IBM

Program Directory

For CBPDO Installation and ServerPac Reference

z/OS

Version 2 Release 4

Program Number 5650-ZOS

CBPDO Level SMC1911

Service Level 1902

Document Date: September 2019

GI11-9848-03

> **Note**
>
> Before using this information and the product it supports, be sure to read the general information under "Notices" on page 323.

This program directory (Document Date: September 2019) applies to the elements of z/OS V2R4, program number 5650-ZOS.

FMIDs	System Name
(z/OS® Element Base and Feature FMIDs are listed in Figure 1 on page 2)	z/OS V2R4

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How to send your comments to IBM®

Exclusive elements of z/OS V2R4 (Service Level 1902)

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.

IBM or any other organizations will only use the personal information that you supply to contact you about the issues that you submit.

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.

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┌─ RATING SCALE ──────────────────────────────────────────────────────────┐
│   very                                    very         not               │
│ satisfied  <====================>  dissatisfied  applicable              │
│    1          2        3       4        5              N                 │
└──────────────────────────────────────────────────────────────────────────┘
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	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
__   Systempac
__   Other

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

__   Yes
__   No

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.

To send us comments, visit the Contact z/OS Web page at

`http://www.ibm.com/systems/z/os/zos/webqs.html`

Include the following information:

- Your name and e-mail address
- 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 V2R4. See *z/OS Planning for Installation* for planning information on z/OS V2R4. See *z/OS Upgrade Workflow* for information on migration to z/OS V2R4.

This Program Directory is intended for the system programmer who is responsible for installing the z/OS V2R4 elements using the CBPDO delivery option. If you are installing z/OS V2R4 with ServerPac, use the book *ServerPac: Installing Your Order*, which is shipped with your ServerPac to install z/OS. That book might refer to specific sections of this Program Directory for information that applies to the ServerPac installation path.

Attention z/OS V2R4 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

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The CBPDO installation of z/OS V2R4 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, JES2 and JES3 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.

In OS/390® Release 3, 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 V2R4 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 V2R4 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.

1.1.1 z/OS V2R4 Summary Table of Elements and Features

Figure 1 lists all elements and features in z/OS V2R4, 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 V2R4 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 87, and 8.3.4, "Set up File System Directories for Wave 2" on page 116.

Figure 1 (Page 1 of 8). z/OS Base Elements and Optional Features									
Element or Feature FMIDs	Level	Type	E X C L	D y n a m	Ripple	A l l o c	D D D E F	P o s t - I	I V P

Alternate Library for REXX
   HWJ9143
   JWJ9144 (Japanese)
	z/OS V1R9	Base	N	N	Wave 1D	Y	Y	Y	N

Base Control Program (BCP)
   HBB77C0
   JBB77CJ (Japanese)
 	
   HAL47C0
	z/OS V2R4	Base	Y	Y	Wave 1A
					Wave 1AL
					Wave 1A
						Y	Y	Y	Y

HUN77B0 (BCP - Support for Unicode) JUN77BJ (Support for Unicode Japanese)	z/OS V2R3	Base	Y	N	Wave 1A Wave 1AL	Y	Y	N	N
HPM77C0 (Program Management Binder)	z/OS V2R4				Wave 0	Y	Y	N	N
HPV77B0 (BCP - Capacity Provisioning)	z/OS V2R3		Y	N	Wave 1E	N	Y	N	N
IOCP HIO1104	OS/390 R1 (MVS/ESA V3)		N	N	Wave 1B	N	N	N	N
BDT HBD6602	OS/390 R2	Base	Y	N	Wave 1F	Y	Y	N	N
Note: You cannot activate any BDT functions until one or both of the optional BDT features (BDT File-to-File or BDT SNA NJE) is installed and enabled.									
BDT File-to-File JBD6201	OS/390 R2	Priced Feature	Y	Y	Wave 1F	N	N	N	N
BDT SNA NJE JBD6202	OS/390 R2	Priced Feature	Y	Y	Wave 1F	N	N	N	N
Common Information Model (CIM) HPG77C0	z/OS V2R4	Base	Y	N	Wave 1E	Y	Y	N	Y

Figure 1 (Page 2 of 8). z/OS Base Elements and Optional Features									
Element or Feature FMIDs	**Level**	**Type**	**E X C L**	**D y n a m**	**Ripple**	**A l l o c**	**D D D E F**	**P o s t - I**	**I V P**
Communications Server IP Services HIP6240 (Base)	z/OS V2R4	Base	Y	Y	Wave 1A	Y	Y	Y	Y
JIP624X (XWindows X11R4)					Wave 1A	N	N	N	N
Communications Server SNA Services HVT6240					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.									
Communications Server Security Level 3 JIP624K	z/OS V2R4	No Charge Feature	Y	N	Wave 1AL	N	N	N	N
Cryptographic Services Open Cryptographic Services Facility (OCSF) Base HCRY740	z/OS V1R9	Base	Y	N	Wave 1D	Y	Y	N	N
Integrated Cryptographic Service Facility (ICSF) HCR77D0	z/OS V2R4				Wave 1A	Y	Y	N	N
Cryptographic Services PKI Services HKY77C0	z/OS V2R4				Wave 1D	Y	Y	Y	N
System SSL HCPT440 JCPT44J (System SSL Japanese)	z/OS V2R4				Wave 1A Wave 1AL	Y	Y	N	N
DFSMSdfp HDZ2240 (Base) JDZ224K (Japanese)	z/OS V2R4	Base	Y	N	Wave 1B	Y Y	Y Y	N N	Y N
DFSMSdss see DFSMSdfp	z/OS V2R4	Priced Feature	Y	Y	Wave 1B	N	N	Y	N

Element or Feature FMIDs	Level	Type	EXCL	Dynam	Ripple	Alloc	DDDEF	Post-I	IVP
Figure 1 (Page 3 of 8). z/OS Base Elements and Optional Features									
DFSMStvs see DFSMSdfp	z/OS V2R4	Priced Feature	Y	Y	Wave 1B	N	N	Y	N
DFSMShsm see DFSMSdfp	z/OS V2R4	Priced Feature	Y	Y	Wave 1B	N	N	N	Y
DFSMSrmm see DFSMSdfp	z/OS V2R4	Priced Feature	Y	Y	Wave 1B	N	N	N	Y
DFSORT HSM1P00 (Resident, Non-resident, Locale)	z/OS V2R4	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 HCS77C0 (Base, English) JCS77CJ (Japanese)	z/OS V2R4	Base	Y	N	Wave 1B	Y	Y	N	Y
HCM HCM1H10	z/OS V2R4	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

Element or Feature FMIDs	Level	Type	EXCL	Dynam	Ripple	Alloc	DDDEF	Post-I	IVP
Figure 1 (Page 4 of 8). z/OS Base Elements and Optional Features									
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
Note: IBM HTTP Server (IHS) - Powered by Apache (FMID HHAP90P) was introduced in z/OS V2R2. The level incorporated in z/OS is based on Apache HTTP Server 2.4. This exclusive element replaced the IBM HTTP Server which was based on Domino Go Web server (FMIDS HIMW530, JIMW53B, and JIMW531) shipped in previous releases.									
IBM Knowledge Center for z/OS HKCZ120	z/OS V2R4	Base	Y	N	Wave 1F	Y	Y	N	N
IBM TDS HRSL440 (IBM Tivoli Directory Server for z/OS Base) JRSL44J (IBM Tivoli Directory Server for z/OS JPN)	z/OS V2R4	Base	Y	N	Wave 1A Wave 1AL	Y	Y	N	N
IBM z/OS Liberty Embedded HWLPEM0	z/OS V2R3	Base	Y	N	Wave 1G	Y	Y	N	N
IBM z/OS Management Facility HSMA240 (z/OSMF Core Functions) HSMA241 (z/OSMF ISPF) HSMA242 (z/OSMF Resource Monitoring) HSMA243 (z/OSMF WLM) HSMA244 (z/OSMF Software Management) HSMA245 (z/OSMF Incident Log) HSMA246 (z/OSMF Capacity Provisioning) HSMA247 (z/OSMF Workflow) HSMA24A (z/OSMF Network Configuration Assistant) HSMA24E (z/OSMF zERT Network Analyzer)	z/OS V2R4	Base	Y	N	Wave 1G	Y	Y	N	N

Figure 1 (Page 5 of 8). z/OS Base Elements and Optional Features

Element or Feature FMIDs	Level	Type	E X C L	D y n a m	Ripple	A l l o c	D D D E F	P o s t - I	I V P
ICKDSF EDU1H01 FDU1H07 FDU1H08 (English panels) FDU1H09 (Japanese panels)	z990 Compatibility Support (V1R17)	Base	N	N	Wave 1C	Y	Y	N	Y
Infoprint Server HMOS705 (IP PrintWay basic mode) JMOS7J5 (Japanese)	z/OS V1R2	Priced Feature	Y	Y	Wave 1G	Y	Y	N	Y
HNET7C0 (NetSpool) JNET7CJ (Japanese)	z/OS V2R4								
HOPI7C0 (Print Interface) JOPI7CJ (Japanese)	z/OS V2R4								
Integrated Security Services Enterprise Identity Mapping HIT7750	z/OS V1R10	Base	Y	N	Wave 1D	Y	Y	N	N
Network Authentication Service HSWK440 JSWK44J (Japanese)	z/OS V2R4				Wave 1A Wave 1AL	Y	Y	N	N
Open Cryptographic Enhanced Plug-ins HRO7740	z/OS V1R9				Wave 1D	N	N	N	N
ISPF HIF7S02 JIF7S14 (Japanese) JIF7S16 (Upper Case English)	z/OS V2R4	Base	Y	N	Wave 1A Wave 1AL	Y	Y	N	Y
JES2 HJE77C0 JJE77CJ (Japanese)	z/OS V2R4	Base	Y	N	Wave 2	Y	Y	Y	N
JES3 HJS77C0	z/OS V2R4	Priced Feature	Y	Y	Wave 2	Y	Y	Y	N
Language Environment HLE77C0 JLE77CJ (Japanese)	z/OS V2R4	Base	Y	N	Wave 1A Wave 1AL	Y	Y	N	Y

Figure 1 (Page 6 of 8). z/OS Base Elements and Optional Features

Element or Feature FMIDs	Level	Type	EXCL	Dynam	Ripple	Alloc	DDDEF	Post-I	IVP
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 HDZ224N (NFS) JDZ224J (NFS Japanese)	z/OS V2R4	Base	Y	N	Wave 1G	Y	Y	N	Y
OpenSSH for z/OS HOS2240	z/OS V2R4	Base	Y	N	Wave 1C	N	Y	N	N
Restricted Use Common Service Area(RUCSA) HBB77C0	z/OS V2R4	Priced Feature	Y	Y	Wave 1A	N	N	N	N
RMF HRM77C0 JRM77CJ (Japanese)	z/OS V2R4	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 HQX77C0	z/OS V2R4	Priced Feature	Y	Y	Wave 2	Y	Y	Y	N
Note: SDSF JES2 Support was removed in z/OS V2R2. As of z/OS V2R3, the SDSF Japanese feature has been discontinued.									
Security Server (RACF) HRF77C0 JRF77CJ (Japanese)	z/OS V2R4	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 HTE77C0 JTE77CE (Information Center Facility and English) JTE77CJ (Japanese)	z/OS V2R4	Base	Y	N	Wave 1C	Y	Y	Y	N

Element or Feature FMIDs	Level	Type	EXCL	Dynam	Ripple	Alloc	DDDEF	Post-I	IVP

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
z/OS Container Extensions HZDC7C0	z/OS V2R4	Base	Y	N	Wave 1G	Y	Y	N	N

z/OS File System
  HZFS440
  JZFS44J
(Japanese)
	z/OS V2R4	Base	Y	N	Wave 1G	Y	Y	N	N

z/OS Font Collection
  HFNT130
  HFNT13J (Chinese, Japanese, Korean)
	z/OS V2R4	Base	Y	N	Wave 1G	Y	Y	N	N

z/OS Security Level 3		No Charge Feature			Wave 1D				
OCSF Security Level 3 JCRY741	z/OS V1R9		Y	N		N	N	N	N
System SSL Security Level 3 JCPT441	z/OS V2R4		Y	N		N	N	N	N
Network Authentication Service Security Level 3 JSWK441	z/OS V2R4		Y	N		N	N	N	N
IBM TDS Security Level 3 JRSL441	z/OS V2R4		Y	N		N	N	N	N

z/OS UNIX System Services
  HOT77C0 (Application Services)
  JOT77CJ (Japanese)
	z/OS V2R4	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

Figure 1 (Page 7 of 8). z/OS Base Elements and Optional Features

Figure 1 (Page 8 of 8). z/OS Base Elements and Optional Features									
Element or Feature FMIDs	Level	Type	EXCL	Dynam	Ripple	Alloc	DDDEF	Post-I	IVP
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 V2R4 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 V2R4.
- 3.0, "Program support" on page 15 describes the IBM support available for z/OS V2R4.
- 4.0, "Program and service level information" on page 21 lists the APARs (program level) and PTFs (service level) incorporated into z/OS V2R4.
- 5.0, "Installation requirements and considerations" on page 27 identifies the resources and considerations for installing and using z/OS V2R4.
- 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 V2R4.
- 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 V2R4.
- Appendix A, "Component IDs for Elements in z/OS V2R4" on page 251 lists the component IDs of the z/OS V2R4.
- Appendix B, "APARs Incorporated into Elements of z/OS V2R4" on page 263 lists the integrated APARs for the z/OS V2R4 elements.
- Appendix C, "DASD Storage Requirements Tables" on page 281 describes the space requirements for the z/OS V2R4 data sets.
- Appendix D, "Additional Cleanup Jobs for z/OS V2R4" on page 321 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 V2R4 or in z/OS V2R4.

Before installing z/OS V2R4, 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 V2R4 with ServerPac, use *ServerPac: Installing Your Order*, which was shipped with your ServerPac to install z/OS V2R4. 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 V2R4 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 V2R4 is 5650-ZOS.

The program announcement material describes the features supported by z/OS V2R4. 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 V2R4 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 V2R4, see *z/OS Information Roadmap*.

2.3 Program source materials

No program viewable program listings (View Program Listings) are provided for z/OS V2R4.

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

3.0 Program support

This section describes the IBM support available for z/OS V2R4.

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 V2R4, 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 25, SMP/E APPLY CHECK (All Wave 0 FMIDs and Service for z/OS V2R4) for a sample APPLY command.

If you obtained z/OS V2R4 as part of a CBPDO, HOLDDATA is included on the CBPDO. If the CBPDO for z/OS V2R4 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:

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

The elements in Figure 2 are included in the **ZOSV2R4** 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 V2R4 Summary Table of Elements and Features" on page 2.

Figure 2 (Page 1 of 4). PSP Bucket Information for z/OS V2R4 Elements in ZOSV2R4 UPGRADE		
Element	**ZOSV2R4 PSP Subset**	**FMIDs Included**
General information	ZOSGEN	General information
BCP	BCP	HBB77C0 JBB77CJ HAL47C0 HIO1104
BCP - Capacity Provisioning	CAPPROV	HPV77B0

Element	ZOSV2R4 PSP Subset	FMIDs Included
BCP Program Management Binder	PMBINDER	HPM77C0
BCP - Support for Unicode Base BCP - Support for Unicode JPN	UNICODE	HUN77B0 JUN77BJ
Bulk Data Transfer (BDT)	BDT	HBD6602 JBD6201 JBD6202
CIM	CIM	HPG77C0
Communications Server IP	CSIP	HIP6240 JIP624K JIP624X
Communications Server for z/OS SNA Services	CSSNA	HVT6240
Cryptographic Services Open Cryptographic Services Facility Base	OCSF	HCRY740
Cryptographic Services Integrated Cryptographic Service Facility	ICSF77D0	HCR77D0
Cryptographic Services PKI Services	PKISERV	HKY77C0
Cryptographic Services System SSL	SSL	HCPT440 JCPT44J
DFSMS	DFSMS	HDZ2240 JDZ224K
DFSORT	DFSORT	HSM1P00
ESCON Director	ESCONDIR	HSWF100
HCD	HCD	HCS77C0 JCS77CJ
HCM	HCM	HCM1H10
IBM HTTP Server - Powered by Apache	ZOSIHSA	HHAP90P
IBM Knowledge Center for z/OS	KC4Z	HKCZ120
IBM TDS	LDAP	HRSL440 JRSL44J
IBM z/OS Liberty Embedded	ZOSWLPEM	HWLPEM0

Figure 2 (Page 2 of 4). PSP Bucket Information for z/OS V2R4 Elements in ZOSV2R4 UPGRADE

Figure 2 (Page 3 of 4). PSP Bucket Information for z/OS V2R4 Elements in ZOSV2R4 UPGRADE		
Element	**ZOSV2R4 PSP Subset**	**FMIDs Included**
IBM z/OS Management Facility	ZOSMF	HSMA240 HSMA241 HSMA242 HSMA243 HSMA244 HSMA245 HSMA246 HSMA247 HSMA24A HSMA24E
Infoprint Server	INFOPRINT	HMOS705 JMOS7J5 HOPI7C0 JOPI7CJ HNET7C0 JNET7CJ
Integrated Security Services Enterprise Identity Mapping	EIM	HIT7750
Integrated Security Services Network Authentication Service	NAPS	HSWK440 JSWK44J
Integrated Security Services OCEP	OCEP	HRO7740
ISPF	ISPF	HIF7S02 JIF7S14 JIF7S16
JES2	JES2	HJE77C0 JJE77CJ
JES3	JES3	HJS77C0
Language Environment	LANGENV	HLE77C0 JLE77CJ
Metal C Runtime Library	METALC	HSD7780
MICR/OCR	MICROCR	EMI2220
Network File System	NFS	HDZ224N JDZ224J
OpenSSH for z/OS	ZOSOSSH	HOS2240
RMF	RMF	HRM77C0 JRM77CJ
Runtime Library Extensions	ZOSCCPP	HTV77C0 JTV77CJ
SDSF	SDSF	HQX77C0

Figure 2 (Page 4 of 4). PSP Bucket Information for z/OS V2R4 Elements in ZOSV2R4 UPGRADE		
Element	**ZOSV2R4 PSP Subset**	**FMIDs Included**
Security Server RACF	RACF®	HRF77C0 JRF77CJ
SMP/E	SMPE	HMP1K00 JMP1K11
TSO/E	TSOE	HTE77C0 JTE77CE JTE77CJ
XL C/C++	ZOSCCPP	HLB77C0 JLB77CJ
z/OS Container Extensions	ZOSCX	HZDC7C0
z/OS File System	zFS	HZFS440 JZFS44J
z/OS Font Collection	ZOSFONTS	HFNT130 HFNT13J
z/OS Security Level 3	OCSF SSL NAPS LDAP	JCRY741 JCPT441 JSWK441 JRSL441
z/OS UNIX System Services	UNIXSS	HOT77C0 JOT77CJ
z/OS Host - 3270 Workstation File Send/Receive	3270PC	HFX1112

3.3 Additional PSP information

Figure 3 lists the PSP UPGRADEs and associated FMIDs that are NOT included in the z/OS V2R4 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 V2R4 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

Figure 3 (Page 2 of 2). PSP Bucket Information Described Outside of z/OS V2R4 UPGRADE		
Element	**PSP UPGRADE**	**Associated FMIDs**
Device Support Facility (ICKDSF)	ICKDSF017	EDU1H01 FDU1H07 FDU1H08 FDU1H09
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 V2R4 are listed in Appendix A, "Component IDs for Elements in z/OS V2R4" on page 251.

4.0 Program and service level information

This section identifies the program and service levels of z/OS V2R4. 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 V2R4 integration test (SOURCEID ZOSV2R4 for z/OS V2R4) 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 V2R4 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 V2R4) or prior levels of z/OS V2R4 elements that have been incorporated into this release are listed in Appendix B, "APARs Incorporated into Elements of z/OS V2R4" on page 263.

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 V2R4 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 V2R4 was ordered. Therefore, the service level of the FMIDs after you have installed z/OS V2R4 will be higher than what is listed and will depend on when it was ordered.

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	• HBB77C0 (SMC1909 / PUT1902) • JBB77CJ (SMC1909 / PUT1902) • HAL47C0 (initial release) • HUN77B0 (SMC1709 / PUT1702) • JUN77BJ (SMC1709 / PUT1702) • HPV77B0 (SMC1709 / PUT1702) • HPM77C0 (SMC1910 / PUT1902) • HIO1104 (SMC9020 / PUT9002)
BDT	• HBD6602 (SMC9615 / PUT9603) • JBD6201 (SMC9615 / PUT9603) • JBD6202 (SMC9615 / PUT9603)
Common Information Model (CIM)	• HPG77C0 (SMC1910 / PUT1902)

Communications Server	• IP
	  – HIP6240 (SMC1911 / PUT1903)
	  – JIP624X (SMC1911 / PUT1903)
	  – JIP624K (SMC1911 / PUT1903)
	• SNA
	  – HVT6240 (SMC1911 / PUT1903)

Cryptographic Services	• Cryptographic Services ICSF
	  – HCR77D0 (SMC1842 / PUT1809)
	• Open Cryptographic Services Facility
	  – HCRY740 (SMC0711 / PUT0703)
	• Cryptographic Services PKI Services
	  – HKY77C0 (SMC1911 / PUT1902)
	• System SSL
	  – HCPT440 (SMC1909 / PUT1902)
	  – JCPT44J (SMC1909 / PUT1902)

DFSMS	• HDZ2240 (SMC1910 / PUT1902) • JDZ224K (SMC1910 / PUT1902)
DFSORT	• HSM1P00 (SMC1910 / PUT1902)
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	• HCS77C0 (SMC1911 / PUT1902) • JCS77CJ (SMC1911 / PUT1902)

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

Element / Feature	FMIDs and Service Levels
HCM	• HCM1H10 (SMC1910 / PUT1902)
HLASM	• HMQ4160 (SMC0814 / PUT0803)
HLASM Toolkit	• JMQ416A (SMC0814 / PUT0803)
IBM HTTP Server - Powered by Apache	• HHAP90P (SMC1512 / PUT1502)
IBM Knowledge Center for z/OS	• HKCZ120 (SMC1911 / PUT1902)
IBM TDS	• HRSL440 (SMC1909 / PUT1902) • JRSL44J (SMC1909 / PUT1902)
IBM z/OS Liberty Embedded	• HWLPEM0 (SMC1710 / PUT1702)
IBM z/OS Management Facility	• HSMA240 (SMC1909 / PUT1902) • HSMA241 (SMC1909 / PUT1902) • HSMA242 (SMC1909 / PUT1902) • HSMA243 (SMC1909 / PUT1902) • HSMA244 (SMC1909 / PUT1902) • HSMA245 (SMC1909 / PUT1902) • HSMA246 (SMC1909 / PUT1902) • HSMA247 (SMC1909 / PUT1902) • HSMA24A (SMC1908 / PUT1901) • HSMA24E (SMC1909 / PUT1902)
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
	  – HNET7C0 (SMC1905 / PUT1901)
	  – JNET7CJ (SMC1905 / PUT1901)
	• Print Interface
	  – HOPI7C0 (SMC1905 / PUT1901)
	  – JOPI7CJ (SMC1905 / PUT1901)

Integrated Security Services	• Enterprise Identity Mapping
	  – HIT7750 (SMC0811 / PUT0802)
	• Network Authentication Service
	  – HSWK440 (SMC1909 / PUT1902)
	  – JSWK44J (SMC1909 / PUT1902)
	• Open Cryptographic Enhanced Plug-ins
	  – HRO7740 (SMC0710 / PUT0702)

ISPF	• HIF7S02 (SMC1911 / PUT1903) • JIF7S14 (SMC1911 / PUT1903) • JIF7S16 (SMC1911 / PUT1903)

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

Element / Feature	FMIDs and Service Levels
JES2	• HJE77C0 (SMC1910 / PUT1902) • JJE77CJ (SMC1910 / PUT1902)
JES3	• HJS77C0 (SMC1910 / PUT1902)
Language Environment	• HLE77C0 (SMC1909/ PUT1902) • JLE77CJ (SMC1909/ PUT1902)
Metal C Runtime Library	• HSD7780 (SMC1108 / PUT1102)
MICR/OCR 2.2.0	• EMI2220
Network File System	• HDZ224N (SMC1909 / PUT1902) • JDZ224J (SMC1909 / PUT1902)
OpenSSH for z/OS	• HOS2240 (SMC1910 / PUT1902)
RMF	• HRM77C0 (SMC1910 / PUT1902) • JRM77CJ (SMC1910 / PUT1902)
Runtime Library Extensions	• HTV77C0 (SMC1902 / PUT1902) • JTV77CJ (SMC1902 / PUT1902)
SDSF	• HQX77C0 (SMC1910 / PUT1902)

Security Server	• RACF
	  − HRF77C0 (SMC1910 / PUT1902)
	  − JRF77CJ (SMC1910 / PUT1902)

SMP/E	• HMP1K00 (SMC1909 / PUT1902) • JMP1K11 (SMC1905 / PUT1901)
TIOC	• ETI1106
TSO/E	• HTE77C0 (SMC1910 / PUT1902) • JTE77CE (SMC1910 / PUT1902) • JTE77CJ (SMC1910 / PUT1902)
XL C/C++	• HLB77C0 (SMC1902 / PUT1902) • JLB77CJ (SMC1902 / PUT1902) • H24P111 • J24P112
z/OS Container Extensions	• HZDC7C0 (initial release)
z/OS File System	• HZFS440 (SMC1909 / PUT1902) • JZFS44J (SMC1909 / PUT1902)
z/OS Font Collection	• HFNT130 (SMC1908 / PUT1902) • HFNT13J (SMC1902 / PUT1901)

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

Element / Feature	FMIDs and Service Levels

z/OS Security Level 3	• IBM TDS Security Level 3
	  – JRSL441 (SMC1909 / PUT1902)
	• OCSF Security Level 3
	  – JCRY741 (SMC0714 / PUT0703)
	• Network Authentication Service Security Level 3
	  – JSWK441 (SMC1909 / PUT1902)
	• System SSL Security Level 3
	  – JCPT441 (SMC1909 / PUT1902)

z/OS UNIX System Services	• Application Services
	  – HOT77C0 (SMC1910 / PUT1902)
	  – JOT77CJ (SMC1910 / PUT1902)

z/OS Host - 3270 Workstation File Send/Receive	• HFX1112

The SMP/E installation logic for elements in z/OS V2R4 is contained in the SMPMCS file on the installation tape. These files are loaded to the SMPPTS data set when an SMP/E RECEIVE is done for z/OS V2R4. 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 on the tape. If you received this product as part of a CBPDO, PTFs not incorporated into this release are provided on the tape.

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 V2R4, see *z/OS Planning for Installation*.

5.2 Target System Requirements

For details on the target system requirements of z/OS V2R4, see *z/OS Planning for Installation*.

5.3 FMIDs Deleted

Installing z/OS V2R4 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 V2R4 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 V2R4 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 V2R4 libraries can reside on all supported DASD types.

The space requirements shown in Appendix C, "DASD Storage Requirements Tables" on page 281 are for:

- All z/OS V2R4 base elements
- All optional features that can coexist
- All corresponding national language FMIDs

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 V2R4 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 78 on page 288, when allocated at the recommended block sizes, is:

- 10944 cylinders on a 3390 device

The total space required for all the distribution data sets listed in Figure 79 on page 302, when allocated at the recommended block sizes, is:

- 19255 cylinders on a 3390 device

As of z/OS V1R7, the ROOT file system may be type HFS or zFS. The total space required on a 3390 device for the ROOT HFS file system and 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.

HFS   4980 cylinders primary and 500 cylinders secondary
zFS   4990 cylinders primary and 500 cylinders secondary

z/OS Font Collection was added in z/OS V2R1 which 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 HFNT130 and HFNT13J are installed, the approximate amount of space required in the file system is 2800 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 jobs FNTHFSAL and FNTZFSAL are provided by the element to allocate and mount a separate file system, either HFS or zFS.

There were four elements added as of z/OS V2R2: IBM HTTP Server - Powered by Apache, IBM Knowledge Center for z/OS, IBM z/OS Management Facility and OpenSSH for z/OS. These elements are installed into the root file system.

- IBM HTTP Server - Powered by Apache is installed under /usr/lpp/ihsa_zos directory.

- IBM Knowledge Center for z/OS 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.

IBM z/OS Liberty Embedded is a new element added in z/OS V2R3 and it 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 a new element added in z/OS V2R4 and it 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.

As of z/OS V1R7, the `/etc` file system may be HFS or zFS. The total space required for the file system (HFS or 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 each type 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
HFS 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 HFS or zFS sizes listed in this section are applicable to z/OS V2R4 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 V2R4, you will need to add their space requirements of HFS or zFS into the above sizes.

The total space required for all the SMP/E data sets listed in Figure 73 on page 282 is:

- 64 cylinders on a 3390 device

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

- 18461 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 V2R4.

6.0 Preparing the installation path

The following steps are required to prepare your system for the installation of the z/OS V2R4 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 V2R4"	
☐	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 V2R4

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*.

As of z/OS V1R7, the root file system along with the file systems mounted at directories /etc, /var, /tmp and /dev might be HFS or zFS file systems.

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.
- 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 V2R4 Installs

You must use the current release level of High Level Assembler, Program Management Binder, and SMP/E which are shipped with z/OS V2R4 to install z/OS V2R4 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. If SCEERUN is not in your LNKLST or LPALST on the driving system, you must add the appropriate STEPLIB DD statement to any JCL and procedures (for example, SMP/E proc).

Note: Be sure the target system's MIGLIB and SASMMOD1 libraries are APF-authorized. For information on authorizing the libraries, see *z/OS MVS Programming: Authorized Assembler Services Reference ALE-DYN*.

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

- Install the current level of High Level Assembler, the Program Management Binder and SMP/E which are shipped in z/OS V2R4 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 V2R4 are integrated into a single package with compatible service levels. Therefore, IBM expects that customers will migrate all elements of z/OS V2R4 at the same time. As of z/OS V2R1, the staging of lower releases of JES2, JES3, and SDSF is no longer supported.

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 V2R4 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, JES3, 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 V2R4 (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 V2R4 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

As of z/OS V1R3, it is no longer possible to install into empty or partially empty SMP/E zones. That is, you are required to install z/OS V2R4 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. This way, 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 V2R4 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 V2R4. 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 Communications Server Security Level 3 and z/OS Security Level 3 (both of which are optional unpriced features), are commented-out in Step 1. Therefore, if you ordered a

language, Communications Server Security Level 3, 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 or Communications Server Security Level 3 features, you also must uncomment those entries to install service for those features.

FMIDSET(ZV24W1A, ZV24W1AL, ZV24W1B,...ZV24W2) 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 V2R4 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 V2R4 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 (Page 1 of 2). Elements in FMIDSET Wave 0		
Element	**FMID(s)**	**Level**
SMP/E	HMP1K00 JMP1K11 (Japanese)	z/OS V2R4 (V3R7)
HLASM	HMQ4160	z/OS V1R10 (V1R6)

Figure 6 (Page 2 of 2). Elements in FMIDSET Wave 0		
Element	**FMID(s)**	**Level**
Program Management Binder	HPM77C0	z/OS V2R4

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, and TIOC.

Figure 7. Elements in FMIDSET Wave 1A		
Element	**FMID(s)**	**Level**
BCP	HBB77C0 HAL47C0	z/OS V2R4
	HUN77B0 (Support for Unicode)	z/OS V2R3
Communications Server IP Services	HIP6240 JIP624X (XWindows X11R4)	z/OS V2R4
Communications Server for z/OS SNA Services	HVT6240	z/OS V2R4
Cryptographic Services	HCR77D0 (ICSF) HCPT440 (System SSL)	z/OS V2R4
IBM Tivoli Directory Server (IBM TDS)	HRSL440	z/OS V2R4
Integrated Security Services	HSWK440 (Network Authentication Service Base)	z/OS V2R4
ISPF	HIF7S02	z/OS V2R4
Language Environment	HLE77C0	z/OS V2R4
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. Elements in FMIDSET Wave 1AL		
Element	**FMID(s)**	**Level**
BCP	JBB77CJ (Japanese) JUN77BJ (Unicode Japanese)	z/OS V2R4 z/OS V2R3
Communications Server	JIP624K (Security Level 3)	z/OS V2R4
Note: FMID JIP624K is export restricted.		
Cryptographic Services	JCPT44J (System SSL Japanese)	z/OS V2R4
IBM Tivoli Directory Server (IBM TDS)	JRSL44J (Japanese)	z/OS V2R4
Integrated Security Services	JSWK44J (Japanese)	z/OS V2R4
ISPF	JIF7S14 (Japanese) JIF7S16 (Upper Case English)	z/OS V2R4
Language Environment	JLE77CJ (Japanese)	z/OS V2R4

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	HIO1104 (IOCP)	MVS V3
DFSMS	HDZ2240 JDZ224K (Japanese)	z/OS V2R4
HCD	HCS77C0 (Base and English) JCS77CJ (Japanese)	z/OS V2R4
z/OS UNIX System Services	HOT77C0 (Application Services) JOT77CJ (Japanese)	z/OS V2R4

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 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	HOS2240	z/OS V2R4
TSO/E	HTE77C0 JTE77CE (Information Center Facility and English) JTE77CJ (Japanese)	z/OS V2R4
Note: The English feature of TSO/E is required if you install the JPN feature.		
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	HCRY740 (Open Cryptographic Services Facility Base) HKY77C0 (PKI Services)	z/OS V1R9 z/OS V2R4
Integrated Security Services	HRO7740 (Open Cryptographic Enhanced Plug–ins) HIT7750 (Enterprise Identity Mapping)	z/OS V1R9 z/OS V1R10
Security Server (RACF)	HRF77C0 JRF77CJ (Japanese)	z/OS V2R4

Figure 11 (Page 2 of 2). Elements in FMIDSET Wave 1D		
Element	**FMID(s)**	**Level**
z/OS Security Level 3	JCRY741 (OCSF Security Level 3) JCPT441 (System SSL Security Level 3) JSWK441 (Network Authentication Service Security Level 3) JRSL441 (IBM TDS Security Level 3)	z/OS V1R9 z/OS V2R4 z/OS V2R4 z/OS V2R4
Note: FMIDs JCRY741, JCPT441, JSWK441, and JRSL441 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	HPV77B0	z/OS V2R3
Common Information Model (CIM)	HPG77C0	z/OS V2R4
RMF	HRM77C0 JRM77CJ (Japanese)	z/OS V2R4
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 BDT, DFSORT, HCM, HLASM Toolkit, and IBM Knowledge Center for z/OS. Figure 13 summarizes the contents of this wave.

Figure 13 (Page 1 of 2). Elements in FMIDSET Wave 1F		
Element	**FMID(s)**	**Level**
BDT	HBD6602 JBD6201 (File to File) JBD6202 (SNA NJE)	OS/390 R2
DFSORT	HSM1P00	z/OS V2R4
HCM	HCM1H10	z/OS V2R4

Figure 13 (Page 2 of 2). Elements in FMIDSET Wave 1F		
Element	**FMID(s)**	**Level**
HLASM Toolkit	JMQ416A	z/OS V1R10 (V1R6)
IBM Knowledge Center for z/OS	HKCZ120	z/OS V2R4

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. 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	HSMA240 (z/OSMF Core Functions) HSMA241 (z/OSMF ISPF) HSMA242 (z/OSMF Resource Monitoring) HSMA243 (z/OSMF WLM) HSMA244 (z/OSMF Software Management) HSMA245 (z/OSMF Incident Log) HSMA246 (z/OSMF Capacity Provisioning) HSMA247 (z/OSMF Workflow) HSMA24A (z/OSMF Network Configuration Assistant) HSMA24E (z/OSMF zERT Network Analyzer)	z/OS V2R4
Infoprint Server	HOPI7C0 (Print Interface Base) JOPI7CJ (Japanese) HNET7C0 (NetSpool Base) JNET7CJ (Japanese)	z/OS V2R4
	HMOS705 (IP PrintWay basic mode) JMOS7J5 (Japanese)	z/OS V1R2
Network File System	HDZ224N JDZ224J (Japanese)	z/OS V2R4
z/OS Container Extensions	HZDC7C0	z/OS V2R4
z/OS File System	HZFS440 JZFS44J (Japanese)	z/OS V2R4
z/OS Font Collection	HFNT130 HFNT13J (Chinese, Japanese, Korean)	z/OS V2R4

6.5.3.10 Elements in Wave 2

Wave 2 contains the JES2, JES3 and SDSF elements, which are listed in Figure 15 on page 42.

Figure 15. Elements in FMIDSET Wave 2		
Element	**FMID(s)**	**Level**
JES2	HJE77C0 JJE77CJ (Japanese)	z/OS V2R4
JES3	HJS77C0	z/OS V2R4
SDSF	HQX77C0	z/OS V2R4

Note:

1. SDSF Japanese feature has been discontinued as of z/OS V2R3 and will not be shipped.

2. To assemble SDSF, JES2 is required.

3. If you are installing z/OS V2R4 on a z/OS V2R2 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 V2R4 SDSF only assembles with z/OS V2R4 JES2.

4. Starting from z/OS V1R10, the SDSF element can be used with either the JES2 or JES3 element. For releases earlier than z/OS V1R10, the SDSF element can only be used with the JES2 element.

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 V2R4 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 V2R4 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 *SMP/E for z/OS 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 *SMP/E for z/OS 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 V2R4 uses the CALLLIBS function that is provided in SMP/E to resolve external references during installation. Before z/OS V2R4 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
- 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 V2R4.

- 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, JES3, 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 50	
☐	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	
☐	HFS or 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 57	
		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	

7.1 Step 1: RECEIVE the Wave 0 elements

You must use the current level of SMP/E, which is included with z/OS V2R4 to install z/OS V2R4 Wave 1 and Wave 2 elements. Therefore, you must receive the Wave 0 FMIDs by only using the SELECT and FORFMID operands to limit SMP/E processing at this time. 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 *SMP/E for z/OS 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 V2R4 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=zosv2r4.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,
            JMP1K11,  /* see NOTE 2 below */
            HMQ4160, /* see NOTE 1 below */
            HPM77C0
            )
         SYSMODS
         HOLDDATA
         FORFMID (
            HMP1K00,
            JMP1K11,  /* see NOTE 2 below */
            HMQ4160,
            HPM77C0
            ).

  /*
```

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

Notes:

1. If High Level Assembler (HLASM) has been previously installed, remove FMID HMQ4160 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.
- Consider using a SystemPac.
- 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 `zosv2r4.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=zosv2r4.global.csi
//SMPHOLD DD DUMMY
//SMPCNTL DD *
 SET BDY(GLOBAL) OPTIONS(ZOSOPT).
 RECEIVE S(DM0FMID).
/*
//SMPPTFIN DD *
++FUNCTION (DM0FMID) REWORK(2017060).
++VER(Z038)
   DELETE(#fmid1,#fmid2).
/*
//STEP2 EXEC PGM=GIMSMP,REGION=0M,TIME=NOLIMIT,COND=(4,LT)
//SMPCSI DD DISP=SHR,DSN=zosv2r4.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=zosv2r4.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=zosv2r4.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 281. Sample jobs to allocate the target and distribution libraries for some elements have been provided. See Appendix C, "DASD Storage Requirements Tables" on page 281 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.HPM77C0.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 78 on page 288 and Figure 79 on page 302 for z/OS V2R4. 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.HPM77C0.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 *SMP/E for z/OS 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 100 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=zosv2r4.global.csi,DISP=SHR
//SMPCNTL  DD *
  SET BDY(GLOBAL) .
    UCLIN .
      ADD GLOBALZONE ZONEINDEX(
        (jes2tgt,jes2.target.csi,TARGET)
        (jes3tgt,jes3.target.csi,TARGET)
        (pptgt,pgmprod.target.csi,TARGET)
        (db2tgt,db2.target.csi,TARGET)
        (imstgt,ims.target.csi,TARGET)
        (cicstgt,cics.target.csi, TARGET)
        (jes2dlb,jes2.dlib.csi,DLIB)
        (jes3dlb,jes3.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,
             jes3tgt,
             pptgt,
             cicstgt,
             db2tgt,
             imstgt,
             jes2dlb,
             jes3dlb,
             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 V2R4 Wave 0 FMIDs to install

Select which z/OS V2R4 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=zosv2r4.global.csi,DISP=SHR
//SMPCNTL DD *
  SET BOUNDARY(targetzone) .
  APPLY CHECK XZREQ
   FORFMID(HMP1K00,
           JMP1K11,               /* see Note 2 below */
           HMQ4160,
           HPM77C0)
   SELECT(HMP1K00,
           JMP1K11,               /* see Note 2 below */
           HMQ4160,               /* see Note 1 below */
           HPM77C0)
   GROUPEXTEND(NOAPARS,NOUSERMODS)
   SOURCEID(ZOSV2R4,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 V2R4)

Notes:

1. If High Level Assembler (HLASM) has been previously installed, remove FMID HMQ4160 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
HPM77C0 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  IEWTPORT
```

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=zosv2r4.global.csi,DISP=SHR
//SMPCNTL DD *
  SET BOUNDARY(targetzone).
  APPLY XZREQ
   FORFMID(HMP1K00,
           JMP1K11,            /* see NOTE 2 below */
           HMQ4160,
           HPM77C0)
   SELECT(HMP1K00,
           JMP1K11,            /* see NOTE 2 below */
           HMQ4160,            /* see NOTE 1 below */
           HPM77C0)
   GROUPEXTEND(NOAPARS,NOUSERMODS)
   SOURCEID(ZOSV2R4,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 V2R4)

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) has been previously installed, remove FMID HMQ4160 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
HPM77C0 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  IEWTPORT
```

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 V2R4 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 V2R4.

Target zone SYSLIB concatenation

- SMPMTS
- MACLIB
- MODGEN
- SISTMAC1 (for Communications Server for z/OS SNA Services)
- SEPWMAC1 (for FFST)
- 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.

- For JES3 systems at the z/OS level, you should add SIATMAC.

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 V2R4.

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.
- For JES3 systems at the z/OS level, you should add AIATMAC.

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 V2R4.
  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 on the tapes assume that all data sets required for SMP/E processing are defined in DDDEFs in the appropriate zones. Refer to *SMP/E for z/OS 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=v2r4vol1
//         DD DSN=ASM.SASMMOD1,DISP=SHR,
//          UNIT=SYSALLDA,VOL=SER=v2r4vol1
//SMPCSI DD DSN=zosv2r4.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,
         jes3dlb,
         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 v2r4vol1 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 V2R4 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 V2R4 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 HJE77C0 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 V2R4 FMIDs.

13. COPY(COPY) indicates that SMP/E will use the utility IEBCOPY.

For more information on SMP/E customization, see *SMP/E for z/OS 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 V2R4, including the elements which are installed into the file system.

In z/OS V2R4, the CBPDO driving system requirements are as follows:

- For the Wave 1 and Wave 2 elements installation, the driving system must be z/OS V2R2 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 V6.0 or higher (5655-R31), or IBM 64-bit SDK for z/OS Java Technology Edition V6.0 or higher (5655-R32) must be available on the driving system.

- If you plan to install z/OS V2R4 into zFS file systems, make sure that zFS is configured and active on the driving system.

This release of z/OS V2R4 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	

Check Box	Activity	Section, Step Description	Your Notes
		Figure 26 (Page 2 of 5). Checklist for Wave 1 and Wave 2 Installation	
		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 76	
		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 82	
☐	Create file system directories	8.1.8, "Create file system directories for Wave 1" on page 87	
☐	Define DDDEFs	8.1.9, "Define DDDEFs for Wave 1 Elements" on page 91	
☐		8.1.10.1, "Migration actions" on page 95	
☐	APPLY	8.2, "Step 2: APPLY Wave 1" on page 95	
☐	FMIDs to Install	8.2.1, "Select which z/OS Wave 1 FMIDs to install" on page 95	
☐	Apply Check Wave 1	8.2.2, "Do an SMP/E APPLY CHECK for Wave 1 FMIDs and service" on page 96	
☐	Apply Wave 1	8.2.2.9, "Do an SMP/E APPLY for Wave 1 FMIDs and Service" on page 100	
☐	Prepare	8.3.1, " Prepare to install Wave 2" on page 113	
☐	Run the Optional Delete Jobs	8.3.2, "Run the Optional Delete Jobs for Wave 2" on page 114	
☐	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 116	
☐	Define DDDEFs	8.3.5, "Define DDDEFs for Wave 2 Elements" on page 117	

Check Box	Activity	Section, Step Description	Your Notes
		Figure 26 (Page 3 of 5). Checklist for Wave 1 and Wave 2 Installation	

Check Box	Activity	Section, Step Description	Your Notes
☐	Set High Level Assembler Options	8.3.6, "Set High Level Assembler Option for SDSF" on page 118	
☐		8.3.7, "Set High Level Assembler Option for JES2" on page 118	
☐	Apply Check Wave 2	8.3.8.1, "Do an SMP/E APPLY CHECK for Wave 2" on page 118	
☐	Apply Wave 2	8.3.8.2, "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 123	
	CNLDEFCL CNLCOMP	8.4.1.1, "Compile MMS Data Sets" on page 124	
	EZAIMSCZ	8.4.1.2, "Run Post-APPLY for Communications Server IP Services" on page 124	
	EPW12011	8.4.3.1, "Run Post-APPLY Link-Edit for FFST" on page 125	
	ICQPOST1 ICQPOST2	8.4.3.2, "Run Post-APPLY for TSO/E Information Center Facility (when appropriate)" on page 125	
	IKYCVSAM	8.4.4.1, "Run Cryptographic Services PKI Services job" on page 126	
	CLNCRSZ	8.4.9.1, "Run SMP/E REPORT CROSSZONE (Target Zone)" on page 127	
☐	Customize	8.5, "Step 5: Customize Wave 1 and Wave 2" on page 127	
	DFSMSdss Actions	8.5.1.2, "Complete DFSMSdss actions" on page 127	
	IPL Text	8.5.1.3, "Write new IPL TEXT" on page 128	
	IODF	8.5.1.4, "Create and update your IODF" on page 129	
	PARMLIB	8.5.2, "PARMLIB member considerations" on page 129	
	PROCLIB	8.5.3, "PROCLIB member considerations" on page 146	
	ISPF Setup	8.5.4, "z/OS V2R4 ISPF setup considerations" on page 150	

Figure 26 (Page 4 of 5). Checklist for Wave 1 and Wave 2 Installation			
Check Box	**Activity**	**Section, Step Description**	**Your Notes**
	Element Customize	8.5.5, "Element customization" on page 156	
		8.5.5.1, "RACF security considerations" on page 157	
		8.5.5.2, "z/OS UNIX System Services customization considerations" on page 157	
		8.5.5.3, "Customization considerations for Wave 1A" on page 158	
		8.5.5.4, "Customization considerations for Wave 1B" on page 161	
		8.5.5.5, "Customization considerations for Wave 1C" on page 169	
		8.5.5.6, "Customization considerations for Wave 1D" on page 171	
		8.5.5.7, "Customization considerations for Wave 1E" on page 173	
		8.5.5.8, "Customization considerations for Wave 1F" on page 175	
		8.5.5.9, "Customization considerations for Wave 1G" on page 179	
		8.5.5.10, " Customization for Wave 2" on page 183	
☐	Verify Installation	8.6, "Step 6: Verify installation of Wave 0, Wave 1 and Wave 2" on page 184	
	IPL	8.6.1, "IPL the z/OS system" on page 184	
	IVPs	8.6.2, "Verify installation of z/OS V2R4 Wave 0, Wave 1 and Wave 2 FMIDs" on page 187	
		8.6.2.1, "IVP jobs for Wave 0" on page 190	
		8.6.3, "IVP jobs for Wave 1A" on page 194	
		8.6.4, "IVP jobs for Wave 1B" on page 194	
		8.6.5, "IVP jobs for Wave 1C" on page 215	
		8.6.6, "IVP jobs for Wave 1D" on page 223	
		8.6.7, "IVP jobs for Wave 1E" on page 223	
		8.6.8, "IVP jobs for Wave 1F" on page 226	
		8.6.9, "IVP jobs for Wave 1G" on page 231	
		8.6.10.1, "Run the installation verification procedure for SDSF" 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**
☐	ACCEPT	8.7, "Step 7: ACCEPT Wave 0, Wave 1 and Wave 2" on page 234	
		8.7.2, "Do an SMP/E ACCEPT CHECK for Wave 0 and Wave 1 FMIDs and Service" on page 235	
		8.7.3, "Do an SMP/E ACCEPT for Wave 0 and Wave 1 FMIDs and service" on page 239	
		8.7.4, "Do an SMP/E ACCEPT CHECK for Wave 2" on page 245	
		8.7.5, "Do an SMP/E ACCEPT for Wave 2" on page 247	
☐	CLEAN UP	8.8, "Step 8: Clean up after Wave 1 and Wave 2" on page 249	

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 V2R4 FMIDs that are installed into the file system, as well as the z/OS V2R4 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 V2R4 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 V2R4

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 job BPXISHFS for space required in the HFS root, or BPXISZFS for space required in the ZFS root. The sample jobs will reside in 'prefix.HBB77C0.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 jobs FNTHFSAL and FNTZFSAL provided in FMID HFNT130 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 or BPXISHFS 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 V2R4. If you plan to install z/OS V2R4 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, IBM Knowledge Center for z/OS, OpenSSH for z/OS, and IBM z/OS Management Facility. These elements are installed into the root file system.

If you plan to install z/OS V2R4 into HFS file systems, specify TYPE(HFS) on the root and mount statements shown above.

2. Ensure that your target root file system data set has been increased prior to installing 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 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 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 185). 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 V2R4 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 185).

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. If you install z/OS V2R4 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 addition to HFS and 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 V2R4 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 V2R4 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 HBB77C0 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.HBB77C0.F6' to remove the withdrawn elements that are not part of z/OS V2R4.

Note: Figure 27 shows withdrawn elements in z/OS V2R4. If you are migrating from z/OS V2R2, or V2R3, 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. Withdrawn Elements from z/OS	
Element Name	**Withdrawn In**

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

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

Library Server HBKQ400	z/OS V2R4
OSA/SF H0GI400	z/OS V2R4

To run the job, perform the following functions:

- Copy the sample job from member CLNOS390 of the SMPTLIB, 'prefix.HBB77C0.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, you will receive the message `GIM39701W SYSMOD DELZOS1 HAS NO ELEMENTS.`, where DELZOS1 is the dummy function delete sysmods. This is acceptable.

After completing the dummy function delete and installing z/OS V2R4, 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 three new sample jobs provided to perform the above tasks. Copy these jobs from SMPTLIB, 'prefix.HBB77C0.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.
- 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.

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.HBB77C0.F6'. This sample JCL contains a dummy function, DM1FMID, that can be used to delete functions replaced by the z/OS V2R4 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 V2R4 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.HBB77C0.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.HDZ2240.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.HDZ2240.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 281. 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 83 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 281 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.HBB77C0.F6'
Note: See note 4 on page 86.			
CUNJUALC	ALLOCATE	BCP Base-Support for Unicode	'prefix.HUN77B0.F1'
BDTJALC	ALLOCATE	BDT	'prefix.HBD6602.F1'
CTVJALL	ALLOCATE	C/C++ Host Performance Analyzer	'prefix.H24P111.F1'
CFZALLOC	ALLOCATE	Common Information Model (CIM)	'prefix.HPG77C0.F1'

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

Job Name	Job Type	Description	RELFILE
EZACSALC	ALLOCATE	Communications Server	'prefix.HIP6240.F1'
CSFALLOC	ALLOCATE	Cryptographic Services ICSF	'prefix.HCR77D0.F1'
Note: See note 5 on page 86.			
CDSISALC	ALLOCATE	Cryptographic Services OCSF	'prefix.HCRY740.F1'
IKYALLOC	ALLOCATE	Cryptographic Services PKI Services	'prefix.HKY77C0.F1'
GSKISALC	ALLOCATE	Cryptographic Services System SSL	'prefix.HCPT440.F1'
DFPALLOC	ALLOCATE	DFSMS	'prefix.HDZ2240.F1'
DGTALLOC	ALLOCATE	DFSMS Japanese	'prefix.JDZ224K.F2'
Note: See note 6 on page 86.			
ICEALLOC	ALLOCATE	DFSORT	'prefix.HSM1P00.F1'
EPW12003	ALLOCATE	FFST	'prefix.HFST101.F4'
IEFGDDMA	ALLOCATE	GDDM (includes GDDM-PGF)	'prefix.HBB77C0.F6'
CBDSALLC	ALLOCATE	HCD	'prefix.HCS77C0.F2'
EEQHCALC	ALLOCATE	HCM	'prefix.HCM1H10.F1'
ASMWTALC	ALLOCATE	HLASM Toolkit	'prefix.JMQ416A.F1'
HAPALLO3	ALLOCATE	IBM HTTP Server - Powered by Apache	'prefix.HHAP90P.F1'
HKC00ALC	ALLOCATE	IBM Knowledge Center for z/OS	'prefix.HKCZ120.F2'
GLDISALC	ALLOCATE	IBM Tivoli Directory Server for z/OS Base	'prefix.HRSL440.F1'
BBLALLOC	ALLOCATE	IBM z/OS Liberty Embedded	'prefix.HWLPEM0.F1'
Note: See note 11 on page 87.			
IZUISALC	ALLOCATE	IBM z/OS Management Facility	'prefix.HSMA240.F3'
ICKALLOC	ALLOCATE	ICKDSF	'prefix.EDU1H01.F3'
Note: See note 8 on page 86.			
ICKALLKG	ALLOCATE	ICKDSF Japanese	'prefix.FDU1H09.F2'
AOPALLOC	ALLOCATE	Infoprint Server	'prefix.HOPI7C0.F1'

Job Name	Job Type	Description	RELFILE
Figure 28 (Page 3 of 3). Wave 1 Allocate Sample Installation Jobs			
ITYALLOC	ALLOCATE	Integrated Security Services Enterprise Identity Mapping	'prefix.HIT7750.F3'
EUVFSALC	ALLOCATE	Integrated Security Services Network Authentication Service	'prefix.HSWK440.F1'
ISPALLOC	ALLOCATE	ISPF Base, Client Server, SCLM & English	'prefix.HIF7S02.F1'
ISPALJPN	ALLOCATE	ISPF Japanese	'prefix.JIF7S14.F1'
ISPALENP	ALLOCATE	ISPF Upper Case English	'prefix.JIF7S16.F1'
CEEISALC	ALLOCATE	Language Environment	'prefix.HLE77C0.F1'
CCRALLOC	ALLOCATE	Metal C Runtime Library	'prefix.HSD7780.F4'
GFSALLOC	ALLOCATE	Network File System	'prefix.HDZ224N.F1'
ERB00ALC	ALLOCATE	RMF (Base and Japanese)	'prefix.HRM77C0.F3'
CLB3JALL	ALLOCATE	Runtime Library Extensions	'prefix.HTV77C0.F1'
IRRALLOC	ALLOCATE	Security Server RACF	'prefix.HRF77C0.F1'
IKJBALL	ALLOCATE	TSO/E	'prefix.HTE77C0.F2'
CCNJALOC	ALLOCATE	XL C/C++	'prefix.HLB77C0.F1'
Note: See note 9 on page 86.			
AZDISALC	ALLOCATE	z/OS Container Extensions	'prefix.HZDC7C0.F2'
Note: See note 12 on page 87.			
IOEIZALC	ALLOCATE	z/OS File System	'prefix.HZFS440.F1'
FNTALLOC	ALLOCATE	z/OS Font Collection	'prefix.HFNT130.F1'
Note: See note 10 on page 86.			

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 83, 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 91).

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 Security Level 3

Communications Server X11R4 XWindows
EREP
ESCON Director Support
HCD Japanese
IBM Tivoli Directory Server for z/OS Japanese
Integrated Security Services OCEP
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. If you are migrating from z/OS V2R2, you must run the sample job CSFALLOC to create the new library before installing Cryptographic Services ICSF.

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 281 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. You must run sample job CCNJALOC to allocate the new libraries before installing XL C/C++ if you are migrating from z/OS V2R2.

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. If you are migrating from z/OS V2R2, you must run the sample job provided by the element to allocate the required target and distribution libraries before installing the element.

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.

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 V2R4" on page 315. 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 V2R4" 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 185).

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 2). Wave 1 Define Directories Sample Installation Jobs			
Job Name	**Job Type**	**Description**	**RELFILE**
BPXISMKD	MKDIR	BCP	'prefix.HBB77C0.F6'
Note: See note 8 on page 90.			
CPOISMKD	MKDIR	BCP - Capacity Provisioning	'prefix.HPV77B0.F1'
CFZISMKD	MKDIR	Common Information Model (CIM)	'prefix.HPG77C0.F1'
EZAISMKD	MKDIR	Communications Server IP	'prefix.HIP6240.F1'
CSFISMKD	MKDIR	Cryptographic Services ICSF	'prefix.HCR77D0.F1'
CDSISMKD	MKDIR	Cryptographic Services OCSF	'prefix.HCRY740.F1'

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

Job Name	Job Type	Description	RELFILE
IKYISMKD	MKDIR	Cryptographic Services PKI Services	'prefix.HKY77C0.F1'
GSKISMKD	MKDIR	Cryptographic Services System SSL	'prefix.HCPT440.F1'
DFPISMKD	MKDIR	DFSMS HFS	'prefix.HDZ2240.F1'
HAPISMK3	MKDIR	IBM HTTP Server - Powered by Apache	'prefix.HHAP90P.F1'
HKCISMKD	MKDIR	IBM Knowledge Center for z/OS	'prefix.HKCZ120.F2'
GLDISMKD	MKDIR	IBM Tivoli Directory Server for z/OS Base	'prefix.HRSL440.F1'
BBLISMKD	MKDIR	IBM z/OS Liberty Embedded	'prefix.HWLPEM0.F1'
Note: See note 7 on page 90.			
IZUISMKD	MKDIR	IBM z/OS Management Facility	'prefix.HSMA240.F3'
AOPISMKD	MKDIR	Infoprint Server	'prefix.HOPI7C0.F1'
ITYISMKD	MKDIR	Integrated Security Services Enterprise Identity Mapping	'prefix.HIT7750.F3'
EUVFSMKD	MKDIR	Integrated Security Services Network Authentication Service	'prefix.HSWK440.F1'
ISPISMKD	MKDIR	ISPF	'prefix.HIF7S02.F1'
CEEISMKD	MKDIR	Language Environment	'prefix.HLE77C0.F1'
GFSISMKD	MKDIR	Network File System	'prefix.HDZ224N.F1'
FOTISMKD	MKDIR	OpenSSH for z/OS	'prefix.HOS2240.F1'
ERBISMKD	MKDIR	RMF™	'prefix.HRM77C0.F3'
CLBISMKD	MKDIR	Runtime Library Extensions	'prefix.HTV77C0.F1
CCNISMKD	MKDIR	XL C/C++	'prefix.HLB77C0.F1'
AZDISMKD	MKDIR	z/OS Container Extensions	'prefix.HZDC7C0.F2'
Note: See note 9 on page 90.			
IOEIZMKD	MKDIR	z/OS File System	'prefix.HZFS440.F1'
FNTISMKD	MKDIR	z/OS Font Collection	'prefix.HFNT130.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 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. Integrated Security Services OCEP (HRO7740), which is setup by Cryptographic Services OCSF, does not supply a MKDIR job.

5. Dependent FMIDs that are installed into the file system and not listed in Figure 29 on page 87 use directories created by their base FMIDs.

6. 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 and sample job FNTHFSAL is provided to allocate an HFS for z/OS Font Collection. The jobs reside in 'prefix.HFNT130.F1' after SMP/E RECEIVE processing is complete. Refer to the sample jobs for information on allocating and mounting a file system for z/OS Font Collection.

7. 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. If you are migrating from z/OS V2R2, you must allocate and mount the separate file system at the recommended mountpoint, sample job BBLZFS is provided in FMID HWLPEM0, then run the BBLISMKD sample job to create the required directories before installing IBM z/OS Liberty Embedded.

8. There is new directory added in z/OS V2R4 BCP FMID. You must run the BPXISMKD job to create the new directory before installation.

9. A new element z/OS Container Extensions is being 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. 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.

8.1.9 Define DDDEFs for Wave 1 Elements

Verify your target and distribution libraries have the DDDEF entries listed in Figure 78 on page 288 and Figure 79 on page 302 for z/OS V2R4. 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 on page 91 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.HBB77C0.F6'
Note: See note 6 on page 94.			
CUNJUDDF	DDDEF	BCP Base-Support for Unicode	'prefix.HUN77B0.F1'
CPODDDEF	DDDEF	BCP - Capacity Provisioning	'prefix.HPV77B0.F1'
BDTJDDEF	DDDEF	BDT	'prefix.HBD6602.F1'
CTVJDDF	DDDEF	C/C++ Host Performance Analyzer	'prefix.H24P111.F1'

Figure 30 (Page 2 of 3). Wave 1 DDDEF Sample Installation Jobs			
Job Name	**Job Type**	**Description**	**RELFILE**
CFZDDDEF	DDDEF	Common Information Model (CIM)	'prefix.HPG77C0.F1'
EZACSDDF	DDDEF	Communications Server	'prefix.HIP6240.F1'
CSFDDDEF	DDDEF	Cryptographic Services ICSF	'prefix.HCR77D0.F1'
Note: See note 7 on page 94.			
IKYDDDEF	DDDEF	Cryptographic Services PKI Services	'prefix.HKY77C0.F1'
CDSISDDD	DDDEF	Cryptographic Services OCSF	'prefix.HCRY740.F1'
GSKISDDD	DDDEF	Cryptographic Services System SSL	'prefix.HCPT440.F1'
DFPDDDEF	DDDEF	DFSMS	'prefix.HDZ2240.F1'
DGTDDDEF	DDDEF	DFSMS Japanese	'prefix.JDZ224K.F2'
Note: See note 8 on page 94.			
ICEDDDEF	DDDEF	DFSORT	'prefix.HSM1P00.F1'
EPW12004	DDDEF	FFST	'prefix.HFST101.F4'
IEFGDDMD	DDDEF	GDDM (includes GDDM-PGF)	'prefix.HBB77C0.F6'
CBDSDDDF	DDDEF	HCD	'prefix.HCS77C0.F2'
EEQHCDDF	DDDEF	HCM	'prefix.HCM1H10.F1'
ASMWTDDF	DDDEF	HLASM Toolkit	'prefix.JMQ416A.F1'
HAPDDDE3	DDDEF	IBM HTTP Server - Powered by Apache	'prefix.HHAP90P.F1'
HKC00DDF	DDDEF	IBM Knowledge Center for z/OS	'prefix.HKCZ120.F2'
GLDISDDD	DDDEF	IBM Tivoli Directory Server for z/OS Base	'prefix.HRSL440.F1'
BBLDDDEF	DDDEF	IBM z/OS Liberty Embedded	'prefix.HWLPEM0.F1'
Note: See note 10 on page 94.			
IZUISDDD	DDDEF	IBM z/OS Management Facility	'prefix.HSMA240.F3'
ICKDDDEF	DDDEF	ICKDSF	'prefix.EDU1H01.F3'
ICKDDDKG	DDDEF	ICKDSF Japanese	'prefix.FDU1H09.F2'
AOPDDDEF	DDDEF	Infoprint Server	'prefix.HOPI7C0.F1'
ITYDDDEF	DDDEF	Integrated Security Services Enterprise Identity Mapping	'prefix.HIT7750.F3'
EUVFSDDD	DDDEF	Integrated Security Services Network Authentication Service	'prefix.HSWK440.F1'

Job Name	Job Type	Description	RELFILE
Figure 30 (Page 3 of 3). Wave 1 DDDEF Sample Installation Jobs			
ISPDDDEF	DDDEF	ISPF Base	'prefix.HIF7S02.F1'
ISPDDJPN	DDDEF	ISPF Japanese	'prefix.JIF7S14.F1'
ISPDDENP	DDDEF	ISPF Upper Case English	'prefix.JIF7S16.F1'
CEEISDDD	DDDEF	Language Environment	'prefix.HLE77C0.F1'
CCRDDDEF	DDDEF	Metal C Runtime Library	'prefix.HSD7780.F4'
GFSDDDEF	DDDEF	Network File System	'prefix.HDZ224N.F1'
FOTISDDF	DDDEF	OpenSSH for z/OS	'prefix.HOS2240.F1'
ERB00DDF	DDDEF	RMF (Base and Japanese)	'prefix.HRM77C0.F3'
CLB3JDDF	DDDEF	Runtime Library Extensions	'prefix.HTV77C0.F1'
IRRDDDEF	DDDEF	Security Server RACF	'prefix.HRF77C0.F1'
IKJBDDD	DDDEF	TSO/E	'prefix.HTE77C0.F2'
CCNJDDDF	DDDEF	XL C/C++	'prefix.HLB77C0.F1'
Note: See note 9 on page 94.			
AZDISDDD	DDDEF	z/OS Container Extensions	'prefix.HZDC7C0.F2'
Note: See note 11 on page 94.			
IOEIZDDD	DDDEF	z/OS File System	'prefix.HZFS440.F1'
FNTDDDEF	DDDEF	z/OS Font Collection	'prefix.HFNT130.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 83).

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 Security Level 3
> Communications Server X-Windows X11R4
> EREP
> ESCON Director Support
> HCD Japanese
> IOCP

MICR/OCR
TIOC
z/OS Security Level 3 OCSF Security Level 3
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. If you are migrating from z/OS V2R2, you must run the sample job CSFDDDEF to create a DDDEF entry for the new library in the SMP/E CSI before installing Cryptographic Services ICSF.

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. As of z/OS V2R3, the XL C/C++ element added new target libraries SCCNM12 and SCCNN12, and distribution libraries ACCNSR6 and ACCNSR7. If you are migrating from z/OS V2R2, you must run sample job CCNJDDDF to create the new DDDEFs in the SMP/E CSI before installing XL C/C++.

10. IBM z/OS Liberty Embedded was introduced in z/OS V2R3. If you are migrating from z/OS V2R2, you must run sample job BBLDDDEF to create the required DDDEF entries in the SMP/E CSI before installing IBM z/OS Liberty Embedded.

11. z/OS Container Extensions is being introduced in z/OS V2R4. You must run sample job AZDISDDD to create the required DDDEF entries in the SMP/E CSI before installing z/OS Container Extensions.

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 V2R4 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 V2R4, 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 V2R4, 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 V2R4 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 V2R4 ISPF setup considerations" on page 150 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 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=v2r4vol1
//        DD DSN=ASM.SASMMOD1,DISP=SHR,
//          UNIT=SYSALLDA,VOL=SER=v2r4vol1
//SMPCSI DD DSN=zosv2r4.global.csi,DISP=SHR
//SMPCNTL DD *
  SET BOUNDARY(targetzone)
      OPTIONS(ZOSOPT) .
  APPLY CHECK  XZREQ
      FORFMID(ZV24W1n)
      SELECT(WAVE1n)
      GROUPEXTEND(NOAPARS,NOUSERMODS)
      SOURCEID(ZOSV2R4,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 v2r4vol1 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 V2R4 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 ZV24W1n 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(ZV24W1n) 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 HBB77C0 BECAUSE IT IS NOT IN THE target ZONE, where *xxxxxx* will be one of the load modules:

  ```
  AMDPRFMT  ATBINPVT  IEAIPL04  IEANUC11  IEFITJT  IEFW21SD
  IWM02CMD
  ```

- GIM23913W LINK-EDIT PROCESSING FOR SYSMOD HBB77C0 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 HBB77C0 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 HIP6240
BECAUSE IT IS NOT IN THE target ZONE.
```

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

```
EZAADMLR  EZAFTSRV  EZAPPRT   EZAPPSST  GXDEM01   GXDEM02
GXDEM03   GXDEM04   GXDEM04A  GXDEM05   GXDEM06
```

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 HTE77C0:

IGC0006A IKJEFT02 IKJEFT09 IKJEGDRP IRXAPPC TEST

```
GIM61903W LMOD xxxxxxxx WAS NOT DELETED BY SYSMOD HTE77C0
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 HTE77C0:

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

```
GIM61903W ALIAS xxxxxxx WAS NOT DELETED BY SYSMOD
HTE77C0 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 HDZ224N
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 z/OS File System Apply Check

During the APPLY CHECK of z/OS File System, you may receive the following message, where *yyyyyy* is
HZFS440 and *xxxxxx* is one of the following modules:

For HZFS440 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 124, 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 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=v2r4vol1
//        DD DSN=ASM.SASMMOD1,DISP=SHR,
//          UNIT=SYSALLDA,VOL=SER=v2r4vol1
//SMPCSI DD DSN=zosv2r4.global.csi,DISP=SHR
//SMPCNTL DD *
  SET BOUNDARY(targetzone)
      OPTIONS(ZOSOPT) .
  APPLY  XZREQ
      FORFMID(ZV24W1n)
      SELECT(WAVE1n)
      GROUPEXTEND(NOAPARS,NOUSERMODS)
      SOURCEID(ZOSV2R4,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 V2R4 Wave 1)

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

Required Updates

1. Update the *job parameters*, as needed.

2. Update the v2r4vol1 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 V2R4 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 ZV24W1n 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(ZV24W1n) 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 V2R4, if the bind of IEANUC01 fails with the following message produced, the SMP/E APPLY might fail for HBB77C0, HDZ2240, HIP6240, and HFST101.

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

Cause: The z/OS V2R4 level of the Program Management Binder was not used for APPLY. The reason could either be the MIGLIB library of z/OS V2R4 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 V2R4 level of the Program Management Binder is installed to the SMP/E APPLY job, as shown in Figure 32 on page 100. 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 HBB77C0 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 HBB77C0 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 HBB77C0 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 HIP6240 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 HIP6240, 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 EZAAD00Y 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

```
EZAAD00X  EZAAD0W3  EZAAD064
```

TCPIP.SEZARPCL

```
EZAAD009 EZAAD00M EZAAD0PH EZAAD0ZO EZAAD0QA EZAAD0PY
EZAAD0QE EZAAD00A EZAAD00N EZAAD0PI EZAAD0BL EZAAD0QB
EZAAD0Q5 EZAAD0QF EZAAD00J EZAAD000 EZAAD0PJ EZAAD0Q7
EZAAD0QG EZAAD0Q6 EZAAD0QH EZAAD00K EZAAD04I EZAAD07Z
EZAAD0Q8 EZAAD0QI EZAAD0EB EZAAD0QJ EZAAD00L 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 HIP6240 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 HIP6240 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 JIP624X 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 JIP624X 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 JIP624X 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 HVT6240 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 HDZ2240.

GIM63201I    ALIAS DWW1RARR WAS DELETED FROM THE LPALIB
             LIBRARY BY SYSMOD HDZ2240.

GIM63201I    ALIAS IDABLARR WAS DELETED FROM THE LPALIB
             LIBRARY BY SYSMOD HDZ2240.

GIM63201I    ALIAS IDABLVBB WAS DELETED FROM THE LPALIB
             LIBRARY BY SYSMOD HDZ2240.

GIM63201I    LMOD IDA019BL WAS DELETED FROM THE LPALIB
             LIBRARY BY SYSMOD HDZ2240.
```
```
GIM23903W LINK-EDIT PROCESSING FOR SYSMOD HDZ2240 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
```

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 ARCPCEND
  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 IGDERRMT 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 *xxxxxxx* WAS NOT DELETED BY SYSMOD HTE77C0 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 HTE77C0 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.
```

8.2.2.14.1 Messages expected during Cryptographic Services APPLY

During the APPLY of Cryptographic Services the following messages may be received and are acceptable if they are the only cause of the return code 4.

- GIM23903W LINK-EDIT PROCESSING FOR SYSMOD HCRY740 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 HCRY740 WAS SUCCESSFUL for MODULE xxxxxxxx IN LMOD yyyyyyyy IN THE xxxxxxxx LIBRARY. THE RETURN CODE WAS 04. DATE yy.ddd -- TIME hh:mm:ss -- SEQUENCE NUMBER nnnnnn --., where yyyyyyyy will be one of the following load modules:

  CDSNM001 CDSNM009 CDSNM010 CDSNM012 CDSNM013 CDSNM036
  CDSNM037 CDSNM038

- IEW2480W A711 EXTERNAL SYMBOL RANDOM OF TYPE LD WAS ALREADY DEFINED AS A SYMBOL OF TYPE LD IN SECTION RANDOM.
- IEW2482W A712 THE ORIGINAL DEFINITION WAS IN A MODULE IDENTIFIED BY DDNAME SMPLTS. THE DUPLICATE DEFINITION IS IN SECTION @@RANDM IN A MODULE IDENTIFIED BY DDNAME SMPxxxxx.

8.2.2.14.2 Messages expected during z/OS Security Level 3 APPLY

During the APPLY of z/OS Security Level 3, the following messages may be received and are acceptable if they are the only cause of the return code 4.

- GIM23903W LINK-EDIT PROCESSING FOR SYSMOD JCRY741 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 JCRY741 WAS SUCCESSFUL FOR MODULE xxxxxxxx IN LMOD *yyyyyyyy* IN THE xxxxxxxx LIBRARY. THE RETURN CODE WAS 04. DATE *yy.ddd* -- TIME *hh:mm:ss* -- SEQUENCE NUMBER nnnnnn --., where *yyyyyyyy* will be one of the following load modules

  CDSNM036   CDSNM037

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

  CDSNM036   CDSNM037

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 Bulk Data Transfer (BDT) APPLY

During the installation of Bulk Data Transfer (BDT), the following message is received for load modules BDTUX10, BDTUX19, and UX08KYWD:

- During the link-edit, one of the following messages is produced:

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

- 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 --.
  ```

If these are the only cause of the condition code 4, it is acceptable.

8.2.2.16.2 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.
```

8.2.2.16.3 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.
```

8.2.2.16.4 Messages expected during IBM Knowledge Center for z/OS APPLY

The APPLY for IBM Knowledge Center for z/OS 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 HDZ224N
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 z/OS Container Extensions for z/OS APPLY

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

8.2.2.17.3 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 HZFS440 and *xxxxxxxx* is one of the following modules:

For HZFS440   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

Starting with z/OS V2R1, the staged migration path with previous levels of JES2, JES3, and SDSF is no longer supported, therefore, you cannot use earlier levels of JES2, JES3, or SDSF with current level of z/OS. You must install the level of JES2, JES3 and SDSF shipped in the current z/OS release before performing the IPL of the z/OS system.

Starting from z/OS V1R10, SDSF can be used with JES2, JES3, or both JES2 and JES3.

- If you plan to use SDSF and JES2, install FMIDs HQX77C0, HJE77C0, and JJE77CJ (if ordered).

- If you plan to use SDSF and JES3, install FMIDs HQX77C0 and HJS77C0 (if ordered).

- If you plan to use SDSF with both JES2 and JES3, install FMIDs HQX77C0, HJE77C0, HJS77C0, and JJE77CJ (if ordered).

You can install JES2, JES3, 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 or JES3 in a sysplex, ensure you understand the sysplex software and hardware requirements before installing JES2 or JES3. 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.

__ If you are installing JES3 in a network environment, ensure that you understand the coexistence considerations before installing JES3.

__ 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*.

__ Ensure that the installation has identified all the user modifications that must be reworked, as is required by the new release of JES3. See *z/OS Upgrade Workflow*, for more information.

__ Before you install SDSF in z/OS V2R4, 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 V2R4 Wave 2 elements, JES2, JES3, 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 V2R4 level of JES2. Member HASIDLFN can be found in 'prefix.HJE77C0.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 HJE77C0) 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 JES3: A sample job, IATJDLFN, is provided to delete JES3 releases replaced by the z/OS V2R4 level of JES3. Member IATJDLFN can be found in 'prefix.HJS77C0.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 IATJDLFN, update it as required, and run the job. Running the sample delete job is optional. Normal SMP/E APPLY/ACCEPT processing of JES3 (FMID HJS77C0) deletes the previous releases of JES3 (if the optional "dummy" function delete was not performed).

Sample job IATJDLFN will RECEIVE, APPLY, and ACCEPT a function named DM1JES3. During SMP/E processing, the functions deleted by DM1JES3 (and all dependent functions) are removed from the target and distribution zones. After the APPLY and ACCEPT of function DM1JES3 has completed, the JES3 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 DM1JES3 along with the entries for the deleted JES3 releases and any associated product HOLDDATA.

During RECEIVE processing of function DM1JES3, a condition code of 4 is expected along with the following message:

```
GIM39701W SYSMOD DM1JES3 HAS NO ELEMENTS.
```

During APPLY processing of function DM1JES3, a return code of 4 is expected, along with the following messages if USERMOD ASMJES3 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 ASMJES3 IN MOD xxxxxxx
```

8.3.2.3 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, JES3, 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.HJE77C0.F1'
IATJALC	ALLOCATE	JES3	'prefix.HJS77C0.F1'
ISFISALC	ALLOCATE	SDSF	'prefix.HQX77C0.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).
- As of z/OS V2R3, the directory blocks required for the SISFLOAD data set has significantly increased. Review the space requirements for the data set shown in the appendix and run sample job ISFISALC to allocate a larger data set if required.

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 281 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. 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.HQX77C0.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 contains the sample jobs used to create the target and distribution DDDEFs unique to JES2, SDSF, and JES3. 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.HJE77C0.F1'
IATJDDEF	DDDEF	JES3	'prefix.HJS77C0.F1'
ISFISDDD	DDDEF	SDSF	'prefix.HQX77C0.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, JES3, and SDSF libraries of previous releases with the DDDEF entries for the libraries of current release.

If you use sample job HASIDDEF, IATJDDEF, 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 SDSF

For SDSF to assemble correctly, the High Level Assembler option must be set to OPTABLE(UNI); OPTABLE(ESA) will not work.

8.3.7 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
```

8.3.8   APPLY Wave 2

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

8.3.8.1 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=v2r4vol1
//       DD DSN=ASM.SASMMOD1,DISP=SHR,
//         UNIT=SYSALLDA,VOL=SER=v2r4vol1
//SMPCSI DD DSN=zosv2r4.global.csi,DISP=SHR
//SMPCNTL DD *
  SET BOUNDARY(targetzone)
      OPTIONS(ZOSOPT) .
  APPLY CHECK  XZREQ
        FORFMID(HJE77C0,HQX77C0,HJS77C0,
                JJE77CJ)  /* If not ordered, remove */
        SELECT(HJE77C0,HQX77C0,HJS77C0,
                JJE77CJ)  /* If not ordered, remove */
  SOURCEID(ZOSV2R4,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 v2r4vol1 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 V2R4 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.
6. If you plan to use JES2 and SDSF only, just remove the JES3 FMID HJS77C0 from the FORFMID and SELECT operands in the sample job above before running the job.

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. If JES3 is included in the APPLY CHECK, then successful APPLY CHECK processing returns a condition code of 4.

8.3.8.1.1 Messages expected during APPLY CHECK Processing for JES3: During the installation of the JES3 component you can expect to receive the following messages:

```
GIM61903W LMOD IATUX86 WAS NOT DELETED BY
SYSMOD HJS77C0 BECAUSE IT IS NOT IN THE target ZONE.

GIM61903W LMOD IATIMDL WAS NOT DELETED BY
SYSMOD HJS77C0 BECAUSE IT IS NOT IN THE target ZONE.
```

These messages are acceptable. Any messages other than the messages listed above or the messages identified in 6.7, "Step 6: Review general installation notes" on page 43 must be investigated.

A condition code of 4 is expected during APPLY CHECK processing for JES3.

8.3.8.2 Do an SMP/E APPLY for Wave 2: **Do not specify ASSEM on the APPLY command for JES2 or JES3.** 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=v2r4vol1
//         DD DSN=ASM.SASMMOD1,DISP=SHR,
//          UNIT=SYSALLDA,VOL=SER=v2r4vol1
//SMPCSI DD DSN=zosv2r4.global.csi,DISP=SHR
//SMPCNTL DD *
  SET BOUNDARY(targetzone)
      OPTIONS(ZOSOPT) .
  APPLY  XZREQ
       FORFMID(HJE77C0,HQX77C0,HJS77C0,
               JJE77CJ)  /* If not ordered, remove */
       SELECT(HJE77C0,HQX77C0,HJS77C0,
               JJE77CJ)   /* If not ordered, remove */
  SOURCEID(ZOSV2R4,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 v2r4vol1 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 V2R4 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.

6. If you plan to use JES2 and SDSF only, just remove the JES3 FMID HJS77C0 from the FORFMID and SELECT operands in the sample job above before running the job.

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. If JES3 is included in the APPLY processing, then successful APPLY processing returns a condition code of 4.

8.3.8.2.1 Messages expected during APPLY Processing for JES3

During the installation of the JES3 component you can expect to receive the following messages:

```
GIM61903W  LMOD IATUX86 WAS NOT DELETED BY
SYSMOD HJS77C0 BECAUSE IT IS NOT IN THE target ZONE.

GIM61903W  LMOD IATIMDL WAS NOT DELETED
BY SYSMOD HJS77C0 BECAUSE IT IS NOT IN THE target ZONE.

GIM23903W LINK-EDIT PROCESSING FOR
SYSMOD xxxxxxx WAS SUCCESSFUL
FOR MODULE xxxxxxxx IN LMOD xxxxxxxx
IN THE xxxxxx LIBRARY. THE RETURN CODE WAS 04.
```

Note: This message might be GIM23903I, depending on the SMP/E service level you have on your driving system.

You might receive either message GIM23903W or the following GIM23913W message for load modules IATNUCF and IATNUCI:

```
GIM23913W LINK-EDIT PROCESSING FOR
SYSMOD HJS77C0 WAS SUCCESSFUL
FOR MODULE xxxxxxxx IN LMOD xxxxxxxx IN THE SIATLIB LIBRARY.
THE RETURN CODE WAS 04.
DATE yy.ddd - TIME hh:mm:ss -
SEQUENCE NUMBER nnnnnn - SYSPRINT FILE nnnnnnnn.
```

These messages are acceptable. Because of the following IEW2454W messages, and the resulting condition code, SMP/E will produce message GIM23903W for every load module that was link-edited in the same utility invocation.

During the installation of the JES3 component you might receive IEW2454W messages (unresolved external references) during the link-edit of load module IATNUCF. The references are:

```
DSDDDR DSIFCT IATCNINX LJMFFCT SMFBUFAB SMFBUFBL
TAPDDR  VARYLFCT
```

You might also receive an IEW0461 or IEW2454W message during the link-edit of load module IATNUCI with an unresolved external reference for IATINIT. These messages are acceptable.

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 *SMP/E for z/OS 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 126 if they are not present on your system. The attributes for these data sets must conform to the attributes of your ISPF/PDF 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 126 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 V2R4 Wave 1, you may run sample job CLNCRSZ, and see *SMP/E for z/OS 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 V2R4, 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)
//*OPERATOR AUTHORIZE IPLTEXT UPDATE FOR volser(JES3 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

8.5.1.4 Create and update your IODF

IODFs created on prior z/OS releases can be used to IPL z/OS V2R4. 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 V2R4 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 V2R4, 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 131.

8.5.2.1 What is new for z/OS V2R4: For a summary of PARMLIB changes in this release, see *z/OS MVS Initialization and Tuning Reference*.

8.5.2.2 z/OS V2R4 PARMLIB members: Figure 40 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	BDTIPCSP	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	DIAG00	DIAG01
DIAG02	ERBRMF00	ERBRMF01	ERBRMF02	ERBRMF03	ERBRMF04
EZAIPCSP	GLZIPCSP	GPMSRV00	GRSCNF00	GRSRNL00	GTFPARM
GTZPRM00	GXLIPCSP	HASLIPCS	HZSPRM00	IARIPCSP	IATIPCSI
IATIPCSP	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				

Figure 41 describes the PARMLIB updates that are recommended for z/OS V2R4. 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(HFS) ENTRYPOINT(GFUAINIT)	BCP (see note)
Notes: 1. The FILESYSTYPE statement allows you to mount an HFS, which is needed in Wave 1. 2. If you plan to use a root zFS file system, you may specify TYPE(ZFS) on the FILESYSTYPE statement.		
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 2 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. and SYSABEND that contain SYSOUT=A.dure is started by JES. If you still want FFST to be started by the master scheduler, change the DD statements for SYSPRINT and SYSABEND so that they contain typical 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.
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
ERBRMF*xx*	Default PARMLIB members provided: ERBRMF00, ERBRMF01, ERBRMF02, ERBRMF03, ERBRMF04	RMF
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
HZSPRM00	Default PARMLIB member HZSPRM00 provided for IBM Health Checker for z/OS	BCP

	Figure 41 (Page 3 of 11). PARMLIB Updates	
PARMLIB Member	**TEXT**	**Element Name**
*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: BDTIPCSP	BDT
	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 members: IATIPCSI, IATIPCSP	JES3
	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 4 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(BDT)	BDT
	SUBSYS SUBNAME(SMS) INITRTN(IGDSSIIN) INITPARM('ID=xx,PROMPT=DISPLAY') SUBSYS SUBNAME(OAM1) INITRTN(CBRINIT)	DFSMS (see note 4)
	SUBSYS SUBNAME(FFST)	FFST
	SUBSYS SUBNAME(ISPF) INITRTN(ISPDTSSI)	ISPF (see note 3)

	SUBSYS SUBNAME(RACF)
	   INITRTN(IRRSSI00)
	   INITPARM('%,X')
		RACF
		(see note 2)

	SUBSYS SUBNAME(TNF) SUBSYS SUBNAME(VMCF) or TNF VMCF	Communications Server IP Services (see note 5)

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. The ISPF member is required only if using ISPF GUI TSO Linemode Support. See *z/OS ISPF Planning and Customizing* for more information.
4. where xx refers to your IGDSMSxx member of PARMLIB. See *z/OS MVS Initialization and Tuning Guide* for more information about IEFSSNxx.
5. VMCF and TNF are restartable beginning with TCP/IP 3.2 and with this enhancement, display and easy modification of the VMCF and TNF subsystems are possible. See *z/OS Communications Server: IP Configuration Guide* for more information and command syntax associated with the restartable VMCF and TNF enhancements.

	Figure 41 (Page 5 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 141.	BDT SNA NJE BDT File-to-File 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 JES3 SDSF RMF Security Server RACF Restricted Use Common Service Area(RUCSA) zEnterprise Data Compression (zEDC)
Notes:		
• (*) indicates the element may register as a z/OS V2R4 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 Guide* for more information about IGDSMSxx.		

Figure 41 (Page 6 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 7 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 8 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.		
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 9 of 11). PARMLIB Updates

PARMLIB Member	TEXT	Element Name
LNKLST*xx* or PROG*xx*	SYS1.CMDLIB	BCP, DFSMS, TSO/E
	SYS1.SBDTLINK	BDT
	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
	ISP.SISPLOAD	ISPF
	SYS1.SHASLNKE SYS1.SHASMIG	JES2
	SYS1.SIATLIB SYS1.SIATLINK SYS1.SIATMIG	JES3
	CEE.SCEERUN CEE.SCEERUN2	Language Environment
LNKLST*xx* or PROG *xx* (continued)	REXX.SEAGALT	Alternate Library for REXX
	SYS1.SERBLINK	RMF
	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 144.

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 10 of 11). PARMLIB Updates		
PARMLIB Member	**TEXT**	**Element Name**
LPALST*xx*	SYS1.SBDTLPA	BDT
	SYS1.SICELPA SYS1.SORTLPA (see note 3)	DFSORT
	TCPIP.SEZALPA	Communications Server IP Services
	ISP.SISPLPA	ISPF
	SYS1.SIATLPA	JES3
	CEE.SCEELPA (see note 1)	Language Environment
	SYS1.SERBLPA	RMF
	ISF.SISFLPA (see note 2) ISF.SISFLOAD	SDSF
	SYS1.SDWWDLPA	DFSMS

Notes:

1. CEE.SCEELPA should be added to LPALSTxx only if CEE.SCEERUN is added to LNKLSTxx. See 8.5.2.5.1, "Making the Run-time library available" on page 144.
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 SICELINK to the link list.
   - To make DFSORT nonresident, add SICELINK and SORTLPA (in this order) to the link list, or use a JOBLIB or STEPLIB for 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).

PARMLIB Member	TEXT	Element Name
PROG*xx* or IEAAPF*xx*	All LNKLST*xx* (or PROG*xx*) libraries. See item 3 on page 145 in 8.5.2.6, "PROGxx and IEAAPFxx considerations" on page 145.	All
	All STEPLIB or ISPLLIB libraries. See Figure 44 on page 150 for the appropriate data sets.	All
	SYS1.SBDTLIB SYS1.SBDTLINK	BDT
	CSF.SCSFMOD0	Cryptographic Services ICSF
	SYS1.SEPWMOD1	FFST
	TCPIP.SEZATCP TCPIP.SEZALNK2 TCPIP.SEZADSIL	Communications Server IP Services
	SYS1.SIEALNKE	All
	SYS1.SERBLINK	RMF
	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 145.		
SCHED*xx*	The default program properties table, IEFSDPPT, shipped by z/OS V2R4 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.	

Figure 41 (Page 11 of 11). PARMLIB Updates

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.

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. If you plan to run the SDSF server and ISF.SISFLOAD is not defined in the LNKLST or LPA, you must also add ISF.SISFLINK to your LNKLST*xx* member of SYS1.PARMLIB or to a LNKLST statement in a PROGxx member.

3. 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.

4. 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 SICELINK to the link list.
   - To make DFSORT nonresident, add SICELINK and SORTLPA (in this order) to the link list, or use a JOBLIB or STEPLIB for 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 V2R4 require the run-time libraries provided by Language Environment, SCEERUN and SCEERUN2, to be made available in the program search order. The best way to do that is by adding the SCEERUN and SCEERUN2 data sets in LNKLST. Below lists the z/OS V2R4 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 IEAAPF*xx*.

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.

3. Ensure entire libraries are accessible to the system, as shown in Figure 43 on page 150.

The following figure, shown in ripple order, describes the PROCLIB updates that are required for z/OS V2R4. 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 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		

PROCLIB Member	Action to Take	Element Name
Figure 42 (Page 2 of 4). PROCLIB Member Updates		
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		

PROCLIB Member	Action to Take	Element Name
Figure 42 (Page 3 of 4). PROCLIB Member Updates		
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. They are provided in your PROCLIB data set.	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		
BDT$V2SP BDT$V2TP	Copy these procedures and update for your environment. BDT$V2SP is the started procedure for BDT. BDT$V2TP is the started procedure for the BDT transaction queuing integrity (TQI) address space. Both of these procedures are provided in your SBDTSAMP library.	BDT
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

PROCLIB Member	Action to Take	Element Name
	Figure 42 (Page 4 of 4). PROCLIB Member Updates	
EPWFFST	Copy this procedure and update for your environment. Sample member is provided in your SEPWSRC2 library.	FFST
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 NFSSAMP 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
RMF RMFCSC RMFGAT 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

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.

DDNAME	Element	Note
Figure 43. PROCLIB Concatenation		
SIOEPROC	z/OS File System	Contains alias ZFS (see Figure 42 on page 146); 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 V2R4 ISPF setup considerations

Figure 44 on page 150 shows the data sets that must be concatenated to ISPF DDNAMEs in the logon procedure to use z/OS V2R4 functions. See Figure 45 on page 155 for Logon Proc using language libraries.

DDNAME	DDDEF	ELEMENT
Figure 44 (Page 1 of 5). Logon PROC Updates		
ISPILIB	SISPSAMP	ISPF
Note: ISPILIB is used for image support (bitmaps) for ISPF C/S.		

DDNAME	DDDEF	ELEMENT
Figure 44 (Page 2 of 5). Logon PROC Updates		
DDNAME	**DDDEF**	**ELEMENT**
ISPLLIB	DFQLLIB DGTLLIB	DFSMS
	SCBDHENU	HCD
	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.

ISPMLIB	SBLSMSG0 SBPXMENU	BCP
	SBDTMSG	BDT
	DGTMLIB DFQMLIB SEDGMENU	DFSMS
	SADMMSG	GDDM
	SCBDMENU	HCD
	SEZAMENU	Communications Server IP Services
	SCSFMSG0	Cryptographic Services ICSF
	SAOPMENU	Infoprint Server
	SISPMENU	ISPF
	SIATMSG0	JES3
	SERBMENU	RMF
	SISFMLIB	SDSF
	HRFMSG	Security Server (RACF)
	SGIMMENU	SMP/E
	ICQMLIB	TSO/E

DDNAME	DDDEF	ELEMENT
Figure 44 (Page 3 of 5). Logon PROC Updates		
ISPPLIB	SBLSPNL0 SBPXPENU	BCP BCP (z/OS UNIX)
	SBDTPNL0	BDT
	DFQPLIB DGTPLIB SEDGPENU	DFSMS
	SEPWPENU	FFST
	SADMPNL	GDDM
	SCBDPENU	HCD
	SEZAPENU	Communications Server IP Services
	SCSFPNL0	Cryptographic Services ICSF
	SAOPPENU	Infoprint Server
	SISPPENU	ISPF
	SHASPNL0	JES2
	SIATPNL0	JES3
	SERBPENU	RMF
	SISFPLIB	SDSF
	HRFPANL	Security Server (RACF)
	SGIMPENU	SMP/E
	ICQPLIB	TSO/E
ISPSLIB	SBLSKEL0	BCP
	DGTSLIB	DFSMS
	SCSFSKL0	Cryptographic Services ICSF
	SISPSLIB	ISPF
	SISPSENU	ISPF
	SISFSLIB	SDSF
	HRFSKEL	Security Server (RACF)
	SGIMSENU	SMP/E
	ICQSLIB	TSO/E

Figure 44 (Page 4 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
	SIATTBL0	JES3
	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 156.		
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 5 of 5). Logon PROC Updates		
DDNAME	**DDDEF**	**ELEMENT**
SYSHELP	HELP	BCP, DFSMS, z/OS UNIX System Services, RACF, RMF, TSO/E Communications Server IP
	SBDTHELP	BDT
	SISPHELP	ISPF
	SISFHELP	SDSF
	HELPENP	TSO/E
SYSPROC	SBLSCLI0	BCP
	SBDTCLI0	BDT
	SCCNUTL	XL C/C++
	DGTCLIB	DFSMS
	SEPWCENU	FFST
	SCBDCLST	HCD
	SCSFCLI0	Integrated Cryptographic Service Facility
	SISPCLIB	ISPF
	SERBCLS	RMF
	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*	SBDTLIB	BDT
	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
- SISFLOAD
- 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.

DDNAME	DDDEF	ELEMENT
ISPMLIB	SBPXMJPN	BCP Japanese
ISPMLIB (Continued)	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

Figure 45 (Page 2 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*.

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 V2R4 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.

- Cryptographic Services OCSF (see 8.5.5.6.1, "Cryptographic Services OCSF customization considerations" on page 172)
- DFSMS (see *z/OS DFSMSdfp Storage Administration*)
- FFST (see 8.5.5.5.3, "FFST customization considerations" on page 169)
- 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 165)
- 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 174)
- Security Server (see 8.5.5.6.3, "Security Server (RACF) customization considerations" on page 172)
- IBM Tivoli Directory Server for z/OS (see 8.5.5.3.4, "IBM Tivoli Directory Server for z/OS customization considerations" on page 159)
- 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")
- z/OS UNIX System Services Application Services (see 8.5.5.4.3, "z/OS UNIX System Services Application Services customization" on page 169)
- IBM Knowledge Center for z/OS (see 8.5.5.8.4, "IBM Knowledge Center for z/OS customization considerations" on page 179)
- z/OS File System (see 8.5.5.9.1, "RACF updates for zFS" on page 179)
- Infoprint Server (see 8.5.5.9.2.4, "Establish security for Infoprint Server" on page 181)
- 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*)

Note: The SDSF element, which is installed in Wave 2, requires certain security permissions to be defined when SDSF is used in a JES3 environment.

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 ISPF C/S with TSO linemode in a GUI window

See *z/OS ISPF Planning and Customizing* for information on customizing ISPF C/S to display TSO linemode output in a GUI window.

8.5.5.3.7.2 z/OS V2R4 Sample panels

Sample ISPF panels are provided to enable panels for most z/OS V2R4 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
- BDT File-to-File Feature
- 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)'
```

8.5.5.4 Customization considerations for Wave 1B

The following sections contain additional customization considerations for Wave 1B.

8.5.5.4.1 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 an HFS 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 an HFS 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. <u>Do required RACF definitions</u>

   • 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 166.)
         - 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. <u>Customize SYSLOGD</u>

- 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. <u>Customize FTP</u>

- 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.

8.5.5.4.1.1 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.

8.5.5.4.1.2 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.

8.5.5.4.1.3 Network Print Facility customization considerations

Refer to the *z/OS Communications Server: IP Configuration Reference*.

8.5.5.4.1.4 Communications Server Security Level 3 customization considerations

Refer to the *z/OS Communications Server: IP Configuration Reference*.

8.5.5.4.2 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*.

8.5.5.4.2.1 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*.

8.5.5.4.2.2 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.

8.5.5.4.2.3 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.

8.5.5.4.2.4 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).

Language Environment is required for Distributed FileManager (DFM/MVS) to do CDRA conversions. If your installation's link list does not refer to the Language Environment runtime library, SCEERUN, you must add the appropriate STEPLIB DD statement to DFM startup procedure SYS1.PROCLIB(DFM). You must also make the same change to SYS1.SAMPLIB(GDETPDEF) and rerun it.

8.5.5.4.3 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 V2R4. 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 V2R4 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 V2R4 in order to retrieve device information.)
- Add a z/OS V2R4 system authorization facility (SAF) exit to monitor and control allocation to switches. z/OS V2R4 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 Cryptographic Services OCSF customization considerations

Your order will only contain the fmids appropriate for your country code. Applying these fmids will activate the correct security level. Detailed steps to get OCSF into operational status are defined in *z/OS Open Cryptographic Services Facility Application Programming*. This book describes:

- Installation of service providers
- Setup of RACF FACILITY class needed to run applications using OCSF
- IVP procedures

8.5.5.6.2 Alternate Library for REXX customization considerations

The following sections describe various considerations for customizing Alternate Library for REXX.

8.5.5.6.2.1 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.

8.5.5.6.3 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.

8.5.5.6.3.1 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 V2R4 (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.

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.

8.5.5.6.3.2 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 131. 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*.

8.5.5.6.3.3 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*.

8.5.5.6.3.4 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 158 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 150 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 158 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 BDT customization considerations

Perform the following steps to activate BDT; these steps are described in more detail in *z/OS BDT Installation*. All samples are in the SBDTSAMP library.

- If a JES3 environment:
  - Add CONSOLE and SYSID statements to the JES3 initialization stream.
  - If installing SNA/NJE, add or modify the NJERMT statement in the JES3 INISH stream.
- Update SYS1.VTAMLST (see sample BDT$VTAM) to define a Communications Server for z/OS SNA Services application to support BDT.
- Allocate BDT and TQI data sets (see sample BDT$ALOC).
- Run the BDTTQBCH utility program (see sample BDT$TQFM) to format the:
  - TQI checkpointing and bitmap data sets
  - Message data set for each processor.
- Create the BDT initialization stream:
  - See sample BDT$FTF for a JES2 or JES3 file-to-file only installation.
  - See sample BDT$NJE for a JES3 SNA NJE only installation.
  - See sample BDT$MIX for a JES3 file-to-file and SNA NJE installation.
- Create user exits, as described in *z/OS BDT Installation*. Assemble and link-edit the BDT user exits into the proper load libraries. If you are a migrating customer, you must reassemble all user exit routines.

8.5.5.8.2 DFSORT customization considerations

Refer to *z/OS DFSORT Installation and Customization* for more information and instructions on DFSORT customization.

8.5.5.8.2.1 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.

8.5.5.8.2.2 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*.

8.5.5.8.2.3 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*.

8.5.5.8.2.4 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 SICELINK to the link list.

To run DFSORT nonresident, perform either of these actions:

- Add SICELINK and SORTLPA (in this order) to the link list.
- Use a JOBLIB or STEPLIB for 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*.

8.5.5.8.2.5 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.

8.5.5.8.3 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*.

8.5.5.8.4 IBM Knowledge Center for z/OS customization considerations

For information on configuring, customizing and setting up RACF security for IBM Knowledge Center for z/OS, refer to *IBM Knowledge Center for z/OS Configuration and User Guide* for V2R4. 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.

8.5.5.9 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 migrating from previous levels of Infoprint Server, see *z/OS Upgrade Workflow* for migration 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.

8.5.5.10 Customization for Wave 2: Once you have successfuly SMP/E APPLY'd JES2, JES3 and SDSF, you must customize the elements.

8.5.5.10.1 SDSF Customization considerations:

Note: When running SDSF in a JES3 environment, you must define SDSF security by using SAF to create the profiles and to activate the classes that are used by SDSF. See *z/OS SDSF Operation and Customization* for details.

SDSF can be run from the link list, link pack area, a steplib, or TSOLIB command. To run SDSF from a steplib, add the SISFLOAD data set as a steplib to your TSO logon procedure and as a steplib to the server JCL. Note that because the SISFLOAD data set must be authorized, any libraries concatenated to your steplib must also be authorized. If you plan to run the SDSF server, you must also add the SISFLINK data set to your LNKLSTxx member of SYS1.PARMLIB.

8.5.5.10.2 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.

8.5.5.10.3 JES3 Initialization considerations: You will need to update the following PARMLIB and PROCLIB members prior to IPLing the JES3 system:

- LNKLST*xx* to include JES3 libraries SIATLIB, SIATLINK, and SIATMIG (if STEPLIBs are not used in the JES3 cataloged procedures or you are using the JES3 DLOG facility).
- LPALST*xx* to include JES3 library SIATLPA
- PROGxx to APF-authorize libraries SIATLIB, SIATLINK, SIATMIG, and SIATLPA.
- JES3 cataloged procedures to include the libraries SIATLIB, SIATLINK, and SIATMIG if the procedures contain a STEPLIB and the library names have been changed.
- Logon procedures used for IPCS setup to include JES3 libraries SIATCLI0, SIATMSG0, SIATPNL0, and SIATTBL0.
- IFAPRD00 to include JES3. Ensure the correct program number is specified.

JES3 enforces the system name (specified in member IEASYM*xx* or IEASYS*xx* in PARMLIB) for the current system matches a name specified on the NAME parameter of a MAINPROC statement in your JES3 initialization deck.

For details on how to create or update the intialization deck, see z/OS JES3 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 127,

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 V2R4. 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.V2R4."
>
> Do not IPL the z/OS V2R4 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, JES3, or SDSF. Do not IPL the z/OS
> V2R4 system with older levels of JES2 or JES3 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 HFS or 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 HFS or zFS data sets for your target /tmp and /dev directories are created in
preparation to IPL your z/OS V2R4 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 46. Mount statements required in BPXPRMxx

Notes:

1. 'root_FS_data_set' and 'etc_FS_data_set' are the file systems in which z/OS V2R4 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 V2R4" 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 46, change TYPE(xxx) to the appropriate TYPE, such as TYPE(HFS) or 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 V2R4 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 V2R4 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 V2R4 system.

To IPL the system, ensure you use the target SYSRES from the Wave 1 installation. In addition, the z/OS V2R4 HFS or 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 V2R4 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  IECTATEN  IECTCATN
IECTCQSC  IEDQATTN  IFFIOM    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 V2R4 Wave 0, Wave 1 and Wave 2 FMIDs

To verify that the z/OS V2R4 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.

To verify JES3 is installed, you should make at least the following minimal checks:

Attention

- For JES3, if you are in a global/local complex, each system must be a member of the same sysplex.
- 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, and ensures service level agreements can be met.

Minimal check:
- Initialize the system.
- Initialize JES.

  Note: For JES3, you should see at least the following message:

  `*IAT3100 JES3 z v.r.m SYSTEM COLDSTART ON yyyy.ddd`

- Submit a job.
- Check the job's output.

More complete checks:
- Perform all the JES3 restarts (for example, COLD, HOT, HOT with ANALYSIS, WARM, WARM with REPLACE). All restarts should be performed with various jobs in different stages of execution (for example, OUTSERV, C/I, MAIN).
- Bring up a JES3 global/local environment. Verify all systems connect properly. Submit jobs to all processors and verify the jobs run successfully.
- In the global/local environment, perform a DSI to switch global processors. Verify both processors connect properly. Once the DSI is complete, submit jobs to run on each processor. Verify the jobs run to completion.
- Perform a DSI again to switch the global back to the original processor.
- Bring up a C/I FSS address space if you plan to use one in production. Verify jobs run successfully through the C/I FSS.
- 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
- Jobs that use or create dynamic output descriptors
- DJC net jobs
- Test miscellaneous JES3 functions:
  - Inquiry and Modify commands
  - Dump Core utility
  - Display DSP
- 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.
- Run all production jobs.
- Communicate with all networks.
- Test critical functions in applications.
- Check for completeness of accounting records.
- Test all non-IBM product functions.
- Ensure performance goals stated in service level agreements can be met.

Figure 47 (Page 1 of 2). Checklist for the IVPs		
Check Box	**Section, Step Description**	**Your Notes**
	8.6.2.1, "IVP jobs for Wave 0" on page 190	
☐	8.6.2.1.1, "Run the High Level Assembler Installation Verification Procedure" on page 191	
☐	8.6.2.2, "Run the BCP and ISPF Installation Verification Procedure" on page 191	
	8.6.3, "IVP jobs for Wave 1A" on page 194	
☐	8.6.3.1, "Run the Language Environment Installation Verification Procedure" on page 194	
	8.6.4, "IVP jobs for Wave 1B" on page 194	
☐	8.6.4.2, "Run the DFSMS Installation Verification Procedure" on page 197	
☐	8.6.4.7, "Run the z/OS UNIX System Services Setup Verification Procedures" on page 215	
	8.6.5, "IVP jobs for Wave 1C" on page 215	

Figure 47 (Page 2 of 2). Checklist for the IVPs		
Check Box	**Section, Step Description**	**Your Notes**
☐	8.6.5.1, "Run the FFST Installation Verification Program" on page 216	
☐	8.6.5.2, "Run the GDDM Installation Verification Procedures" on page 216	
☐	8.6.5.3, "Run the ICKDSF Installation Verification Procedure" on page 222	
	8.6.6, "IVP jobs for Wave 1D" on page 223	
☐	8.6.4.1, "Run the Communications Server IP Services Installation Verification Procedures" on page 194	
☐	8.6.8.2, "Run the High Level Assembler Toolkit Installation Verification Program" on page 230	
	8.6.7, "IVP jobs for Wave 1E" on page 223	
☐	8.6.7.1, "Run the Runtime Library Extensions Installation Verification Procedures" on page 223	
☐	8.6.7.4, "Run the XL C/C++ Installation Verification Procedures" on page 224	
☐	8.6.7.3, "Run the RMF Installation Verification Procedure" on page 224	
☐	8.6.6.1, "Run the Security Server (RACF) Installation Verification Procedures" on page 223	
	8.6.8, "IVP jobs for Wave 1F" on page 226	
☐	8.6.8.1, "Run the DFSORT Installation Verification Procedures" on page 226	
☐	8.6.10.1, "Run the installation verification procedure for SDSF" on page 233	
	8.6.9, "IVP jobs for Wave 1G" on page 231	
☐	8.6.9.1, "Run the z/OS File System Installation Verification Procedures" on page 231	
☐	8.6.9.2, "Run the Infoprint Server Installation Verification Procedures" on page 231	
☐	8.6.9.3, "Run the Network File System Installation Verification Procedures" on page 232	

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 226.

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 V2R4 ISPF data sets. The data sets are allocated to the appropriate DDs, as are documented in Figure 44 on page 150.

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 48.

```
    Licensed Materials - Property of IBM
    5650-ZOS Copyright IBM Corp. 1980, 2019.
    US Government Users Restricted Rights -
    Use, duplication or disclosure restricted
    by GSA ADP Schedule Contract with IBM Corp.
```

Figure 48. 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 48.

Execute the steps listed in Figure 49 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 49. 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
ISRJP01	=6	ISRTSO
ISRTSO	=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 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 224.

8.6.4 IVP jobs for Wave 1B

8.6.4.1 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 CSV2R4
IST1349I COMPONENT ID IS 5695-11701-240
```

Before beginning the installation verification procedures for Communications Server IP Services, verify you have all the required values as listed beginning on page 162.

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. <u>Start TCP/IP</u>

   - 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.
     ```

4. <u>Start the FTP daemon</u>

   - 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. <u>Test the following commands from TSO:</u>

   - Issue:

     ```
     ping loopback
     ```

   - Expected results:

     ```
     CS VyRx: Pinging host LOOPBACK  (127.0.0.1).
     Ping #1 response took n.nnn seconds.
     ```

   - Issue

     ```
     netstat home
     ```

   - Expected results:

     ```
     MVS TCP/IP NETSTAT CS VyRx   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 VxRy 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!!!

8.6.4.2 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.

8.6.4.2.1 *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*.

8.6.4.3 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.

8.6.4.3.1   *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.

8.6.4.3.2 *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 50 on page 201.

```
   Panel  Help
----------------------------------------------------------------
EDG@PRIM          REMOVABLE MEDIA MANAGER (DFSMSrmm) - z/OS V2R4
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 50. DFSMSrmm Primary Option Menu

Enter VOLUME on the option line to display the DFSMSrmm Volume Menu, as shown in Figure 50.
DFSMSrmm displays a panel, as shown in Figure 51 on page 202.

```
 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 51. DFSMSrmm Volume Menu

Select option 7, ADDSCR, and press ENTER. DFSMSrmm displays the DFSMSrmm Add Scratch
Volumes panel shown in Figure 52 on page 203. 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 52. 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 53 on page 205.

```
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 53. 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.

8.6.4.4 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.

8.6.4.4.1   *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 (either JES2 or JES3) 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.

8.6.4.4.2   *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 8.6.4.4.1, " Setup requirements." 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 either JES2 or JES3.

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 54 on page 209 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 2.4.0 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 54 (Part 1 of 4). Example of a z/OS V2R4 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 54 (Part 2 of 4). Example of a z/OS V2R4 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 54 (Part 3 of 4). Example of a z/OS V2R4 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 54 (Part 4 of 4). Example of a z/OS V2R4 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 55 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 55. 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.

8.6.4.5 Run the DFSMS File System Installation Verification Procedure

To validate the DFSMS function that is installed in the file system, perform the following verification steps if DFSMS is installed in an HFS. Note that the confighfs script shown below is intended to be run with a mounted HFS file system; it is not intended to be run when a zFS file system is mounted.

1. Note that confighfs is located under the `/usr/lpp/dfsms/bin` directory

2. Invoke the following confighfs command under the z/OS UNIX shell after you have successfully applied the HDZ2240 FMID. (In this example, -l is the lowercase of the letter l.) Figure 56 on page 214 shows the expected output.

   ```
   confighfs -l /
   ```

```
IBM is a registered trademark of the IBM Corp.

# cd /usr/lpp/dfsms/bin
# confighfs -l /
HFS Limits
 Maximum virtual storage: _____748(MB)
 Minimum fixed storage:    _____0(MB)


Statistics for file system ZOS23.ROOT.HFS
( 03/31/15 4:04pm )
 File system size:_____44820    (pages)
                  _____175.078(MB)
 Used pages:       _____34851    (pages)
                  _____136.137(MB)
 Attribute pages: _____104    (pages)
                  _____0.406(MB)
 Cached pages:     _____680    (pages)
                  _____2.656(MB)
 Seq I/O reqs:    _____0
 Random I/O reqs: _____16
 Lookup hit:      _____136
 Lookup miss:     _____44
 1st page hit:    _____16
 1st page miss:   _____17
 Index new tops:  _____0
 Index splits:    _____0
 Index joins:     _____0
 Index read hit:  _____420
 Index read miss: _____16
 Index write hit: _____12
 Index write miss:_____0
 RFS flags        _____4F(HEX)
 RFS error flags: _____0(HEX)
 High format RFN: _____8843(HEX)
 Member count:    _____1237
 Sync interval:   _____60(seconds)
 APM count:       _____5
```

Figure 56. Expected results from DFSMS installation verification

The example in Figure 56 assumes the root HFS at / belongs to (is owned by) the target system. If the target system has been added to a shared HFS in a sysplex environment, then the sysplex root HFS may be owned by another system. If the owning system is at a lower level, then an error can occur:
ERRNO=134(86) REASON=11A204F6. For the purposes of the IVP, this reason code can be ignored.

In addition, Figure 56 assumes that an HFS is mounted. Do not run confighfs when a zFS file system is mounted because it will result in an error message.

If z/OS V2R4 is installed in a zFS root file system, the following command may be invoked under the z/OS UNIX shell to validate the product is installed in the zFS and is an example (it must be modified as required for your environment)

```
zfsadm aggrinfo -long OMVS.ZFS.ZOS24.ROOT
```

In the example above, OMVS.ZFS.ZOS24.ROOT, is zFS name. The output will display information about the file system.

8.6.4.6 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 V2.4 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.

8.6.4.7 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 141), verify GDDM-PGF has been installed properly by performing the following steps:

1. Use the commands suggested for a CLIST in Figure 57 on page 222 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 141), 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" on page 218.

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"):

      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 57. 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.xxxxxxxxxxxx
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.

8.6.6 IVP jobs for Wave 1D

There are currently no installation verification procedures for the following elements in Wave 1D:

- Cryptographic Services
  - OCSF
  - 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 141), verify it has been installed properly by IPLing z/OS V2R4. If you receive message ICH520I stating `z/OS SECURITY SERVER (RACF HRF77C0) 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 58. 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 141), verify RMF has been installed properly by performing the following steps:

- Test the new element level by issuing the START command for RMF with PARMLIB member ERBRMF02 and reply with the desired options or GO.
- Modify RMF to start one or more Monitor II background sessions, using member ERBRMF03. This member tests all Monitor II reports.
- Modify RMF to start a Monitor III data gatherer session, using member ERBRMF04, and then start a data reporter session.
- Request several reports on the Monitor III report screen to verify these functions are working.

Monitor I and II and the Monitor III gatherer will run without further attention until the sessions are over or until the next IPL.

For more information on starting RMF and available options, 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 141), 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 59. 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 60). 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 60. 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:

- BDT
- HCM
- IBM Knowledge Center for z/OS

Note: The ISPF installation verification procedures are described in 8.6.2.2, "Run the BCP and ISPF Installation Verification Procedure" on page 191.

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 61 on page 227, 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 61. 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 V2R4" is shown in the heading of the DFLTS output of step TOOLRUN. 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 62 on page 228.

```
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 62. Expected TOOLRUN DEPTSP Output from ICETOOLJ

4. Compare the LIST1 output of step TOOLRUN to Figure 63. (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 63. Expected TOOLRUN LIST1 Output from ICETOOLJ

5. Compare the DEPTOT output of step TOOLRUN to Figure 64. (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 64. 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 65 on page 229.

Notes:

1. The ICECSRTJ sample job can be found in the SICESAMP target library.

2. The SCEERUN library (the Language Environment run-time library) must be in the link list or concatenated to STEPLIB to run the ICECSRTJ sample job.

```
a
A
b
B
c
C
d
D
e
E
```

Figure 65. 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.

8.6.9 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 131), 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 179 has been completed, and the logon proc is set up as described in 8.5.4, "z/OS V2R4 ISPF setup considerations" on page 150 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 on page 231.

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 z/OS NETWORK FILE SYSTEM SERVER
  (HDZ224N) STARTED.
```

For the client, the operator's console should display the following GFSC700I message:

```
GFSC700I z/OS NETWORK FILE SYSTEM CLIENT
  (HDZ224N) 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 66 on page 233 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:
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 66. Example of AIX client command sequence

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 141), 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.

   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 and JES3

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

To activate specific functions of JES3, see the following books:

1. z/OS Introduction and Release Guide
2. z/OS JES3 Initialization and Tuning Guide
3. z/OS JES3 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 V2R4 Wave 0 and Wave 1 FMIDs to install

Select which z/OS V2R4 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 67 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=v2r4vol1
//       DD DSN=ASM.SASMMOD1,DISP=SHR,
//         UNIT=SYSALLDA,VOL=SER=v2r4vol1
//SMPCSI   DD DSN=zosv2r4.global.csi,DISP=SHR
//SMPCNTL DD *
  SET BOUNDARY(dlibzone)
      OPTIONS(ZOSOPT) .
  ACCEPT CHECK XZREQ
         FORFMID(ZV24Wn)
         SELECT(WAVEn)
         GROUPEXTEND(NOAPARS,NOUSERMODS)
         SOURCEID(ZOSV2R4,RSU*)
         FIXCAT(IBM.ProductInstall-RequiredService)
         BYPASS(HOLDSYSTEM,
         HOLDUSER,HOLDCLASS(UCLREL,ERREL,HIPER)) .
 /*
```

Figure 67. SMP/E ACCEPT CHECK (All FMIDs and Service for z/OS V2R4 Wave 0 and Wave 1)

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

Required Updates

1. Update the *job parameters*.

2. Update the v2r4vol1 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 V2R4 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 ZV24W*n* 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(ZV24W*n*) 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
HPM77C0 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  IEWTPORT
```

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 HBB77C0
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 HIP6240
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 HDZ2240 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 HTE77C0
BECAUSE IT IS NOT IN THE dlib ZONE
```

In the message text, *xxxxxxx* is one of the following aliases for SYSMOD HTE77C0:

```
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 HDZ224N
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 HZFS440 and *xxxxxxxx* will be one of the following modules:

For HZFS440   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 68 on page 240 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 FMIDSET of 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=v2r4vol1
//        DD DSN=ASM.SASMMOD1,DISP=SHR,
//          UNIT=SYSALLDA,VOL=SER=v2r4vol1
//SMPCSI   DD DSN=zosv2r4.global.csi,DISP=SHR
//SMPCNTL DD *
  SET BOUNDARY(dlibzone)
      OPTIONS(ZOSOPT) .
  ACCEPT XZREQ
      FORFMID(ZV24Wn)
      SELECT(WAVEn)
      GROUPEXTEND(NOAPARS,NOUSERMODS)
      SOURCEID(ZOSV2R4,RSU*)
      FIXCAT(IBM.ProductInstall-RequiredService)
      BYPASS(HOLDSYSTEM,HOLDUSER,
      HOLDCLASS(UCLREL,ERREL,HIPER))
      COMPRESS(ALL) .
 /*
```

Figure 68. SMP/E ACCEPT (All FMIDs and Service for z/OS V2R4 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 v2r4vol1 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 V2R4 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 ZV24W*n* 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(ZV24Wn) 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 HPM77C0 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  IEWTPORT
```

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 HBB77C0
BECAUSE IT IS NOT IN THE dlib ZONE.
```

In the message, *xxxxxxx* is one of the following modules:

```
AMDPRFMT  ATBINPVT  IEAIPL04  IEANUC11  IEFITJT  IEFW21SD
IWM02CMD
```

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 HIP6240
BECAUSE IT IS NOT IN THE dlib ZONE.
```

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

```
EZAADMLR  EZAFTSRV  EZAIMSLN  EZAPPRT   EZAPPSST  GXDEM01
GXDEM02   GXDEM03   GXDEM04   GXDEM04A  GXDEM05   GXDEM06
```

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 HDZ2240 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 HTE77C0
BECAUSE IT IS NOT IN THE dlib ZONE
```

In the message text, *xxxxxxx* is one of the following LMODs for SYSMOD HTE77C0:

```
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.

8.7.3.6.1 Messages expected during OCSF Security Level 3 ACCEPT

During the ACCEPT of OCSF Security Level 3, the following messages might be received. These messages are acceptable if they are the only cause of return code 4.

```
GIM61903W LMOD CDSNM036 WAS NOT DELETED BY SYSMOD
JCRY741 BECAUSE CDSNM036 IS NOT IN THE dlib ZONE
```

```
GIM61903W LMOD CDSNM037 WAS NOT DELETED BY SYSMOD
JCRY741 BECAUSE CDSNM037 IS NOT IN THE dlib ZONE
```

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 HDZ224N
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 HZFS440, *xxxxxxxx* is one of the following modules, and *xxxx* is the name
of the distribution zone.

For HZFS440　　　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 69 on page 245 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=v2r4vol1
//         DD DSN=ASM.SASMMOD1,DISP=SHR,
//          UNIT=SYSALLDA,VOL=SER=v2r4vol1
//SMPCSI DD DSN=zosv2r4.global.csi,DISP=SHR
//SMPCNTL DD *
  SET BOUNDARY(dlibzone)
      OPTIONS(ZOSOPT) .
  ACCEPT CHECK  XZREQ
        FORFMID(HJE77C0,HQX77C0,HJS77C0,
               JJE77CJ) /* If not ordered, remove */
        SELECT(HJE77C0,HQX77C0,HJS77C0,
               JJE77CJ) /* If not ordered, remove */
  SOURCEID(ZOSV2R4,RSU*)
  FIXCAT(IBM.ProductInstall-RequiredService)
  GROUPEXTEND(NOAPARS,NOUSERMODS)
  BYPASS(HOLDSYSTEM,HOLDUSER,
  HOLDCLASS(ERREL,UCLREL,HIPER)) .
 /*
```

Figure 69. 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 v2r4vol1 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 V2R4 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.

6. If you plan to use JES2 and SDSF, and did not order JES3, remove the JES3 FMID HJS77C0 from the FORFMID and SELECT operands in the sample job before running the job.

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.

8.7.4.1 Messages expected during ACCEPT CHECK Processing for JES3: During the installation of the JES3 component you can expect to receive the following messages:

```
GIM61903W LMOD IATUX86 WAS NOT DELETED BY SYSMOD HJS77C0
BECAUSE IT IS NOT IN THE dlib ZONE.

GIM61903W LMOD IATIMDL WAS NOT DELETED BY SYSMOD HJS77C0
BECAUSE IT IS NOT IN THE dlib ZONE.
```

A condition code of 4 is expected during ACCEPT CHECK processing.

8.7.5 Do an SMP/E ACCEPT for Wave 2

Do not specify ASSEM on the ACCEPT command for JES2, JES3, and SDSF. The specification of ASSEM on the ACCEPT command can cause serviceability problems.

Figure 70 on page 247 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=v2r4vol1
//        DD DSN=ASM.SASMMOD1,DISP=SHR,
//          UNIT=SYSALLDA,VOL=SER=v2r4vol1
//SMPCSI DD DSN=zosv2r4.global.csi,DISP=SHR
//SMPCNTL DD *
  SET BOUNDARY(dlibzone)
      OPTIONS(ZOSOPT) .
  ACCEPT  XZREQ
       FORFMID(HJE77C0,HQX77C0,HJS77C0,
               JJE77CJ) /* If not ordered, remove */
       SELECT(HJE77C0,HQX77C0,HJS77C0,
               JJE77CJ) /* If not ordered, remove */
  SOURCEID(ZOSV2R4,RSU*)
  FIXCAT(IBM.ProductInstall-RequiredService)
  BYPASS(HOLDUSER,
  HOLDCLASS(ERREL,UCLREL,HIPER))
  GROUPEXTEND(NOAPARS,NOUSERMODS)
  COMPRESS(ALL) .
 /*
```

Figure 70. 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 v2r4vol1 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 V2R4 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.
>
> 6. If you plan to use JES2 and SDSF, and did not order JES3, remove the JES3 FMID HJS77C0 from the FORFMID and SELECT operands in the sample job before running the job.

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.

8.7.5.1 Messages expected during ACCEPT Processing for JES3: During the installation of the JES3 component you can expect to receive the following messages:

```
GIM61903W LMOD IATUX86 WAS NOT DELETED BY SYSMOD HJS77C0
BECAUSE IT IS NOT IN THE dlib ZONE.

GIM61903W LMOD IATIMDL WAS NOT DELETED BY SYSMOD HJS77C0
BECAUSE IT IS NOT IN THE dlib ZONE.
```

A condition code of 4 is expected during ACCEPT processing for JES3.

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 V2R4" on page 321.

8.8.1 Do global zone cleanup for previous versions of JES2, JES3, and SDSF

Because each version of JES2, JES3, and SDSF are complete replacements for previous versions of JES2, JES3, 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 V2R4 and systems having other levels of JES2, JES3, and SDSF.

The FMIDs listed as deleted in the output of the ACCEPT of the base FMIDs (HJE77C0, HJS77C0, and HQX77C0) 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 JES3:   Sample job IATIGCLN is provided by the JES3 element. You can use IATIGCLN to delete old JES3 FMIDs, the associated SYSMODS of these JES3 FMIDs, and HOLDDATA from the SMP/E global zone. To perform the deletion, copy member IATIGCLN from JES3 library SIATSAMP, modify it for your environment, and run the job.

8.8.1.3 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 V2R4

This appendix lists each z/OS V2R4 Component ID along with its corresponding FMIDs. The table is listed by Component ID in alphanumeric order.

FMID	COMP ID	Component Name	RETAIN Release
HOPI7C0 JOPI7CJ	5647A01OP	InfoPrint Server (Print Interface and IP PrintWay extended mode)	7C0 7CJ
HFNT130 HFNT13J	5650FNT00	z/OS Font Collection	130 13J
H24P111 J24P112	5655A4501	C/C++ Base Performance Analyzer	111 112
HIP6240 JIP624K JIP624X	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)	240 24K 24X
HHAP90P	5655I3510	WebSphere® Application Server z/OS IHS Z APACHE	90P
HKCZ120	5655K2000	Knowledge Center for z/OS	120
HOS2240	5655M2301	OpenSSH for z/OS	240
HSMA24A	5655S28CA	z/OSMF Network Configuration Assistant	24A
HSMA24E	5655S28ZE	z/OSMF zERT Network Analyzer	24E
HSMA240	5655S28CU	z/OSMF Console UI	240
HSMA240	5655S28PR	z/OSMF Cloud Provisioning and Management for z/OS	240
HSMA240	5655S28RF	z/OSMF RESTFILES	240
HSMA240	5655S28RJ	z/OSMF RESTJobs (Representational State Transfer)	240
HSMA240	5655S28SM	z/OSMF Core	240
HSMA240	5655S28TS	z/OSMF TSO REST Services	240
HSMA240	5655S28WL	z/OSMF Liberty Server	240
HSMA241	5655S2801	z/OSMF ISPF	241
HSMA242	5655S2802	z/OSMF Resource Monitoring	242
HSMA243	5655S2803	z/OSMF WLM Administration	243
HSMA244	5655S2804	z/OSMF Software Deployment	244
HSMA245	5655S2805	z/OSMF Incident Log	245
HSMA246	5655S2806	z/OSMF Capacity Provisioning	246
HSMA247	5655S2807	z/OSMF Workflow	247

Figure 71 (Page 1 of 11). Component IDs

FMID	COMP ID	Component Name	RETAIN Release
HSMA240	5655S2809	z/OSMF Sysplex Management	240
HWLPEM0	5655W6514	Liberty Profile on z/OS	EM0
HIF7S02 JIF7S14 JIF7S16	565504201	ISPF for z/OS - DM and C/S (Interactive System Productivity Facility)	S02 S14 S16
HIF7S02 JIF7S14 JIF7S16	565504202	ISPF for z/OS - PDF and SCLM (Interactive System Productivity Facility)	S02 S14 S16
HRSL440 JRSL44J JRSL441	565506803	Tivoli Directory Server for z/OS (TDS for z/OS / LDAP)	440 44J 441
HCRY740 JCRY741	565506804	Integrated Security Services OCSF Integrated Security Services OCSF Security Level 3	740 741
HCPT440 JCPT44J JCPT441	565506805	System SSL System SSL Security Level 3	440 44J 441
HSWK440 JSWK44J JSWK441	565506807	Integrated Security Services Network Authentication Service Integrated Security Services Network Authentication Service Security Level 3	440 44J 441
HRO7740	565506809	Integrated Security Services OCEP Enhanced Plugin	740
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
HTE77C0	5665IXX00	TSO/E REXX SAA (Time Sharing Option/Extensions)	7C0
HRM77C0 JRM77CJ	566527404	RMF (Resource Measurement Facility)	7C0 7CJ
HTE77C0 JTE77CJ	566528501	TSO/E Edit (Time Sharing Option/Extensions)	7C0 7CJ
HTE77C0 JTE77CJ	566528502	TSO/E Scheduler (Time Sharing Option/Extensions)	7C0 7CJ

Figure 71 (Page 2 of 11). Component IDs

FMID	COMP ID	Component Name	RETAIN Release
HTE77C0 JTE77CJ	566528503	TSO/E Test (Time Sharing Option/Extensions)	7C0 7CJ
HTE77C0 JTE77CJ	566528504	TSO/E XMIT - IDTF (Time Sharing Option/Extensions - Transmit and Receive - Interactive Data Transmission Facility)	7C0 7CJ
HTE77C0 JTE77CJ	566528505	TSO/E Session Manager (Time Sharing Option/Extensions)	7C0 7CJ
JTE77CE JTE77CJ	566528506	TSO/E ICF (Time Sharing Option/Extensions - Information Center Facility)	7CE 7CJ
HTE77C0 JTE77CJ	566528507	TSO/E ECF - MVSSERV (Time Sharing Option/Extensions - Enhanced Connectivity Facility)	7C0 7CJ
HTE77C0 JTE77CJ	566528508	TSO/E REXX (Time Sharing Option/Extensions)	7C0 7CJ
HIO1104	566529101	Input/Output Configuration Program (IOCP common)	104
HIO1104	566529102	Input/Output Configuration Program (IOCP MVS Control External Writer)	104
HIO1104	566529103	Input/Output Configuration Program (IOCP) Standalone	104
HBD6602 JBD6201 JBD6202	566530201	Bulk Data Transfer (BDT) including File-to-File and SNA NJE	602 201 202
HFX1112	566531101	z/OS Host - 3270 Workstation File Send/Receive	112
HQX77C0	566548801	SDSF (System Display and Search Facility)	7C0
HQX77C0	566548802	SDSF z/OSMF Plugin	7C0
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
HCR77D0	568505101	ICSF (Integrated Cryptographic Service Facility) - HCR77D0 Cryptographic Support for z/OS V2R2 - z/OS V2R3	7D0
HBB77C0	568505103	ICSF - Crypto at IPL	7C0
HLE77C0 JLE77CJ	568819801	Language Environment (LE) CEL / Common Execution Library	7C0 7CJ
HLE77C0 JLE77CJ	568819802	Language Environment (LE) COBOL Library	7C0 7CJ

Figure 71 (Page 3 of 11). Component IDs

FMID	COMP ID	Component Name	RETAIN Release
HLE77C0 JLE77CJ	568819803	Language Environment (LE) PL/I Library	7C0 7CJ
HLE77C0 JLE77CJ	568819804	Language Environment (LE) Fortran Library	7C0 7CJ
HLE77C0 JLE77CJ	568819805	Language Environment (LE) C/C++ Run Time Library (RTL)	7C0 7CJ
HLE77C0 JLE77CJ	568819806	Language Environment (LE) VA PL/I Library	7C0 7CJ
HLE77C0 JLE77CJ	568819807	Language Environment (LE) ANSI C/C++ Class Library	7C0 7CJ
HLE77C0	568819810	Automatic Binary Optimizer for z/OS Library	7C0
HLE77C0 JLE77CJ	568819812	Language Environment (LE) Enterprise COBOL Library	7C0 7CJ
HDZ2240	5695DF1VR	DFSMS-CICSVR Server Support	240
HDZ2240	5695DF100	DFSMS Installation	240
HDZ2240	5695DF101	DFSMS SMS (Storage Management Subsystem)	240
HDZ2240	5695DF102	DFSMS BAM (Base Access Methods)	240
HDZ2240	5695DF103	DFSMS AMS (Access Method Services)	240
HDZ2240	5695DF104	DFSMS Common Services	240
HDZ2240	5695DF105	DFSMS ICF Catalog	240
HDZ2240	5695DF106	DFSMS VSAM/Media Manager	240
HDZ2240	5695DF107	DFSMS OCEOV (Open/Close/End Of Volume)	240
HDZ2240	5695DF109	DFSMS Checkpoint Restart	240
HDZ2240	5695DF110	DFSMS Device Support - BTLS/Tape	240
HDZ2240	5695DF111	DFSMS Device Support - DASD	240
HDZ2240	5695DF113	DFSMS Device Support Services	240
HDZ2240	5695DF114	DFSMS Utilities	240
HDZ2240	5695DF115	DFSMS PDSE (Partitioned Datas Set Extended) and FAMS	240
HDZ2240	5695DF116	DFSMS VMA (Volume Mount Analyzer)	240
HDZ2240	5695DF117	DFSMS SDM (System Data Mover)	240
HDZ2240	5695DF118	DFSMS Compression Services	240
HDZ2240	5695DF119	DFSMS Common Function/Reuse	240
HDZ2240	5695DF120	DFSMS Distributed File Manager (DFM)	240

Figure 71 (Page 4 of 11). Component IDs

FMID	COMP ID	Component Name	RETAIN Release
HDZ224N JDZ224J	5695DF121	DFSMS Network File System (NFS) Server	24N 24J
HDZ2240	5695DF122	DFSMS VSAM Record Level Sharing (RLS)	240
HDZ2240 JDZ224K	5695DF123	DFSMS Naviquest	240 24K
HDZ2240	5695DF124	DFSMS Cloud Data Access	240
HDZ2240	5695DF125	DFSMS z/OS Management Facility - DASD Management	240
HDZ2240	5695DF126	DFSMS Media Manager	240
HDZ2240	5695DF133	DFSMS Device Management Services (DADSM/CVAF)	240
HDZ2240	5695DF140	DFSMS CDRA (Character Data Representation Architecture)	240
HDZ2240 JDZ224K	5695DF161	DFSMS ISMF and HCD (Interactive Storage Management Facility)	240 24K
HDZ2240 JDZ224K	5695DF170	DFSMShsm (Hierarchical Storage Management)	240 24K
HDZ2240 JDZ224K	5695DF175	DFSMSdss (Data Set Services)	240 24K
HDZ2240	5695DF180	DFSMSoam (Object Access Method)	240
HDZ2240	5695DF185	DFSMS Hierarchical File System (HFS)	240
HDZ2240 JDZ224K	5695DF186	DFSMSrmm (Removable Media Manager)	240 24K
HPM77C0	5695PMB01	Program Management (Binder)	7C0
HOT77C0 JOT77CJ	5695SCPE1	z/OS UNIX System Services (USS) Parallel Environment	7C0 7CJ
HBB77C0 JBB77CJ	5695SCPX1	z/OS UNIX System Services (USS) Kernel and File System	7C0 7CJ
HOT77C0 JOT77CJ	5695SCPX2	z/OS UNIX System Services (USS) Shell and Utilities	7C0 7CJ
HOT77C0	5695SCPX3	z/OS UNIX System Services (USS) Debugger (DBX)	7C0
HOT77C0 JOT77CJ	5695SCPX4	z/OS UNIX System Services (USS) Application Services	7C0 7CJ
HOT77C0	5695SCPX7	z/OS UNIX System Services (USS) Compression Library	7C0
HCS77C0 JCS77CJ	5695SC1XL	HCD (Hardware Configuration Definition)	7C0 7CJ
HWJ9143 JWJ9144	569501403	Alternate Library for REXX	143 144

Figure 71 (Page 5 of 11). Component IDs

FMID	COMP ID	Component Name	RETAIN Release
Figure 71 (Page 6 of 11). Component IDs			
HNET7C0 JNET7CJ	569504002	Infoprint NetSpool	7C0 7CJ
HMOS705 JMOS7J5	569504004	PrintWay basic mode	705 7J5
HFST101	569504402	FFST (First Failure Support Technology™)	101
HVT6240	569511701	Communications Server for z/OS SNA Services (VTAM)	240
HGD3200	569516701	GDDM (Graphical Data Display Manager)	200
JGD3219 JGD3227	569516702	GDDM National Language Support (Graphical Data Display Manager NLS)	219 227
HZFS440 JZFS44J	5696EFS00	z/OS File System (ZFS)	440 44J
HMQ4160	569623400	High Level Assembler (HLASM)	160
JMQ416A	569623401	High Level Assembler (HLASM) Toolkit	16A
HCM1H10	569711900	Hardware Configuration Manager (HCM)	H10
HSM1P00	5740SM105	DFSORT	P00
HBB77C0 JBB77CJ	5752BB1CS	Dynamic Device Reconfiguration (DDR)	7C0 7CJ
HBB77C0 JBB77CJ	5752BB1CT	Machine Check Handler (MCH)	7C0 7CJ
HBB77C0 JBB77CJ	5752BB131	Event Notification Facility (ENF) Dynamic output	7C0 7CJ
HBB77C0	5752BDPUT	z/OS Service	7C0
HBB77C0	5752BDTST	z/OS Preventive Service	7C0
HBB77C0	5752OS390	z/OS BCP General	7C0
HBB77C0 JBB77CJ	5752SCACB	Advanced Program-to-Program Communication (APPC)	7C0 7CJ
HBB77C0 JBB77CJ	5752SCACR	ACR (Alternate CPU Recovery)	7C0 7CJ
HBB77C0 JBB77CJ	5752SCASA	z/OS Reuse	7C0 7CJ
HBB77C0	5752SCASE	Address Space Services	7C0
HBB77C0	5752SCASR	Symptom Record (SYMREC) services	7C0
HBB77C0 JBB77CJ	5752SCAVM	Availability Manager	7C0 7CJ
HBB77C0	5752SCAXR	System REXX	7C0

FMID	COMP ID	Component Name	RETAIN Release
		Figure 71 (Page 7 of 11). Component IDs	
HBB77C0	5752SCBBR	Component Broker	7C0
HPV77B0	5752SCCAP	Capacity Provisioning	7B0
HSD7780	5752SCCCR	Metal C Runtime Library	780
HBB77C0	5752SCCEA	Common Event Adapter	7C0
HZDC7C0	5752SCCDE	z/OS Container Extensions Appliance	7C0
HPG77C0	5752SCCIM	CIM (Common Information Model)	7C0
HPG77C0	5752SCCM2	CIM ESERVER OS Management (Common Information Model)	7C0
HPG77C0	5752SCCM3	CIM Client for Java (Common Information Model)	7C0
HPG77C0	5752SCCM4	CIM Job Cluster Management (Common Information Model)	7C0
HPG77C0	5752SCCM5	CIM Problem Determination (Common Information Model)	7C0
HPG77C0	5752SCCM6	CIM Workload Manager (Common Information Model)	7C0
HPG77C0	5752SCCM7	CIM SMI-S	7C0
HPG77C0	5752SCCM8	CIM Performance Monitoring (Common Information Model)	7C0
HBB77C0	5752SCCON	z/OS Container Extensions Virtualization	7C0
HBB77C0 JBB77CJ	5752SCCSR	Callable Service Requests	7C0 7CJ
HBB77C0 JBB77CJ	5752SCCTX	Context Services	7C0 7CJ
HZDC7C0	5752SCCWF	z/OS Container Extensions z/OSMF Workflows	7C0
HBB77C0 JBB77CJ	5752SCDIV	Data-in-virtual (DIV)	7C0 7CJ
HBB77C0 JBB77CJ	5752SCDMP	SNAP/ABDUMP SDUMP	7C0 7CJ
HBB77C0	5752SCEZA	zAware Bulk Load Client	7C0
HBB77C0	5752SCFXE	BCP Function Registry	7C0
HBB77C0 JBB77CJ	5752SCGTZ	BCP Generic Tracker	7C0 7CJ
HBB77C0	5752SCHCW	Device Driver Manager	7C0
HBB77C0 JBB77CJ	5752SCHIS	z/OS Hardware Instrumentation	7C0 7CJ
HBB77C0 JBB77CJ	5752SCHWI	HWIBCPII - BCPii (Base Control Program Internal Interface)	7C0 7CJ
HBB77C0	5752SCHWT	WEB Enablement toolkit	7C0

FMID	COMP ID	Component Name	RETAIN Release
HBB77C0 JBB77CJ	5752SCHZS	Health Checker	7C0 7CJ
HBB77C0	5752SCIQP	z/OS PCIe Services	7C0
HBB77C0 JBB77CJ	5752SCIXL	Cross System Extended Services (XES)	7C0 7CJ
HBB77C0	5752SCJSC	JES Common Coupling	7C0
HBB77C0	5752SCLDR	Program Loader	7C0
HBB77C0 JBB77CJ	5752SCLOG	System logger	7C0 7CJ
HBB77C0 JBB77CJ	5752SCLWT	Loadwait/Restart	7C0 7CJ
HBB77C0 JBB77CJ	5752SCMMS	MVS message service (MMS)	7C0 7CJ
HBB77C0 JBB77CJ	5752SCOBR	Outboard recording (OBR) of SYS1.LOGREC error recording	7C0 7CJ
HBB77C0 JBB77CJ	5752SCPFA	Predictive Failure Analysis (PFA)	7C0 7CJ
HBB77C0	5752SCPX6	z/OS UNIX System Services (USS) BCP support	7C0
HBB77C0 JBB77CJ	5752SCRRS	Resource Recovery Services (RRS)	7C0 7CJ
HBB77C0	5752SCRTD	Runtime Diagnostics (RTD)	7C0
HBB77C0 JBB77CJ	5752SCRTM	Recovery Termination Manager (RTM)	7C0 7CJ
HBB77C0	5752SCRT2	Sub-Capacity Reporting Tool (z/OS SCRT - Java Version)	7C0
HBB77C0 JBB77CJ	5752SCSDS	Global Resource Serialization (GRS)	7C0 7CJ
HBB77C0 JBB77CJ	5752SCSLP	SLIP/PER	7C0 7CJ
HBB77C0 JBB77CJ	5752SCSPI	Service processor interface (SPI)	7C0 7CJ
HBB77C0 JBB77CJ	5752SCTRC	Component Trace	7C0 7CJ
HBB77C0 JBB77CJ	5752SCTTR	Transaction Trace	7C0 7CJ
HUN77B0 JUN77BJ	5752SCUNI	Support for Unicode	7B0 7BJ

Figure 71 (Page 8 of 11). Component IDs

FMID	COMP ID	Component Name	RETAIN Release
Figure 71 (Page 9 of 11). Component IDs			
HBB77C0	5752SCURP	Usage Reporting Program	7C0
HBB77C0 JBB77CJ	5752SCVTM	Virtual Terminal Manager	7C0 7CJ
HBB77C0 JBB77CJ	5752SCWLM	Workload Manager (WLM)	7C0 7CJ
HBB77C0 JBB77CJ	5752SCXCF	Cross System Coupling Facility (XCF)	7C0 7CJ
HBB77C0	5752SCXML	XML System Services	7C0
HBB77C0 JBB77CJ	5752SCXMS	Cross Memory Services (XMS)	7C0 7CJ
HJS77C0	5752SC1BA	JES3 (Job Entry Subsystem 3)	7C0
HBB77C0	5752SC1BC	BCP Batch Container	7C0
HJE77C0 JJE77CJ	5752SC1BH	JES2 (Job Entry Subsystem 2)	7C0 7CJ
HBB77C0	5752SC1BL	Multi Leaving Workstation (MLW)	7C0
HBB77C0	5752SC1BN	System Security Support (SAF)	7C0
HBB77C0 JBB77CJ	5752SC1B2	External Writer (XWTR)	7C0 7CJ
HBB77C0 JBB77CJ	5752SC1B3	Scheduler Restart	7C0 7CJ
HBB77C0 JBB77CJ	5752SC1B4	Allocation/Unallocation	7C0 7CJ
HBB77C0	5752SC1B5	SWA Manager	7C0
HBB77C0 JBB77CJ	5752SC1B6	Initiator/Terminator	7C0 7CJ
HBB77C0 JBB77CJ	5752SC1B8	Command processing - includes - Command processors / Master scheduler / Master trace	7C0 7CJ
HBB77C0 JBB77CJ	5752SC1B9	Converter/Interpreter	7C0 7CJ
HBB77C0 JBB77CJ	5752SC1CH	Virtual Storage Management (VSM)	7C0 7CJ
HBB77C0 JBB77CJ	5752SC1CJ	Contents Supervisor	7C0 7CJ
HBB77C0 JBB77CJ	5752SC1CK	Communications Task (COMMTASK)	7C0 7CJ

FMID	COMP ID	Component Name	RETAIN Release
Figure 71 (Page 10 of 11). Component IDs			
HBB77C0	5752SC1CL	Task Manager	7C0
HBB77C0 JBB77CJ	5752SC1CM	Recovery Termination Manager (RTM)	7C0 7CJ
HBB77C0	5752SC1CP	Extended Precision Floating Point Register	7C0
HBB77C0 JBB77CJ	5752SC1CR	Real Storage Manager (RSM)	7C0 7CJ
HBB77C0 JBB77CJ	5752SC1CU	Region Control Task (RCT)	7C0 7CJ
HBB77C0 JBB77CJ	5752SC1CV	Timer Supervisor	7C0 7CJ
HBB77C0 JBB77CJ	5752SC1CW	Auxiliary Storage Manager (ASM)	7C0 7CJ
HBB77C0 JBB77CJ	5752SC1CX	System Resource Manager (SRM)	7C0 7CJ
HBB77C0 JBB77CJ	5752SC1CZ	MP Reconfiguration	7C0 7CJ
HBB77C0 JBB77CJ	5752SC1C3	I/O Supervisor (IOS)	7C0 7CJ
HBB77C0 JBB77CJ	5752SC1C4	Device Independent Display Operator Control (DIDOCS)	7C0 7CJ
HBB77C0 JBB77CJ	5752SC1C5	Supervisor Control - includes Interrupt handlers / Dispatcher	7C0 7CJ
HBB77C0	5752SC1C6	Execute Channel Program (EXCP)	7C0
HBB77C0	5752SC1C8	Nucleus Initialization Program (NIP)	7C0
HBB77C0	5752SC1C9	Initial Program Loader (IPL)	7C0
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
HBB77C0	5752SC1GC	BCP Portable Grid Container	7C0
HBB77C0	5752SC1S4	Supervisor SYSGEN	7C0
HBB77C0	5752SC1S5	Scheduler SYSGEN	7C0
ETI1106	5752SC1T3	TSO TIOC (Terminal Input/Output Controller)	106

FMID	COMP ID	Component Name	RETAIN Release
Figure 71 (Page 11 of 11). Component IDs			
HBB77C0 JBB77CJ	5752SC100	SMF Scheduler	7C0 7CJ
HBB77C0	5752SC101	Supervisor Mapping Macro (MAPMACS)	7C0
HBB77C0	5752SC102	System Management Facility (SMF)	7C0
HBB77C0 JBB77CJ	5752SC106	On Line Test Executive Program (OLTEP)	7C0 7CJ
HBB77C0 JBB77CJ	5752SC111	Generalized Trace Facility (GTF)	7C0 7CJ
HBB77C0	5752SC112	Super Zap (AMASPZAP) / AMATERSE	7C0
HBB77C0	5752SC115	Stand-Alone Dump (AMDSADMP)	7C0
HBB77C0	5752SC118	GTF Trace edit	7C0
HBB77C0	5752SC132	Interactive Problem Control System (IPCS)	7C0
HAL47C0	5752SC133	Future function	7C0
HBB77C0	5752SC141	JES Services	7C0
HBB77C0 JBB77CJ	5752SC142	System Trace	7C0 7CJ
HBB77C0 JBB77CJ	5752SC143	Auto Dump Services (DAE)	7C0 7CJ
HBB77C0	5752SC144	Allocation Services	7C0
HBB77C0 JBB77CJ	5752SC164	Virtual Lookaside Facility (VLF)	7C0 7CJ
HBB77C0	5752SYBLD	z/OS Install	7C0
HIT7750	5752XXEIM	Enterprise Identity Mapping (EIM)	750
HRF77C0 JRF77CJ	5752XXH00	RACF (Security Server Resource Access Control Facility)	7C0 7CJ
HKY77C0	5752XXPKI	PKI Services (Public Key Infrastructure)	7C0

Appendix B. APARs Incorporated into Elements of z/OS V2R4

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 HBB77C0 (BCP)

OA47790 OA48450 OA50154 OA50621 OA50638 OA50653 OA51107 OA51146
OA51148 OA51289 OA51327 OA51429 OA51523 OA51633 OA51675 OA51721
OA51752 OA51771 OA51807 OA51866 OA51946 OA51956 OA51960 OA51976
OA51993 OA52014 OA52018 OA52047 OA52089 OA52121 OA52142 OA52167
OA52189 OA52235 OA52247 OA52248 OA52250 OA52282 OA52308 OA52344
OA52350 OA52351 OA52371 OA52381 OA52399 OA52406 OA52407 OA52422
OA52431 OA52446 OA52450 OA52456 OA52457 OA52477 OA52479 OA52488
OA52498 OA52504 OA52507 OA52512 OA52525 OA52526 OA52527 OA52528
OA52530 OA52538 OA52544 OA52548 OA52550 OA52560 OA52561 OA52567
OA52585 OA52590 OA52591 OA52592 OA52595 OA52601 OA52608 OA52613
OA52618 OA52623 OA52624 OA52629 OA52630 OA52640 OA52641 OA52642
OA52643 OA52644 OA52649 OA52652 OA52662 OA52663 OA52676 OA52679
OA52685 OA52695 OA52698 OA52701 OA52705 OA52716 OA52717 OA52720
OA52729 OA52738 OA52739 OA52741 OA52755 OA52757 OA52758 OA52763
OA52774 OA52776 OA52780 OA52781 OA52786 OA52789 OA52791 OA52800
OA52805 OA52808 OA52818 OA52822 OA52828 OA52862 OA52867 OA52868
OA52884 OA52893 OA52900 OA52902 OA52903 OA52905 OA52906 OA52909
OA52917 OA52921 OA52938 OA52940 OA52947 OA52948 OA52949 OA52954
OA52960 OA52962 OA52969 OA52979 OA52981 OA52996 OA52997 OA52999
OA53003 OA53007 OA53011 OA53019 OA53022 OA53024 OA53033 OA53036
OA53037 OA53055 OA53064 OA53078 OA53079 OA53082 OA53083 OA53089
OA53093 OA53094 OA53096 OA53099 OA53102 OA53111 OA53119 OA53123
OA53128 OA53131 OA53142 OA53143 OA53149 OA53152 OA53153 OA53155
OA53156 OA53157 OA53180 OA53191 OA53205 OA53246 OA53248 OA53250
OA53257 OA53267 OA53271 OA53273 OA53274 OA53275 OA53276 OA53289
OA53290 OA53304 OA53306 OA53320 OA53356 OA53359 OA53374 OA53376
OA53377 OA53381 OA53392 OA53393 OA53394 OA53400 OA53402 OA53406
OA53408 OA53414 OA53420 OA53422 OA53427 OA53434 OA53439 OA53449
OA53460 OA53470 OA53487 OA53492 OA53505 OA53509 OA53523 OA53531

OA53544 OA53551 OA53552 OA53556 OA53592 OA53599 OA53614 OA53629
OA53631 OA53640 OA53641 OA53646 OA53656 OA53656 OA53659 OA53660
OA53672 OA53674 OA53687 OA53711 OA53713 OA53715 OA53717 OA53721
OA53738 OA53761 OA53777 OA53780 OA53785 OA53806 OA53807 OA53810
OA53811 OA53816 OA53819 OA53827 OA53842 OA53897 OA53914 OA53920
OA53931 OA53941 OA53952 OA53991 OA54006 OA54024 OA54038 OA54041
OA54058 OA54064 OA54067 OA54100 OA54119 OA54129 OA54135 OA54151
OA54167 OA54171 OA54175 OA54179 OA54187 OA54198 OA54210 OA54211
OA54222 OA54227 OA54255 OA54259 OA54283 OA54315 OA54344 OA54366
OA54376 OA54379 OA54381 OA54399 OA54406 OA54407 OA54414 OA54444
OA54450 OA54455 OA54457 OA54468 OA54529 OA54542 OA54552 OA54557
OA54567 OA54568 OA54573 OA54595 OA54599 OA54600 OA54601 OA54602
OA54633 OA54649 OA54664 OA54670 OA54674 OA54680 OA54688 OA54713
OA54729 OA54735 OA54736 OA54761 OA54781 OA54784 OA54816 OA54819
OA54829 OA54834 OA54884 OA54905 OA54914 OA54926 OA54929 OA54930
OA54949 OA55079 OA55096 OA55110 OA55121 OA55126 OA55137 OA55151
OA55168 OA55169 OA55172 OA55174 OA55202 OA55207 OA55213 OA55232
OA55237 OA55241 OA55244 OA55249 OA55251 OA55269 OA55272 OA55282
OA55306 OA55309 OA55316 OA55348 OA55375 OA55390 OA55396 OA55397
OA55432 OA55437 OA55453 OA55459 OA55479 OA55498 OA55521 OA55526
OA55572 OA55586 OA55592 OA55620 OA55653 OA55671 OA55681 OA55691
OA55695 OA55732 OA55739 OA55755 OA55756 OA55766 OA55777 OA55799
OA55805 OA55807 OA55811 OA55828 OA55830 OA55850 OA55858 OA55893
OA55898 OA55928 OA55944 OA55974 OA55978 OA55984 OA55994 OA56030
OA56037 OA56054 OA56062 OA56068 OA56094 OA56169 OA56180 OA56205
OA56209 OA56215 OA56217 OA56236 OA56273 OA56278 OA56360 OA56363
OA56382 OA56387 OA56390 OA56435 OA56513 OA56527 OA56539 OA56570
OA56604 OA56616 OA56659 OA56827

APARs Incorporated into JBB77CJ

OA51327 OA52716 OA53082 OA53111 OA53143 OA53155 OA53156 OA53273
OA53624 OA53674 OA53711 OA54633

APARs Incorporated into HPV77B0 (BCP - Capacity Provisioning)

OA47783 OA50656 OA50844

APARs Incorporated into HUN77B0 (BCP - Support for Unicode)

OA47998 OA48941 OA49031 OA49458 OA49653 OA49733 OA49992 OA50235
OA50306 OA50314 OA50969 OA51185 OA51304 OA51449 OA51611

APARs Incorporated into JUN77BJ (Unicode JPN)

No APARs have been incorporated at this time.

APARs Incorporated into HPM77C0 (BCP Program Management Binder)

OA51791 OA51895 OA52596 OA52845 OA52846 OA52850 OA53141 OA53262
OA53548 OA53813 OA53938 OA54045 OA54164 OA54365 OA54702 OA55010
OA55217 OA55372 OA55590 OA55754 OA55791 OA55861 OA55985 OA56458
OA56528 OA56667

APARs Incorporated into HBD6602 (BDT)

OW02466 OW02491 OW02703 OW06303 OW07581 OW08052 OW13686 OW14761
OW16558 OY00989 OY01181 OY01214 OY01465 OY01657 OY01963 OY02278
OY02507 OY02517 OY02556 OY02855 OY03037 OY03043 OY03193 OY03823
OY03900 OY04558 OY04723 OY04746 OY04757 OY04797 OY04960 OY05750
OY05860 OY05862 OY06461 OY06694 OY06854 OY07282 OY07358 OY07532
OY07737 OY07738 OY08097 OY08243 OY08520 OY08693 OY09047 OY09152
OY09208 OY09266 OY09340 OY09444 OY09724 OY09810 OY09814 OY10011
OY10450 OY10548 OY10660 OY10846 OY10938 OY11070 OY11117 OY11225
OY11226 OY11415 OY11487 OY11702 OY11739 OY12279 OY12342 OY12437
OY12637 OY13131 OY13133 OY13406 OY13591 OY14050 OY14244 OY14749
OY14959 OY15068 OY15125 OY15218 OY15466 OY15882 OY15962 OY16130
OY16264 OY16719 OY16986 OY17085 OY17238 OY17314 OY17428 OY17457
OY17584 OY17640 OY17978 OY17985 OY18308 OY18469 OY18554 OY18731
OY18908 OY19076 OY19284 OY19321 OY19388 OY19391 OY19894 OY19898
OY19902 OY19960 OY20171 OY20431 OY20784 OY20901 OY20923 OY21002
OY21460 OY21506 OY21813 OY21829 OY21841 OY21875 OY22428 OY22674
OY22782 OY23216 OY23309 OY23876 OY24777 OY25628 OY25822 OY26508
OY27326 OY27346 OY27743 OY27892 OY27898 OY27956 OY28054 OY28281
OY28729 OY29281 OY29347 OY29399 OY29778 OY29957 OY30006 OY30068
OY30079 OY30258 OY30281 OY31473 OY33022 OY33144 OY33982 OY33985
OY34270 OY35019 OY35732 OY36496 OY38230 OY39828 OY40931 OY41599
OY45904 OY47404 OY47780 OY52343 OY53129 OY54436 OY55413 OY58208
OY59355 OY60833 OY60850 OY64461 OZ96792 OZ96975 OZ97192 OZ97459
OZ97533 OZ97640 OZ97699 OZ97701 OZ97702 OZ97703 OZ97723 OZ97724
OZ97905

APARs Incorporated into JBD6201 (BDT File-to-File)

OW18026

APARs Incorporated into JBD6202 (BDT SNA NJE)

OY10539 OY11415 OY12637 OY16986 OY17978 OY18308 OY18908 OY19960
OY21506 OY26802 OY29281 OY30281 OY38230 OY54126 OY59355

APARs Incorporated into HPG77C0 (Common Information Model (CIM))

OA52978 OA53160 OA53937 OA55275 OA55278 OA55502

APARs Incorporated into HIP6240 (Communications Server IP Services)

PH00024 PH03318 PI71717 PI82671 PI86139 PI88947 PI92999 PI96816
PH00025 PH03475 PI77349 PI82757 PI86457 PI89227 PI93670 PI97231
PH00255 PH03490 PI77457 PI82880 PI86553 PI89541 PI93733 PI97583
PH00394 PH03516 PI77699 PI82975 PI86556 PI89637 PI93839 PI97640
PH00646 PH03603 PI78551 PI83075 PI86638 PI89679 PI93840 PI97665
PH00676 PH03785 PI78640 PI83217 PI86806 PI89745 PI93842 PI97728
PH00771 PH03789 PI79434 PI83360 PI86837 PI90071 PI93843 PI97809
PH00856 PH04315 PI79890 PI83818 PI86950 PI90224 PI93844 PI98315
PH01208 PH04377 PI79892 PI83876 PI86992 PI90773 PI93845 PI98515
PH01330 PH04384 PI80221 PI84099 PI87015 PI90866 PI93846 PI98636
PH01540 PH04809 PI80678 PI84331 PI87456 PI90942 PI94457 PI98770
PH01606 PH04867 PI80691 PI84604 PI87509 PI91076 PI94876 PI99073
PH02025 PH05346 PI80717 PI84686 PI87647 PI91192 PI94955 PI99383
PH02093 PH06553 PI80720 PI84687 PI87665 PI91273 PI95231 PI99384
PH02309 PH06752 PI80723 PI84688 PI87685 PI91445 PI95805 PI99480
PH02332 PH07121 PI81083 PI84832 PI87802 PI91927 PI96113 PI99589
PH02491 PH07649 PI81188 PI84885 PI88056 PI92180 PI96128 PI92261
PH02516 PH08210 PI81483 PI85822 PI88348 PI92611 PI96363 PI91114
PH02631 PH08460 PI81687 PI85929 PI88782 PI92649 PI96477 PH03302
PI49567 PI82200 PI85990 PI88929 PI92650 PI96675

APARs Incorporated into HVT6240 (Communications Server for z/OS SNA Services)

OA52658 OA52851 OA53308 OA54110 OA54629 OA55310 OA55925 OA56892
OA56421 OA52953 OA53407 OA54244 OA54728 OA55429 OA55991 OA52681
OA53053 OA53791 OA54306 OA55004 OA55580 OA56439 OA52702 OA53251
OA53953 OA54410 OA55234 OA55752 OA56857

APARs Incorporated into JIP624K (Communications Server Security Level 3)

No APARS were integrated into JIP624K.

APARs Incorporated into JIP624X (XWINDOWS)

No APARs were integrated into JIP624X.

APARs Incorporated into HCRY740 (Cryptographic Services: OCSF)

No APARs have been incorporated at this time.

APARs Incorporated into HKY77C0 (Cryptographic Services PKI Services)

OA52721 OA52722 OA52986 OA55287 OA55353 OA55388 OA55910

APARs Incorporated into HCPT440 (Cryptographic Services: System SSL)

OA52863 OA52896 OA53424 OA53745 OA54127 OA54786 OA54821 OA55013
OA55141 OA55576 OA55998 OA57026

APARs Incorporated into JCPT44J (Cryptographic Services: System SSL Japanese)

No APARs have been incorporated at this time.

APARs Incorporated into HDZ2240 (DFSMS)

OA43560 OA46170 OA47187 OA49086 OA49604 OA49739 OA49853 OA50264
OA50569 OA50661 OA50662 OA50664 OA50669 OA50681 OA50682 OA50703
OA50742 OA50752 OA50796 OA50823 OA50828 OA50850 OA50927 OA51052
OA51063 OA51066 OA51067 OA51068 OA51069 OA51070 OA51073 OA51075
OA51088 OA51132 OA51135 OA51165 OA51197 OA51303 OA51341 OA51361
OA51380 OA51385 OA51401 OA51450 OA51460 OA51466 OA51485 OA51487
OA51488 OA51502 OA51572 OA51607 OA51657 OA51681 OA51684 OA51705
OA51717 OA51735 OA51756 OA51767 OA51783 OA51789 OA51853 OA51875
OA51884 OA51898 OA51900 OA51902 OA51905 OA51906 OA51921 OA51933
OA51934 OA51938 OA51944 OA51954 OA51964 OA51965 OA52039 OA52040
OA52080 OA52084 OA52085 OA52090 OA52091 OA52098 OA52104 OA52118
OA52132 OA52133 OA52138 OA52144 OA52160 OA52170 OA52174 OA52175
OA52177 OA52192 OA52193 OA52198 OA52209 OA52210 OA52220 OA52238
OA52251 OA52261 OA52263 OA52280 OA52304 OA52305 OA52315 OA52318
OA52326 OA52329 OA52330 OA52335 OA52338 OA52340 OA52341 OA52343
OA52353 OA52360 OA52365 OA52367 OA52376 OA52384 OA52385 OA52387
OA52390 OA52391 OA52398 OA52398 OA52409 OA52412 OA52418 OA52419
OA52429 OA52444 OA52449 OA52460 OA52487 OA52492 OA52493 OA52501
OA52509 OA52513 OA52514 OA52515 OA52517 OA52518 OA52519 OA52520
OA52521 OA52542 OA52543 OA52547 OA52549 OA52551 OA52568 OA52569
OA52570 OA52579 OA52587 OA52603 OA52607 OA52615 OA52622 OA52626
OA52628 OA52631 OA52632 OA52633 OA52634 OA52639 OA52645 OA52646
OA52647 OA52648 OA52654 OA52657 OA52661 OA52664 OA52665 OA52666
OA52668 OA52670 OA52672 OA52674 OA52677 OA52682 OA52683 OA52688
OA52691 OA52692 OA52693 OA52703 OA52704 OA52706 OA52711 OA52731
OA52732 OA52733 OA52734 OA52742 OA52744 OA52754 OA52756 OA52764
OA52765 OA52767 OA52768 OA52769 OA52777 OA52778 OA52779 OA52782
OA52785 OA52790 OA52792 OA52795 OA52796 OA52797 OA52801 OA52802
OA52809 OA52810 OA52814 OA52815 OA52817 OA52821 OA52829 OA52830
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OA52870 OA52872 OA52876 OA52879 OA52892 OA52894 OA52901 OA52912
OA52913 OA52914 OA52915 OA52915 OA52918 OA52920 OA52928 OA52929
OA52931 OA52932 OA52933 OA52936 OA52937 OA52943 OA52946 OA52950
OA52958 OA52959 OA52961 OA52965 OA52968 OA52975 OA52976 OA52977
OA52982 OA52983 OA52984 OA52989 OA52990 OA52991 OA52993 OA52994

OA53008 OA53018 OA53030 OA53032 OA53034 OA53035 OA53041 OA53049
OA53051 OA53059 OA53060 OA53061 OA53062 OA53066 OA53067 OA53070
OA53071 OA53073 OA53074 OA53075 OA53076 OA53095 OA53101 OA53104
OA53105 OA53107 OA53110 OA53112 OA53113 OA53114 OA53121 OA53130
OA53134 OA53139 OA53140 OA53154 OA53159 OA53164 OA53168 OA53169
OA53171 OA53172 OA53173 OA53176 OA53177 OA53179 OA53182 OA53184
OA53186 OA53187 OA53190 OA53194 OA53199 OA53200 OA53201 OA53203
OA53207 OA53208 OA53209 OA53214 OA53217 OA53218 OA53219 OA53234
OA53237 OA53238 OA53239 OA53243 OA53247 OA53256 OA53258 OA53278
OA53284 OA53288 OA53292 OA53298 OA53299 OA53300 OA53301 OA53302
OA53303 OA53323 OA53334 OA53346 OA53353 OA53361 OA53363 OA53364
OA53382 OA53383 OA53388 OA53396 OA53397 OA53410 OA53413 OA53423
OA53426 OA53454 OA53457 OA53459 OA53461 OA53463 OA53464 OA53465
OA53467 OA53478 OA53479 OA53480 OA53494 OA53499 OA53512 OA53513
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OA53670 OA53675 OA53682 OA53683 OA53688 OA53689 OA53690 OA53696
OA53700 OA53707 OA53710 OA53712 OA53716 OA53718 OA53723 OA53724
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OA53955 OA53956 OA53959 OA53960 OA53961 OA53962 OA53962 OA53963
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OA54191 OA54208 OA54212 OA54219 OA54229 OA54232 OA54237 OA54253
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OA54393 OA54408 OA54425 OA54435 OA54436 OA54438 OA54466 OA54467
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OA54858 OA54860 OA54863 OA54864 OA54869 OA54871 OA54872 OA54890

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OA55199 OA55209 OA55221 OA55226 OA55228 OA55238 OA55247 OA55248
OA55252 OA55266 OA55267 OA55271 OA55283 OA55290 OA55291 OA55294
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OA55352 OA55362 OA55363 OA55365 OA55366 OA55379 OA55384 OA55385
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OA55481 OA55482 OA55483 OA55487 OA55488 OA55489 OA55497 OA55499
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OA55544 OA55546 OA55548 OA55552 OA55553 OA55561 OA55574 OA55593
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OA56695 OA56696 OA56712 OA56721 OA56722 OA56730 OA56746 OA56752
OA56753 OA56765 OA56766 OA56767 OA56770 OA56793 OA56800 OA56803
OA56809 OA56814 OA56823 OA56843 OA56848 OA56854 OA56885 OA56887
OA56897 OA56900 OA56926 OA56932 OA56942 OA57002 OA57015 OA57024
OA57044 OA57054 OA57129 OA57149 OA57255 OA57372

APARs Incorporated into JDZ224K (DFSMS Japanese)

OA52914 OA54825 OA54860 OA55351 OA53259 OA55827 OA56417

APARs Incorporated into HSM1P00 (DFSORT)

PH00868 PH00912 PH03085 PH04732 PI78921 PI83467 PI84884 PI88548
PI90928 PI92090 PI99290 PI95269 PI97828 PI81037

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 HCS77C0 (HCD)

OA50153 OA52289 OA52494 OA52593 OA52636 OA52637 OA53597 OA53598
OA53804 OA53896 OA53977 OA54233 OA54456 OA54488 OA54531 OA54534
OA54679 OA54709 OA54811 OA54851 OA54912 OA55301 OA55447 OA55992
OA56032 OA56347 OA56673 OA56674 OA56755 OA57192 OA57250 OA57426

APARs Incorporated into JCS77CJ

OA50153 OA52494 OA52593 OA52636 OA52637 OA53598 OA53896 OA54709
OA54912 OA55447 OA56674

APARs Incorporated into HCM1H10 (HCM)

IO25603 IO25758 IO26495 IO26494 IO26421

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 HRSL440 (IBM Tivoli Directory Server for z/OS Base)

OA52891 OA53058 OA53204 OA53601 OA53615 OA53894 OA54234 OA54877
OA55857 OA55982 OA56136 OA56301 OA56308

APARs Incorporated into JRSL44J (IBM Tivoli Directory Server for z/OS JPN)

OA53204 OA53601

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 HCR77D0 (ICSF)

OA53817 OA53854 OA54037 OA54132 OA54240 OA54251 OA54264 OA54316
OA54509 OA54712 OA54913 OA54918 OA55118 OA55342 OA55455 OA55656
OA55721 OA55958

APARs Incorporated into HNET7C0 (Infoprint Server NetSpool)

No APARs have been incorporated at this time.

APARs Incorporated into JNET7CJ

No APARs have been incorporated at this time.

APARs Incorporated into HOPI7C0 (Infoprint Server Print Interface)

OA53507 OA53789 OA53792 OA54193 OA54203 OA54204 OA55338 OA55400
OA55478 OA55823 OA55834 OA56003

APARs Incorporated into JOPI7CJ

OA53789 OA54204

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 HSWK440 (Integrated Security Services Network Authentication Service)

OA52923 OA53458 OA53651 OA54527 OA54889 OA55116 OA55358 OA57171
OA57429 OA57675

APARs Incorporated into JSWK44J (Integrated Security Services Network Authentication Service JPN)

OA53651

APARs Incorporated into HRO7740 (Integrated Security Services OCEP)

No APARs have been incorporated at this time.

APARs Incorporated into HIO1104 (IOCP)

OY01989 OY03274 OY11391 OY13461 OY14989 OY16934 OY17169 OZ87310
OZ90023 OZ91644 OZ92967

APARs Incorporated into HIF7S02 (ISPF)

OA51736 OA52195 OA52465 OA52468 OA52469 OA52470 OA52471 OA52500
OA52502 OA52581 OA52582 OA52583 OA52584 OA52684 OA52730 OA52967
OA53014 OA53015 OA53028 OA53108 OA53136 OA53254 OA53311 OA53324
OA53368 OA53387 OA53405 OA53510 OA53625 OA53630 OA53681 OA53730
OA53829 OA53908 OA54009 OA54027 OA54042 OA54072 OA54076 OA54225
OA54362 OA54363 OA54441 OA54518 OA54519 OA54520 OA54560 OA54569
OA54594 OA54626 OA54637 OA54681 OA54687 OA54703 OA54746 OA54747
OA54749 OA54810 OA54832 OA54959 OA54974 OA55005 OA55117 OA55143
OA55182 OA55431 OA55434 OA55448 OA55465 OA55469 OA55520 OA55535
OA55536 OA55670 OA55689 OA55724 OA55820 OA55831 OA55913 OA55932
OA56059 OA56074 OA56157 OA56161 OA56190 OA56319 OA56562 OA56645
OA56731 OA56769 OA56912 OA56980

APARs Incorporated into JIF7S14

No APARs have been incorporated at this time.

APARs Incorporated into JIF7S16

No APARs have been incorporated at this time.

APARs Incorporated into HJE77C0 (JES2)

OA52887 OA53065 OA53170 OA53450 OA53759 OA53969 OA55219 OA55500

APARs Incorporated into JJE77CJ

No APARs have been incorporated at this time.

APARs Incorporated into HJS77C0 (JES3)

OA51198 OA52276 OA52281 OA52799 OA53020 OA53043 OA53146 OA53150
OA53213 OA53310 OA53444 OA53481 OA53655 OA53665 OA53691 OA53694
OA53695 OA53873 OA53987 OA54085 OA54090 OA54094 OA54097 OA54098
OA54099 OA54115 OA54166 OA54221 OA54419 OA54566 OA54618 OA54658
OA54708 OA54848 OA55002 OA55007 OA55084 OA55265 OA55340 OA55676
OA55888 OA56004 OA56023 OA56052 OA56080 OA56154 OA56581 OA56680
OA56709 OA56711 OA56838 OA57201

APARs Incorporated into HLE77C0 (Language Environment)

PH06630 PI72387 PI78252 PI78867 PI80338 PI80340 PI81708 PI81739
PI81896 PI82130 PI82862 PI83007 PI83640 PI83844 PI85011 PI85662
PI86743 PI86921 PI88923 PI89400 PI95476

APARs Incorporated into JLE77CJ

PI66987

APARs Incorporated into HKCZ120 (IBM Knowledge Center for z/OS)

PH01607 PH01924 PH04576 PH08800 PH08801 PI41359 PI45049 PI46365
PI46376 PI47286 PI47492 PI54363 PI80538 PI80640 PI80644 PI80648
PI83462 PI83636 PI84148 PI84939 PI89697 PI91506 PI92780 PI93338
PI95144 PI95243 PI96192 PI98785 PI98787

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 HDZ224N (Network File System)

OA51691 OA51700 OA51706 OA51961 OA51962 OA52562 OA52605 OA52606
OA52651 OA52710 OA52973 OA52974 OA53085 OA53086 OA53087 OA53088
OA53223 OA53229 OA53375 OA53389 OA53390 OA53524 OA53542 OA53576
OA53585 OA53596 OA53698 OA53705 OA53763 OA53832 OA53881 OA53919

OA54153 OA54695 OA54846 OA55063 OA55124 OA55191 OA55253 OA55559
OA55749 OA56099 OA56600

APARs Incorporated into JDZ224J (NFS Japanese)

OA53391 OA55749

APARs Incorporated into HOS2240 (OpenSSH for z/OS)

OA52511 OA52873 OA53253 OA53532 OA53808 OA54299 OA54734 OA55414
OA55708 OA55852 OA56087

APARs Incorporated into HRM77C0 (RMF)

OA52253 OA52452 OA52694 OA53025 OA53026 OA53281 OA53282 OA53411
OA53626 OA53673 OA53676 OA53948 OA53965 OA53967 OA54017 OA54104
OA54105 OA54134 OA54339 OA54386 OA54404 OA54655 OA54718 OA54720
OA54914 OA54915 OA54916 OA54952 OA55102 OA55103 OA55245 OA55298
OA55335 OA55556 OA55594 OA55602 OA55688 OA55699 OA55886 OA56011
OA56022 OA56141 OA56171 OA56219 OA56285 OA56286 OA56287 OA56492
OA56508 OA56116 OA56672 OA56747 OA56825 OA56826 OA56860 OA56908
OA56913 OA57204 OA57218 OA57219

APARs Incorporated into JRM77CJ

OA52452 OA52694 OA54915 OA56747

APARs Incorporated into HQX77C0 (SDSF)

PI88841 PI96990 PI95294 PH01113 PH01888 PH03062 PH04360

APARs Incorporated into HRF77C0 (Security Server: RACF)

OA50992 OA51635 OA52053 OA52110 OA52135 OA52291 OA52357 OA52370
OA52408 OA52415 OA52650 OA52834 OA52924 OA52925 OA52930 OA53185
OA53242 OA53380 OA53412 OA53506 OA53679 OA53752 OA53930 OA53946
OA54209 OA54350 OA54460 OA54502 OA54526 OA54530 OA54957 OA54892
OA54894 OA54948 OA54987 OA54988 OA55014 OA55146 OA55149 OA55188
OA55154 OA55344 OA55357 OA55781 OA55864 OA55976 OA56038 OA56045
OA56070 OA56343 OA56651 OA57010

APARs Incorporated into JRF77CJ

No APARs have been incorporated at this time.

APARs Incorporated into HIT7750 (Integrated Security Services Enterprise Identity Mapping)

No APARs have been incorporated at this time.

APARs Incorporated into HTV77C0 (Runtime Library Extensions)

PH00377 PH03048 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 HTE77C0 (TSO/E)

OA42234 OA48390 OA51401 OA52594 OA52784 OA52798 OA53042 OA53331
OA53765 OA54131 OA54294 OA54409 OA54555 OA55019 OA55347

APARs Incorporated into JTE77CE

No APARs incorporated at this time.

APARs Incorporated into JTE77CJ

No APARs incorporated at this time.

APARs Incorporated into HLB77C0 (XL C/C++)

PH00644 PH02956 PH03046 PH03047 PH03313 PH03329 PH04982 PH05185
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 HZDC7C0 (z/OS Container Extensions)

No APARs have been incorporated at this time.

APARs Incorporated into HZFS440 (z/OS File System)

OA52459 OA52841 OA52878 OA52955 OA53116 OA53231 OA53352 OA53379
OA53430 OA53557 OA53558 OA53573 OA53605 OA53606 OA53607 OA53657
OA53708 OA53782 OA53821 OA53822 OA53844 OA53898 OA53982 OA53990
OA53995 OA54005 OA54021 OA54062 OA54073 OA54108 OA54130 OA54142
OA54176 OA54180 OA54201 OA54228 OA54287 OA54298 OA54303 OA54314
OA54342 OA54358 OA54416 OA54423 OA54470 OA54472 OA54476 OA54478
OA54489 OA54515 OA54536 OA54537 OA54543 OA54575 OA54651 OA54652
OA54671 OA54721 OA54765 OA54779 OA54945 OA55111 OA55127 OA55211
OA55216 OA55223 OA55235 OA55250 OA55349 OA55616 OA55619 OA55627
OA55641 OA55704 OA55707 OA55762 OA55770 OA55798 OA56172 OA56175
OA56191 OA56334 OA56411 OA56643

APARs Incorporated into JZFS44J

No APARs have been incorporated at this time.

APARs Incorporated into HFNT130 (z/OS Font Collection)

PH07395

APARs Incorporated into HFNT13J

No APARs have been incorporated at this time.

APARs Incorporated into HSMA240 (z/OSMF Core Functions)

PH00433 PH00751 PH01682 PH01770 PH02887 PH03750 PH04035 PH04255
PH04410 PH04662 PH05053 PI79820 PI79822 PI79826 PI79857 PI80753
PI80933 PI81366 PI81784 PI82869 PI83034 PI83035 PI83180 PI83553
PI84201 PI84304 PI84346 PI84367 PI84378 PI84379 PI84380 PI85314
PI85503 PI85665 PI86052 PI86515 PI87221 PI87297 PI87639 PI87683
PI88589 PI88651 PI88809 PI88944 PI89459 PI89571 PI89954 PI90124
PI90267 PI91116 PI91339 PI91540 PI92211 PI92213 PI92518 PI92534
PI92549 PI92595 PI92728 PI92905 PI94210 PI94524 PI94965 PI95006
PI95452 PI95683 PI95767 PI95899 PI96293 PI96462 PI96730 PI96931
PI97157 PI98415 PI98878

APARs Incorporated into HSMA241 (z/OSMF ISPF)

PI80934 PI90266 PI92508 PI94193 PI98526

APARs Incorporated into HSMA242 (z/OSMF Resource Monitoring)

PH00038 PI79914 PI80935 PI83405 PI84374 PI87646 PI89935 PI92245
PI92575

APARs Incorporated into HSMA243 (z/OSMF WLM)

PH00521 PH02111 PI80936 PI81656 PI84383 PI87652 PI89361 PI92556
PI94871 PI96460 PI98413 PI98533

APARs Incorporated into HSMA244 (z/OSMF Software Management)

PH00267 PH01709 PH02650 PI75753 PI79217 PI79217 PI79666 PI79666
PI80772 PI80772 PI80825 PI82795 PI82795 PI83691 PI83691 PI84025
PI84025 PI84929 PI84929 PI85814 PI85814 PI86377 PI86377 PI87807
PI87807 PI88595 PI88595 PI88619 PI88619 PI91732 PI91732 PI92593
PI93204 PI97077 PI97461 PI98555

APARs Incorporated into HSMA245 (z/OSMF Incident Log)

PH02062 PI80938 PI81657 PI83040 PI87427 PI92594

APARs Incorporated into HSMA246 (z/OSMF Capacity Provisioning)

PH00085 PI80090 PI80940 PI82921 PI87635 PI92582

APARs Incorporated into HSMA247 (z/OSMF Workflow)

PH00582 PH04669 PH04817 PI79813 PI80941 PI81658 PI81785 PI82694
PI83223 PI84202 PI85957 PI87424 PI91117 PI92884 PI96932 PI98209

APARs Incorporated into HSMA24A (z/OSMF Network Configuration Assistant)

PH01253 PH04326 PH06823 PI84043 PI91383 PI94468 PI98791 PH02459
PH04783 PI80214 PI86456 PI91579 PI97043 PH02708 PH04983 PI80219
PI87482 PI91955 PI97737 PH04130 PH05703 PI80223 PI89816 PI94208
PI98391

APARs Incorporated into HSMA24E (z/OSMF zERT Network Analyzer)

PH03137 PH08345

APARs Incorporated into JCRY741 (z/OS Security Level 3 OCSF)

No APARs have been incorporated at this time.

APARs Incorporated into JCPT441 (z/OS Security Level 3 System SSL Security Level 3)

OA52863 OA53745 OA54786 OA54821 OA55013 OA55141 OA55576 OA55998
OA57026

APARs Incorporated into JSWK441 (z/OS Security Level 3 - Network Authentication Service Security
Level 3)

OA57429

APARs Incorporated into JRSL441 (z/OS Security Level 3 IBM TDS Security Level 3)

No APARs have been incorporated at this time.

APARs Incorporated into HOT77C0 (z/OS UNIX System Services Application Services)

OA52481 OA52497 OA52897 OA53232 OA53448 OA54559 OA54620 OA55299
OA55855 OA56001

APARs Incorporated into JOT77CJ

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.

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 82
- 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 HFS or 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 87
- 8.3.4, "Set up File System Directories for Wave 2" on page 116

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 91
- 8.3.5, "Define DDDEFs for Wave 2 Elements" on page 117

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 129 for more information on using the target system libraries.

C.2 SMP/E Data Sets for z/OS V2R4

A complete set of SMP/E data sets is required for the installation of z/OS V2R4. See *SMP/E for z/OS Reference*, for information on the use of these 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

Figure 72. Storage Requirements for the SMP/E Work Data Sets

Note: Space for SYSUT1 through SYSUT4 cannot be allocated in blocks (BLKS).

Abbreviations used for the ORG field are:

HFS   file system
PDS   Partition Data Set
PDSE   Partition Data Set Extended

DDDEF Name	ORG	NOTE	RECFM	LRECL	No. of 3390 TRKS	No. of DIR BLKS
SMPJHOME	HFS					
SMPLTS	PDSE		U	0	0	--
SMPMTS	PDS		FB	80	6	2
SMPPTS	PDSE		FB	80	1115	--
SMPSCDS	PDS		FB	80	5	15
SMPSTS	PDS		FB	80	7	2

Figure 73. Storage Required for SMP/E Data Sets for z/OS V2R4

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 6.0 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 V2R4. 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 74 on page 284.
- LPA-eligible RMODE 24 libraries; see Figure 75 on page 284.
- Load libraries for change migration; see Figure 76 on page 284.
- Load libraries for callable services; see Figure 77 on page 285.

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 74 on page 284 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 74. 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
SERBLPA	RMF	TVOL1	LMOD

Figure 75 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 75. LPA-eligible RMODE 24 load libraries			
DDDEF name	**Element or feature name**	**Volume**	**Type**
SBDTLPA	BDT	TVOL1	LMOD
SEZALPA	Communications Server	TVOL1	LMOD
SIATLPA	JES3	TVOL1	LMOD
SICELPA	DFSORT	TVOL1	LMOD
SISFLPA	SDSF	TVOL1	LMOD
SISPLPA	ISPF	TVOL1	LMOD
SORTLPA	DFSORT	TVOL1	LMOD

Figure 76 on page 284 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 76. Load libraries for change migration			
DDDEF name	**Element or feature name**	**Volume**	**Type**
MIGLIB	BCP, BDT, 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
SIATMIG	JES3	TVOL1	LMOD

Figure 77 lists z/OS libraries that contain load modules that are used as callable services from other elements and non-z/OS products.

Figure 77. 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 V2R4

Figure 78 on page 288 describes the target libraries required to install z/OS V2R4. 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 V2R4 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

In the tables, abbreviations used for the **NOTE** column are:

| **1** | New library introduced in z/OS V1R1. |
| **2** | New library introduced in z/OS V1R2. |

3	New library introduced in z/OS V1R3.
4	New library introduced in z/OS V1R4.
5	New library introduced in z/OS V1R5.
6	New library introduced in z/OS V1R6.
7	New library introduced in z/OS V1R7.
8	New library introduced in z/OS V1R8.
9	New library introduced in z/OS V1R9.
10	New library introduced in z/OS V1R10.
11	New library introduced in z/OS V1R11.
21	New library introduced in z/OS V2R1.
22	New library introduced in z/OS V2R2.
23	New library introduced in z/OS V2R3.
24	New library introduced in z/OS V2R4.
N	Library used only for National Language support. This library can be empty if the language is not ordered.
*	An "*" in the NOTE column indicates that the library is empty after the z/OS release is installed.

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 74 on page 284 for required LPA and optional RMODE 31 LPA-eligible libraries, and Figure 75 on page 284 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 129 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.

Library DDNAME	Mem Type	Tar Vol	T Y P E	Org	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks	N O T E
ADFMAC1	CLST	T1	U	PDS	FB	80	2	2	
CBRDBRM	DATA	T1	U	PDS	FB	80	10	3	
CMDLIB	LMOD	T1	E	PDS	U	0	73	75	
CSSLIB	LMOD	T1	E	PDS	U	0	92	275	
DBBLIB	DATA	T1	U	PDS	VB	80	53	34	
DFQLLIB	LMOD	T1	U	PDS	U	0	6	5	
DFQMKLB	MSG	T1	U	PDS	FB	80	3	2	N
DFQMLIB	MSG	T1	U	PDS	FB	80	3	2	
DFQPKLB	PANL	T1	U	PDS	FB	80	36	17	N
DFQPLIB	PANL	T1	U	PDS	FB	80	36	17	
DGTCLIB	CLST	T1	U	PDS	FB	80	171	14	
DGTLLIB	LMOD	T1	U	PDS	U	0	211	149	
DGTMKLB	MSG	T1	U	PDS	FB	80	48	33	N
DGTMLIB	MSG	T1	U	PDS	FB	80	48	33	
DGTPKLB	PANL	T1	S	PDS	FB	80	856	391	N
DGTPLIB	PANL	T1	U	PDS	FB	80	860	391	
DGTSKLB	SKEL	T1	U	PDS	FB	80	4	2	N
DGTSLIB	SKEL	T1	U	PDS	FB	80	33	5	
DGTTLIB	TABL	T1	U	PDS	FB	80	5	6	
FONTLIB	LMOD	T2	U	PDS	VBM	12284	283	165	21
FONTLIBB	LMOD	T2	U	PDS	VBM	12284	3402	523	21
FONT300	LMOD	T2	U	PDS	VBM	12284	3739	488	21
HELP	HELP	T1	E	PDS	FB	80	213	45	
HELPENP	HELP	T1	U	PDS	FB	80	34	10	
HLPKLB	HELP	T1	U	PDS	FB	80	4	4	N
HRFCLST	CLST	T1	U	PDS	FB	80	19	3	

Figure 78 (Page 1 of 14). Storage required for target libraries for z/OS V2R4

Figure 78 (Page 2 of 14). Storage required for target libraries for z/OS V2R4									
Library DDNAME	Mem Type	Tar Vol	TYPE	Org	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks	NOTE
HRFMSG	MSG	T1	U	PDS	FB	80	12	5	
HRFPANL	PANL	T1	U	PDS	FB	80	225	90	
HRFSKEL	SKEL	T1	U	PDS	FB	80	66	14	
ICQABTXT	MAC	T2	U	PDS	FB	80	5	3	
ICQCCLIB	CLST	T1	U	PDS	FB	80	165	10	
ICQILIB	MAC	T2	U	PDS	FB	80	3	2	
ICQKABTX	MAC	T2	U	PDS	FB	80	5	4	N
ICQKCLIB	CLST	T1	U	PDS	FB	80	2	2	N
ICQKILIB	MAC	T2	U	PDS	FB	80	3	3	N
ICQKMLIB	MSG	T1	U	PDS	FB	80	18	30	N
ICQKPLIB	PANL	T1	U	PDS	FB	80	342	424	N
ICQKTABL	TABL	T1	U	PDS	FB	80	7	11	N
ICQMLIB	MSG	T1	U	PDS	FB	80	17	15	
ICQPLIB	PANL	T1	U	PDS	FB	80	335	213	
ICQSLIB	SKEL	T1	U	PDS	FB	80	2	2	
ICQTABLS	TABL	T1	U	PDS	FB	80	9	6	
IGDVBS1	DATA	T1	U	PDS	VB	4100	9	2	
IMAGELIB	LMOD	T1	U	PDS	U	0	20	30	
KANLIB	LMOD	T1	U	PDS	U	0	3	5	N
KHELP	HELP	T1	E	PDS	FB	80	44	17	N
LINKLIB	LMOD	T1	E	PDS	U	0	3210	1055	
LPALIB	LMOD	T1	E	PDS	U	0	1133	450	
MACLIB	MAC	T2	E	PDS	FB	80	4362	153	
MIGLIB	LMOD	T1	E	PDS	U	0	1133	493	
MODGEN	MAC	T2	E	PDS	FB	80	655	59	
MSGENP	MSG	T2	U	PDS	VB	259	9	2	N
MSGENU	MSG	T2	U	PDS	VB	259	57	10	
MSGJPN	MSG	T2	S	PDS	VB	259	50	10	N
NFSLIBE	LMOD	T1	U	PDSE	U	0	213	-	7
NFSMAC	MAC	T2	U	PDS	FB	80	4	2	

Library DDNAME	Mem Type	Tar Vol	TYPE	Org	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks	NOTE
NFSSAMP	SAMP	T2	U	PDS	FB	80	13	2	
NFSTARB	DATA	T1	U	PDS	VB	264	28	2	
NUCLEUS	LMOD	T1	E	PDS	U	0	709	153	
PARMLIB	PARM	T1	E	PDS	FB	80	20	10	
PROCLIB	PROC	T1	E	PDS	FB	80	9	7	
SACBCNTL	SAMP	T2	U	PDS	FB	80	29	7	
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	459	100	
SADMMSG	MSG	T1	U	PDS	FB	80	2	2	
SADMOPS	SAMP	T2	U	PDS	VB	255	7	2	
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	6	
SAFHFORT	LMOD	T1	U	PDS	U	0	19	69	
SAMPLIB	SAMP	T2	E	PDS	FB	80	1624	101	
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	N
SAOPPENU	PANL	T1	U	PDS	FB	80	89	36	
SAOPPJPN	PANL	T1	U	PDS	FB	80	89	40	N
SASMMAC1	MAC	T2	U	PDS	FB	80	13	2	
SASMMAC2	MAC	T2	U	PDS	FB	80	5	2	
SASMMOD1	LMOD	T1	U	PDS	U	0	43	6	

Figure 78 (Page 3 of 14). Storage required for target libraries for z/OS V2R4

Library DDNAME	Mem Type	Tar Vol	TYPE	Org	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks	NOTE
SASMMOD2	LMOD	T1	U	PDS	U	0	69	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	21	3	9
SBBLEXEC	EXEC	T1	U	PDS	VB	255	2	2	23
SBBLJCL	SAMP	T1	U	PDS	FB	80	3	2	23
SBDTCLI0	CLST	T1	U	PDS	FB	80	4	2	
SBDTCMD	LMOD	T1	U	PDS	U	0	2	2	
SBDTHELP	HELP	T1	U	PDS	FB	80	3	2	
SBDTLIB	LMOD	T1	U	PDS	U	0	28	16	
SBDTLINK	LMOD	T1	U	PDS	U	0	3	2	
SBDTLPA	LMOD	T1	U	PDS	U	0	3	2	
SBDTMAC	MAC	T2	U	PDS	FB	80	117	19	
SBDTMSG	MSG	T1	U	PDS	FB	80	2	2	
SBDTPNL0	PANL	T1	U	PDS	FB	80	7	5	
SBDTSAMP	SAMP	T2	U	PDS	FB	80	11	2	
SBLSCLI0	CLST	T1	E	PDS	FB	80	325	19	
SBLSKEL0	SKEL	T1	E	PDS	FB	80	9	6	
SBLSMSG0	MSG	T1	E	PDS	FB	80	10	10	
SBLSPNL0	PANL	T1	E	PDS	FB	80	378	235	
SBLSTBL0	TABL	T1	E	PDS	FB	80	6	3	
SBPXEXEC	EXEC	T1	U	PDS	FB	80	42	4	
SBPXMENU	MSG	T1	U	PDS	FB	80	11	10	
SBPXMJPN	MSG	T1	U	PDS	FB	80	11	10	N
SBPXPENU	PANL	T1	U	PDS	FB	80	34	27	
SBPXPJPN	PANL	T1	U	PDS	FB	80	36	28	N
SBPXTENU	TABL	T1	U	PDS	FB	80	2	2	
SBPXTJPN	TABL	T1	U	PDS	FB	80	2	2	N
SCBDCLST	CLST	T1	U	PDS	FB	80	3	3	

Figure 78 (Page 4 of 14). Storage required for target libraries for z/OS V2R4

Library DDNAME	Mem Type	Tar Vol	TYPE	Org	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks	NOTE
SCBDHENU	LMOD	T1	U	PDS	U	0	477	642	
SCBDHJPN	LMOD	T1	U	PDS	U	0	933	1472	N
SCBDMENU	MSG	T1	U	PDS	FB	80	28	79	
SCBDMJPN	MSG	T1	U	PDS	FB	80	28	79	N
SCBDPENU	PANL	T1	U	PDS	FB	80	89	114	
SCBDPJPN	PANL	T1	U	PDS	FB	80	89	114	N
SCBDTEMP	DATA	T1	U	PDS	FB	80	21	2	
SCBDTENU	TABL	T1	U	PDS	FB	80	2	2	
SCBDTJPN	TABL	T1	U	PDS	FB	80	2	2	N
SCCNCMP	LMOD	T1	U	PDSE	U	0	5018	-	2
SCCNDOC	BOOK	T2	U	PDS	FB	80	2	2	2
SCCNJCL	SAMP	T2	U	PDS	FB	80	4	2	2
SCCNM10	DATA	T1	U	PDS	FB	80	23	11	22
SCCNM11	DATA	T1	U	PDS	FB	80	23	11	22
SCCNM12	DATA	T1	U	PDS	FB	80	22	10	23
SCCNN10	DATA	T1	U	PDS	FB	80	34	11	22
SCCNN11	DATA	T1	U	PDS	FB	80	117	15	22
SCCNN12	DATA	T1	U	PDS	FB	80	118	17	23
SCCNOBJ	DATA	T1	U	PDS	FB	80	33	5	5
SCCNPRC	PROC	T1	U	PDS	FB	80	7	5	2
SCCNSAM	SAMP	T2	U	PDS	FB	80	25	14	2
SCCNUTL	EXEC	T1	U	PDS	FB	80	6	2	2
SCCR3BND	LMOD	T1	U	PDS	U	0	13	35	11
SCCR6BND	LMOD	T1	U	PDS	U	0	13	35	11
SCDRTABL	DATA	T1	U	PDS	FB	80	283	2	
SCDSSAMP	SAMP	T2	U	PDS	FB	80	3	2	
SCEEBIND	LMOD	T1	U	PDSE	U	0	11	-	
SCEEBND2	DATA	T2	U	PDS	FB	80	4	7	2
SCEECICS	LMOD	T1	U	PDS	U	0	2	2	
SCEECLST	CLST	T1	U	PDS	FB	80	10	2	

Figure 78 (Page 5 of 14). Storage required for target libraries for z/OS V2R4

Library DDNAME	Mem Type	Tar Vol	T Y P E	Org	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks	N O T E
SCEECMAP	DATA	T1	U	PDS	FB	80	481	11	
SCEECPP	DATA	T1	U	PDS	FB	80	18	5	
SCEEGXLT	DATA	T1	U	PDS	FB	80	127	35	
SCEEH	MAC	T2	U	PDS	FB	120	115	12	2
SCEEHARP	MAC	T2	U	PDS	FB	80	3	2	
SCEEHH	MAC	T2	U	PDS	FB	80	145	19	
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	23	6	
SCEEHT	MAC	T2	U	PDS	FB	120	19	3	2
SCEELIB	DATA	T1	U	PDS	FB	80	72	3	
SCEELKED	LMOD	T1	U	PDS	U	0	635	2690	
SCEELKEX	DATA	T1	U	PDS	FB	80	102	196	
SCEELOCL	DATA	T1	U	PDS	FB	80	74	5	
SCEELOCX	DATA	T1	U	PDS	FB	80	848	22	
SCEELPA	LMOD	T1	U	PDS	U	0	249	3	
SCEEMAC	MAC	T2	U	PDS	FB	80	76	10	
SCEEMSGP	MSG	T1	U	PDS	FB	150	2	2	N
SCEEOBJ	DATA	T1	U	PDS	FB	80	6	5	
SCEEPROC	PROC	T1	U	PDS	FB	80	4	3	
SCEERUN	LMOD	T1	U	PDS	U	0	1736	919	
SCEERUN2	LMOD	T1	U	PDSE	U	0	24208	-	
SCEESAMP	SAMP	T2	U	PDS	FB	80	132	37	
SCEESPC	LMOD	T1	U	PDS	U	0	13	77	
SCEESPCO	DATA	T1	U	PDS	FB	80	4	4	
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	-	2
SCLBHH	DATA	T2	U	PDS	FB	120	10	2	
SCLBJCL	SAMP	T2	U	PDS	FB	80	6	2	

Figure 78 (Page 6 of 14). Storage required for target libraries for z/OS V2R4

Library DDNAME	Mem Type	Tar Vol	TYPE	Org	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks	NOTE
SCLBSID	DATA	T1	U	PDS	FB	80	3	2	
SCSFCLI0	CLST	T1	U	PDS	FB	80	30	3	
SCSFHDRS	DATA	T2	U	PDS	FB	80	6	2	
SCSFMOD0	LMOD	T1	U	PDS	U	0	260	178	
SCSFMOD1	LMOD	T1	U	PDS	U	0	2	2	
SCSFMSG0	MSG	T1	U	PDS	FB	80	9	6	
SCSFOBJ	DATA	T2	U	PDS	FB	80	2	2	
SCSFPNL0	PANL	T1	U	PDS	FB	80	44	22	
SCSFSKL0	SKEL	T1	U	PDS	FB	80	2	2	
SCSFSTUB	LMOD	T1	U	PDS	U	0	52	160	23
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	10	2	2
SCUNJCL	SAMP	T2	U	PDS	FB	80	3	2	2
SCUNLOCL	DATA	T1	U	PDS	FB	80	960	43	8
SCUNMENU	DATA	T1	U	PDS	VB	259	2	2	4
SCUNMJPN	DATA	T1	U	PDS	VB	259	2	2	N
SCUNTBL	DATA	T1	U	PDS	FB	256	43564	984	2
SDFQPKSR	DATA	T2	U	PDS	VB	255	14	3	N
SDFQPSRC	DATA	T2	U	PDS	VB	255	14	3	
SDGTPKSR	DATA	T2	U	PDS	VB	255	241	73	N
SDGTPSRC	DATA	T2	U	PDS	VB	255	244	74	
SDGTTSRC	DATA	T2	U	PDS	VB	255	3	3	
SDMSSVM	LMOD	T1	U	PDS	U	0	72	177	
SDMSSVMS	LMOD	T1	U	PDS	U	0	2	2	
SDWWDLPA	LMOD	T1	U	PDS	U	0	2	2	3
SEAGALT	LMOD	T2	U	PDS	U	0	2	3	9
SEAGJENU	SAMP	T2	U	PDS	FB	80	4	2	9
SEAGMENU	MSG	T1	U	PDS	VB	255	2	2	9

Figure 78 (Page 7 of 14). Storage required for target libraries for z/OS V2R4

Library DDNAME	Mem Type	Tar Vol	TYPE	Org	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks	NOTE
SEAGMJPN	MSG	T1	U	PDS	VB	255	2	2	N
SEAGSAM	SAMP	T2	U	PDS	FB	80	2	2	9
SEDGEXE1	EXEC	T1	U	PDS	FB	80	106	7	
SEDGMENU	MSG	T1	U	PDS	FB	80	12	11	
SEDGMJPN	MSG	T1	U	PDS	FB	80	12	11	N
SEDGPENU	PANL	T1	U	PDS	FB	80	184	87	
SEDGPJPN	PANL	T1	U	PDS	FB	80	189	87	N
SEDGPKSR	DATA	T2	U	PDS	VB	255	67	32	N
SEDGPSRC	DATA	T2	U	PDS	VB	255	68	32	
SEEQINST	DATA	T2	U	PDS	FB	80	2152	2	
SEPWBENU	DATA	T2	U	PDS	FB	4096	6	2	N
SEPWCENU	CLST	T1	U	PDS	FB	80	3	2	
SEPWMAC1	MAC	T2	U	PDS	FB	80	2	2	N
SEPWMOD1	LMOD	T1	U	PDS	U	0	13	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	145	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	29	3	
SERBLINK	LMOD	T1	U	PDS	U	0	572	48	
SERBLPA	LMOD	T1	U	PDS	U	0	7	14	
SERBMENU	MSG	T1	U	PDS	FB	80	6	6	
SERBMJPN	MSG	T1	U	PDS	FB	80	6	6	N
SERBPENU	PANL	T1	U	PDS	FB	80	368	134	
SERBPJPN	PANL	T1	U	PDS	FB	80	378	137	N
SERBPWSV	DATA	T2	U	PDS	VB	255	6074	2	
SERBT	TABL	T1	U	PDS	FB	80	19	5	N
SERBTENU	TABL	T1	U	PDS	FB	80	7	2	

Figure 78 (Page 8 of 14). Storage required for target libraries for z/OS V2R4

Library DDNAME	Mem Type	Tar Vol	TYPE	Org	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks	NOTE
SERBTJPN	TABL	T1	U	PDS	FB	80	7	2	N
SEUVFEXC	EXEC	T1	U	PDS	FB	80	2	2	
SEUVFLIB	DATA	T2	U	PDS	FB	80	7	3	N
SEUVFSAM	SAMP	T2	U	PDS	FB	80	4	2	
SEZACMAC	MAC	T2	U	PDS	FB	80	314	90	
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	11
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	2847	-	4
SEZALPA	LMOD	T1	U	PDS	U	0	3	5	4
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	90	6	
SEZANPNL	DATA	T1	U	PDS	FB	80	22	20	
SEZAOLDX	LMOD	T1	U	PDS	U	0	3	5	3
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	3
SEZARNT3	DATA	T1	U	PDS	FB	80	79	12	3
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	3

Figure 78 (Page 9 of 14). Storage required for target libraries for z/OS V2R4

Library DDNAME	Mem Type	Tar Vol	TYPE	Org	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks	NOTE
Figure 78 (Page 10 of 14). Storage required for target libraries for z/OS V2R4									
SEZAROE3	DATA	T1	U	PDS	FB	80	79	12	3
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	
SEZAXAWL	DATA	T1	U	PDS	U	0	14	51	3
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	3
SEZAXTLB	DATA	T1	U	PDS	U	0	20	114	3
SEZAX11L	DATA	T1	U	PDS	U	0	58	286	3
SFNTILIB	LMOD	T2	U	PDS	VBM	16124	3194	527	21
SFOMHDRS	MAC	T2	U	PDS	FB	80	18	2	
SFOMOBJ	DATA	T1	U	PDS	FB	80	68	37	
SFONDLIB	LMOD	T2	U	PDS	VBM	12284	18765	740	21
SGIMCLS0	CLST	T1	U	PDS	FB	80	2	2	
SGIMLMD0	LMOD	T1	U	PDS	U	0	69	9	
SGIMMENU	MSG	T1	U	PDS	FB	80	9	6	
SGIMMJPN	MSG	T1	U	PDS	FB	80	9	6	N
SGIMPENU	PANL	T1	U	PDS	FB	80	150	88	
SGIMPJPN	PANL	T1	U	PDS	FB	80	149	88	N
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	N
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	
SGSKSAMP	SAMP	T2	U	PDS	FB	80	4	2	
SHAPEXE3	EXEC	T1	S	PDS	VB	255	2	2	22

Library DDNAME	Mem Type	Tar Vol	TYPE	Org	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks	NOTE

Figure 78 (Page 11 of 14). Storage required for target libraries for z/OS V2R4

Library DDNAME	Mem Type	Tar Vol	TYPE	Org	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks	NOTE
SHAPJCL3	SAMP	T2	S	PDS	FB	80	2	2	22
SHASLNKE	LMOD	T1	U	PDSE	U	0	117	-	7
SHASMAC	MAC	T2	U	PDS	FB	80	517	57	
SHASMENU	MSG	T1	U	PDS	VB	259	7	2	
SHASMIG	LMOD	T1	U	PDS	U	0	58	76	
SHASMJPN	MSG	T1	U	PDS	VB	259	7	2	N
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	6	
SHASSRC	SRCE	T2	U	PDS	FB	80	2238	25	
SIATCLI0	CLST	T1	U	PDS	FB	80	10	2	
SIATLIB	LMOD	T1	U	PDS	U	0	181	135	
SIATLINK	LMOD	T1	U	PDS	U	0	13	7	
SIATLPA	LMOD	T1	U	PDS	U	0	21	17	
SIATMAC	MAC	T2	U	PDS	FB	80	655	74	
SIATMIG	LMOD	T1	U	PDS	U	0	74	84	
SIATMSG0	MSG	T1	U	PDS	FB	80	2	2	
SIATPARM	PARM	T1	U	PDS	FB	80	2	2	
SIATPNL0	PANL	T1	U	PDS	FB	80	12	7	
SIATSAMP	SAMP	T2	U	PDS	FB	80	17	3	
SIATSRC	SRCE	T2	U	PDS	FB	80	3499	89	
SIATTBL0	TABL	T1	U	PDS	FB	80	2	2	
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	23	13	
SICELPA	LMOD	T1	U	PDS	U	0	2	2	
SICEPROC	SAMP	T2	U	PDS	FB	80	2	2	

Library DDNAME	Mem Type	Tar Vol	TYPE	Org	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks	NOTE
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	11	5	N
SICHPJPN	PANL	T1	U	PDS	FB	80	230	89	N
SIEAHDR	MAC	T2	U	PDS	FB	80	234	13	
SIEAHDRV	DATA	T2	U	PDS	VB	260	28	4	6
SIEALNKE	LMOD	T1	S	PDSE	U	0	3736	-	6
SIEAMIGE	LMOD	T1	S	PDSE	U	0	20	-	7
SIEASID	DATA	T2	U	PDS	FB	80	7	4	6
SIFALIB	LMOD	T1	U	PDS	U	0	9	2	
SIOEEXEC	EXEC	T1	U	PDS	FB	80	5	2	
SIOEMJPN	MSG	T1	U	PDS	VB	255	7	2	N
SIOEPROC	PROC	T1	U	PDS	FB	80	2	2	
SIOESAMP	SAMP	T2	U	PDS	FB	80	4	2	
SISFEXEC	EXEC	T1	U	PDS	FB	80	15	3	
SISFHELP	HELP	T1	U	PDS	FB	80	2	2	4
SISFJCL	SAMP	T2	U	PDS	FB	80	14	2	
SISFLINK	LMOD	T1	U	PDS	U	0	3	2	
SISFLOAD	LMOD	T1	U	PDS	U	0	234	20	
SISFLPA	LMOD	T1	U	PDS	U	0	52	2	
SISFMAC	SRCE	T2	U	PDS	FB	80	41	3	9
SISFMIG	LMOD	T1	U	PDS	U	0	12	37	10
SISFMLIB	MSG	T1	U	PDS	FB	80	2	2	
SISFPLIB	PANL	T1	U	PDS	FB	80	457	244	
SISFSLIB	SKEL	T1	U	PDS	FB	80	7	4	
SISFSRC	SRCE	T2	U	PDS	FB	80	3	2	
SISFTLIB	TABL	T1	U	PDS	FB	80	107	2	
SISPALIB	DATA	T2	U	PDS	FB	80	2	2	
SISPCLIB	CLST	T1	U	PDS	FB	80	19	4	

Figure 78 (Page 12 of 14). Storage required for target libraries for z/OS V2R4

Library DDNAME	Mem Type	Tar Vol	TYPE	Org	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks	NOTE
SISPEXEC	EXEC	T1	U	PDS	FB	80	107	4	
SISPGENP	DATA	T2	U	PDS	FB	80	279	201	N
SISPGENU	DATA	T2	U	PDS	FB	80	281	202	
SISPGJPN	DATA	T2	U	PDS	FB	80	279	201	N
SISPGMLI	DATA	T2	U	PDS	FB	80	174	79	
SISPGUI	DATA	T2	U	PDS	VB	255	317	2	
SISPHELP	HELP	T1	U	PDS	FB	80	3	2	
SISPLOAD	LMOD	T1	U	PDS	U	0	132	72	
SISPLPA	LMOD	T1	U	PDS	U	0	451	44	
SISPMACS	MAC	T2	U	PDS	FB	80	58	12	
SISPMENP	MSG	T1	U	PDS	FB	80	48	51	N
SISPMENU	MSG	T1	U	PDS	FB	80	48	51	
SISPMJPN	MSG	T1	U	PDS	FB	80	49	51	N
SISPPENP	PANL	T1	U	PDS	FB	80	492	309	N
SISPPENU	PANL	T1	U	PDS	FB	80	492	309	
SISPPJPN	PANL	T1	U	PDS	FB	80	490	309	N
SISPSAMP	SAMP	T2	U	PDS	FB	80	99	21	
SISPSENP	SKEL	T1	U	PDS	FB	80	106	75	N
SISPSENU	SKEL	T1	U	PDS	FB	80	106	75	
SISPSJPN	SKEL	T1	U	PDS	FB	80	106	75	N
SISPSLIB	SKEL	T1	U	PDS	FB	80	26	7	
SISPTENP	TABL	T1	U	PDS	FB	80	4	2	N
SISPTENU	TABL	T1	U	PDS	FB	80	4	2	
SISPTJPN	TABL	T1	U	PDS	FB	80	4	2	N
SISTASGD	DATA	T1	U	PDS	VB	512	61	5	
SISTASN1	DATA	T1	U	PDS	FB	1024	11	4	
SISTCLIB	LMOD	T1	U	PDS	U	0	124	129	
SISTCMIP	DATA	T1	U	PDS	FB	80	2	2	
SISTDAT1	DATA	T1	U	PDS	VB	6156	28	2	
SISTDAT2	DATA	T1	U	PDS	VB	259	6	2	

Figure 78 (Page 13 of 14). Storage required for target libraries for z/OS V2R4

Library DDNAME	Mem Type	Tar Vol	T Y P E	Org	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks	N O T E
SISTGDMO	DATA	T1	U	PDS	FB	500	120	2	
SISTMAC1	MAC	T2	U	PDS	FB	80	17	3	
SORTLIB	LMOD	T1	U	PDS	U	0	28	41	
SORTLPA	LMOD	T1	U	PDS	U	0	32	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	285	83	

Figure 78 (Page 14 of 14). Storage required for target libraries for z/OS V2R4

C.5 Distribution Libraries for z/OS V2R4

Figure 79 on page 302 describes the distribution libraries required to install z/OS V2R4. 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

In the tables, abbreviations used for the **NOTE** column are:

1   New library introduced in z/OS V1R1.
2   New library introduced in z/OS V1R2.
3   New library introduced in z/OS V1R3.
4   New library introduced in z/OS V1R4.

5	New library introduced in z/OS V1R5.
6	New library introduced in z/OS V1R6.
7	New library introduced in z/OS V1R7.
8	New library introduced in z/OS V1R8.
9	New library introduced in z/OS V1R9.
10	New library introduced in z/OS V1R10.
11	New library introduced in z/OS V1R11.
21	New library introduced in z/OS V2R1.
22	New library introduced in z/OS V2R2.
23	New library introduced in z/OS V2R3.
24	New library introduced in z/OS V2R4.
N	Library used only for National Language support. This library can be empty if the language is not ordered.
*	An "*" in the NOTE column indicates that the library is empty after the z/OS release is installed.

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 82.

Figure 79 (Page 1 of 14). Storage required for distribution libraries for z/OS V2R4							
Library DDNAME	**TYPE**	**ORG**	**RECFM**	**LRECL**	**No. of 3390 Trks**	**No. of DIR Blks**	**NOTE**
AACBCNTL	-	PDS	FB	80	29	7	
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	669	436	

Library DDNAME	TYPE	ORG	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks	NOTE
AADMMSG	-	PDS	FB	80	2	2	
AADMOPS	-	PDS	VB	255	7	2	
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	111	89	
AADRYLIB	-	PDS	FB	80	11	6	
AAFHMOD1	-	PDS	U	0	168	709	
AAFHSRC1	-	PDS	FB	80	18	4	
AAOPEXEC	-	PDS	FB	80	3	2	
AAOPHFS	-	PDS	VB	255	2622	21	
AAOPHJPN	-	PDS	VB	255	474	7	
AAOPMENU	-	PDS	FB	80	4	3	
AAOPMJPN	-	PDS	FB	80	4	3	
AAOPMOD1	-	PDS	U	0	202	62	
AAOPPENU	-	PDS	FB	80	89	36	
AAOPPJPN	-	PDS	FB	80	89	40	
AASMMAC1	-	PDS	FB	80	13	2	
AASMMAC2	-	PDS	FB	80	5	2	
AASMMOD1	-	PDS	U	0	40	26	
AASMMOD2	-	PDS	U	0	117	111	
AASMPUT2	-	PDS	FB	80	134	2	
AASMSAM1	-	PDS	FB	80	25	3	
AASMSAM2	-	PDS	FB	80	12	2	
AAXREXEC	-	PDS	VB	255	21	3	
AAZDFFS	-	PDS	VB	256	17246	4	24
ABBLEXEC	-	PDS	VB	255	2	2	23
ABBLJCL	-	PDS	FB	80	3	2	23
ABBLLIB	-	PDS	VB	255	15559	2	23
ABDTCLI0	-	PDS	FB	80	4	2	

Figure 79 (Page 2 of 14). Storage required for distribution libraries for z/OS V2R4

Library DDNAME	TYPE	ORG	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks	NOTE
ABDTHELP	-	PDS	FB	80	3	2	
ABDTMAC	-	PDS	FB	80	117	19	
ABDTMOD	-	PDS	U	0	38	45	
ABDTMSG	-	PDS	FB	80	2	2	
ABDTPNL0	-	PDS	FB	80	7	5	
ABDTSAMP	-	PDS	FB	80	11	2	
ABLSCLI0	-	PDS	FB	80	325	19	
ABLSKEL0	-	PDS	FB	80	9	6	
ABLSMSG0	-	PDS	FB	80	10	10	
ABLSPNL0	-	PDS	FB	80	378	235	
ABLSTBL0	-	PDS	FB	80	6	3	
ABMFMOD0	-	PDS	U	0	34	27	
ABPXEXEC	-	PDS	FB	80	44	4	
ABPXMENU	-	PDS	FB	80	11	10	
ABPXMJPN	-	PDS	FB	80	11	10	
ABPXMOD1	-	PDS	U	0	339	210	
ABPXPENU	-	PDS	FB	80	34	27	
ABPXPJPN	-	PDS	FB	80	36	28	
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	3	
ACBDHENU	-	PDS	U	0	477	642	
ACBDHJPN	-	PDS	U	0	489	1472	
ACBDMENU	-	PDS	FB	80	28	79	
ACBDMJPN	-	PDS	FB	80	28	79	
ACBDMOD1	-	PDS	U	0	345	143	
ACBDMOD2	-	PDS	U	0	6	9	
ACBDMOD3	-	PDS	U	0	6	9	
ACBDPENU	-	PDS	FB	80	90	114	

Figure 79 (Page 3 of 14). Storage required for distribution libraries for z/OS V2R4

Library DDNAME	TYPE	ORG	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks	NOTE
ACBDPJPN	-	PDS	FB	80	95	114	
ACBDTEMP	-	PDS	FB	80	21	2	
ACBDTENU	-	PDS	FB	80	2	2	
ACBDTJPN	-	PDS	FB	80	2	2	
ACBRDBRM	-	PDS	FB	80	10	3	
ACBRMOD0	-	PDS	U	0	168	178	
ACCNCMP	-	PDSE	U	0	5018	-	
ACCNSR1	-	PDS	FB	80	71	23	
ACCNSR2	-	PDS	FB	80	23	11	22
ACCNSR3	-	PDS	FB	80	34	11	22
ACCNSR4	-	PDS	FB	80	23	11	22
ACCNSR5	-	PDS	FB	80	117	15	22
ACCNSR6	-	PDS	FB	80	22	10	23
ACCNSR7	-	PDS	FB	80	118	17	23
ACCRHFS	-	PDS	VB	256	4	2	
ACCRMOD	-	PDS	U	0	26	24	
ACDMMOD0	-	PDS	U	0	56	40	
ACDRMODS	-	PDS	U	0	9	2	
ACDRTABL	-	PDS	FB	80	283	2	
ACDSHFS	-	PDS	VB	255	558	5	
ACDSSAMP	-	PDS	FB	80	3	2	
ACEEMOD1	-	PDS	U	0	517	517	
ACEEMOD2	-	PDSE	U	0	24024	-	
ACEESRC1	-	PDS	FB	80	190	15	
ACEESRC2	-	PDS	FB	120	115	12	
ACEESRC3	-	PDS	FB	120	19	3	
ACFZHFS	-	PDS	VB	255	983	2	
ACLBDLL	-	PDS	U	0	103	5	
ACLBDLL2	-	PDSE	U	0	349	-	
ACLBHFS1	-	PDS	VB	255	6066	9	
ACLBOBJ	-	PDS	FB	80	125	10	

Figure 79 (Page 4 of 14). Storage required for distribution libraries for z/OS V2R4

Library DDNAME	TYPE	ORG	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks	NOTE
ACLBSR1	-	PDS	FB	120	18	3	
ACLMMOD0	-	PDS	U	0	272	191	
ACMDLIB	-	PDS	U	0	36	41	
ACSFCLI0	U	PDS	FB	80	30	3	
ACSFHDRS	U	PDS	FB	80	6	2	
ACSFHFS	U	PDS	VB	255	38	3	
ACSFMOD0	U	PDS	U	0	225	229	
ACSFMOD1	U	PDS	U	0	2	2	
ACSFMSG0	U	PDS	FB	80	9	6	
ACSFOBJ	U	PDS	FB	80	2	2	
ACSFPNL0	U	PDS	FB	80	46	22	
ACSFSKL0	U	PDS	FB	80	2	2	
ACSFTLIB	U	PDS	FB	80	2	2	
ACSSLIB	-	PDS	U	0	88	264	
ACTVMOD	-	PDS	U	0	12	2	
ACTVSRC	-	PDS	FB	80	3	2	
ACUNHF	-	PDS	VB	255	10	2	
ACUNJCL	-	PDS	FB	80	3	2	
ACUNLOCL	-	PDS	FB	80	960	43	
ACUNMAC	-	PDS	FB	80	88	3	
ACUNMENU	-	PDS	VB	259	2	2	
ACUNMJPN	-	PDS	VB	259	2	2	
ACUNMOD	-	PDS	U	0	82	56	
ACUNSAMP	-	PDS	FB	80	42	4	
ACUNTBL	-	PDS	FB	256	43564	984	
ADBBLIB	-	PDS	VB	80	55	34	
ADFPMOD0	-	PDS	U	0	27	20	
ADFQMKLB	-	PDS	FB	80	3	2	
ADFQMLIB	-	PDS	FB	80	3	2	
ADFQPKLB	-	PDS	FB	80	36	17	
ADFQPKSR	-	PDS	VB	255	14	3	

Figure 79 (Page 5 of 14). Storage required for distribution libraries for z/OS V2R4

Library DDNAME	TYPE	ORG	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks	NOTE
ADFQPLIB	-	PDS	FB	80	36	17	
ADFQPSRC	-	PDS	VB	255	14	3	
ADGTCLIB	-	PDS	FB	80	171	14	
ADGTLLIB	-	PDS	U	0	250	297	
ADGTMKLB	-	PDS	FB	80	48	33	
ADGTMLIB	-	PDS	FB	80	48	33	
ADGTPKLB	-	PDS	FB	80	856	391	
ADGTPKSR	-	PDS	VB	255	241	73	
ADGTPLIB	-	PDS	FB	80	860	391	
ADGTPSRC	-	PDS	VB	255	244	74	
ADGTSKLB	-	PDS	FB	80	4	2	
ADGTSLIB	-	PDS	FB	80	33	5	
ADGTTLIB	-	PDS	FB	80	5	6	
ADGTTSRC	-	PDS	VB	255	3	3	
ADMSSVM	-	PDS	U	0	38	177	
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	
AEDCHFS	-	PDS	VB	255	4077	75	
AEDCMOD1	-	PDS	U	0	1409	1799	
AEDCMOD2	-	PDS	U	0	12	73	
AEDCMSEP	-	PDS	FB	150	2	2	
AEDCOBJ1	-	PDS	FB	80	9	7	
AEDCSRC6	-	PDS	FB	80	704	68	
AEDCSRC7	-	PDS	FB	80	1086	245	
AEDGEXE1	-	PDS	FB	80	106	7	
AEDGHFS	-	PDS	VB	256	94	3	
AEDGMENU	-	PDS	FB	80	12	11	

Figure 79 (Page 6 of 14). Storage required for distribution libraries for z/OS V2R4

Library DDNAME	TYPE	ORG	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks	NOTE
AEDGMJPN	-	PDS	FB	80	12	11	
AEDGMOD1	-	PDS	U	0	56	33	
AEDGPENU	-	PDS	FB	80	184	87	
AEDGPJPN	-	PDS	FB	80	189	87	
AEDGPKSR	-	PDS	VB	255	67	32	
AEDGPSRC	-	PDS	VB	255	68	32	
AEDGSRC1	-	PDS	FB	80	19	2	
AEEQINST	-	PDS	FB	80	2152	2	
AEPWBENU	-	PDS	FB	4096	6	2	
AEPWMOD1	-	PDS	U	0	133	114	
AEPWSRC1	-	PDS	FB	80	12	3	
AERBCLS	-	PDS	FB	80	29	3	
AERBMAC1	-	PDS	FB	80	68	4	
AERBMENU	-	PDS	FB	80	6	6	
AERBMJPN	-	PDS	FB	80	6	6	
AERBMOD1	-	PDS	U	0	517	166	
AERBPENU	-	PDS	FB	80	368	134	
AERBPJPN	-	PDS	FB	80	378	137	
AERBPWSV	-	PDS	VB	255	6155	2	
AERBT	-	PDS	FB	80	19	5	
AERBTENU	-	PDS	FB	80	7	2	
AERBTJPN	-	PDS	FB	80	7	2	
AEUVFEXC	-	PDS	FB	80	2	2	
AEUVFHFS	-	PDS	VB	255	64	3	
AEUVFLIB	-	PDS	FB	80	7	3	
AEUVFSAM	-	PDS	FB	80	4	2	
AEZADBR1	-	PDS	FB	80	6	2	
AEZAMAC1	-	PDS	FB	80	104	13	
AEZAMAC2	-	PDS	FB	80	396	88	
AEZAMAC3	-	PDS	FB	80	140	26	
AEZAMODS	-	PDSE	U	0	3471	-	

Figure 79 (Page 7 of 14). Storage required for distribution libraries for z/OS V2R4

Figure 79 (Page 8 of 14). Storage required for distribution libraries for z/OS V2R4							
Library DDNAME	TYPE	ORG	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks	NOTE
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	1617	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	1337	82	
AFNTDLIB	-	PDS	VBM	12284	18765	740	21
AFNTILIB	-	PDS	VBM	16124	3194	527	21
AFNTLIB	-	PDS	VBM	12284	283	165	21
AFNTLIBB	-	PDS	VBM	12284	3402	523	21
AFNT300	-	PDS	VBM	12284	3739	488	21
AFOMHDRS	-	PDS	FB	80	22	2	
AFOMHFS	-	PDS	VB	255	26807	153	
AFOMMOD1	-	PDS	U	0	535	44	
AFOMOBJ	-	PDS	FB	80	68	37	
AFONTHFS	-	PDS	VB	255	36513	5	21
AGDEMOD0	-	PDS	U	0	65	55	
AGENLIB	-	PDS	FB	80	6	2	
AGFTAJL1	-	PDS	FB	80	2	2	
AGFTAMD1	-	PDS	U	0	22	23	
AGFUMOD1	-	PDS	U	0	35	24	
AGIMBIN	-	PDS	VB	255	4	3	
AGIMCLS0	-	PDS	FB	80	2	2	
AGIMMENU	-	PDS	FB	80	9	6	

Library DDNAME	TYPE	ORG	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks	NOTE
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	
AGSKHFS	-	PDS	VB	255	18	3	
AGSKSAMP	-	PDS	FB	80	4	2	
AHAPEXE3	-	PDS	VB	255	2	2	22
AHAPINC3	-	PDS	VB	255	441	2	22
AHAPJCL3	-	PDS	FB	80	2	2	22
AHASMAC	-	PDS	FB	80	517	57	
AHASMENU	-	PDS	VB	259	7	2	
AHASMJPN	-	PDS	VB	259	7	2	
AHASMOD	-	PDS	U	0	159	80	
AHASPARM	-	PDS	FB	80	2	2	
AHASPNL0	-	PDS	FB	80	18	4	
AHASSAMP	-	PDS	FB	80	91	6	
AHASSRC	-	PDS	FB	80	2238	25	
AHELP	-	PDS	FB	80	212	45	
AHELPENP	-	PDS	FB	80	34	10	
AHKCKC4Z	U	PDS	VB	259	535	3	22
AHLPKLB	-	PDS	FB	80	4	4	
AIATCLI0	-	PDS	FB	80	10	2	

Figure 79 (Page 9 of 14). Storage required for distribution libraries for z/OS V2R4

Library DDNAME	TYPE	ORG	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks	NOTE

Library DDNAME	TYPE	ORG	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks	NOTE
AIATMAC	-	PDS	FB	80	655	74	
AIATMOD	-	PDS	U	0	264	275	
AIATMSG0	-	PDS	FB	80	2	2	
AIATPARM	-	PDS	FB	80	2	2	
AIATPNL0	-	PDS	FB	80	12	7	
AIATSAMP	-	PDS	FB	80	17	3	
AIATSRC	-	PDS	FB	80	3498	89	
AIATTBL0	-	PDS	FB	80	2	2	
AIBMMOD3	-	PDS	U	0	343	614	
AIBMSRC3	-	PDS	FB	80	28	6	
AICELIB	-	PDS	U	0	89	94	
AICESAMP	-	PDS	FB	80	7	3	
AICESRCE	-	PDS	FB	80	4	3	
AICEUSER	-	PDS	FB	80	17	2	
AICHMJPN	-	PDS	FB	80	11	5	
AICHPJPN	-	PDS	FB	80	230	89	
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	424	
AICQKMA3	-	PDS	FB	80	18	30	
AICQKMA4	-	PDS	FB	80	7	11	
AICQKMA5	-	PDS	FB	80	2	2	
AICQMAC1	-	PDS	FB	80	335	213	
AICQMAC2	-	PDS	FB	80	2	2	
AICQMAC3	-	PDS	FB	80	17	15	
AICQMAC4	-	PDS	FB	80	9	6	
AICQMAC5	-	PDS	FB	80	165	10	
AIEAHDR	-	PDS	FB	80	234	13	
AIEAHDRV	-	PDS	VB	260	28	4	

Library DDNAME	TYPE	ORG	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks	NOTE
AIEALNKE	-	PDSE	U	0	3614	-	
AIEAMIGE	-	PDSE	U	0	17	-	
AIEASID	-	PDS	FB	80	7	4	
AIEWMOD0	-	PDS	U	0	88	62	
AIFALIB	-	PDS	U	0	10	6	
AIGDVBS1	-	PDS	VB	4100	21	2	
AIGZMOD1	-	PDS	U	0	119	254	
AIGZSRC1	-	PDS	FB	80	32	7	
AIKYHFS	-	PDS	VB	255	1596	9	
AIMAGE	-	PDS	FB	80	630	17	
AIMFMOD0	-	PDS	U	0	9	5	
AINDLMD	-	PDS	U	0	3	3	
AIOEEXEC	-	PDS	FB	80	5	2	
AIOEHLIB	-	PDS	VB	255	2	2	
AIOEMJPN	-	PDS	VB	255	7	2	
AIOEPROC	-	PDS	FB	80	2	2	
AIOESAMP	-	PDS	FB	80	4	2	
AISFEXEC	-	PDS	FB	80	15	3	
AISFHELP	-	PDS	FB	80	2	2	
AISFHFS	-	PDS	VB	255	140	3	10
AISFJCL	-	PDS	FB	80	14	2	
AISFLOAD	-	PDS	U	0	266	164	
AISFMAC	-	PDS	FB	80	41	3	
AISFMLIB	-	PDS	FB	80	2	2	
AISFPLIB	-	PDS	FB	80	460	244	
AISFSLIB	-	PDS	FB	80	7	4	
AISFSRC	-	PDS	FB	80	3	2	
AISFTLIB	-	PDS	FB	80	107	2	
AISPALIB	-	PDS	FB	80	2	2	
AISPCLIB	-	PDS	FB	80	19	4	
AISPEXEC	-	PDS	FB	80	107	4	

Figure 79 (Page 11 of 14). Storage required for distribution libraries for z/OS V2R4

Library DDNAME	TYPE	ORG	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks	NOTE
Figure 79 (Page 12 of 14). Storage required for distribution libraries for z/OS V2R4							
AISPGENP	-	PDS	FB	80	279	201	
AISPGENU	-	PDS	FB	80	281	202	
AISPGJPN	-	PDS	FB	80	279	201	
AISPGMLI	-	PDS	FB	80	174	79	
AISPGUI	-	PDS	VB	255	317	2	
AISPHELP	-	PDS	FB	80	3	2	
AISPMACS	-	PDS	FB	80	58	12	
AISPMENP	-	PDS	FB	80	48	51	
AISPMENU	-	PDS	FB	80	48	51	
AISPMJPN	-	PDS	FB	80	49	51	
AISPMOD1	-	PDS	U	0	588	549	
AISPPENP	-	PDS	FB	80	492	309	
AISPPENU	-	PDS	FB	80	492	309	
AISPPJPN	-	PDS	FB	80	490	309	
AISPSAMP	-	PDS	FB	80	103	22	
AISPSENP	-	PDS	FB	80	106	75	
AISPSENU	-	PDS	FB	80	106	75	
AISPSJPN	-	PDS	FB	80	106	75	
AISPSLIB	-	PDS	FB	80	26	7	
AISPTENP	-	PDS	FB	80	4	2	
AISPTENU	-	PDS	FB	80	4	2	
AISPTJPN	-	PDS	FB	80	4	2	
AISTASGD	-	PDS	VB	512	61	5	
AISTASN1	-	PDS	FB	1024	11	4	
AISTCMIP	-	PDS	FB	80	2	2	
AISTDAT1	-	PDS	VB	6156	28	2	
AISTDAT2	-	PDS	VB	259	6	2	
AISTGDMO	-	PDS	FB	500	120	2	
AISTMAC1	-	PDS	FB	80	17	3	
AITYHFS	-	PDS	VB	255	101	2	
AIZUFS	-	PDSE	VB	259	5550	-	22

Library DDNAME	TYPE	ORG	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks	NOTE
AKHELP	-	PDS	FB	80	45	17	
AKLIB	-	PDS	U	0	3	3	
ALINKLIB	-	PDS	U	0	229	271	
ALPALIB	-	PDS	U	0	28	37	
AMACLIB	-	PDS	FB	80	4109	137	
AMIGLIB	-	PDS	U	0	165	226	
AMODGEN	-	PDS	FB	80	657	59	
AMSGENP	-	PDS	VB	259	9	2	
AMSGENU	-	PDS	VB	259	57	10	
AMSGJPN	-	PDS	VB	259	51	10	
ANFSLIBE	-	PDSE	U	0	273	-	
ANFSMAC	-	PDS	FB	80	4	2	
ANFSSAMP	-	PDS	FB	80	13	2	
ANFSTARB	-	PDS	VB	264	42	2	
ANUCLEUS	-	PDS	U	0	42	58	
AOSACB	-	PDS	U	0	110	98	
AOSA0	-	PDS	U	0	153	121	
AOSA1	-	PDS	U	0	115	83	
AOSBN	-	PDS	U	0	375	303	
AOSB0	-	PDS	U	0	3	3	
AOSB3	-	PDS	U	0	186	194	
AOSCA	-	PDS	U	0	5	5	
AOSCD	-	PDS	U	0	172	202	
AOSCE	-	PDS	U	0	9	12	
AOSC2	-	PDS	U	0	2	2	
AOSC5	-	PDS	U	0	1783	1384	
AOSC6	-	PDS	U	0	9	10	
AOSD0	-	PDS	U	0	147	173	
AOSD7	-	PDS	U	0	6	9	
AOSG0	-	PDS	U	0	2	2	
AOSJSC	-	PDS	U	0	3	3	

Figure 79 (Page 13 of 14). Storage required for distribution libraries for z/OS V2R4

Library DDNAME	TYPE	ORG	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks	NOTE
AOST3	-	PDS	U	0	15	23	
AOST4	-	PDS	U	0	143	166	
AOSU0	-	PDS	U	0	404	275	
AOSXCF	-	PDS	U	0	244	160	
AOS00	-	PDS	U	0	27	20	
AOS04	-	PDS	U	0	7	6	
AOS05	-	PDS	U	0	3	2	
AOS06	-	PDS	U	0	13	17	
AOS11	-	PDS	U	0	12	13	
AOS12	-	PDS	U	0	230	143	
AOS24	-	PDS	U	0	10	7	
AOS26	-	PDS	U	0	926	1000	
AOS28	-	PDS	U	0	308	264	
AOS32	-	PDS	U	0	71	104	
APARMLIB	-	PDS	FB	80	20	9	
APROCLIB	-	PDS	FB	80	9	7	
ASAMPLIB	-	PDS	FB	80	953	82	
ASSFMOD0	-	PDS	U	0	125	59	
ATSOMAC	-	PDS	FB	80	72	12	
AUADS	-	PDS	FB	80	2	2	
CIPLIB	-	PDS	U	0	7	9	
HHRFCLST	-	PDS	FB	80	19	3	
HHRFMSG	-	PDS	FB	80	12	5	
HHRFPANL	-	PDS	FB	80	225	90	
HHRFSKEL	-	PDS	FB	80	66	14	

Figure 79 (Page 14 of 14). Storage required for distribution libraries for z/OS V2R4

C.6 File System for z/OS V2R4

Abbreviations used for the HFS or 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
Z9X   New file system path introduced in z990 Exploitation feature
NLV   File system path for NLV

Note: The NLV directories will be empty if the NLV features are not ordered.

DDDEF Name	TYPE	PATH	Note
		Figure 80 (Page 1 of 4). HFS or zFS Paths for z/OS V2R4	
NFSCUTIL	X	/usr/lpp/NFS/IBM/	
SAOPBIN	X	/usr/lpp/Printsrv/bin/IBM/	
SAOPCLAS	X	/usr/lpp/Printsrv/classes/IBM/	
SAOPICEN	X	/usr/lpp/Printsrv/InfoprintCentral/IBM/	ZV2R2
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
SAOPICTE	X	/usr/lpp/Printsrv/InfoprintCentral/html/En_US/IBM/	ZV1R5
SAOPICTJ	X	/usr/lpp/Printsrv/InfoprintCentral/html/Ja_JP/IBM/	ZV1R5NLV
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

DDDEF Name	TYPE	PATH	Note
		Figure 80 (Page 2 of 4). HFS or zFS Paths for z/OS V2R4	
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
SAZDFFS	N	/usr/lpp/zcx_zos/IBM/	ZV2R4
SBBLLIB	N	/usr/lpp/liberty_zos/IBM/	ZV2R3
SBPXXMLS	X	/usr/lib/xml_schema/IBM/	ZV1R6
SCDSHFS	X	/usr/lpp/ocsf/IBM/	
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
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/	

DDDEF Name	TYPE	PATH	Note
		Figure 80 (Page 3 of 4). HFS or zFS Paths for z/OS V2R4	
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/	
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

DDDEF Name	TYPE	PATH	Note
Figure 80 (Page 4 of 4). HFS or zFS Paths for z/OS V2R4			
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
SGSKHFS	X	/usr/lpp/gskssl/IBM/	
SHAPBIN3	N	/usr/lpp/ihsa_zos/IBM/	ZV2R2
SHKCKC4Z	N	/usr/lpp/kc4z/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
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SITYHFS	X	/usr/lpp/eim/IBM/	ZV1R5
SIZUFSD	X	/usr/lpp/zosmf/IBM/	ZV2R2
	X	/usr/man/C/cat1/IBM/	
	X	/usr/man/Ja_JP/cat1/IBM/	

For more information about creating file system directories, see 8.1.8, "Create file system directories for Wave 1" on page 87.

Appendix D. Additional Cleanup Jobs for z/OS V2R4

D.1 Perform global zone cleanup for deleted FMIDs

Because z/OS V2R4 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 V2R4 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 HZFS440), 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.

Figure 81 (Page 1 of 2). Cleanup Sample Jobs			
Sample Job	**Element**	**Comment**	**Job location**
AOPCLNDD	Infoprint Server	Obsolete DDs	SAMPLIB
BPXCLNDD	BCP and UNIX System Services	obsolete Chinese NLV	SAMPLIB
ISPDDDEL ISPDSDEL	ISPF	obsolete German and Swiss German NLVs	SISPSAMP
Note: ISPDDDEL is a sample job for deleting DDDEFs in the CSI, and ISPDSDEL is a sample job for deleting data sets.			
IKJCLNDD	TSO/E	obsolete Chinese NLV	SAMPLIB

Figure 81 (Page 2 of 2). Cleanup Sample Jobs			
Sample Job	**Element**	**Comment**	**Job location**
IOECLNDD	z/OS File System	obsolete Distributed File Service	SIOESAMP
CLNOSASF	BCP	obsolete OSA/SF	SAMPLIB

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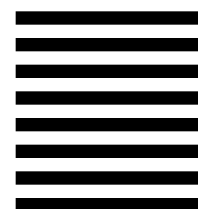Page Number: Comment:

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