2.0 Program Materials

An IBM program is identified by a program number and a feature number. The program number for z/OS V2R5 is 5650-ZOS.

The program announcement material describes the features supported by z/OS V2R5. 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 V2R5 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 V2R5, see *z/OS Information Roadmap*.

2.3 Program Source Materials

No program viewable program listings (View Program Listings) are provided for z/OS V2R5.

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 V2R5.

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 V2R5, make sure that you have reviewed the current Preventive Service Planning (PSP) information. Review the PSP Bucket for general information, installation documentation, and the cross product Dependencies sections. For the recommended service section, instead of reviewing the PSP Bucket, it is recommended you use the IBM.ProductInstall-RequiredService fix category in SMP/E to ensure you have all the recommended service installed. Use the FIXCAT(IBM.ProductInstall-RequiredService) operand on the APPLY CHECK command. See Figure 24, SMP/E APPLY CHECK (All Wave 0 FMIDs and Service for z/OS V2R5) for a sample APPLY command.

If you obtained z/OS V2R5 as part of a CBPDO, HOLDDATA is included on the CBPDO. If the CBPDO for z/OS V2R5 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 **ZOSV2R5** UPGRADE. The entries in are in alphabetic order based on the Element column. For descriptions of the FMIDs in the table, see .

Figure 2 (Page 1 of 4). PSP Bucket Information for z/OS V2R5 Elements in ZOSV2R5 UPGRADE		
Element	**ZOSV2R5 PSP Subset**	**FMIDs Included**
General information	ZOSGEN	General information

Element	ZOSV2R5 PSP Subset	FMIDs Included
Figure 2 (Page 2 of 4). PSP Bucket Information for z/OS V2R5 Elements in ZOSV2R5 UPGRADE		
BCP	BCP	HBB77D0 JBB77DJ HAL47C0 JAL47DJ HIO1105 HWT0500
BCP - Capacity Provisioning	CAPPROV	HPV77D0
BCP Program Management Binder	PMBINDER	HPM77D0
BCP - Support for Unicode Base BCP - Support for Unicode JPN	UNICODE	HUN77D0 JUN77DJ
Bulk Data Transfer (BDT)	BDT	HBD6602 JBD6201 JBD6202
CIM	CIM	HPG77C0
Communications Server IP	CSIP	HIP6250 JIP625K JIP625X
Communications Server for z/OS SNA Services	CSSNA	HVT6250
Cryptographic Services Integrated Cryptographic Service Facility	ICSF77D2	HCR77D2
Cryptographic Services PKI Services	PKISERV	HKY77D0
Cryptographic Services System SSL	SSL	HCPT450 JCPT45J
DFSMS	DFSMS	HDZ2250 JDZ225K
DFSORT	DFSORT	HSM1Q00
ESCON Director	ESCONDIR	HSWF100
HCD	HCD	HCS77D0 JCS77DJ
HCM	HCM	HCM1I10
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

Element	ZOSV2R5 PSP Subset	FMIDs Included
Figure 2 (Page 3 of 4). PSP Bucket Information for z/OS V2R5 Elements in ZOSV2R5 UPGRADE		
IBM z/OS Management Facility	ZOSMF	HSMA250 HSMA251 HSMA252 HSMA253 HSMA254 HSMA255 HSMA256 HSMA257 HSMA25A HSMA25E
Infoprint Server	INFOPRINT	HMOS705 JMOS7J5 HOPI7D0 JOPI7DJ HNET7D0 JNET7DJ
Integrated Security Services Network Authentication Service	NAPS	HSWK450 JSWK45J
ISPF	ISPF	HIF7T02 JIF7T14 JIF7T16
JES2	JES2	HJE77D0 JJE77DJ
JES3	JES3	HJS77D0
Language Environment	LANGENV	HLE77D0 JLE77DJ
Metal C Runtime Library	METALC	HSD7780
MICR/OCR	MICROCR	EMI2220
Network File System	NFS	HDZ225N JDZ225J
OpenSSH for z/OS	ZOSOSSH	HOS2240
RMF	RMF	HRM77D0 JRM77DJ
Runtime Library Extensions	ZOSCCPP	HTV77C0 JTV77CJ
SDSF	SDSF	HQX77D0
Security Server RACF	RACF®	HRF77D0 JRF77DJ

Figure 2 (Page 4 of 4). PSP Bucket Information for z/OS V2R5 Elements in ZOSV2R5 UPGRADE		
Element	**ZOSV2R5 PSP Subset**	**FMIDs Included**
SMP/E	SMPE	HMP1K00 JMP1K11
TSO/E	TSOE	HTE77D0 JTE77DE JTE77DJ
XL C/C++	ZOSCCPP	HLB77C0 JLB77CJ
z/OS Container Extensions	ZOSCX	HZDC7C0
z/OS Data Gatherer	ZDG	HRG77D0
z/OS File System	zFS	HZFS450 JZFS45J
z/OS Font Collection	ZOSFONTS	HFNT140 HFNT14J
z/OS Security Level 3	SSL NAPS LDAP	JCPT451 JSWK451 JRSL441
z/OS UNIX System Services	UNIXSS	HOT77C0 JOT77CJ
z/OS Host - 3270 Workstation File Send/Receive	3270PC	HFX1112
Future Function	ZAI	HZAI250

3.3 Additional PSP Information

Figure 3 lists the PSP UPGRADEs and associated FMIDs that are NOT included in the z/OS V2R5 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 V2R5 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 V2R5 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 V2R5 are listed in Appendix A, "Component IDs for Elements in z/OS V2R5" on page 249.

4.0 Program and Service Level Information

This section identifies the program and service levels of z/OS V2R5. 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 V2R5 integration test (SOURCEID ZOSV2R5 for z/OS V2R5) 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 V2R5 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 V2R5) or prior levels of z/OS V2R5 elements that have been incorporated into this release are listed in .

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 V2R5 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 V2R5 was ordered. Therefore, the service level of the FMIDs after you have installed z/OS V2R5 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	• HBB77D0 (SMC2108 / PUT2102) • JBB77DJ (SMC2108 / PUT2102) • HAL47C0 (initial release) • JAL47DJ (initial release) • HWT0500 (SMC2111 / PUT2102) • HUN77D0 (SMC2109 / PUT2102) • JUN77DJ (SMC2109 / PUT2102) • HPV77D0 (SMC2111 / PUT2102) • HPM77D0 (SMC2110 / PUT2102) • HIO1105 (SMC2045 / PUT2010)
BDT	• HBD6602 (SMC9615 / PUT9603) • JBD6201 (SMC9615 / PUT9603) • JBD6202 (SMC9615 / PUT9603)
Common Information Model (CIM)	• HPG77C0 (SMC1910 / PUT1902)

Communications Server	• IP
	  – HIP6250 (SMC2110 / PUT2102)
	  – JIP625X (SMC2110 / PUT2102)
	  – JIP625K (SMC2110 / PUT2102)
	• SNA
	  – HVT6250 (SMC2110 / PUT2102)

Cryptographic Services	• Cryptographic Services ICSF
	  – HCR77D2 (SMC2111 / PUT2103)
	• Cryptographic Services PKI Services
	  – HKY77D0 (SMC2110 / PUT2102)
	• System SSL
	  – HCPT450 (SMC2109 / PUT2102)
	  – JCPT45J (SMC2109 / PUT2102)

DFSMS	• HDZ2250 (SMC2111 / PUT2102) • JDZ225K (SMC2111 / PUT2102)
DFSORT	• HSM1Q00 (SMC2111 / PUT2102)
EREP	• EER3500 (SMC0504 / PUT0501)
ESCON Director Support	• HSWF100
FFST	• HFST101
GDDM	• HGD3200 (SMC9606 / PUT9601) • JGD3219 (SMC9606 / PUT9601) • JGD3227 (SMC9606 / PUT9601)
GDDM PGF	• HGD3201 (SMC9606 / PUT9601)
HCD	• HCS77D0 (SMC2110 / PUT2102) • JCS77DJ (SMC2110 / PUT2102)

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

Element / Feature	FMIDs and Service Levels
HCM	• HCM1I10 (SMC2108 / PUT2102)
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	• HSMA250 (SMC2109 / PUT2102) • HSMA251 (SMC2109 / PUT2102) • HSMA252 (SMC2032 / PUT2008) • HSMA253 (SMC2109 / PUT2102) • HSMA254 (SMC2109 / PUT2102) • HSMA255 (SMC2109 / PUT2102) • HSMA256 (SMC2109 / PUT2102) • HSMA257 (SMC2109 / PUT2102) • HSMA25A (SMC2108 / PUT2102) • HSMA25E (SMC2108 / PUT2102)
ICKDSF	• EDU1H01 (ICKDSF) (SMC0241 / PUT0209) • FDU1H07 (ISMF Base) (SMC0241 / PUT0209) • FDU1H08 (ISMF Eng) (SMC0241 / PUT0209) • FDU1H09 (ISMF Jpn) (SMC0241 / PUT0209)

Infoprint Server	• IP PrintWay basic mode
	  – HMOS705 (SMC0117 / PUT0104)
	  – JMOS7J5 (SMC0117 / PUT0104)
	• NetSpool
	  – HNET7D0 (SMC2107 / PUT2102)
	  – JNET7DJ (SMC2107 / PUT2102)
	• Print Interface
	  – HOPI7D0 (SMC2107 / PUT2102)
	  – JOPI7DJ (SMC2107 / PUT2102)

Integrated Security Services	• Network Authentication Service
	  – HSWK450 (SMC2109 / PUT2102)
	  – JSWK45J (SMC2109 / PUT2102)

ISPF	• HIF7T02 (SMC2110 / PUT2102) • JIF7T14 (SMC2110 / PUT2102) • JIF7T16 (SMC2110 / PUT2102)
JES2	• HJE77D0 (SMC2109 / PUT2102) • JJE77DJ (SMC2109 / PUT2102)
JES3	• HJS77D0 (SMC2109 / PUT2102)

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

Element / Feature	FMIDs and Service Levels
Language Environment	• HLE77D0 (SMC2108 / PUT2102) • JLE77DJ (SMC2108 / PUT2102)
Metal C Runtime Library	• HSD7780 (SMC1108 / PUT1102)
MICR/OCR 2.2.0	• EMI2220
Network File System	• HDZ225N (SMC2110 / PUT2102) • JDZ225J (SMC2110 / PUT2102)
OpenSSH for z/OS	• HOS2240 (SMC1910 / PUT1902)
RMF	• HRM77D0 (SMC2109 / PUT2102) • JRM77DJ (SMC2109 / PUT2102)
Runtime Library Extensions	• HTV77C0 (SMC2006 / PUT2006) • JTV77CJ (SMC2006 / PUT2006)
SDSF	• HQX77D0 (SMC2109 / PUT2102)

Security Server	• RACF
	  – HRF77D0 (SMC2109 / PUT2102)
	  – JRF77DJ (SMC2109 / PUT2102)

SMP/E	• HMP1K00 (SMC1909 / PUT1902) • JMP1K11 (SMC1905 / PUT1901)
TIOC	• ETI1106
TSO/E	• HTE77D0 (SMC2109 / PUT2102) • JTE77DE (SMC2109 / PUT2102) • JTE77DJ (SMC2109 / PUT2102)
XL C/C++	• HLB77C0 (SMC2006 / PUT2006) • JLB77CJ (SMC2006 / PUT2006) • H24P111 • J24P112
z/OS Container Extensions	• HZDC7C0 (initial release)
z/OS Data Gatherer	• HRG77D0 (SMC2110 / PUT2102)
z/OS File System	• HZFS450 (SCM2109 / PUT2102) • JZFS45J (SCM2109 / PUT2102)
z/OS Font Collection	• HFNT140 (SMC2103 / PUT2101) • HFNT14J (SMC2106 / PUT2102)

z/OS Security Level 3	• IBM TDS Security Level 3
	  – JRSL441 (SMC1909 / PUT1902)
	• Network Authentication Service Security Level 3
	  – JSWK451 (SMC2109 / PUT2102)
	• System SSL Security Level 3
	  – JCPT451 (SMC2109 / PUT2102)

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

Element / Feature	FMIDs and Service Levels

z/OS UNIX System Services	• Application Services
	   – 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 V2R5 is contained in the SMPMCS files in the CBPDO order. These files are loaded to the SMPPTS data set when an SMP/E RECEIVE is done for z/OS V2R5. You may browse or print the installation logic files using TSO/E, ISPF, or IEBGENER (or IEBPTPCH).

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

5.0 Installation Requirements and Considerations

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

5.1 Driving System Requirements

For details on the driving system requirements of z/OS V2R5, see *z/OS Planning for Installation*.

5.2 Target System Requirements

For details on the target system requirements of z/OS V2R5, see *z/OS Planning for Installation*.

5.3 FMIDs Deleted

Installing z/OS V2R5 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 V2R5 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 V2R5 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 V2R5 libraries can reside on all supported DASD types.

The space requirements shown in Appendix C, "DASD Storage Requirements Tables" on page 277 are for:

- All z/OS V2R5 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 V2R5 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 when allocated at the recommended block sizes, is:

- 11239 cylinders on a 3390 device

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

- 19231 cylinders on a 3390 device

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

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

zFS   4479 cylinders primary and 550 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 HFNT140 and HFNT14J are installed, the approximate amount of space required in the file system is 2795 cylinders on a 3390 DASD.

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

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 was 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 was 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.

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

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

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

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

zFS   165 cylinders primary; 16 cylinders secondary

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

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

zFS   300 cylinders primary; 50 cylinders secondary

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

Note: The zFS sizes listed in this section are applicable to z/OS V2R5 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 V2R5, you will need to add their space requirements of zFS into the above sizes.

The total space required for all the SMP/E data sets listed in is:

- 64 cylinders on a 3390 device

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

- 17126 cylinders on a 3390 device

6.0 Preparing the Installation Path

The following steps are required to prepare your system for the installation of the z/OS V2R5 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 V2R5"	
□	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 V2R5

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*.

6.3 Step 2: Cloning File System Data Sets

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

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

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

Note: Ensure the following tasks are completed before proceeding:

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

6.3.1 Using High Level Assembler, Program Management Binder, and SMP/E for Subsequent z/OS V2R5 Installs

You must use the current release level of High Level Assembler, Program Management Binder, and SMP/E which are shipped with z/OS V2R5 to install z/OS V2R5 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 use STEPLIB to access the target system's MIGLIB or SASMMOD1 data sets, you must:

- Install the current level of High Level Assembler, the Program Management Binder and SMP/E which are shipped in z/OS V2R5 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 V2R5 are integrated into a single package with compatible service levels. Therefore, IBM expects that customers will migrate all elements of z/OS V2R5 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 V2R5 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 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 V2R5 (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 V2R5 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 V2R5 CBPDO into zones which contain the full release of z/OS from which you are migrating. This requirement is due to the sharing of load modules between waves, the need to have SMP/E find those load modules in Wave 0, and the dependencies on the driving system requirements which determine the wave order.

6.5.3 Elements in each Wave, Ripple, and FMIDSET

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

through contain the elements to be installed during each wave and ripple of the z/OS V2R5 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 V2R5. 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(ZV25W1A, ZV25W1AL, ZV25W1B,...ZV25W2) 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 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 are for the elements documented in this program directory. To present a full z/OS V2R5 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 V2R5 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)

Figure 6 (Page 2 of 2). Elements in FMIDSET Wave 0		
Element	**FMID(s)**	**Level**
HLASM	HMQ4160	z/OS V1R10 (V1R6)
Program Management Binder	HPM77D0	z/OS V2R5

6.5.3.2 Elements in Wave 1A

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

Figure 7. Elements in FMIDSET Wave 1A		
Element	**FMID(s)**	**Level**
BCP	HBB77D0 HAL47C0 HWT0500 HUN77D0 (Support for Unicode)	z/OS V2R5 z/OS V2R4 z/OS V2R5 z/OS V2R5
Communications Server IP Services	HIP6250 JIP625X (XWindows X11R4)	z/OS V2R5
Communications Server for z/OS SNA Services	HVT6250	z/OS V2R5
Cryptographic Services	HCR77D2 (ICSF) HCPT450 (System SSL)	z/OS V2R5
IBM Tivoli Directory Server (IBM TDS)	HRSL440	z/OS V2R4
Integrated Security Services	HSWK450 (Network Authentication Service Base)	z/OS V2R5
ISPF	HIF7T02	z/OS V2R5
Language Environment	HLE77D0	z/OS V2R5
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	JBB77DJ (Japanese) JUN77DJ (Unicode Japanese) JAL47DJ (z/OS Authorized Code Scanner JPN)	z/OS V2R5 z/OS V2R5 z/OS V2R5
Communications Server	JIP625K (Security Level 3)	z/OS V2R5
Note: FMID JIP625K is export restricted.		
Cryptographic Services	JCPT45J (System SSL Japanese)	z/OS V2R5
IBM Tivoli Directory Server (IBM TDS)	JRSL44J (Japanese)	z/OS V2R4
Integrated Security Services	JSWK45J (Japanese)	z/OS V2R5
ISPF	JIF7T14 (Japanese) JIF7T16 (Upper Case English)	z/OS V2R5
Language Environment	JLE77DJ (Japanese)	z/OS V2R5

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	HIO1105 (IOCP)	z/OS V2R5
DFSMS	HDZ2250 JDZ225K (Japanese)	z/OS V2R5
HCD	HCS77D0 (Base and English) JCS77DJ (Japanese)	z/OS V2R5
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 Data Gatherer, z/OS Host - 3270 Workstation File Send/Receive, and TSO/E.

Figure 10 (Page 1 of 2). Elements in FMIDSET Wave 1C		
Element	**FMID(s)**	**Level**
EREP	EER3500	V3R5

Figure 10 (Page 2 of 2). Elements in FMIDSET Wave 1C		
Element	**FMID(s)**	**Level**
ESCON Director	HSWF100	MVS/ESA V5
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	HTE77D0 JTE77DE (Information Center Facility and English) JTE77DJ (Japanese)	z/OS V2R5
Note: The English feature of TSO/E is required if you install the JPN feature.		
z/OS Data Gatherer	HRG77D0	z/OS V2R5
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	HKY77D0 (PKI Services)	z/OS V2R5
Security Server (RACF)	HRF77D0 JRF77DJ (Japanese)	z/OS V2R5

Figure 11 (Page 2 of 2). Elements in FMIDSET Wave 1D		
Element	**FMID(s)**	**Level**
z/OS Security Level 3	JCPT451 (System SSL Security Level 3) JSWK451 (Network Authentication Service Security Level 3) JRSL441 (IBM TDS Security Level 3)	z/OS V2R5 z/OS V2R5 z/OS V2R4
Note: FMIDs JCPT451, JSWK451, 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	HPV77D0	z/OS V2R5
Common Information Model (CIM)	HPG77C0	z/OS V2R4
RMF	HRM77D0 JRM77DJ (Japanese)	z/OS V2R5
Note: RMF Data Gatherer and Reporter is split into separate FMIDs in z/OS V2R5.		
Runtime Library Extensions	HTV77C0 JTV77CJ (Japanese)	z/OS V2R4
XL C/C++	H24P111 (Host Performance Analyzer) J24P112 (Japanese Messages) HLB77C0 (XL C/C++ Base) JLB77CJ (XL C/C++ Japanese)	OS/390 2.4 z/OS V2R4

6.5.3.8 Elements in Wave 1F

FMIDSET Wave 1F contains 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	HSM1Q00	z/OS V2R5
HCM	HCM1I10	z/OS V2R5

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 (Page 1 of 2). Elements in FMIDSET Wave 1G		
Element	**FMID(s)**	**Level**
IBM HTTP Server - Powered by Apache	HHAP90P	z/OS V2R2
IBM z/OS Liberty Embedded	HWLPEM0	z/OS V2R3
IBM z/OS Management Facility	HSMA250 (z/OSMF Core Functions) HSMA251 (z/OSMF ISPF) HSMA252 (z/OSMF Resource Monitoring) HSMA253 (z/OSMF WLM) HSMA254 (z/OSMF Software Management) HSMA255 (z/OSMF Incident Log) HSMA256 (z/OSMF Capacity Provisioning) HSMA257 (z/OSMF Workflow) HSMA25A (z/OSMF Network Configuration Assistant) HSMA25E (z/OSMF zERT Network Analyzer)	z/OS V2R5
Infoprint Server	HOPI7D0 (Print Interface Base) JOPI7DJ (Japanese) HNET7D0 (NetSpool Base) JNET7DJ (Japanese) HMOS705 (IP PrintWay basic mode) JMOS7J5 (Japanese)	z/OS V2R5 z/OS V1R2
Network File System	HDZ225N JDZ225J (Japanese)	z/OS V2R5
z/OS Container Extensions	HZDC7C0	z/OS V2R4
z/OS File System	HZFS450 JZFS45J (Japanese)	z/OS V2R5

Figure 14 (Page 2 of 2). Elements in FMIDSET Wave 1G		
Element	**FMID(s)**	**Level**
z/OS Font Collection	HFNT140 HFNT14J (Chinese, Japanese, Korean)	z/OS V2R5
Note: Beginning in z/OS V2R4, Base z/OS order for English does not include DBCS feature.		
Future Function	HZAI250	z/OS V2R5

6.5.3.10 Elements in Wave 2

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

Figure 15. Elements in FMIDSET Wave 2		
Element	**FMID(s)**	**Level**
JES2	HJE77D0 JJE77DJ (Japanese)	z/OS V2R5
JES3	HJS77D0	z/OS V2R5
SDSF	HQX77D0	z/OS V2R5
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 V2R5 on a z/OS V2R3 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 V2R5 SDSF only assembles with z/OS V2R5 JES2.		

6.6 Step 5: Review Library Restructure/Renaming Notes

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

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

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

IBM recommends that you do the following:

1. Perform the dummy function delete of the element.

2. Delete the old libraries.

3. Allocate new libraries using the sample jobs provided.

4. Update the DDDEFs using the sample jobs provided.

5. Follow the rest of the instructions in the appropriate installation chapters.

6.7 Step 6: Review General Installation Notes

This section describes the general information and messages that you receive during APPLY CHECK, APPLY, ACCEPT CHECK, and ACCEPT processing of the z/OS V2R5 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 V2R5 FMIDs will delete the previous releases. However, the total installation time will be decreased if you run the optional dummy delete job. If you do not run the dummy delete job, then several load modules will be link-edited multiple times. The first link-edit will remove the previous release and can produce the following program binder messages, which can be ignored:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

    Note: You must investigate and resolve any "requisites" or "holds" that were not satisfied before continuing with the install.
- LINK LMODS CALLLIBS is not required to be run after the installation is finished. Because the CALLable services are upwardly compatible, there is no need to re-link.

- The sample jobs are shown using REGION=0M. A region value equal to 0K or 0M gives the job all the storage available below and above 16 megabytes. Be aware that this can affect the performance of other jobs running in the system. If you do not choose to run with a region size of 0M, refer to *z/OS SMP/E Reference* for more information on how to determine region sizes.
- TIME=NOLIMIT is specified on the samples because the jobs take a long time to execute.

6.7.1 SMP/E CALLLIBs Processing

z/OS V2R5 uses the CALLLIBS function that is provided in SMP/E to resolve external references during installation. Before z/OS V2R5 is installed, ensure that DDDEFs exist for the following libraries:

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

7.0 Installation Instructions for Wave 0 FMIDs

This chapter describes how to install the Wave 0 elements in z/OS V2R5.

- 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.

Check Box	Activity	Section, Step Description	Your Notes
Figure 16. Checklist for Wave 0 Installation			
☐	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	
☐	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, Program Management Binder, and High level Assembler that is included with z/OS V2R5 to install z/OS V2R5 Wave 1 and Wave 2 elements. Therefore, you must receive the Wave 0 elements FMIDs by using the SELECT and FORFMID operands to limit SMP/E processing at this time if the levels of the Wave 0 elements FMIDs that are installed on the z/OS target system are not the same level as the Wave 0 elements in z/OS V2R5. After you install the Wave 0 FMIDs, you can use SMP/E to update the Global zone to improve RECEIVE processing (see note 5 on page 64) and receive the FMIDs and service for the rest of z/OS elements (see 8.1.5, "RECEIVE the rest of the CBPDO" on page 78). See *z/OS SMP/E Commands* for more information about the changes to SMP/E RECEIVE processing.

7.1.1 RECEIVE Wave 0 FMIDs and Service

Select which z/OS V2R5 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=zosv2r5.global.csi,DISP=SHR
//SMPPTFIN DD DSN=SMPMCS,
//            UNIT=(TAPE,,DEFER),
//            VOL=SER=vvvvvv,
//            LABEL=(5,SL),
//            DISP=(SHR,KEEP)
//SMPHOLD   DD DSN=HOLDDATA,
//            UNIT=(TAPE,,DEFER),
//            VOL=SER=vvvvvv,
//            LABEL=(3,SL),
//            DISP=(SHR,KEEP)
//SMPCNTL DD *
  SET BOUNDARY(GLOBAL).
  RECEIVE SELECT (
            HMP1K00,   /* see NOTE 1 below */
            JMP1K11,   /* see NOTE 2 below */
            HMQ4160, /* see NOTE 1 below */
            HPM77D0
            )
        SYSMODS
        HOLDDATA
        FORFMID (
            HMP1K00,
            JMP1K11,   /* see NOTE 2 below */
            HMQ4160,
            HPM77D0
            ).

  /*
```

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

Notes:

1. If High Level Assembler (HLASM) or SMP/E has been previously installed, remove HLASM FMID HMQ4160 or SMP/E FMID HMP1K00 from the SELECT operand.

2. If the Japanese feature is not ordered, remove FMID JMP1K11 from the SELECT and FORFMID parameters.

Successful receive processing returns a condition code of 0.

7.2 Step 2: Prepare to Install Wave 0

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

Required Planning Tasks Check List

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

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

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

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

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

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

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

7.2.1 Run optional delete jobs for Wave 0 elements

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

1. Update the *job parameters*.

2. Change `zosv2r5.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=zosv2r5.global.csi
//SMPHOLD DD DUMMY
//SMPCNTL DD *
 SET BDY(GLOBAL) OPTIONS(ZOSOPT).
 RECEIVE S(DM0FMID).
/*
//SMPPTFIN DD *
++FUNCTION (DM0FMID) REWORK(2020060).
++VER(Z038)
   DELETE(#fmid1,#fmid2).
/*
//STEP2 EXEC PGM=GIMSMP,REGION=0M,TIME=NOLIMIT,COND=(4,LT)
//SMPCSI DD DISP=SHR,DSN=zosv2r5.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=zosv2r5.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=zosv2r5.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 277. Sample jobs to allocate the target and distribution libraries for some elements have been provided. See Appendix C, "DASD Storage Requirements Tables" on page 277 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.HPM77D0.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 77 on page 284 and Figure 78 on page 298 for z/OS V2R5. 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.HPM77D0.F1'

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

7.3 Step 3: APPLY Wave 0

This section describes step 3 of wave 0.

7.3.1 Create a cross-zone set

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

In OS/390 Release 3, SMP/E introduced the operand, XZREQ, which provides a method for a user to more easily install cross-zone requisites. SMP/E identifies the cross-zone requisites needed in the set-to zone by reading CIFREQ data in the secondary zones of the zone group in effect for the current APPLY/ACCEPT commands. Any CIFREQ data that is for FMIDs installed or being installed in the set-to zone that are not yet in the set-to zone causes the required SYSMODs to become candidates for installation. If the FORFMID operand is also used, the FMID specified on the CIFREQ must match one of the FMIDs specified on the FORFMID operand for the SYSMOD to become a candidate.

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

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

For more information on this operand, refer to *z/OS SMP/E Commands*. See for an example of how to set up the ZONEINDEX, ZONESET, and XZREQCHK for use during the APPLY/ACCEPT; see 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=zosv2r5.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 V2R5 Wave 0 FMIDs to install

Select which z/OS V2R5 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 .

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 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=zosv2r5.global.csi,DISP=SHR
//SMPCNTL DD *
  SET BOUNDARY(targetzone) .
  APPLY CHECK XZREQ
   FORFMID(HMP1K00,
           JMP1K11,                 /* see Note 2 below */
           HMQ4160,
           HPM77D0)
   SELECT(HMP1K00,                  /* see Note 1 below */
          JMP1K11,                  /* see Note 2 below */
          HMQ4160,                  /* see Note 1 below */
          HPM77D0)
   GROUPEXTEND(NOAPARS,NOUSERMODS)
   SOURCEID(ZOSV2R5,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 V2R5)

Notes:

1. If High Level Assembler (HLASM) or SMP/E has been previously installed, remove HLASM FMID HMQ4160 or SMP/E FMID HMP1K00 from the SELECT operand.

2. If the Japanese feature is not ordered, remove FMID JMP1K11 from the SELECT and FORFMID parameters.

3. HLASM Toolkit is included in Wave 1 elements in this program directory. If you plan to use HLASM Toolkit before you do the APPLY for Wave 1 FMIDs, install FMID JMQ416A during Wave 0 by adding FMID JMQ416A to the FORFMID and SELECT operands in the APPLY CHECK job for Wave 0 FMIDs. To install FMID JMQ416A during Wave 0, you must also run the SMP/E RECEIVE command against FMID JMQ416A before running the APPLY CHECK job for Wave 0 FMIDs.

Required Updates

1. Update the *job parameters*.

2. Replace the CSI name on the SMPCSI DD statement with your CSI name.

3. Update *targetzone* to your target zone name.

4. The XZREQ operand only needs to be specified when cross-zone processing is required. If this operand is specified when there is no zone group set up, the following messages will be received, which are acceptable:

```
GIM50810W THE XZREQ OPERAND WAS SPECIFIED ON THE APPLY
COMMAND BUT SINCE NO ZONES WERE APPLICABLE FOR CROSS-ZONE
REQUISITE CHECKING, THE XZREQ OPERAND WILL BE IGNORED.

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

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

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

Any messages other than those stated in 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
HPM77D0 BECAUSE IT IS NOT IN THE target ZONE.
```

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

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

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

Be certain that all the exception conditions have been satisfied before adding a BYPASS(HOLDSYSTEM) during the SMP/E APPLY step. See 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=zosv2r5.global.csi,DISP=SHR
//SMPCNTL DD *
  SET BOUNDARY(targetzone).
  APPLY XZREQ
   FORFMID(HMP1K00,
           JMP1K11,            /* see NOTE 2 below */
           HMQ4160,
           HPM77D0)
   SELECT(HMP1K00,             /* see Note 1 below */
           JMP1K11,            /* see NOTE 2 below */
           HMQ4160,            /* see NOTE 1 below */
           HPM77D0)
   GROUPEXTEND(NOAPARS,NOUSERMODS)
   SOURCEID(ZOSV2R5,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 V2R5)

Required Updates

1. Update the *job parameters*.

2. Replace the CSI name on the SMPCSI DD statement with your CSI name.

3. Update *targetzone* to your target zone name.

4. The XZREQ operand only needs to be specified when cross-zone processing is required. If this operand is specified when there is no zone group set up, the following messages will be received, which are acceptable:

   ```
   GIM50810W THE XZREQ OPERAND WAS SPECIFIED ON THE APPLY
   COMMAND BUT SINCE NO ZONES WERE APPLICABLE FOR CROSS-ZONE
   REQUISITE CHECKING, THE XZREQ OPERAND WILL BE IGNORED.

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

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

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

Notes:

1. If High Level Assembler (HLASM) or SMP/E has been previously installed, remove HLASM FMID HMQ4160 or SMP/E FMID HMP1K00 from the SELECT operand.

2. If the Japanese feature is not ordered, remove FMID JMP1K11 from the SELECT and FORFMID parameters.

3. HLASM Toolkit is included in Wave 1 elements in this program directory. If you plan to use HLASM Toolkit before you do the APPLY for Wave 1 FMIDs and you have included FMID JMQ416A in the APPLY CHECK job for Wave 0 FMIDs, you must add FMID JMQ416A to the FORFMID and SELECT operands in the APPLY job for Wave 0 FMIDs.

Any messages other than those stated in 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
HPM77D0 BECAUSE IT IS NOT IN THE target ZONE.
```

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

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

7.4 Step 4: Wave 0 Customization

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

7.4.1 High Level Assembler

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

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

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

- Place High Level Assembler into Link Pack Area.

7.4.2 SMP/E Customization

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

7.4.2.1 Update SMP/E Entries

The SYSLIB concatenation for APPLY processing for the rest of z/OS V2R5 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 V2R5.

Target zone SYSLIB concatenation

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

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

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

- 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 V2R5.

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 V2R5.
  3. Do not make the RC=4 unless all products in the zone have a maximum return code of 4.

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

  Make sure that you include ASM and LKED subentries.

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

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

```
//OPTIONS JOB <job parameters>
//STEP1   EXEC PGM=GIMSMP
//STEPLIB DD DSN=SYS1.MIGLIB,DISP=SHR,
//          UNIT=SYSALLDA,VOL=SER=v2r5vol1
//          DD DSN=ASM.SASMMOD1,DISP=SHR,
//          UNIT=SYSALLDA,VOL=SER=v2r5vol1
//SMPCSI DD DSN=zosv2r5.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.

1. Update the *job parameters*.

2. Update the v2r5vol1 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 V2R5 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 V2R5 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 HJE77D0 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 V2R5 FMIDs.

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

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

8.0 Installation Instructions for Wave 1 and Wave 2 FMIDs

This chapter describes how to install the Wave 1 and Wave 2 elements in z/OS V2R5, including the elements which are installed into the file system.

In z/OS V2R5, the CBPDO driving system requirements are as follows:

- For the Wave 1 and Wave 2 elements installation, the driving system must be z/OS V2R3 or later, with z/OS UNIX active in full function mode.

- For the Wave 1 and Wave 2 elements installation, the BCP Program Management Binder, SMP/E, and the High Level Assembler from Wave 0 must be available on the driving system.

- For the Wave 1 and Wave 2 elements installation, a Java Runtime Environment using IBM 31-bit SDK for z/OS Java Technology Edition V8.0 or higher (5655-DGG), or IBM 64-bit SDK for z/OS Java Technology Edition V8.0 or higher (5655-DGH) must be available on the driving system.

- You must install z/OS V2R5 into zFS file systems, so make sure that zFS is configured and active on the driving system.

This release of z/OS V2R5 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 77	
		8.1.4, "Rename user-defined security label beginning with 'SYS' if it exists" on page 78	
☐	Receive the rest of the CBPDO	8.1.5, "RECEIVE the rest of the CBPDO" on page 78	
☐	Run Required and Optional Delete Jobs	8.1.6, "Run required and optional Delete Jobs" on page 79	
☐	Allocate Libraries	8.1.7, "Allocate target and distribution libraries for Wave 1 elements" on page 83	
☐	Create file system directories	8.1.8, "Create file system directories for Wave 1" on page 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 96	
☐	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 113	
☐	Allocate Libraries	8.3.3, "Allocate Target and Distribution Libraries for Wave 2 Elements" on page 115	
☐	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 116	

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 117	
□		8.3.7, "Set High Level Assembler Option for JES2" on page 117	
□	Apply Check Wave 2	8.3.8.1, "Do an SMP/E APPLY CHECK for Wave 2" on page 117	
□	Apply Wave 2	8.3.8.2, "Do an SMP/E APPLY for Wave 2" on page 119	
□	Post-APPLY	8.4, "Step 4: Do Post-APPLY work for Wave 1 and Wave 2" on page 122	
	CNLDEFCL CNLCOMP	8.4.1.1, "Compile MMS Data Sets" on page 123	
	EZAIMSCZ	8.4.1.2, "Run Post-APPLY for Communications Server IP Services" on page 123	
	EPW12011	8.4.3.1, "Run Post-APPLY Link-Edit for FFST" on page 124	
	ICQPOST1 ICQPOST2	8.4.3.2, "Run Post-APPLY for TSO/E Information Center Facility (when appropriate)" on page 124	
	IKYCVSAM	8.4.4.1, "Run Cryptographic Services PKI Services job" on page 125	
	CLNCRSZ	8.4.9.1, "Run SMP/E REPORT CROSSZONE (Target Zone)" on page 126	
□	Customize	8.5, "Step 5: Customize Wave 1 and Wave 2" on page 126	
	DFSMSdss Actions	8.5.1.2, "Complete DFSMSdss actions" on page 126	
	IPL Text	8.5.1.3, "Write new IPL TEXT" on page 127	
	IODF	8.5.1.4, "Create and update your IODF" on page 128	
	PARMLIB	8.5.2, "PARMLIB member considerations" on page 128	
	PROCLIB	8.5.3, "PROCLIB member considerations" on page 145	
	ISPF Setup	8.5.4, "z/OS V2R5 ISPF setup considerations" on page 149	

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

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 156	
		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 157	
		8.5.5.4, "Customization considerations for Wave 1B" on page 167	
		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 174	
		8.5.5.9, "Customization considerations for Wave 1G" on page 178	
		8.5.5.10, " Customization for Wave 2" on page 182	
☐	Verify Installation	8.6, "Step 6: Verify installation of Wave 0, Wave 1 and Wave 2" on page 183	
	IPL	8.6.1, "IPL the z/OS system" on page 184	
	IVPs	8.6.2, "Verify installation of z/OS V2R5 Wave 0, Wave 1 and Wave 2 FMIDs" on page 186	
		8.6.2.1, "IVP jobs for Wave 0" on page 189	
		8.6.3, "IVP jobs for Wave 1A" on page 193	
		8.6.4, "IVP jobs for Wave 1B" on page 196	
		8.6.5, "IVP jobs for Wave 1C" on page 213	
		8.6.6, "IVP jobs for Wave 1D" on page 221	
		8.6.7, "IVP jobs for Wave 1E" on page 222	
		8.6.8, "IVP jobs for Wave 1F" on page 224	
		8.6.9, "IVP jobs for Wave 1G" on page 229	
		8.6.10.1, "Run the installation verification procedure for SDSF" on page 231	

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 232	
		8.7.2, "Do an SMP/E ACCEPT CHECK for Wave 0 and Wave 1 FMIDs and Service" on page 233	
		8.7.3, "Do an SMP/E ACCEPT for Wave 0 and Wave 1 FMIDs and service" on page 237	
		8.7.4, "Do an SMP/E ACCEPT CHECK for Wave 2" on page 242	
		8.7.5, "Do an SMP/E ACCEPT for Wave 2" on page 244	
☐	CLEAN UP	8.8, "Step 8: Clean up after Wave 1 and Wave 2" on page 246	

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 V2R5 FMIDs that are installed into the file system, as well as the z/OS V2R5 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 V2R5 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 V2R5

Refer to 5.4.1, "Total DASD Storage Requirements" on page 28 for the total space required for the root file system. You can also refer to the sample BPXISZFS for space required in the ZFS root. The sample jobs will reside in 'prefix.HBB77D0.F6' after the SMP/E RECEIVE step is complete. The 'prefix' is the high-level qualifier specified as the DSPREFIX value in the SMPTLIB DDDEF or the OPTIONS entry of the global zone.

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

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

8.1.3 Driving system with an active root file system

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

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

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

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

   Update 'root_FS_data_set' and 'etc_FS_data_set' with the names of your root file system and /etc file system in which you will install z/OS V2R5. When you install z/OS V2R5 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.

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

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

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

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

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

4. If you have /etc and /var as symbolic links, run BPXISETD to convert the /etc and /var symbolic links to directories (see 8.6.1.2, "BPXISETS and BPXISETD" on page 184). Ensure your target system's /etc file system data set is mounted to the driving system. You may choose to have /var mounted on your driving system.

5. Install and customize the z/OS V2R5 Wave 1 and Wave 2 elements.

6. Run BPXISETS to convert the /etc and /var directories to a symbolic link (see 8.6.1.2, "BPXISETS and BPXISETD" on page 184).

7. IPL the target system using the BPXPRMxx parmlib tailored in step 1. z/OS UNIX will come up automatically with the Wave 1 root file system and /etc file system. When you install z/OS V2R5 into zFS file systems, ensure you have activated zFS on the target system before you IPL with the zFS file systems. For information on zFS considerations, see *z/OS File System Administration*.

8. Run the Wave 1 and Wave 2 IVPs.

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

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

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

8.1.4.1 z/OS File System installation considerations

1. z/OS File System (zFS) Support

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

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

8.1.5 RECEIVE the rest of the CBPDO

RECEIVE FMIDs and service for the z/OS V2R5 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 V2R5 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 HBB77D0 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.HBB77D0.F6' to remove the withdrawn elements that are not part of z/OS V2R5.

Note: Figure 27 shows withdrawn elements in z/OS V2R5. If you are migrating from z/OS V2R3, or z/OS V2R4, you must run CLNOS390 job to remove the obsolete elements. See z/OS Upgrade Workflow for the complete list of obsolete libraries, DDDEFs and paths.

Figure 27 (Page 1 of 2). Withdrawn Elements from z/OS	
Element Name	**Withdrawn In**
BookManager Read and NLS HBKM300 JBKM310 (English) JBKM311 (Dutch) JBKM312 (French) JBKM313 (German) JBKM314 (Spanish) JBKM315 (Italian) JBKM316 (Brazilian Portuguese) JBKM317 (Canadian French) JBKM318 (Danish)	z/OS V2R4
Cryptographic Services Open Cryptographic Services Facility Base HCRY740	z/OS V2R5
DFS/SMB H0H2410 J0H241J	z/OS V2R4
GDDM NLS JGD3220 (Brazilian Portuguese) JGD3221 (Simplified Chinese) JGD3222 (Danish) JGD3223 (French) JGD3224 (German) JGD3225 (Korean) JGD3226 (Italian) JGD3228 (Norwegian) JGD3229 (Canadian French) JGD3230 (Spanish) JGD3231 (Traditional Chinese) JGD3232 (Swedish)	z/OS V2R4
Integrated Security Services Enterprise Identity Mapping HIT7750	z/OS V2R5
Integrated Security Services OCEP HRO7740	z/OS V2R5
ISPF NLS JIF7R11 (Swiss German) JIF7R15 (German)	z/OS V2R4
Library Server HBKQ400	z/OS V2R4
OSA/SF H0GI400	z/OS V2R4

Figure 27 (Page 2 of 2). Withdrawn Elements from z/OS	
Element Name	**Withdrawn In**

SMP/E - Planning/Migration Assistant (PMA)
    HBCNC00
    HBCND0B
    JBCND1B
	z/OS V2R4

z/OS Security Level 3 OCSF JCRY741	z/OS V2R5

To run the job, perform the following functions:

- Copy the sample job from member CLNOS390 of the SMPTLIB, 'prefix.HBB77D0.F6'. The SMPTLIB is created during RECEIVE processing. Its high-level qualifier (prefix) is the value specified as the DSPREFIX in the SMPTLIB DDDEF or the OPTIONS entry of the global zone.
- Run the sample job after modifying it to meet your system's requirements.
- During the RECEIVE of DELZOS1 and DELZOS2, you will receive the message `GIM39701W SYSMOD DELZOS1n HAS NO ELEMENTS.`, where n (1 and/or 2) is the dummy function delete sysmods. This is acceptable.

After completing the dummy function delete and installing z/OS V2R5, 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 five sample jobs provided to perform the above tasks. Copy these jobs from SMPTLIB, 'prefix.HBB77D0.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.
- CLNCRSRV is the cleanup job for Cryptographic Services - OCSF.
- CLNISEIM is the cleanup job for Integrated Security Services - EIM.
- CLNLBSRV is the cleanup job for Library Server.
- CLNOSASF is the cleanup job for OSA/SF.

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

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

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

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

Sample JCL that can be used to delete BCP functions is provided in member CLNDELFN of the SMPTLIB, 'prefix.HBB77D0.F6'. This sample JCL contains a dummy function, DM1FMID, that can be used to delete functions replaced by the z/OS V2R5 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 V2R5 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.HBB77D0.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.HDZ2250.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.HDZ2250.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 277. If needed, sample jobs to allocate the target and distribution libraries for some elements have been provided.

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

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

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

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

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

If these elements have been installed previously, the JCL for the jobs needs to be modified to remove or comment out the DD statements for the pre-existing libraries, or the job will fail. See Appendix C, "DASD Storage Requirements Tables" on page 277 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.HBB77D0.F6'
Note: See note 4 on page 86.			
BPNPALC	ALLOCATE	z/OS Authorized Code Scanner JPN	'prefix.JAL47DJ.F2'
CUNJUALC	ALLOCATE	BCP Base-Support for Unicode	'prefix.HUN77D0.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'
EZACSALC	ALLOCATE	Communications Server	'prefix.HIP6250.F1'
CSFALLOC	ALLOCATE	Cryptographic Services ICSF	'prefix.HCR77D2.F1'
Note: See note 5 on page 87.			
IKYALLOC	ALLOCATE	Cryptographic Services PKI Services	'prefix.HKY77D0.F1'
GSKISALC	ALLOCATE	Cryptographic Services System SSL	'prefix.HCPT450.F1'
DFPALLOC	ALLOCATE	DFSMS	'prefix.HDZ2250.F1'
DGTALLOC	ALLOCATE	DFSMS Japanese	'prefix.JDZ225K.F2'
Note: See note 6 on page 87.			
ICEALLOC	ALLOCATE	DFSORT	'prefix.HSM1Q00.F1'

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

Job Name	Job Type	Description	RELFILE
EPW12003	ALLOCATE	FFST	'prefix.HFST101.F4'
IEFGDDMA	ALLOCATE	GDDM (includes GDDM-PGF)	'prefix.HBB77D0.F6'
CBDSALLC	ALLOCATE	HCD	'prefix.HCS77D0.F2'
EEQHCALC	ALLOCATE	HCM	'prefix.HCM1I10.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.			
BBLZFS	ZFSALLOC	sample ZFS allocate job	'prefix.HWLPEM0.F1'
IZUISALC	ALLOCATE	IBM z/OS Management Facility	'prefix.HSMA250.F3'
ICKALLOC	ALLOCATE	ICKDSF	'prefix.EDU1H01.F3'
Note: See note 8 on page 87.			
ICKALLKG	ALLOCATE	ICKDSF Japanese	'prefix.FDU1H09.F2'
AOPALLOC	ALLOCATE	Infoprint Server	'prefix.HOPI7D0.F1'
EUVFSALC	ALLOCATE	Integrated Security Services Network Authentication Service	'prefix.HSWK450.F1'
ISPALLOC	ALLOCATE	ISPF Base, SCLM & English	'prefix.HIF7T02.F1'
ISPALJPN	ALLOCATE	ISPF Japanese	'prefix.JIF7T14.F1'
ISPALENP	ALLOCATE	ISPF Upper Case English	'prefix.JIF7T16.F1'
CEEISALC	ALLOCATE	Language Environment	'prefix.HLE77D0.F1'
CCRALLOC	ALLOCATE	Metal C Runtime Library	'prefix.HSD7780.F4'
GFSALLOC	ALLOCATE	Network File System	'prefix.HDZ225N.F1'
ERB00ALC	ALLOCATE	RMF (Base and Japanese)	'prefix.HRM77D0.F12'
CLB3JALL	ALLOCATE	Runtime Library Extensions	'prefix.HTV77C0.F1'
IRRALLOC	ALLOCATE	Security Server RACF	'prefix.HRF77D0.F1'

Job Name	Job Type	Description	RELFILE
IKJBALL	ALLOCATE	TSO/E	'prefix.HTE77D0.F3'
CCNJALOC	ALLOCATE	XL C/C++	'prefix.HLB77C0.F1'
Note: See note 9 on page 87.			
AZDISALC	ALLOCATE	z/OS Container Extensions	'prefix.HZDC7C0.F2'
Note: See note 12 on page 87.			
GRB00ALC	ALLOCATE	z/OS Data Gatherer	'prefix.HRG77D0.F2'
IOEIZALC	ALLOCATE	z/OS File System	'prefix.HZFS450.F1'
FNTALLOC	ALLOCATE	z/OS Font Collection	'prefix.HFNT140.F1'
Note: See note 10 on page 87.			

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

Notes:

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

2. For all elements shown in Figure 28 on page 84, if you specify a volume for any data set in the allocate job, you must also specify the same volume in the corresponding DDDEF entry in the DDDEF job (see Figure 30 on page 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
   IOCP
   MICR/OCR
   OpenSSH for z/OS
   TIOC
   z/OS File System Japanese
   z/OS Security Level 3
   z/OS Host - 3270 Workstation File Send/Receive

4. For BCP, if BCP Japanese FMID is ordered, ensure that TSO/E Japanese libraries are allocated by running IKJBALL and that BCP National Language features installed into the shared libraries with TSO/E National Language features.

5. The Cryptographic Services ICSF libraries contain parts and aliases which provide for successful link edit of Cryptographic Services ICSF load modules for customers who do not have CICS® installed. Since these libraries contain aliases provided by CICS, customers who install both Cryptographic Services ICSF and CICS should install the products into separate target and distribution data sets.

   As of z/OS V2R3, Cryptographic Services ICSF added a new library SCSFSTUB.

6. Special Note for DFSMS Japanese

   DFSMS Japanese and ICKDSF Japanese both share library DGTPKLB. If you ordered both of these, run sample job ICKALLKG before attempting to install DFSMS Japanese. Appendix C, "DASD Storage Requirements Tables" on page 277 describes the space requirements for DGTPKLB.

7. The following element languages do not supply sample allocate jobs. Their allocation statements are in the base FMID jobs, and need to be uncommented to become active.

   - Infoprint Server Japanese
   - TSO/E Japanese
   - z/OS File System Japanese

8. Sample job, ICKALLOC, incorrectly allocates SYS1.LINKLIB and SYS1.SAMPLIB. These data sets already exist.

9. As of z/OS V2R3, the XL C/C++ element added new target data sets SCCNM12 and SCCNN12, and distribution libraries ACCNSR6 and ACCNSR7.

10. As of z/OS V2R3, the sizes of several data sets that are required for the installation of the z/OS Font Collection element have significantly increased. Before installing the element, review the space requirements for the element's data sets in the sample allocate job and run the sample allocate job to re-allocate data sets if necessary.

11. IBM z/OS Liberty Embedded was introduced in z/OS V2R3.

12. z/OS Container Extensions was introduced in z/OS V2R4. You must run the sample job provided by the element to allocate the required distribution library before installing the element if you are migrating from z/OS V2R3.

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 on page 88. For new directories introduced in the current release, see C.6, "File System for z/OS V2R5" on page 311. 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 V2R5" on page 31 prior to running the BPXISMKD job.

Note: It is assumed that you have cloned the entire set of file system data sets as described in 6.3, "Step 2: Cloning File System Data Sets" on page 32 and that the clone is your target system. Before running the mkdir jobs, ensure the cloned file system data sets mounted on the /tmp and /dev directories are

unmounted. After unmounting, verify these directories are empty. Also, ensure that the clone of /etc is mounted, so that necessary /etc changes can be made by the mkdir jobs. If /etc and /var are symbolic links, run BPXISETD to convert them back to a directory to mount them (see 8.6.1.2, "BPXISETS and BPXISETD" on page 184).

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

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

Job Name	Job Type	Description	RELFILE
Figure 29 (Page 1 of 2). Wave 1 Define Directories Sample Installation Jobs			
BPXISMKD	MKDIR	BCP	'prefix.HBB77D0.F6'
Note: See note 7 on page 90.			
CPOISMKD	MKDIR	BCP - Capacity Provisioning	'prefix.HPV77D0.F1'
CFZISMKD	MKDIR	Common Information Model (CIM)	'prefix.HPG77C0.F1'
EZAISMKD	MKDIR	Communications Server IP	'prefix.HIP6250.F1'
CSFISMKD	MKDIR	Cryptographic Services ICSF	'prefix.HCR77D2.F1'
IKYISMKD	MKDIR	Cryptographic Services PKI Services	'prefix.HKY77D0.F1'
GSKISMKD	MKDIR	Cryptographic Services System SSL	'prefix.HCPT450.F1'
DFPISMKD	MKDIR	DFSMS	'prefix.HDZ2250.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 6 on page 90.			
IZUISMKD	MKDIR	IBM z/OS Management Facility	'prefix.HSMA250.F3'
AOPISMKD	MKDIR	Infoprint Server	'prefix.HOPI7D0.F1'
EUVFSMKD	MKDIR	Integrated Security Services Network Authentication Service	'prefix.HSWK450.F1'
ISPISMKD	MKDIR	ISPF	'prefix.HIF7T02.F1'
CEEISMKD	MKDIR	Language Environment	'prefix.HLE77D0.F1'

Figure 29 (Page 2 of 2). Wave 1 Define Directories Sample Installation Jobs			
Job Name	**Job Type**	**Description**	**RELFILE**
GFSISMKD	MKDIR	Network File System	'prefix.HDZ225N.F1'
FOTISMKD	MKDIR	OpenSSH for z/OS	'prefix.HOS2240.F1'
ERBISMKD	MKDIR	RMF™	'prefix.HRM77D0.F12'
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 8 on page 91.			
IOEIZMKD	MKDIR	z/OS File System	'prefix.HZFS450.F1'
FNTISMKD	MKDIR	z/OS Font Collection	'prefix.HFNT140.F1'
Note: See note 5 on page 90.			

Notes:

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

2. Be careful when modifying the samples because path names are case sensitive.

3. After the jobs are submitted, you will get a return code of 0. Check the held output to ensure the directories and symbolic links were created properly.

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

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

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

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

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

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

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

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

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

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

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

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

This can be caused by:

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

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

4. Dependent FMIDs that are installed into the file system and not listed in use directories created by their base FMIDs.

5. If you plan to install z/OS Font Collection in a separate file system, allocate and mount the file system to the driving system before running the sample job FNTISMKD to define the directories. Sample job FNTZFSAL is provided to allocate a zFS for z/OS Font Collection. The job resides in 'prefix.HFNT140.F1' after SMP/E RECEIVE processing is complete. Refer to the sample job for information on allocating and mounting a file system for z/OS Font Collection.

6. IBM z/OS Liberty Embedded was a new element introduced in z/OS V2R3 and installed in the file system. It is recommended that the element be installed in a separate file system due to space requirements.

7. There is a new directory added in z/OS V2R5 BCP FMID. You must run the BPXISMKD job to create the new directory before installation. The installation of FMID HZAI250 requires that the BPXISMKD

job be run to create a new directory in the file system. You must run the BPXISMKD job to create the new directory in the file system before installing FMID HZAI250.

8. A new element z/OS Container Extensions was introduced in z/OS V2R4 and installs into the file system. It is recommended that the element be installed in a separate file system due to space requirements. If you are migrating from z/OS V2R3, you must allocate and mount the separate file system at the recommended mountpoint shown in sample job AZDISALC. Sample job AZDISALC is provided in FMID HZDC7C0, in 'prefix.HZDC7C0.F2' after SMP/E RECEIVE processing is complete, then run the AZDISMKD sample job to create the required directories before installing z/OS Container Extensions.

8.1.9 Define DDDEFs for Wave 1 Elements

Verify your target and distribution libraries have the DDDEF entries listed in and for z/OS V2R5. Sample jobs to define DDDEF entries for most elements have been provided.

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

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

Run the jobs after the elements have been RECEIVEd.

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

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

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

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

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

Figure 30 (Page 1 of 3). Wave 1 DDDEF Sample Installation Jobs			
Job Name	**Job Type**	**Description**	**RELFILE**
EAGKDDEF	DDDEF	Alternate Library for REXX	'prefix.HWJ9143.F1'

Job Name	Job Type	Description	RELFILE
BPXISDDD	DDDEF	BCP (Selected BCP component libraries only)	'prefix.HBB77D0.F6'
Note: See note 6 on page 94 and 11 on page 94.			
BPNPDDD	DDDEF	z/OS Authorized Code Scanner JPN	'prefix.JAL47DJ.F2'
CUNJUDDF	DDDEF	BCP Base-Support for Unicode	'prefix.HUN77D0.F1'
CPODDDEF	DDDEF	BCP - Capacity Provisioning	'prefix.HPV77D0.F1'
BDTJDDEF	DDDEF	BDT	'prefix.HBD6602.F1'
CTVJDDF	DDDEF	C/C++ Host Performance Analyzer	'prefix.H24P111.F1'
CFZDDDEF	DDDEF	Common Information Model (CIM)	'prefix.HPG77C0.F1'
EZACSDDF	DDDEF	Communications Server	'prefix.HIP6250.F1'
CSFDDDEF	DDDEF	Cryptographic Services ICSF	'prefix.HCR77D2.F1'
Note: See note 7 on page 94.			
IKYDDDEF	DDDEF	Cryptographic Services PKI Services	'prefix.HKY77D0.F1'
GSKISDDD	DDDEF	Cryptographic Services System SSL	'prefix.HCPT450.F1'
DFPDDDEF	DDDEF	DFSMS	'prefix.HDZ2250.F1'
DGTDDDEF	DDDEF	DFSMS Japanese	'prefix.JDZ225K.F2'
Note: See note 8 on page 94.			
ICEDDDEF	DDDEF	DFSORT	'prefix.HSM1Q00.F1'
EPW12004	DDDEF	FFST	'prefix.HFST101.F4'
IEFGDDMD	DDDEF	GDDM (includes GDDM-PGF)	'prefix.HBB77D0.F6'
CBDSDDDF	DDDEF	HCD	'prefix.HCS77D0.F2'
EEQHCDDF	DDDEF	HCM	'prefix.HCM1I10.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'

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

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

Job Name	Job Type	Description	RELFILE
BBLDDDEF	DDDEF	IBM z/OS Liberty Embedded	'prefix.HWLPEM0.F1'
Note: See note 9 on page 94.			
IZUISDDD	DDDEF	IBM z/OS Management Facility	'prefix.HSMA250.F3'
ICKDDDEF	DDDEF	ICKDSF	'prefix.EDU1H01.F3'
ICKDDDKG	DDDEF	ICKDSF Japanese	'prefix.FDU1H09.F2'
AOPDDDEF	DDDEF	Infoprint Server	'prefix.HOPI7D0.F1'
EUVFSDDD	DDDEF	Integrated Security Services Network Authentication Service	'prefix.HSWK450.F1'
ISPDDDEF	DDDEF	ISPF Base	'prefix.HIF7T02.F1'
ISPDDJPN	DDDEF	ISPF Japanese	'prefix.JIF7T14.F1'
ISPDDENP	DDDEF	ISPF Upper Case English	'prefix.JIF7T16.F1'
CEEISDDD	DDDEF	Language Environment	'prefix.HLE77D0.F1'
CCRDDDEF	DDDEF	Metal C Runtime Library	'prefix.HSD7780.F4'
GFSDDDEF	DDDEF	Network File System	'prefix.HDZ225N.F1'
FOTISDDF	DDDEF	OpenSSH for z/OS	'prefix.HOS2240.F1'
ERB00DDF	DDDEF	RMF (Base and Japanese)	'prefix.HRM77D0.F12'
CLB3JDDF	DDDEF	Runtime Library Extensions	'prefix.HTV77C0.F1'
IRRDDDEF	DDDEF	Security Server RACF	'prefix.HRF77D0.F1'
IKJBDDD	DDDEF	TSO/E	'prefix.HTE77D0.F3'
CCNJDDDF	DDDEF	XL C/C++	'prefix.HLB77C0.F1'
AZDISDDD	DDDEF	z/OS Container Extensions	'prefix.HZDC7C0.F2'
Note: See note 10 on page 94.			
GRB00DDF	DDDEF	z/OS Data Gatherer	'prefix.HRG77D0.F2'
IOEIZDDD	DDDEF	z/OS File System	'prefix.HZFS450.F1'
FNTDDDEF	DDDEF	z/OS Font Collection	'prefix.HFNT140.F1'

Notes:

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

2. Be careful when creating DDDEFs or modifying the samples because path names are case-sensitive.

3. For all elements in the above table, if you specify a volume for any data set in the DDDEF job, you must also specify the same volume in the corresponding allocate entry in the allocate job (see Figure 28 on page 84).

4. The following Wave 1 elements that are documented in this program directory do not supply sample DDDEF jobs:

> Most BCP components and BCP Japanese feature
> Communications Server for z/OS SNA Services
> Communications Server Security Level 3
> Communications Server X-Windows X11R4
> EREP
> ESCON Director Support
> HCD Japanese
> IOCP
> MICR/OCR
> TIOC
> z/OS Security Level 3 System SSL Security Level 3
> z/OS Host - 3270 Workstation File Send/Receive

5. The following elements do not supply sample DDDEF jobs. Their DDDEFs are in the base FMID jobs and need to be uncommented to become active.

   - TSO/E Japanese
   - z/OS File System Japanese

6. If BCP Japanese FMID is ordered, ensure that the DDDEFs of TSO/E Japanese libraries are defined by running IKJBDDD since the BCP National Language features are installed into the shared libraries with TSO/E National Languages.

7. The Cryptographic Services ICSF libraries contain parts and aliases that provide for successful link edit of Cryptographic Services ICSF load modules for customers who do not have CICS installed. Since these libraries contain aliases provided by CICS, customers who install both Cryptographic Services ICSF and CICS should install the products into separate target and distribution data sets.

   As of z/OS V2R3, Cryptographic Services ICSF added a new library SCSFSTUB.

8. Special Note for DFSMS Japanese.

   If DFSMS Japanese and ICKDSF Japanese are ordered, ensure that the DDDEFs of ICKDSF Japanese are defined by running ICKDDDKG so that the DFSMS Japanese feature can install into the shared libraries of ICKDSF Japanese.

9. IBM z/OS Liberty Embedded was introduced in z/OS V2R3.

10. z/OS Container Extensions was introduced in z/OS V2R4. If you are migrating from z/OS V2R3, you must run sample job AZDISDDD to create the required DDDEF entries in the SMP/E CSI before installing z/OS Container Extensions.

11. Before installing FMID HZAI250, you must run job BPXISDDD to create a new DDDEF entry that is required.

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 V2R5 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 V2R5, 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 V2R5, 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 V2R5 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 V2R5 ISPF setup considerations" on page 149 to identify the appropriate DD statements and the SMP/E libraries that need to be concatenated.

8.2.1 Select which z/OS Wave 1 FMIDs to install

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

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

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

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

Figure 31 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=v2r5vol1
//         DD DSN=ASM.SASMMOD1,DISP=SHR,
//         UNIT=SYSALLDA,VOL=SER=v2r5vol1
//SMPCSI DD DSN=zosv2r5.global.csi,DISP=SHR
//SMPCNTL DD *
  SET BOUNDARY(targetzone)
      OPTIONS(ZOSOPT) .
  APPLY CHECK  XZREQ
      FORFMID(ZV25W1n)
      SELECT(WAVE1n)
      GROUPEXTEND(NOAPARS,NOUSERMODS)
      SOURCEID(ZOSV2R5,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 v2r5vol1 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 V2R5 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 ZV25W1n 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(ZV25W1n) 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 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 HBB77D0 BECAUSE IT IS NOT IN THE target ZONE, where *xxxxxxx* will be one of the load modules:

  ```
  AMDPRFMT  ANTKINIT  ATBINPVT  IEAIPL04  IEANUC11  IEFITJT
  IEFW21SD  IWMO2CMD
  ```

- GIM23913W LINK-EDIT PROCESSING FOR SYSMOD HBB77D0 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 HBB77D0 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 HIP6250
BECAUSE IT IS NOT IN THE target ZONE.
```

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

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

8.2.2.2 Additional messages expected during Wave 1AL APPLY CHECK

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

8.2.2.3 Additional messages expected during Wave 1B APPLY CHECK

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

8.2.2.4 Additional messages expected during Wave 1C APPLY CHECK

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

8.2.2.4.1 Messages expected during EREP APPLY CHECK

You may receive the following messages:

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

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

8.2.2.4.2 Messages expected during TSO/E APPLY CHECK

You might receive the following message, which is acceptable. In the message, *xxxxxxx* will be one of the following load modules for SYSMOD HTE77D0:

IGC0006A IKJEFT02 IKJEFT09 IKJEGDRP IRXAPPC TEST

```
GIM61903W LMOD xxxxxxxx WAS NOT DELETED BY SYSMOD HTE77D0
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 HTE77D0:

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

```
GIM61903W ALIAS xxxxxxx WAS NOT DELETED BY SYSMOD
HTE77D0 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 HDZ225N
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
HZFS450 and *xxxxxxx* is one of the following modules:

For HZFS450 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 , 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=v2r5vol1
//         DD DSN=ASM.SASMMOD1,DISP=SHR,
//         UNIT=SYSALLDA,VOL=SER=v2r5vol1
//SMPCSI DD DSN=zosv2r5.global.csi,DISP=SHR
//SMPCNTL DD *
  SET BOUNDARY(targetzone)
      OPTIONS(ZOSOPT) .
  APPLY  XZREQ
      FORFMID(ZV25W1n)
      SELECT(WAVE1n)
      GROUPEXTEND(NOAPARS,NOUSERMODS)
      SOURCEID(ZOSV2R5,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 V2R5 Wave 1)

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

> **Required Updates**
>
> 1. Update the *job parameters*, as needed.
>
> 2. Update the v2r5vol1 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 V2R5 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 ZV25W1n 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(ZV25W1n) 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 , 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 V2R5, if the bind of IEANUC01 fails with the following message produced, the SMP/E APPLY might fail for HBB77D0, HDZ2250, HIP6250, and HFST101.

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

Cause: The z/OS V2R5 level of the Program Management Binder was not used for APPLY. The reason could either be the MIGLIB library of z/OS V2R5 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 V2R5 level of the Program Management Binder is installed to the SMP/E APPLY job, as shown in . 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 , 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 HBB77D0 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 HBB77D0 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 *nnnnn* -- SYSPRINT FILE *xxxxxxxx*.

- GIM23903W LINK-EDIT PROCESSING FOR SYSMOD HBB77D0 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 *nnnnn*.

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 HIP6250 BECAUSE IT IS NOT IN THE target ZONE, where *xxxxxxx* will be one of the following modules:

  EZAADMLR   EZAFTSRV   EZAPPRT   EZAPPSST   GXDEM01   GXDEM02
  GXDEM03   GXDEM04   GXDEM04A   GXDEM05   GXDEM06

During the APPLY of HIP6250, 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 EZAAD00Z
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

```
EZAAD0O9 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 HIP6250 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 HIP6250 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 JIP625X 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 JIP625X 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 JIP625X 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 HVT6250 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 HDZ2250.

GIM63201I    ALIAS DWW1RARR WAS DELETED FROM THE LPALIB
             LIBRARY BY SYSMOD HDZ2250.

GIM63201I    ALIAS IDABLARR WAS DELETED FROM THE LPALIB
             LIBRARY BY SYSMOD HDZ2250.

GIM63201I    ALIAS IDABLVBB WAS DELETED FROM THE LPALIB
             LIBRARY BY SYSMOD HDZ2250.

GIM63201I    LMOD IDA019BL WAS DELETED FROM THE LPALIB
             LIBRARY BY SYSMOD HDZ2250.

GIM23903W LINK-EDIT PROCESSING FOR SYSMOD HDZ2250 WAS SUCCESSFUL FOR
MODULE xxxxxxxx IN LMOD xxxxxxxx IN THE xxxxxxxx LIBRARY.
THE RETURN CODE WAS 04.  DATE yy.ddd -- TIME hh:mm:ss--
SEQUENCE NUMBER nnnnnn.

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

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

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

Messages from the Binder have the following format:

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

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

```
EMODVOL1 HASPXSUB IDACAT13 IDAOCEA1 IDAOCEA2 IDA0192G
IDA0192P IEFAB4DC IFG0EX0A IFG0RR0B IFG0RR0G IFG0RR0H
IFG0SIOA IFG019EV IFG019RC IFG0190P IFG0191X IFG0192A
IFG0192F IFG0192I IFG0192Y IFG0193C IFG0193G IFG0194A
IFG0194F IFG0194J IFG0194K IFG0195A IFG0195B IFG0195T
IFG0196V IFG0198N IFG0199B IFG020EV IFG0200N IFG0200P
IFG0200S IFG0200T IFG0200U IFG0200V IFG0200W IFG0201A
IFG0202E IFG0202L IFG0204A IFG0204J IFG0209B IFG0230P
IFG0231P IFG0231T IFG0232Z IFG0234J IFG0239B IFG055ZZ
IFG0550P IFG0550Y IFG0551L IFG0552B IFG0552P IFG0552X
IFG0553B IFG0553F IFG0554A IFG0554J IFG0554K IFG0554L
```

```
IFG0554P IFG0554T IFG0555J IFG0555T IFG0556B IFG0557A
IFG0559B IFG0559C IGC0101I IGC01020 IGGDAP01 IGGDYXCS
IGGPRE00 IGGVRF00 IGG019EK IGG019JD IGG019SI IGG0190A
IGG0191A IGG0191C IGG0191G IGG0191L IGG0191Q IGG0191R
IGG01911 IGG0193A IGG0193B IGG0193M IGG0193Y IGG01930
IGG01935 IGG01946 IGG0196M IGG0196R IGG0196S IGG0197A
IGG0197C IGG0197L IGG0197N IGG0197V IGG0198B IGG0199F
IGG020FC IGG020T1 IGG020T2 IGG0200P IGG0201A IGG0201D
IGG0201P IGG0201W IGG0201Z IGG0202A IGG0202D IGG0202I
IGG02028 IGG02029 IGG0203A IGG0203B IGG0203M IGG0203Y
IGG0203Z IGG02030 IGG02035 IGG02046 IGG0206M IGG0213Z
IGG029DM IGG032DB IGG0325A IGG0325H IGG0325Z IGG055V1
IGG0550P IGG0553A IGG0553F IGG0553J IGWFARC0 IGWFTRFE
IGWFTROC IHJ019SI ISTOCMDC NSLCTRLO NSLEHDRI NSLEHDRO
NSLETRLI NSLETRLO NSLOHDRI NSLOHDRO OMODVOL1 READPSWD
SECLOADA
```

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

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

```
IFG0198N
```

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

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

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

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

  ```
  ARCFAIL  ARCFAIL2  ARCGIVER
  ```

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

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

```
CBRKHLI    CBROPDDT CBROPMLT CBRTRDEF CBRTRFMT CBRTRRCD
CBRTRSSM   DSNHLI   IGDACTPT IGDACTTT IGX00024 OAMUTPCL
OSREQPCL   XSDTABLE
```

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

8.2.2.13 Additional messages expected during Wave 1C APPLY

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

8.2.2.13.1 Messages expected during EREP APPLY

You may receive the following messages.

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


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

8.2.2.13.2 Messages expected during TSO/E APPLY

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

- GIM61903W LMOD *xxxxxxxx* WAS NOT DELETED BY SYSMOD HTE77D0 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 HTE77D0 BECAUSE *xxxxxxxx* IS NOT IN THE target ZONE, where *xxxxxxx* will be one of the following ALIASs:

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

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

  ```
  ADFMDOLD  ADFMDFLT  ADFMDF01  IKJEFLA  CHSFVMPC  IGC0009C
  IGC0009D
  ```

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

- IEW2609W 5104 SECTION IKJSONRW USABILITY ATTRIBUTE OF REENTRANT CONFLICTS WITH REQUESTED USABILITY OF REFRESHABLE.
- IEW2609W 5104 SECTION IKJSONW2 USABILITY ATTRIBUTE OF REENTRANT CONFLICTS WITH REQUESTED USABILITY OF REFRESHABLE.
- IEW2609W 5104 SECTION IKTTMPX2 USABILITY ATTRIBUTE OF REENTRANT CONFLICTS WITH REQUESTED USABILITY OF REFRESHABLE.

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

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

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

8.2.2.14 Additional messages expected during Wave 1D APPLY

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

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

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

8.2.2.16 Additional messages expected during Wave 1F APPLY

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

8.2.2.16.1 Messages expected during 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 HDZ225N
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 HZFS450 and *xxxxxxxx* is one of the following modules:

For HZFS450   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 the 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 HQX77D0, HJE77D0, and JJE77DJ (if ordered).

- If you plan to use SDSF and JES3, install FMIDs HQX77D0 and HJS77D0 (if ordered).

- If you plan to use SDSF with both JES2 and JES3, install FMIDs HQX77D0, HJE77D0, HJS77D0, and JJE77DJ (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 V2R5, 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 V2R5 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 V2R5 level of JES2. Member HASIDLFN can be found in 'prefix.HJE77D0.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 HJE77D0) 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 V2R5 level of JES3. Member IATJDLFN can be found in 'prefix.HJS77D0.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 HJS77D0) 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

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.HJE77D0.F1'
IATJALC	ALLOCATE	JES3	'prefix.HJS77D0.F1'
ISFISALC	ALLOCATE	SDSF	'prefix.HQX77D0.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).

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 for the appropriate DASD storage requirements.

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

8.3.4 Set up File System Directories for Wave 2

You must create the required directories in the root file system for the target system before installing SDSF, if the directories required for installation of SDSF do not exist. You can create the directories by running the sample jobs listed in Figure 34 on page 116. 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.HQX77D0.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 DDDEFs for the target and distribution data sets. To use a sample job, copy the job and customize it as required for your installation. You only need to run these jobs if any of the DDDEF entries do not exist. The following fields are represented.

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

Figure 35. Wave 2 DDDEF Sample Installation Jobs

Job Name	Job Type	Description	RELFILE
HASIDDEF	DDDEF	JES2	'prefix.HJE77D0.F1'
IATJDDEF	DDDEF	JES3	'prefix.HJS77D0.F1'
ISFISDDD	DDDEF	SDSF	'prefix.HQX77D0.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 115).