SCBDCLST	HCD
	SCSFCLI0	Integrated Cryptographic Service Facility
	SISPCLIB	ISPF
	SERBCLS	RMF
	SGRBCLS	z/OS Data Gatherer
	HRFCLST	Security Server (RACF)
	SGIMCLS0	SMP/E
Notes: 1. Ensure all libraries in the SYSPROC concatenation have the same record format. 2. EOY2GDF, EOY2PSEG, and EOYPARM members of SEOYCLIB should be customized for the customer site. 3. Data Sets SCCNUTL contain only REXX EXECs.		
STEPLIB or LNKLST*xx*	SEPWMOD4	FFST
	SCBDHENU	HCD
Note: If the following libraries are removed from LNKLST*xx*, add them to the STEPLIB concatenation and authorize every library in the concatenation using PROG*xx* or IEAAPF*xx*. • SISPLOAD • SCEERUN • SCLBDLL • SCLBDLL2 • SCCNCMP		

The logon PROC updates for the Language libraries are listed below. Add appropriate Language libraries to your logon PROC. Unless the English library is specified as required in the table, you can remove the English library after you add the Language libraries.

Figure 45 (Page 1 of 2). Logon PROC Updates for Language libraries

DDNAME	DDDEF	ELEMENT
ISPMLIB	SBPXMJPN	BCP Japanese
	DFQMKLB DGTMKLB SEDGMJPN	DFSMS Japanese
	SCBDMJPN	HCD Japanese
	SAOPMJPN	Infoprint Server Japanese
	SISPMENP SISPMJPN	ISPF Upper Case English ISPF Japanese
	SCEEMSGP	Language Environment Upper Case English
	SERBMJPN	RMF Japanese
	SICHMJPN	Security Server (RACF) Japanese
	SGIMMJPN	SMP/E Japanese
	ICQKMLIB	TSO/E Japanese
ISPPLIB	SBPXPJPN	BCP Japanese
	DFQPKLB DGTPKLB SEDGPJPN	DFSMS Japanese
	SCBDPJPN	HCD Japanese
	SAOPPJPN	Infoprint Server Japanese
	SISPPENP SISPPJPN	ISPF Upper Case English ISPF Japanese
	SERBPJPN	RMF Japanese
	SICHPJPN	Security Server (RACF) Japanese
	SGIMPJPN	SMP/E Japanese
	ICQKPLIB	TSO/E Japanese
ISPSLIB	DGTSKLB	DFSMS Japanese
	SISPSENP SISPSJPN	ISPF Upper Case English ISPF Japanese

Figure 45 (Page 1 of 2). Logon PROC Updates for Language libraries		
DDNAME	**DDDEF**	**ELEMENT**
ISPTLIB	SBPXTJPN	BCP Japanese
	SCBDTJPN	HCD Japanese
	SISPTENP SISPTJPN	ISPF Upper Case English ISPF Japanese
	SERBTJPN	RMF Japanese
	SGIMTJPN SGIMTENU	SMP/E Japanese SMP/E English
	ICQKTABL	TSO/E Japanese
Note: Both the Japanese and English SMP/E libraries are required in the ISPTLIB concatenation.		
SYSEXEC	ICQKCLIB	TSO/E Japanese
SYSHELP	KHELP	BCP (z/OS UNIX), TSO/E, z/OS UNIX System Services Japanese
	HLPKLB	DFSMS Japanese

8.5.4.1 SMP/E customization considerations for ISPF

Use the ISPCTL1 and ISPCTL2 files to generate JCL for submitted SMP/E jobs. The SMP/E job submit facility lets you browse and edit this JCL. You can omit these files from your logon procedure and let ISPF automatically allocate them as needed. To save the input JCL generated by the dialogs, allocate a permanent sequential data set to ISPCTL1 (LRECL=80, RECFM=FB) before you enter the SMP/E dialogs or just use EDIT CREATE.

Allocate a single, installation-wide table data set to the ISPTLIB and SMPTABL DD statements. SMP/E uses this table data set to save process status information for the SYSMOD management dialogs. The data set must be a partitioned data set (LRECL=80, RECFM=FB). Because the data set is also in the concatenation of ISPTLIB, make the block size compatible with the block size of the corresponding ISPF data sets.

8.5.4.2 Update ISPF Command Table ISPTCM (if Required): For more information and instructions about updating ISPTCM, see *z/OS ISPF Planning and Customizing*.

Note: ISPTCM was updated to remove MVSSERV by ISPF APAR OA58883 in z/OS V2R4.

8.5.5 Element customization

After the elements are installed, you should examine (and if necessary, change) any installation exits and modifications to meet your installation's needs.

8.5.5.1 RACF security considerations

To perform the customization procedures for several of the z/OS 3.1 Wave 1 elements, you must have certain security permissions available. You may set up the security for all of the Wave 1 elements at this time. The following list shows elements that require RACF security and the location of more information.

- DFSMS (see *z/OS DFSMSdfp Storage Administration*)
- FFST (see 8.5.5.5.3, “FFST customization considerations” on page 168)
- HCD (see *z/OS HCD User's Guide*)
- HCM (see *z/OS and z/VM HCM User's Guide*)
- Communications Server IP Services (see 4 on page 163)
- Cryptographic Services ICSF (see *z/OS Cryptographic Services ICSF Administrator's Guide* and *z/OS Cryptographic Services ICSF System Programmer's Guide*)
- RMF (see 8.5.5.7.3, “RMF customization considerations” on page 173)
- Security Server (see 8.5.5.6.2, “Security Server (RACF) customization considerations” on page 171)
- IBM Tivoli Directory Server for z/OS (see 8.5.5.3.4, “IBM Tivoli Directory Server for z/OS customization considerations” on page 158)
- TSO/E (see *z/OS TSO/E Customization*)
- z/OS UNIX System Services (see 8.5.5.2, “z/OS UNIX System Services customization considerations” on page 156)
- z/OS UNIX System Services Application Services (see 8.5.5.4.2, “z/OS UNIX System Services Application Services customization” on page 168)
- Future Function (see 8.5.5.8.3, “Future Function customization considerations” on page 177)
- z/OS File System (see 8.5.5.9.1, “RACF updates for zFS” on page 177)
- Infoprint Server (see 8.5.5.9.2.4, “Establish security for Infoprint Server” on page 179)
- Network File System (see *z/OS Network File System Guide and Reference*)
- IBM z/OS Management Facility (see *IBM z/OS Management Facility Configuration Guide*)

8.5.5.2 z/OS UNIX System Services customization considerations

Note: This section must be completed before the Communications Server IP Services customization section can be performed.

A SAMPLIB member is provided with z/OS UNIX System Services Kernel, BPXISEC1, which is a sample TSO CLIST that provides all the RACF commands needed for the security setup of z/OS UNIX System Services. This CLIST is being provided as a central location for these commands and should be used by customers in conjunction with *z/OS UNIX System Services Planning* to reference detailed information. You may also need to refer to:

- *z/OS Security Server RACF Security Administrator's Guide*
- *z/OS Security Server RACF System Programmer's Guide*
- *z/OS Security Server RACF Command Language Reference*

This CLIST is structured into separate sections, each with a set of block comments, describing the RACF function that will be setup and what needs to be changed by the customer. **Ensure you execute this CLIST from a RACF special user ID!**

8.5.5.3 Customization considerations for Wave 1A

The following sections contain additional customization considerations for Wave 1A.

8.5.5.3.1 Integrated Security Services Network Authentication Service customization considerations

The following customization actions should be done at this time:

- Catalog all of the EUVF.SEUVF*xxx*, where *xxx* is LIB (Library) and EXC (REXX execs for the TSO logon procedure).
- Copy the SKRBKDC started task proc in EUVF.SEUVFSAM to SYS1.PROCLIB
- Copy the SKRBWTR started task proc in EUVF.SEUVFSAM to SYS1.PROCLIB or to a proclib in the IEFPDSI DD name in your MSTJCLxx member in your PARMLIB concatenation.
- Customize the SKRBWTR procedure according to your system installation needs.
- Copy the appropriate CTIKDCxx member from EUVF.SEUVFSAM to your installation's PARMLIB member and customize as necessary to support the component's tracing that you may need to perform.

Detailed steps to get the program into operational status are defined in *z/OS Integrated Security Services Network Authentication Service Administration*.

8.5.5.3.2 Language Environment customization considerations

Refer to *z/OS Language Environment Customization* for more information and instructions on Language Environment customization. You can customize any of the following items for Language Environment:

- Default run-time options
- User exits:
  - Assembler user exit
  - High-level language user exit
  - Abnormal termination exit
- CLISTs
- Place Language Environment modules in the link pack area
- COBOL COBPACKs
- Fortran LIBPACKs
- Make Language Environment available under CICS (optional)
  - Add CICS PPT entries
  - Add DCT entries
  - Add Language Environment-CICS data sets to CICS startup job stream
- Language-specific features:
  - OS/VS COBOL Compatibility Library
  - COBOL parameter list exit
  - COBOL reusable environment
  - C/C++ Base locale time information
  - Improving performance on IMS/DC
  - Fortran unit attribute table
  - VS Fortran compatibility unit attribute table

– VS Fortran compatibility run-time options
– VS Fortran compatibility error option table

8.5.5.3.3 Cryptographic Services ICSF customization considerations

Refer to *z/OS Cryptographic Services ICSF Administrator's Guide* and *z/OS Cryptographic Services ICSF System Programmer's Guide* for more information on Cryptographic Services ICSF customization.

8.5.5.3.4 IBM Tivoli Directory Server for z/OS customization considerations

Refer to the *z/OS IBM Tivoli Directory Server Administration and Use for z/OS*.

8.5.5.3.5 IBM Generic Tracker for z/OS customization considerations

Note that this list of available samples is not meant to be a list of required customization steps when installing the current release. Instead this list is meant to be a simple inventory of potential tools available to execute typical tracking facility tasks or to learn more about the tracking facility functions.

GTZCNIDJ creates GTZPRM*xx* parmlib members from existing CNIDTR*xx* parmlib members.
GTZPRNTJ prints data and associated information currently stored in the tracking facility.
GTZSMFJ Sample JCL for formatting SMF records of record type 125 in text form.
GTZSHCK a sample local health check in METAL C to report tracked events
GTZSHCKJ builds the GTZSHCK sample health check
GTZSHCKX a sample REXX health check to report tracked events

Refer to the samples' prologue and *z/OS MVS Diagnosis: Tools and Service Aids* for more information and instructions about IBM Generic Tracker customization.

8.5.5.3.6 IBM Health Checker for z/OS customization considerations

Note that only HZSALLCP in the list below is recommended to be used to complete your IBM Health Checker for z/OS setup. The remaining list is meant to be a simple inventory of potential tools to execute typical tasks or to learn more about the IBM Health Checker for z/OS functions. All these items can be found in SYS1.SAMPLIB.

HZSALLCP allocates the persistent data dataset. This sample must be updated so HZSPROC and this sample reflect the same dataset.
HZSPRINT prints the current, or logstream copies of message buffers
HZSMSGNJ generates a health check's message table and associated message files
HZSSADCK a sample HZSADDCHECK dynamic exit routine
HZSSCHKP a sample local health check with use of persistent data services HZSPREAD and HZSPWRIT
HZSSCHKR a sample local health check with use of check message service HZSFMSG
HZSSMSGT a sample message definition file as input to message table generating tool HZSMSGNJ
HZSSRCHC a sample remote health check with use of check parameter parsing service HZSCPARS
HZSSRCHK a sample remote health check with use of check message service HZSFMSG and format MGBFORMAT=1
HZSSSYMD a sample symbol definition file to be used as additional input to message table generating tool HZSMSGNJ

HZSSXCHK a sample REXX health check with use of a REXXIN dataset
HZSSXCHN a sample REXX health check with use of check message service HZSLFMSG and REQUEST=DIRECTMSG

Refer to *IBM Health Checker for z/OS User's Guide* for more information and instructions about IBM Health Checker customization.

8.5.5.3.7 ISPF customization considerations

Refer to *z/OS ISPF Planning and Customizing* for more detailed information on customizing ISPF.

8.5.5.3.7.1 z/OS 3.1 Sample panels

Sample ISPF panels are provided to enable panels for most z/OS 3.1 elements. These panels reside in the SISPPENU data set after APPLY processing. Two sample panels are supplied:

ISR@390S This sample panel is distributed with options used by system programmers and administrators. It includes options for:

- GDDM Print Queue Manager
- HCD I/O configuration
- APPC Administration Dialog
- Work Load Manager
- FFST dump formatting
- Infoprint Server
- RMF
- SMP/E
- TCP/IP NPF

ISR@390U This sample menu panel includes the options used by most ISPF users. It includes options for:

- DFSMSrmm/ISMF
- DFSMSdfp/ISMF
- IPCS for dump reading
- z/OS Unix Browse Files
- z/OS Unix Edit Files
- z/OS Unix Shell
- Security Server
- TSO/E Information Center Facility
- SDSF

Options for these elements have not been included in the samples:

- Communications Server for z/OS SNA Services IPCS Trace

  The panels for this element require extensive setup. Refer to "Installing the VTAM® Dump Analysis Enhancements and the VIT Analysis Tool" in *z/OS Communications Server: New Function Summary* for information about enabling these panels.

ISPF customization for RACF panels

If your installation uses the TSO/E session manager, and you want it to capture the output of RACF panels, specify PANEL(ICHP00SM) instead of PANEL(ICHP00), in ISR@390U. For example, change:

```
12,'PANEL(ICHP00) SCRNAME(SECURITY)'
```

to

```
12,'PANEL(ICHP00SM) SCRNAME(SECURITY)'
```

8.5.5.3.8 Communications Server IP Services customization considerations

Perform the following steps to complete the installation and initial customization of the Communications Server IP Services address space and key servers. At the completion of these steps, the Communications Server will have been set up for a basic configuration with no network attachments. **Additional customization will be required** to link the host to the network, bring up additional services, and optimize the use of initially configured services.

By choosing appropriate data set names and procedure names, these configuration steps can be done without interfering with any existing IP configuration. However, some customers may choose to simply review these steps and instead do IP configuration according to procedures they already have in place.

Refer to *z/OS Communications Server: New Function Summary* and *z/OS Communications Server: IP Configuration Guide* for more detailed customization instructions.

Before running the verification procedure you must have a fully functional z/OS UNIX environment and a fully functional security environment, either RACF or some other security program.

The following steps must be run from a TSO user ID with an OMVS segment defined. The user ID must be uid=0 or permitted to access the 'BPX.SUPERUSER' resource in the FACILITY class. The user ID must also be able to create and write to the required TSO datasets and hierarchical file system files and to perform RACF definitions. Steps in the EZARACFI job provide guidance for creating the entries that are required to complete the Communications Server IP IVP.

The PROCLIB used to contain the IVP procedures (*IVP_proclib_dsn*) must be in the PROCLIB concatenation. Before executing the steps, the following values must be known:

- ***target_lib_hlq***: high level qualifier of the TCP/IP target libraries (SEZAxxxx data sets). This will have been selected when the HLQ variable was chosen for the EZACSALC job run earlier in the Program Directory steps.
- ***dyn_alc_hlq***: high level qualifier of dynamically allocated TCP/IP data sets. Default is TCPIP, but we recommend use of TCPIVP.
- ***Default_RACF_group***: RACF group to which TCPIP and server procedures will be permitted. Default is OMVSGRP, which is the value used by the z/OS UNIX IVP. If you change the RACF Group for the z/OS UNIX IVP, it will need to be changed here as well. This group must be defined before the instructions below are executed.
- ***TCPIP_PROFILE_name***: data set name for the TCPIP.PROFILE. Defaults to TCPIP.PROFILE.TCPIP, but we recommend use of 'TCPIVP.TCPPARMS(PROFILE)'. For the purpose of these installation verification procedures, this must be an MVS data set, not a ZFS file.

- ***TCPIP_DATA_name***: data set name for the TCPIP.DATA data set. Defaults to TCPIP.TCPIP.DATA, but we recommend use of 'TCPIVP.TCPPARMS(TCPDATA)'. For the purpose of these installation verification procedures, this must be in an MVS data set, not a ZFS file.
- ***TCPIP_procname***: procedure name chosen for the TCP/IP address space; defaults to TCPIP.
- ***SYSLOGD_procname***: procedure name for syslog daemon; defaults to SYSLOGD
- ***FTPD_procname***: procedure name for FTP daemon; defaults to FTPD.
- ***IVP_proclib_dsn***: data set name of the IVP-specific procedure library.
- ***IVP_jcllib_dsn***: data set name for batch jobs used for installation and verification.
- ***IVP_configuration_dsn***: name of partitioned dataset to be used to contain configuration files for executing the IVP. We recommend use of 'TCPIVP.TCPPARMS'
- ***hostname***: The name of the system as it will be known in the TCP network.

Note: To avoid accidently overlaying an existing system environment, a default is not used. The preceding environment settings are meant to be discarded and not used in a live network.

When executing the following steps, you must use the same value for each of the *highlighted variables* (for example, *dyn_alc_hlq*) for each step where that variable is required.

Also verify:

- the Communications Server IP Services datasets have been added to the appropriate LNKLSTxx and LPALSTxx members of PARMLIB.
- BPXPRMxx parmlib member in use by z/OS UNIX has been updated for Communications Server IP Services.
  - Check there is a FILESYSTYPE statement specifying entry point EZBPFINI, as shown in the following example.

    ```
    FILESYSTYPE TYPE(INET) ENTRYPOINT(EZBPFINI)
    NETWORK DOMAINNAME(AF_INET)
    DOMAINNUMBER(2)
    MAXSOCKETS(60000)
    ```

  - If any changes are required, the new OMVS parameters may be updated by using the SETOMVS RESET=(yy) command or by re-IPLing.

Customization steps

1. Allocate required data sets
   - Customize the EZAGETIN job
     - This job allocates required TCPIP datasets, such as translation tables, HOSTS.LOCAL, ETC.SERVICES, etc
     - Copy the sample job to a JCL data set of your choice: *target_lib_hlq*.SEZAINST(EZAGETIN) to *IVP_jcllib_dsn*(EZAGETIN)
     - Fill in any required parameters on the //JOB statement
     - Set the DSPREFIX variable on the //PROC statement to *dyn_alc_hlq* or accept the default of TCPIP.
     - Set the TGTPRFX variable to *target_lib_hlq* or accept the default of TCPIP.

  - Set variables on the //PROC statement for the DASD volume serial and type where the datasets will be allocated
- Run the EZAGETIN job.
  - Expected results: The job should complete with all steps receiving a condition code 0.
- Update the *dyn_alc_hlq*HOSTS.LOCAL file
  - Copy an existing HOST entry, change the IP address to the loopback address and fill in the appropriate *hostname* value; for example:

    ```
    HOST : 127.0.0.1   :hostname ::::
    ```

  - Comment out the additional sample HOST, NET, and GATEWAY statements.
- Run makesite to create the hlq.HOSTS.ADDRINFO and hlq.HOSTS.SITEINFO datasets
  - From TSO, issue the following command:

    ```
    makesite hlq=dyn_alc_hlq
    ```

  - Expected results:
    - The following messages should be seen at the TSO session:

      ```
      EZA0547I Writing out dyn_alc_hlq.HOSTS.SITEINFO ...
      EZA0548I Writing out dyn_alc_hlq.HOSTS.ADDRINFO ...
      ```

    - Messages EZA0550I through EZA0566I will also be generated showing statistics from the input data set read and the output data sets created.

2. Allocate the partitioned dataset for IVP configuration

   - If not already allocated, *IVP_configuration_dsn* must be allocated now. To do so, copy the allocation job: *target_lib_hlq*.SEZAINST(ALOCPARM) to *IVP_jcllib_dsn*(ALOCPARM).
   - Fill in any required parameters on the //JOB statement.
   - Change the //ALLOCT EXEC statement to set the DSN variable to *IVP_configuration_dsn*, or accept the default of 'TCPIVP.TCPPARMS'.
   - Change the //ALLOCT EXEC statement to set the DSP variable to the appropriate final disposition of the dataset, or accept the default of 'CATLG'.
   - Change the //ALLOCT EXEC statement to set the TVOL1 variable to the volume serial of the volume on which you wish to allocate the data set.
   - Submit the ALOCPARM job.
     - Expected results: The job should complete with a condition code 0.

3. Customize the TCP/IP address space

   - Customize the procedure for starting the TCP/IP address space:
     - Copy the sample start procedure from the SEZAINST library to the appropriate proclib: *target_lib_hlq*.SEZAINST(TCPIPROC) to *IVP_proclib_dsn(TCPIP_procname)*
     - Make changes necessary to fit your environment
       - If desired, change the default jobname to the chosen procedure name on the //PROC statement: TCPIP to *TCPIP_procname*

         Note: If the system is configured for common INET (CINET is specified in the BPXPRMxx member of SYS1.PARMLIB), the name chosen for the TCP/IP start procedure must match the one used for the SUBFILESYSTYPE NAME value. For this IVP, however, common INET will not be used. See *z/OS UNIX System Services Planning* for details.

- Set up the //PROFILE DD card to point to the data set to be used to contain the TCPIP.PROFILE.
  - Either uncomment one of the provided statements (to use either TCPIP.PROFILE.TCPIP or TCPIVP.TCPPARMS(PROFILE) as the value of *TCPIP_PROFILE_name*) **-or-**
  - Copy one of the provided //PROFILE DD statements, uncomment it, and set DSN equal to *TCPIP_PROFILE_name*
- If desired, change the default TCPIP.DATA name to the selected *TCPIP_DATA_name*
  - Set up the //SYSTCPD DD card to point to data set to be used to contain the TCPIP.DATA
    - Either uncomment one of the provided statements (to use either TCPIP.SEZAINST(TCPDATA) or the recommended value of TCPIVP.TCPPARMS(TCPDATA) as the value of *TCPIP_DATA_name*) **-or-**
    - Copy one of the provided //SYSTCPD DD statements, uncomment it, and set DSN equal to *TCPIP_DATA_name*
  - Comment out the PARM= card of the //EXEC statement. Uncomment the SET statement on the line above the EXEC statement and specify the appropriate dsname for the TCPIP.DATA data set. Uncomment the two lines for the PARM, following the EXEC statement, that specifies the setting for the RESOLVER_CONFIG environment variable.

    ```
    //* SET PARM1=TCPIVP.TCPPARMS(TCPDATA) ...
    //* PARM=('&PARMS',
    //* 'ENVAR("RESOLVER_CONFIG=//''&PARM1''")')
    ```

  - If not using 'TCPIVP.TCPPARMS(TCPDATA)' for *TCPIP_DATA_name*, change the ENVAR setting on the //EXEC statement to use *TCPIP_DATA_name*.

- Customize the TCPIP profile data set
  - Copy the sample TCPIP profile dataset from the SEZAINST library to the selected location: *target_lib_hlq*.SEZAINST(SAMPPROF) to *TCPIP_PROFILE_name*

    Note: If *TCPIP_PROFILE_name* is not an existing data set, it will need to be allocated.
  - If not using the default value for *FTPD_procname*, change the PORT statement that specifies FTPD1 to the chosen *FTPD_procname*1 (be sure to add the 1 at the end).
- Customize the TCPIP.DATA data set
  - Copy the sample TCPIP.DATA dataset from the SEZAINST library to the selected location: *target_lib_hlq*.SEZAINST(TCPDATA) to *TCPIP_DATA_name*.

    Note: If *TCPIP_DATA_name* is not an existing data set, it will need to be allocated.
  - Set TCPIPJOBNAME to the value of *TCPIP_procname*.
  - Set HOSTNAME statement to the *hostname* of the system as it will be known in the TCP network.
  - Set DOMAINORIGIN statement to the domain for this host or comment out the statement.
  - Set DATASETPREFIX to the value of *dyn_alc_hlq*.

4. Do required RACF definitions
   - Customize the EZARACFI job

– This job will perform the RACF definitions and define OMVS segments required for the TCP/IP address and servers.
– Copy the sample job to a JCL data set of your choice: *target_lib_hlq*.SEZAINST(EZARACFI) to *IVP_jcllib_dsn*(EZARACFI).
– Fill in any required parameters on the //JOB statement.
– If not using the default value for *Default_RACF_group*, change the DFLTGRP(OMVSGRP) definitions on the ADDUSER statements for the DAEMONS step to use the selected value for *Default_RACF_group*. (Note, it is assumed this group has already been created.).
– If desired, comment out ADDUSER and RDEFINE statements for any servers for which you do not want to do RACF definitions at this time. Note, however, the step will be terminated by the first comment statement, so move any comments to the end of the //SYSTSIN input.
– For this IVP, RACF definitions are required for the TCPIP, SYSLOGD, and FTPD started procedures.
– If not using the default value for *TCPIP_procname*, change 'TCPIP' on the ADDUSER and RDEFINE statements to the selected value for *TCPIP_procname*.
– If not using the default value for *SYSLOGD_procname*, change 'SYSLOGD' on the ADDUSER and RDEFINE statements to the selected value for *SYSLOGD_procname*.
– If not using the default value for *FTPD_procname*, change 'FTPD' on the ADDUSER and RDEFINE statements to the selected value for *FTPD_procname*.

  Note: For the purposes of the IVP, the preceding RACF definitions are the only ones used. You may, however, wish to uncomment additional RACF definitions for other applications that are not part of the IVP in the EZARACF sample.
– Additional steps are required when running with BPX.DAEMON set up (If you are not running with BPX.DAEMON, skip to Step 4 on page 165.)
  - If you have a BPX.DAEMON environment, you must ensure all load modules loaded into an address space come from controlled libraries. If a module is loaded from a noncontrolled library, the address space loses its authorization. This means you must define all the libraries from where modules may be loaded as program controlled. See *z/OS UNIX System Services Planning* for more information on the BPX.DAEMON resource in the FACILITY class. The following steps, found in EZARACF, can be used for including z/OS IP in an existing BPX.DAEMON environment.
  - Permit servers to the BPX.DAEMON resource.(EZARACF)
    • Uncomment the //BPXDAEMN EXEC statement and the //SYSTSPRT DD and //SYSTSIN DD cards associated with it.
    • Uncomment (remove the //*) RACF statements to permit (PE) the TCP/IP address space and the FTP daemon to a resource in the FACILITY class.
    • If not using the default value for *TCPIP_procname* change 'TCPIP' on the PE statement to the selected value for *TCPIP_procname*.
    • If not using the default value for *FTPD_procname* change 'FTPD' on the PE statement to the selected value for *FTPD_procname*.
  - Enable program control for runtime library modules
    • Uncomment the //PADS EXEC statement and the //SYSTSPRT and //SYSTSIN DD cards associated with it.
    • Uncomment (remove the //*) RALT statements for 'SYS1.LINKLIB', 'cee.SCEERUN', and 'tcpip.SEZALOAD'.

- Change the high level qualifier for the C run-time library from 'cee' to the appropriate high level qualifier.
- Change the 'volser' value on the RALT statement to the volume serial for the C run-time library.
- Change the high level qualifier for the TCP/IP load libraries from 'tcpip' to *target_lib_hlq*.
- Change the 'volser' value on the RALT statement for the TCP/IP load library to the volume serial for the TCP/IP load library.
- Uncomment the SETROPTS statement and move it to immediately after the last uncommented RALT statement.

- Run the EZARACFI job
  - Expected results: The job completes with condition code 0 and no error messages.
    - Note, if the users are already defined to RACF, error messages for 'invalid user ID' are generated. Successful ADDUSER definitions produce only the TSO 'READY' prompt in the output.
    - The condition code returned is the condition code for the last RACF command issued, so read the job output to verify the RACF definitions were done.

5. Customize SYSLOGD

   - Copy the sample start procedure from the SEZAINST library to the appropriate PROCLIB: *target_lib_hlq*.SEZAINST(SYSLOGD) to *IVP_proclib_dsn(SYSLOGD_procname)*.
   - If desired, change the default jobname to the chosen procedure name on the //PROC statement: SYSLOGD to *SYSLOGD_procname*.
   - Comment out the //CONFHFS EXEC statement and uncomment the //CONFPDS EXEC statement.
   - On the //CONFPDS EXEC statement, either accept the default location for the configuration file or change TCPIVP.TCPPARMS(SYSLOG) to *IVP_configuration_dsn*(SYSLOG).
   - Copy the sample configuration file to the IVP-specific configuration files: /usr/lpp/tcpip/samples/syslog.conf to *IVP_configuration_dsn*(SYSLOG).

     From TSO, this can be done with an OGET command (note that the command should be issued on one line):

     ```
     oget '/usr/lpp/tcpip/samples/syslog.conf'
     'IVP_configuration_dsn (SYSLOG)'
     ```

6. Customize FTP

   - Set up the FTPD proc
     - Copy the sample start procedure from the SEZAINST library to the appropriate proclib: *target_lib_hlq*.SEZAINST(FTPD) to *IVP_proclib_dsn(FTPD_procname)*.
     - If desired, change the default jobname to the chosen procedure name on the //PROC statement: FTPD to *FTPD_procname*.
     - Comment out the first PARM= card on the //EXEC statement. Uncomment the SET statement and both lines of the second PARM= on the //EXEC statement. Change PARM1= on the // SET statement to point to the appropriate TCPIP.DATA data set.
   - Uncomment the //SYSFTPD DD statement which specifies TCPIVP.TCPPARMS(FTPSDATA).

  - On the //SYSFTPD DD statement, either accept the default location for the server FTP.DATA file or change TCPIVP.TCPPARMS(FTPSDATA) to *IVP_configuration_dsn*(FTPSDATA).
- Uncomment the //SYSTCPD DD statement which specifies TCPIVP.TCPPARMS(TCPDATA).
- On the //SYSTCPD DD statement, either accept the default location for the TCPIP.DATA set or change TCPIVP.TCPPARMS (TCPDATA) to *TCPIP_DATA_name*.

7. Set up the server and client FTP.DATA files
   - Copy the sample server FTP.DATA file to the appropriate server FTP.DATA file: *target_lib_hlq*.SEZAINST(FTPSDATA) to *IVP_configuration_dsn*(FTPSDATA)
   - Copy the sample client FTP.DATA file to the appropriate client FTP.DATA file: *target_lib_hlq*.SEZAINST(FTCDATA) to *IVP_configuration_dsn*(FTCDATA)

- **Note**: See *z/OS Communications Server: SNA Resource Definition Reference* and *z/OS Communications Server: SNA Network Implementation Guide* for detailed information on setting up and verifying VTAM configuration.
- Ensure the *IVP_Default_LUs* are defined to VTAM. Sample definitions are provided in *target_lib_hlq*.SEZAINST(IVPLU).
  - The *IVP_Default_LUs* must be defined in a dataset that is in the concatenation of datasets specified on the VTAMLST DD statement in the procedure used to start VTAM.
  - If changes were made to the VTAMLST concatenation, stop and restart VTAM.
- Refresh LLA

  If LLA is running and has not been refreshed since the Communications Server code was installed, refresh LLA before proceeding with the IVP.

8.5.5.3.8.1 CICS sockets interface customization considerations

Refer to the *z/OS Communications Server: IP CICS Sockets Guide* for the customization required to use the CICS Sockets Interface.

8.5.5.3.8.2 IMS sockets interface customization considerations

Refer to the *z/OS Communications Server: IP IMS Sockets Guide* for the customization required to use the IMS Sockets Interface.

8.5.5.3.8.3 Network Print Facility customization considerations

Refer to the *z/OS Communications Server: IP Configuration Reference*.

8.5.5.3.8.4 Communications Server Security Level 3 customization considerations

Refer to the *z/OS Communications Server: IP Configuration Reference*.

8.5.5.4 Customization considerations for Wave 1B

The following sections contain additional customization considerations for Wave 1B.

8.5.5.4.1 DFSMS customization considerations

For information on activating Object Access Method, see *z/OS DFSMS OAM Planning, Installation, and Storage Administration Guide for Tape Libraries* or *z/OS DFSMS OAM Planning, Installation, and Storage Administration Guide for Object Support*.

For information on activating DFSMShsm, see *z/OS DFSMShsm Implementation and Customization Guide*.

For information on activating DFSMSrmm, see *z/OS DFSMSrmm Implementation and Customization Guide*.

8.5.5.4.1.1 Make ISMF available to the TSO user

To make ISMF available to the TSO users, refer to *z/OS DFSMS Using the Interactive Storage Management Facility*. For cataloging information, see *z/OS DFSMS Managing Catalogs*.

8.5.5.4.1.2 3800/3900 Printing Subsystem

If you are installing an IBM 3800 or 3900 Printing Subsystem for the first time, you must install library character sets, graphic character modification modules, and character arrangement tables in SYS1.IMAGELIB. A job to accomplish this task is contained in member LCSBLD1 of SYS1.SAMPLIB after DFSMS has been installed. If you have run LCSBLD1 previously, you do not need to rerun it after installing DFSMS.

8.5.5.4.1.3 Starter set information

The Starter Set is a pre-defined Source Control Data Set (SCDS) containing information that defines a specific storage management policy.

This is provided as a sample SCDS to allow new SMS installations to start SMS before having to go through defining the construct definitions, and writing the Automatic Class Selection (ACS) routines.

The sample SCDS named SCDS.PRIMARY.LINEAR is packaged in the target library SYS1.IGDVBS1 as member DFPSSCDS.

SYS1.SAMPLIB will contain the following members:

DFPSSDCR source ACS routine for DATACLAS

DFPSSMCR source ACS routine for MGMTCLAS

DFPSSSCR source ACS routine for STORCLAS

DFPSSSGR source ACS routine for STORGRP

DFPSSIMP JCL to IMPORT SCDS

> **Note:** After the SMP/E APPLY is performed for DFSMS, run job DFPSSIMP available in SYS1.SAMPLIB to IMPORT 'SCDS.PRIMARY.LINEAR' from target library SYS1.IGDVBS1.

For more information about the Starter Set, refer to the *z/OS DFSMSdfp Storage Administration*. This manual contains a detailed description of the sample SCDS.

8.5.5.4.1.4 Activate CDRA

If your installation will use the Character Data Representation Architecture (CDRA) and numeric conversion routines provided in this release of z/OS, you must activate the function by tailoring and running SYS1.SAMPLIB(CDRAINIT).

8.5.5.4.2 z/OS UNIX System Services Application Services customization

For details on getting the shell and utilities in operational status, see *z/OS UNIX System Services Planning*.

8.5.5.5 Customization considerations for Wave 1C

The following sections contain additional customization considerations for Wave 1C.

8.5.5.5.1 EREP customization considerations

The JCL job used to run EREP should include an EXEC PGM=IFCEREP1 statement. Refer to *EREP User's Guide* for more information. For more information on creating, maintaining, and refreshing the SYS1.LOGREC data set or the Logrec Log Stream, see *z/OS MVS Diagnosis: Tools and Service Aids*.

8.5.5.5.2 ESCON Director Support customization considerations: The following sections describe customization considerations for ESCON Director Support.

8.5.5.5.2.1 ESCON Director Support security

Installation of ESCON Director Support enables nonauthorized programs to issue I/O to online switches using the EXCP access method, if the switch control unit/device has been defined to z/OS 3.1. To control access to a switch from a host processor, any combination of the following can be used:

- Keep the device offline to z/OS 3.1 to prevent nonauthorized programs from allocating the device. OFFLINE=YES is the IOCP default. (ESCON Director Support itself does not require a switch to be online to z/OS 3.1 in order to retrieve device information.)
- Add a z/OS 3.1 system authorization facility (SAF) exit to monitor and control allocation to switches. z/OS 3.1 allocation will call SAF whenever a user or program allocates a switch.
- Monitor and control allocation to switches using RACF. RACF provides a resource class, DEVICES, to control allocation to unit record, teleprocessing, and graphics devices.

8.5.5.5.3 FFST customization considerations

See FFST operations in *z/OS Communications Server: SNA Diagnosis Vol 2, FFST Dumps and the VIT* for more information on how to get the program into operational status by coding macros.

- Considerations when invoking FFST in a NetView environment:

  Make sure NetView tasks CNMCALRT and BNJDSERV are active for Alerts to appear on the NPDA alert screen. See the help for NCCF LIST and NCCF START for more information. If your installation uses NetView filters to prevent certain data from being collected or displayed, ensure that a filter is not blocking CPU information. You may automate the setting of the CPU hardware monitor filter during NetView initialization by updating CNMSTYLE as follows:

- Locate "PDFILTER" and in that section add the following statement to allow FFST to pass CPU Generic Alerts to NetView, where *x* represents a unique suffix.

  ```
  NPDA.PDFILTER.x = NPDA SRFILTER AREC PASS TREF CPU
  ```

  See *NetView Administration Reference* for more information about this statement.
- Considerations when invoking FFST with RACF:

  If you use RACF or another security program to protect any of the FFST data sets, verify the application programmer has the necessary access for the following data sets:
  - FFST message log to review the messages that are issued when a probe statement is executed
  - FFST CLIST library to invoke the translators and to format the diagnostic output
  - FFST panel library to invoke the help screens for the translators and the dump formatter
  - Data sets allocated for the outputs produced by FFST
  - In addition, you need to associate the RACF SYSSTC1 user ID with the FFST started task using the RACF STARTED class or using an entry in the RACF started procedures table, ICHRIN03. See *z/OS Security Server RACF System Programmer's Guide* for additional information.

8.5.5.5.4 GDDM and GDDM-PGF customization considerations

Refer to *GDDM System Customization and Administration* for more information on GDDM customization. Customization includes tuning the operating-system-related values and defining input and output devices to GDDM. These activities include:

- Activating language features
- Updating GDDM defaults
- Defining GDDM to TSO
- Defining GDDM to CICS
- Defining GDDM to IMS
- Making GDDM-OS/2 available
- Making GDDM-PCLK available
- Making GDDM-REXX available
- Reblocking any existing objects

8.5.5.5.5 ICKDSF customization considerations

ICKDSF provides a sample job for creating the stand-alone tape. Edit and submit SYS1.SAMPLIB(ICKSAT) to copy the ICKDSF Stand-Alone program to an unlabeled tape. Consult the instructions in the sample job for more information. Successful creation of a stand-alone tape returns a condition code of 0. Refer to the *Device Support Facilities (ICKDSF) User's Guide and Reference* for additional information on loading the stand-alone tape.

8.5.5.5.6 TSO/E customization considerations

Refer to *z/OS TSO/E Customization* for more information on TSO/E customization.

8.5.5.5.7 z/OS Host - 3270 Workstation File Send/Receive customization considerations

The following sections describe various customization considerations for z/OS Host - 3270 Workstation File Send/Receive.

8.5.5.5.7.1 Modify translate tables for z/OS Host - 3270 Workstation File Send/Receive

The translate tables included in this program, which convert between ASCII and EBCDIC codes, might not be suitable for your installation. These tables may be modified by patching the IND$FILE module.

The translate character that is most likely to cause problems is the EBCDIC character X'3F' that translates to an ASCII X'1A'. This later character is treated as an end-of-file (EOF) in many personal computer programs, especially editors.

The entry points to the IND$FILE module are:

EBCDASCI EBCDIC to ASCII translate table
ASCIEBCD ASCII to EBCDIC translate table

Refer to the binder listing for the proper offsets for these entry points. It is advised that the USERMOD SMP/E format be used to modify the translation tables.

The example below shows how to change the EBCDIC character “3F” to translate to “5B” instead of “1A”:

```
1. Find the offset of the EBCDIC-to-
   ASCII translation table (EBCDASCI)               020F40
2. Add the character value "3F" to that address     +   3F
                                                    ------
3. This is the verify address                     = 020F7F

++USERMOD(*******) .              (******* = ALPHABETIC NAME)
++VER(Z038)   FMID(HFX1102) .
++ZAP(EBCDASCI) .
  NAME EBCDASCI
VER 020F7F 1A
REP 020F7F 5B
  IDRDATA *******
```

If you change the EBCDASCI table to translate X'3F' to some other character, you should also change the ASCIEBCD table to translate that ASCII character back to X'3F'.

8.5.5.6 Customization considerations for Wave 1D:

The following sections describe customization considerations and tasks for Wave 1D.

8.5.5.6.1 Alternate Library for REXX customization considerations

The following sections describe various considerations for customizing Alternate Library for REXX.

8.5.5.6.1.1 Activating Alternate Library for REXX

Alternate Library for REXX is fully operational when the SMP/E installation and the customization activities described below are complete. If you do not APF-Authorize the load module library, REXX.SEAGALT, you will get an abend condition when the Alternate Library for REXX routines are requested by an APF-Authorized routine.

8.5.5.6.2 Security Server (RACF) customization considerations

Refer to *z/OS Security Server RACF System Programmer's Guide* for information on z/OS Security Server RACF customization and refer to *z/OS Upgrade Workflow* for migration actions.

8.5.5.6.2.1 Prepare the RACF database

Before you load the initial program with the new RACF active, complete either of the following actions:

- Allocate, format, and catalog a RACF database on the target system (IRRMIN00 with PARM=NEW).
- Upgrade the existing RACF database templates to the current level of the RACF templates that are shipped with z/OS 3.1 (IRRMIN00 with PARM=UPDATE).

  If your templates are already at the level required by this release, you do not need to update the templates. Message IRR8025 may be issued and no further action is required.

You can create or upgrade a RACF database by running the IRRMIN00 utility, as described in *z/OS Security Server RACF System Programmer's Guide*. Sample jobs are provided in SYS1.SAMPLIB member RACJCL. Since z/OS V2R5, the member RACJCL in SYS1.SAMPLIB data set contains additional JCLs to support "RACF VSAM DATABASE" new functionality.

It is recommended that a backup database is created that RACF will maintain as a duplicate of the primary. Those migrating from a prior level of RACF should not update both the primary and backup database templates at the same time.

8.5.5.6.2.2 Automate Dynamic Parse initialization

Note: Because all RACF installations must activate dynamic parse after each IPL, it is **strongly** recommended that you automate dynamic parse initialization.

The IRRDPI00 command builds a “dynamic” table for parsing segment-related keywords. Dynamic parse is used to add, list, alter, or delete DFP, TSO, or any other nonbase segment information with the RACF commands.

There are two methods to automate dynamic parse initialization. The first involves updating the RACF parameter library to automatically invoke the IRRDPI00 UPDATE command at every IPL. This method requires the RACF subsystem address space to be active. Example of the first method (IRROPTxx) is shown in Figure 41 on page 130. The second method involves PARMLIB and PROCLIB updates to START IRRDPTAB at every IPL. These methods are described in *z/OS Security Server RACF System Programmer's Guide*.

8.5.5.6.2.3 Additional considerations before IPLing your system

The following is a list of considerations to consider before IPLing your system. For information on these topics, see *z/OS Security Server RACF System Programmer's Guide*.

- Define RACF coupling facility structures.
- Create or update the database range table.
- Create or update the database name table or alter the master JCL. Note that if this step is not done, the system prompts the operator during IPL. The operator can then reply with the RACF database name.

- Either the RACF database table or the RACF range table or both, maybe replaced by specifying the equivalent information in a IRRPRMxx member in parmlib. Up to 3 RACF parmlib members maybe concatenated together.

  Note: The existence and use of a RACF parmlib member will override all other specifications.
- Update the RACF class descriptor table and the RACF router table.
- Identify the RACF address space as an MVS subsystem.
- Create or update the started procedures table or use the STARTED CLASS.
- Create exit routines and a naming convention table.

You might also want to consider activating the REXX RACVAR function, which is described in *z/OS Security Server RACF Macros and Interfaces*.

8.5.5.6.2.4 Other system considerations for initial installation

If you plan to make the change listed below, be sure to do so before you define your users, groups, and resources to RACF:

- Add TSO profiles to the UADS data set for any new TSO users by using the ADD subcommand of TSO/E ACCOUNT. See *z/OS TSO/E Administration*.

  Note: RACF provides your installation with the option of placing TSO user logon information in the TSO segment of the RACF user profile.

8.5.5.7 Customization considerations for Wave 1E:

The following sections describe considerations for customizing elements that are part of Wave 1E.

8.5.5.7.1 Runtime Library Extensions customization considerations

The following sections describe considerations for customizing Runtime Library Extensions.

8.5.5.7.1.1 Customization of the Runtime Library Extensions for CICS

To ensure that CICS can communicate with the Runtime Library Extensions, you must add a Runtime Library Extensions entry to the CICS System Definition (CSD). To do so, update the CICS System Definition (CSD) file using the program definitions in member CLB3YCSD in the Runtime Library Extensions data set SCLBJCL. This member contains the necessary input to the CICS System Definition (CSD) file utility program to define Runtime Library Extensions routines in the PPT. The group name for the Runtime Library Extensions routines is **CLB**.

Note: If you intend to use the Runtime Library Extensions under CICS, add the SCLBDLL data set to the DFHRPL DD concatenation in your CICS startup job stream and ensure that Language Environment is available under CICS (see 8.5.5.3.2, “Language Environment customization considerations” on page 157 for more information).

8.5.5.7.2 CIM customization considerations

The customization for element CIM has to be done after IPL of your target system. For detailed information on how to customize CIM for z/OS, refer to *z/OS Common Information Model User's Guide*.

8.5.5.7.3 RMF customization considerations

If you are a new RMF customer, skip the first two steps. These steps are optional for existing RMF customers.

1. Redefine the user reports for RMF, using the ERBRMFU utility.
2. Reinstall your user exits, ensuring that they run in 31-bit mode.
3. Customize the RMF Monitor III CLISTs.

   If the RMF CLISTs and default naming conventions are not acceptable, you can modify the RMF CLIST ERBRMF3X, which invokes RMF, displaying the primary menu. This CLIST can be found in your RMF SERBCLS system library. Follow the instructions in the commented text to customize the CLIST to your local environment.
4. Refer to *z/OS RMF User's Guide*, for a description of all customization steps that are required for new RMF customers as well as for installations that are migrating from a previous release.

8.5.5.7.4 XL C/C++ Compiler customization considerations

The following topics describe areas you may consider for tailoring for the XL C/C++ compiler.

8.5.5.7.4.1 Tailor the TSO environment: If you want to use TSO or compile a program with the XL C/C++ Compiler, refer to Figure 44 on page 149 for information on the data sets, which must be concatenated. Modify the TSO/E logon PROC by concatenating the listed data sets to the corresponding DDNAMEs.

8.5.5.7.4.2 Tailor REXX EXECs

For information on tailoring REXX EXECs, refer to the *z/OS XL C/C++ User's Guide*.

8.5.5.7.4.3 Customized default options for XL C/C++ Compiler

For information about customizing default options for the XL C/C++ compiler, see *z/OS XL C/C++ User's Guide*.

8.5.5.7.4.4 Customization of the Performance Analyzer for CICS

To ensure that CICS/ESA can communicate with the Performance Analyzer, you must add Performance Analyzer entries to the CICS processing program table (PPT). To do so, update the CICS system definition (CSD) file using the program definitions in member CTVSCSD in the Performance Analyzer data set SCTVJCL. PTF UQ35263 must be installed to obtain the member. This member contains the necessary input to the CICS System Definition (CSD) file utility program to define the Performance Analyzer routines in the PPT. The group name for the Performance Analyzer routines is EQA.

Note: If you intend to use the Performance Analyzer under CICS, add the SCTVMOD data set to the DFHRPL DD concatenation in your CICS startup job stream and ensure that Language Environment is available under CICS (refer to 8.5.5.3.2, “Language Environment customization considerations” on page 157 for more information).

8.5.5.8 Customization considerations for Wave 1F:

The following sections describe customizations considerations for Wave 1F.

8.5.5.8.1 DFSORT customization considerations

Refer to *z/OS DFSORT Installation and Customization* for more information and instructions on DFSORT customization.

8.5.5.8.1.1 Change DFSORT installation options

Starting from z/OS V1R10, you can change DFSORT installation options by creating and using ICEPRMxx members in concatenated PARMLIB. This method simplifies the management of DFSORT installation options, particularly in multisystem environments.

You can activate the ICEPRMxx members that you want to use by issuing an appropriate START ICEOPT command from the console, or by including a START ICEOPT command in an appropriate COMMNDxx member in PARMLIB. Before you activate your ICEPRMxx members by using a COMMNDxx member, it is recommended that you test the ICEPRMxx members by activating them from the console. ICEOPT issues messages to the console to indicate the status of your changes to the installation defaults, and errors that it detects. Be sure to review these console messages and the return code from ICEOPT.

It is recommended that you use ICEPRMxx members to change DFSORT installation options because they are easier to use and more flexible than the old method using the ICEMAC macro and SMP/E USERMODs. However, the old method is still supported.

In a multisystem environment, you can only activate ICEPRMxx parmlib members that contain DFSORT installation options in z/OS V1R10 or later. For z/OS V1R10 or later, the installation options in the activated ICEPRMxx members are merged with the ICEMAC installation options at run time.

Give the user ID that is assigned to the ICEOPT started task READ access to the ICEPRMxx PARMLIB members. For example,

```
ADDSD 'SYS1.PARMLIB' UACC(NONE)
PERMIT 'SYS1.PARMLIB' CLASS(DATASET) ID(userid) ACCESS(READ)
```

Note: The ICEOPT procedure requires READ authority to all of the data sets in the data sets in the concetenated PARMLIB.

See *z/OS DFSORT Installation and Customization* for information about ICEPRMxx members, the START ICEOPT command, ICEOPT messages and return codes, and the syntax for options that you can specify using the ICEPRMxx members.

Note: You can control who can issue the START ICEOPT command by using MVS Console Security. See *MVS Planning: Operations* for information about controlling who can issue the START ICEOPT command.

8.5.5.8.1.2 Change DFSORT SVC name

Sample jobs ICESVREC and ICESVAPP set the name of the SVC that DFSORT uses. You can change the default SVC name by either specifying an alternate routing code or assigning a user SVC number. With slight modification, you can use ICESVREC and ICESVAPP sample jobs in SICESAMP to create this SVC.

- To specify SVC 109 with the alternate routing code:

  - Install an SMP/E USERMOD that creates a copy of IGX00017 named IGX00038; then load it into LPA or MLPA.
  - In the sample job ICESVREC, change the name ICESVC to IGX00038.
  - Modify the DFSORT default installation options to specify SVC=(,ALT). You can perform this modification any time after you apply the DFSORT element by using the ICEPRMxx PARMLIB member (recommended), or by using the ICEMAC macro and an SMP/E USERMOD. See the "Changing the Installation Defaults" topic in *z/OS DFSORT Installation and Customization*.
- To assign a user SVC number:
  - Select an available type-3 SVC number nnn in the range 200-255.
  - Install an SMP/E USERMOD to create a copy of IGX00017 with a different name. For example, you could name the copy ICESVC.
  - Create or modify an IEASVCxx member of parmlib to add the SVC. If you used the name ICESVC for the copy of IGX00017, and chose 255 as the SVC number, the entry would look like this:

    ```
    SVCPARM 255,REPLACE,TYPE(3),EPNAME(ICESVC)
    ```

  - Then load a copy of IGX00017 into LPA or MLPA.
  - Modify the DFSORT default installation options to specify SVC=nnn, where nnn is the SVC number that you selected. You can perform this modification any time after you apply the DFSORT element by using the ICEPRMxx PARMLIB member (recommended), or by using the ICEMAC macro and an SMP/E USERMOD. See the "Changing the DFSORT Installation Defaults" topic in *z/OS DFSORT Installation and Customization*.
- Load the initial program.

Note: DFSORT can be tested without making the SVC available as long as you do not write DFSORT SMF records (type 16 records).

Without the SVC available, DFSORT performance with input, output, or work data sets on cached DASD devices (for example, IBM 3990 Model 3) may be degraded. Always use the SVC if you will be running benchmarks.

The DFSORT SVC is available after it is loaded in LPA. You can load the SVC in LPA by using one of the following methods:

- Add the SVC load module to MLPA by specifying it in the IEALPAxx PARMLIB member that is used for IPL.
- On a supported release of z/OS, add the SICELPA library to the LPA list in the LPALSTxx PARMLIB member that is used for a cold start (CLPA) IPL.

For more information about loading modules in LPA, see *z/OS MVS Initialization and Tuning Guide*, *z/OS MVS Initialization and Tuning Reference*, and *z/OS MVS System Commands*.

8.5.5.8.1.3 Replacing IEBGENER with ICEGENER (optional)

You can achieve more efficient processing for jobs set up to use the IEBGENER system utility by using the ICEGENER facility of DFSORT. Qualifying IEBGENER jobs are processed by the equivalent (though not identical), but more efficient, DFSORT copy function. If, for any reason, the DFSORT copy function cannot be used (for example, when IEBGENER control statements are specified), control is automatically

transferred to the IEBGENER system utility. DFSORT transfers control to IEBGENER using the name for IEBGENER from the environment installation module (ICEAM2 or ICEAM4) or time-of-day installation module (ICETD1-4) used for the run. The ICEGENER facility can be used either for selected IEBGENER jobs or automatically for all IEBGENER jobs.

You can invoke ICEGENER in one of the following ways:

- For selective use, substitute the name ICEGENER (or the alias SORTGENR) for the name IEBGENER in any jobs you choose.
- To make ICEGENER the system's default "IEBGENER", install an SMP/E USERMOD to create an alias of “IEBGENER” for ICEGENER. With slight modification, you can use the ICEGAREC and ICEGAAPP sample jobs in SICESAMP to create this alias. Then place the ICEGENER load module ahead of IEBGENER in the system's search order for programs. For example, you can place the ICEGENER load module with its new alias in LPA. All jobs and programs that call IEBGENER will then execute ICEGENER instead. If ICEGENER needs to call IEBGENER, it will do so automatically. For information about placing modules in LPA and Dynamic LPA, and about placing libraries ahead of the LINKLIB library in the link list, see *z/OS MVS Initialization and Tuning Reference*.

For notes and restrictions pertaining to the use of ICEGENER, see *z/OS DFSORT Installation and Customization*.

8.5.5.8.1.4 Make DFSORT programs available

After you install DFSORT, make its programs available on the system. To activate the ICEPRMxx members using the START ICEOPT started task command of DFSORT, ensure that the ICEOPT PROC of DFSORT is in PROCLIB. See the “System Planning Considerations” chapter in *z/OS DFSORT Installation and Customization* for information about using the START ICEOPT command.

To run DFSORT resident, complete the following actions:

- Load the modules from SORTLPA into LPA or Dynamic LPA.
- Add SIEALNKE before the SICELINK to the link list.

To run DFSORT nonresident, perform either of these actions:

- Add SIEALNKE before the SICELINK and SORTLPA (in this order) to the link list (this assumes SORTLPA is removed from the LPA list).
- Use a JOBLIB or STEPLIB for SIEALNKE, SICELINK and SORTLPA (in this order).

If you plan to record DFSORT SMF type-16 records or use IBM cached DASD devices, the DFSORT SVC must be accessible:

- Load the DFSORT SVC from SICELPA into LPA or MLPA.
- IPL to make the SVC available.

Notes:

1. For information about adding modules to LPA, Dynamic LPA, and the link list, and for information about assigning user SVC numbers, see *z/OS MVS Initialization and Tuning Guide* and *z/OS MVS Initialization and Tuning Reference*.
2. You can combine SORTLIB with SICELINK. If you combine these libraries, you will only need to supply a SORTLIB DD statement for tape work data set sort or Conventional merge applications that use dynamic linkedit of user exits. You will have to specify SORTLIB=SYSTEM as an installation default by using an ICEPRMxx member of PARMLIB (recommended), or by using the ICEMAC macro and an SMP/E USERMOD. See the "Changing the Installation Defaults" topic in *z/OS DFSORT Installation and Customization*.

8.5.5.8.1.5 Invoking DFSORT from a REXX CLIST

DFSORT can be invoked from a REXX CLIST. If DFSORT is available in the program search order, you can invoke DFSORT with:

```
ADDRESS LINKMVS ICEMAN
```

If DFSORT is not available in program search order, you can invoke DFSORT with:

```
"CALL 'SYS1.SICELINK(SORT)'"
```

SYS1.SICELINK is the name of your SICELINK library used for installation.

8.5.5.8.2 HCM customization considerations

For information about setting up TCP/IP communication between HCM on the workstations and HCD on the z/OS host or for information about downloading the workstation code, see *z/OS and z/VM HCM User's Guide*.

8.5.5.8.3 Future Function customization considerations

For information on configuring, customizing and setting up RACF security for Future Function, refer to *IBM Knowledge Center for z/OS Configuration and User Guide* for V2R5. Note that the default tree structure created by the Knowledge Center post-installation configuration scripts has changed. As a result, see *z/OS Upgrade Workflow* for actions required if migrating Knowledge Center data from V2R2.

8.5.5.8.4 IBM z/OS Change Tracker customization considerations

For information on configuring, customizing, and setting up security for IBM z/OS Change Tracker, refer to *IBM z/OS Change Tracker Guide and Reference*. Notice that customization activities are done via a z/OSMF Workflow which you can find installed at /usr/lpp/cyg/zosmf/workflows/cygwflw.xml.

8.5.5.9 Customization considerations for Wave 1G

8.5.5.9.1 RACF updates for zFS

To use zFS, you must create RACF definitions. For detailed information about the required group, user, and started tasks, refer to one of the appropriate books:

- *z/OS File System Administration*

8.5.5.9.2 Infoprint Server Customization Considerations

Detailed steps to get the program into operational status are defined in *z/OS Infoprint Server Customization*.

8.5.5.9.2.1 Initialize NetSpool Message Log Data Set

If you are using NetSpool, you may continue to use your existing message log data set, or you may record messages in the common message log. If you are customizing NetSpool for the first time, use of the common message log is recommended. If you want to also use the optional NetSpool message log data set, SYS1.SAMPLIB member APIMIJCL can be used to allocate and initialize the NetSpool message log data set. Refer to *z/OS Infoprint Server Customization* for information on using the common message log.

8.5.5.9.2.2 Initialize IP PrintWay basic mode Operational Data Sets

This step is required **only** for IP PrintWay basic mode. If you are using (or migrating to) IP PrintWay extended mode, you do not need these data sets.

For IP PrintWay basic mode, the transmission queue and message log data sets must be allocated and primed. The following jobs are provided in SYS1.SAMPLIB to perform this function:

ANFDEAL Allocates IP PrintWay transmission queue data set
ANFQINIT Initializes IP PrintWay transmission queue data set
ANFMIJCL Allocates and initializes IP PrintWay message log data set

If you used IP PrintWay in a previous z/OS release, you may use your existing transmission queue and message log data sets.

8.5.5.9.2.3 Customize the UNIX environment for Infoprint Server

The customization steps described in this section are sufficient for a default configuration. Only the lpd and printer inventory daemons are started in the default configuration. If you want to use any of the following functions, additional customization is required:

- Infoprint Central
- Infoprint Server subsystem
- IP PrintWay Extended Mode
- IPP Server
- NetSpool
- Transform manager

Refer to *z/OS Infoprint Server Customization* for additional customization for these functions.

1. Create the configuration files for the Infoprint Server daemons:

   A sample job is provided in SYS1.SAMPLIB(AOPCPETC) to copy the sample configuration files from /usr/lpp/Printsrv/samples to /etc/Printsrv. Review the comments in the job to determine which configuration files are required for your installation, and then run the job to create the configuration files.

The defaults provided in the sample aopd.conf file will start the printer inventory manager and the LPD. If you want to modify any of the defaults, refer to *z/OS Infoprint Server Customization*. If you are migrating from a previous level of Infoprint Server, and/or you are using NetSpool or IP PrintWay Extended Mode, you must update the aopd.conf file to start the appropriate daemons.

Note: Infoprint Server will default to search for its configuration file in `/etc/Printsrv/aopd.conf`. If you change the name or directory for this file, see *z/OS Infoprint Server Customization* for information on how to configure your environment.

2. Modify `/etc/profile` to update the following environment variables:

   - PATH

     Add `/usr/lpp/Printsrv/bin` to the PATH environment variable.

     Note: The `/usr/lpp/Printsrv/bin` directory must occur **before** `/bin` in the PATH environment variable so the InfoPrint Server (Print Interface and IP PrintWay extended mode) version of the lp, lpstat, and cancel commands will be invoked.
   - LIBPATH

     Add `/usr/lpp/Printsrv/lib` to the LIBPATH environment variable.
   - MANPATH

     Add `/usr/lpp/Printsrv/man/%L` to the MANPATH environment variable.

     Note: The `/usr/lpp/Printsrv/man/%L` directory must occur **before** `/usr/man/%L` in the MANPATH environment variable so the InfoPrint Server (Print Interface and IP PrintWay extended mode) version of the lp, lpstat, and cancel man pages will be displayed.
   - NLSPATH

     Add `/usr/lpp/Printsrv/%L/%N` to the NLSPATH environment variable.

   Infoprint Server may optionally use additional environment variables to set defaults for operation. Refer to *z/OS Infoprint Server Customization* for detailed information on the usage of these parameters.

3. Review the aopstart EXEC for possible updates. For security reasons, Infoprint Server daemons use some variables only if they are set in the aopstart EXEC. Daemons do not use the same variables set in the `/etc/profile` file. For information about how to set variables in the aopstart EXEC, refer to *z/OS Infoprint Server Customization*.

8.5.5.9.2.4 Establish security for Infoprint Server

1. Define or update RACF profiles for Infoprint Server security.

   A sample CLIST is provided in SYS1.SAMPLIB(AOPRACF) that can be used to define the security environment for Infoprint Server. This CLIST must be modified before it is run. All commands are commented out by default. The CLIST can be used to perform the following functions:

   - Define two RACF groups for print administrators and operators. The default names for these groups are:

     AOPADMIN RACF group for administrators who maintain the Printer Inventory.

AOPOPER RACF group for operators who will control starting and stopping the Infoprint Server daemons.

Note: You may use one RACF group for both AOPADMIN and AOPOPER if your installation's security policy does not require a distinction between operators and administrators. For more information on security considerations for Infoprint Server, refer to *z/OS Infoprint Server Customization*.

- Create a RACF profile in the PRINTSRV class named AOP.ADMINISTRATOR to control who has access to the Printer Inventory. You must name this profile AOP.ADMINISTRATOR. Alternatively, you can use your existing AOPADMIN profile in the FACILITY class. You can also create an optional profile named AOP.CONFIGURATION in the PRINTSRV class. Refer to *z/OS Infoprint Server Customization*, for information about why it is desirable to use the PRINTSRV class profile rather than the previously-defined FACILITY class profile.
- Define the JCL startup procedures in the STARTED class and define a user ID to be associated with these started procedures.

2. Customize permissions:

   Run the aopsetup shell script to define permissions, specifying the names of the operator group and administrator group you defined in the previous step. To run the aopsetup shell script, you must run it from a user ID that has UID=0 or has read access to the BPX.SUPERUSER facility class.

   Note: The aopsetup shell script requires access to the directory defined as base-directory in the aopd.conf configuration file. The default for base-directory is /var/Printsrv. Therefore, you must have access to the /var/Printsrv directory before you can run aopsetup. If you have your target system's /var file system mounted to your driving system, you may run aopsetup from your driving system. If you do not have access to the target system's /var from your driving system, you must run aopsetup from the target system. If you want to run aopsetup from the driving system, refer to the comments in the aopsetup shell script for information on the proper syntax to invoke the script.

   To run the aopsetup shell script using the default names listed in the previous step, enter:

   ```
   /usr/lpp/Printsrv/bin/aopsetup AOPOPER AOPADMIN
   ```

   You can run aopsetup from an rlogin shell, from an OMVS session, or using BPXBATCH.

8.5.5.9.2.5 Make updates to the Communications Server IP Profile

Print Interface requires the use of TCP port 515 in a default configuration. Ensure dataset hlq.PROFILE.TCPIP does not reserve port 515 for another application. You may need to ensure the ports listed below are not reserved, if you want to use these functions of Infoprint Server:

IPP server port 631

See *z/OS Communications Server: IP Configuration Reference* for more information.

8.5.5.9.2.6 Customize IP PrintWay and NetSpool

If you are using the IP PrintWay or NetSpool components of Infoprint Server, additional customization is required.

- For NetSpool, logical printers must be defined to VTAM with APPL definition statements.
- For IP PrintWay Basic Mode, the functional subsystem must be defined to JES.
- For IP PrintWay Extended Mode, job selection criteria must be defined in the printer inventory.

Refer to *z/OS Infoprint Server Customization* for instructions on customizing IP PrintWay and NetSpool. If you are upgrading from previous levels of Infoprint Server, see *z/OS Upgrade Workflow* for upgrade considerations.

8.5.5.9.2.7 Customize HTTP Server for Infoprint Central

If you want to use the print management functions provided by Infoprint Central for the web, you must customize the IBM HTTP Server - Powered by Apache, and update the `conf/httpd.conf` and `bin/envvars` files to include configuration information for Infoprint Server. See *z/OS Infoprint Server Customization* for instructions on customizing the HTTP Server for use with Infoprint Server.

8.5.5.9.2.8 Download client code to workstation

The Infoprint Port Monitor allows Windows users to print to any z/OS printer defined in the Printer Inventory, using standard print-submission methods from Windows applications that support printing. The Infoprint Port Monitor is located in a subdirectory of the `/usr/lpp/Printsrv/win/` directory, depending on locale. It is downloaded to the workstation using FTP. The directory locations for each NLV are shown below:

English `/usr/lpp/Printsrv/win/En_US/`
Japanese `/usr/lpp/Printsrv/win/Ja_JP/`

Refer to *z/OS Infoprint Server User's Guide* for instructions to download the client code to the workstation.

8.5.5.9.3 Network File System customization considerations

Detailed steps to get the program into operational status are defined in *z/OS Network File System Guide and Reference*. Omitting these steps will prevent successful operation of the program.

8.5.5.9.4 Configuring IBM z/OS Management Facility

To activate IBM z/OS Management Facility, you must configure the element after installing it as described in this program directory. For information about configuring IBM z/OS Management Facility, see IBM z/OS Management Facility Configuration.

8.5.5.9.5 XML Toolkit for z/OS customization considerations: If you mount the file system in which you have installed Toolkit in read-only mode during execution, then you have to perform more tasks before your file system is read-only. See the SMP/E manuals for details.

The Toolkit consists of a set of interfaces and conforms to various specifications that are necessary for activation. The following two tables presents a quick summary of the major features found in the XML Toolkit for z/OS package. Symbols in the tables have the following meaning:

- "-": feature absent;
- "S": completely supported;

- "P": subset;
- "X": experimental;
- "N/A": not applicable.

Figure 46. Interfaces and Specifications for the Toolkit Parsers

Interfaces and Specifications	**C++ Edition Parser V1.11.0**
DOM 1.0	S
DOM 2.0	S
DOM 3.0	P, X
SAX 1.0	S
SAX 2.0	S
XML 1.0	S
XML 1.1	X
XML Namespaces 1.0	S
XML Namespaces 1.1	S
Schema	S

Figure 47. Interfaces and Specifications for the Toolkit Processors

Interfaces and Specifications	**C++ Edition Processor V1.11.0**
XSL Transformations	S
XPATH 1.0	S
XML 1.1	S
XML Namespaces 1.1	S

Sample applications have also been provided to demonstrate the features of the Toolkit. The procedures required to set up and configure these sample applications for z/OS and z/OS UNIX environments are described in the *XML Toolkit for z/OS User's Guide*.

8.5.5.10 Customization for Wave 2: Once you have successfully SMP/E APPLY'd JES2 and SDSF, you must customize the elements.

8.5.5.10.1 JES2 Initialization considerations: You will need to update the following PARMLIB and PROCLIB members prior to IPL of the new JES2 system:

- LNKLST*xx* to include libraries SHASLNKE and SHASMIG
- Logon procedures used for IPCS setup to include the JES2 libraries SHASMIG, SHASPARM, and SHASPNL0
- PROG*xx* to APF-authorize libraries SHASLNKE and SHASMIG

- JES2 cataloged procedures to include the library SHASLNKE, if the procedures contain a STEPLIB and the library names have been changed.

For details on how to create or update the initialization deck, see z/OS JES2 Initilaization and Tuning Reference.

8.6 Step 6: Verify installation of Wave 0, Wave 1 and Wave 2

After you have successfully completed the following steps, you should verify the installation of the Wave 0, Wave 1 and Wave 2 elements:

- SMP/E APPLYed the Wave 0, Wave 1 and Wave 2 elements,
- Performed the Post-APPLY work, and
- Finished the minimal customization documented in 8.5, “Step 5: Customize Wave 1 and Wave 2” on page 126,

The Wave 0, Wave 1 and Wave 2 installation verification procedures (IVPs) should be run from your **target** system, unless specifically noted.

8.6.1 IPL the z/OS system

Attention

Do not IPL the new release in a production environment until you have tested the new release with a simulated production load that includes all applications and all non-IBM products, which ensures service level agreements can be met.

Do not IPL in a shared resource environment unless you have installed service for any applicable toleration and coexistence PTFs on lower z/OS releases that will coexist with z/OS 3.1. To identify the required coexistence PTFs that must be installed on lower z/OS releases, receive the latest HOLDDATA and run the SMP/E MISSINGFIX command with a fix category (FIXCAT) of “IBM.Coexistence.z/OS.V2R5.”

Do not IPL the z/OS 3.1 system with a root file system used with previous z/OS releases. Invoking programs contained in previous file systems, may result in unpredictable behavior.

Starting with z/OS V2R1, you cannot use earlier levels of JES2 or SDSF. Do not IPL the z/OS 3.1 system with older levels of JES2 used with previous z/OS releases.

8.6.1.1 File system execution: When a z/OS system is loaded with the initial program, the root file system must be mounted in read-only mode during execution. After the Wave 1 elements were installed during SMP/E APPLY processing, customization of some elements requires updates to the target system /etc and /var file systems. These updates must have been completed at this point.

8.6.1.2 BPXISETS and BPXISETD: Before IPLing, you will need to convert the /etc and /var directories to symbolic links. First unmount the zFS data sets on the /etc and /var directories. Use the BPXISETS REXX exec found in SAMPLIB to convert the /etc and /var directories to symbolic links. To submit the REXX exec in the background, you can use the BPXISJCL provided in SAMPLIB.

If, for any reason, you require the /etc or /var symbolic links to be removed and the /etc or /var directories recreated, use the BPXISETD REXX exec from SAMPLIB. Again, the BPXISJCL job can be used to submit this in the background.

Ensure the separate zFS data sets for your target /tmp and /dev directories are created in preparation to IPL your z/OS 3.1 system. The BPXPRMxx member should contain the following mount statements:

```
ROOT   FILESYSTEM('root_FS_data_set')
       TYPE(xxx)  MODE(RDWR)

MOUNT  FILESYSTEM('etc_FS_data_set')
       MOUNTPOINT('/etc')
       TYPE(xxx)  MODE(RDWR)

MOUNT  FILESYSTEM('var_FS_data_set')
       MOUNTPOINT('/var')
       TYPE(xxx)  MODE(RDWR)

MOUNT  FILESYSTEM('tmp_FS_data_set')
       MOUNTPOINT('/tmp')
       TYPE(xxx)  MODE(RDWR)

MOUNT  FILESYSTEM('dev_FS_data_set')
       MOUNTPOINT('/dev')
       TYPE(xxx)  MODE(RDWR)
```

Figure 48. Mount Statements Required in BPXPRMxx

Notes:

1. 'root_FS_data_set' and 'etc_FS_data_set' are the file systems in which z/OS 3.1 was just installed.
2. 'var_FS_data_set' is the file system that you created in 6.2, “Step 1: Separating File System Data Sets for z/OS 3.1” on page 31.
3. 'tmp_FS_data_set' and 'dev_FS_data_set' are the file systems that you just created.
4. On the ROOT and MOUNT statements shown in Figure 48 on page 184, change TYPE(xxx) to the appropriate TYPE, such as TYPE(ZFS), that is applicable to your installation.

If IBM z/OS Management Facility element is installed in a separate file system, ensure that the BPXPRMxx PARMLIB member is updated to add a mount statement for the file system used for the installation of the IBM z/OS Management Facility element to ensure the file system will be mounted during IPL of the z/OS 3.1 target system.

Update the BPXPRMxx PARMLIB member to add a mount statement for the separate file system in which IBM z/OS Liberty Embedded is installed to ensure that the file system will be mounted during IPL of the z/OS 3.1 system target system.

Update the BPXPRMxx PARMLIB member to add a mount statement for the file system in which the z/OS Container Extensions element is installed to allow the file system to be mounted during IPL of the z/OS 3.1 system.

To IPL the system, ensure you use the target SYSRES from the Wave 1 installation. In addition, the z/OS 3.1 zFS data sets in which you installed Wave 0, Wave 1 and Wave 2 elements, should be used as the root file system and the file system mounted on /etc directory when IPLing the system.

Be sure that you have synchronized your security databases; see 8.1.1, “Set up User and Group IDs Required for Installation” on page 72.

If you needed to define a user ID alias table for your security setup be sure to add the USERIDALIASTABLE keyword in your BPXPRMxx parmlib member specifying your table location. See *z/OS UNIX System Services Planning* for details.

IEA299I may be received during system initialization. This message is issued only if a conditional resource initialization module (RIM) is not found. Processing continues because z/OS 3.1 is not dependent on the function of the indicated RIM. However, subsystems, program products, or applications might require conditional RIMs. Check the installation procedures for any subsystem that fails for mention of the indicated RIM. Any RIMs shipped by these products must reside in the SYS1.NUCLEUS library.

The following messages might be issued one or more times, depending on which products you have installed and which I/O device types are defined to your system during IPL:

```
IEA093I MODULE IEANUC01 CONTAINS UNRESOLVED WEAK EXTERNAL REFERENCE <name>.
```

References to modules with any of the following names can be ignored:

```
AOMATTN   AOMATTNT  CBRATTN   IARYGGTS  IECTCATN  IECTCQSC
IRDVATT1  ISTZFMAA  ISTZFMAB  IXCIOATX
```

```
IEA093I MODULE IGGDDT01 CONTAINS UNRESOLVED WEAK EXTERNAL REFERENCE <name>.
```

All such messages for unresolved external references in IGGDDT01 can be ignored. For more information, see APAR II03282.

```
IEA093I  MODULE IGC116 CONTAINS UNRESOLVED WEAK EXTERNAL REFERENCE IGX03007.
```

8.6.2 Verify installation of z/OS 3.1 Wave 0, Wave 1 and Wave 2 FMIDs

To verify that the z/OS 3.1 elements are installed, you should make at least the following **minimal checks:**

- Initialize the system.
- Initialize JES.
- Submit a job and check its output. (You can run the BCP installation verification job provided in member IVPJOBS in your SAMPLIB data set.)
- If CICS or IMS is installed, initialize a region and sign on to a terminal.

For **more complete checks**, you can perform the following tasks:

- Run critical production jobs.
- Run a mixture of jobs, for example:
  - Jobs that produce large amounts of SYSOUT
  - Jobs that submit other jobs to the internal reader
  - Jobs with many SYSOUT data sets
  - Jobs with many DD statements
  - Jobs that perform dynamic allocations
- Test NJE lines.
- Test RJE/RJP lines.
- Send output to JES- and PSF-controlled printers.
- Issue TSO/E LOGON, TRANSMIT, RECEIVE, SUBMIT, STATUS, CANCEL, and LOGOFF commands.
- Ensure all exit routines and local modifications perform correctly.
- Communicate with all networks without IP.
- Test critical functions in applications.
- Check for completeness of accounting records.
- Test all non-IBM product functions.
- Ensure that performance goals stated in service level agreements can be met.

Figure 49 (Page 1 of 3). Checklist for the IVPs

Check Box	Section, Step Description	Your Notes
	8.6.2.1, “IVP jobs for Wave 0” on page 188	
□	8.6.2.1.1, “Run the High Level Assembler Installation Verification Procedure” on page 188	
□	8.6.2.2, “Run the BCP and ISPF Installation Verification Procedure” on page 188	
	8.6.3, “IVP jobs for Wave 1A” on page 191	
□	8.6.3.2, “Run the Language Environment Installation Verification Procedure” on page 194	
	8.6.4, “IVP jobs for Wave 1B” on page 195	

Figure 49 (Page 1 of 3). Checklist for the IVPs

Check Box	Section, Step Description	Your Notes
□	8.6.4.1, “Run the DFSMS Installation Verification Procedure” on page 195	
□	8.6.4.5, “Run the z/OS UNIX System Services Setup Verification Procedures” on page 211	
	8.6.5, “IVP jobs for Wave 1C” on page 211	
□	8.6.5.1, “Run the FFST Installation Verification Program” on page 211	
□	8.6.5.2, “Run the GDDM Installation Verification Procedures” on page 211	
□	8.6.5.3, “Run the ICKDSF Installation Verification Procedure” on page 218	
	8.6.6, “IVP jobs for Wave 1D” on page 219	
□	8.6.3.1, “Run the Communications Server IP Services Installation Verification Procedures” on page 191	
□	8.6.8.2, “Run the High Level Assembler Toolkit Installation Verification Program” on page 226	
	8.6.7, “IVP jobs for Wave 1E” on page 219	
□	8.6.7.1, “Run the Runtime Library Extensions Installation Verification Procedures” on page 219	
□	8.6.7.4, “Run the XL C/C++ Installation Verification Procedures” on page 220	
□	8.6.7.3, “Run the RMF Installation Verification Procedure” on page 220	
□	8.6.6.1, “Run the Security Server (RACF) Installation Verification Procedures” on page 219	
	8.6.8, “IVP jobs for Wave 1F” on page 221	
□	8.6.8.1, “Run the DFSORT Installation Verification Procedures” on page 222	
□	8.6.8.3, “Run the IBM z/OS Change Tracker Installation Verification Procedures” on page 227	
□	8.6.10.1, “Run the installation verification procedure for SDSF” on page 232	
	8.6.9, “IVP jobs for Wave 1G” on page 227	
□	8.6.9.1, “Run the z/OS File System Installation Verification Procedures” on page 227	

Figure 49 (Page 2 of 3). Checklist for the IVPs		
Check Box	**Section, Step Description**	**Your Notes**
□	8.6.9.2, “Run the Infoprint Server Installation Verification Procedures” on page 227	
□	8.6.9.3, “Run the Network File System Installation Verification Procedures” on page 228	
□	8.6.9.4, “Run the XML Toolkit for z/OS Installation Verification Procedures” on page 230	

8.6.2.1 IVP jobs for Wave 0

The following sections describe IVP jobs for Wave 0.

8.6.2.1.1 Run the High Level Assembler Installation Verification Procedure

1. Assemble the Verification Program

   HLASM provides a sample job, ASMWIVP, found in the SASMSAM1 library. This job is provided to verify the element has installed correctly. This job assembles the source statements in member ASMASAMP found in the SASMSAM1 library.

2. Run the Verification Program (optional)

   The program being assembled is not intended to be run; however, if it is run, it sets a return code of zero and returns to the caller.

8.6.2.2 Run the BCP and ISPF Installation Verification Procedure

Because the BCP and ISPF are used to verify some of the installation verification procedures in Wave 1A, the BCP and ISPF should be verified now rather than in 8.6.8, “IVP jobs for Wave 1F” on page 221.

To verify the BCP was installed properly, you should run IVPJOBS found in your SAMPLIB library. Refer to the comments in the job for instructions, expected condition codes, and expected output.

Note: The command statement labeled “LISTACTV” issues a Console Management “DISPLAY ACTIVE, LIST” COMMAND. It will also generate a WTO which should be responded to immediately. The system will not accept any new work until the operator has replied to the IEFC166D message.**:** The system will not process any more work until this system prompt is responded to.

8.6.2.2.1 ISPF

Log on to TSO using a LOGON procedure that includes the z/OS 3.1 ISPF data sets. The data sets are allocated to the appropriate DDNAMEs, as are documented in Figure 44 on page 149.

Enter `ISPSTART nlslang` at the TSO/E READY prompt (where *nlslang* is the language you are using). The IBM-supplied default is ENGLISH. The ISPF Primary Option Menu is displayed with the ISPF logo in a pop-up window. The logo contains a copyright date, as shown in Figure 50 on page 189.

```
Licensed Materials - Property of IBM
5655-ZOS Copyright IBM Corp. 1980, 2023.
US Government Users Restricted Rights -
Use, duplication or disclosure restricted
by GSA ADP Schedule Contract with IBM Corp.
```

Figure 50. ISPF Copyright Logo

Enter the command `PANELID` on the Option line. The panel ID ISP@MSTR should appear in the upper left corner of the screen.

Enter `X` on the Option line to return to TSO/E READY.

Enter `ISPF` *`nlslang`* or `PDF` *`nlslang`* at the TSO/E READY prompt (where *nlslang* is the language you are using). The IBM-supplied default is ENGLISH.

The ISPF Primary Option Menu is displayed with the ISPF logo in a pop-up window. The logo contains a copyright date, as shown in Figure 50 on page 189.

Execute the steps listed in Figure 51 on page 189 to verify the basic ISPF functions have been properly installed. After entering the command `PANELID`, the panel name appears in the upper left corner of the screen.

Figure 51 (Page 1 of 2). Installation Verification Functions

In command line of panel...	**Enter**	**Panel displayed**
ISPF Primary Option	PANELID	ISR@PRIM
ISR@PRIM	0	ISPISMMN
ISPISMMN	=1	ISRBRO01
ISRBRO01	=2	ISREDM01
ISREDM01	=3.1	ISRUDA1
ISRUDA1	=3.2	ISRUDA2/ISRUDA2S*
Note: *ISRUDA2S if SMS is active.		
ISRUDA2/ISRUDA2S	=3.3	ISRUMC1
ISRUMC1	=3.4	ISRUDLP
ISRUDLP	=3.12	ISRSSNEW
ISRSSNEW	=3.13	ISRSEPRI
ISRSEPRI	=3.14	ISRSFSPR
ISRSFSPR	=4.1	ISRFP01
ISRFP01	=5.1	ISRJP01

Figure 51 (Page 1 of 2). Installation Verification Functions		
In command line of panel...	**Enter**	**Panel displayed**
ISRJP01	=6	ISRTSO/ISRTSOA
Note: ISRTSOA if requested by the configuration table.		
ISRTSO/ISRTSOA	=7	ISPYXD1
ISPYXD1	=X;9	ISRDIIS
ISRDIIS	=11	ISRWORK
ISRWORK	=10	FLMDMN

8.6.2.2.2 ISPF SCLM

This procedure allocates, assembles, and link-edits a test ISPF SCLM project and then uses this project to save and build an assembler source module. To execute this procedure, you need the following information:

- **A high-level qualifier to be used to define the temporary project definition.**

  This forms the prefix for the data sets allocated by this procedure. You can use your user ID as the high-level qualifier (*hlq*). Seven data sets will be allocated:
  - *hlq*.PROJDEFS.ACCTDB
  - *hlq*.PROJDEFS.BLDLIST
  - *hlq*.PROJDEFS.INFO
  - *hlq*.PROJDEFS.LOAD
  - *hlq*.PROJDEFS.OBJ
  - *hlq*.PROJDEFS.SOURCE
  - *hlq*.PROJDEFS.SYSPRINT

  These data sets must not previously exist. A minimum of nine 3390 DASD tracks are required for the allocation. At the end of the procedure you are given the option to delete these data sets.
- **The name of the SCLM macro library.**

  The SMP/E DDDEF for SISPMACS points to this data set.
- **A volume serial for a VSAM data set.**

  The volume used for the allocation of the *hlq*.PROJDEFS.ACCTDB data set.
- **The location of the High Level Assembler module ASMA90.**

  This location will be either in normal MVS search sequence (STEPLIB, LNKLST, LPA, etc.) or the High Level Assembler data set name (SASMMOD1).

After you have obtained the required information, follow these steps to perform the installation verification:

1. From the ISPF Primary Option Panel, select Option 10, SCLM.
2. From the SCLM panel, select Option 6, TSO or SCLM Commands.
3. Enter the command: `FLMIVP`
4. Answer the prompts with the information gathered during preparation.

5. At this point, the procedure will:

   - Allocate the necessary data sets. (If the data set allocation fails, diagnose the problem, take corrective action, and then rerun the FLMIVP procedure.)
   - Create, assemble, and link-edit the SCLM project definition
   - Test the installation by executing SAVE and BUILD commands
   - Indicate if the installation test passed or failed. If the test failed, the messages reported to the screen and the contents of the *hlq*.PROJDEFS.SYSPRINT and *hlq*.PROJDEFS.BLDLIST data sets can be used to determine the cause of the failure. If you cannot determine the cause of the failure, contact the IBM Support Center.
   - Prompt you to determine if the data sets should be deleted or retained.

   If errors occur during the SCLM installation verification procedure, use the FLMIVPC EXEC to delete the data sets allocated by FLMIVP.

8.6.3 IVP jobs for Wave 1A

There are currently no installation verification procedures for the following elements in Wave 1A:

- Communications Server for z/OS SNA Services
- TIOC
- Cryptographic Services ICSF
- System SSL

8.6.3.1 Run the Communications Server IP Services Installation Verification Procedures

Before beginning the installation verification procedures for Communications Server IP Services, SNA(VTAM) must be started in order for Communications Server IP Services to initialize successfully. To start VTAM from the MVS operator console, issue the following command:

```
S VTAM_procname,,,(LIST=start_list_id)
```

Expected results: The following messages will be displayed on the MVS operator console:

```
IST020I VTAM INITIALIZATION COMPLETE FOR CS 3.1
IST1349I COMPONENT ID IS 5695-11701-310
```

Before beginning the installation verification procedures for Communications Server IP Services, verify you have all the required values as listed beginning on page 160.

1. Set up TSO user's TCPIP.DATA

   On the TSO user ID from which the IVP will be executed, the SYSTCPD DD card of the TSO logon procedure must point to the data set specified by *TCPIP_DATA_name*. Either change the TSO logon procedure (and log off and on again), or do the following steps to override the SYSTCPD definition for the rest of the TSO logon session:

   - In TSO ready mode or from TSO option 6, drop the existing definition by entering the following command:

     ```
     FREE FI(SYSTCPD)
     ```

- Establish the new SYSTCPD definition with this command:

  ```
  ALLOC FI(SYSTCPD) DS('TCPIP_DATA_name')
  ```

2. Start the SYSLOG daemon
   - From the MVS operator console, issue:

     ```
     S SYSLOGD_procname
     ```

   - Expected results:

     ```
     FSUM1248 SYSLOGD_procname INITIALIZATION COMPLETE
     ```

3. Start TCP/IP
   - From the MVS operator console, issue

     ```
     S TCPIP_procname
     ```

   - Expected results:

     The following messages will be displayed on the MVS operator console:

     ```
     EZZ4202I Z/OS UNIX - TCP/IP CONNECTION ESTABLISHED FOR TCPIP_procname
     EZB6473I TCP/IP STACK FUNCTIONS INITIALIZATION COMPLETE
     EZAIN11I ALL TCPIP SERVICES FOR PROC tcpproc_name ARE AVAILABLE
     EZD1314I TCP/IP AND EXTENDED SERVICES ARE NOW INITIALIZED FOR STACK:
     tcpstackname.
     ```

     Note: EZD1314I is issued by default in z/OS V2R5 and later releases.

4. Start the FTP daemon
   - From the MVS operator console, issue

     ```
     S FTPD_procname
     ```

   - Expected results:
     - The *FTPD_procname* task will end after forking another task. The forked task (for example, FTPD1), will remain running.
     - The following message will be displayed on the MVS operator console:

       ```
       EZY2702I SERVER-FTP: INITIALIZATION COMPLETED AT hh:mm:ss ON mm/dd/yy
       ```

5. Test the following commands from TSO:
   - Issue:

     ```
     ping loopback
     ```

   - Expected results:

     ```
     CS v.r: Pinging host LOOPBACK  (127.0.0.1).
     Ping #1 response took n.nnn seconds.
     ```

   - Issue

```
netstat home
```

- Expected results:

```
MVS TCP/IP NETSTAT CS v.r   TCPIP NAME:
TCPIP_procname  hh:mm:ss

Home address list:

Address          Link             Flg

-------          ----             ---

127.0.0.1        LOOPBACK         P
```

Note: If you are using the sample profile without any changes, then you will not see the 'P' under the Flg header.

6. Set up environment variables required in the z/OS UNIX Shell

   - Set the following environment variables in the z/OS UNIX Shell for the user ID on which the IVP will be executed. From the z/OS UNIX shell, issue the following commands:

     ```
     export X_SITE="//'dyn_alc_hlq.HOSTS.SITEINFO'"
     export X_ADDR="//'dyn_alc_hlq.HOSTS.ADDRINFO'"
     export RESOLVER_CONFIG="//'TCPIP_DATA_name'"
     ```

7. Test commands from the z/OS UNIX shell

   - The following steps may require superuser authority to execute.
   - Ensure you have write access to your local directory. Then, in the z/OS UNIX shell, copy the verification shell script to your local directory. For example:

     ```
     cp /usr/lpp/tcpip/samples/ivp.scp /your_target_directory/ivp.scp
     ```

   - Run the shell script, directing output to a file.

     ```
     ivp.scp > ivp.out
     ```

   - The following tests are done by the shell script. The script will display the expected results and the actual results.

     ```
     oping loopback
     onetstat -h
     ```

   - Review the ivp.out file, ensuring the actual results match the expected results.

8. Test the following commands from the MVS operator console

   - Issue the following DISPLAY command:

     ```
     display tcpip,TCPIP_procname,netstat,home
     ```

   - Expected results:

```
EZZ2500I NETSTAT CS v.r TCPIP_procname

HOME ADDRESS LIST:

ADDRESS          LINK             FLG
127.0.0.1        LOOPBACK         P
1 OF 1 RECORDS DISPLAYED
```

9. Run the IVPFTP batch job to verify that FTP has been correctly set up

   - This job will get a sample file, FTPTESTP, from the *target_lib_hlq*.SEZAINST partitioned dataset and store it into the /tmp directory. It will then get the file from the /tmp directory hfs and store it in the *IVP_configuration_dsn* partitioned data set as FTPTESTG.
   - Copy IVP test job to your chosen JCL dataset: *target_lib_hlq*.SEZAINST(IVPFTP) to *IVP_jcllib_dsn*(IVPFTP)
   - Fill in any required parameters on the //JOB statement.
   - Change the //SYSFTPD DD card to set the DSN variable to *IVP_configuration_dsn*(FTCDATA), or accept the default of 'TCPIVP.TCPPARMS(FTCDATA)' for the FTP client FTP.DATA file.
   - Change the //SYSTCPD DD card to set the DSN variable to *TCPIP_DATA_name*, or accept the default of 'TCPIVP.TCPPARMS(TCPDATA)'.
   - Change the input values for *'userid password'* to match the TSO user ID and password to be used for the FTP client. For example:

     ```
     USER1 USER1PW
     ```

   - Change the PUT statement to specify the appropriate SEZAINST dataset for sample dataset to be moved: 'tcpip' to *target_lib_hlq*.
   - Change the GET statement to specify the appropriate location for the retrieved dataset: 'TCPIVP.TCPPARMS' to *IVP_configuration_dsn* (or accept the default of 'TCPIVP.TCPPARMS')
   - Submit batch IVPFTP

     Expected results:
     - The job should complete with condition code zero.
     - The /tmp directory should contain a file called ftptestp.
     - The *IVP_configuration_dsn* should contain member FTPTESTG.
     - Both the new file and the new partitioned dataset member should contain the one line:

       ```
       The File Transfer Protocol is working!!!
       ```

8.6.3.2 Run the Language Environment Installation Verification Procedure:

To verify that Language Environment is installed properly, run CEEWIVP in your SCEESAMP library. If the z/OS XL C/C++ compiler uses 64-bit virtual memory, ensure that MEMLIMIT > 0. The actual value of MEMLIMIT might vary with each customer. See the comments in the job for instructions, expected condition codes, and expected output.

Note: As of z/OS V1R8, the IPA Link step of the z/OS XL C/C++ compiler uses 64-bit virtual memory, which requires sufficient storage above the 2 GB bar (2 GB address line). For information about using MEMLIMIT to ensure that sufficient storage above the 2 GB bar is available for the IPA Link step, see 8.6.7.4, “Run the XL C/C++ Installation Verification Procedures” on page 220.

8.6.4 IVP jobs for Wave 1B

8.6.4.1 Run the DFSMS Installation Verification Procedure: To test the successful installation of DFSMS, run the following IVPs found in SAMPLIB:

```
DFPS1IVP  DFPS2IVP  DFPS3IVP  DFPX1IVP  DFPX2IVP  DFPX3IVP
```

Note: The members with the prefix 'DFPS' use SMS managed volumes and datasets. The members with the prefix 'DFPX' use non-SMS managed volumes and datasets.

8.6.4.1.1 DFSMSdfp OAM Installation Verification Procedure: It is recommended that you run the OAM Installation Verification Program (CBRSAMIV) at initial installation and at migration. CBRSAMIV verifies that OAM object support is successfully installed and operational. It ensures that the proper environment exists for applications to utilize the OSREQ Macro Application Programming Interface (API).

For detailed information about how to run the IVP program (CBRSAMIV) and invoke the OSREQ API, refer to *z/OS DFSMS OAM Planning, Installation, and Storage Administration Guide for Object Support*.

8.6.4.2 DFSMSrmm Installation Verification Procedures

DFSMSrmm Samples Provided in SAMPLIB

- EDGIVPPM Sample Parmlib for Use in the IVP
- EDGIVP1 IVP Job 1 to Initialize Tape Volumes
- EDGIVP2 IVP Job 2 to Use Tape Volumes

This topic helps you prepare for and run the DFSMSrmm installation verification procedures (IVP). You can use the IVP to ensure that the DFSMSrmm functional component has been successfully installed by SMP/E and can be activated on your system. The IVP does not test all the functions in DFSMSrmm but validates that the key interfaces are in place.

8.6.4.2.1 Preparing to run the IVP: Before you run the IVP, you need to activate some of DFSMSrmm's functions. This topic lists and describes the steps you should perform to set up DFSMSrmm for the IVP. Chapter 2. Implementing DFSMSrmm in *z/OS DFSMSrmm Implementation and Customization Guide* contains all the steps needed to install DFSMSrmm.

If this is first time you are setting up DFSMSrmm, follow all the steps described in this topic. If your system has previously been set up for use with DFSMSrmm, you might not need to perform all the steps listed here. Evaluate your installation setup to determine which steps you can omit.

1. Install DFSMSrmm with SMP/E.

   Ensure that DFSMS including DFSMSrmm is SMP/E applied.

   Once you have used SMP/E to install DFSMSrmm, IPL your system without performing any implementation tasks and have DFSMSrmm take no part in removable media management. The ability to run without DFSMSrmm is especially helpful if you are running another tape management product in production.

2. Update SYS1.PARMLIB members.

   For detailed instructions, see "Step 5: Updating SYS1.PARMLIB Members" in *z/OS DFSMSrmm Implementation and Customization Guide*. At a minimum, you should update IEFSSN*xx*. Also update IFAPRD*xx* member in SYS1.PARMLIB to enable DFSMSrmm".

3. Update the procedure library.

   Refer to "Step 8: Updating the Procedure Library" in *z/OS DFSMSrmm Implementation and Customization Guide* for detailed instructions. Use member EDGDFRMM of SYS1.SAMPLIB as a sample DFSMSrmm procedure.

4. Assign DFSMSrmm a RACF user ID.

   Perform this step if you want to use a specific RACF user ID for DFSMSrmm during the IVP. When running on a system with RACF installed, assign DFSMSrmm a RACF user ID by adding a profile in the STARTED class as described in "Step 9: Assigning DFSMSrmm a RACF User ID" in *z/OS DFSMSrmm Implementation and Customization Guide*. You can use the DFSMSrmm procedure name that you created in Step 3 as the RACF user ID but any installation-selected RACF user ID is acceptable. As data sets are created for use by the DFSMSrmm procedure, add the RACF user ID to the access list for the data sets. "Table 6. Data Sets Requiring Access by the DFSMSrmm RACF User ID" in *z/OS DFSMSrmm Implementation and Customization Guide* lists the data sets that the DFSMSrmm procedure should be able to access.

   If you are using an equivalent security product, review the RACF-related information to determine the changes that might be required to run DFSMSrmm with that product.

5. Define parmlib member EDGRMM*xx*.

   Refer to "Step 10: Defining Parmlib Member EDGRMMxx" in *z/OS DFSMSrmm Implementation and Customization Guide* for detailed instructions. Use member EDGIVPPM of SYS1.SAMPLIB as a sample parmlib member.

6. Specify DFSMSrmm options.

   Refer to *z/OS DFSMSrmm Implementation and Customization Guide* for information on tailoring the DFSMSrmm sample parmlib member EDGIVPPM to specify DFSMSrmm options for the IVP.

   During the IVP, DFSMSrmm runs in record-only mode. DFSMSrmm records information about tape volumes, but does no validation. You can tailor EDGIVPPM to specify that DFSMSrmm run in warning mode or protect mode if you want DFSMSrmm to validate volumes.

   If you are running the IVP on a system with no other tape management system you can select any mode: record-only, warning or protect. If there is a possibility of accidental use of the wrong tape volumes, we suggest that you run in protect mode. However, if you run the IVP on a system where others are using tape including the use of scratch tapes, be aware that DFSMSrmm rejects all scratch tapes not defined to it while running in protect mode. See "Defining System Options: OPTION" in *z/OS DFSMSrmm Implementation and Customization Guide* for information about DFSMSrmm modes of operation.

7. Create the DFSMSrmm control data set.

Refer to *z/OS DFSMSrmm Implementation and Customization Guide* for detailed instructions. You can use the sample JCL in member EDGJMFAL in SYS1.SAMPLIB to allocate a control data set. Ensure that the control data set name is the same as that specified in the parmlib member EDGRMMxx that you created. Initialize the control data set by running the EDGUTIL utility. You can use the sample JCL in member EDGJUTIL in SYS1.SAMPLIB. Set the rack and bin count fields to 0.

8. Create the journal.

   Refer to *z/OS DFSMSrmm Implementation and Customization Guide* for detailed instructions. You can use sample JCL in member EDGJNLAL in SYS1.SAMPLIB to allocate a journal data set.

9. Make the DFSMSrmm ISPF Dialog available to users.

   Refer to *z/OS DFSMSrmm Implementation and Customization Guide* for detailed instructions.

10. Restart z/OS with DFSMSrmm implemented.

    You are ready to start the system with DFSMSrmm implemented. Refer to *z/OS DFSMSrmm Implementation and Customization Guide* for information on conditions that determine if you need to IPL the system to restart z/OS with DFSMSrmm implemented. Perform this step so that the changes you made to IEFSSNxx and other parmlib members when you performed Step 2 take effect.

11. Start DFSMSrmm.

    Refer to "Step 19: Starting DFSMSrmm" for detailed instructions. When you start DFSMSrmm, if it issues message EDG0103D, reply 'RETRY'. If you do not reply 'RETRY', DFSMSrmm will not record any tape usage activity.

DFSMSrmm is activated and you are ready to run the IVP.

8.6.4.2.2 Running the IVP: To run the IVP, perform these steps:

1. You need three tape volumes that do not have any data on them, and a single tape unit online to your system. Ask your tape librarian to externally label these volumes EDG000, EDG001, and EDG002 for your testing.

   Ensure that the tape volumes you use are suitable for use with DFSMSrmm during the IVP. For example, if you have an existing tape management system, check that the volumes are either not managed by it or are designated for use with DFSMSrmm for testing.

2. Ensure that TSO help information has been correctly installed by entering this command from a TSO terminal:

   ```
   HELP RMM
   ```

   DFSMSrmm lists help information for the RMM TSO subcommand, including a list of subcommands, function, syntax, and operands.

3. Add some shelf locations to DFSMSrmm by entering this RMM TSO command from a TSO terminal:

   ```
   RMM ADDRACK RMM000 COUNT(10)
   ```

4. Add some volumes to DFSMSrmm by using the DFSMSrmm ISPF dialog. Enter this command from a TSO terminal:

%RMMISPF

DFSMSrmm displays the DFSMSrmm ISPF dialog primary option menu as shown in Figure 52 on page 198.

```
  Panel  Help
------------------------------------------------------------------
EDG@PRIM         REMOVABLE MEDIA MANAGER (DFSMSrmm) - z/OS 3.1
Option ===>

0  OPTIONS       - Specify dialog options and defaults
1  USER          - General user facilities
2  LIBRARIAN     - Librarian functions
3  ADMINISTRATOR - Administrator functions
4  SUPPORT       - System support facilities
5  COMMANDS      - Full DFSMSrmm structured dialog
6  LOCAL         - Installation defined dialog
X  EXIT          - Exit DFSMSrmm Dialog

Enter selected option or END command.  For more info., enter HELP
or PF1.




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```

Figure 52. DFSMSrmm Primary Option Menu

Enter VOLUME on the option line to display the DFSMSrmm Volume Menu, as shown in Figure 52 on page 198. DFSMSrmm displays a panel, as shown in Figure 53 on page 199.

```
 Panel  Help
------------------------------------------------------------
EDGPT000                     DFSMSrmm Volume Menu
Option ===>

0  OPTIONS   - Specify dialog options and defaults
1  DISPLAY   - Display volume information
2  ADD       - Add a new volume
3  CHANGE    - Change volume information
4  RELEASE   - Delete or release a volume
5  SEARCH    - Search for volumes
6  REQUEST   - Request a volume
7  ADDSCR    - Add one or more SCRATCH volumes
8  CONFIRM   - Confirm librarian or operator actions
9  STACKED   - Add one or more stacked volumes


Enter selected option or END command.  For more info., enter HELP
or PF1.



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```

Figure 53. DFSMSrmm Volume Menu

Select option 7, ADDSCR, and press ENTER. DFSMSrmm displays the DFSMSrmm Add Scratch Volumes panel shown in Figure 54 on page 200. Complete the details as shown in the panel and press ENTER:

```
  Panel  Help
------------------------------------------------------------------
EDGPT230          DFSMSrmm Add Scratch Volumes   3 Volumes added
Command ===>


Volume . . . . . . . EDG000     Pool  . . . . . . .
                                 or
Volume type  . . . . PHYSICAL   Rack  . . . . . . . RMM000
Media name . . . . . 3480
Vendor . . . . . . .            Media information .
Storage group  . . .            Location name . . . SHELF

Count  . . . . . . . 3         ( Default is 1 )

Description  . . . .
Account number . . .
Assigned date  . . . 2007/340  YYYY/DDD      MVS use . . . . YES
Assigned time  . . . 02:14:38                VM use  . . . . NO
Create date  . . . . 2007/340                IRMM use  . . . .
Create time  . . . . 02:14:38

Media type . . . . . CST
Label  . . . . . . . SL    ( AL, NL or SL )
  Current version          Label version number( for example 3 )
  Required version         Label version number( for example 4 )
Density  . . . . . . 3480  ( 1600, 3480, 6250 or * )
Initialize . . . . . YES   ( Default is YES )

Press ENTER to ADD one or more SCRATCH volumes, or END command
to CANCEL.
```

Figure 54. DFSMSrmm Add Scratch Volumes Panel

DFSMSrmm displays the message `3 volumes added` in the right hand corner of the screen.

Exit the DFSMSrmm ISPF dialog by entering **=X** on the command line.

5. Initialize tape volumes by editing and submitting the JCL in member EDGIVP1 in SYS1.SAMPLIB. Mount the three tape volumes requested by this job in the sequence EDG002, EDG001, and EDG000.

   Ensure that the job completes with a return code of zero and the expected messages in EDGIVP1 are in the job output.

6. Write data to tape volumes by editing and submitting the JCL in member EDGIVP2 in SYS1.SAMPLIB. Mount the three tape volumes requested by this job in the sequence EDG000, EDG001, and EDG002. Use the three volumes initialized in Step 5.

Ensure that all steps of the job complete with a return code of zero. Message IEC502E is issued when the job finishes with the second volume, EDG001. Check that the message in the SYSLOG contains the text RACK=RMM001 on the right hand side as follows:

```
IEC502E RK ddd,EDG001,SL,jjjjjjjj,WRITE22 - RACK=RMM001
```

7. To display data set information that is recorded by DFSMSrmm, enter these RMM TSO subcommands:

   ```
   RMM LISTDATASET 'RMMIVP.TEST1' VOLUME(EDG000) SEQ(1)
   RMM LISTDATASET 'RMMIVP.TEST2' VOLUME(EDG000) SEQ(2)
   RMM LISTDATASET 'RMMIVP.TEST3' VOLUME(EDG001) SEQ(1)
   RMM LISTDATASET 'RMMIVP.TEST4' VOLUME(EDG001) SEQ(2)
   RMM LISTDATASET 'RMMIVP.TEST4' VOLUME(EDG002) SEQ(1)
   ```

   DFSMSrmm displays data set information, as shown in Figure 55 on page 202.

```
Data set name = RMMIVP.TEST1
Volume        = EDG000         Physical file sequence number = 1
Owner         = TEST                      Data set sequence = 1
Create date   = 2015/089 Create time = 12:50:01 System ID = TEST
Expiration date       = 2015/094          Expir. time = 12:50:01
         set by       = OCE_DEF     Original expir.date  =
LASTREF Extra Days    = 0          WHILECATALOG          = OFF
Block size            = 80         Block count           = 10
Data set size(KB)     = 1
Physical size(KB)     = 0          Compression           = 0.00
Percent of volume     = 0          Total block count     = 10
Logical Record Length = 80         Record Format         = FB
Date last written     = 2015/089   Date last read     = 2015/089
Job name              = EDGIVP2    Last job name      = EDGIVP2
Step name             = WRITE11    Last step name     = WRITE11
Program name          = IEBDG      Last program name     = IEBDG
DD name               = SEQOUT     Last DD name          = SEQOUT
Device number         = 0B50       Last Device number    = 0B50
Management class      =            VRS management value  =
Storage group         =            VRS retention date    =
Storage class         =            VRS retained          = NO
Data class            =            Closed by Abend       = NO
                                   Deleted               = NO
VRSEL exclude         = NO         Catalog status        = YES
Primary VRS details:
       Name           =
       Job name       =            Type                  =
       Subchain NAME  =            Subchain start date   =
Secondary VRS details:
       Value or class =
       Job name       =
       Subchain NAME  =            Subchain start date   =
Security Class   =           Description   =
BES key index    = 0

Last Change information:
Date             = 2015/089    Time = 12:50:01  System  = 3090
User change date =             Time =           User ID = *OCE
```

Figure 55. Sample Data Set Information

To cleanup after running the IVP or to prepare to rerun the IVP, issue these commands to remove information from the DFSMSrmm control data set.

```
RMM DELETEVOLUME EDG000 FORCE
RMM DELETEVOLUME EDG001 FORCE
RMM DELETEVOLUME EDG002 FORCE
RMM DELETERACK RMM000 COUNT(10)
```

When you have completed running the IVP, you can return the three volumes to your tape library.

8.6.4.3 DFSMShsm Installation Verification Procedures:

The DFSMShsm installation verification procedure (IVP) is an optional procedure that verifies that the DFSMShsm product is correctly installed and can be started and stopped using a minimum of DASD resources.

When the System Modification Program/Extended (SMP/E) installs the DFSMShsm product modules onto an MVS system, it places the ARCIVPST member into SYS1.SAMPLIB. This ARCIVPST member is the job that you run for the IVP procedure.

Note: If you have not performed an initial program load for your MVS system with the CLPA (create link pack area) option, do it before you run DFSMShsm.

8.6.4.3.1 Setup requirements:

The following information is required to run the DFSMShsm IVP:

- The catalog, with its associated alias, which must be defined before attempting to run the IVP.
- The name of the IVP user ID.
- A high-level qualifier for the data sets that are required by the IVP.
- A volume serial number and unit type of a device containing one free cylinder for a temporary user catalog.
- A name for a temporary user catalog for the migration control data set (MCDS).
- The name of the system master catalog.
- The job control parameters for each job. (Usually this is defined as HSM.)
- The volume serial number and unit type of a device containing one free cylinder for a temporary MCDS.
- The version of JES (JES2) on the system.

  Note: In an SMS environment, no consideration is given to whether data sets allocated by the IVP are SMS or non-SMS managed.

8.6.4.3.2 Steps for running the Installation Verification Procedure:

The following steps are used to prepare for and run the DFSMShsm installation verification procedure:

1. Edit the job ARCIVPST inserting the correct parameters in the job statement. See "HSMIVP" in *z/OS DFSMShsm Implementation and Customization Guide* for a listing of ARCIVPST.

   ARCIVPST is an IEBUPDTE job, HSMIVP, that creates the partitioned data set DFSMSHSM.IVP.CNTL. Be sure to change the job control statement before running this job. For an example listing of the HSMIVP job, refer to the samples provided in SYS1.SAMPLIB.

2. After the edit, run the job in ARCIVPST. The result of this job is a partitioned data set named DFSMSHSM.IVP.CNTL, containing the member HSMIVP1. The partitioned data set is allocated on one cylinder of SYSDA.

3. Edit member HSMIVP1 in the DFSMSHSM.IVP.CNTL data set. Globally change the HSMIVP1 parameters by substituting the values determined in 8.6.4.3.1, “ Setup requirements” on page 203. For a listing of HSMIVP1 parameters, see "HSMIVP1" in *z/OS DFSMShsm Implementation and Customization Guide*.

   This job allocates data sets on your system for the DFSMShsm IVP. For an example listing of the HSMIVP1 job, refer to the samples provided in SYS1.SAMPLIB. Note that you must ensure that you globally change the following values before submitting this job.

?UCATUNIT Defines a unit type for the temporary user catalog.

?UCATVOL Defines the volume serial number of the volume for the temporary user catalog.

?UCATNAM Defines the name of the temporary user catalog for the MCDS.

?MCATNAM Defines the name and password of the system master catalog.

?JOBPARM Defines the job control parameters that are used for each job.

?HIQUAL Defines the high-level qualifier for the data sets used by the IVP. Usually this is defined as HSM. This value must be between 1 and 7 characters; the first character must be alphabetic. This value must be different from the value that is specified for the high-level qualifier on the control data set. Ensure that this IVP parameter is unique so that it does not conflict with any other alias currently in use.

?CDSUNIT Defines a unit type for the temporary MCDS.

?CDSVOL Defines the volume serial number of the volume for the temporary MCDS.

?JESVER Defines the version of JES on the system as JES2.

4. Run the HSMIVP1 job to create the following:
   - A user catalog
   - An MCDS VSAM data set
   - A startup procedure DFSMSHSM in SYS1.PROCLIB

     Note: If a startup procedure named DFSMSHSM already exists in the SYS1.PROCLIB data set, it will be overwritten.
   - Members ARCCMD00, HSMIVP2, and UCLINCHK in the partitioned data set DFSMSHSM.IVP.CNTL

     Rule: If the HSMIVP1 job is submitted while you are editing member HSMIVP1, you must exit the edit so that the HSMIVP1 job can update the partitioned data set DFSMSHSM.IVP.CNTL.
5. After job HSMIVP1 has completed, start DFSMShsm by typing the command **S DFSMSHSM** from the system console.
6. Review the console messages created as IVP output. Scan the console for messages ARC0001I and ARC0008I informing you that DFSMShsm has started and that initialization has completed. See Figure 56 on page 206 for an example of the console screen.

   Note that you can expect to see error messages that are issued because many data sets are not allocated until later in the DFSMShsm installation when the starter set jobs are run. For a description of the messages, use LookAt or see *MVS System Messages*.
7. Run job UCLINCHK.

   The job attempts actions which fail if DFSMShsm is correctly installed; You may receive the following messages

```
ARC1001I HSMIVP.UCLINCHK  RECALL FAILED, RC=0002, REAS=0000
ARC1102I DATA SET IS NOT MIGRATED/BACKED UP
```

You may also receive other error messages during the IDCAMS job, depending on your system environment:

```
ALLOCATE DA('HSMIVP.UCLINCHK')
IKJ56238I DATA SET HSMIVP.UCLINCHK NOT ALLOCATED, UNKNOWN ERROR DURING
RECALL
IGD04001I UNEXPECTED CATALOG LOCATE PROCESSING ERROR - RETURN CODE 38
REASON CODE 4
IDC3003I FUNCTION TERMINATED. CONDITION CODE IS 12
```

Note: A request to mount volume "MIGRAT" is an error condition that indicates that UCLIN has not run or has not run correctly.

Do not progress to the next step until the UCLINCHK job has run with the result described in Step 7.

```
S DFSMSHSM
$HASP100 DFSMSHSM ON STCINRDR
IEF695I START DFSMSHSM WITH JOBNAME DFSMSHSM IS ASSIGNED TO USER IBMUSER
 , GROUP SYS1
$HASP373 DFSMSHSM STARTED
ARC0041I MEMBER ARCSTR00 USED IN DFSMSHSM.IVP.CNTL
ARC0036E I/O DISABLED FOR DFSMSHSM PROBLEM 310
ARC0036E (CONT.) DETERMINATION OUTPUT DATA SET, REAS= 1
ARC0020I ****************************
ARC0036E I/O DISABLED FOR DFSMSHSM PROBLEM 312
ARC0036E (CONT.) DETERMINATION OUTPUT DATA SET, REAS= 2
ARC0021I  DFSMSHSM LOGGING FUNCTION DISABLED
ARC0020I ****************************
ARC0035E DFSMSHSM JOURNAL IS PERMANENTLY DISABLED, 315
ARC0035E (CONT.) REASON=8
ARC0860E JOURNAL SPACE MONITORING DISABLED - RC=24. 316
ARC0860E (CONT.) MIGRATION, BACKUP, FRBACKUP, DUMP, AND RECYCLE HELD.
ARC0001I DFSMSHSM 03.01.00 STARTING HOST=1 IN 317
ARC0001I (CONT.) HOSTMODE=MAIN
IEC130I BAKCAT   DD STATEMENT MISSING
ARC0945I OPEN OF DDNAME=BAKCAT FAILED, VSAM REASON 319
ARC0945I (CONT.) CODE IS X'80'
ARC0134I BACKUP CONTROL DATA SET NOT OPENED, BACKUP 320
ARC0134I (CONT.) WILL NOT BE ENABLED
IEC130I OFFCAT   DD STATEMENT MISSING
ARC0945I OPEN OF DDNAME=OFFCAT FAILED, VSAM REASON 322
ARC0945I (CONT.) CODE IS X'80'
ARC0133I OFFLINE CONTROL DATA SET NOT OPENED, TAPE 323
ARC0133I (CONT.) SUPPORT WILL NOT BE ACTIVE
ARC6374E BCDS IS NOT DEFINED, AGGREGATE BACKUP AND 324
ARC6374E (CONT.) RECOVERY FUNCTIONS ARE DISABLED
ARC1700I DFSMSHSM COMMANDS ARE RACF PROTECTED
ARC0041I MEMBER ARCCMD00 USED IN DFSMSHSM.IVP.CNTL
ARC0100I SETSYS COMMAND COMPLETED
ARC0101I QUERY SETSYS COMMAND STARTING ON HOST=1
ARC0147I BUDENSITY=*, BUUNIT=3590-1, BU RECYCLE 355
ARC0147I (CONT.) PERCENTAGE=020%, MOUNT WAIT TIME=015 MINUTE(S),
ARC0147I (CONT.) TAPESPANSIZE(0500)
ARC0419I SELECTVOLUME=SCRATCH, 356
ARC0419I (CONT.) TAPEDELETION=SCRATCHTAPE, PARTIALTAPE=REUSE,
ARC0419I (CONT.) DISASTERMODE=NO
ARC0259I TAPEDATASETORDER=PRIORITY
ARC0408I INPUT TAPE ALLOCATION=NOWAIT, OUTPUT TAPE 358
ARC0408I (CONT.) ALLOCATION=NOWAIT, RECYCLE TAPE ALLOCATION=NOWAIT,
ARC0408I (CONT.) TAPEFORMAT=SINGLEFILE
```

Figure 56 (Part 1 of 4). Example of a z/OS 3.1 DFSMShsm Startup Screen (IVP)

```
ARC0417I TAPE INPUT PROMPT FOR BACKUPTAPES=YES
ARC0417I TAPE INPUT PROMPT FOR DUMPTAPES=YES
ARC0417I TAPE INPUT PROMPT FOR MIGRATIONTAPES=YES
ARC0442I TAPE OUTPUT PROMPT FOR TAPECOPY=NO, DUPLEX 362
ARC0442I (CONT.) BACKUP TAPES=NO, DUPLEX MIGRATION TAPES=NO
ARC0410I TAPEMIGRATION=NONE(ROUTETOTAPE(ANY)), 363
ARC0410I (CONT.) MIGDENSITY=*, MIGUNIT=3590-1, ML2 RECYCLE
ARC0410I (CONT.) PERCENTAGE=020%, TAPEMAXRECALLTASKS=01, ML2 PARTIALS
ARC0410I (CONT.) NOT ASSOCIATED GOAL=010, RECONNECT(NONE)
ARC0444I CLOUDMIGRATION RECONNECT(NONE)
ARC0411I TAPESECURITY=PASSWORD, DEFERMOUNT
ARC0412I RECYCLEOUTPUT BACKUP=**NONE**, 366
ARC0412I (CONT.) MIGRATION=**NONE**, RECYCLETAKEAWAYRETRY=(NO,
ARC0412I (CONT.) MAXRETRYATTEMPTS=12, DELAY=0300)
ARC0840I MAXRECYCLETASKS=02, RECYCLE INPUT 367
ARC0840I (CONT.) DEALLOCATION FREQUENCY BACKUP=000 MIGRATION=000
ARC0149I MONITOR STARTUP NOSPACE NOVOLUME, MCDS(080), 368
ARC0149I (CONT.) BCDS(  0), OCDS(  0), JOURNAL(  0)
ARC0150I JOURNAL=NONE, LOG=NO, TRACE=NO, SMFID=NONE, 369
ARC0150I (CONT.) DEBUG=NO, EMERG=NO, JES=2, SYS1DUMP=YES, RACFIND=YES,
ARC0150I (CONT.) ERASEONSCRATCH=NO, PDA=ON, DSSXMMODE=(BACKUP=NO,
ARC0150I (CONT.) CDSBACKUP=NO, DUMP=NO, MIGRATION=NO, RECOVERY=NO)
ARC0151I DAYS=001, ML1DAYS=060, 370
ARC0151I (CONT.) PRIMARYSPMGMTSTART=(0000 NONE),
ARC0151I (CONT.) MAXMIGRATIONTASKS=0002, INTERVALMIGRATION=YES,
ARC0151I (CONT.) MIGRATIONCLEANUPDAYS(0010 0030 0003), SDSP=NONE,
ARC0151I (CONT.) MIGRATION PREFIX=IBMUSER, SCRATCH EXPIRED DATA
ARC0151I (CONT.) SETS=NO, SECONDARYSPMGMTSTART=(0000 NONE)
ARC0267I MIGRATIONSUBTASKS=NO, ADDITIONALMIGSUBTASKS=**
ARC0272I PRIMARY SPACE MGMT CYCLE LENGTH=00 DAYS, 372
ARC0272I (CONT.) CYCLE=*NONE*, TODAY IS DAY=0, CYCLE START
ARC0272I (CONT.) DATE=00/00/00
ARC0272I SECONDARY SPACE MGMT CYCLE LENGTH=00 DAYS, 373
ARC0272I (CONT.) CYCLE=*NONE*, TODAY IS DAY=0, CYCLE START
ARC0272I (CONT.) DATE=00/00/00, ML1OVERFLOW(DATASETSIZE=002000000K,ARC02
ARC0139I MAXINTERVALTASKS=02, ONDEMANDMIGRATION=NO, 374
ARC0139I (CONT.) ODMNOTIFICATIONLIMIT=00100,
ARC0139I (CONT.) MAXSSMTASKS(TAPEMOVEMENT=01, CLEANUP=02)
ARC0374I ACCEPTPSCBUSERID=NO
ARC0152I MAXRECALLTASKS=15, 376
ARC0152I (CONT.) RECALL=ANYSTORAGEVOLUME(LIKE), MAXEXTENTS=00,
ARC0152I (CONT.) CONVERSION=NO, VOLCOUNT=*NONE*,
ARC0152I (CONT.) TAPERECALLLIMITS(TASK=00015, TAPE=00020)
ARC0153I SCRATCHFREQ=9999, SYSOUT(CLASS=A, COPIES=01, 377
ARC0153I (CONT.) SPECIAL FORMS=NONE), SWAP=YES, PERMISSION=NO,
```

Figure 56 (Part 2 of 4). Example of a z/OS 3.1 DFSMShsm Startup Screen (IVP)

```
ARC0153I (CONT.) EXITS=NONE, UNLOAD=NO, DATASETSERIALIZATION=DFHSM,
ARC0153I (CONT.) USECMS=NO
ARC0418I TAPEUTILIZATION PERCENT=0097, LIBRARYMIGRATION
ARC0418I TAPEUTILIZATION PERCENT=0097, LIBRARYBACKUP
ARC0418I TAPEUTILIZATION PERCENT=0097, UNIT=3480 380
ARC0418I (CONT.) CAPACITYMODE=**NONE**
ARC0418I TAPEUTILIZATION PERCENT=0097, UNIT=3480X 381
ARC0418I (CONT.) CAPACITYMODE=**NONE**
ARC0418I TAPEUTILIZATION PERCENT=0097, UNIT=3490 382
ARC0418I (CONT.) CAPACITYMODE=**NONE**
ARC0418I TAPEUTILIZATION PERCENT=0097, UNIT=3590-1 383
ARC0418I (CONT.) CAPACITYMODE=**NONE**
ARC0638I MAXDUMPTASKS=02, ADSTART=(0000 0000 0000), 384
ARC0638I (CONT.) DUMPIO=(1,4), VOLUMEDUMP=(STANDARD),
ARC0638I (CONT.) MAXDUMPRECOVERTASKS=01
ARC0274I BACKUP=NO, SPILL=NO, MAXDSRECOVERTASKS=02, 385
ARC0274I (CONT.) MAXDSTAPERECOVERTASKS=02
ARC0154I MAXBACKUPTASKS=02, ABSTART= (0000 0000 0000), 386
ARC0154I (CONT.) VERSIONS=002, FREQUENCY=000, SKIPABPRIMARY=NO, BACKUP
ARC0154I (CONT.) PREFIX=IBMUSER, INCREMENTALBACKUP=ORIGINAL,
ARC0154I (CONT.) PROFILEBACKUP=YES, INUSE=(RETRY=NO, DELAY=015,
ARC0154I (CONT.) SERIALIZATION=REQUIRED)
ARC0269I DS DASD BACKUP TASKS=02, DS TAPE BACKUP 387
ARC0269I (CONT.) TASKS=02, DEMOUNTDELAY=0060, MAXIDLETASKS=00, DS
ARC0269I (CONT.) BACKUP MAX DASD SIZE=000003000, DS BACKUP STD DASD
ARC0269I (CONT.) SIZE=000000250, SWITCHTAPES TIME=0000,
ARC0269I (CONT.) PARTIALTAPE=MARKFULL, GENVSAMCOMPNAMES=YES
ARC1823I MAXCOPYPOOL (FRBACKUP TASKS=0015, FRRECOV 388
ARC1823I (CONT.) TASKS=0015, DSS TASKS=0024),
ARC1823I (CONT.) FASTREPLICATION(DATASETRECOVERY=NONE
ARC1823I (CONT.) FCRELATION=EXTENT VOLUMEPAIRMESSAGES=NO
ARC1823I (CONT.) MESSAGEDATASET(NO HLQ=HSMMSG))
ARC0375I CDSVERSIONBACKUP, 389
ARC0375I (CONT.) MCDSBACKUPDSN=IBMUSER.MCDS.BACKUP,
ARC0375I (CONT.) BCDSBACKUPDSN=IBMUSER.BCDS.BACKUP,
ARC0375I (CONT.) OCDSBACKUPDSN=IBMUSER.OCDS.BACKUP,
ARC0375I (CONT.) JRNLBACKUPDSN=IBMUSER.JRNL.BACKUP
ARC0376I BACKUPCOPIES=0004, BACKUPDEVICECATEGORY=TAPE 390
ARC0376I (CONT.) UNITNAME=3590-1, DENSITY=*, RETPD=0007, NOPARALLEL,
ARC0376I (CONT.) LATESTFINALQUALIFIER=V0000000, DATAMOVER=HSM
ARC0203I CSALIMITS=YES, CSA CURRENTLY USED=0 BYTES, 391
ARC0203I (CONT.) MWE=0, MAXIMUM=0K BYTES, ACTIVE=0%, INACTIVE=0%
ARC0340I COMPACTION OPTIONS ARE: TAPEMIGRATION=NO, 392
ARC0340I (CONT.) DASDMIGRATION=NO, TAPEBACKUP=NO, DASDBACKUP=NO,
ARC0340I (CONT.) TAPEHARDWARECOMPACT=NO, ZCOMPRESS OPTIONS ARE:
```

Figure 56 (Part 3 of 4). Example of a z/OS 3.1 DFSMShsm Startup Screen (IVP)

```
ARC0340I (CONT.) TAPEMIGRATE=NO, DASDMIGRATE=NO, TAPEBACKUP=NO,
ARC0340I (CONT.) DASDBACKUP=NO
ARC0341I COMPACT PERCENT IS 40%
ARC0339I OPTIMUMDASDBLOCKING=YES, LOGGING LEVEL=FULL, 394
ARC0339I (CONT.) LOG TYPE=SYSOUT A
ARC6008I AGGREGATE BACKUP/RECOVERY PROCNAME = DFHSMABR
ARC6009I AGGREGATE BACKUP/RECOVERY MAXADDRESSSPACE = 01
ARC6366I AGGREGATE BACKUP/RECOVERY UNIT NAME = 3590-1
ARC6368I AGGREGATE BACKUP/RECOVERY ACTIVITY LOG 398
ARC6368I (CONT.) MESSAGE LEVEL IS FULL
ARC6371I AGGREGATE RECOVERY ML2 TAPE UNIT NAME = 3590-1
ARC6372I NUMBER OF ABARS I/O BUFFERS = 01
ARC6373I ABARS ACTIVITY LOG OUTPUT TYPE = SYSOUT(A)
ARC6033I AGGREGATE RECOVERY UNIT NAME = 3590-1
ARC6036I AGGREGATE BACKUP OPTIMIZE = 3
ARC6036I AGGREGATE RECOVERY TGTGDS = SOURCE
ARC6036I AGGREGATE RECOVERY ABARSVOLCOUNT = *NONE*
ARC6036I AGGREGATE RECOVERY PERCENTUTILIZED = 080
ARC6036I AGGREGATE BACKUP/RECOVERY ABARSDELETEACTIVITY 407
ARC6036I (CONT.) = NO
ARC6036I AGGREGATE BACKUP/RECOVERY ABARSTAPES = STACK
ARC6036I AGGREGATE BACKUP ABARSKIP = NOPPRC, NOXRC
ARC1500I PLEXNAME=ARCPLEX0,PROMOTE PRIMARYHOST=NO, 410
ARC1500I (CONT.) PROMOTE SSM=NO,COMMON RECALL QUEUE BASE NAME=*****,
ARC1500I (CONT.) COMMON RECALL QUEUE TAPEDATASETORDER=*****,COMMON
ARC1500I (CONT.) DUMP QUEUE BASE NAME=**** AND MSC=***,COMMON RECOVER
ARC1500I (CONT.) QUEUE BASE NAME=**** AND MSC=***
ARC0468I EXTENDEDTTOC=N
ARC0278I CLASSTRANSITIONS EVENTDRIVENMIGRATION=Y, 412
ARC0278I (CONT.) SERIALIZATIONEXIT=N
ARC0101I QUERY SETSYS COMMAND COMPLETED ON HOST=1
ARC0101I QUERY STARTUP COMMAND STARTING ON HOST=1
ARC0143I PARMLIB MEMBER=ARCCMD00, DFSMSHSM AUTHORIZED 415
ARC0143I (CONT.) USERID=IBMUSER, HOSTID=1, PRIMARY HOST=YES, LOGSW=NO,
ARC0143I (CONT.) STARTUP=YES, EMERGENCY=NO, CDSQ=YES, CDSR=NO, PDA=YES,
ARC0143I (CONT.)  RESTART=NOT SPECIFIED, CDSSHR=NOT SPECIFIED,
ARC0143I (CONT.) RNAMEDSN=NO, STARTUP PARMLIB MEMBER=ARCSTR0
ARC0249I CELLS=(200,100,100,50,20),HOSTMODE=MAIN
ARC0101I QUERY STARTUP COMMAND COMPLETED ON HOST=1
ARC0101I QUERY CSALIMITS COMMAND STARTING ON HOST=1
ARC0203I CSALIMITS=YES, CSA CURRENTLY USED=0 BYTES, 419
ARC0203I (CONT.) MWE=0, MAXIMUM=0K BYTES, ACTIVE=0%, INACTIVE=0%
ARC0101I QUERY CSALIMITS COMMAND COMPLETED ON HOST=1
ARC0038I RESOURCE MANAGER SUCCESSFULLY ADDED.  RETURN 421
ARC0038I (CONT.) CODE=00
ARC0008I DFSMSHSM INITIALIZATION SUCCESSFUL
```

Figure 56 (Part 4 of 4). Example of a z/OS 3.1 DFSMShsm Startup Screen (IVP)

8. Prevent extraneous error messages from occurring when you stop DFSMShsm by putting the system in debug mode.

   For example, if you specify `F  DFSMSHSM,SETSYS DEBUG`, then DFSMShsm operates in debug mode.

9. Stop DFSMShsm

   For example, if you specify `F  DFSMSHSM,STOP`, DFSMShsm stops with a message ARC0002I, which indicates DFSMShsm has stopped successfully. See Figure 57 on page 210 for an example of the shutdown screen.

```
F DFSMSHSM,STOP
ARC0016I DFSMShsm SHUTDOWN HAS BEEN REQUESTED
ARC0002I DFSMShsm SHUTDOWN HAS COMPLETED
$HASP395 DFSMSHSM   ENDED
$HASP150 DFSMSHSM   OUTGRP=1.1.1 ON PRT1     2 (2) RECORDS
$HASP150 DFSMSHSM   OUTGRP=2.1.1 ON PRT1     7 (7) RECORDS
$HASP160 PRT1       INACTIVE - CLASS=AJ
$HASP250 DFSMSHSM   IS PURGED
```

Figure 57. Example of DFSMShsm Shutdown Screen

   You can start the IVP again from the beginning at any time by returning to Step 5.

10. Run job HSMIVP2, which is a member of DFSMSHSM.IVP.CNTL, to remove the IVP temporary data sets from your system.

11. After running the IVP, you can delete member DFSMSHSM from the SYS1.PROCLIB data set and delete the DFSMSHSM.IVP.CNTL data set. They are no longer needed. The DFSMSHSM configuration and the parameters in the ARCCMD00 member created by the IVP are used to determine if the product is correctly installed and can be started and stopped. They are not intended for use in a fully functional DFSMShsm environment. Return to "How to Implement DFSMShsm" in *z/OS DFSMShsm Implementation and Customization Guide* for the next steps to take to implement DFSMShsm.

8.6.4.4 Run the HCD Installation Verification Procedure: To verify that HCD is installed, you should at least make the following minimal checks.

1. Issue the `'D IOS,CONFIG'` command and verify the resulting IOS506I message.

2. Invoke HCD. You will receive the primary task selection panel of HCD, Hardware Configuration. Verify that it says "z/OS V3.1 HCD" at the first line of the panel. Select "What's new in this release" from the primary task selection panel. Verify it says "What's New in This Release" at the heading of the panel. Finally, scroll forward. You will see:

   ```
   What's New in This Release
   ```

   This panel tells you what changes have been made in the present release. If you have not used HCD before, select Item 8, 'Getting Started with This Dialog' on the primary selection panel for "Overview of Changes".

For information on HCD support for new processor types and the enhanced capabilities of new processor models, select 'Query supported hardware and installed UIMs' on the primary selection panel and then 'List supported processors.'

For information on new functions and enhancements of the present HCD release, move your cursor to a highlighted topic, then press Enter. Pressing F12 on the panel describing the selected topic returns you to this panel to select another topic.

8.6.4.5 Run the z/OS UNIX System Services Setup Verification Procedures: Refer to the z/OS UNIX System Services setup verification procedure in *z/OS UNIX System Services Planning*.

8.6.5 IVP jobs for Wave 1C

There are currently no installation verification procedures for the following elements in Wave 1C:

- MICR/OCR
- TSO/E

8.6.5.1 Run the FFST Installation Verification Program: FFST provides a program for execution to verify you have installed FFST correctly. Perform the following steps to ensure successful installation of FFST.

1. Start FFST with the procedure (EPWFFST) provided.
2. Execute the IVP provided. This is found in your SEPWSRC2 data set, member EPW12012. This job issues several EPW90xxI messages. See FFST operations in *z/OS Communications Server: SNA Diagnosis Vol 2, FFST Dumps and the VIT*, for detailed explanations.

This completes the testing of FFST.

8.6.5.2 Run the GDDM Installation Verification Procedures: The installation verification procedures for OS/390 GDDM consist of:

- Testing GDDM/MVS Base.
- Testing GDDM-PGF
- Testing GDDM-REXX.
- Testing GDDM Under CICS (if applicable):
  - Testing GDDM-PGF Under CICS
  - Testing the Print Utility ADMOPUC Under CICS
- Testing GDDM Under IMS (if applicable):
  - Testing GDDM-PGF Under IMS
  - Testing the Print Utility ADMOPUI Under IMS

8.6.5.2.1 Testing GDDM/MVS Base

Before performing the installation verification procedures, ensure the default User Control key is set. The default User Control key is PA3. If your keyboard does not have a PA3 key, or the PA3 key is already

used by another application, set the User Control key to another value. To do this, add the following nickname user default specification to the external defaults file, or external defaults module:

```
ADMMNICK FAM=1,PROCOPT=((CTLKEY,type,value))
```

where `type` defines the type of key selected for entering User Control (1=PF key, 4=PA key), and `value` defines the number of the PF or PA key to be used. The line must start with a space in column 1.

For more information about nicknames and supplying user-default specifications, see *GDDM System Customization and Administration*.

For more information about User Control, see the *GDDM User's Guide*.

This is how to test that GDDM/MVS has been installed successfully for use under TSO:

1. Allocate the GDDM symbol and map data sets on your TSO session by typing:

   ```
   ALLOC F(ADMSYMBL) DA('GDDM.SADMSYM') SHR REU
   ALLOC F(ADMGDF)   DA('GDDM.SADMGDF') SHR REU
   ```

   If you also intend to use this step to test the GDDM TSO Print Utility, you must allocate the Master Print Queue data set:

   ```
   ALLOC F(ADMPRNTQ) DA('your-master-print-queue') SHR REU
   ```

2. Run the GDDM installation verification program:

   ```
   CALL *(ADMUGC) 'FROM(ADMTEST)'
   ```

   A picture should be displayed that shows the words 'Welcome to GDDM Version 3.2'. This picture is the ADMTEST ADMGDF from the SADMGDF data set being displayed by the ADMUGC conversion utility.

   If the terminal does not support graphics, the following message will be displayed:

   ```
   ADM0275 W GRAPHICS CANNOT BE SHOWN. REASON CODE 3
   ```

3. Go into GDDM User Control by pressing the User Control key.

   The User Control panel should now be superimposed on the bottom of the display, using the language specified by the NATLANG external default.

   While you are in this panel, you can also test the GDDM print utility if you have already customized it. For information about the print utility, see *GDDM System Customization and Administration*. To create a file for testing the GDDM print utility using GDDM User Control:

   a. Press **PF4** for the User Control output panel.

   b. Type the terminal ID of the printer to which you want to send the output, as defined to Communications Server for z/OS SNA Services, or in your external defaults module.

   c. Press **PF4** to send the file to be printed. A highlighted message is displayed when the print has completed successfully.

4. Press **PF3** until you are back in TSO.

This completes the test of the graphic and alphanumeric functions of GDDM/MVS.

8.6.5.2.2 Testing GDDM-PGF

If GDDM-PGF has been enabled (see 8.5.2.3, “IFAPRDxx considerations” on page 140), verify GDDM-PGF has been installed properly by performing the following steps:

1. Use the commands suggested for a CLIST in Figure 58 on page 217 to call the Interactive Chart Utility (ICU).

   When you start, the Home Panel of the ICU is displayed in the language specified in the NATLANG external default.

   For information about using the ICU, you can access the built-in help facility by pressing the **PF1** key; you can also find more information in *GDDM-PGF Interactive Chart Utility*.

2. This is what you do:

   a. Type `0` to move to the Chart by Example panel.

   b. Type `1` on the Chart by Example panel to get data headings and titles for your chart.

   c. Type any number from 1 through 7 on the Chart by Example - Data panel to get the sample data supplied with the ICU.

   d. Display the data by pressing **PF5**, the Display key.

   e. Return to the Home panel by pressing **PF12**.

   f. Exit the ICU by pressing **PF9** twice.

This completes the tests of the graphic and alphanumeric functions of GDDM-PGF.

8.6.5.2.3 Testing GDDM-REXX

If GDDM-REXX has been enabled (see 8.5.2.3, “IFAPRDxx considerations” on page 140), verify GDDM-REXX has been installed properly by performing the following steps:

1. Allocate the GDDM map and symbol set data sets to your session by typing:

   ```
   ALLOC F(ADMGDF) DA('GDDM.SADMGDF') SHR REU
   ALLOC F(ADMSYMBL) DA('GDDM.SADMSYM') SHR REU
   ```

2. Type the command `EXEC 'GDDM.SADMSAM(ERXMODEL)'` from a terminal that can display graphics.

3. Press **ENTER**.

   A picture is displayed, with the large characters “GDDM-REXX” near the top of the screen.

4. Press **ENTER** again or press the PF3 key to return to TSO.

8.6.5.2.4 Testing GDDM under CICS

This section describes how to verify the installation of GDDM under the CICS subsystem.

To test GDDM under CICS, you must have allocated the required GDDM VSAM data sets, defined them to CICS, and included them in the CICS startup JCL. You must also have defined GDDM to CICS in your CICS tables or CSD.

8.6.5.2.4.1 Testing GDDM/MVS Base under CICS

Before performing the installation verification procedures, ensure the default User Control key is set. The default User Control key is PA3. If your keyboard does not have a PA3 key, or the PA3 key is already used by another application, set the User Control key to another value. To do this, add the following nickname user default specification to the external defaults file, or external defaults module:

```
ADMMNICK FAM=1,PROCOPT=((CTLKEY,type,value))
```

where `type` defines the type of key selected for entering User Control (1=PF.key, 4=PA key) and `value` defines the number of the PF or PA key to be used. The line must start with a space in column 1.

For more information about nicknames and supplying user-default specifications, see *GDDM System Customization and Administration*.

For more information about User Control, see the *GDDM User's Guide*.

This is how to test GDDM/MVS has been installed successfully for use under the CICS subsystem:

1. Type the transaction name for the GDDM/MVS installation verification program: ADMA.
2. Press **ENTER**

   A picture should be displayed that shows the words “Welcome to GDDM Version 3.2”. This picture is the ADMTEST ADMGDF, which is stored in the ADMF data set.
3. Go into GDDM User Control by pressing the User Control key.

   The User Control panel should now be superimposed on the bottom of the display, using the language specified by the NATLANG external default.

   While you are in this panel, you can also test the GDDM print utility if you have already customized it. For information about the print utility, see *GDDM System Customization and Administration*. To create a print file for testing the GDDM print utility using GDDM User Control:

   a. Press **PF4** for the User Control output panel.

   b. Type the terminal ID of the printer to which you want to send the output, as defined in your TCT.

   c. Press **PF4** to send the file to be printed.

      A highlighted message is displayed when the print has completed successfully.
4. Press **PF3** until you have left the transaction.

This completes the test of the graphic and alphanumeric functions of GDDM/MVS under CICS.

8.6.5.2.4.2 Testing GDDM-PGF under CICS

This is how to test GDDM-PGF has been installed successfully for use under the CICS subsystem:

1. Type the transaction name for the ICU: ADMC
2. Press **ENTER**.

   The Home Panel of the ICU is displayed in the language specified in the NATLANG external default. For information about using the ICU, you can access the built-in help facility by pressing the **PF1** key; you can also find more information in *GDDM-PGF Interactive Chart Utility*.

3. This is what you do:
   a. Type `0` to move to the Chart by Example panel.
   b. Type `1` on the Chart by Example panel to get data headings and titles for your chart.
   c. Type any number from 1 through 7 on the Chart by Example - Data panel to get the sample data supplied with the ICU.
   d. Display the data by pressing **PF5**, the Display key.
   e. Return to the Home panel by pressing **PF12**
   f. Exit the ICU by pressing **PF9** twice.

This tests the graphic and alphanumeric functions of GDDM-PGF under CICS.

8.6.5.2.4.3 Testing the Print Utility ADMOPUC under CICS

To test the GDDM print utility ADMOPUC, use the tests in 8.6.5.2.4.1, "Testing GDDM/MVS Base under CICS."

For information about setting up the print utility and how to select particular printers, see *GDDM System Customization and Administration*.

8.6.5.2.5 Testing GDDM under IMS: This section describes how to verify the installation of GDDM under the IMS subsystem.

8.6.5.2.5.1 Testing GDDM/MVS Base under IMS

1. Type the transaction name for the Image Symbol Editor: ADM ISSE
2. Press **ENTER**.

   If you are not familiar with the Image Symbol Editor, there is a help facility you can view by pressing the **PF1** key. You can also find more information in *GDDM Using the Image Symbol Editor*.

   When you start the transaction, the first panel of the Image Symbol Editor is displayed. It is called Step Selection.

   This is what you do:

   a. Type the symbol set name ADMDHII. (note the final period), and choose option 2, Edit Symbol Set.
   b. Press **ENTER**.

      The next panel, Symbol Selection, is displayed.

   c. Press **PF6**.

      A different set of characters should be displayed on the same panel. (If GDDM message ADM0824 or ADM0825 is displayed, and some of the characters are displayed as "?", this does not invalidate the test).

   d. Move the cursor to a nonblank character in the set of characters (not one in reverse-video).

e. Press **ENTER**

   The display should change to the Symbol Definition panel, and the pixel pattern of the chosen symbol should be displayed at the left of the screen. (If message ADM0824 or ADM0825 was displayed earlier, the symbol is the one that could not be displayed and not the "?" chosen).

f. Leave the cursor where it is, and type the command TEST ON

g. Press **ENTER**

   If your device supports programmed symbols (PS), a small copy of the character should be displayed below and to the right of the pixel pattern. Otherwise, GDDM message ADM0861 is displayed, but this does not invalidate the test.

h. Exit the Image Symbol Editor by pressing **PF3** three times.

This tests both the graphic and alphanumeric functions of GDDM.

If your workstation is capable of showing graphics, but does not have PS support, you can test the graphic functions of GDDM/MVS by running one of the sample programs, described in the *GDDM Base Application Programming Reference*.

8.6.5.2.5.2 Testing GDDM-PGF under IMS

This is how to test GDDM-PGF has been installed successfully for IMS:

1. Type the transaction name for the ICU: ADM CHART
2. Press **ENTER**.

   The Home Panel of the ICU is displayed in the language specified by the NATLANG external default. For information about using the ICU, you can access the built-in help facility by pressing the **PF1** key; you can also find more information in *GDDM-PGF Interactive Chart Utility*.

3. This is what you do:
   a. Type 0 to move to the Chart by Example panel.
   b. Type 1 on the Chart by Example panel to get data headings and titles for your chart.
   c. Type any number from 1 through 7 on the Chart by Example - Data panel to get the sample data supplied with the ICU.
   d. Display the data by pressing **PF5**, the Display key.
   e. If you have a printer, create a print file so you can later test the GDDM print utility (see 8.6.5.2.5.3, "Testing the Print Utility ADMOPUI under IMS" on page 217):
      1) Press **PF4**, the Print key.
      2) Type the LTERM name of the printer.
      3) Press **ENTER**.

         The message `CHART SUCCESSFULLY OUTPUT` is displayed.

   f. Return to the Home panel by pressing **PF12**.

g. Exit the ICU by pressing **PF9** twice.

This completes the tests of the graphic and alphanumeric functions of GDDM-PGF under IMS.

8.6.5.2.5.3 Testing the Print Utility ADMOPUI under IMS

This is how to test the print utility ADMOPUI has been installed successfully for IMS. However, before you can start, you must have a GDDM file for it to print. If GDDM-PGF has been ENABLED, you can use the ICU to produce one; see 8.6.5.2.5.2, "Testing GDDM-PGF under IMS."

If GDDM-PGF has not been installed, you can create a print file using the IMS version of the sample program ADMUSP1. The source for this program is called ADMUSP1I.

Find the program in the sample library SADMSAM, and compile and link-edit it as described in *GDDM Base Application Programming Guide*.

1. Give the LTERM name on the transaction invocation.
2. Assign the ADMPRINT transaction to a suitable class, and start it.

   After you have created a print file, the print utility prints it asynchronously.

```
Suggested name: CHART

/* INTERACTIVE CHART UTILITY */
 ALLOC F(ADMCDATA) DA(ADMCDATA) SHR REU
 ALLOC F(ADMCDEF)  DA(ADMCDEF)  SHR REU
 ALLOC F(ADMCFORM) DA(ADMCFORM) SHR REU
 ALLOC F(ADMGDF)   DA(ADMGDF)   SHR REU
 ALLOC F(ADMSYMBL) DA(ADMSYMBL 'GDDM.SADMSYM') SHR REU
 CALL *(ADMCHART)
 FREE F(ADMCDATA)
 FREE F(ADMCDEF)
 FREE F(ADMCFORM)
 FREE F(ADMGDF)
 FREE F(ADMSYMBL)
```

Figure 58. Suggested CLIST for Using the ICU

The ADMSYMBL allocation must not have concatenated data sets if you want to save symbol sets. Concatenated partitioned data sets cannot be accessed read/write.

You are advised to make both the system and the user's own symbol sets available to users of the ICU. This gives the users a wide choice of type faces from the system sets, and special symbols from their own.

8.6.5.2.6 What to Do If Any of the Installation Tests Fail

If any of the tests fail, the first thing you may see is an error message displayed on your screen. On the other hand, you may find that graphics are not displayed on your screen.

If you receive an error message, look it up in *GDDM Messages*. If it is a GDDM-OS/2 Link message, you can also use the online help.

If graphics cannot be shown on one or more of the terminals when you test GDDM or the telecommunication network, see *GDDM Diagnosis*.

If you cannot quickly identify the cause of the error, you may find it useful to read *GDDM Diagnosis*, which contains detailed information about diagnosing problems with GDDM and its components. Information about detailed diagnosis and the procedure for reporting errors can be found in *GDDM Diagnosis*.

8.6.5.3 Run the ICKDSF Installation Verification Procedure:

SYS1.SAMPLIB(ICKVER) contains the ICKDSF Installation Verification Procedure. Copy ICKVER to a work data set. Edit and submit ICKVER to verify the installation of ICKDSF. The job may be executed against any ***offline*** device that is supported; it will not alter the volume in any way. Note that ICKDSF was placed in SYS1.LINKLIB by SMP/E. Note that `ccuu` specifies the address (in hexadecimal) of the device to be analyzed.

The following information messages will appear in the SYSPRINT data set due to the execution of the above job. The contents of these messages may vary slightly due to variations on your particular pack.

- VERIFY HEADER ON OUTPUT

```
ICKDSF - MVS/ESA DEVICE SUPPORT FACILITIES 17.0
ANALYZE UNIT(ccuu) NODRIVE SCAN CYLR(1,2)
ICK00700I DEVICE INFORMATION FOR ccuu IS CURRENTLY AS FOLLOWS:
PHYSICAL DEVICE = xxxx
STORAGE CONTROLLER = xxxx
STORAGE CONTROL DESCRIPTOR = xx
DEVICE DESCRIPTOR = xx
ADDITIONAL DEVICE INFORMATION = xxxxxxxx
TRKS/CYL = xx, # PRIMARY CYLS = xxxxx
ICK04000I DEVICE IS IN SIMPLEX STATE
ICK00091I ccuu NED= xxxx.xxx.xxx.xx.xxxxxxxxxxx
ICK03091I EXISTING VOLUME SERIAL READ = xxxxxx
ICK01400I ccuu ANALYZE STARTED
ICK01408I ccuu DATA VERIFICATION TEST STARTED
ICK01405I ccuu ALL DATA 'MACHINE READABLE' WITHOUT ERRORS
ICK01406I ccuu ANALYZE ENDED
ICK00001I FUNCTION COMPLETED, HIGHEST CONDITION CODE WAS 0
hh:mm:ss dd/mm/yy
```

The *Device Support Facilities (ICKDSF) User's Guide and Reference* has more information about using ICKDSF.

8.6.5.4 Run the z/OS Data Gatherer Installation Verification Procedure:

If the z/OS Advanced Data Gatherer feature has been enabled (see 8.5.2.3, “IFAPRDxx considerations” on page 140), verify that the z/OS Data Gatherer has been installed properly by performing the following steps:

- Test the new element level by issuing the START command for procedure RMF with PARMLIB member ERBRMF02 and reply with the desired options or GO.
- Modify procedure RMF to start a Monitor III data gatherer session, using member ERBRMF04.

Monitor I and Monitor III gatherer will run without further attention until the sessions are over or until the next IPL.

For more information on starting the RMF procedure and available options, see *z/OS Data Gatherer User's Guide*.

8.6.6 IVP jobs for Wave 1D

There are currently no installation verification procedures for the following elements in Wave 1D:

- Cryptographic Services
  - PKI Services

8.6.6.1 Run the Security Server (RACF) Installation Verification Procedures

If Security Server (RACF) has been enabled (see 8.5.2.3, “IFAPRDxx considerations” on page 140), verify it has been installed properly by IPLing z/OS 3.1. If you receive message ICH520I stating `z/OS SECURITY SERVER (RACF HRF77E0) IS ACTIVE`, RACF will have been installed and initialized successfully.

8.6.7 IVP jobs for Wave 1E

The following sections describe installation verification procedures for Wave 1E.

8.6.7.1 Run the Runtime Library Extensions Installation Verification Procedures

There is one IVP job you should run to ensure the Runtime Library Extensions was properly installed. The JCL can be found in your SCLBJCL library. Refer to the JCL for instructions and expected output.

Figure 59. IVP for Runtime Library Extensions

Job name	Job Description
CLB3JIV1	Verify the IO Streams Class Library and Complex Class Library installation

8.6.7.2 Run the Common Information Model (CIM) Installation Verification Procedure:

To verify Common Information Model (CIM) is installed, run sample job, CFZIVP. The IVP job CFZIVP can be found in library SAMPLIB. Before you run the CIM IVP job, ensure that you have created and mounted a file system at the /var/wbem directory. For information about creating and mounting a file system at the /var/wbem directory, see *z/OS Common Information Model User's Guide*.

8.6.7.3 Run the RMF Installation Verification Procedure:

If RMF has been enabled (see 8.5.2.3, “IFAPRDxx considerations” on page 140), verify RMF has been installed properly by performing the following steps:

- Modify procedure RMF to start one or more Monitor II background sessions, using member ERBRMF03. This member tests all Monitor II reports.
- Start a Monitor III data reporter session and request several reports on the Monitor III report screen to verify these functions are working.

For more information on RMF sessions, see *z/OS RMF User's Guide*.

8.6.7.4 Run the XL C/C++ Installation Verification Procedures

If XL C/C++ has been enabled (see 8.5.2.3, “IFAPRDxx considerations” on page 140), verify the following C/C++ components have been installed properly:

- XL C/C++ Base Compiler
- C/C++ Host Performance Analyzer

Notes:

1. As of z/OS V1R8, the IPA Link step of the z/OS XL C/C++ compiler uses 64-bit virtual memory, which requires sufficient storage above the 2 GB bar (2 GB address line). You can set the MEMLIMIT system parameter to provide the required virtual storage above the 2 GB bar. Use the following checklist to ensure that sufficient storage above the 2 GB bar is available:

   - Increase the default size of the MEMLIMIT system parameter in the SMFPRMxx PARMLIB member to 3 GB.
   - Increase the MEMLIMIT value for z/OS UNIX System Services users through the RACF OMVS segment to 3 GB.
   - If you use the IEFUSI exit routine, ensure that the MEMLIMIT value is more than 3 GB.

   For additional information about the MEMLIMIT system parameter, see *z/OS MVS Programming: Extended Addressability Guide*.

2. The CCNJIV1 and CCNJIV2 IVP jobs allocate one of the temporary data sets as a PDSE data set. You cannot allocate a PDSE data set to a VIO device type or to multiple volumes. Before you run these two IVP jobs, check the storage and data classes that allocate temporary data sets to verify if you can allocate temporary datasets as PDSE data sets. You can check the class by viewing the dataclas attributes in the panel that is displayed for option 4 of ISMF.

   If you cannot allocate temporary data sets as PDSE data sets due to system configuration; for example, the device type is VIO or the volume count of SMS-managed data sets is greater than one, add the following code to the DFSMS DATACLAS routines:

```
FILTLIST CCPGM                 /* IPALINK Note               */
 INCLUDE(CCN*)                 /* Desc: Bypass CCN* Programs */
IF
   ((&DATACLAS = '') &&
   (&PGM EQ &CCPGM)) THEN      /* Bypass CCN* C/C++ Programs */
   DO                          /* Example: CCNDRVR           */
     SET &DATACLAS = ''        /* Bypass Dataclas            */
     WRITE 'DC IS BLANKED OUT' /* Write out a Message        */
     EXIT CODE(0)              /* Exit Routine               */
   END
```

8.6.7.4.1 Run the XL C/C++ Installation Verification Procedure

There are two IVP jobs you should run to ensure the C/C++ compilers were properly installed. The JCL can be found in your SCCNJCL library. Refer to the JCL for instructions and expected output.

Figure 60. IVPs for XL C/C++ Compilers

Job name	Job Description
CCNJIV1	Verify the XL C Compiler Installation
CCNJIV2	Verify the XL C++ Compiler Installation

8.6.7.4.2 Run the C/C++ Host Performance Anaylzer Installation Verification Procedure

There is one IVP job you should run to ensure the C/C++ Host Performance Analyzer is properly installed (see Figure 61 on page 221). The JCL can be found in your SCTVJCL library. Refer to the JCL for instructions and expected output. Ensure the following service has been applied to the C/C++ Host Performance Analyzer:

```
UQ07576  UQ07577  UQ08624  UQ16061  UQ16062  UQ23233
UQ23234  UQ35263  UQ47678  UQ58554  UQ78078  UQ78229
```

Figure 61. IVPs for C/C++ Host Performance Analyzer

Job name	Job Description
PROFFUNC	Sample JCL For Function Level Trace

8.6.8 IVP jobs for Wave 1F

There are currently no installation verification procedures for the following elements in Wave 1F:

- HCM
- Future Function

Note: The ISPF installation verification procedures are described in 8.6.2.2, “Run the BCP and ISPF Installation Verification Procedure” on page 188.

8.6.8.1 Run the DFSORT Installation Verification Procedures:

Once you have completed your configuration, you should review, modify, and run the following sample jobs to verify DFSORT is installed correctly.

- ICEJCLJ, to invoke DFSORT directly. Sorts and copies a data set.
- ICEINVJ, to invoke DFSORT from an assembler program. Sorts and copies a data set.
- ICETOOLJ, to invoke ICETOOL directly. Performs multiple operations which include listing your installation defaults, copying and sorting data sets, displaying statistics and printing reports.
- ICECSRTJ, if you use Locale Processing at your site, to verify data is sorted correctly using the Danish locale (LOCALE=DA_DK). To run this job, you must have the Language Environment element installed, and have the SCEERUN library available for the job to use.
- ICEGENJ, to invoke ICEGENER directly. Copies a data set.

8.6.8.1.1 ICEJCLJ and ICEINVJ verification

Verify the ICEJCLJ and ICEINVJ jobs each ran correctly by:

1. Checking the condition code for each step is 0.
2. Comparing the SORTOUT output of step PRTAFTER to Figure 62 on page 223, which shows what the first 20 records and last 10 records of the 360 output records look like.

```
*****000001**************************ABCDEFGHIJKLMNOP*****
*****000037**************************ABCDEFGHIJKLMNOP*****
*****000073**************************ABCDEFGHIJKLMNOP*****
*****000109**************************ABCDEFGHIJKLMNOP*****
*****000145**************************ABCDEFGHIJKLMNOP*****
*****000181**************************ABCDEFGHIJKLMNOP*****
*****000217**************************ABCDEFGHIJKLMNOP*****
*****000253**************************ABCDEFGHIJKLMNOP*****
*****000289**************************ABCDEFGHIJKLMNOP*****
*****000325**************************ABCDEFGHIJKLMNOP*****
*****000002**************************BCDEFGHIJKLMNOPQ*****
*****000038**************************BCDEFGHIJKLMNOPQ*****
*****000074**************************BCDEFGHIJKLMNOPQ*****
*****000110**************************BCDEFGHIJKLMNOPQ*****
*****000146**************************BCDEFGHIJKLMNOPQ*****
*****000182**************************BCDEFGHIJKLMNOPQ*****
*****000218**************************BCDEFGHIJKLMNOPQ*****
*****000254**************************BCDEFGHIJKLMNOPQ*****
*****000290**************************BCDEFGHIJKLMNOPQ*****
*****000326**************************BCDEFGHIJKLMNOPQ*****
.
.
.
*****000036**************************9ABCDEFGHIJKLMNO*****
*****000072**************************9ABCDEFGHIJKLMNO*****
*****000108**************************9ABCDEFGHIJKLMNO*****
*****000144**************************9ABCDEFGHIJKLMNO*****
*****000180**************************9ABCDEFGHIJKLMNO*****
*****000216**************************9ABCDEFGHIJKLMNO*****
*****000252**************************9ABCDEFGHIJKLMNO*****
*****000288**************************9ABCDEFGHIJKLMNO*****
*****000324**************************9ABCDEFGHIJKLMNO*****
*****000360**************************9ABCDEFGHIJKLMNO*****
```

Figure 62. Expected PRTAFTER SORTOUT Output from ICEJCLJ and ICEINVJ

8.6.8.1.2 ICETOOLJ verification: To verify that the ICETOOLJ job ran correctly, follow these steps:

1. Check that the condition code for each step is 0.
2. Check that DFSORT release, shown in the heading of the DFLTS output of step TOOLRUN, is the same release as the ZOS release. See *z/OS DFSORT Installation and Customization* for an example of how the complete DFLTS output will look if you have not changed any DFSORT installation options. If you have changed DFSORT installation options, the output should reflect the options you selected. In either case, dates in your listing will differ from those in the example output.
3. Compare the DEPTSP output of step TOOLRUN to Figure 63 on page 224.

```
JOHN       BURT           IS IN DEPARTMENT J69
ANDY       GELLAI         IS IN DEPARTMENT J82
PAUL       LEE            IS IN DEPARTMENT J69
MIGUEL     MADRID         IS IN DEPARTMENT J69
JANICE     MEAD           IS IN DEPARTMENT J69
LEE        TOWNSEND       IS IN DEPARTMENT J82
WILLIAM    WARREN         IS IN DEPARTMENT J82
FRANK      YAEGER         IS IN DEPARTMENT J69
HOLLY      YAMAMOTO-SMITH IS IN DEPARTMENT J69
```

Figure 63. Expected TOOLRUN DEPTSP Output from ICETOOLJ

4. Compare the LIST1 output of step TOOLRUN to Figure 64 on page 224. (Carriage control characters are shown in position 1; do not be concerned if you do not see them.)

```
1KEYS AND TOTALS        - 1 -

 KEY              PD_TOTAL   ZD_TOTAL
 ----------   ------------   --------
 ABCDXYZ123           1041        579
 BCDXYZ123A            -42        290
 CDXYZ123AB            142        314
 DXYZ123ABC            326        338
 XYZ123ABCD           -615        363
 YZ123ABCDX           -339        399
 Z123ABCDXY            -63        435
 123ABCDXYZ            213        471
 23ABCDXYZ1            489        507
 3ABCDXYZ12            765        543

 MINIMUM              -615        290
```

Figure 64. Expected TOOLRUN LIST1 Output from ICETOOLJ

5. Compare the DEPTOT output of step TOOLRUN to Figure 65 on page 224. (Carriage control characters are shown in position 1; do not be concerned if you do not see them.)

```
1(45,3,CH)             VALUE COUNT
 J62                   000000000000001
 J69                   000000000000006
 J82                   000000000000003
 L92                   000000000000005
```

Figure 65. TOOLMSG Output

Note: The TOOLMSG output of step TOOLRUN shows the result of each ICETOOL operation requested.

8.6.8.1.3 ICECSRTJ verification: Verify the ICECSRTJ job ran correctly by:

1. Checking the condition code for each step is 0.
2. Comparing the SORTOUT output of step CSORT to Figure 66 on page 225.

Notes:

1. The ICECSRTJ sample job can be found in the SICESAMP target library.

```
a
A
b
B
c
C
d
D
e
E
```

Figure 66. Expected CSORT SORTOUT Output from ICECSRTJ

8.6.8.1.4 ICEGENER verification: You can use the sample job ICEGENJ supplied with the licensed program to verify the installation of the ICEGENER facility. Before performing the verification, you should review the comments in the sample job.

Examine the results of each step in the verification job to ensure the data has been copied correctly and the SYSOUT output was produced by the appropriate program (DFSORT copy or the IEBGENER utility).

If message ICE054I appears, showing a nonzero number of records in and records out, DFSORT did perform a copy application. You should be able to recognize the difference between the output produced by IEBGENER and any output produced by DFSORT because there is a distinct difference in the style between the two types of output.

The following steps each exercise a function of copying. Each step copies from the generated data set to a printed output (JES spool) file. If you see the data printed, you know a copy function was performed.

1. The job step called GEN creates (using the IEBDG utility program) the data to be copied by the rest of the steps.
2. The GCOPY1 step copies and prints the data created by GEN. Because the EXEC statement specifies PGM=ICEGENER, the ICEGENER facility is used and it selects DFSORT copy to perform the copy application. If the application runs correctly, the DFSORT messages will indicate DFSORT copied 360 records.
3. The BCOPY1 step copies and prints the data in a different manner to verify the different invocation path works. Because the EXEC statement specifies IEBGENER, the method used to perform the copy application depends on how you have installed the ICEGENER facility:

- If you chose selective use of ICEGENER, the IEBGENER utility performs the copy application.
- If you chose automatic use of ICEGENER, the ICEGENER facility selects DFSORT copy to perform the copy application.

4. The GCOPY2 step also copies and prints the data. Because the EXEC statement specifies PGM=ICEGENER, the ICEGENER facility is used. Because the SYSIN data set contains IEBGENER control statements, ICEGENER selects the IEBGENER utility to perform the copy application.

The following result indicates that the ICEGENER facility was not installed correctly:

- You receive an ABEND 163 and message ICE163A. Ensure that you use GENER=IEBGENR, the default. If you have an alias of IEBGENR for the ICEGENER facility, remove it.

If you later decide to discontinue automatic use of ICEGENER, see *z/OS DFSORT Installation and Customization* for information on how to do that.

The DFSORT SVC is called to write SMF records and to process data sets on cached DASD devices. If the SVC is not properly installed, a DFSORT application might result in:

- A system abend (56D or Fnn) when writing an SMF type-16 record.
- Degraded performance when using data sets on cached DASD devices.

In either case, message ICE187I is issued if the SVC is installed at the wrong level. If you are using a cached DASD device, message ICE191I is issued as a warning that performance might be degraded. However, the run continues successfully if there are no other errors. You can specify a SORTDIAG DD statement to cause an additional message, ICE816I, to be issued. This message shows the abend code resulting from an attempted SVC call.

You can use the abend code in ICE816I or the abend code resulting from the attempt to write an SMF type-16 record to determine the reason DFSORT failed to call the SVC correctly.

8.6.8.2 Run the High Level Assembler Toolkit Installation Verification Program:

A sample job, ASMWTIVP from library SASMSAM2 is provided to verify the feature has installed correctly. Note that, in the following example, the high-level qualifier for library SASMSAM2 is the high-level qualifier for the sample target library, in which the High-Level Assembler Toolkit has been installed.

This job performs the following functions:

- Assembles test sample ASMTSAMP from library SASMSAM2.
- Link edits test sample ASMTSAMP from library SASMSAM2.
- Disassembles test module ASMTSAMP.
- Creates language extraction file.

ASMWTIVP uses TSO Batch to carry out its functions.

8.6.8.3 Run the IBM z/OS Change Tracker Installation Verification Procedures:

To verify the installation and configuration of IBM z/OS Change Tracker, use the verification step of the z/OSMF Workflow. There is additional verification information found in the *IBM z/OS Change Tracker Guide and Reference*. Notice that customization z/OSMF Workflow can be found installed at /usr/lpp/cyg/zosmf/workflows/cygwflw.xml.

8.6.9 IVP jobs for Wave 1G

This section describes various installation verification procedures for Wave 1G.

8.6.9.1 Run the z/OS File System Installation Verification Procedures

To ensure the installation of the z/OS File System completed successfully, do the following:

1. If the BPXPRMxx entry for zFS was made, determine if zFS is started. To do this, view SYSLOG and look for the following message:

   ```
   IOEZ00055I ZFS kernel: Initialization Complete.
   ```

   The following message in SYSLOG indicates a possible error:

   ```
   nn BPXF032D FILESYSTYPE ZFS Terminated. Reply 'R' when
      ready to restart. Reply 'I' to ignore.
   ```

The possible cause is the started task could not initialize; contact the IBM Support Center for help.

Note: If a problem is detected during the installation verification, ensure that all of the installation steps for the z/OS File System have been completed. It may be helpful to review the installation and post installation steps that are summarized in the publication referenced for the post installation customization work described below.

To use the zFS support, refer to *z/OS File System Administration* to define zFS aggregates and file systems.

8.6.9.2 Run the Infoprint Server Installation Verification Procedures

If Infoprint Server has been enabled (see Figure 41 on page 130), verify Infoprint Server has been installed properly by performing the steps described in this section. This installation verification procedure (IVP) assumes the customization described in 8.5.5.9.2, “Infoprint Server Customization Considerations” on page 178 has been completed, and the logon proc is set up as described in 8.5.4, “z/OS 3.1 ISPF setup considerations” on page 149 so you have access to the Infoprint Server ISPF panels. The IVP described in this section verifies the Printer Inventory Manager and Print Interface components of Infoprint Server. No IVP is provided for the NetSpool or IP PrintWay components. You can perform a simple verification test by printing a file using the **lp** command.

1. Start the Printer Inventory Manager. See *z/OS Infoprint Server Operation and Administration*.
2. Define one or more printers using the Infoprint Server ISPF panels.

   For detailed information on defining printers, refer to *z/OS Infoprint Server Operation and Administration*.

3. Ensure your PATH environment variable is correctly set with `/usr/lpp/Printsrv/bin` concatenated **ahead of** `/bin` before you attempt to enter the **lp** command.
4. Print a sample file to the printer you just defined. You can print the sample configuration file provided with InfoPrint Server (Print Interface and IP PrintWay extended mode) by entering one of these commands:
   - Run a batch job specifying:

     ```
     //STEP0001 EXEC AOPPRINT,PRINTER='printer_name'
     //SYSIN DD PATH='/etc/Printsrv/aopd.conf',PATHOPTS=ORDONLY
     ```

   - From within z/OS UNIX System Services:

     ```
     lp -d printer_name /etc/Printsrv/aopd.conf
     ```

   Note:

   a. *printer_name* is the name of the printer that you defined in Step 2.

   b. The **lp** command will place the file on the JES spool. Either IP PrintWay or PSF must be configured, depending on the type of printer you defined, to send the file to the physical printer.

8.6.9.3 Run the Network File System Installation Verification Procedures

This installation verification procedure (IVP) assumes the customization described in the *z/OS Network File System Guide and Reference* has been completed. This includes the installation of the **mvslogin**, **mvslogout** (or **mvslogut**), and **showattr** commands on the clients which enable the client users to access the MVS system and to display system attributes. For the clients with PCNFSD support, the PCNFSD protocol enables the clients to access the MVS system without issuing the mvslogin and mvslogout commands. For details, refer to the same manual (section on "Installing the Client Enabling Commands" and appendix on "Using the PCNFSD Protocol").

In this step, you manually verify your system is installed correctly. Before you begin, perform the following sequence of steps:

1. Have the Network Controller (for example, IBM 3172 Controller) attached to your system.
2. Ensure the following have started correctly:
   - z/OS UNIX
   - Communications Server IP Services
   - PORTMAPPER, or RPCBIND if using IPv6
   - Network File System Server

For the server, the operator's console should display the following GFSA348I message:

```
GFSA348I (MVSNFS) z/OS NETWORK FILE SYSTEM SERVER
  (HDZ331N, HDZ331N) STARTED.
```

For the client, the operator's console should display the following GFSC700I message:

```
GFSC700I z/OS NETWORK FILE SYSTEM CLIENT
  (HDZ331N) STARTED.
```

Use any of the Network File System clients to verify the operation of the server. This section contains an example of using the AIX® client to verify the server is operational. See *z/OS Network File System Guide and Reference* for information about the supported Network File System clients.

8.6.9.3.1 Network File System Client Command sequence examples

Figure 67 on page 229 illustrates the command sequences used by an AIX Network File System client and the expected confirmation of operation. In the example, the following parameters are used:

mvshost Specifies the nickname of the remote host where the Network File System is running.

user01 Specifies the MVS login user ID. See *z/OS Security Server RACF Security Administrator's Guide* for information on how to define a RACF user ID for the Network File System client user in order to access the Network File System.

nfstest Specifies the MVS data set's high-level qualifier or is an alias of a user catalog. Usually, MVS data sets are RACF protected, unless RACF is not used at your site at all. Also *nfstest* should be specified in the EXPORTS file before the Network File System Server is started. Refer to the *z/OS Network File System Guide and Reference* (section on "Allocating and Modifying the Exports Data Set" and appendix on "Sample Exports Data Set"), for information on how to update the EXPORTS file.

```
$ mkdir /mvsdir
$ su
Password:
# mount mvshost:nfstest /mvsdir
# <enter "control and D" to exit super user mode>
$ mvslogin mvshost user01
Password required
GFSA973A Enter MVS password for USER01:
GFSA955I USER01 logged in ok.
$ cat > "/mvsdir/testfile"
This is a string of text entered.
<enter "control and D" keys to finish entering the data>
$ cat "/mvsdir/testfile"
This is a string of text entered.
$
```

Figure 67. Example of AIX Client Command Sequence

8.6.9.4 Run the XML Toolkit for z/OS Installation Verification Procedures

To verify that FMID HXML1B0 has installed correctly, run the following procedure:

1. Open the UNIX shell prompt.
2. Set up an environment variable to point to the location where the XML Parser, C++ Edition component was installed:

   ```
   export XERCESCROOT=/usr/lpp/ixm/IBM/xml4c-5_8
   ```

3. Type in the following command statements:

   ```
   export LIBPATH=$XERCESCROOT/lib:$LIBPATH
   export PATH=$XERCESCROOT/bin:$PATH
   ```

4. Run the DOMPrint application from the `$XERCESCROOT/bin` directory by typing the following command statement:

   DOMPrint -v=always -wenc=IBM-1047-s390 -wfpp=on $XERCESCROOT/samples/
   /data/personal.xml

This sample application should then parse the `personal.xml` file, construct the DOM tree, and invoke `DOMWriter::writeNode()` to serialize the resultant DOM tree back to an XML stream.

If you see the following sample output from DOMPrint, the Toolkit FMID HXML1B0 was installed correctly:

```
<?xml version="1.0" encoding="IBM-1047-s390" standalone="no" ?>
<!DOCTYPE personnel SYSTEM "personal.dtd">
<!-- @version: -->
<personnel>

  <person id="Big.Boss">
    <name>
      <family>Boss</family>
      <given>Big</given>
    </name>
    <email>chief@foo.com</email>
   <link subordinates="one.worker two.worker three.worker four.worker fiv
e.worker"/>
  </person>

  <person id="one.worker">
    <name>
      <family>Worker</family>
      <given>One</given>
    </name>
    <email>one@foo.com</email>
    <link manager="Big.Boss"/>
  </person>
```

```
  <person id="two.worker">
    <name>
      <family>Worker</family>
      <given>Two</given>
    </name>
    <email>two@foo.com</email>
    <link manager="Big.Boss"/>
  </person>

  <person id="three.worker">
    <name>
      <family>Worker</family>
      <given>Three</given>
    </name>
    <email>three@foo.com</email>
    <link manager="Big.Boss"/>
  </person>

  <person id="four.worker">
    <name>
      <family>Worker</family>
      <given>Four</given>
    </name>
    <email>four@foo.com</email>
    <link manager="Big.Boss"/>
  </person>

  <person id="five.worker">
    <name>
      <family>Worker</family>
      <given>Five</given>
    </name>
    <email>five@foo.com</email>
    <link manager="Big.Boss"/>
  </person>


</personnel>
```

8.6.10 IVP jobs for Wave 2

The SDSF element provides an IVP job that is described in the following section.

8.6.10.1 Run the installation verification procedure for SDSF:

If SDSF has been enabled (see 8.5.2.3, “IFAPRDxx considerations” on page 140), verify SDSF has been installed properly. To do so, you might want to access SDSF once through ISPF and once through TSO.

- If you made changes to your TSO logon procedure, log off the system and then log on again to execute the modified procedure. If you made changes to your ISPF initialization CLIST, exit ISPF and then reaccess it.
- Access SDSF

1. **Accessing SDSF from ISPF:**

   If you used the ISPF sample panels to enable SDSF, select Option 13 from the ISPF Primary Options Menu, and Option 14 on the z/OS Applications panel. The SDSF Menu should be displayed. You can display the panel name by entering PANELID on the COMMAND INPUT line. The panel name should be ISFPCU41. When using SWAPBAR, the screen-name will be displayed as SDSF for "SDSF MENU" by default rather than ISFPCU41 since z/OS V2R5.

   If you did not use the ISPF sample panels, select the SDSF option from the ISPF panel you added it to. The SDSF Menu should be displayed. If message ISF922E is displayed, check your modifications to the ISPF panel and correct the problems before continuing. If the panel is not displayed, has only options LOG, DA, O, and H, or is garbled, check the modifications to the ISPF panel that the SDSF option was added and correct the problems before continuing.

2. **Accessing SDSF from TSO:**

   From TSO, enter SDSF or ISF. The SDSF Menu should be displayed.

8.6.11 Activate functions of JES2

To activate specific functions of JES2, see the following books:

1. z/OS Planning for Installation
2. z/OS Introduction and Release Guide
3. z/OS JES2 Initialization and Tuning Guide
4. z/OS JES2 Initialization and Tuning Reference
5. z/OS JES2 Commands

8.7 Step 7: ACCEPT Wave 0, Wave 1 and Wave 2

The following sections contain detailed information about the ACCEPT process for Wave 0, Wave 1 and Wave 2.

8.7.1 Select which z/OS 3.1 Wave 0 and Wave 1 FMIDs to install

Select which z/OS 3.1 Wave 0 and Wave 1 FMIDs to ACCEPT by choosing the appropriate FMIDSETs that were defined in 6.5.3, “Elements in each Wave, Ripple, and FMIDSET” on page 35. The example shows the FMIDSETs being installed one at a time and must be repeated for each ripple by changing WAVE*n* to WAVE0, WAVE1A, WAVE1AL, WAVE1B, WAVE1C, and so forth. If desired, multiple ripples can be combined, but they must be run in order.

8.7.2 Do an SMP/E ACCEPT CHECK for Wave 0 and Wave 1 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 68 on page 233 shows a sample of an ACCEPT CHECK for the functions specified in the SELECT operand, plus all the APPLY'd PTFs that are applicable only to FMIDs listed in the FMIDSET of the FORFMID.

```
//CHECK JOB <job parameters>
//STEP1 EXEC PGM=GIMSMP,REGION=0M,TIME=NOLIMIT
//STEPLIB DD DSN=SYS1.MIGLIB,DISP=SHR,
//         UNIT=SYSALLDA,VOL=SER=v31vol1
//        DD DSN=ASM.SASMMOD1,DISP=SHR,
//         UNIT=SYSALLDA,VOL=SER=v31vol1
//SMPCSI   DD DSN=zos31.global.csi,DISP=SHR
//SMPCNTL DD *
  SET BOUNDARY(dlibzone)
      OPTIONS(ZOSOPT) .
  ACCEPT CHECK XZREQ
          FORFMID(ZV31Wn)
          SELECT(WAVEn)
          GROUPEXTEND(NOAPARS,NOUSERMODS)
          SOURCEID(ZOS31,RSU*)
          FIXCAT(IBM.ProductInstall-RequiredService)
          BYPASS(HOLDSYSTEM,
          HOLDUSER,HOLDCLASS(UCLREL,ERREL,HIPER)) .
/*
```

Figure 68. SMP/E ACCEPT CHECK (All FMIDs and Service for z/OS 3.1 Wave 0 and Wave 1)

Note: ZOSOPT is the option name for z/OS.

Required Updates

1. Update the *job parameters*.
2. Update the v31vol1 with the volume serial number for the MIGLIB and SASMMOD1 libraries that are the targets of the Wave 0 installation. This will allow you to access the z/OS 3.1 level of the Wave 0 elements using the STEPLIB DD statements.
3. Replace the CSI name on the SMPCSI DD statement with your CSI name.
4. Update *dlibzone* to your dlib zone name.
5. Update WAVE*n* to change *n* to 0, 1A, 1AL, 1B, 1C, 1D, 1E, 1F or 1G. If you choose to perform the DUMMY DELETE option to remove the FMIDs of prior releases, you must ACCEPT Wave 1A and Wave 1C concurrently and then Wave 0 and Wave 1B concurrently because of the prereq requirements. Then continue with the ACCEPT of Wave 1AL, 1D, 1E, 1F, and 1G.
6. Update ZV31Wn to change *n* to 0, 1A, 1AL, 1B, 1C, 1D, 1E, 1F or 1G. This FMIDSET includes FMIDs for all elements within the specific ripple.
7. The XZREQ operand only needs to be specified when cross-zone processing is required.

Note that if you BYPASS(HOLDCLASS(HIPER)), you should run the SMP/E REPORT ERRSYSMODS command to identify missing HIPER HOLDs before putting your system into production.

Any messages other than those listed in 6.7, “Step 6: Review General Installation Notes” on page 43 or those listed in the following sections need to be investigated.

Notes:

1. Adding the FMIDSET(ZV31Wn) in the FORFMID operand ensures the PTF service for all FMIDs (new, changed, and unchanged) will get accepted at the same time as the ripple for the new FMIDs is installed.
2. 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 messages will be received and are acceptable:

   ```
   GIM50810W THE XZREQ OPERAND WAS SPECIFIED ON THE ACCEPT
   COMMAND BUT SINCE NO ZONES WERE APPLICABLE FOR CROSS-ZONE
   REQUISITE CHECKING, THE XZREQ OPERAND WILL BE IGNORED.

   GIM20501I ACCEPT PROCESSING IS COMPLETE. THE HIGHEST RETURN
   CODE WAS 04.
   ```

3. While ACCEPTing this wave, there may be PTFs identified through ++ IF REQs which must also be ACCEPTed. It is possible that these PTFs, which must be installed, are for FMIDs which will be deleted in a subsequent ripple. In this case, you may have to add BYPASS(APPLYCHECK) in order to have the IF REQ'd PTFs ACCEPTed since the PTFs' FMIDs are no longer applicable in the target zone.

8.7.2.1 Additional messages expected during Wave 0 ACCEPT CHECK

Successful ACCEPT CHECK processing of Wave 0 returns a condition code of 0 or 4.

8.7.2.1.1 Messages expected during Binder ACCEPT CHECK: During the ACCEPT CHECK of the Binder, the following messages may be received; they are acceptable if they are the only reasons for the condition code 4.

```
GIM61903W LMOD xxxxxxxx WAS NOT DELETED BY SYSMOD
HPM77E0 BECAUSE IT IS NOT IN THE dlib ZONE
```

In the message text, *xxxxxxxx* will be one of the following LMODs. If these are the only cause of the condition code 4, it is acceptable.

```
AKJLKL01  AMBLIST  HEWLD     HEWLKED  IEWBFDAT  IEWBIND
IEWBLINK  IEWBXEP
```

8.7.2.2 Additional messages expected during Wave 1A ACCEPT CHECK

Successful ACCEPT CHECK processing of Wave 1A returns a condition code of 4.

8.7.2.2.1 Messages expected during BCP ACCEPT CHECK

You might receive the following message, which is acceptable:

```
GIM61903W LMOD xxxxxxxx WAS NOT DELETED BY SYSMOD HBB77E0
BECAUSE xxxxxxxx IS NOT IN THE dlib ZONE
```

In the message text, *xxxxxxx* is one of the modules listed below:

```
AMDPRFMT  ANTKINIT  ATBINPVT  IEAIPL04  IEANUC11
IEFITJT  IEFW21SD  IWMO2CMD
```

Successful ACCEPT CHECK processing returns a condition code of 4.

8.7.2.2.2 Messages expected during Communications Server IP Services ACCEPT CHECK

During the ACCEPT CHECK of Communications Server IP Services, the following messages are received, which are acceptable:

```
GIM61903W LMOD xxxxxxxx WAS NOT DELETED BY SYSMOD HIP6310
BECAUSE xxxxxxxx IS NOT IN THE dlib ZONE
```

In the message text, *xxxxxxx* will be one of the following modules:

```
EZAADMLR  EZAFTSRV  EZAIMSLN  EZAPPRT   EZAPPSST  GXDEMO1
GXDEMO2   GXDEMO3   GXDEMO4   GXDEMO4A  GXDEMO5   GXDEMO6
```

8.7.2.3 Additional messages expected during Wave 1AL ACCEPT CHECK

Successful ACCEPT CHECK processing of Wave 1AL returns a condition code of 0 or 4.

8.7.2.4 Additional messages expected during Wave 1B ACCEPT CHECK

Successful ACCEPT CHECK processing of Wave 1B returns a condition code of 4.

8.7.2.4.1 Messages expected during DFSMS ACCEPT CHECK

The following messages may be received during DFSMS ACCEPT CHECK processing:

```
GIM61903W LMOD yyyyyyyy WAS NOT DELETED BY HDZ3310 BECAUSE
IT IS NOT IN THE dlib ZONE.
```

In the message, *yyyyyyyy* will be one of the following modules and dlib is the name of the distribution zone.

```
ARCZCUC  ARCZDLC  ARCZPUT  EDGCXTRC  EMODVOL1  IDA019BL
OMODVOL1
```

Successful ACCEPT CHECK processing returns a condition code of 4.

8.7.2.5 Additional messages expected during Wave 1C ACCEPT CHECK

Successful ACCEPT CHECK processing of Wave 1C returns a condition code of 0.

8.7.2.5.1 Message expected during EREP ACCEPT CHECK

You may expect to receive the following message.

```
GIM61903W LMOD IFCILG04 WAS NOT DELETED BY SYSMOD EER3500
BECAUSE IT IS NOT IN THE dlib ZONE
```

8.7.2.5.2 Messages expected during TSO/E ACCEPT CHECK

You might receive the following message, which is acceptable.

```
GIM61903W LMOD xxxxxxx WAS NOT DELETED BY SYSMOD HTE77E0
BECAUSE IT IS NOT IN THE dlib ZONE
```

In the message text, *xxxxxxx* is one of the following aliases for SYSMOD HTE77E0:

```
IGC0006A IKJEFT02 IKJEFT09 IKJEGDRP IRXAPPC TEST
```

Successful ACCEPT CHECK processing returns a condition code of 4.

8.7.2.6 Additional messages expected during Wave 1D ACCEPT CHECK

Successful ACCEPT CHECK processing of Wave 1D returns a condition code of 0 or 4.

8.7.2.7 Additional messages expected during Wave 1E ACCEPT CHECK

Successful ACCEPT CHECK processing of Wave 1E returns a condition code of 0 or 4.

8.7.2.8 Additional messages expected during Wave 1F ACCEPT CHECK

Successful ACCEPT CHECK processing of Wave 1F returns a condition code of 0.

8.7.2.9 Additional messages expected during Wave 1G ACCEPT CHECK

Successful ACCEPT CHECK processing of Wave 1G returns a condition code of 0 or 4. Successful ACCEPT CHECK processing of Wave 1G returns a condition code of 4 when the expected messages documented in the following section are issued.

8.7.2.9.1 Messages expected during Network File System ACCEPT CHECK

During the ACCEPT CHECK of Network File System, the following messages might be received. This message is acceptable if it is the only cause of the return code 4.

```
GIM61903W LMOD yyyyyyyy WAS NOT DELETED BY SYSMOD HDZ331N
BECAUSE yyyyyyyy IS NOT IN THE xxxx ZONE
```

In the message text, *yyyyyyyy* will be one of the following modules and *xxxx* is the name of the distribution zone.

```
GFSAMAIN  GFSCMAIN  GFSATCPL  GFSATPNL  GFSATPRL  GFSAXOUT
GFSAXPRT  GFSAXSRB  GFSAXTIN  GFSAHFST  GFSALEGT  GFSAXEPL
```

8.7.2.9.2 Messages expected during z/OS File System ACCEPT CHECK

During the ACCEPT CHECK of z/OS File System, the following message might be received. This message is acceptable if it is the only cause of the return code 4.

```
GIM61903W LMOD xxxxxxxx WAS NOT DELETED BY SYSMOD yyyyyy
BECAUSE IT IS NOT IN THE dlib ZONE
```

In the message text, *yyyyyy* is HZFS510 and *xxxxxxxx* will be one of the following modules:

For HZFS510 IOEZM004, IOEZM006, IOEZM007

8.7.3 Do an SMP/E ACCEPT for Wave 0 and Wave 1 FMIDs and service

Be certain all the exception conditions have been satisfied before adding a BYPASS(HOLDSYSTEM) during the SMP/E ACCEPT step.

Figure 69 on page 238 shows a sample of an ACCEPT for the functions specified in the SELECT operand, plus all the APPLY'd PTFs that are applicable only to FMIDs listed in the FORFMID.

```
//ACCEPT JOB <job parameters>
//STEP1 EXEC PGM=GIMSMP,REGION=0M,TIME=NOLIMIT
//STEPLIB DD DSN=SYS1.MIGLIB,DISP=SHR,
//         UNIT=SYSALLDA,VOL=SER=v31vol1
//        DD DSN=ASM.SASMMOD1,DISP=SHR,
//         UNIT=SYSALLDA,VOL=SER=v31vol1
//SMPCSI   DD DSN=zos31.global.csi,DISP=SHR
//SMPCNTL DD *
  SET BOUNDARY(dlibzone)
      OPTIONS(ZOSOPT) .
  ACCEPT XZREQ
      FORFMID(ZV31Wn)
      SELECT(WAVEn)
      GROUPEXTEND(NOAPARS,NOUSERMODS)
      SOURCEID(ZOS31,RSU*)
      FIXCAT(IBM.ProductInstall-RequiredService)
      BYPASS(HOLDSYSTEM,HOLDUSER,
      HOLDCLASS(UCLREL,ERREL,HIPER))
      COMPRESS(ALL) .
/*
```

Figure 69. SMP/E ACCEPT (All FMIDs and Service for z/OS 3.1 Wave 0 and wave 1)

Note: ZOSOPT is now the option name for z/OS.

Required Updates

1. Update the *job parameters*.
2. Update the v31vol1 with the volume serial number for the MIGLIB and SASMMOD1 libraries that are the targets of the Wave 0 installation. By doing so, you can access the z/OS 3.1 level of Wave 0 elements using the STEPLIB DD statements.
3. Replace the CSI name on the SMPCSI DD statement with your CSI name.
4. Update *dlibzone* to your dlib zone name.
5. Update WAVE*n* to change *n* to 0, 1A, 1AL, 1B, 1C, 1D, 1E, 1F, or 1G. If you choose to perform the DUMMY DELETE option to remove the FMIDs of prior releases, you must ACCEPT Wave 1A and Wave 1C concurrently and then Wave 0 and Wave 1B concurrently because of the prereq requirements. Then, continue with the ACCEPT of WAVE 1AL, 1D, 1E, 1F, and 1G.
6. Update ZV31Wn to change *n* to 0, 1A, 1AL, 1B, 1C, 1D, 1E, 1F, or 1G. This FMIDSET includes FMIDs for all elements within the specific ripple.
7. The XZREQ operand only needs to be specified when cross-zone processing is required.

Note that if you BYPASS(HOLDCLASS(HIPER)), you should run the SMP/E REPORT ERRSYSMODS command to identify missing HIPER HOLDs before putting your system into production.

If you do not BYPASS(HOLDCLASS(HIPER)), the FMIDs may not be installed if any of the HIPER maintenance is unavailable.

Any messages other than in 6.7, “Step 6: Review General Installation Notes” on page 43 or those listed in the following sections need to be investigated.

Notes:

1. Adding the FMIDSET(ZV31Wn) in the FORFMID operand ensures that the PTF service for all FMIDs (new, changed, unchanged) will get accepted at the same time as the ripple for the new FMIDs is installed.
2. 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 messages will be received, which are acceptable:

   ```
   GIM50810W THE XZREQ OPERAND WAS SPECIFIED ON THE ACCEPT
   COMMAND BUT SINCE NO ZONES WERE APPLICABLE FOR CROSS-ZONE
   REQUISITE CHECKING, THE XZREQ OPERAND WILL BE IGNORED.

   GIM20501I ACCEPT PROCESSING IS COMPLETE. THE HIGHEST RETURN
   CODE WAS 04.
   ```

8.7.3.1 Additional messages expected during Wave 0 ACCEPT

Successful ACCEPT processing returns a condition code of 0 or 4.

8.7.3.1.1 Messages expected During Binder ACCEPT

During the ACCEPT of the Binder, the following messages may be received and are acceptable if they are the only reasons for the condition code 4.

```
GIM61903W LMOD xxxxxxxx WAS NOT DELETED
BY SYSMOD HPM77E0 BECAUSE IT IS NOT IN THE dlib ZONE
```

In the message text, *xxxxxxxx* will be one of the following LMODs. If these are the only cause of the condition code 4, it is acceptable.

```
AKJLKL01  AMBLIST  HEWLD  HEWLKED  IEWBFDAT  IEWBIND
IEWBLINK  IEWBXEP
```

8.7.3.2 Additional messages expected during Wave 1A ACCEPT

Successful ACCEPT processing of Wave 1A returns a condition code of 4.

8.7.3.2.1 Messages expected during BCP ACCEPT

You might receive the following messages, which are acceptable.

```
GIM61903W LMOD xxxxxxxx WAS NOT DELETED BY SYSMOD HBB77E0
BECAUSE IT IS NOT IN THE dlib ZONE.
```

In the message, *xxxxxxx* is one of the following modules:

```
AMDPRFMT  ATBINPVT  IEAIPL04  IEANUC11  IEFITJT  IEFW21SD
IWMO2CMD
```

Successful ACCEPT processing returns a condition code of 4.

8.7.3.2.2 Messages expected during Communications Server IP Services ACCEPT

During the ACCEPT of Communications Server IP Services, the following messages are received and are acceptable:

```
GIM61903W LMOD xxxxxxxx WAS NOT DELETED BY SYSMOD HIP6310
BECAUSE IT IS NOT IN THE dlib ZONE.
```

In the message, *xxxxxxx* will be one of the following modules:

```
EZAADMLR  EZAFTSRV  EZAIMSLN  EZAPPRT   EZAPPSST  GXDEMO1
GXDEMO2   GXDEMO3   GXDEMO4   GXDEMO4A  GXDEMO5   GXDEMO6
```

The following MOD entries in the Communications Server IP Services FMID are superseded by MOD entries in feature FMIDs. Therefore, these MOD entries might be flagged as “NOT SEL” during the ACCEPT.

- MAC EZACDIRB
- MAC EZAODIRB
- MOD EZACXADE
- MOD EZACXAEN
- MOD EZACX3DE
- MOD EZACX3EN
- MOD EZACX3FR
- MOD EZACX3HD
- MOD EZACX3HE
- MOD EZACX3IK
- MOD EZAPX3CC
- MOD EZBISXGM
- MOD EZBISXES

8.7.3.3 Additional messages expected during Wave 1AL ACCEPT

Successful ACCEPT processing of Wave 1AL returns a condition code of 0 or 4.

8.7.3.4 Additional messages expected during Wave 1B ACCEPT

Successful ACCEPT processing of Wave 1B returns a condition code of 4.

8.7.3.4.1 Messages expected during DFSMS ACCEPT

The following messages may be received during ACCEPT processing of DFSMS.

```
GIM61903W LMOD yyyyyyyy WAS NOT DELETED BY HDZ3310 BECAUSE
IT IS NOT IN THE dlib ZONE.
```

In the message, *yyyyyyyy* will be one of the following modules and *xxxx* is the name of the distribution zone.

```
ARCZCUC  ARCZDLC  ARCZPUT  EDGCXTRC  EMODVOL1  IDA019BL
OMODVOL1
```

Successful ACCEPT processing returns a condition code of 4.

8.7.3.5 Additional messages expected during Wave 1C ACCEPT

Successful ACCEPT processing of Wave 1C returns a condition code of 4.

8.7.3.5.1 Message expected during EREP ACCEPT

```
GIM61903W LMOD IFCILG04 WAS NOT DELETED BY SYSMOD EER3500
BECAUSE IT IS NOT IN THE dlib ZONE
```

8.7.3.5.2 Messages expected during TSO/E ACCEPT

You might receive the following message, which is acceptable.

```
GIM61903W LMOD xxxxxxx WAS NOT DELETED BY SYSMOD HTE77E0
BECAUSE IT IS NOT IN THE dlib ZONE
```

In the message text, *xxxxxxx* is one of the following LMODs for SYSMOD HTE77E0:

```
IGC0006A IKJEFT02 IKJEFT09 IKJEGDRP IRXAPPC TEST
```

Successful ACCEPT processing returns a condition code of 4.

8.7.3.6 Additional messages expected during Wave 1D ACCEPT

Successful ACCEPT processing of Wave 1D returns a condition code of 0 or 4.

8.7.3.7 Additional messages expected during Wave 1E ACCEPT

Successful ACCEPT processing of Wave 1E returns a condition code of 0.

8.7.3.8 Additional messages expected during Wave 1F ACCEPT

Successful ACCEPT processing of Wave 1F returns a condition code of 0 or 4.

8.7.3.8.1 Messages expected during DFSORT ACCEPT

IEW2454W messages can be ignored if they are issued for symbols starting with “CEE,” such as: CEEINT, CEESTART, CEEBETBL, CEETREC, CEESETL, CEEQRYL, CEEARLU, CEESTXF, and CEESCOL. (Other unlisted symbols starting with “CEE” can also be ignored.) These are typical

messages from the Binder during steps that store modules into distribution libraries when you ACCEPT DFSORT FMIDs and PTFs at the same time. Any other messages should be investigated.

8.7.3.9 Additional messages expected during Wave 1G ACCEPT

Successful ACCEPT processing of Wave 1G returns a condition code of 0 or 4. Successful ACCEPT processing of Wave 1G returns a condition code of 4 when the expected messages documented in the following section are issued.

8.7.3.9.1 Messages expected during Network File System ACCEPT

During the ACCEPT of Network File System, the following message might be received. This message is acceptable if it is the only cause of the return code 4.

```
GIM61903W LMOD yyyyyyyy WAS NOT DELETED BY SYSMOD HDZ331N
BECAUSE yyyyyyyy IS NOT IN THE xxxx ZONE
```

In the message text, *yyyyyyyy* will be one of the following modules and *xxxx* is the name of the distribution zone.

```
GFSAMAIN  GFSCMAIN  GFSATCPL  GFSATPNL  GFSATPRL  GFSAXOUT
GFSAXPRT  GFSAXSRB  GFSAXTIN  GFSAHFST  GFSALEGT  GFSAXEPL
```

8.7.3.9.2 Messages expected during z/OS File System ACCEPT

During the ACCEPT of z/OS File System, the following messages might be received. These messages are acceptable if they are the only cause of the return code 4.

```
GIM61903W LMOD xxxxxxxx WAS NOT DELETED BY SYSMOD yyyyyyy
BECAUSE IT IS NOT IN THE xxxx ZONE
```

In the message text, *yyyyyyy* is HZFS510, *xxxxxxxx* is one of the following modules, and *xxxx* is the name of the distribution zone.

For HZFS510 IOEZM004, IOEZM006, IOEZM007

8.7.4 Do an SMP/E ACCEPT CHECK for Wave 2

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

Figure 70 on page 243 shows a sample ACCEPT CHECK for the functions specified in the SELECT operand, plus APPLYed PTFs that are applicable only to the FMIDs listed in the FORFMID.

```
//CHECK JOB <job parameters>
//STEP1 EXEC PGM=GIMSMP,REGION=0M,TIME=NOLIMIT
//STEPLIB DD DSN=SYS1.MIGLIB,DISP=SHR,
//         UNIT=SYSALLDA,VOL=SER=v31vol1
//        DD DSN=ASM.SASMMOD1,DISP=SHR,
//         UNIT=SYSALLDA,VOL=SER=v31vol1
//SMPCSI DD DSN=zos31.global.csi,DISP=SHR
//SMPCNTL DD *
  SET BOUNDARY(dlibzone)
      OPTIONS(ZOSOPT) .
  ACCEPT CHECK  XZREQ
        FORFMID(HJE77E0,HQX77E0,
                JJE77EJ) /* If not ordered, remove */
        SELECT(HJE77E0,HQX77E0,
                JJE77EJ) /* If not ordered, remove */
  SOURCEID(ZOS31,RSU*)
  FIXCAT(IBM.ProductInstall-RequiredService)
  GROUPEXTEND(NOAPARS,NOUSERMODS)
  BYPASS(HOLDSYSTEM,HOLDUSER,
  HOLDCLASS(ERREL,UCLREL,HIPER)) .
/*
```

Figure 70. SMP/E ACCEPT CHECK for Wave 2 (All FMIDs and All Service)

Note: ZOSOPT is now the option name for z/OS.

Required Updates

1. Update the *job parameters*.
2. Update the v31vol1 with the volume serial number for the MIGLIB and SASMMOD1 libraries that are the targets of the Wave 0 installation. By doing so, you can access the z/OS 3.1 level of Wave 0 elements using the STEPLIB DD statements.
3. Replace the CSI name on the SMPCSI DD statement with your CSI name.
4. Update *dlibzone* to your dlib zone name.
5. The XZREQ operand only needs to be specified when cross-zone processing is required.

Note that if you BYPASS(HOLDCLASS(HIPER)), you should run the SMP/E REPORT ERRSYSMODS command to identify missing HIPER HOLDs before putting your system into production.

If you do not BYPASS(HOLDCLASS(HIPER)), the FMIDs may not be installed if any of the HIPER maintenance is unavailable.

Any messages other than those listed in 6.7, “Step 6: Review General Installation Notes” on page 43 or those listed below should be investigated.

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 messages will be received, which are acceptable:

```
GIM50810W THE XZREQ OPERAND WAS SPECIFIED ON THE ACCEPT CHECK
COMMAND BUT SINCE NO ZONES WERE APPLICABLE FOR CROSS-ZONE
REQUISITE CHECKING, THE XZREQ OPERAND WILL BE IGNORED.

GIM20501I ACCEPT PROCESSING IS COMPLETE. THE HIGHEST RETURN
CODE WAS 04.
```

Successful ACCEPT CHECK processing for JES2 and SDSF returns a condition code of 0.

8.7.5 Do an SMP/E ACCEPT for Wave 2

Do not specify ASSEM on the ACCEPT command for JES2 and SDSF. The specification of ASSEM on the ACCEPT command can cause serviceability problems.

Figure 71 on page 244 shows a sample ACCEPT for the functions specified in the SELECT operand, plus APPLY'd PTFs that are applicable only to the FMIDs listed in the FORFMID.

```
//ACCEPT JOB <job parameters>
//STEP1 EXEC PGM=GIMSMP,REGION=0M,TIME=NOLIMIT
//STEPLIB DD DSN=SYS1.MIGLIB,DISP=SHR,
//         UNIT=SYSALLDA,VOL=SER=v31vol1
//        DD DSN=ASM.SASMMOD1,DISP=SHR,
//         UNIT=SYSALLDA,VOL=SER=v31vol1
//SMPCSI DD DSN=zos31.global.csi,DISP=SHR
//SMPCNTL DD *
  SET BOUNDARY(dlibzone)
      OPTIONS(ZOSOPT) .
  ACCEPT  XZREQ
        FORFMID(HJE77E0,HQX77E0,
                JJE77EJ) /* If not ordered, remove */
        SELECT(HJE77E0,HQX77E0,
                JJE77EJ) /* If not ordered, remove */
  SOURCEID(ZOS31,RSU*)
  FIXCAT(IBM.ProductInstall-RequiredService)
  BYPASS(HOLDUSER,
  HOLDCLASS(ERREL,UCLREL,HIPER))
  GROUPEXTEND(NOAPARS,NOUSERMODS)
  COMPRESS(ALL) .
/*
```

Figure 71. SMP/E ACCEPT for Wave 2 (FMIDs and All Service)

Note: ZOSOPT is now the option name for z/OS.

Required Updates

1. Update the *job parameters*.
2. Update the v31vol1 with the volume serial number for the MIGLIB and SASMMOD1 libraries that are the targets of the Wave 0 installation. By doing so, you can access the z/OS 3.1 level of Wave 0 elements using the STEPLIB DD statements.
3. Replace the CSI name on the SMPCSI DD statement with your CSI name.
4. Update *dlibzone* to your dlib zone name.
5. The XZREQ operand only needs to be specified when cross-zone processing is required.

Note that if you BYPASS(HOLDCLASS(HIPER)), you should run the SMP/E REPORT ERRSYSMODS command to identify missing HIPER HOLDs before putting your system into production.

If you do not BYPASS(HOLDCLASS(HIPER)), the FMIDs may not be installed if any of the HIPER maintenance is unavailable.

Any messages other than those listed in 6.7, "Step 6: Review General Installation Notes" on page 43 or those listed below should be investigated.

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 messages will be received, which are acceptable:

```
GIM50810W THE XZREQ OPERAND WAS SPECIFIED ON THE ACCEPT COMMAND
BUT SINCE NO ZONES WERE APPLICABLE FOR CROSS-ZONE REQUISITE
CHECKING, THE XZREQ OPERAND WILL BE IGNORED.

GIM20501I ACCEPT PROCESSING IS COMPLETE. THE HIGHEST RETURN
CODE WAS 04.
```

Successful ACCEPT processing of JES2 and SDSF returns a condition code of 0.

8.8 Step 8: Clean up after Wave 1 and Wave 2

To do an optional global zone cleanup, see Appendix D, "Additional Cleanup Jobs for z/OS 3.1" on page 315.

8.8.1 Do global zone cleanup for previous versions of JES2 and SDSF

Because each version of JES2 and SDSF are complete replacements for previous versions of JES2 and SDSF, you might want to delete the old FMIDs so future (unneeded) service will not be received for them, unless you plan to share the SMPPTS between z/OS 3.1 and systems having other levels of JES2 and SDSF.

The FMIDs listed as deleted in the output of the ACCEPT of the base FMIDs (HJE77E0 and HQX77E0) can be deleted from the FMID list in the global zone.

8.8.1.1 Do global zone cleanup for JES2: Sample job HASIGCLN is provided by the JES2 element. You can use HASIGCLN to delete old JES2 FMIDs, the associated SYSMODS of these JES2 FMIDs, and HOLDDATA from the SMP/E global zone. To perform the deletion, copy member HASIGCLN from JES2 library SHASSAMP, modify it for your environment, and run the job.

8.8.1.2 Do global zone cleanup for SDSF: Sample job ISFIGCLN is provided by the SDSF element. You can use ISFIGCLN to delete old SDSF FMIDs, the associated SYSMODS of these SDSF FMIDs, and HOLDDATA from the SMP/E global zone. To perform the deletion, copy member ISFIGCLN from SDSF library SISFJCL, modify it for your environment, and run the job. This sample job completes with a return code of 4.

Refer to *z/OS Upgrade Workflow* for a complete list of clean up activities including:

- Delete obsolete libraries, DDDEFs and Zones
- Run SMP/E Report Crosszone

Appendix A. Component IDs for Elements in z/OS 3.1

This appendix lists each z/OS 3.1 Component ID along with its corresponding FMIDs. The table is listed by Component ID in alphanumeric order.

Figure 72 (Page 1 of 11). Component IDs

FMID	COMP ID	Component Name	RETAIN Release
HOPI7D0 JOPI7DJ	5647A01OP	InfoPrint Server (Print Interface and IP PrintWay extended mode)	7D0 7DJ
HFNT140 HFNT14J	5650FNT00	z/OS Font Collection	140 14J
H24P111 J24P112	5655A4501	C/C++ Base Performance Analyzer	111 112
HXML1B0	5655D4401	XML Parser, C++ Edition	1B0
HXML1B0	5655D4403	XSLT Processor, C++ Edition	1B0
HIP6310 JIP631K JIP631X	5655HAL00	Communications Server for z/OS IP Services (TCP/IP /TCPIP) Communications Server Security Level 3 (TCP/IP / TCPIP) Communications Server X11R4 XWindows (TCP/IP / TCPIP)	310 31K 31X
HHAP90P	5655I3510	WebSphere® Application Server z/OS IHS Z APACHE	90P
HKCZ300	5655K2000	Future Function	300
HOS3310	5655M2301	OpenSSH for z/OS	310
HSMA31A	5655S28CA	z/OSMF Network Configuration Assistant	31A
HSMA31E	5655S28ZE	z/OSMF zERT Network Analyzer	31E
HSMA310	5655S28CU	z/OSMF Console UI	310
HSMA310	5655S28PR	z/OSMF Cloud Provisioning and Management for z/OS	310
HSMA310	5655S28RF	z/OSMF RESTFILES	310
HSMA310	5655S28RJ	z/OSMF RESTJobs (Representational State Transfer)	310
HSMA310	5655S28SM	z/OSMF Core	310
HSMA310	5655S28TS	z/OSMF TSO REST Services	310
HSMA310	5655S28WL	z/OSMF Liberty Server	310
HSMA311	5655S2801	z/OSMF ISPF	311
HSMA312	5655S2802	z/OSMF Resource Monitoring	312
HSMA313	5655S2803	z/OSMF WLM Administration	313
HSMA314	5655S2804	z/OSMF Software Management	314
HSMA315	5655S2805	z/OSMF Incident Log	315

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Figure 72 (Page 2 of 11). Component IDs

FMID	COMP ID	Component Name	RETAIN Release
HSMA316	5655S2806	z/OSMF Capacity Provisioning	316
HSMA317	5655S2807	z/OSMF Workflow	317
HSMA310	5655S2809	z/OSMF Sysplex Management	310
HWLPEM0	5655W6514	Liberty Profile on z/OS	EM0
HIF83A2 JIF83A4 JIF83A6	565504201	ISPF for z/OS - DM (Interactive System Productivity Facility)	3A2 3A4 3A6
HIF83A2 JIF83A4 JIF83A6	565504202	ISPF for z/OS - PDF and SCLM (Interactive System Productivity Facility)	3A2 3A4 3A6
HRSL510 JRSL51J JRSL511	565506803	Tivoli Directory Server for z/OS (TDS for z/OS / LDAP)	510 51J 511
HCPT510 JCPT51J JCPT511	565506805	System SSL System SSL Security Level 3	510 51J 511
HSWK510 JSWK51J JSWK511	565506807	Integrated Security Services Network Authentication Service Integrated Security Services Network Authentication Service Security Level 3	510 51J 511
HLB77C0 JLB77CJ	56551210A	XL C/C++ Compiler	7C0 7CJ
HTV77C0 JTV77CJ	56551210D	Runtime Library Extensions	7C0 7CJ
EER3500	565826001	EREP	500
EDU1H01	565899201	ICKDSF	H01
FDU1H07 FDU1H08 FDU1H09	565899202	ICKDSF ISMF Panels	H07 H08 H09
HTE77E0	5665IXX00	TSO/E REXX SAA (Time Sharing Option/Extensions)	7E0
HRG77E0	566527401	z/OS Data Gatherer	7E0
HRM77E0 JRM77EJ	566527404	RMF (Resource Measurement Facility)	7E0 7EJ
HTE77E0 JTE77EJ	566528501	TSO/E Edit (Time Sharing Option/Extensions)	7E0 7EJ
HTE77E0 JTE77EJ	566528502	TSO/E Scheduler (Time Sharing Option/Extensions)	7E0 7EJ

Figure 72 (Page 3 of 11). Component IDs

FMID	COMP ID	Component Name	RETAIN Release
HTE77E0 JTE77EJ	566528503	TSO/E Test (Time Sharing Option/Extensions)	7E0 7EJ
HTE77E0 JTE77EJ	566528504	TSO/E XMIT - IDTF (Time Sharing Option/Extensions - Transmit and Receive - Interactive Data Transmission Facility)	7E0 7EJ
HTE77E0 JTE77EJ	566528505	TSO/E Session Manager (Time Sharing Option/Extensions)	7E0 7EJ
JTE77EE JTE77EJ	566528506	TSO/E ICF (Time Sharing Option/Extensions - Information Center Facility)	7EE 7EJ
HTE77E0 JTE77EJ	566528508	TSO/E REXX (Time Sharing Option/Extensions)	7E0 7EJ
HIO1106	566529101	Input/Output Configuration Program (IOCP common)	106
HIO1106	566529102	Input/Output Configuration Program (IOCP MVS Control External Writer)	106
HIO1106	566529103	Input/Output Configuration Program (IOCP) Standalone	106
HFX1112	566531101	z/OS Host - 3270 Workstation File Send/Receive	112
HQX77E0	566548801	SDSF (System Display and Search Facility)	7E0
HQX77E0	566548802	SDSF z/OSMF Plugin	7E0
HGD3201	566881201	GDDM-PGF (Graphical Data Display Manager - Presentation Graphics Feature)	201
HMP1K00 JMP1K11	566894901	SMP/E (System Modification Program Extended)	K00 K11
HSWF100	568500101	ESCON Director Support	100
HCR77E0	568505101	ICSF (Integrated Cryptographic Service Facility) - HCR77E0 Cryptographic Support for z/OS V2R5	7E0
HBB77E0	568505103	ICSF - Crypto at IPL	7E0
HLE77E0 JLE77EJ	568819801	Language Environment (LE) CEL / Common Execution Library	7E0 7EJ
HLE77E0 JLE77EJ	568819802	Language Environment (LE) COBOL Library	7E0 7EJ
HLE77E0 JLE77EJ	568819803	Language Environment (LE) PL/I Library	7E0 7EJ
HLE77E0 JLE77EJ	568819804	Language Environment (LE) Fortran Library	7E0 7EJ
HLE77E0 JLE77EJ	568819805	Language Environment (LE) C/C++ Run Time Library (RTL)	7E0 7EJ

Figure 72 (Page 4 of 11). Component IDs

FMID	COMP ID	Component Name	RETAIN Release
HLE77E0 JLE77EJ	568819806	Language Environment (LE) VA PL/I Library	7E0 7EJ
HLE77E0 JLE77EJ	568819807	Language Environment (LE) ANSI C/C++ Class Library	7E0 7EJ
HLE77E0	568819810	Automatic Binary Optimizer for z/OS Library	7E0
HLE77E0 JLE77EJ	568819812	Language Environment (LE) Enterprise COBOL Library	7E0 7EJ
HDZ3310	5695DF1VR	DFSMS-CICSVR Server Support	310
HDZ3310	5695DF100	DFSMS Installation	310
HDZ3310	5695DF101	DFSMS SMS (Storage Management Subsystem)	310
HDZ3310	5695DF102	DFSMS BAM (Base Access Methods)	310
HDZ3310	5695DF103	DFSMS AMS (Access Method Services)	310
HDZ3310	5695DF104	DFSMS Common Services	310
HDZ3310	5695DF105	DFSMS Catalog	310
HDZ3310	5695DF106	DFSMS VSAM	310
HDZ3310	5695DF107	DFSMS OCEOV (Open/Close/End Of Volume)	310
HDZ3310	5695DF109	DFSMS Checkpoint Restart	310
HDZ3310	5695DF110	DFSMS Device Support - BTLS/Tape	310
HDZ3310	5695DF111	DFSMS Device Support - DASD	310
HDZ3310	5695DF113	DFSMS Device Support Services	310
HDZ3310	5695DF114	DFSMS Utilities	310
HDZ3310	5695DF115	DFSMS PDSE (Partitioned Datas Set Extended) and FAMS	310
HDZ3310	5695DF116	DFSMS VMA (Volume Mount Analyzer)	310
HDZ3310	5695DF117	DFSMS SDM (System Data Mover)	310
HDZ3310	5695DF118	DFSMS Compression Services	310
HDZ3310	5695DF119	DFSMS Common Function/Reuse	310
HDZ331N JDZ331J	5695DF121	z/OS Network File System (NFS)	31N 31J
HDZ3310	5695DF122	DFSMS VSAM Record Level Sharing (RLS)	310
HDZ3310 JDZ331K	5695DF123	DFSMS Naviquest	310 31K
HDZ3310	5695DF124	DFSMS Cloud Data Access	310
HDZ3310	5695DF126	DFSMS Media Manager	310

Figure 72 (Page 5 of 11). Component IDs

FMID	COMP ID	Component Name	RETAIN Release
HDZ3310	5695DF133	DFSMS Device Management Services (DADSM/CVAF)	310
HDZ3310	5695DF140	DFSMS CDRA (Character Data Representation Architecture)	310
HDZ3310 JDZ331K	5695DF161	DFSMS ISMF and HCD (Interactive Storage Management Facility)	310 31K
HDZ3310 JDZ331K	5695DF170	DFSMShsm (Hierarchical Storage Management)	310 31K
HDZ3310 JDZ331K	5695DF175	DFSMSdss (Data Set Services)	310 31K
HDZ3310	5695DF180	DFSMS OAM (Object Access Method)	310
HDZ3310 JDZ331K	5695DF186	DFSMSrmm (Removable Media Manager)	310 31K
HPM77E0	5695PMB01	Program Management (Binder)	7E0
HOT77E0 JOT77EJ	5695SCPE1	z/OS UNIX System Services (USS) Parallel Environment	7E0 7EJ
HBB77E0 JBB77EJ	5695SCPX1	z/OS UNIX System Services (USS) Kernel and File System	7E0 7EJ
HOT77E0 JOT77EJ	5695SCPX2	z/OS UNIX System Services (USS) Shell and Utilities	7E0 7EJ
HOT77E0	5695SCPX3	z/OS UNIX System Services (USS) Debugger (DBX)	7E0
HOT77E0 JOT77EJ	5695SCPX4	z/OS UNIX System Services (USS) Application Services	7E0 7EJ
HOT77E0	5695SCPX7	z/OS UNIX System Services (USS) Compression Library	7E0
HCS77E0 JCS77EJ	5695SC1XL	HCD (Hardware Configuration Definition)	7E0 7EJ
HWJ9143 JWJ9144	569501403	Alternate Library for REXX	143 144
HNET7D0 JNET7DJ	569504002	Infoprint NetSpool	7D0 7DJ
HMOS705 JMOS7J5	569504004	PrintWay basic mode	705 7J5
HFST101	569504402	FFST (First Failure Support Technology™)	101
HVT6310	569511701	Communications Server for z/OS SNA Services (VTAM)	310
HGD3200	569516701	GDDM (Graphical Data Display Manager)	200
JGD3219 JGD3227	569516702	GDDM National Language Support (Graphical Data Display Manager NLS)	219 227

Figure 72 (Page 6 of 11). Component IDs

FMID	COMP ID	Component Name	RETAIN Release
HZFS510 JZFS51J	5696EFS00	z/OS File System (ZFS)	510 51J
HZFS510 JZFS51J	5696EFS01	Data Set File System	510 51J
HMQ4160	569623400	High Level Assembler (HLASM)	160
JMQ416A	569623401	High Level Assembler (HLASM) Toolkit	16A
HCM1J10	569711900	Hardware Configuration Manager (HCM)	J10
HSM1310	5740SM105	DFSORT	310
HBB77E0 JBB77EJ	5752BB1CS	Dynamic Device Reconfiguration (DDR)	7E0 7EJ
HBB77E0 JBB77EJ	5752BB1CT	Machine Check Handler (MCH)	7E0 7EJ
HBB77E0 JBB77EJ	5752BB131	Event Notification Facility (ENF) Dynamic output	7E0 7EJ
HBB77E0	5752BDPUT	z/OS Service	7E0
HBB77E0	5752BDTST	z/OS Preventive Service	7E0
HBB77E0	5752OS390	z/OS BCP General	7E0
HBB77E0 JBB77EJ	5752SCACB	Advanced Program-to-Program Communication (APPC)	7E0 7EJ
HBB77E0 JBB77EJ	5752SCACR	ACR (Alternate CPU Recovery)	7E0 7EJ
HBB77E0 JBB77EJ	5752SCASA	z/OS Reuse	7E0 7EJ
HBB77E0	5752SCASE	Address Space Services	7E0
HBB77E0	5752SCASR	Symptom Record (SYMREC) services	7E0
HBB77E0 JBB77EJ	5752SCAVM	Availability Manager	7E0 7EJ
HBB77E0	5752SCAXR	System REXX	7E0
HBB77E0	5752SCBBR	Component Broker	7E0
HPV77E0	5752SCCAP	Capacity Provisioning	7E0
HSD7780	5752SCCCR	Metal C Runtime Library	780
HBB77E0	5752SCCEA	Common Event Adapter	7E0
HZDC7C0	5752SCCDE	z/OS Container Extensions Appliance	7C0
HPG77E0	5752SCCIM	CIM (Common Information Model)	7E0

Figure 72 (Page 7 of 11). Component IDs

FMID	COMP ID	Component Name	RETAIN Release
HPG77E0	5752SCCM2	CIM ESERVER OS Management (Common Information Model)	7E0
HPG77E0	5752SCCM3	CIM Client for Java (Common Information Model)	7E0
HPG77E0	5752SCCM4	CIM Job Cluster Management (Common Information Model)	7E0
HPG77E0	5752SCCM5	CIM Problem Determination (Common Information Model)	7E0
HPG77E0	5752SCCM6	CIM Workload Manager (Common Information Model)	7E0
HPG77E0	5752SCCM7	CIM SMI-S	7E0
HPG77E0	5752SCCM8	CIM Performance Monitoring (Common Information Model)	7E0
HBB77E0	5752SCCON	z/OS Container Extensions Virtualization	7E0
HBB77E0 JBB77EJ	5752SCCSR	Callable Service Requests	7E0 7EJ
HBB77E0 JBB77EJ	5752SCCTX	Context Services	7E0 7EJ
HZDC7C0	5752SCCWF	z/OS Container Extensions z/OSMF Workflows	7C0
HCYG100 JCYG10J	5752SCCYG	IBM z/OS Change Tracker	100 10J
HBB77E0 JBB77EJ	5752SCDIV	Data-in-virtual (DIV)	7E0 7EJ
HBB77E0 JBB77EJ	5752SCDMP	SNAP/ABDUMP SDUMP	7E0 7EJ
HBB77E0	5752SCEZA	zAware Bulk Load Client	7E0
HBB77E0	5752SCFXE	BCP Function Registry	7E0
HBB77E0 JBB77EJ	5752SCGTZ	BCP Generic Tracker	7E0 7EJ
HBB77E0	5752SCHCW	Device Driver Manager	7E0
HBB77E0 JBB77EJ	5752SCHIS	z/OS Hardware Instrumentation	7E0 7EJ
HBB77E0 JBB77EJ	5752SCHWI	HWIBCPII - BCPii (Base Control Program Internal Interface)	7E0 7EJ
HBB77E0	5752SCHWT	WEB Enablement toolkit	7E0
HBB77E0 JBB77EJ	5752SCHZS	IBM Health Checker for z/OS	7E0 7EJ
HBB77E0	5752SCIQP	z/OS PCIe Services	7E0
HBB77E0 JBB77EJ	5752SCIXL	Cross System Extended Services (XES)	7E0 7EJ

Figure 72 (Page 8 of 11). Component IDs

FMID	COMP ID	Component Name	RETAIN Release
HBB77E0	5752SCJSC	JES Common Coupling	7E0
HBB77E0	5752SCLDR	Program Loader	7E0
HBB77E0 JBB77EJ	5752SCLOG	System logger	7E0 7EJ
HBB77E0 JBB77EJ	5752SCLWT	Loadwait/Restart	7E0 7EJ
HBB77E0 JBB77EJ	5752SCMMS	MVS message service (MMS)	7E0 7EJ
HBB77E0 JBB77EJ	5752SCOBR	Outboard recording (OBR) of SYS1.LOGREC error recording	7E0 7EJ
HBB77E0 JBB77EJ	5752SCPFA	Predictive Failure Analysis (PFA)	7E0 7EJ
HBB77E0	5752SCPX6	z/OS UNIX System Services (USS) BCP support	7E0
HBB77E0 JBB77EJ	5752SCRRS	Resource Recovery Services (RRS)	7E0 7EJ
HBB77E0	5752SCRTD	Runtime Diagnostics (RTD)	7E0
HBB77E0 JBB77EJ	5752SCRTM	Recovery Termination Manager (RTM)	7E0 7EJ
HBB77E0	5752SCRT2	Sub-Capacity Reporting Tool (z/OS SCRT - Java Version)	7E0
HBB77E0 JBB77EJ	5752SCSDS	Global Resource Serialization (GRS)	7E0 7EJ
HBB77E0 JBB77EJ	5752SCSLP	SLIP/PER	7E0 7EJ
HBB77E0 JBB77EJ	5752SCSPI	Service processor interface (SPI)	7E0 7EJ
HBB77E0 JBB77EJ	5752SCTRC	Component Trace	7E0 7EJ
HBB77E0 JBB77EJ	5752SCTTR	Transaction Trace	7E0 7EJ
HUN77E0 JUN77EJ	5752SCUNI	Support for Unicode	7E0 7EJ
HBB77E0	5752SCURP	Usage Reporting Program	7E0
HBB77E0 JBB77EJ	5752SCVTM	Virtual Terminal Manager	7E0 7EJ
HBB77E0 JBB77EJ	5752SCWLM	Workload Manager (WLM)	7E0 7EJ

Figure 72 (Page 9 of 11). Component IDs

FMID	COMP ID	Component Name	RETAIN Release
HBB77E0 JBB77EJ	5752SCXCF	Cross System Coupling Facility (XCF)	7E0 7EJ
HBB77E0	5752SCXML	XML System Services	7E0
HBB77E0 JBB77EJ	5752SCXMS	Cross Memory Services (XMS)	7E0 7EJ
HJE77E0 JJE77EJ	5752SC1BH	JES2 (Job Entry Subsystem 2)	7E0 7EJ
HBB77E0	5752SC1BL	Multi Leaving Workstation (MLW)	7E0
HBB77E0	5752SC1BN	System Authorization Facility (SAF)	7E0
HBB77E0 JBB77EJ	5752SC1B2	External Writer (XWTR)	7E0 7EJ
HBB77E0 JBB77EJ	5752SC1B3	Scheduler Restart	7E0 7EJ
HBB77E0 JBB77EJ	5752SC1B4	Allocation/Unallocation	7E0 7EJ
HBB77E0	5752SC1B5	SWA Manager	7E0
HBB77E0 JBB77EJ	5752SC1B6	Initiator/Terminator	7E0 7EJ
HBB77E0 JBB77EJ	5752SC1B8	Command processing - includes - Command processors / Master scheduler / Master trace	7E0 7EJ
HBB77E0 JBB77EJ	5752SC1B9	Converter/Interpreter	7E0 7EJ
HBB77E0 JBB77EJ	5752SC1CH	Virtual Storage Management (VSM)	7E0 7EJ
HBB77E0 JBB77EJ	5752SC1CJ	Contents Supervisor	7E0 7EJ
HBB77E0 JBB77EJ	5752SC1CK	Communications Task (COMMTASK)	7E0 7EJ
HBB77E0	5752SC1CL	Task Manager	7E0
HBB77E0 JBB77EJ	5752SC1CM	Recovery Termination Manager (RTM)	7E0 7EJ
HBB77E0	5752SC1CP	Extended Precision Floating Point Register	7E0
HBB77E0 JBB77EJ	5752SC1CR	Real Storage Manager (RSM)	7E0 7EJ

Figure 72 (Page 10 of 11). Component IDs

FMID	COMP ID	Component Name	RETAIN Release
HBB77E0 JBB77EJ	5752SC1CU	Region Control Task (RCT)	7E0 7EJ
HBB77E0 JBB77EJ	5752SC1CV	Timer Supervisor	7E0 7EJ
HBB77E0 JBB77EJ	5752SC1CW	Auxiliary Storage Manager (ASM)	7E0 7EJ
HBB77E0 JBB77EJ	5752SC1CX	System Resource Manager (SRM)	7E0 7EJ
HBB77E0 JBB77EJ	5752SC1CZ	MP Reconfiguration	7E0 7EJ
HBB77E0 JBB77EJ	5752SC1C3	I/O Supervisor (IOS)	7E0 7EJ
HBB77E0 JBB77EJ	5752SC1C4	Device Independent Display Operator Control (DIDOCS)	7E0 7EJ
HBB77E0 JBB77EJ	5752SC1C5	Supervisor Control - includes Interrupt handlers / Dispatcher	7E0 7EJ
HBB77E0	5752SC1C6	Execute Channel Program (EXCP)	7E0
HBB77E0	5752SC1C8	Nucleus Initialization Program (NIP)	7E0
HBB77E0	5752SC1C9	Initial Program Loader (IPL)	7E0
EMI2220	5752SC1DF	3890 Document Processor	220
EMI2220	5752SC1DL	Optical Character Reader (OCR)	220
EMI2220	5752SC1DM	3895 Document Reader/Inscriber	220
EMI2220	5752SC1DN	3540 Diskette I/O Unit	220
EMI2220	5752SC1D5	Output Control Record	220
HBB77E0	5752SC1S4	Supervisor SYSGEN	7E0
HBB77E0	5752SC1S5	Scheduler SYSGEN	7E0
ETI1106	5752SC1T3	TSO TIOC (Terminal Input/Output Controller)	106
HBB77E0 JBB77EJ	5752SC100	SMF Scheduler	7E0 7EJ
HBB77E0	5752SC101	Supervisor Mapping Macro (MAPMACS)	7E0
HBB77E0	5752SC102	System Management Facility (SMF)	7E0
HBB77E0 JBB77EJ	5752SC106	On Line Test Executive Program (OLTEP)	7E0 7EJ
HBB77E0 JBB77EJ	5752SC111	Generalized Trace Facility (GTF)	7E0 7EJ

Figure 72 (Page 11 of 11). Component IDs

FMID	COMP ID	Component Name	RETAIN Release
HBB77E0	5752SC112	Super Zap (AMASPZAP) / AMATERSE	7E0
HBB77E0	5752SC115	Stand-Alone Dump (AMDSADMP)	7E0
HBB77E0	5752SC118	GTF Trace edit	7E0
HBB77E0	5752SC132	Interactive Problem Control System (IPCS)	7E0
HAL47C0 JAL47DJ	5752SC133	z/OS Authorized Code Scanner JPN	7C0 7DJ
HBB77E0	5752SC141	JES Common Services	7E0
HBB77E0 JBB77EJ	5752SC142	System Trace	7E0 7EJ
HBB77E0 JBB77EJ	5752SC143	Auto Dump Services (DAE)	7E0 7EJ
HBB77E0	5752SC144	Allocation Services	7E0
HBB77E0 JBB77EJ	5752SC164	Virtual Lookaside Facility (VLF)	7E0 7EJ
HBB77E0	5752SYBLD	z/OS Install	7E0
HRF77E0 JRF77EJ	5752XXH00	RACF (Security Server Resource Access Control Facility)	7E0 7EJ
HKY77E0	5752XXPKI	PKI Services (Public Key Infrastructure)	7E0
HWT0500	5752SCHWT	z/OS Web Enablement Toolkit	500
HZAI310	5752SCZEN	IBM Z Deep Neural Network Library (zDNN)	310

Appendix B. APARs Incorporated into Elements of z/OS 3.1

This appendix is sorted by the element name.

APARs Incorporated into HWJ9143 (Alternate Library for REXX)

PN71194 PQ00096

APARs Incorporated into JWJ9144 (Alternate Library for REXX (Japanese))

No APARs have been incorporated at this time.

APARs Incorporated into HBB77E0 (BCP)

OA53790 OA54048 OA55896 OA56101 OA56936 OA57232 OA58107 OA58189
OA58383 OA58689 OA58833 OA58858 OA59374 OA59792 OA59806 OA59825
OA59947 OA60036 OA60092 OA60108 OA60140 OA60275 OA60319 OA60328
OA60381 OA60390 OA60428 OA60463 OA60480 OA60558 OA60561 OA60571
OA60594 OA60598 OA60645 OA60648 OA60650 OA60660 OA60730 OA60843
OA60854 OA60868 OA60891 OA60895 OA60919 OA60947 OA60958 OA60962
OA60975 OA61004 OA61030 OA61050 OA61061 OA61064 OA61067 OA61083
OA61085 OA61093 OA61098 OA61099 OA61100 OA61107 OA61110 OA61117
OA61126 OA61131 OA61139 OA61158 OA61176 OA61177 OA61181 OA61191
OA61204 OA61217 OA61222 OA61223 OA61233 OA61240 OA61241 OA61242
OA61243 OA61248 OA61252 OA61257 OA61261 OA61280 OA61284 OA61289
OA61290 OA61294 OA61311 OA61313 OA61314 OA61315 OA61333 OA61336
OA61336 OA61342 OA61363 OA61368 OA61371 OA61375 OA61377 OA61380
OA61384 OA61394 OA61395 OA61404 OA61406 OA61432 OA61443 OA61444
OA61466 OA61468 OA61478 OA61487 OA61499 OA61505 OA61505 OA61511
OA61516 OA61522 OA61525 OA61538 OA61542 OA61558 OA61574 OA61586
OA61590 OA61591 OA61595 OA61612 OA61616 OA61621 OA61624 OA61626
OA61633 OA61634 OA61642 OA61651 OA61668 OA61684 OA61695 OA61715
OA61720 OA61722 OA61724 OA61731 OA61759 OA61760 OA61762 OA61769
OA61771 OA61773 OA61774 OA61788 OA61797 OA61798 OA61799 OA61802
OA61804 OA61811 OA61813 OA61816 OA61819 OA61825 OA61828 OA61832
OA61847 OA61848 OA61855 OA61858 OA61860 OA61881 OA61886 OA61890
OA61901 OA61902 OA61917 OA61922 OA61924 OA61926 OA61927 OA61941
OA61944 OA61947 OA61952 OA61960 OA61975 OA61976 OA61986 OA61991
OA62013 OA62016 OA62018 OA62027 OA62030 OA62035 OA62054 OA62060
OA62061 OA62069 OA62072 OA62091 OA62096 OA62118 OA62124 OA62142
OA62145 OA62153 OA62168 OA62171 OA62176 OA62182 OA62184 OA62186
OA62187 OA62192 OA62202 OA62209 OA62239 OA62246 OA62252 OA62255
OA62258 OA62268 OA62274 OA62300 OA62307 OA62310 OA62321 OA62331
OA62336 OA62354 OA62363 OA62381 OA62402 OA62405 OA62428 OA62448
OA62467 OA62489 OA62491 OA62500 OA62507 OA62531 OA62532 OA62535

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OA62546 OA62551 OA62552 OA62567 OA62568 OA62581 OA62582 OA62583
OA62596 OA62606 OA62619 OA62625 OA62626 OA62635 OA62646 OA62653
OA62658 OA62660 OA62666 OA62671 OA62680 OA62697 OA62701 OA62702
OA62703 OA62719 OA62720 OA62721 OA62728 OA62735 OA62744 OA62748
OA62754 OA62756 OA62762 OA62764 OA62781 OA62783 OA62788 OA62789
OA62794 OA62798 OA62800 OA62804 OA62823 OA62865 OA62867 OA62879
OA62925 OA62938 OA62949 OA62950 OA62954 OA62971 OA62976 OA62981
OA62990 OA62994 OA62999 OA63001 OA63009 OA63030 OA63059 OA63064
OA63077 OA63083 OA63088 OA63098 OA63104 OA63105 OA63145 OA63146
OA63152 OA63167 OA63189 OA63191 OA63198 OA63232 OA63238 OA63241
OA63248 OA63257 OA63272 OA63274 OA63277 OA63288 OA63297 OA63305
OA63312 OA63318 OA63354 OA63360 OA63392 OA63404 OA63406 OA63419
OA63420 OA63421 OA63455 OA63457 OA63463 OA63466 OA63468 OA63470
OA63472 OA63482 OA63488 OA63502 OA63503 OA63507 OA63510 OA63523
OA63551 OA63554 OA63576 OA63610 OA63613 OA63624 OA63654 OA63663
OA63670 OA63692 OA63739 OA63755 OA63779 OA63792 OA63816 OA63846
OA63854 OA63874 OA63875 OA63876 OA63906 OA63912 OA63919 OA63930
OA63967 OA63973 OA63979 OA63986 OA63990 OA64001 OA64025 OA64037
OA64045 OA64046 OA64077 OA64083 OA64145 OA64156 OA64163 OA64166
OA64167 OA64168 OA64179 OA64202 OA64212 OA64217 OA64222 OA64246
OA64257 OA64269 OA64286 OA64294 OA64320 OA64326 OA64357 OA64369
OA64386 OA64490 OA64521 OA64922

APARs Incorporated into JBB77EJ

OA60036 OA60275 OA60571 OA60650 OA61223 OA61243 OA61313 OA61342
OA61851

APARs Incorporated into HPV77E0 (BCP - Capacity Provisioning)

OA62211 OA62347 OA63499

APARs Incorporated into HUN77E0 (BCP - Support for Unicode)

OA52686 OA52855 OA52874 OA53307 OA53732 OA53828 OA54424 OA54426
OA55214 OA55239 OA55727 OA55758 OA55795 OA55884 OA56221 OA56241
OA56511 OA56512 OA56812 OA57008 OA57214 OA58551 OA58671 OA59065
OA59506 OA59656 OA60042 OA60082 OA60359 OA61232 OA61490

APARs Incorporated into JUN77EJ (Unicode JPN)

No Apars were incorporated into JUN77EJ at this time.

APARs Incorporated into HPM77E0 (BCP Program Management Binder)

OA61632 OA61768 OA62305 OA62360 OA62824 OA62845 OA63070 OA63073
OA63213 OA63323 OA63377 OA63938

APARs Incorporated into HPG77E0 (Common Information Model (CIM))

OA57530 OA57478 OA57687 OA58866 OA58777 OA58895 OA61507 OA62910
OA63747 OA64099

APARs Incorporated into HIP6310 (Communications Server IP Services)

PH34117 PH35001 PH35132 PH35571 PH36143 PH36689 PH37084 PH37130
PH37232 PH37289 PH37372 PH37603 PH37918 PH38136 PH38187 PH38213
PH38240 PH38303 PH38318 PH38618 PH38674 PH38686 PH38727 PH38859
PH38998 PH39244 PH39376 PH39574 PH39707 PH39767 PH39846 PH39860
PH40263 PH40473 PH40807 PH40833 PH40897 PH41160 PH41164 PH41270
PH41410 PH41491 PH41570 PH41585 PH41587 PH41588 PH41628 PH41726
PH42006 PH42083 PH42357 PH42487 PH42581 PH42618 PH43139 PH43441
PH43504 PH43684 PH44281 PH44309 PH44379 PH44460 PH44704 PH44740
PH44803 PH44968 PH45176 PH45452 PH45473 PH45493 PH45668 PH45671
PH45870 PH45902 PH45944 PH46112 PH46362 PH46915 PH47010 PH47177
PH47404 PH47591 PH47680 PH48018 PH48100 PH48237 PH48511 PH48576
PH48580 PH48661 PH49144 PH49419 PH49587 PH49652 PH49977 PH50150
PH50437 PH50458 PH50982 PH51048 PH51361 PH51973 PH52401

APARs Incorporated into HVT6310 (Communications Server for z/OS SNA Services)

OA61219 OA61321 OA61338 OA61361 OA61532 OA61565 OA61734 OA61807
OA61824 OA61910 OA62070 OA62080 OA62119 OA62127 OA62170 OA62351
OA62362 OA62386 OA62460 OA62652 OA62831 OA63197 OA63219 OA63280
OA63292 OA63329 OA63555 OA63578 OA63606 OA63771 OA63982 OA64272

APARs Incorporated into JIP631K (Communications Server Security Level 3)

No APARS were integrated into JIP631K.

APARs Incorporated into JIP631X (XWINDOWS)

No APARs were integrated into JIP631X.

APARs Incorporated into HKY77E0 (Cryptographic Services PKI Services)

OA59864 OA60903 OA62306 OA63582 OA63582 OA62306 OA61781

APARs Incorporated into HCPT510 (Cryptographic Services: System SSL)

OA61491 OA62457 OA62871 OA61783 OA63262 OA63853 OA63632 OA64071
OA63164 OA63252

APARs Incorporated into JCPT51J (Cryptographic Services: System SSL Japanese)

OA63164 OA63164

APARs Incorporated into HDZ3310 (DFSMS)

OA54431 OA56267 OA57768 OA59031 OA59251 OA59284 OA59285 OA59611
OA59812 OA59847 OA59936 OA59978 OA60138 OA60142 OA60278 OA60284
OA60330 OA60336 OA60402 OA60461 OA60464 OA60474 OA60475 OA60487
OA60510 OA60517 OA60586 OA60709 OA60721 OA60774 OA60780 OA60798
OA60810 OA60818 OA60850 OA60858 OA60859 OA60866 OA60929 OA60970
OA60984 OA60985 OA60986 OA61009 OA61018 OA61022 OA61065 OA61071
OA61072 OA61143 OA61170 OA61171 OA61172 OA61218 OA61228 OA61263
OA61265 OA61303 OA61317 OA61323 OA61332 OA61344 OA61346 OA61365
OA61367 OA61370 OA61381 OA61389 OA61397 OA61437 OA61492 OA61494
OA61495 OA61527 OA61531 OA61557 OA61566 OA61599 OA61622 OA61660
OA61697 OA61708 OA61735 OA61737 OA61741 OA61752 OA61757 OA61786
OA61787 OA61794 OA61806 OA61835 OA61838 OA61849 OA61850 OA61864
OA61879 OA61882 OA61903 OA61907 OA61923 OA61939 OA61940 OA61953
OA61971 OA61996 OA61997 OA62004 OA62019 OA62025 OA62028 OA62034
OA62058 OA62065 OA62067 OA62068 OA62073 OA62074 OA62090 OA62097
OA62105 OA62120 OA62123 OA62126 OA62130 OA62136 OA62138 OA62149
OA62163 OA62179 OA62222 OA62224 OA62225 OA62226 OA62228 OA62232
OA62241 OA62251 OA62259 OA62260 OA62261 OA62269 OA62279 OA62296
OA62309 OA62318 OA62325 OA62333 OA62337 OA62338 OA62343 OA62346
OA62352 OA62367 OA62370 OA62372 OA62374 OA62380 OA62384 OA62388
OA62389 OA62403 OA62413 OA62415 OA62421 OA62423 OA62442 OA62449
OA62459 OA62469 OA62471 OA62477 OA62485 OA62488 OA62506 OA62522
OA62530 OA62534 OA62537 OA62540 OA62542 OA62543 OA62544 OA62548
OA62549 OA62553 OA62560 OA62569 OA62607 OA62609 OA62610 OA62618
OA62621 OA62650 OA62651 OA62659 OA62662 OA62669 OA62674 OA62688
OA62704 OA62705 OA62706 OA62709 OA62714 OA62727 OA62743 OA62749
OA62765 OA62773 OA62778 OA62779 OA62809 OA62810 OA62816 OA62825
OA62828 OA62836 OA62841 OA62864 OA62884 OA62888 OA62893 OA62929
OA62939 OA62941 OA62947 OA62953 OA62957 OA62966 OA62967 OA62969
OA62972 OA63016 OA63021 OA63023 OA63024 OA63025 OA63027 OA63031
OA63037 OA63040 OA63043 OA63047 OA63049 OA63063 OA63065 OA63066
OA63069 OA63080 OA63082 OA63095 OA63101 OA63111 OA63116 OA63121
OA63124 OA63127 OA63128 OA63134 OA63137 OA63157 OA63163 OA63168
OA63169 OA63170 OA63183 OA63187 OA63195 OA63196 OA63208 OA63235
OA63245 OA63256 OA63261 OA63281 OA63283 OA63291 OA63298 OA63316
OA63324 OA63325 OA63344 OA63347 OA63369 OA63390 OA63391 OA63409
OA63411 OA63428 OA63444 OA63461 OA63484 OA63490 OA63492 OA63494
OA63498 OA63501 OA63529 OA63547 OA63552 OA63553 OA63560 OA63567
OA63571 OA63572 OA63588 OA63589 OA63600 OA63603 OA63629 OA63639
OA63643 OA63646 OA63648 OA63674 OA63679 OA63680 OA63687 OA63688
OA63702 OA63710 OA63713 OA63714 OA63721 OA63732 OA63738 OA63742
OA63744 OA63762 OA63768 OA63775 OA63780 OA63801 OA63803 OA63807

OA63818 OA63843 OA63849 OA63869 OA63886 OA63888 OA63889 OA63896
OA63904 OA63907 OA63954 OA63957 OA63974 OA63975 OA63997 OA64010
OA64015 OA64027 OA64067 OA64075 OA64082 OA64091 OA64107 OA64117
OA64125 OA64130 OA64171 OA64189 OA64208 OA64211 OA64227 OA64249
OA64616 OA64790 OA64830 OA64849 OA64855 OA64856 OA64858 OA64862
OA65087 OA65151 OA65215 OA65220 OA65266 PH32615 PH32770 PH33365
PH33868 PH33910 PH35418 PH37254 PH37665 PH37695 PH41574 PH42336
PH42703 PH47379

APARs Incorporated into JDZ331K (DFSMS Japanese)

No APARs have been incorporated.

APARs Incorporated into HSM1310 (DFSORT)

PH32615 PH32770 PH33365 PH33868 PH34436 PH35418 PH37254
PH37695 PH39080 PH41574 PH42336 PH42703 PH37665

APARs Incorporated into EER3500 (EREP - REWORK 199105)

This is the version that was shipped since OS/390 R1.

IR80711 IR80768 IR81185 IR81370 IR81547 IR81591 IR81804 IR82451
IR82751 IR82977 IR83371 IR83723 IR83856 IR83943 IR85611 IR85611
IR85711 IR85846 IR85846 IR85931 IR86094 IR86094 IR86191 IR86533
IR86533 IR86658 IR86881 IR87037 IR87038 IR87038 IR87039 IR87040
IR87242 IR87623 IR87632 IR87733 IR87733 IR88018 IR88180 IR88291
IR88374 IR88472 IR88473 IR88596 IR88730 IR88730 IR88776 IR88841
IR88854 IR88949 IR88949 IR88991 IR89166 IR89166 IR89210 IR89296
IR89318 IR89400 IR89419 IR89539 IR89685 IR89922 IR89922 IR89966
IR90141 IR90561 IR90741 IR90770 IR90850 IR90868 IR90959 IR90959
IR91068 IR91068 IR91068 IR91215 IR91464 IR91592 IR91601 IR91836
IR91852 IR92091 IR92091 IR92091 IR92396 IR92655 IR92798 IR92852
IR93183 IR93183 IR93227 IR93460

APARs Incorporated in EER3500 (EREP-SUP'd in z/OS V1R7)

This is the version that is SUP'd in z/OS V1R7. The APARs listed in the preceding section are still in this version.

IR22107 IR22113 IR22155 IR22361 IR22450 IR22549 IR22587 IR22987
IR23340 IR23532 IR25252 IR25562 IR25718 IR25856 IR27261 IR27350
IR27351 IR27996 IR28576 IR28731 IR29301 IR29955 IR30614 IR30886
IR31012 IR31687 IR32362 IR32608 IR32927 IR32971 IR33045 IR33151
IR33211 IR34613 IR34712 IR35814 IR35816 IR36215 IR36491 IR37709
IR37835 IR38057 IR38058 IR38450 IR38641 IR38950 IR39127 IR39721
IR39722 IR40683 IR40684 IR41039 IR41115 IR41673 IR41712 IR41986

IR42026 IR42503 IR42671 IR42672 IR43043 IR43044 IR43045 IR43046
IR44590 IR44854 IR45030 IR46224 IR46582 IR47431 IR48613 IR49633
IR50051 IR50866 IR50902 IR51078 IR51695 IR53169 IR53273 IR54199
IR54657 IR93614 IR94013 IR94126 IR94181 IR94340 IR94385 IR94450
IR94783 IR94943 IR95091 IR95102 IR95192 IR95324 IR95338 IR95500
IR95588 IR95713 IR95908 IR95965 IR96031 IR96698 IR96724 IR97014
IR97218 IR97314 IR97326 IR97455 IR97631 IR97934 IR97983 IR98123
IR98372 IR98410 IR98501 IR99102 IR99109 IR99262 IR99281

APARs Incorporated into HSWF100 (ESCON Director)

No APARs have been incorporated at this time.

APARs Incorporated into HFST101 (FFST)

PN29099 PN29717 PN29718 PN31356 PN31357 PN31410 PN31484 PN31768
PN31914 PN31916 PN33190 PN34219 PN34224 PN34526 PN35401 PN35590
PN35723 PN36140 PN36526

APARs Incorporated into HGD3200 (GDDM)

PN59427 PN62024 PN62733 PN63738 PN64024 PN65404 PN65498 PN65512
PN65514 PN65681 PN65937 PN65966 PN66171 PN66450 PN66458 PN66461
PN66468 PN66474 PN66507 PN66951 PN67035 PN67882 PN68256 PN68922
PN68927 PN69043 PN69302 PN69421 PN69423 PN69592 PN69719 PN69769
PN70250 PN70433 PN70441 PN70621 PN72131 PN72461 PN72998 PN73336
PN73449 PN73542 PN73588 PN73756 PN73783 PN73970 PN74028 PN74032
PN74087 PN74186 PN74248 PN74255 PN74318 PN74817 PN75807 PN76011
PN76158 PN76418 PN76534 PN76546 PN77428 PN77824 PN78575 PN79934
PN80122 PN80374 PN80720 PN82044 PN82794

APARs Incorporated into HGD3201 (GDDM-PGF)

PN43524 PN45816 PN53932 PN62127 PN64948 PN66658 PN74910 PN79959
PN84114

APARs Incorporated into HCS77E0 (HCD)

OA59076 OA59077 OA61049 OA61114 OA61296 OA61580 OA61656 OA61914
OA62238 OA62394 OA62414 OA62565 OA63115 OA63802 OA63860 OA64216
OA62014

APARs Incorporated into JCS77EJ

No APARs have been incorporated at this time.

APARs Incorporated into HCM1J10 (HCM)

IO28647 IO28695 IO28809

APARs Incorporated into HMQ4160 (HLASM)

PQ88271 PQ88470 PQ89655 PQ90802 PQ91893 PQ92291 PQ92371 PQ92508
PQ92579 PQ93977 PQ95145 PQ96292 PQ98607 PQ99158 PQ99706 PK00040
PK01064 PK02523 PK02660 PK05761 PK06113 PK06652 PK07828 PK09700
PK12545 PK14299 PK15306 PK17439 PK17447 PK17728 PK18170 PK19083
PK23005 PK24143 PK25298 PK25410 PK26756 PK27282 PK27577 PK27657
PK27979 PK29624 PK31383 PK31465 PK34746 PK36579 PK37014 PK37093
PK40237 PK42535 PK43179 PK55677 PK55678 PK56245 PK56672 PK58463

APARs Incorporated into JMQ416A (HLASM Toolkit)

PQ90771 PQ91484 PQ94993 PQ96247 PQ98212 PK01063 PK01283 PK05664
PK06190 PK06707 PK07828 PK07940 PK08886 PK09261 PK10316 PK10355
PK12514 PK12866 PK13983 PK15286 PK15984 PK17443 PK19580 PK20237
PK21002 PK25270 PK26240 PK26914 PK28745 PK29714 PK30620 PK30719
PK31375 PK31469 PK39957 PK40271 PK40813 PK41381 PK42140 PK42414
PK43326 PK43386 PK45696 PK46123 PK47176 PK50735 PK56760

APARs Incorporated into H24P111 (Host Performance Analyzer)

PQ06312 PQ07631 PQ11614 PQ19762 PQ30041 PQ39109 PQ51796 PQ517796
PQ71319 PQ75940

APARs Incorporated into J24P112 (Host Performance Analyzer JPN)

PQ06312 PQ19762 PQ11614

APARs Incorporated into HHAP90P (IBM HTTP Server - Powered by Apache)

PI11659 PI21538 PI25124 PI30622 PI36674

APARs Incorporated into HZAI310 (IBM Z Deep Neural Network Library)

OA62849 OA62886 OA62887 OA63718 OA63719 OA63720 OA63949 OA63951
OA62901 OA62902 OA62903 OA63759 OA63760 OA63761 OA63950 OA63952

APARs Incorporated into HRSL510 (IBM Tivoli Directory Server for z/OS Base)

OA61706 OA62500 OA62557 OA62693 OA63237

APARs Incorporated into JRSL51J (IBM Tivoli Directory Server for z/OS JPN)

No APARs have been incorporated at this time.

APARs Incorporated into EDU1H01 (ICKDSF)

PN60520 PN60881 PN61480 PN62330 PN62342 PN62444 PN63044 PN63507
PN64655 PN64868 PN65609 PN66540 PN66541 PN67080 PN68358 PN69166
PN69797 PN70013 PN70767 PN71101 PN71972 PN72104 PN73132 PN74048
PN74223 PN76727 PN76862 PN76939 PN77249 PN79757 PN80327 PN80879
PN83877 PN84194 PN84489 PN84759 PN85067 PN85631 PN86705 PN87929
PN88014 PN89166 PN89905 PN91223 PQ00652 PQ02288 PQ03341 PQ05231
PQ07015 PQ08691 PQ10899 PQ11775 PQ11919 PQ13687 PQ18005 PQ18393
PQ20390 PQ20391 PQ23131 PQ24114 PQ24577 PQ26800 PQ29648 PQ32380
PQ37791 PQ38921 PQ42534 PQ43495 PQ44667 PQ46396 PQ47472 PQ49243
PQ50940 PQ53196 PQ53326 PQ56431 PQ62077

APARs Incorporated into FDU1H07 and FDU1H08

PL84215 PN00713 PN03938 PN09082 PN18300 PN18847 PN19767 PN20378
PN21633 PN24896 PN24903 PN38041 PN38414 PN42498 PN42602 PN50159
PN50950 PN55778 PN61073 PN61959 PN66436 PN66767 PN68866 PN73788
PN87510 PQ13447 PQ26624 PQ47107 PQ57770

APARs Incorporated into FDU1H09

PL84215 PN00713 PN03938 PN18300 PN18847 PN19767 PN20378 PN24896
PN24903 PN38414 PN50159 PN50950 PN55778 PN61073 PN61959 PN73788
PN87510 PQ13447 PQ26624 PQ47107 PQ57770

APARs Incorporated into HCR77E0 (ICSF)

OA61978 OA63657 OA63531 OA63132 OA62656 OA63375 OA63053 OA61977
OA61609 OA62763 OA62253 OA62162 OA61916 OA61253 OA61646 OA61844
OA61541 OA63314 OA64012 OA60606

APARs Incorporated into HNET7D0 (Infoprint Server NetSpool)

No APARs have been incorporated at this time.

APARs Incorporated into JNET7DJ

No APARs have been incorporated at this time.

APARs Incorporated into HOPI7D0 (Infoprint Server Print Interface)

OA57389 OA58592 OA58836 OA59678 OA59679 OA59784 OA60141 OA60155
OA60159 OA60368

APARs Incorporated into JOPI7DJ

OA58836

APARs Incorporated into HMOS705 (Infoprint Server IP PrintWay Basic Mode)

OW39337 OW40050 OW40901 OW41343 OW41808 OW42039 OW42727 OW44057
OW44111 OW44172 OW44216 OW44283 OW44335 OW44464 OW44603 OW44687
OW44788 OW44965 OW45138 OW45332 OW45368 OW45718 OW45762 OW45827
OW45852 OW45913 OW46013 OW46331 OW46515 OW46596 OW46688 OW46968
OW47002 OW47086 OW47479 OW47560 OW47717 OW47960 OW48211 OW48387
OW48525 OW48557 OW48955

APARs Incorporated into JMOS7J5

OW44283 OW44965 OW45368 OW46331 OW46515 OW47560 OW48387 OW48557

APARs Incorporated into HSWK510 (Integrated Security Services Network Authentication Service)

OA61376 OA61733

APARs Incorporated into JSWK51J (Integrated Security Services Network Authentication Service JPN)

No APARs have been incorporated at this time.

APARs Incorporated into HIO1106 (IOCP)

OA60286

APARs Incorporated into HIF83A2 (ISPF)

OA58848 OA61353 OA61470 OA61471 OA61553 OA61567 OA61568 OA61602
OA61635 OA61637 OA61658 OA61672 OA61703 OA61906 OA61985 OA62144
OA62174 OA62229 OA62320 OA62326 OA62396 OA62409 OA62443 OA62473
OA62601 OA62637 OA62699 OA62711 OA62766 OA62916 OA62919 OA62927
OA63079 OA63380 OA63399 OA63545 OA63557 OA63601 OA63605 OA63612
OA63628 OA63653 OA63658 OA63781 OA63901 OA63977 OA64088 OA64120
OA64153 OA64154 OA64181

APARs Incorporated into JIF83A4

No APARs have been incorporated at this time.

APARs Incorporated into JIF83A6

No APARs have been incorporated at this time.

APARs Incorporated into HJE77E0 (JES2)

OA54931 OA57667 0A58489 OA58722 0A59794 OA59979 OA60008 OA60102
OA60221 OA60291 OA60449 OA60677 OA60777 OA60844 0A60927 OA60950
OA60951 OA60966 OA60972 OA60987 OA61102 OA61150 OA61179 OA61225
OA61231 OA61327 OA61631 OA61648 OA61750 OA61755 OA61780 OA61820
OA61845 OA61859 OA61880 OA61932 OA62024 OA62057 OA62088 OA62115
OA62147 OA62156 OA62178 OA62199 0A62218 OA62436 OA62439 OA62479
OA62528 OA62597 OA62787 OA62796 OA62868 OA63112 OA63119 OA63120
OA63207 OA63287 OA63308 OA63534 OA63563 OA63581 OA63583 OA63599
OA63651 OA63671 OA63971 OA63991 OA64054 0A64072 OA64073 OA64197
OA64234 OA64295 OA64400

APARs Incorporated into JJE77EJ

No APARs have been incorporated at this time.

APARs Incorporated into HLE77E0 (Language Environment)

PH50270 PH43203 PH50683 PH49813 PH48771 PH45216 PH49049 PH46617
PH45557 PH46883 PH46549 PH45491 PH39134 PH41221 PH42167 PH41923
PH40444 PH39893 PH38650 PH38776 PH37272 PH38695 PH37938 PH37834
PH37611 PH37519 PH37025

APARs Incorporated into JLE77EJ

No APARs have been incorporated at this time.

APARs Incorporated into HKCZ300 (Future Function)

No APARs have been incorporated at this time.

APARs Incorporated into HSD7780 (Metal C Runtime Library)

OA30396 OA34838

APARs Incorporated into EMI2220 (MICR/OCR)

Service up to, and including, PUT8605 Program Update Tape (service level) is included in this FMID.

APARs Incorporated into HDZ331N (Network File System)

OA61273 OA61460 OA61128 OA61716 OA58912 OA61777 OA61875 OA62008
OA61885 OA62385 OA62161 OA62055 OA62284 OA62330 OA62696 OA62860
OA62357 OA63304 OA63512 OA63881 OA63933 OA63754 OA63925 OA64205
OA64139

APARs Incorporated into JDZ331J (NFS Japanese)

OA56576

APARs Incorporated into HOS3310 (OpenSSH for z/OS)

OA57583 OA57975 OA58523 OA58974 OA58328 OA60095 OA60340 OA61054
OA61535 OA62122 OA62133 OA62371 OA63410 OA63229

APARs Incorporated into HRM77E0 (RMF)

OA62806 OA62930 OA63143 OA63156

APARs Incorporated into JRM77EJ

OA61673

APARs Incorporated into HQX77E0 (SDSF)

PH43035 PH43322 PH44104 PH44450 PH45123 PH45175 PH45971 PH47984
PH48032 PH49367 PH49573 PH49654 PH49810 PH50463 PH50703 PH50749
PH50900 PH51049 PH51243 PH51471 PH52729

APARs Incorporated into HRF77E0 (Security Server: RACF)

OA57194 OA57380 OA57821 OA57972 OA58204 OA58619 OA58640 OA58751
OA58753 OA58882 OA58989 OA59104 OA59210 OA59252 OA59387 OA59588
OA59912 OA59946 OA59983 OA60579 OA60597 OA60717 OA60904
OA61878 OA63212 OA63922 OA61456 OA63106 OA63878 OA63867 OA63879
OA62933 OA62547 OA63625 OA62713 OA61951 OA61933 OA63091 OA64042
OA64050 OA63899 OA63715 OA62960 OA60301 OA62875 OA63211 OA63327
OA64066 OA64186 OA61936 OA62201 OA61195

APARs Incorporated into JRF77EJ

No APARs have been incorporated at this time.

APARs Incorporated into HTV77C0 (Runtime Library Extensions)

PH00377 PH03048 PH24219 PH24282 PH24350 PI91446 PI91447 PI96211
PI96212 PI96214 PI99202

APARs Incorporated into JTV77CJ (Runtime Library Extensions JPN)

No APARs have been incorporated at this time.

APARs Incorporated into HMP1K00 and JMP1K11 (SMP/E)

List of APARs for HMP1K00:
IO12202 IO13385 IO13872 IO13881 IO14005 IO14063 IO14140 IO14155
IO14172 IO14229 IO14267 IO14418 IO14568 IO14693 IO14750 IO14873
IO15468 IO15654 IO16590 IO16845 IO17074 IO17536 IO17772 IO17846
IO17881 IO18034 IO18091 IO18093 IO18136 IO18269 IO18273 IO18378
IO18493 IO18592 IO18620 IO18838 IO18854 IO18879 IO18945 IO18999
IO19037 IO19179 IO19219 IO19281 IO19616 IO19713 IO19798 IO19937
IO19975 IO20023 IO20058 IO20159 IO20547 IO20566 IO20807 IO20858
IO20889 IO20906 IO20987 IO21021 IO21150 IO21231 IO21248 IO21279
IO21488 IO21669 IO21940 IO22076 IO22234 IO22289 IO22326 IO22422
IO22581 IO22704 IO22780 IO22885 IO22984 IO23035 IO23270 IO23466
IO23592 IO23838 IO24076 IO24161 IO24370 IO24440 IO24712 IO24768
IO24792 IO24810 IO24946 IO25034 IO25060 IO25081 IO25475 IO25506
IO25572 IO25595 IO25722 IO25852 IO25884 IO26161 IO26194 IO26200
IO26243 IO26275 IO26315 IO26415 IO26758 IO26787

List of APARs for JMP1K11:
IO14693 IO14873 IO15468 IO17536 IO18093 IO18838 IO20858 IO20889
IO21150 IO21279 IO22234 IO22780 IO23270 IO23466 IO24440 IO25475
IO26194

APARs Incorporated into ETI1106 (TIOC)

OZ27476 OZ28922 OZ34273 OZ36819 OZ39784 OZ42197 OZ42972 OZ43111
OZ43223 OZ43490 OZ44359 OZ44765 OZ45384 OZ46377 OZ46729 OZ48113
OZ48875 OZ49608 AZ49617 AZ50214 AZ51683 AZ56262 AZ56745 AZ57305
AZ59270 AZ61617 AZ62047

APARs Incorporated into HTE77E0 (TSO/E)

OA61193 OA61551 OA61900 OA62106 OA62135 OA62451 OA62885 OA63821
OA64150 OA64359 OA64380

APARs Incorporated into JTE77EE

No APARs incorporated at this time.

APARs Incorporated into JTE77EJ

No APARs incorporated at this time.

APARs Incorporated into HLB77C0 (XL C/C++)

PH00644 PH02956 PH03046 PH03047 PH03313 PH03329 PH04982 PH05185
PH18005 PH18007 PH18274 PH18814 PH22657 PH23450 PH24217 PH24218
PH24870 PH05752 PH05782 PI92813 PI95387 PI96197 PI96199 PI96200

PI96201 PI96202 PI96203 PI96204 PI96205 PI96206 PI96208 PI96209
PI96210 PI96691 PI98160 PI99141 PI99657 PI99704 PI99705

APARs Incorporated into JLB77CJ (XL C/C++ JPN)

No APARs have been incorporated at this time.

APARs Incorporated into HXML1B0 (XML Toolkit for z/OS)

OA29506 OA29514 OA29535 OA29550 OA32726 OA32738 OA35395 OA40164
OA40212 OA45841 OA47098 OA47652 OA48803 OA51049 OA51297 OA51592
OA52092 OA52269 OA56607 OA58876

APARs Incorporated into HZDC7C0 (z/OS Container Extensions)

No APARs have been incorporated at this time.

APARs Incorporated into HRG77E0 (z/OS Data Gatherer)

OA60212 OA61036 OA61041 OA61287 OA61464 OA61465 OA61744 OA61815
OA61846 OA62062 OA62064 OA62081 OA62502 OA62579 OA62622 OA62840
OA62899 OA62937 OA62992 OA63108 OA63156 OA63190 OA63337 OA63445
OA63638 OA63937

APARs Incorporated into HZFS510 (z/OS File System)

OA64144 OA63955 OA63934 OA63929 OA63845 OA63778 OA63489 OA63414
OA63387 OA63218 OA63214 OA62924 OA62563 OA62188 OA62150 OA62085
OA62084 OA61623 OA61292 OA61076 OA60828

APARs Incorporated into JZFS51J

OA62150

APARs Incorporated into HFNT140 (z/OS Font Collection)

PH17670 PH17836

APARs Incorporated into HFNT14J

PH12469 PH13040

APARs Incorporated into HSMA310 (z/OSMF Core Functions)

PH39685 PH39687 PH44783 PH44343 PH38968 PH39690 PH44068 PH47601
PH52243 PH44152 PH40166 PH41248 PH43884 PH39327 PH44611 PH47746
PH50830 PH50205 PH51498 PH48846 PH43965 PH44884 PH39582 PH39914

PH39900 PH39305 PH41334 PH39637 PH40862 PH40099 PH42742 PH41196
PH39605 PH42326 PH42913 PH42766 PH42478 PH43805 PH43649 PH45239
PH46454 PH44934 PH45988 PH44158 PH45102 PH44355 PH39328 PH41855
PH45350 PH44157 PH49334 PH47651 PH47322 PH50369 PH50233 PH51432
PH51551 PH50275 PH48850 PH48916 PH51861 PH35995 PH36272 PH37308
PH43014

APARs Incorporated into HSMA311 (z/OSMF ISPF)

No APARs have been incorporated at this time.

APARs Incorporated into HSMA312 (z/OSMF Resource Monitoring)

No APARs have been incorporated at this time.

APARs Incorporated into HSMA313 (z/OSMF WLM)

PH45125 PH49359 PH52526 PH37515 PH35412

APARs Incorporated into HSMA314 (z/OSMF Software Management)

PH35208 PH33827 PH36640 PH36768 PH37379 PH37377 PH38411 PH40046
PH41252 PH41343 PH40045 PH43613 PH41901 PH42028 PH44449 PH44129
PH45615 PH45551 PH46130 PH48165 PH45201 PH47050 PH49385 PH47294
PH48158 PH51682 PH51773 PH49451 PH49995 PH44443 PH50363

APARs Incorporated into HSMA315 (z/OSMF Incident Log)

PH40407 PH39848 PH42630 PH47683

APARs Incorporated into HSMA316 (z/OSMF Capacity Provisioning)

PH47457

APARs Incorporated into HSMA317 (z/OSMF Workflow)

PH38975 PH38906 PH40841 PH39153 PH46392 PH47852 PH48070 PH43962
PH52483

APARs Incorporated into HSMA31A (z/OSMF Network Configuration Assistant)

PH51245 PH46836 PH50430 PH50502 PH45245 PH50219 PH47400 PH35304
PH39292 PH42145 PH42519 PH45839 PH48878

APARs Incorporated into HSMA31E (z/OSMF zERT Network Analyzer)

PH38855 PH43118 PH43119 PH47970 PH50660

APARs Incorporated into JCPT511 (z/OS Security Level 3 System SSL Security Level 3)

OA61491 OA62457 OA62871 OA61783 OA63262 OA63853 OA63632 OA64071
OA63164 OA63252

APARs Incorporated into JSWK511 (z/OS Security Level 3 - Network Authentication Service Security Level 3)

No APARs have been incorporated at this time.

APARs Incorporated into JRSL511 (z/OS Security Level 3 IBM TDS Security Level 3)

No APARs have been incorporated at this time.

APARs Incorporated into HOT77E0 (z/OS UNIX System Services Application Services)

OA57154 OA57350 OA57659 OA57870 OA58041 OA58146 OA58166 OA58390
OA58433 OA58589 OA58618 OA58641 OA58714 OA58745 OA58906 OA59201
OA59392 OA59459 OA59485 OA59605 OA59902 OA59989 OA60389 OA60684
OA60693 OA60001 OA60544 OA60877 OA61069 OA61517 OA61698 OA62319
OA62429 OA62850 OA60361 OA62908 OA63210 OA63199 OA63294 OA63395
OA63729 OA64333

APARs Incorporated into JOT77EJ

No APARs have been incorporated at this time.

APARs Incorporated into HFX1112 (z/OS Host - 3270 Workstation File Send/Receive)

No APARs have been incorporated at this time.

APARs Incorporated into HWT0500 (z/OS Web Enablement Toolkit)

OA54901 OA54902 OA57158 OA57191 OA57228 OA57447 OA57475 OA58707
OA58708 OA58983 OA60127 OA60535

Appendix C. DASD Storage Requirements Tables

The following sections contain information about storage requirements for DASD.

C.1 Understanding the DASD Storage Requirements Tables

The DASD space requirements shown in this appendix represent the actual storage required by the FMIDs listed in Figure 1 on page 2 after the product and integration-tested service are installed and the data sets are compressed, plus approximately 15%. The directory blocks have been increased by 40% for load libraries and 15% for the rest. The additional space allows for service installation. When allocating these data sets, you can specify additional storage and directory blocks to allow for future maintenance.

The storage requirements tables in this appendix reflect the data sets required if you are installing **all** base and optional elements of z/OS. They do not reflect any customization performed by the customer. For example, the PARMLIB and PROCLIB space shown is the space required for the SMP/E installation without taking into account copying members from your production PARMLIB and PROCLIB data sets.

For libraries required for IPL, libraries that cannot have secondary space allocated, data sets that cannot be partitioned data set extended (PDSE), and data sets that should have a high-level qualifier of SYS1, see the information sent with the z/OS product. For references to cataloging, see *z/OS DFSMS Managing Catalogs*.

Sample jobs to allocate the target and distribution libraries for certain elements are provided. For descriptions and locations of these jobs, see:

- 7.2.2, “Allocate Target and Distribution Libraries for Wave 0 elements” on page 52
- 8.1.7, “Allocate target and distribution libraries for Wave 1 elements” on page 83
- 8.3.3, “Allocate Target and Distribution Libraries for Wave 2 Elements” on page 116

You only need to run these jobs if any of the libraries do not exist on the target system.

Similarly, sample jobs for certain elements are provided to set up the zFS directories. For more information about these jobs and where to find them, see:

- 7.2.3, “Create File System Directories for Wave 0” on page 53
- 8.1.8, “Create file system directories for Wave 1” on page 88
- 8.3.4, “Set up File System Directories for Wave 2” on page 117

Sample jobs to define DDDEF entries for the target and distribution libraries for certain elements are provided. For descriptions and locations of these jobs, see:

- 7.2.4, “Define DDDEFs for Wave 0 elements” on page 53
- 8.1.9, “Define DDDEFs for Wave 1 Elements” on page 92
- 8.3.5, “Define DDDEFs for Wave 2 Elements” on page 117

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You only need to run these jobs if any of the DDDEF entries do not exist.

Note that the DDDEFs should point to the target system data sets and not to the production data sets. To use the target PARMLIB data set to IPL, you can use the PARMLIB concatenation to isolate the new members or copy the members to the production library. Refer to 8.5.2, “PARMLIB member considerations” on page 128 for more information on using the target system libraries.

C.2 SMP/E Data Sets for z/OS 3.1

A complete set of SMP/E data sets is required for the installation of z/OS 3.1. See *z/OS SMP/E Reference*, for information on the use of these data sets.

Figure 73. Storage Requirements for the SMP/E Work Data Sets

DDDEF Name	DSORG	RECFM	LRECL	BLK SIZE	No. of BLKS	No. of 3390 TRKS	No. of DIR BLKS
SMPWRK1	PO	FB	80	n/a	n/a	150	300
SMPWRK2	PO	FB	80	n/a	n/a	150	300
SMPWRK3	PO	FB	80	n/a	n/a	9500	990
SMPWRK4	PO	FB	80	n/a	n/a	132	300
SMPWRK6	PO	FB	80	n/a	n/a	20000	1500
SYSUT1	--	--	--	n/a	n/a	7500	seq
SYSUT2	--	--	--	n/a	n/a	1500	seq
SYSUT3	--	--	--	n/a	n/a	960	seq
SYSUT4	--	--	--	n/a	n/a	48240	seq

Note: Space for SYSUT1 through SYSUT4 cannot be allocated in blocks (BLKS).

Abbreviations used for the ORG field are:

ZFS z/OS file system
PDS Partition Data Set
PDSE Partition Data Set Extended

Figure 74. Storage Required for SMP/E Data Sets for z/OS 3.1

DDDEF Name	ORG	NOTE	RECFM	LRECL	No. of 3390 TRKS	No. of DIR BLKS
SMPJHOME	ZFS					
SMPLTS	PDSE		U	0	0	--
SMPMTS	PDS		FB	80	6	2
SMPPTS	PDSE		FB	80	946	--
SMPSCDS	PDS		FB	80	5	15
SMPSTS	PDS		FB	80	7	2

Note: The DDDEF SMPJHOME is required during the SMP/E installation of the product. Ensure the SMPJHOME DDDEF in the SMP/E zone in which z/OS is being installed refers to the path containing the Java Software Development Kit, Version 8.0 or later. This DDDEF will be used to find the jar command during SMP/E APPLY or RESTORE processing.

SMPPTS Considerations

The size of the SMPPTS data set reflects the total space requirements after receiving the changed and unchanged FMIDs for z/OS 3.1. Additional space will be required for the SMPPTS based on the service received. The size of the SMPPTS shown does not include service since the total space required for the SMPPTS is dependent on the amount of service received.

C.3 Load Module Libraries References

Load module libraries (or “load libraries”), which are data sets containing load modules, have been divided into several tables. Several tables are used because load libraries with different characteristics must be managed differently. You must put some load libaries in specific places in the system-wide search order for programs, such as in the link pack area (LPA) list. Others you can add anywhere in the search order for programs; however, performance and virtual storage considerations will govern appropriate placement for each installation.

The load library tables are:

- Required LPA and optional RMODE 31 LPA-eligible libraries; see Figure 75 on page 278.
- LPA-eligible RMODE 24 libraries; see Figure 76 on page 278.
- Load libraries for change migration; see Figure 77 on page 278.
- Load libraries for callable services; see Figure 78 on page 279.

Some load libraries fall into more than one category and thus could be placed in more than one table. However, we've selected the most likely tables for these load libraries rather than listing them in multiple tables.

Figure 75 on page 278 lists z/OS libraries that contain required LPA and optional RMODE 31 LPA-eligible modules. Because the only libraries listed in this category are those that contain only RMODE 31 load modules, no virtual storage below 16 MB is used when the libraries are included in the LPA list.

Figure 75. Required LPA and Optional RMODE 31 LPA-eligible Load Libraries

DDDEF name	Element or feature name	Volume	Type
LPALIB	BCP, DFSMSdfp, DFSMSdss, DFSMShsm, DFSMSrmm, DFSMStvs, FFST, Communications Server, ISPF, Security Server RACF, TIOC, TSO/E, z/OS UNIX System Services	TVOL1	LMOD
SCEELPA	Language Environment	TVOL1	LMOD
SGRBLPA	z/OS Data Gatherer	TVOL1	LMOD

Figure 76 lists z/OS libraries that contain RMODE 24 LPA-eligible modules. All RMODE 24 modules placed in LPA are loaded below 16 MB. Placing them in LPA increases common area used below 16 MB and might decrease the private area available below 16 MB. Some of the modules in these libraries need to be placed in LPA to use a z/OS element or function. Other elements and functions can be used without having their modules placed in LPA but perform better when their modules are placed in LPA. For more information about placing modules in LPA and the effects of doing so on performance and virtual storage, see *z/OS MVS Initialization and Tuning Guide*.

Figure 76. LPA-eligible RMODE 24 Load Libraries

DDDEF name	Element or feature name	Volume	Type
SEZALPA	Communications Server	TVOL1	LMOD
SCYGLPA	IBM z/OS Change Tracker	TVOL1	LMOD
SICELPA	DFSORT	TVOL1	LMOD
SISPLPA	ISPF	TVOL1	LMOD
SORTLPA	DFSORT	TVOL1	LMOD

Figure 77 on page 278 lists z/OS libraries that contain load modules that are used from another system for migration purposes. These libraries are used, or might be used, during migration from one level of software to another. For example, the MIGLIB library contains load modules used by IPCS to read dumps taken on one level of z/OS on another level. Also included in this list are libraries containing WLM functions.

Figure 77. Load Libraries for Change Migration			
DDDEF name	**Element or feature name**	**Volume**	**Type**
MIGLIB	BCP, Communications Server, Cryptographic Services, DFSMSdfp, DFSMSdss, DFSMShsm, DFSMSrmm, DFSMStvs, Security Server RACF, SMP/E, TSO/E	TVOL1	LMOD
SCBDHENU	HCD	TVOL1	LMOD
SHASMIG	JES2	TVOL1	LMOD

Figure 78 lists z/OS libraries that contain load modules that are used as callable services from other elements and non-z/OS products.

Figure 78. Load Libraries for Callable Services			
DDDEF name	**Element or feature name**	**Volume**	**Type**
CSSLIB	BCP, DFSMSdfp, Infoprint Server	TVOL1	LMOD
SAFHFORT	Language Environment	TVOL1	LMOD
SCEEBIND	Language Environment	TVOL1	LMOD
SCEELKED	Language Environment	TVOL1	LMOD
SCEESPC	Language Environment	TVOL1	LMOD
SDMSSVM	DFSMSdfp	TVOL1	LMOD
SEZACMTX	Communications Server	TVOL1	LMOD
SEZADPIL	Communications Server	TVOL1	LMOD
SEZARPCL	Communications Server	TVOL1	LMOD
SIBMCAL2	Language Environment	TVOL1	LMOD
SIBMAM24	Language Environment	TVOL1	LMOD
SIBMCALL	Language Environment	TVOL1	LMOD
SIBMMATH	Language Environment	TVOL1	LMOD
SIBMTASK	Language Environment	TVOL1	LMOD
SISPLOAD	ISPF	TVOL1	LMOD

C.4 Target Libraries for z/OS 3.1

Figure 79 on page 281 describes the target libraries required to install z/OS 3.1. It maps all the z/OS target libraries to either target library volume 1 (TVOL1) or target library volume 2 (TVOL2). This mapping comprises IBM's recommended system layout. Abbreviations used for Member Type for z/OS 3.1 are:

CLST CLIST
DATA Data
EXEC Exec

FONT Font
HELP Help
LMOD Load Module
MAC Macro
MSG Message
PARM Parameter
PANL Panel
PROC Procedure
SAMP Sample
SKEL Skeleton
BOOK Book
SRCE Source
TABL Table
TEXT Text

Abbreviations used for Target Volume Are:

T1 TVOL1
T2 TVOL2

Abbreviations used for the data set type field are:

U Unique data set, allocated by this product and used only by this product. 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. 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. 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.

The following abbreviations are used for the ORG field.

PDS Partition Data Set
PDSE Partition Data Set Extended
SEQ Sequential Data Set

All target libraries listed have the following attributes:

- The default name of the data set may be changed.

  Note: Target IPCS data sets (data sets that start with the low level qualifier of SBLS) may be renamed. Be aware, however, if the name is different from SYS1.SBLS*, then clists in the SBLSCLI0

data set will have to be modified. In SBLSCLI0, the data set names within several clists are specified as:
  - SYS1.SBLSCLI0
  - SYS1.SBLSMSG0
  - SYS1.SBLSKEL0
  - SYS1.SBLSPNL0
  - SYS1.SBLSTBL0
- 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. You must not merge any data sets that contain like-named members or aliases. For example, SFOMOBJ and SCLBCPP are the two libraries that cannot be merged together.
- The data set may be either a PDS or a PDSE.
- 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; see Figure 75 on page 278 for required LPA and optional RMODE 31 LPA-eligible libraries, and Figure 76 on page 278 for LPA-eligible RMODE 24 libraries.
- The data set may be in the LNKLST.
- Some of the target libraries must be APF-authorized; see 8.5.2, “PARMLIB member considerations” on page 128 for information about the data sets that must be APF-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.

If you currently have a previous release of this product 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 if 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.

Figure 79 (Page 1 of 14). Storage Required for Target Libraries for z/OS 3.1

Library DDNAME	Mem Type	Tar Vol	TYPE	Org	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks
ADFMAC1	CLST	T1	U	PDS	FB	80	2	2
CBRDBRM	DATA	T1	U	PDS	FB	80	12	3
CMDLIB	LMOD	T1	E	PDS	U	0	72	77
CSSLIB	LMOD	T1	E	PDS	U	0	102	296
DBBLIB	DATA	T1	U	PDS	VB	80	53	25
DFQLLIB	LMOD	T1	U	PDS	U	0	6	5
DFQMKLB	MSG	T1	U	PDS	FB	80	3	2
DFQMLIB	MSG	T1	U	PDS	FB	80	3	2

Figure 79 (Page 2 of 14). Storage Required for Target Libraries for z/OS 3.1

Library DDNAME	Mem Type	Tar Vol	TYPE	Org	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks
DFQPKLB	PANL	T1	U	PDS	FB	80	36	12
DFQPLIB	PANL	T1	U	PDS	FB	80	44	14
DGTCLIB	CLST	T1	U	PDS	FB	80	173	11
DGTLLIB	LMOD	T1	U	PDS	U	0	203	132
DGTMKLB	MSG	T1	U	PDS	FB	80	48	23
DGTMLIB	MSG	T1	U	PDS	FB	80	48	23
DGTPKLB	PANL	T1	S	PDS	FB	80	872	288
DGTPLIB	PANL	T1	U	PDS	FB	80	878	287
DGTSKLB	SKEL	T1	U	PDS	FB	80	4	2
DGTSLIB	SKEL	T1	U	PDS	FB	80	33	4
DGTTLIB	TABL	T1	U	PDS	FB	80	5	5
FONTLIB	LMOD	T2	U	PDS	VBM	12284	1216	243
FONTLIBB	LMOD	T2	U	PDS	VBM	12284	3402	523
FONT300	LMOD	T2	U	PDS	VBM	12284	3739	488
HELP	HELP	T1	E	PDS	FB	80	130	29
HELPENP	HELP	T1	U	PDS	FB	80	34	7
HLPKLB	HELP	T1	U	PDS	FB	80	4	3
HRFCLST	CLST	T1	U	PDS	FB	80	19	3
HRFMSG	MSG	T1	U	PDS	FB	80	12	4
HRFPANL	PANL	T1	U	PDS	FB	80	225	89
HRFSKEL	SKEL	T1	U	PDS	FB	80	67	14
ICQABTXT	MAC	T2	U	PDS	FB	80	5	3
ICQCCLIB	CLST	T1	U	PDS	FB	80	165	7
ICQILIB	MAC	T2	U	PDS	FB	80	3	2
ICQKABTX	MAC	T2	U	PDS	FB	80	5	4
ICQKCLIB	CLST	T1	U	PDS	FB	80	2	2
ICQKILIB	MAC	T2	U	PDS	FB	80	3	3
ICQKMLIB	MSG	T1	U	PDS	FB	80	18	22
ICQKPLIB	PANL	T1	U	PDS	FB	80	342	303
ICQKTABL	TABL	T1	U	PDS	FB	80	7	9

Figure 79 (Page 3 of 14). Storage Required for Target Libraries for z/OS 3.1

Library DDNAME	Mem Type	Tar Vol	TYPE	Org	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks
ICQMLIB	MSG	T1	U	PDS	FB	80	17	12
ICQPLIB	PANL	T1	U	PDS	FB	80	335	152
ICQSLIB	SKEL	T1	U	PDS	FB	80	2	2
ICQTABLS	TABL	T1	U	PDS	FB	80	9	5
IGDVBS1	DATA	T1	U	PDS	VB	4100	9	2
IMAGELIB	LMOD	T1	U	PDS	U	0	19	27
KANLIB	LMOD	T1	U	PDS	U	0	3	5
KHELP	HELP	T1	E	PDS	FB	80	44	12
LINKLIB	LMOD	T1	E	PDS	U	0	3316	1053
LPALIB	LMOD	T1	E	PDS	U	0	1145	440
MACLIB	MAC	T2	E	PDS	FB	80	4484	119
MIGLIB	LMOD	T1	E	PDS	U	0	1142	558
MODGEN	MAC	T2	E	PDS	FB	80	671	42
MSGENP	MSG	T2	U	PDS	VB	259	9	2
MSGENU	MSG	T2	U	PDS	VB	259	58	7
MSGJPN	MSG	T2	S	PDS	VB	259	51	7
NFSLIBE	LMOD	T1	U	PDSE	U	0	219	-
NUCLEUS	LMOD	T1	E	PDS	U	0	1123	150
PARMLIB	PARM	T1	E	PDS	FB	80	20	7
PROCLIB	PROC	T1	E	PDS	FB	80	9	6
SACBCNTL	SAMP	T2	U	PDS	FB	80	30	6
SADMCDA	DATA	T1	U	PDS	FB	400	2	2
SADMCFO	DATA	T1	U	PDS	FB	400	2	2
SADMDAT	DATA	T1	U	PDS	VB	255	29	2
SADMGDF	DATA	T1	U	PDS	FB	400	9	3
SADMIMG	DATA	T1	U	PDS	FB	400	2	2
SADMMAP	DATA	T1	U	PDS	FB	400	20	2
SADMMOD	LMOD	T1	U	PDS	U	0	230	100
SADMMSG	MSG	T1	U	PDS	FB	80	2	2
SADMOPS	SAMP	T2	U	PDS	VB	255	7	2

Figure 79 (Page 4 of 14). Storage Required for Target Libraries for z/OS 3.1

Library DDNAME	Mem Type	Tar Vol	TYPE	Org	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks
SADMPCF	DATA	T2	U	PDS	FB	400	97	6
SADMPNL	PANL	T1	U	PDS	FB	80	4	3
SADMSAM	SAMP	T2	U	PDS	FB	80	173	13
SADMSYM	DATA	T2	U	PDS	FB	400	198	28
SADRYLIB	DATA	T1	U	PDS	FB	80	11	5
SAFHFORT	LMOD	T1	U	PDS	U	0	19	69
SAMPLIB	SAMP	T2	E	PDS	FB	80	1684	79
SAOPEXEC	EXEC	T1	U	PDS	FB	80	3	2
SAOPMENU	MSG	T1	U	PDS	FB	80	4	3
SAOPMJPN	MSG	T1	U	PDS	FB	80	4	3
SAOPPENU	PANL	T1	U	PDS	FB	80	89	36
SAOPPJPN	PANL	T1	U	PDS	FB	80	90	40
SASMMAC1	MAC	T2	U	PDS	FB	80	14	2
SASMMAC2	MAC	T2	U	PDS	FB	80	5	2
SASMMOD1	LMOD	T1	U	PDS	U	0	48	6
SASMMOD2	LMOD	T1	U	PDS	U	0	68	5
SASMPUT2	DATA	T2	U	PDS	FB	80	134	2
SASMSAM1	SAMP	T2	U	PDS	FB	80	25	3
SASMSAM2	SAMP	T2	U	PDS	FB	80	12	2
SAXREXEC	DATA	T2	U	PDS	VB	255	28	4
SBBLEXEC	EXEC	T1	U	PDS	VB	255	2	2
SBBLJCL	SAMP	T1	U	PDS	FB	80	3	2
SBLSCLI0	CLST	T1	E	PDS	FB	80	363	17
SBLSKEL0	SKEL	T1	E	PDS	FB	80	11	5
SBLSMSG0	MSG	T1	E	PDS	FB	80	10	7
SBLSPNL0	PANL	T1	E	PDS	FB	80	378	183
SBLSTBL0	TABL	T1	E	PDS	FB	80	6	3
SBPNCFG	DATA	T2	U	PDS	FB	80	2	2
SBPNEXEC	EXEC	T1	U	PDS	FB	80	14	2
SBPNLOAD	LMOD	T1	U	PDS	U	0	21	4

Figure 79 (Page 5 of 14). Storage Required for Target Libraries for z/OS 3.1

Library DDNAME	Mem Type	Tar Vol	TYPE	Org	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks
SBPNLPA	LMOD	T1	U	PDS	U	0	20	5
SBPNPNL	PANL	T1	U	PDS	FB	80	3	2
SBPNPNLJ	PANL	T1	U	PDS	FB	80	2	2
SBPNSAMP	SAMP	T1	U	PDS	FB	80	2	2
SBPXEXEC	EXEC	T1	U	PDS	FB	80	44	3
SBPXMENU	MSG	T1	U	PDS	FB	80	11	7
SBPXMJPN	MSG	T1	U	PDS	FB	80	11	7
SBPXPENU	PANL	T1	U	PDS	FB	80	34	20
SBPXPJPN	PANL	T1	U	PDS	FB	80	35	20
SBPXTENU	TABL	T1	U	PDS	FB	80	2	2
SBPXTJPN	TABL	T1	U	PDS	FB	80	2	2
SCBDCLST	CLST	T1	U	PDS	FB	80	3	2
SCBDHENU	LMOD	T1	U	PDS	U	0	471	635
SCBDHJPN	LMOD	T1	U	PDS	U	0	495	1486
SCBDMENU	MSG	T1	U	PDS	FB	80	28	23
SCBDMJPN	MSG	T1	U	PDS	FB	80	27	23
SCBDPENU	PANL	T1	U	PDS	FB	80	88	34
SCBDPJPN	PANL	T1	U	PDS	FB	80	90	34
SCBDTEMP	DATA	T1	U	PDS	FB	80	25	2
SCBDTENU	TABL	T1	U	PDS	FB	80	2	2
SCBDTJPN	TABL	T1	U	PDS	FB	80	2	2
SCCNCMP	LMOD	T1	U	PDSE	U	0	6850	-
SCCNDOC	BOOK	T2	U	PDS	FB	80	2	2
SCCNJCL	SAMP	T2	U	PDS	FB	80	5	2
SCCNM10	DATA	T1	U	PDS	FB	80	22	11
SCCNM11	DATA	T1	U	PDS	FB	80	22	11
SCCNM12	DATA	T1	U	PDS	FB	80	22	10
SCCNM13	DATA	T1	U	PDS	FB	80	22	10
SCCNN10	DATA	T1	U	PDS	FB	80	34	11
SCCNN11	DATA	T1	U	PDS	FB	80	115	15

Figure 79 (Page 6 of 14). Storage Required for Target Libraries for z/OS 3.1

Library DDNAME	Mem Type	Tar Vol	TYPE	Org	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks
SCCNN12	DATA	T1	U	PDS	FB	80	118	17
SCCNN13	DATA	T1	U	PDS	FB	80	121	17
SCCNOBJ	DATA	T1	U	PDS	FB	80	33	5
SCCNPRC	PROC	T1	U	PDS	FB	80	7	5
SCCNSAM	SAMP	T2	U	PDS	FB	80	25	14
SCCNUTL	EXEC	T1	U	PDS	FB	80	6	2
SCCR3BND	LMOD	T1	U	PDS	U	0	13	35
SCCR6BND	LMOD	T1	U	PDS	U	0	13	35
SCDRTABL	DATA	T1	U	PDS	FB	80	283	2
SCEEBIND	LMOD	T1	U	PDSE	U	0	11	-
SCEEBND2	DATA	T2	U	PDS	FB	80	4	5
SCEECICS	LMOD	T1	U	PDS	U	0	2	2
SCEECLST	CLST	T1	U	PDS	FB	80	10	2
SCEECMAP	DATA	T1	U	PDS	FB	80	481	9
SCEECPP	DATA	T1	U	PDS	FB	80	18	5
SCEEGXLT	DATA	T1	U	PDS	FB	80	127	25
SCEEH	MAC	T2	U	PDS	FB	120	115	12
SCEEHARP	MAC	T2	U	PDS	FB	80	3	2
SCEEHH	MAC	T2	U	PDS	FB	80	170	14
SCEEHNEI	MAC	T2	U	PDS	FB	80	4	2
SCEEHNET	MAC	T2	U	PDS	FB	80	3	2
SCEEHSYS	MAC	T2	U	PDS	FB	80	29	6
SCEEHT	MAC	T2	U	PDS	FB	120	19	3
SCEELIB	DATA	T1	U	PDS	FB	80	84	3
SCEELKED	LMOD	T1	U	PDS	U	0	647	2712
SCEELKEX	DATA	T1	U	PDS	FB	80	106	203
SCEELOCL	DATA	T1	U	PDS	FB	80	74	4
SCEELOCX	DATA	T1	U	PDS	FB	80	848	17
SCEELPA	LMOD	T1	U	PDS	U	0	251	3
SCEEMAC	MAC	T2	U	PDS	FB	80	76	7

Figure 79 (Page 7 of 14). Storage Required for Target Libraries for z/OS 3.1

Library DDNAME	Mem Type	Tar Vol	TYPE	Org	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks
SCEEMSGP	MSG	T1	U	PDS	FB	150	2	2
SCEEOBJ	DATA	T1	U	PDS	FB	80	6	4
SCEEPROC	PROC	T1	U	PDS	FB	80	4	3
SCEERUN	LMOD	T1	U	PDS	U	0	1748	908
SCEERUN2	LMOD	T1	U	PDSE	U	0	24757	-
SCEESAMP	SAMP	T2	U	PDS	FB	80	135	32
SCEESPC	LMOD	T1	U	PDS	U	0	13	76
SCEESPCO	DATA	T1	U	PDS	FB	80	4	3
SCLBCPP	DATA	T1	U	PDS	FB	80	86	9
SCLBDLL	LMOD	T1	U	PDS	U	0	19	3
SCLBDLL2	LMOD	T1	U	PDSE	U	0	21	-
SCLBHH	DATA	T2	U	PDS	FB	120	9	2
SCLBJCL	SAMP	T2	U	PDS	FB	80	6	2
SCLBSID	DATA	T1	U	PDS	FB	80	3	2
SCLCCMP	LMOD	T1	U	PDSE	U	0	5217	-
SCLCDOC	BOOK	T2	U	PDS	FB	80	2	2
SCLCJCL	SAMP	T2	U	PDS	FB	80	3	2
SCLCSAM	SAMP	T2	U	PDS	FB	80	2	2
SCSFCLI0	CLST	T1	U	PDS	FB	80	30	3
SCSFMOD0	LMOD	T1	U	PDS	U	0	211	177
SCSFMOD1	LMOD	T1	U	PDS	U	0	2	2
SCSFMSG0	MSG	T1	U	PDS	FB	80	9	4
SCSFPNL0	PANL	T1	U	PDS	FB	80	48	17
SCSFSKL0	SKEL	T1	U	PDS	FB	80	2	2
SCSFSTUB	LMOD	T1	U	PDS	U	0	50	170
SCSFTLIB	TABL	T1	U	PDS	FB	80	2	2
SCTVJCL	SAMP	T2	U	PDS	FB	80	3	2
SCTVMOD	LMOD	T1	U	PDS	U	0	12	3
SCUNHF	DATA	T2	U	PDS	VB	255	7	2
SCUNJCL	SAMP	T2	U	PDS	FB	80	3	2

Figure 79 (Page 8 of 14). Storage Required for Target Libraries for z/OS 3.1

Library DDNAME	Mem Type	Tar Vol	TYPE	Org	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks
SCUNLOCL	DATA	T1	U	PDS	FB	80	958	30
SCUNMENU	DATA	T1	U	PDS	VB	259	2	2
SCUNMJPN	DATA	T1	U	PDS	VB	259	2	2
SCUNTBL	DATA	T1	U	PDS	FB	256	43703	707
SCYGINST	SAMP	T2	U	PDS	FB	80	4	2
SCYGLNK	LMOD	T1	U	PDS	U	0	18	14
SCYGLPA	LMOD	T1	U	PDS	U	0	2	2
SCYGMENU	MSG	T2	U	PDS	FB	80	5	3
SCYGMSEN	MSG	T2	U	PDS	VB	259	2	2
SCYGPENU	PANL	T2	U	PDS	FB	80	33	15
SCYGSAMP	SAMP	T2	U	PDS	FB	80	17	6
SCYGSKL	SKEL	T2	U	PDS	FB	80	10	5
SCYGMJPN	MSG	T2	U	PDS	FB	80	5	3
SCYGMSJP	MSG	T2	U	PDS	VB	259	2	2
SCYGPJPN	PANL	T2	U	PDS	FB	80	33	15
SDFQPKSR	DATA	T2	U	PDS	VB	255	14	3
SDFQPSRC	DATA	T2	U	PDS	VB	255	14	3
SDGTPKSR	DATA	T2	U	PDS	VB	255	258	55
SDGTPSRC	DATA	T2	U	PDS	VB	255	257	55
SDGTTSRC	DATA	T2	U	PDS	VB	255	3	3
SDMSSVM	LMOD	T1	U	PDS	U	0	38	164
SDMSSVMS	LMOD	T1	U	PDS	U	0	2	2
SDWWDLPA	LMOD	T1	U	PDS	U	0	2	2
SEAGALT	LMOD	T2	U	PDS	U	0	2	3
SEAGJENU	SAMP	T2	U	PDS	FB	80	4	2
SEAGMENU	MSG	T1	U	PDS	VB	255	2	2
SEAGMJPN	MSG	T1	U	PDS	VB	255	2	2
SEAGSAM	SAMP	T2	U	PDS	FB	80	2	2
SEDGEXE1	EXEC	T1	U	PDS	FB	80	107	6
SEDGMENU	MSG	T1	U	PDS	FB	80	12	9

Figure 79 (Page 9 of 14). Storage Required for Target Libraries for z/OS 3.1

Library DDNAME	Mem Type	Tar Vol	TYPE	Org	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks
SEDGMJPN	MSG	T1	U	PDS	FB	80	12	9
SEDGPENU	PANL	T1	U	PDS	FB	80	186	63
SEDGPJPN	PANL	T1	U	PDS	FB	80	188	61
SEDGPKSR	DATA	T2	U	PDS	VB	255	68	23
SEDGPSRC	DATA	T2	U	PDS	VB	255	68	23
SEEQINST	DATA	T2	U	PDS	FB	80	1182	2
SEPWBENU	DATA	T2	U	PDS	FB	4096	6	2
SEPWCENU	CLST	T1	U	PDS	FB	80	3	2
SEPWMAC1	MAC	T2	U	PDS	FB	80	2	2
SEPWMOD1	LMOD	T1	U	PDS	U	0	14	12
SEPWMOD2	LMOD	T1	U	PDS	U	0	4	6
SEPWMOD3	LMOD	T1	U	PDS	U	0	2	2
SEPWMOD4	LMOD	T1	U	PDS	U	0	189	75
SEPWPENU	PANL	T1	U	PDS	FB	80	3	2
SEPWSRC1	DATA	T2	U	PDS	FB	80	6	2
SEPWSRC2	SAMP	T2	U	PDS	FB	80	4	2
SERBCLS	CLST	T1	U	PDS	FB	80	22	3
SERBLNKE	LMOD	T1	U	PDSE	U	0	834	-
SERBMENU	MSG	T1	U	PDS	FB	80	6	6
SERBMJPN	MSG	T1	U	PDS	FB	80	6	6
SERBPENU	PANL	T1	U	PDS	FB	80	372	135
SERBPJPN	PANL	T1	U	PDS	FB	80	385	138
SERBPWSV	DATA	T2	U	PDS	VB	255	1631	2
SERBT	TABL	T1	U	PDS	FB	80	18	5
SERBTENU	TABL	T1	U	PDS	FB	80	7	2
SERBTJPN	TABL	T1	U	PDS	FB	80	7	2
SEUVFEXC	EXEC	T1	U	PDS	FB	80	2	2
SEUVFLIB	DATA	T2	U	PDS	FB	80	7	3
SEUVFSAM	SAMP	T2	U	PDS	FB	80	4	2
SEZACMAC	MAC	T2	U	PDS	FB	80	314	90

Figure 79 (Page 10 of 14). Storage Required for Target Libraries for z/OS 3.1

Library DDNAME	Mem Type	Tar Vol	TYPE	Org	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks
SEZACMTX	LMOD	T1	U	PDS	U	0	38	194
SEZADBCX	DATA	T1	U	PDS	VB	231	225	2
SEZADBRM	DATA	T1	U	PDS	FB	80	6	2
SEZADPIL	LMOD	T1	U	PDS	U	0	4	6
SEZADSIL	DATA	T1	U	PDS	U	0	25	3
SEZADSIM	DATA	T1	U	PDS	FB	80	3	3
SEZADSIP	PARM	T1	U	PDS	FB	80	2	2
SEZAEXEC	EXEC	T1	U	PDS	FB	80	7	2
SEZAINST	SAMP	T2	U	PDS	FB	80	211	52
SEZALIBN	LMOD	T1	U	PDS	U	0	9	44
SEZALNK2	LMOD	T1	U	PDS	U	0	13	2
SEZALOAD	LMOD	T1	U	PDSE	U	0	2874	-
SEZALPA	LMOD	T1	U	PDS	U	0	3	5
SEZAMENU	MSG	T1	U	PDS	FB	80	4	4
SEZANCLS	CLST	T1	U	PDS	FB	80	42	12
SEZANMAC	MAC	T2	U	PDS	FB	80	97	7
SEZANPNL	DATA	T1	U	PDS	FB	80	22	20
SEZAOLDX	LMOD	T1	U	PDS	U	0	3	5
SEZAPENU	PANL	T1	U	PDS	FB	80	13	7
SEZARNT1	DATA	T1	U	PDS	FB	80	115	64
SEZARNT2	DATA	T1	U	PDS	FB	80	19	6
SEZARNT3	DATA	T1	U	PDS	FB	80	79	12
SEZARNT4	DATA	T1	U	PDS	FB	80	10	6
SEZAROE1	DATA	T1	U	PDS	FB	80	110	60
SEZAROE2	DATA	T1	U	PDS	FB	80	19	6
SEZAROE3	DATA	T1	U	PDS	FB	80	79	12
SEZARPCL	LMOD	T1	U	PDS	U	0	10	40
SEZATCP	LMOD	T1	U	PDS	U	0	95	12
SEZATCPX	DATA	T1	U	PDS	FB	80	7	7
SEZATELX	DATA	T1	U	PDS	FB	80	5	7

Figure 79 (Page 11 of 14). Storage Required for Target Libraries for z/OS 3.1

Library DDNAME	Mem Type	Tar Vol	TYPE	Org	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks
SEZAXAWL	DATA	T1	U	PDS	U	0	14	51
SEZAXLD1	DATA	T1	U	PDS	F	256	2	2
SEZAXLD2	DATA	T1	U	PDS	VB	5124	87	11
SEZAXMLB	DATA	T1	U	PDS	U	0	51	181
SEZAXTLB	DATA	T1	U	PDS	U	0	20	114
SEZAX11L	DATA	T1	U	PDS	U	0	58	286
SFNTILIB	LMOD	T2	U	PDS	VBM	16124	3194	527
SFOMHDRS	MAC	T2	U	PDS	FB	80	18	2
SFOMOBJ	DATA	T1	U	PDS	FB	80	69	27
SFONDLIB	LMOD	T2	U	PDS	VBM	12284	18764	740
SGIMCLS0	CLST	T1	U	PDS	FB	80	2	2
SGIMLMD0	LMOD	T1	U	PDS	U	0	78	9
SGIMMENU	MSG	T1	U	PDS	FB	80	9	6
SGIMMJPN	MSG	T1	U	PDS	FB	80	9	6
SGIMPENU	PANL	T1	U	PDS	FB	80	150	88
SGIMPJPN	PANL	T1	U	PDS	FB	80	149	88
SGIMSENU	SKEL	T1	U	PDS	FB	80	14	5
SGIMTENU	TABL	T1	U	PDS	FB	80	2	2
SGIMTJPN	TABL	T1	U	PDS	FB	80	2	2
SGLDEXEC	EXEC	T1	U	PDS	FB	80	2	3
SGLDEXPC	DATA	T2	U	PDS	FB	80	3	2
SGLDHDRC	DATA	T2	U	PDS	FB	80	9	2
SGLDSAMP	SAMP	T2	U	PDS	FB	80	13	3
SGRBCLS	CLST	T1	U	PDS	FB	80	7	2
SGRBLINK	LMOD	T1	U	PDS	U	0	75	37
SGRBLPA	LMOD	T1	U	PDS	U	0	9	14
SGSKSAMP	SAMP	T2	U	PDS	FB	80	4	2
SHAPEXE3	EXEC	T1	S	PDS	VB	255	2	2
SHAPJCL3	SAMP	T2	S	PDS	FB	80	2	2
SHASLNKE	LMOD	T1	U	PDSE	U	0	130	-

Figure 79 (Page 12 of 14). Storage Required for Target Libraries for z/OS 3.1

Library DDNAME	Mem Type	Tar Vol	TYPE	Org	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks
SHASMAC	MAC	T2	U	PDS	FB	80	534	42
SHASMENU	MSG	T1	U	PDS	VB	259	7	2
SHASMIG	LMOD	T1	U	PDS	U	0	65	96
SHASMJPN	MSG	T1	U	PDS	VB	259	7	2
SHASPARM	PARM	T1	U	PDS	FB	80	2	2
SHASPNL0	PANL	T1	U	PDS	FB	80	18	4
SHASSAMP	SAMP	T2	U	PDS	FB	80	91	5
SHASSRC	SRCE	T2	U	PDS	FB	80	2403	19
SIBMAM24	LMOD	T1	U	PDS	U	0	6	23
SIBMCALL	LMOD	T1	U	PDS	U	0	2	2
SIBMCAL2	LMOD	T1	U	PDS	U	0	2	2
SIBMMATH	LMOD	T1	U	PDS	U	0	13	54
SIBMTASK	LMOD	T1	U	PDS	U	0	2	3
SICELINK	LMOD	T1	U	PDS	U	0	25	13
SICELPA	LMOD	T1	U	PDS	U	0	2	2
SICEPROC	SAMP	T2	U	PDS	FB	80	2	2
SICESAMP	SAMP	T2	U	PDS	FB	80	7	3
SICESRCE	MAC	T2	U	PDS	FB	80	4	3
SICEUSER	MAC	T2	U	PDS	FB	80	17	2
SICHMJPN	MSG	T1	U	PDS	FB	80	12	4
SICHPJPN	PANL	T1	U	PDS	FB	80	232	64
SIEAHDR	MAC	T2	U	PDS	FB	80	310	14
SIEAHDRV	DATA	T2	U	PDS	VB	260	27	3
SIEALNKE	LMOD	T1	S	PDSE	U	0	4218	-
SIEAMIGE	LMOD	T1	S	PDSE	U	0	36	-
SIEASID	DATA	T2	U	PDS	FB	80	9	4
SIFALIB	LMOD	T1	U	PDS	U	0	9	2
SIOEEXEC	EXEC	T1	U	PDS	FB	80	11	2
SIOEMJPN	MSG	T1	U	PDS	VB	255	9	2
SIOEPROC	PROC	T1	U	PDS	FB	80	2	2

Figure 79 (Page 13 of 14). Storage Required for Target Libraries for z/OS 3.1

Library DDNAME	Mem Type	Tar Vol	TYPE	Org	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks
SIOESAMP	SAMP	T2	U	PDS	FB	80	4	2
SISFEXEC	EXEC	T1	U	PDS	FB	80	5	2
SISFHELP	HELP	T1	U	PDS	FB	80	2	2
SISFJCL	SAMP	T2	U	PDS	FB	80	25	2
SISFLOAD	LMOD	T1	U	PDS	U	0	270	26
SISFLPA	LMOD	T1	U	PDS	U	0	290	6
SISFMAC	SRCE	T2	U	PDS	FB	80	7	2
SISFMLIB	MSG	T1	U	PDS	FB	80	2	2
SISFPLIB	PANL	T1	U	PDS	FB	80	64	32
SISFSLIB	SKEL	T1	U	PDS	FB	80	11	4
SISFSRC	SRCE	T2	U	PDS	FB	80	2	2
SISFTLIB	TABL	T1	U	PDS	FB	80	2	2
SISPALIB	DATA	T2	U	PDS	FB	80	2	2
SISPCLIB	CLST	T1	U	PDS	FB	80	19	3
SISPEXEC	EXEC	T1	U	PDS	FB	80	106	4
SISPGENP	DATA	T2	U	PDS	FB	80	268	137
SISPGENU	DATA	T2	U	PDS	FB	80	281	137
SISPGJPN	DATA	T2	U	PDS	FB	80	271	137
SISPGMLI	DATA	T2	U	PDS	FB	80	170	56
SISPHELP	HELP	T1	U	PDS	FB	80	2	2
SISPLOAD	LMOD	T1	U	PDS	U	0	127	72
SISPLPA	LMOD	T1	U	PDS	U	0	390	41
SISPMACS	MAC	T2	U	PDS	FB	80	56	9
SISPMENP	MSG	T1	U	PDS	FB	80	48	37
SISPMENU	MSG	T1	U	PDS	FB	80	48	37
SISPMJPN	MSG	T1	U	PDS	FB	80	50	37
SISPPENP	PANL	T1	U	PDS	FB	80	480	538
SISPPENU	PANL	T1	U	PDS	FB	80	482	538
SISPPJPN	PANL	T1	U	PDS	FB	80	482	538
SISPSAMP	SAMP	T2	U	PDS	FB	80	91	13

Figure 79 (Page 14 of 14). Storage Required for Target Libraries for z/OS 3.1

Library DDNAME	Mem Type	Tar Vol	TYPE	Org	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks
SISPSENP	SKEL	T1	U	PDS	FB	80	101	52
SISPSENU	SKEL	T1	U	PDS	FB	80	101	52
SISPSJPN	SKEL	T1	U	PDS	FB	80	101	52
SISPSLIB	SKEL	T1	U	PDS	FB	80	26	6
SISPTENP	TABL	T1	U	PDS	FB	80	4	2
SISPTENU	TABL	T1	U	PDS	FB	80	4	2
SISPTJPN	TABL	T1	U	PDS	FB	80	4	2
SISTCLIB	LMOD	T1	U	PDS	U	0	128	136
SISTDAT1	DATA	T1	U	PDS	VB	6156	28	2
SISTDAT2	DATA	T1	U	PDS	VB	259	6	2
SISTMAC1	MAC	T2	U	PDS	FB	80	17	3
SIXMEXP	DATA	T2	U	PDS	FB	80	114	2
SIXMLOD1	LMOD	T1	U	PDSE	U	0	7604	-
SORTLIB	LMOD	T1	U	PDS	U	0	26	41
SORTLPA	LMOD	T1	U	PDS	U	0	33	13
SVCLIB	LMOD	T1	U	PDS	U	0	2	2
UADS	DATA	T1	U	PDS	FB	80	2	2
VTAMLIB	LMOD	T1	U	PDS	U	0	263	79

C.5 Distribution Libraries for z/OS 3.1

Figure 80 on page 295 describes the distribution libraries required to install z/OS 3.1. Abbreviations used for the data set type field are:

U Unique data set, allocated by this product and used only by this product. 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. 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. 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.

Abbreviations used for the ORG field are:

PDS Partition Data Set
PDSE Partition Data Set Extended
SEQ Sequential Data Set

All distribution libraries listed have the following attributes:

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

If you currently have a previous release of this product 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, refer to 7.2.2, “Allocate Target and Distribution Libraries for Wave 0 elements” on page 52 and 8.1.7, “Allocate target and distribution libraries for Wave 1 elements” on page 83.

Figure 80 (Page 1 of 14). Storage Required for Distribution Libraries for z/OS 3.1

Library DDNAME	TYPE	ORG	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks
AACBCNTL	-	PDS	FB	80	30	6
AADFMAC1	-	PDS	FB	80	2	2
AADMCDA	-	PDS	FB	400	2	2
AADMCFO	-	PDS	FB	400	2	2
AADMDAT	-	PDS	VB	255	29	2
AADMGDF	-	PDS	FB	400	9	3
AADMIMG	-	PDS	FB	400	2	2
AADMMAP	-	PDS	FB	400	20	2
AADMMOD	-	PDS	U	0	368	436
AADMMSG	-	PDS	FB	80	2	2
AADMOPS	-	PDS	VB	255	7	2

Figure 80 (Page 2 of 14). Storage Required for Distribution Libraries for z/OS 3.1

Library DDNAME	TYPE	ORG	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks
AADMPCF	-	PDS	FB	400	97	6
AADMPNL	-	PDS	FB	80	4	3
AADMSAM	-	PDS	FB	80	173	13
AADMSYM	-	PDS	FB	400	198	28
AADRLIB	-	PDS	U	0	109	79
AADRYLIB	-	PDS	FB	80	11	5
AAFHMOD1	-	PDS	U	0	168	709
AAFHSRC1	-	PDS	FB	80	18	4
AAOPEXEC	-	PDS	FB	80	3	2
AAOPHFS	-	PDS	VB	255	2651	23
AAOPHJPN	-	PDS	VB	255	481	7
AAOPMENU	-	PDS	FB	80	4	3
AAOPMJPN	-	PDS	FB	80	4	3
AAOPMOD1	-	PDS	U	0	219	63
AAOPPENU	-	PDS	FB	80	89	36
AAOPPJPN	-	PDS	FB	80	90	40
AASMMAC1	-	PDS	FB	80	23	2
AASMMAC2	-	PDS	FB	80	5	2
AASMMOD1	-	PDS	U	0	36	26
AASMMOD2	-	PDS	U	0	114	111
AASMPUT2	-	PDS	FB	80	134	2
AASMSAM1	-	PDS	FB	80	25	3
AASMSAM2	-	PDS	FB	80	12	2
AAXREXEC	-	PDS	VB	255	28	4
AAZDFFS	-	PDS	VB	256	19897	7
ABBLEXEC	-	PDS	VB	255	2	2
ABBLJCL	-	PDS	FB	80	3	2
ABBLLIB	-	PDS	VB	255	18509	2
ABLSCLI0	-	PDS	FB	80	363	17
ABLSKEL0	-	PDS	FB	80	11	5
ABLSMSG0	-	PDS	FB	80	10	7

Figure 80 (Page 3 of 14). Storage Required for Distribution Libraries for z/OS 3.1

Library DDNAME	TYPE	ORG	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks
ABLSPNL0	-	PDS	FB	80	378	183
ABLSTBL0	-	PDS	FB	80	6	3
ABMFMOD0	-	PDS	U	0	32	24
ABPNCFG	-	PDS	FB	80	2	2
ABPNEXEC	-	PDS	FB	80	14	2
ABPNLIB	-	PDS	U	0	11	4
ABPNLPA	-	PDS	U	0	20	4
ABPNPNL	-	PDS	FB	80	3	2
ABPNPNLJ	-	PDS	FB	80	2	2
ABPNSAMP	-	PDS	FB	80	2	2
ABPXEXEC	-	PDS	FB	80	46	3
ABPXMENU	-	PDS	FB	80	11	7
ABPXMJPN	-	PDS	FB	80	11	7
ABPXMOD1	-	PDS	U	0	371	217
ABPXPENU	-	PDS	FB	80	34	20
ABPXPJPN	-	PDS	FB	80	35	20
ABPXSPC	-	PDS	U	0	5	6
ABPXTENU	-	PDS	FB	80	2	2
ABPXTJPN	-	PDS	FB	80	2	2
ABPXXMLS	-	PDS	VB	256	4	2
ACBDCLST	-	PDS	FB	80	3	2
ACBDHENU	-	PDS	U	0	471	635
ACBDHJPN	-	PDS	U	0	495	1486
ACBDMENU	-	PDS	FB	80	28	23
ACBDMJPN	-	PDS	FB	80	27	23
ACBDMOD1	-	PDS	U	0	349	124
ACBDMOD2	-	PDS	U	0	6	7
ACBDMOD3	-	PDS	U	0	6	7
ACBDPENU	-	PDS	FB	80	88	34
ACBDPJPN	-	PDS	FB	80	90	34
ACBDTEMP	-	PDS	FB	80	25	2

Figure 80 (Page 4 of 14). Storage Required for Distribution Libraries for z/OS 3.1

Library DDNAME	TYPE	ORG	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks
ACBDTENU	-	PDS	FB	80	2	2
ACBDTJPN	-	PDS	FB	80	2	2
ACBRDBRM	-	PDS	FB	80	12	3
ACBRMOD0	-	PDS	U	0	172	159
ACCNCMP	-	PDSE	U	0	6846	-
ACCNSR1	-	PDS	FB	80	73	23
ACCNSR2	-	PDS	FB	80	22	11
ACCNSR3	-	PDS	FB	80	34	11
ACCNSR4	-	PDS	FB	80	22	11
ACCNSR5	-	PDS	FB	80	115	15
ACCNSR6	-	PDS	FB	80	22	10
ACCNSR7	-	PDS	FB	80	118	17
ACCNSR8	-	PDS	FB	80	22	10
ACCNSR9	-	PDS	FB	80	121	17
ACCRHFS	-	PDS	VB	256	4	2
ACCRMOD	-	PDS	U	0	26	24
ACDMMOD0	-	PDS	U	0	56	35
ACDRMODS	-	PDS	U	0	9	2
ACDRTABL	-	PDS	FB	80	283	2
ACEEMOD1	-	PDS	U	0	535	458
ACEEMOD2	-	PDSE	U	0	24514	-
ACEESRC1	-	PDS	FB	80	209	13
ACEESRC2	-	PDS	FB	120	115	12
ACEESRC3	-	PDS	FB	120	19	3
ACFZHFS	-	PDS	VB	255	970	2
ACLBDLL	-	PDS	U	0	104	5
ACLBDLL2	-	PDSE	U	0	348	-
ACLBHFS1	-	PDS	VB	255	6377	11
ACLBOBJ	-	PDS	FB	80	126	10
ACLBSR1	-	PDS	FB	120	17	3
ACLCCMP	-	PDSE	U	0	5217	-

Figure 80 (Page 5 of 14). Storage Required for Distribution Libraries for z/OS 3.1

Library DDNAME	TYPE	ORG	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks
ACLCSR1	-	PDS	FB	80	18	2
ACLMMOD0	-	PDS	U	0	262	164
ACMDLIB	-	PDS	U	0	34	34
ACSFCLI0	U	PDS	FB	80	30	3
ACSFHFS	U	PDS	VB	255	44	3
ACSFMOD0	U	PDS	U	0	242	203
ACSFMOD1	U	PDS	U	0	2	2
ACSFMSG0	U	PDS	FB	80	9	4
ACSFPNL0	U	PDS	FB	80	48	17
ACSFSKL0	U	PDS	FB	80	2	2
ACSFTLIB	U	PDS	FB	80	2	2
ACSSLIB	-	PDS	U	0	98	285
ACTVMOD	-	PDS	U	0	12	2
ACTVSRC	-	PDS	FB	80	3	2
ACUNHF	-	PDS	VB	255	7	2
ACUNJCL	-	PDS	FB	80	3	2
ACUNLOCL	-	PDS	FB	80	958	30
ACUNMAC	-	PDS	FB	80	96	2
ACUNMENU	-	PDS	VB	259	2	2
ACUNMJPN	-	PDS	VB	259	2	2
ACUNMOD	-	PDS	U	0	83	48
ACUNSAMP	-	PDS	FB	80	43	4
ACUNTBL	-	PDS	FB	256	43703	707
ACYGINST	-	PDS	FB	80	4	2
ACYGLNK	-	PDS	U	0	18	14
ACYGLPA	-	PDS	U	0	2	2
ACYGMENU	-	PDS	FB	80	5	3
ACYGMJPN	-	PDS	FB	80	5	3
ACYGMSEN	-	PDS	VB	259	2	2
ACYGMSJP	-	PDS	VB	259	2	2
ACYGPENU	-	PDS	FB	80	33	15

Figure 80 (Page 6 of 14). Storage Required for Distribution Libraries for z/OS 3.1

Library DDNAME	TYPE	ORG	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks
ACYGPJPN	-	PDS	FB	80	33	15
ACYGSAMP	-	PDS	FB	80	17	6
ACYGSKL	-	PDS	FB	80	10	5
ACYGZFS	-	PDS	VB	255	74	2
ADBBLIB	-	PDS	VB	80	55	25
ADFPMOD0	-	PDS	U	0	27	17
ADFQMKLB	-	PDS	FB	80	3	2
ADFQMLIB	-	PDS	FB	80	3	2
ADFQPKLB	-	PDS	FB	80	36	12
ADFQPKSR	-	PDS	VB	255	14	3
ADFQPLIB	-	PDS	FB	80	44	14
ADFQPSRC	-	PDS	VB	255	14	3
ADGTCLIB	-	PDS	FB	80	173	11
ADGTLLIB	-	PDS	U	0	234	258
ADGTMKLB	-	PDS	FB	80	48	23
ADGTMLIB	-	PDS	FB	80	48	23
ADGTPKLB	-	PDS	FB	80	872	288
ADGTPKSR	-	PDS	VB	255	258	55
ADGTPLIB	-	PDS	FB	80	878	287
ADGTPSRC	-	PDS	VB	255	257	55
ADGTSKLB	-	PDS	FB	80	4	2
ADGTSLIB	-	PDS	FB	80	33	4
ADGTTLIB	-	PDS	FB	80	5	5
ADGTTSRC	-	PDS	VB	255	3	3
ADMSSVM	-	PDS	U	0	38	166
AEAGJENU	-	PDS	FB	80	4	2
AEAGMENU	-	PDS	VB	255	2	2
AEAGMJPN	-	PDS	VB	255	2	2
AEAGMOD1	-	PDS	U	0	3	3
AEAGSAM	-	PDS	FB	80	2	2
AEDCCPP1	-	PDS	FB	80	18	5

Figure 80 (Page 7 of 14). Storage Required for Distribution Libraries for z/OS 3.1

Library DDNAME	TYPE	ORG	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks
AEDCHFS	-	PDS	VB	255	4285	82
AEDCMOD1	-	PDS	U	0	1405	1787
AEDCMOD2	-	PDS	U	0	12	72
AEDCMSEP	-	PDS	FB	150	2	2
AEDCOBJ1	-	PDS	FB	80	9	6
AEDCSRC6	-	PDS	FB	80	704	49
AEDCSRC7	-	PDS	FB	80	1123	240
AEDGEXE1	-	PDS	FB	80	107	6
AEDGHFS	-	PDS	VB	256	73	2
AEDGMENU	-	PDS	FB	80	12	9
AEDGMJPN	-	PDS	FB	80	12	9
AEDGMOD1	-	PDS	U	0	53	28
AEDGPENU	-	PDS	FB	80	186	63
AEDGPJPN	-	PDS	FB	80	188	61
AEDGPKSR	-	PDS	VB	255	68	23
AEDGPSRC	-	PDS	VB	255	68	23
AEDGSRC1	-	PDS	FB	80	19	2
AEEQINST	-	PDS	FB	80	1182	2
AEPWBENU	-	PDS	FB	4096	6	2
AEPWMOD1	-	PDS	U	0	135	114
AEPWSRC1	-	PDS	FB	80	12	3
AERBCLS	-	PDS	FB	80	22	3
AERBMAC1	-	PDS	FB	80	3	2
AERBMENU	-	PDS	FB	80	6	6
AERBMJPN	-	PDS	FB	80	6	6
AERBMOD2	-	PDSE	U	0	835	-
AERBPENU	-	PDS	FB	80	372	135
AERBPJPN	-	PDS	FB	80	385	138
AERBPWSV	-	PDS	VB	255	2642	3
AERBT	-	PDS	FB	80	18	5
AERBTENU	-	PDS	FB	80	7	2

Figure 80 (Page 8 of 14). Storage Required for Distribution Libraries for z/OS 3.1

Library DDNAME	TYPE	ORG	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks
AERBTJPN	-	PDS	FB	80	7	2
AEUVFEXC	-	PDS	FB	80	2	2
AEUVFHFS	-	PDS	VB	255	61	3
AEUVFLIB	-	PDS	FB	80	7	3
AEUVFSAM	-	PDS	FB	80	4	2
AEZADBR1	-	PDS	FB	80	6	2
AEZAMAC1	-	PDS	FB	80	115	13
AEZAMAC2	-	PDS	FB	80	402	88
AEZAMAC3	-	PDS	FB	80	140	26
AEZAMODS	-	PDSE	U	0	3539	-
AEZARNT1	-	PDS	FB	80	115	64
AEZARNT2	-	PDS	FB	80	19	6
AEZARNT3	-	PDS	FB	80	79	12
AEZARNT4	-	PDS	FB	80	10	6
AEZAROE1	-	PDS	FB	80	110	60
AEZAROE2	-	PDS	FB	80	19	6
AEZAROE3	-	PDS	FB	80	79	12
AEZASMP1	-	PDS	FB	80	1575	109
AEZAXLTD	-	PDS	F	256	2	2
AEZAXLTK	-	PDS	VB	5124	103	12
AEZAXLT1	-	PDS	FB	80	7	7
AEZAXLT2	-	PDS	FB	80	5	7
AEZAXLT3	-	PDS	VB	231	1338	82
AFNTDLIB	-	PDS	VBM	12284	18764	740
AFNTILIB	-	PDS	VBM	16124	3194	527
AFNTLIB	-	PDS	VBM	12284	1233	243
AFNTLIBB	-	PDS	VBM	12284	3402	523
AFNT300	-	PDS	VBM	12284	3739	488
AFOMHDRS	-	PDS	FB	80	22	2
AFOMHFS	-	PDS	VB	255	26813	115
AFOMMOD1	-	PDS	U	0	584	40

Figure 80 (Page 9 of 14). Storage Required for Distribution Libraries for z/OS 3.1

Library DDNAME	TYPE	ORG	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks
AFOMOBJ	-	PDS	FB	80	84	27
AFONTHFS	-	PDS	VB	255	36524	5
AGDEMOD0	-	PDS	U	0	61	48
AGENLIB	-	PDS	FB	80	6	2
AGFTAJL1	-	PDS	FB	80	2	2
AGFTAMD1	-	PDS	U	0	21	20
AGFUMOD1	-	PDS	U	0	33	20
AGIMBIN	-	PDS	VB	255	5	3
AGIMCLS0	-	PDS	FB	80	2	2
AGIMMENU	-	PDS	FB	80	9	6
AGIMMJPN	-	PDS	FB	80	9	6
AGIMPENU	-	PDS	FB	80	150	88
AGIMPJPN	-	PDS	FB	80	149	88
AGIMSENU	-	PDS	FB	80	14	5
AGIMTENU	-	PDS	FB	80	2	2
AGIMTJPN	-	PDS	FB	80	2	2
AGLDEXEC	-	PDS	FB	80	2	3
AGLDEXPC	-	PDS	FB	80	3	2
AGLDHCLI	-	PDS	VB	255	6	2
AGLDHDRC	-	PDS	FB	80	9	2
AGLDHFS	-	PDS	VB	255	78	4
AGLDHJPN	-	PDS	VB	255	3	2
AGLDSAMP	-	PDS	FB	80	13	3
AGRBCLS	-	PDS	FB	80	7	2
AGRBMAC1	-	PDS	FB	80	89	4
AGRBMOD1	-	PDS	U	0	78	66
AGRBZDGU	-	PDS	VB	255	1935	2
AGSKHFS	-	PDS	VB	255	19	3
AGSKSAMP	-	PDS	FB	80	4	2
AHAPEXE3	-	PDS	VB	255	2	2
AHAPINC3	-	PDS	VB	255	365	2

Figure 80 (Page 10 of 14). Storage Required for Distribution Libraries for z/OS 3.1

Library DDNAME	TYPE	ORG	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks
AHAPJCL3	-	PDS	FB	80	2	2
AHASMAC	-	PDS	FB	80	534	42
AHASMENU	-	PDS	VB	259	7	2
AHASMJPN	-	PDS	VB	259	7	2
AHASMOD	-	PDS	U	0	181	70
AHASPARM	-	PDS	FB	80	2	2
AHASPNL0	-	PDS	FB	80	18	4
AHASSAMP	-	PDS	FB	80	91	5
AHASSRC	-	PDS	FB	80	2403	19
AHELP	-	PDS	FB	80	130	29
AHELPENP	-	PDS	FB	80	34	7
AHLPKLB	-	PDS	FB	80	4	3
AIBMMOD3	-	PDS	U	0	275	490
AIBMSRC3	-	PDS	FB	80	28	7
AICELIB	-	PDS	U	0	86	82
AICESAMP	-	PDS	FB	80	7	3
AICESRCE	-	PDS	FB	80	4	3
AICEUSER	-	PDS	FB	80	17	2
AICHMJPN	-	PDS	FB	80	12	4
AICHPJPN	-	PDS	FB	80	232	64
AICQAB	-	PDS	FB	80	5	3
AICQILIB	-	PDS	FB	80	3	2
AICQKAB	-	PDS	FB	80	5	4
AICQKILB	-	PDS	FB	80	3	3
AICQKMA1	-	PDS	FB	80	342	303
AICQKMA3	-	PDS	FB	80	18	22
AICQKMA4	-	PDS	FB	80	7	9
AICQKMA5	-	PDS	FB	80	2	2
AICQMAC1	-	PDS	FB	80	335	152
AICQMAC2	-	PDS	FB	80	2	2
AICQMAC3	-	PDS	FB	80	17	12

Figure 80 (Page 11 of 14). Storage Required for Distribution Libraries for z/OS 3.1

Library DDNAME	TYPE	ORG	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks
AICQMAC4	-	PDS	FB	80	9	5
AICQMAC5	-	PDS	FB	80	165	7
AIEAHDR	-	PDS	FB	80	310	14
AIEAHDRV	-	PDS	VB	260	27	3
AIEALNKE	-	PDSE	U	0	4070	-
AIEAMIGE	-	PDSE	U	0	34	-
AIEASID	-	PDS	FB	80	9	4
AIEWMOD0	-	PDS	U	0	84	54
AIFALIB	-	PDS	U	0	10	6
AIGDVBS1	-	PDS	VB	4100	21	2
AIGZMOD1	-	PDS	U	0	118	254
AIGZSRC1	-	PDS	FB	80	30	7
AIKYHFS	-	PDS	VB	255	1278	6
AIMAGE	-	PDS	FB	80	630	12
AIMFMOD0	-	PDS	U	0	9	5
AINDLMD	-	PDS	U	0	3	3
AIOEEXEC	-	PDS	FB	80	11	2
AIOEHLIB	-	PDS	VB	255	2	2
AIOEMJPN	-	PDS	VB	255	9	2
AIOEPROC	-	PDS	FB	80	2	2
AIOESAMP	-	PDS	FB	80	4	2
AISFEXEC	-	PDS	FB	80	5	2
AISFHELP	-	PDS	FB	80	2	2
AISFHFS	-	PDS	VB	255	156	3
AISFJCL	-	PDS	FB	80	25	2
AISFLOAD	-	PDS	U	0	536	215
AISFMAC	-	PDS	FB	80	7	2
AISFMLIB	-	PDS	FB	80	2	2
AISFPLIB	-	PDS	FB	80	64	32
AISFSLIB	-	PDS	FB	80	11	4
AISFSRC	-	PDS	FB	80	2	2

Figure 80 (Page 12 of 14). Storage Required for Distribution Libraries for z/OS 3.1

Library DDNAME	TYPE	ORG	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks
AISFTLIB	-	PDS	FB	80	2	2
AISPALIB	-	PDS	FB	80	2	2
AISPCLIB	-	PDS	FB	80	19	3
AISPEXEC	-	PDS	FB	80	106	4
AISPGENP	-	PDS	FB	80	268	137
AISPGENU	-	PDS	FB	80	281	137
AISPGJPN	-	PDS	FB	80	271	137
AISPGMLI	-	PDS	FB	80	170	56
AISPHELP	-	PDS	FB	80	2	2
AISPMACS	-	PDS	FB	80	56	9
AISPMENP	-	PDS	FB	80	48	37
AISPMENU	-	PDS	FB	80	48	37
AISPMJPN	-	PDS	FB	80	50	37
AISPMOD1	-	PDS	U	0	515	464
AISPPENP	-	PDS	FB	80	482	538
AISPPENU	-	PDS	FB	80	482	538
AISPPJPN	-	PDS	FB	80	485	538
AISPSAMP	-	PDS	FB	80	94	13
AISPSENP	-	PDS	FB	80	101	52
AISPSENU	-	PDS	FB	80	101	52
AISPSJPN	-	PDS	FB	80	101	52
AISPSLIB	-	PDS	FB	80	26	6
AISPTENP	-	PDS	FB	80	4	2
AISPTENU	-	PDS	FB	80	4	2
AISPTJPN	-	PDS	FB	80	4	2
AISTDAT1	-	PDS	VB	6156	28	2
AISTDAT2	-	PDS	VB	259	6	2
AISTMAC1	-	PDS	FB	80	17	3
AIXMEXP	-	PDS	FB	80	114	2
AIXMHFS	-	PDS	VB	256	4069	2
AIXMLOD1	-	PDSE	U	0	7604	-

Figure 80 (Page 13 of 14). Storage Required for Distribution Libraries for z/OS 3.1

Library DDNAME	TYPE	ORG	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks
AIZUFS	-	PDSE	VB	259	4771	-
AKHELP	-	PDS	FB	80	44	12
AKLIB	-	PDS	U	0	3	3
ALINKLIB	-	PDS	U	0	234	272
ALPALIB	-	PDS	U	0	28	37
AMACLIB	-	PDS	FB	80	4192	105
AMIGLIB	-	PDS	U	0	167	229
AMODGEN	-	PDS	FB	80	672	42
AMSGENP	-	PDS	VB	259	9	2
AMSGENU	-	PDS	VB	259	58	7
AMSGJPN	-	PDS	VB	259	52	7
ANFSLIBE	-	PDSE	U	0	305	-
ANFSTARB	-	PDS	VB	264	51	2
ANUCLEUS	-	PDS	U	0	41	56
AOSACB	-	PDS	U	0	111	98
AOSA0	-	PDS	U	0	155	108
AOSA1	-	PDS	U	0	114	72
AOSBN	-	PDS	U	0	393	308
AOSB0	-	PDS	U	0	3	3
AOSB3	-	PDS	U	0	187	194
AOSCA	-	PDS	U	0	5	3
AOSCD	-	PDS	U	0	173	202
AOSCE	-	PDS	U	0	9	12
AOSC2	-	PDS	U	0	2	2
AOSC5	-	PDS	U	0	1803	1361
AOSC6	-	PDS	U	0	9	9
AOSD0	-	PDS	U	0	140	152
AOSD7	-	PDS	U	0	6	9
AOSG0	-	PDS	U	0	2	2
AOSJSC	-	PDS	U	0	6	6
AOST3	-	PDS	U	0	15	23

Figure 80 (Page 14 of 14). Storage Required for Distribution Libraries for z/OS 3.1

Library DDNAME	TYPE	ORG	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks
AOST4	-	PDS	U	0	134	143
AOSU0	-	PDS	U	0	389	240
AOSXCF	-	PDS	U	0	252	160
AOS00	-	PDS	U	0	27	20
AOS04	-	PDS	U	0	5	6
AOS05	-	PDS	U	0	3	2
AOS06	-	PDS	U	0	13	17
AOS11	-	PDS	U	0	12	13
AOS12	-	PDS	U	0	240	143
AOS24	-	PDS	U	0	10	7
AOS26	-	PDS	U	0	893	964
AOS28	-	PDS	U	0	294	230
AOS32	-	PDS	U	0	71	104
APARMLIB	-	PDS	FB	80	20	7
APROCLIB	-	PDS	FB	80	9	6
ASAMPLIB	-	PDS	FB	80	1011	66
ASSFMOD0	-	PDS	U	0	122	51
ATSOMAC	-	PDS	FB	80	72	10
AUADS	-	PDS	FB	80	2	2
CIPLIB	-	PDS	U	0	6	7
HHRFCLST	-	PDS	FB	80	19	3
HHRFMSG	-	PDS	FB	80	12	4
HHRFPANL	-	PDS	FB	80	225	89
HHRFSKEL	-	PDS	FB	80	67	14

C.6 File System for z/OS 3.1

Abbreviations used for the zFS Path type are:

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

Abbreviations for the NOTE column are:

ZV1R1 New file system path introduced in z/OS V1R1
ZV1R2 New file system path introduced in z/OS V1R2
ZV1R3 New file system path introduced in z/OS V1R3
ZV1R4 New file system path introduced in z/OS V1R4
ZV1R5 New file system path introduced in z/OS V1R5
ZV1R6 New file system path introduced in z/OS V1R6
ZV1R7 New file system path introduced in z/OS V1R7
ZV1R9 New file system path introduced in z/OS V1R9
ZV1R10 New file system path introduced in z/OS V1R10
ZV1R11 New file system path introduced in z/OS V1R11
ZV1R13 New file system path introduced in z/OS V1R13
ZV2R1 New file system path introduced in z/OS V2R1
ZV2R2 New file system path introduced in z/OS V2R2
ZV2R3 New file system path introduced in z/OS V2R3
ZV2R4 New file system path introduced in z/OS V2R4
ZV2R5 New file system path introduced in z/OS V2R5
ZV31 New file system path introduced in z/OS 3.1
Z9X New file system path introduced in z990 Exploitation feature
NLV File system path for NLV

Note:

1. The NLV directories will be empty if the NLV features are not ordered.
2. DDDEF Name and zFS PATH for FMID HZAI310 is changed in z/OS 3.1.

Figure 81 (Page 1 of 5). zFS Paths for z/OS 3.1

DDDEF Name	TYPE	PATH	Note
NFSCUTIL	X	/usr/lpp/NFS/IBM/	
SADRHFS	N	/usr/lpp/dfsms/dss/IBM/	ZV2R5
SAIEFFS2	X	/usr/lpp/aie/IBM/	ZV31
SAOPBIN	X	/usr/lpp/Printsrv/bin/IBM/	
SAOPCLAS	X	/usr/lpp/Printsrv/classes/IBM/	
SAOPICEN	X	/usr/lpp/Printsrv/InfoprintCentral/IBM/	ZV2R2
SAOPICFB	N	/usr/lpp/Printsrv/InfoprintCentral/fba/IBM/	ZV2R5
SAOPICHE	X	/usr/lpp/Printsrv/InfoprintCentral/help/En_US/IBM/	ZV1R5
SAOPICHJ	X	/usr/lpp/Printsrv/InfoprintCentral/help/Ja_JP/IBM/	ZV1R5NLV
SAOPICIM	X	/usr/lpp/Printsrv/InfoprintCentral/Images/IBM/	ZV1R5
SAOPICSC	X	/usr/lpp/Printsrv/InfoprintCentral/Scripts/IBM/	ZV1R5
SAOPICSE	N	/usr/lpp/Printsrv/InfoprintCentral/Scripts/nls/IBM/	ZV2R4
SAOPICSJ	N	/usr/lpp/Printsrv/InfoprintCentral/Scripts/nls/ja/IBM/	ZV2R4
SAOPICSM	N	/usr/lpp/Printsrv/InfoprintCentral/samples/IBM/	ZV2R5

Figure 81 (Page 2 of 5). zFS Paths for z/OS 3.1

DDDEF Name	TYPE	PATH	Note
SAOPICXE	X	/usr/lpp/Printsrv/InfoprintCentral/xml/En_US/IBM/	ZV1R5
SAOPICXJ	X	/usr/lpp/Printsrv/InfoprintCentral/xml/Ja_JP/IBM/	ZV1R5NLV
SAOPICXM	X	/usr/lpp/Printsrv/InfoprintCentral/xml/IBM/	ZV1R5
SAOPICXS	X	/usr/lpp/Printsrv/InfoprintCentral/xsl/IBM/	ZV1R5
SAOPJAJP	X	/usr/lpp/Printsrv/Ja_JP/IBM/	NLV
SAOPLIB	X	/usr/lpp/Printsrv/lib/IBM/	
SAOPMCT1	X	/usr/lpp/Printsrv/man/C/cat1/IBM/	
SAOPMCT5	X	/usr/lpp/Printsrv/man/C/cat5/IBM/	
SAOPMCT8	X	/usr/lpp/Printsrv/man/C/cat8/IBM/	
SAOPSAM1	X	/usr/lpp/Printsrv/samples/IBM/	
SAOPUSEN	X	/usr/lpp/Printsrv/C/IBM/	
SAOPWENU	X	/usr/lpp/Printsrv/win/En_US/IBM/	
SAOPWJPN	X	/usr/lpp/Printsrv/win/Ja_JP/IBM/	NLV
SARCHFS	N	/usr/lpp/dfsms/hsm/IBM/	ZV2R5
SAZDFFS	N	/usr/lpp/zcx_zos/IBM/	ZV2R4
SBBLLIB	N	/usr/lpp/liberty_zos/IBM/	ZV2R3
SBPXXMLS	X	/usr/lib/xml_schema/IBM/	ZV1R6
SCEEI	X	/usr/include/IBM/	
SCEEIARP	X	/usr/include/arpa/IBM/	
SCEEINEI	X	/usr/include/netinet/IBM/	
SCEEINET	X	/usr/include/net/IBM/	
SCEEISYS	X	/usr/include/sys/IBM/	
SCEEMTHD	X	/usr/lib/nls/method/IBM/	ZV1R2
SCEESAMC	X	/usr/lpp/le/samples/ansic++/IBM/	ZV1R2
SCFZHFS	X	/usr/lpp/wbem/IBM/	ZV1R7
SCLBHFS1	X	/usr/lpp/cbclib/IBM/	ZV1R5
SCPOHFS	X	/usr/lpp/cpo/IBM/	ZV1R9
SCPOLIB	X	/usr/lpp/cpo/lib/IBM/	ZV1R9
SCSFHFS	X	/usr/lpp/pkcs11/IBM/	ZV1R9
SCYGPLGI	N	/usr/lpp/cyg/zosmf/plugins/IBM/	ZV2R5
SCYGTMPL	N	/usr/lpp/cyg/zosmf/workflows/templates/IBM/	ZV2R5
SCYGWFLW	N	/usr/lpp/cyg/zosmf/workflows/IBM/	ZV2R5

Figure 81 (Page 3 of 5). zFS Paths for z/OS 3.1

DDDEF Name	TYPE	PATH	Note
SEDGHFS	X	/usr/lpp/dfsms/rmm/IBM/	ZV1R7
SERBHFS	X	/usr/lpp/gpm/IBM/	ZV1R13
SEUVFHFS	X	/usr/lpp/skrb/IBM/	ZV1R6
SEZABIN	X	/usr/lpp/tcpip/bin/IBM/	
SEZAHTCP	X	/usr/lpp/tcpip/IBM/	
SEZAMCT1	X	/usr/lpp/tcpip/man/C/cat1/IBM/	
SEZAMMSC	X	/usr/lpp/tcpip/lib/nls/msg/C/IBM/	
SEZASAMP	X	/usr/lpp/tcpip/samples/IBM/	
SEZASBIN	X	/usr/lpp/tcpip/sbin/IBM/	
SEZAXAR	X	/usr/lpp/tcpip/X11R6/lib/IBM/	
SEZAXINC	X	/usr/lpp/tcpip/X11R6/include/IBM/	
SEZAXSMP	X	/usr/lpp/tcpip/X11R6/Xamples/IBM/	
SFNTWTYP	N	/usr/lpp/fonts/worldtype/IBM/	ZV2R1
SFOMBCPH	X	/usr/lpp/bcp/IBM/	ZV1R10
SFOMCEA	X	/usr/share/cea/IBM/	ZV1R10
SFOMINC	X	/usr/include/IBM/	
SFOMINCM	X	/usr/include/metal/IBM/	ZV1R9
SFOMJVCL	X	/usr/include/java_classes/IBM/	ZV1R5
SFOMJVRT	X	/usr/lib/java_runtime/IBM/	ZV1R5
SFOMJ64R	X	/usr/lib/java_runtime64/IBM/	ZV1R6
SFOMTA	X	/usr/share/lib/terminfo/a/IBM/	
SFOMTC	X	/usr/share/lib/terminfo/c/IBM/	
SFOMTD	X	/usr/share/lib/terminfo/d/IBM/	
SFOMTH	X	/usr/share/lib/terminfo/h/IBM/	
SFOMTI	X	/usr/share/lib/terminfo/i/IBM/	
SFOMTJ	X	/usr/share/lib/terminfo/j/IBM/	
SFOMTL	X	/usr/share/lib/terminfo/l/IBM/	
SFOMTL2	X	/usr/share/lib/terminfo/L/IBM/	
SFOMTV	X	/usr/share/lib/terminfo/v/IBM/	
SFOMTW	X	/usr/share/lib/terminfo/w/IBM/	
SFOMTX	X	/usr/share/lib/terminfo/x/IBM/	
SFOM1MNC	X	/usr/man/C/man1/IBM/	

Figure 81 (Page 4 of 5). zFS Paths for z/OS 3.1

DDDEF Name	TYPE	PATH	Note
SFOM1MNJ	X	/usr/man/Ja_JP/man1/IBM/	NLV
SFOTSSH	X	/usr/lib/ssh/IBM/	
SFSUMANC	X	/usr/man/C/IBM/	
SFSUMANJ	X	/usr/man/Ja_JP/IBM/	NLV
SFSUMBIN	X	/bin/IBM/	
SFSUMCHR	X	/usr/lib/nls/charmap/IBM/	
SFSUMJPN	X	/usr/lib/nls/msg/Ja_JP/IBM/	NLV
SFSUMLCD	X	/usr/lib/nls/localedef/IBM/	
SFSUMLCL	X	/usr/lib/nls/locale/IBM/	
SFSUMLIB	X	/usr/lib/IBM/	
SFSUMMSC	X	/usr/lib/nls/msg/C/IBM/	
SFSUMUUC	X	/usr/lib/uucp/IBM/	
SFSUSAMP	X	/samples/IBM/	
SFSUSBIN	X	/usr/sbin/IBM/	
SGFUBIN	X	/usr/lpp/dfsms/bin/IBM/	
SGFUMSG	X	/usr/lpp/dfsms/nls/msg/C/IBM/	
SGIMDIR	X	/usr/lpp/smp/IBM/	ZV1R7
SGLDHCLI	X	/usr/lpp/ldapclient/IBM/	
SGLDHFS	X	/usr/lpp/ldap/IBM/	ZV1R4
SGLDHJPN	X	/usr/lpp/ldap/lib/nls/msg/Ja_JP/IBM/	NLV
SGRBZDGU	N	/usr/lpp/IBM/zdg/IBM/	ZV31
SGSKHFS	X	/usr/lpp/gskssl/IBM/	
SHAPBIN3	N	/usr/lpp/ihsa_zos/IBM/	ZV2R2
SHZCINC	X	/usr/lpp/hzc/include/IBM/	ZV2R1
SHZCLIB	X	/usr/lpp/hzc/lib/IBM/	ZV2R1
SIKYHFS	X	/usr/lpp/pkiserv/IBM/	ZV1R3
SIOEHLMD	X	/usr/lpp/dfs/global/bin/IBM/	
SISCRHFS	N	/usr/lpp/scrt/IBM/	ZV2R3
SISFHFS	X	/usr/lpp/sdsf/IBM/	ZV1R10
SISPZHFS	X	/usr/lpp/ispf/bin/IBM/	ZV1R10
SIXMHFS	X	/usr/lpp/ixm/IBM	
SIZUFSD	X	/usr/lpp/zosmf/IBM/	ZV2R2

Figure 81 (Page 5 of 5). zFS Paths for z/OS 3.1

DDDEF Name	TYPE	PATH	Note
	X	/usr/man/C/cat1/IBM/	
	X	/usr/man/Ja_JP/cat1/IBM/	
	N	/usr/lpp/bcp/upgrade/	ZV2R5

For more information about creating file system directories, see 8.1.8, “Create file system directories for Wave 1” on page 88.

Appendix D. Additional Cleanup Jobs for z/OS 3.1

D.1 Perform global zone cleanup for deleted FMIDs

Because z/OS 3.1 is a complete replacement for previous releases of z/OS, you might want to delete the old FMIDs from the global zone so future (unneeded) service will not be received for them, unless you plan to share the global zone and SMPPTS between z/OS 3.1 and systems with older levels of z/OS.

The FMIDs listed as deleted in the output of the ACCEPT of all Wave 0, Wave 1 and 2 FMIDs may be deleted from the FMID list in the global zone. Refer to sample job CLNGLOB in your SAMPLIB data set for global zone cleanup.

D.2 Run optional cleanup sample jobs for obsolete NLVs DDDEFs, data sets, and path

Starting with z/OS V2R4, all national languages (NLVs) FMIDs except Japanese are no longer shipped in BCP, ISPF, TSO/E and UNIX System Services. If you have previously installed these NLVs, you can delete the obsolete DDDEFs, data sets, and path with the following optional sample jobs provided by the elements.

As of z/OS V2R4, Distributed File Service (FMIDs H0H2410 and J0H241J) is withdrawn. The FMIDs H0H2410 and J0H241J are deleted by z/OS File System (FMID HZFS510), and the obsolete data sets, paths, and DDDEFs in the CSI can be deleted with the cleanup sample job provided by the element listed in the following figure.

The OSA/SF element is withdrawn as of z/OS V2R4. After sample job CLNOS390 has been run to delete OSA/SF FMID H0GI400, you may run sample job CLNOSASF to delete the obsolete data sets and DDDEFs for OSA/SF in the SMP/E CSI.

The ISPF Client/Server component is withdrawn as of z/OS V2R5. You can use the sample jobs listed in the following figure to delete the obsolete DDDEFs and data sets.

As of z/OS V2R5, there are obsolete data sets that will be empty and DDDEFs for RMF that can be deleted after RMF is installed. You can run sample job ERB00CLN to remove the obsolete RMF data sets and DDDEFs after z/OS V2R5 RMF is installed.

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Figure 82. Cleanup Sample Jobs

Sample Job	Element	Comment	Job location
AIECLNAI	IBM Z Deep Neural Network Library (zDNN)	Sample job to delete Obsolete DDNAME , obsolete file system path	SAMPLIB
Note: AIECLNAI is a sample job to delete an obsolete file system path for IBM Z Deep Neural Network Library that was changed in z/OS 3.1.			
AOPCLNDD	Infoprint Server	Obsolete DDNAMES	SAMPLIB
BPXCLNDD	BCP and UNIX System Services	obsolete Chinese NLV	SAMPLIB
ISPDDDEL ISPDSDEL ISPDSWSA	ISPF	obsolete German and Swiss German NLVs and ISPF Client/Server component	SISPSAMP
Note: ISPDDDEL is a sample job for deleting ISPF NLV and Client/Server DDDEFs in the CSI, ISPDSDEL is a sample job for deleting ISPF NLV data sets, and ISPDSWSA is a sample job for deleting ISPF Client/Server data sets.			
IKJCLNDD	TSO/E	obsolete Chinese NLV	SAMPLIB
IOECLNDD	z/OS File System	obsolete Distributed File Service	SIOESAMP
CLNOSASF	BCP	obsolete OSA/SF	SAMPLIB
ERB00CLN	RMF	obsolete DDDEFs and data sets	SAMPLIB
GFSDELET	NFS	obsolete DDDEFs and data sets for NFS	SAMPLIB

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