

z/OS and z/OS.e



Planning for Installation

Version 1 Release 3

z/OS and z/OS.e



Planning for Installation

Version 1 Release 3

Note

Before using this information and the product it supports, be sure to read the general information under "Notices" on page 235.

Seventh Edition, May 2002

This is a major revision of GA22-7504-05.

This edition applies to version 1, release 3 of z/OS (5694-A01) and version 1, release 3 of z/OS.e (5655-G52), and to all subsequent releases and modifications until otherwise indicated in new editions.

Order publications through your IBM representative or the IBM branch office serving your locality. Publications are not stocked at the address below.

IBM welcomes your comments. A form for readers' comments may be provided at the back of this publication, or you may address your comments to the following address:

IBM Corporation
Department 55JA, Mail Station P384
2455 South Road
Poughkeepsie, NY 12601-5400
United States of America

FAX (United States and Canada): 1+845+432-9405

FAX (Other Countries):

Your International Access Code +1+845+432-9405

IBMLink (United States customers only): IBMUSM10(MHVRCFS)

Internet e-mail: mhvrdfs@us.ibm.com

World Wide Web: <http://www.ibm.com/servers/eserver/zseries/zos/webqs.html>

If you would like a reply, be sure to include your name, address, telephone number, or FAX number.

Make sure to include the following in your comment or note:

- Title and order number of this book
- Page number or topic related to your comment

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

© **Copyright International Business Machines Corporation 1996, 2002. All rights reserved.**

US Government Users Restricted Rights – Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM Corp.

Contents

Tables	vii
About this book	ix
Who should use this book	ix
How to use this book	ix
Summary of World Wide Web sites referred to in this book	x
Summary of changes	xiii
Chapter 1. Learning about z/OS and z/OS.e	1
Introduction to z/OS and z/OS.e elements and features	2
List of base elements and optional features	2
Elements, features, and functions withdrawn from z/OS and OS/390	20
Release cycles	27
Methods of installing z/OS and z/OS.e	27
ServerPac (entitled with z/OS and z/OS.e)	27
CBPDO (entitled with z/OS, not available with z/OS.e)	28
SystemPac (additional charge with z/OS and z/OS.e)	29
Other installation methods (additional charge with z/OS and z/OS.e)	29
National languages in which z/OS and z/OS.e are available	30
Integration testing by IBM	32
Service	33
Service policy	33
ServerPac service level	34
CBPDO service level	34
SystemPac service level	35
PSP information	35
Consolidated service testing by IBM	36
Maintenance after installation	37
Service distribution	39
Education and training	41
Publications	41
How z/OS.e differs from z/OS	42
Summary of changes for the z/OS installation planner	45
Changes in z/OS V1R3	45
Changes in z/OS V1R2	46
Changes in z/OS V1R1	49
Chapter 2. Choosing the software installation method	53
Packages for installing z/OS	53
Packages for installing z/OS.e	54
Installing z/OS or z/OS.e without using an installation package	55
Chapter 3. Preparing the driving system	57
What is the Customized Offerings Driver?	57
Identifying driving system software requirements for installing z/OS or z/OS.e via ServerPac or dump-by-data-set SystemPac	58
Preparing for installation	60
Identifying driving system software requirements for installing z/OS or z/OS.e via full volume dump SystemPac	62
Identifying driving system software requirements for installing z/OS via CBPDO	63
Driving system Wave 0	63
Driving system Wave 1	63

Driving system Wave 2	65
Driving system Wave 3	65
Identifying driving system software requirements for installing subsystems	65
Identifying driving system hardware requirements	66
Chapter 4. Preparing the target system	67
Choosing software products to install and identifying requisites	67
Choosing the z/OS or z/OS.e base and optional features	67
Identifying functional requisites for z/OS and z/OS.e elements and features	68
Choosing IBM products that you want to run with z/OS or z/OS.e	69
Choosing ISV products that you want to run with z/OS or z/OS.e	69
Ordering z/OS, z/OS.e, and related IBM products	69
Identifying hardware requirements for the target system	71
Identifying processor requirements.	72
Identifying DASD space requirements	74
Identifying I/O device requirements	74
Identifying service needed for the target system.	75
If you are installing a z/OS or z/OS.e ServerPac order....	75
If you are installing a z/OS CBPDO order...	75
If you are installing a z/OS or z/OS.e SystemPac order...	75
Using your existing JES2 or JES3 with z/OS V1R3	75
Allowable JES-BCP combinations	76
JES data compatibility	76
ServerPac and SystemPac delivery of JES2, JES3, and SDSF	77
Placing your existing JES2 or JES3 in a separate zone	77
Applying service required to use your existing JES2 or JES3	79
Using z/OS V1R3 SDSF with your existing JES2	79
Migrating your existing JES2 or JES3 to z/OS V1R3 level	80
Putting NetView and System Automation in the correct zone	81
Chapter 5. Ensuring coexistence and fallback	83
Understanding coexistence	83
Rolling z/OS or z/OS.e across a multisystem configuration	84
Understanding fallback	84
Coexistence-Migration-Fallback policy	85
Applying the coexistence-migration-fallback policy to V1R3.	86
OS/390 R9 coexistence and fallback service	89
OS/390 R10 coexistence and fallback service	93
z/OS V1R1 coexistence and fallback service	95
z/OS V1R2 coexistence and fallback service	98
JES2 coexistence and fallback service	99
JES3 coexistence and fallback service	99
Chapter 6. Preparing for migration	101
Deciding which to migrate first — software (to z/OS) or hardware (to z800 or z900)	101
Identifying z/OS and z/OS.e element and feature migration actions	105
Migration table	105
BCP — binder COMPAT option default change.	111
BookManager BookServer migration actions.	111
C/C++ migration actions	112
JES2 migration action for pre-release 4 mode	113
JES2 and JES3 migration actions for changed job ID format.	113
Language Environment migration actions	114
SMP/E migration actions for data sets	116
Identifying z/OS and z/OS.e system-level migration actions	116

/etc and /var migration actions	116
Application development environment migration actions	117
Couple data set migration actions	117
IFAPRDxx migration actions.	118
LOADxx migration action	118
ServerPac and SystemPac migration actions	119
Virtual storage migration considerations	119
Identifying migration actions needed for ISV products	120
Chapter 7. Preparing for customization and test	121
Using dynamic enablement	121
Deciding whether to dynamically enable	122
Dynamic enablement Step 1: Notify IBM	124
Dynamic enablement Step 2: Update parmlib	124
Dynamic enablement Step 3: Establish the active parmlib member	128
Disabling what was enabled	129
Scheduling test activities	129
Chapter 8. Preparing for future installations.	131
System and installation requirements	131
Separating data from software	132
Placing data sets on specific volumes	135
Product sets	136
Recommended data set placement	138
Implementing the recommended data set placements	149
Choosing a naming convention for data sets	152
Using symbolic substitution	152
Data set names restructured	152
Using indirect catalog entries	153
Using parmlib concatenation (logical parmlib)	153
DASD space utilization and performance	154
Undefined record format data sets	154
Using recommended block sizes for z/OS and z/OS.e data sets	155
Appendix A. Installation plan skeleton	157
Learn about z/OS or z/OS.e	157
Prepare the driving system	158
Driving system components: Software	158
Driving system components: Hardware	159
Prepare target system hardware and software	159
Target system components: Software	159
Target system components: Hardware	160
Ensure coexistence and fallback	160
Coexistence and fallback service required	160
Additional coexistence and fallback actions required.	160
Prepare for migration	161
Pre-IPL migration actions.	161
Post-IPL migration actions	162
Build and verify the target system	162
Build and verify the target system (ServerPac or dump-by-data-set SystemPac installation)	162
Build and verify the target system (CBPDO installation)	164
Build and verify the target system (SystemPac full volume dump installation)	165
Customize and test the system	165
Customization actions	166
Test activities	167

Plan for future installations	167
Appendix B. Software requirements for z/OS and z/OS.e elements and features	169
Appendix C. Minimum releases of IBM software products that run with z/OS and z/OS.e	183
Appendix D. Hardware requirements for z/OS and z/OS.e elements and features	199
Hardware Requirements for Communications Server	209
IP Hardware Requirements	209
SNA Hardware Requirements	212
Appendix E. Making a copy of your system software (cloning)	213
Choosing names	214
Initializing the new volumes	215
Setting up SMS	216
Defining new catalogs and CSI data sets	216
Copying the software data sets	216
Copying the SMP/E zones	218
Making the copy usable	219
Testing	219
Migrating to another system.	220
Appendix F. OS/390 R8 migration and fallback.	223
OS/390 R8 fallback service	223
Identifying OS/390 R8 – to – z/OS V1R3 migration actions	226
Appendix G. Accessibility	233
Using assistive technologies	233
Keyboard navigation of the user interface.	233
Notices	235
Trademarks.	236
Index	241

|
|
|

Tables

1.	Base elements and optional features in z/OS V1R3 and z/OS.e V1R3.	3
2.	National languages supported (in addition to U.S. English) and the elements and features available in each language	30
3.	Expiration dates for z/OS, z/OS.e, and OS/390 service support. Anticipated dates are based on the three-year service policy.	33
4.	RSU content and RSU SOURCEID for each month of 2002	38
5.	Driving System PTFs for ServerPac, SystemPac (dump-by-data-set), and CBPDO (Wave 1)	60
6.	DASD storage requirements for z/OS V1R3 and z/OS.e V1R3 elements and features	74
7.	Past OS/390 and z/OS, present z/OS and z/OS.e, and projected future z/OS and z/OS.e releases that may coexist	88
8.	Coexistence and fallback service (PTFs) needed on OS/390 R9 systems	89
9.	Coexistence and fallback service (PTFs) needed on OS/390 R10 systems	93
10.	Coexistence and fallback service (PTFs) needed on z/OS V1R1 systems	95
11.	Coexistence and fallback service (PTFs) needed on z/OS V1R2 systems	98
12.	Architecture mode supported by release and server	102
13.	Directory of migration actions by element and feature	106
14.	FEATURENAME values for z/OS and z/OS.e priced features, and TCP/IP	125
15.	Software requirements for z/OS V1R3 and z/OS.e V1R3 elements and features	170
16.	Minimum levels of products that run with z/OS V1R3 and z/OS.e V1R3	183
17.	Hardware requirements for z/OS V1R3 and z/OS.e V1R3 elements and features.	199
18.	Fallback service (PTFs) needed on OS/390 R8 systems	223
19.	Elements and features that have migration actions in a migration from OS/390 R8 to z/OS V1R3	227

About this book

This book helps you prepare to install z/OS (5694-A01) or z/OS.e (5655-G52) by giving you information you need to write an installation plan. To *install* means to perform the tasks necessary to make the system operational, starting with a decision to either install for the first time or upgrade, and ending when the system is ready for production. An *installation plan* is a record of the actions you need to take to install z/OS or z/OS.e; see Appendix A, “Installation plan skeleton” on page 157 for a skeleton.

Do you know about the wizard version of this book?

The z/OS and z/OS.e Installation Planning Wizard is a Web-based, interactive version of the book you’re reading. It differs from the “static” printed and softcopy versions in that the information you read is tailored to your system environment, based on questions you answer when you start using the wizard. Look for the z/OS and z/OS.e Installation Planning Wizard at the z/OS and z/OS.e wizard Web site:

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

Who should use this book

This book is intended for experienced z/OS or OS/390 users planning to install z/OS Version 1 Release 3 (V1R3) or z/OS.e V1R3. By “experienced” we mean that the reader’s experience consists of installing and managing the z/OS or OS/390 operating system, subsystems, network products, non-IBM products, and other software that runs with z/OS or OS/390.

How to use this book

The organization of this book is based on a logical sequence of actions required to install z/OS or z/OS.e. Therefore, we suggest that you start with “Summary of changes” on page xiii (if you’re familiar with the prior edition of this book), then go to Chapter 1 and read sequentially through the book. Fill out your installation plan as you go, or later, using your own blank installation plan or a copy of the IBM-provided installation plan skeleton (see Appendix A, “Installation plan skeleton” on page 157).

When you read this book online and you come across highlighted references to other books or to World Wide Web sites, you can link directly to those books or sites in order to search or browse for further information. On the Web, link by clicking on a highlighted book title or Web address. Elsewhere (CD-ROM, DVD, or z/OS BookManager READ), either click on a highlighted book title or put the cursor on a highlighted book title and press Enter.

See “Publications” on page 41 for information about other books in the z/OS and z/OS.e library.

Summary of World Wide Web sites referred to in this book

Where necessary, this book refers to information on the World Wide Web. The Web sites referred to are summarized here for your convenience. If you are reading this book online, you can click on the Web addresses to link directly to the Web sites.

Downloads:

- IBM Book Graphics Conversion Utility (TransMogrifier):
<http://www.ibm.com/software/office/bkmgr/transmog.html>
- IBM Network Printer Manager for the Web, AFP Printer Driver for Windows, and AFP Viewer Plug-in for Windows:
<http://www.ibm.com/printers/download.html>
- A tool to help migrate to workload manager (WLM) goal mode:
<http://www.ibm.com/eserver/zseries/zos/rmf/rmfhtmls/rmftools.htm>

Education and training:

- IBM Learning Services:
<http://www.training.ibm.com/>

Installation and ordering:

- CustomPac fee offerings:
<http://www.ibm.com/ca/custompac/>
- IBM License Manager (ILM):
<http://www.ibm.com/eserver/zseries/zos/ilm/>
- Planning and Migration Assistant:
<http://www.ibm.com/eserver/zseries/zos/smpe/pma/>
- ShopzSeries:
<https://www14.software.ibm.com/ShopzSeries>
- Software pricing (Workload License Charges and IBM License Manager):
http://www.ibm.com/eserver/zseries/wlc_lm/
- z/OS product catalog (order checklist):
<http://www.ibm.com/eserver/zseries/software/swinfo/os390.htm>
- z/OS.e product catalog (order checklist):
<http://www.ibm.com/eserver/zseries/software/swinfo/zose.htm>

ISVs:

- A list of independent software vendors (ISVs) that support z/OS and z/OS.e, as well as announcements, testimonials, and other information:
<http://www.ibm.com/eserver/zseries/solutions/s390da/>
- The Global Solutions Directory, which has a directory of ISV products that support z/OS and z/OS.e:
<http://www.ibm.com/software/solutions/isv>
- Information about selectable ISV products delivered in SystemPac:
<http://www.ibm.com/ca/custompac/>

Professional, product support, and network services:

- IBM Global Services:
<http://www.ibm.com/services/>
- IBMLink:

<http://www.ibm.com/ibmlink/>

- zSeries Technical Support:
<http://www.ibm.com/eserver/zseries/support/>

Publications, flashes, and papers:

- C/C++ IBM Open Class Library Transition Guide:
<http://www.ibm.com/software/ad/c390/czos/czosdocs.html>
- z/OS Internet Library:
<http://www.ibm.com/eserver/zseries/zos/bkserv/>
- z/OS.e Internet Library:
<http://www.ibm.com/eserver/zseries/zose/bkserv/>
- Redbooks:
<http://www.ibm.com/redbooks>
- IBM Systems Center flashes:
<http://www.ibm.com/support/techdocs>
- White paper about migrating from LANRES:
<http://www.ibm.com/eserver/zseries/library/whitepapers/gm130035.html>
- z800 software pricing configuration technical paper:
<http://www.ibm.com/eserver/zseries/library/techpapers/pdf/gm130121.pdf>

Service:

- ShopzSeries:
<https://www14.software.ibm.com/ShopzSeries>
- System/390 Service Update Facility:
<http://www.ibm.com/eserver/zseries/zos/suf/>
- RefreshPac (fee offering):
<http://www.ibm.com/ca/custompac/>
- To download Enhanced HOLDDATA:
<http://service.boulder.ibm.com/390holddata.html>
- C/C++ service, including informational APARs:
<http://www.ibm.com/software/ad/c390/czos/support/>

Test:

- z/OS and z/OS.e Consolidated Service Test:
<http://www.ibm.com/eserver/zseries/zos/servicetst/>
- z/OS and z/OS.e Integration Test:
<http://www.ibm.com/eserver/zseries/zos/integtst/>

Wizards (interactive information tools):

- The z/OS and z/OS.e Installation Planning Wizard, the z/OS Parallel Sysplex Customization Wizard, and other z/OS and z/OS.e wizards:
<http://www.ibm.com/eserver/zseries/zos/wizards/>

z/OS home page:

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

z/OS.e home page:

<http://www.ibm.com/eserver/zseries/zose/>

Summary of changes

This topic summarizes the changes made to this book. For product changes, see “Summary of changes for the z/OS installation planner” on page 45.

Summary of Changes

for GA22-7504-06

z/OS Version 1 Release 3 and z/OS.e Version 1 Release 3

This book contains information previously presented in GA22-7504-05, which supports z/OS Version 1 Release 3 and z/OS.e Version 1 Release 3.

New information:

- “Installing z/OS or z/OS.e without using an installation package” on page 55 is new.

Changed information:

- The Application Support Class and Collection Class libraries were planned to be removed from base element C/C++ IBM Open Class Library as of z/OS V1R4. The removal has been postponed to a future release. As is still the case, new application development involving C++ classes should make use of the C++ Standard Library, shipped with Language Environment, instead of the C/C++ IBM Open Class Library. For additional information, the C/C++ IBM Open Class Library Transition Guide is available at <http://www.ibm.com/software/ad/c390/czos/czosdocs.html>.
- Appendix C, “Minimum releases of IBM software products that run with z/OS and z/OS.e” on page 183 indicates the operating system on which each product runs (z/OS, z/OS.e, or both). Some corrections were made. The following products, previously listed as running on both z/OS and z/OS.e, are now listed as running on z/OS only:
 - Content Manager OnDemand for z/OS and OS/390 V7 (5655-H39)
 - Content Manager OnDemand for OS/390 V2 (5655-A88)
 - DataInterchange MVS/CICS V3 (5655-B30)
 - DB2 PM (Performance Monitor) for OS/390 V7 (5655-E61)
 - DISOSS/370 V3 (5665-290)
 - Emulation Program V1 (5735-XXB)
 - GDQF (Graphical Display and Query Facility) V2 (5688-169)
 - ImagePlus Object Distribution Manager (IODM) V3 (5655-A26)
 - MERVA ESA V4 (5648-B29)
 - MERVA Extended Connectivity for MVS/ESA V3 (5655-110)
 - MQSeries Integrator Agent (MQSI) for CICS Transaction Server V1 (5655-F25)
 - NETDA (Network Design and Analysis) V2 (5685-045)
 - Network Security Processor MVS Support Program V2 (5655-A16)
 - NTO (Network Terminal Option) V1 (5735-XX7)
 - NTuneMON V2 (5648-141)
 - NTuneMON V3 (5648-D72)
 - X.25 NPSI (NCP Packet Switching Interface) V2 (5668-719)
 - X.25 NPSI (NCP Packet Switching Interface) V3 (5688-035)
 - X.25 SNA Interconnection V1 (5685-005)
 - X.25 SNA Interconnection V2 (5685-035)
 - X.25 SNA NSF (Network Supervisory Function) V1 (5685-003)
 - IMS feature of the product Classic Connect V2 (5655-B73)

The following products, previously listed as running on z/OS only, are now listed as running on both z/OS and z/OS.e:

- AFP Toolbox for MVS V1 (5655-A25)
- Application Support Facility V3 (5655-002)
- File Manager for z/OS and OS/390 V2 (5655-G75)

System Automation for OS/390 V1 (5645-005), previously listed as running on both z/OS and z/OS.e, is now removed. It runs on neither z/OS nor z/OS.e. (It runs on OS/390.)

This book contains terminology, maintenance, and editorial changes. Technical changes or additions to the text and illustrations are indicated by a vertical line to the left of the change. Changes are shown relative to GA22-7504-03, that is, all changes made since the last V1R2 edition are shown. (Change lines from GA22-7504-04 and GA22-7504-05 are included.)

Summary of Changes

for GA22-7504-05

z/OS Version 1 Release 3 and z/OS.e Version 1 Release 3

This book contains information previously presented in GA22-7504-04, which was published at announcement of z/OS V1R3 and z/OS.e V1R3. This book is being published at general availability of z/OS V1R3 and z/OS.e V1R3.

New information:

- The following is added to “Changes in z/OS V1R3” on page 45: “The IFAPRDxx parmlib member shipped by IBM now has statements for z/OS.e as well as for z/OS. The statements are separated by a commented section. The product and features that you ordered are enabled, and the product and features that you did not order are disabled.”
- Some driving system PTFs are added to Table 5 on page 60:
 - For an OS/390 R8 driving system, DFSMSdfp PTF UW79796 is added.
 - For an OS/390 R9 driving system, DFSMSdfp PTF UW79796 is added.
 - For an OS/390 R10 driving system, BCP PTF UW84942 and DFSMSdfp PTFs UW79797 and UW85001 are added.
 - For a z/OS V1R1 driving system, BCP PTF UW84942 and DFSMSdfp PTFs UW79797 and UW85001 are added.
 - For a z/OS V1R2 driving system, BCP PTF UW84943 and DFSMSdfp PTFs UW79797 and UW85001 are added.
- Two program management binder PTFs and one SMP/E PTF are added as driving system requirements for servicing your ServerPac and for CBPDO Wave 1. The binder PTFs are UW85908 and UW86153, and the SMP/E PTF is UR53536 (service level 31.10). In addition, if your driving system is z/OS V1R1 or earlier, you are told to specify ALL31(ON) and STACK(ANY) as Language Environment run-time options during installation. (These are the defaults as of z/OS V1R2.)
- The following is added to “How z/OS.e differs from z/OS” on page 42: “Ensure that your automation policies, including automatic restart management policies, do not try to use a z/OS.e image to start products that z/OS.e does not support. For example, do not identify a z/OS.e image as a restart target in a Parallel Sysplex configuration that contains a mix of z/OS.e and z/OS images with the z/OS images running IMS, CICS, or DB2 having a requirement for CICS. CICS, IMS, or DB2 using CICS cannot restart on a z/OS.e image, but must restart on a z/OS image.”

The following is also added: "With z/OS.e, vector graphics in IBM and non-IBM product documentation might not display correctly because GDDM is not supported. If you experience this problem, convert the book using the Book Graphics Conversion Utility (TransMogrifier), which is available free of charge as a download from the BookManager Web site at <http://www.ibm.com/software/office/bkmgr/transmog.html>. Converted books have no dependency on GDDM."

- Coexistence PTFs are added to Chapter 5, "Ensuring coexistence and fallback" on page 83:
 - The table of OS/390 R9 coexistence PTFs has these additions: DFSMSdftp PTF UW79796, Security Server PTFs UW85646 and UW87240, and z/OS UNIX System Services PTF UW833872.
 - The table of OS/390 R10 coexistence PTFs has these additions: BCP PTF UW84942, DFSMSdftp PTFs UW79797 and UW85001, Security Server PTFs UW85647 and UW87241, and z/OS UNIX System Services PTF UW82162.
 - The table of z/OS V1R1 coexistence PTFs has these additions: BCP PTF UW84942, DFSMSdftp PTFs UW79797 and UW85001, Security Server PTFs UW85647 and UW87241, and z/OS UNIX System Services PTF UW82162.
 - The table of z/OS V1R2 coexistence PTFs has these additions: BCP PTF UW84943, DFSMSdftp PTFs UW79797 and UW85001, Security Server PTFs UW85648 and UW87242, and z/OS UNIX System Services PTF UW82163.
- The following is added to Appendix C, "Minimum releases of IBM software products that run with z/OS and z/OS.e" on page 183: "To see the most up-to-date list of products that are orderable to run on z/OS.e V1R3, see the z/OS.e ServerPac product catalog (order checklist) at <http://www.ibm.com/eserver/zseries/software/swinfo/zose.htm>. The product catalog is updated more frequently than this appendix."

Changed information:

- Previously it was stated that the only COBOL applications supported by z/OS.e are precompiled COBOL DB2 stored procedures that use the Language Environment preinitialization interface (CEEPIPI). However, any other precompiled applications that use the CEEPIPI are also supported.
- Previously it was stated that PL/I applications are not supported by z/OS.e. However, precompiled PL/I applications are supported.
- The migration table (Table 13 on page 106) has been updated to say that if you are running in a Parallel Sysplex, you might need to update your HCD channel definitions. The coupling facility channel types on the z800 and z900 are not the same as on prior processors, and you might need to update the channel definitions to get connectivity. You are referred to *z/OS HCD Planning*.
- There are changes in Appendix C, "Minimum releases of IBM software products that run with z/OS and z/OS.e" on page 183:
 - IMS/ESA V6R1 (5655-158) now requires PTFs UQ48303 and UQ48822, not UQ48302 and UQ48818.
 - IMS V7R1 (5655-B01) now requires PTFs UQ48304 and UQ48823, not UQ48302 and UQ48818.
 - Expedite Base/MVS V4 (5695-EDI) was listed as a product that does not run on z/OS.e. In fact, it does run on z/OS.e.
 - Tivoli OPC V2 (5697-OPC) was listed as a product that runs on z/OS.e. In fact, it does not run on z/OS.e.

- A restriction has been added to Tivoli Workload Scheduler V8.1 (5698-WKB) and Tivoli Workload Scheduler for z/OS V8.1 (5697-WSZ) stating that the GRAPH command is not supported with z/OS.e.

Deleted information:

- SMP/E PTF UR52320 (service level 27.16) was erroneously listed as a driving system requirement in Table 5 on page 60 and in “Driving system Wave 0” on page 63. The PTF is not a requirement. It has been removed from the book.
- Previously, with the SMP/E Planning and Migration Assistant (PMA) in z/OS.e, you were told to not specify a CustomPac inventory data set in your PMA configuration because processing of the CustomPac inventory data set was not supported under z/OS.e. The restriction is removed. You may specify a CustomPac inventory data set.

Technical changes or additions to the text and illustrations are indicated by a vertical line to the left of the change. Changes are shown relative to GA22-7504-03, that is, all changes made since the last V1R2 edition are shown. (Change lines from GA22-7504-04 are included.)

Summary of Changes

for GA22-7504-04

z/OS Version 1 Release 3 and z/OS.e Version 1 Release 3

This book contains information previously presented in GA22-7504-03, which supports z/OS Version 1 Release 2.

New information:

- All information about z/OS.e is new. This book supports both z/OS and z/OS.e.
- “Withdrawn as of z/OS V1R4 (last delivered in z/OS V1R3)” on page 25 is new.
- “Withdrawn in a future z/OS release” on page 25 is new.
- “Consolidated service testing by IBM” on page 36 is new.
- “How z/OS.e differs from z/OS” on page 42 is new.
- “Changes in z/OS V1R3” on page 45 is new.
- “Defining the capacity at which you’ll run z/OS.e” on page 72 is new.
- “z/OS V1R2 coexistence and fallback service” on page 98 is new.
- “BCP — binder COMPAT option default change” on page 111 is new.
- “SMP/E migration actions for data sets” on page 116 is new.
- Appendix G, “Accessibility” on page 233 is new.

Changed information:

- Some PTFs were added to the driving system requirements and to the lists of coexistence and fallback PTFs.
- The migration tables are redesigned. Previous editions of this book had multiple migration tables — one for each release from which migration was supported. The multiple tables have been combined into a single table. See “Migration table” on page 105.
- The IBM S/390 Parallel Enterprise Server – Generation 5 (G5) and Generation 6 (G6), and the IBM S/390 Multiprise 3000 Enterprise Server, are now considered part of the IBM @server zSeries series of servers. Thus, references to zSeries servers are now meant to include the G5, G6, and Multiprise 3000 servers.

This book includes terminology, maintenance, and editorial changes. Technical changes or additions to the text and illustrations are indicated by a vertical line to the left of the change. Routine additions of z/OS.e information, such as “and z/OS.e”, are not marked. Significant additions of z/OS.e information are marked.

Starting with z/OS V1R3, you may notice changes in the style and structure of some content in this book—for example, headings that use uppercase for the first letter of initial words only, and procedures that have a different look and format. The changes are ongoing improvements to the consistency and retrievability of information in our books.

Summary of Changes for GA22-7504-03 z/OS Version 1 Release 2

This book contains information previously presented in GA22-7504-02, which supports z/OS Version 1 Release 2.

This update of the z/OS V1R2 book was made to the Web and CD-ROM copies only, not to the printed copy.

New information:

- “JES2 and JES3 migration actions for changed job ID format” on page 113 is new.
- “LOADxx migration action” on page 118 is new.

Changed information:

- Some PTFs were added to the driving system requirements and to the lists of coexistence and fallback PTFs.

This book contains terminology, maintenance, and editorial changes, including changes to improve consistency and retrievability.

Summary of Changes for GA22-7504-02 z/OS Version 1 Release 2

This book contains information previously presented in GA22-7504-01, which supports z/OS Version 1 Release 1.

New information:

- “Couple data set migration actions” on page 117 is new.
- “Migration consideration for 31-bit applications” on page 116 is new.

Deleted information:

- The appendix “Data Set Placement Recommendations for Target Volumes” was deleted. The appendix showed IBM’s recommended system layout for target volume data sets, so that you could manually assign target volume data sets to specific DASD volumes (TVOL1 and TVOL2). As of z/OS V1R1, ServerPac and SystemPac installers have a better way to implement IBM’s recommended system layout; they can do it automatically using the CustomPac Installation Dialog’s Create a Recommended System Layout function. See *ServerPac: Using the Installation Dialog* for details. CBPDO installers don’t have an automatic

method but they can still find the required information; it has been added to the target libraries table of the “DASD Storage Requirements Tables” appendix of *z/OS Program Directory*.

This book contains terminology, maintenance, and editorial changes, including changes to improve consistency and retrievability.

**Summary of Changes
for GA22-7504-01
z/OS Version 1 Release 1**

This book contains information previously presented in GA22-7504-00, which supports z/OS Version 1 Release 1.

This update of the z/OS V1R1 book was made to the Web and CD-ROM copies only, not to the printed copy. Some Web addresses in the book were updated; some driving system and coexistence PTF numbers were added and corrected; and the minimum VM/ESA release required to run z/OS as a VM guest on a G5, G6, or Multiprise 3000 server was corrected from VM/ESA V2R3 to VM/ESA V2R4.

This book contains terminology, maintenance, and editorial changes, including changes to improve consistency and retrievability.

Chapter 1. Learning about z/OS and z/OS.e

z/OS (program number 5694-A01), the next generation of the OS/390 operating system, enables you to manage the volatility of e-business workloads. z/OS delivers the highest qualities of service for enterprise transactions and data, and extends these qualities to new applications using the latest software technologies. Some highlights of z/OS are:

- The 64-bit z/Architecture implemented by z/OS and the IBM @server zSeries server eliminates bottlenecks associated with the lack of addressable memory. 64-bit real (central) storage support eliminates expanded storage, helps eliminate paging, and may allow you to consolidate your current systems into fewer logical partitions (LPARs) or to a single native image.
- The Intelligent Resource Director (IRD) expands the capabilities of the workload manager (WLM) by enabling resources to be dynamically managed across LPARs based on workload priorities.
- Managed System Infrastructure (msys) is a technology that facilitates the manageability of z/OS. msys for Setup and msys for Operations can greatly reduce the complexity associated with configuring and operating z/OS and products that run on z/OS.
- A Workload License Charges pricing model offers you flexibility in how your software product licenses are managed and charged.
- HiperSockets provides high-speed, low-latency TCP/IP data communication across LPARs within the same zSeries server. HiperSockets acts like a TCP/IP network within the server, eliminating the need to use I/O subsystem operations and the need to traverse an external network to communicate between LPARs in the same server.

z/OS.e (program number 5655-G52) is a lower-priced version of z/OS and is designed to handle new e-business workloads. z/OS.e offers all of the qualities of service of z/OS (availability, scalability, reliability, security) but lacks some of the functions that support traditional workloads. z/OS.e does not run the following types of applications: CICS, IMS, COBOL (with an exception), Fortran, and PL/I (with an exception). The COBOL exception is that execution of precompiled COBOL DB2 stored procedures and other precompiled applications that use the Language Environment preinitialization interface (CEEPIPI) is supported. The PL/I exception is that execution of precompiled PL/I applications is supported. Also disabled are selected z/OS base elements and optional features. The only IBM server on which z/OS.e runs is the new IBM @server zSeries 800 (z800) server.

z/OS and z/OS.e use the same operating system software (their code is identical). Upon IPL, custom parameters invoke an operating environment that is comparable to z/OS in all aspects of operation, service, management, reporting, and zSeries hardware functionality. No new skills are required for z/OS.e.

For additional z/OS overview information, see:

- *z/OS Introduction and Release Guide*
- The z/OS Web site: <http://www.ibm.com/eserver/zseries/zos/>

For additional z/OS.e overview information, see:

- *z/OS.e Overview*
- The z/OS.e Web site: <http://www.ibm.com/eserver/zseries/zose/>
- "How z/OS.e differs from z/OS" on page 42

The rest of this chapter helps you learn about z/OS and z/OS.e by describing their elements and features, the release cycles, the methods available for installing, the national languages in which the operating systems are available, integration testing by IBM, service, education and training, publications, z/OS.e differences compared with z/OS, and release-by-release changes that affect installation planning.

Introduction to z/OS and z/OS.e elements and features

z/OS and z/OS.e consist of base elements and optional features:

- The *base elements* (or simply *elements*) deliver essential operating system functions. The base elements are listed in Table 1 on page 3. When you order z/OS or z/OS.e, you receive all of the base elements. However, with z/OS.e, some base elements are not functional or not licensed for use, or both.
- The *optional features* (or simply *features*) are orderable with z/OS or z/OS.e and provide additional operating system functions. The optional features are listed in Table 1 on page 3. Note that some optional features that are orderable with z/OS are not orderable with z/OS.e.

Optional features are unpriced or priced:

- *Unpriced features* are shipped to you **only if** you order them. If you plan to use any unpriced features, IBM recommends that you order them when you order your base elements. You must not wait until the next release becomes available. Once a release's base elements are no longer orderable, neither are its unpriced features.
- *Priced features* are **always** shipped to you. When IBM packages your order, we *enable* the priced features that you ordered. These features are ready to use after you install z/OS or z/OS.e (and customize them as needed). We *disable* the priced features that you did not order. Although they are installed on your system, you cannot use them. Later on, if you decide to use them, you notify IBM and you enable them dynamically (which is known as *dynamic enablement*). You dynamically enable by updating parmlib member IFAPRDxx and you notify IBM by contacting your IBM representative. If you are on a z800 or z900 server, you must also verify that the IEASYSxx ILMODE parameter is set to ILMODE=NONE.

Elements and features may be exclusive or nonexclusive:

- An element or feature is called *exclusive* to z/OS or z/OS.e if it exists only within z/OS or z/OS.e (not also as a separately orderable, or stand-alone, product) and if future functional enhancements will occur only within z/OS or z/OS.e.
- An element or feature is called *nonexclusive* if it exists both (1) within z/OS or z/OS.e and (2) as a stand-alone product.

z/OS and z/OS.e use the same operating system software (their code is identical). However, as mentioned earlier, a number of elements and features are not supported with z/OS.e. This means that even though you install them along with the rest of the system, you cannot use them. Various means are employed to make them unusable, depending on the particular element or feature: code that is not functional, a license for use not available, a feature that is not orderable. Table 1 on page 3 lists the means for each one.

List of base elements and optional features

Table 1 on page 3 lists the base elements and optional features in z/OS V1R3 and z/OS.e V1R3. The following table headings are used:

Name What this book calls the element or feature. (To help you distinguish

elements from features, element names in this column are highlighted.) Also, this column tells you which elements and features are only in z/OS (not also in z/OS.e).

Function level

The most recent release in which the element or feature changed. (“Change” means that one or more of the element’s or feature’s FMIDs [function modification identifiers] was changed, or that the element or feature was added to the system. New function added in program temporary fixes [PTFs] is not considered change.) Also, for nonexclusive elements and features, the equivalent level of the stand-alone product is listed in parentheses.

Note: The function level is expressed as a z/OS function level. The z/OS and z/OS.e function levels are identical.

Do not confuse the function level with the product level. All elements and features are at the V1R3 product level but they are at various function levels. For example, the product level of z/OS ISPF is V1R3 but its function level is V1R2 because V1R2 was the last release in which it changed.

Type and description

- “Type” means the following:
 - Whether it’s a base element or optional feature
 - Whether the base element or optional feature is exclusive (existing only within z/OS or z/OS.e) or nonexclusive (also available as a stand-alone product)
 - If an optional feature, whether it’s priced or unpriced
 - If an optional feature, whether it supports dynamic enablement (note that all the priced features support dynamic enablement)
- “Description” is a brief description of the element or feature, and miscellaneous facts about it.

To learn more about the functions that the elements and features provide, see *z/OS Introduction and Release Guide*.

Table 1. Base elements and optional features in z/OS V1R3 and z/OS.e V1R3

Name	Function level	Type and description
BCP	z/OS V1R3	Type: base element, exclusive. The Base Control Program (BCP) provides essential operating system services. The BCP includes the I/O configuration program (IOCP), the workload manager (WLM), system management facilities (SMF), the z/OS UNIX System Services (z/OS UNIX) kernel, and support for Unicode. As of z/OS V1R3 and z/OS.e V1R3, the BCP also includes the program management binder, which was formerly in the DFSMSdfp base element.
BDT	OS/390 R2	Type: base element, exclusive. Bulk Data Transfer (BDT) provides the base services that the optional BDT features (BDT File-to-File and BDT SNA NJE) need to transfer data from one computer system to another. You cannot activate any BDT functions until one or both of the optional BDT features is enabled.

Table 1. Base elements and optional features in z/OS V1R3 and z/OS.e V1R3 (continued)

Name	Function level	Type and description
BDT File-to-File (z/OS only)	OS/390 R2	Type: optional feature, exclusive, priced, can be dynamically enabled. This feature is supported with z/OS but not with z/OS.e. With z/OS.e, you install the code but it is not functional and you are not licensed to use it. BDT File-to-File allows users at one z/OS system in a SNA network to copy data sets to or from another z/OS system in the network. This feature is related to the element BDT.
BDT SNA NJE	OS/390 R2	Type: optional feature, exclusive, priced, can be dynamically enabled. BDT SNA NJE allows JES3 users to transmit jobs, output, commands, and messages from one computer system to another within a SNA network. This feature is related to the element BDT and the feature JES3.
BookManager BookServer	z/OS V1R2	Type: base element, exclusive. BookManager BookServer converts BookManager books to HTML for display through a web browser. As of OS/390 R9 it became exclusive. As of z/OS V1R2, the base element is functionally richer than the stand-alone product BookManager BookServer for World Wide Web for MVS/ESA V2R2, 5655-A20 (which is still service supported but no longer marketed).
BookManager BUILD (z/OS only)	OS/390 R1 (BookManager BUILD/MVS V1R3, 5695-045)	Type: optional feature, nonexclusive, priced, can be dynamically enabled. This feature is supported with z/OS but not with z/OS.e. With z/OS.e, you install the code but it is not functional and you are not licensed to use it. BookManager BUILD creates softcopy books that can be used by any of the BookManager products, such as BookManager READ or BookManager BookServer.
BookManager READ (z/OS only)	OS/390 R1 (BookManager READ/MVS V1R3, 5695-046)	Type: base element, nonexclusive. This element is supported with z/OS but not with z/OS.e. With z/OS.e, you install the code but it is not functional and you are not licensed to use it. BookManager READ is used to display, search, and manage online books and bookshelves. A related optional feature is BookManager BUILD. In OS/390 R10, the DBCS Print Utility formerly in the Softcopy Print element was added to BookManager READ via PTF UQ99324.

Table 1. Base elements and optional features in z/OS V1R3 and z/OS.e V1R3 (continued)

Name	Function level	Type and description
C/C++ IBM Open Class Library	z/OS V1R2	<p>Type: base element, exclusive.</p> <p>C/C++ IBM Open Class Library provides a set of C++ class libraries.</p> <p>Because the C/C++ IBM Open Class Library is a base element, your applications can use it at run time without the requirement for you to have a license for either the C/C++ with Debug Tool or C/C++ without Debug Tool features. Also, your applications can access the required dynamic link libraries (DLLs); you do not have to use the DLL Rename Utility to package and redistribute these DLLs with your applications.</p> <p>As of OS/390 R10, the C/C++ SOM Enabled Class Library was removed from the operating system.</p> <p>The Application Support Class and Collection Class libraries are planned to be removed in the future. New application development involving C++ classes should make use of the C++ Standard Library, shipped with Language Environment, instead of the C/C++ IBM Open Class Library. For additional information, the C/C++ IBM Open Class Library Transition Guide is available at http://www.ibm.com/software/ad/c390/czos/czosdocs.html.</p>
C/C++ with Debug Tool	z/OS V1R2	<p>Type: optional feature, exclusive, priced, can be dynamically enabled.</p> <p>C/C++ with Debug Tool includes:</p> <ul style="list-style-type: none"> • Two C compilers, one at z/OS V1R2 level and one at OS/390 R10 level. The older compiler is provided as an aid to migration to the newer one. IBM intends to remove the older compiler in the future. • Two C++ compilers, one at z/OS V1R2 level (which supports the ISO 1998 Standard level of C++) and one at OS/390 R10 level (which doesn't support the standard). The older compiler is provided as an aid to migration to the newer one. IBM intends to remove the older compiler in the future. • A debug tool, which runs with C and C++ as well as other languages. • C/C++ application development utilities. <p>For information about which level of the compiler to use, refer to <i>z/OS C/C++ Compiler and Run-Time Migration Guide</i>.</p> <p>C/C++ with Debug Tool works with the base element C/C++ IBM Open Class Library and with the ISO Standard C++ Library supplied in the base element Language Environment.</p> <p>You can order either C/C++ with Debug Tool or C/C++ without Debug Tool, but not both.</p>
C/C++ without Debug Tool	z/OS V1R2	<p>Type: optional feature, exclusive, priced, can be dynamically enabled.</p> <p>This feature is the same as the C/C++ with Debug Tool feature except that it does not have the Debug Tool component.</p> <p>You can order either C/C++ with Debug Tool or C/C++ without Debug Tool, but not both.</p>

Table 1. Base elements and optional features in z/OS V1R3 and z/OS.e V1R3 (continued)

Name	Function level	Type and description
Communications Server	z/OS V1R2	<p>Type: base element, exclusive, can be dynamically enabled.</p> <p>Communications Server (also known as CS z/OS) supports secure TCP/IP, SNA, and UNIX networking throughout an enterprise. It gives you the ability to connect subsystems and applications to each other, and to connect network devices (such as terminals and printers) to the system.</p> <p>Communications Server consists of two components: IP Services and SNA Services. SNA Services includes AnyNet function. Prior to OS/390 R6, IP Services was the base element TCP/IP and SNA Services was the base element VTAM.</p> <p>In OS/390 R6 and R7, this element was known as eNetwork Communications Server. In OS/390 R8 it was renamed SecureWay Communications Server. In OS/390 R10 it was renamed IBM Communications Server. In z/OS V1R1 it was renamed Communications Server.</p> <p>Related optional features are Communications Server NPF and Communications Server Security Level 3.</p> <p>X-Windows X11R4 support, which was included in releases prior to z/OS V1R2 but not in z/OS V1R2 (it was available separately), is back in z/OS V1R3.</p> <p>See “Elements, features, and functions withdrawn from z/OS and OS/390” on page 20 for functions that have been removed from Communications Server.</p> <p>IP Services uses the firewall CDMF DES 40-bit, SNMPv3 DES 56-bit, and IP Sec DES 56-bit algorithms for encryption. SNA Services uses the limited DES algorithm for encryption.</p>
Communications Server NPF (z/OS only)	z/OS V1R2	<p>Type: optional feature, exclusive, unpriced, cannot be dynamically enabled. This feature is supported with z/OS but not with z/OS.e. With z/OS.e, it is not orderable.</p> <p>Communications Server NPF provides a printing function that reroutes print data to the IP network. This feature is exclusive as of OS/390 R5.</p> <p>Prior to OS/390 R7, this feature was known as TCP/IP NPF. In OS/390 R7 it was renamed eNetwork Communications Server NPF. In OS/390 R10 it was renamed IBM Communications Server NPF. In z/OS V1R1 it was renamed Communications Server NPF.</p> <p>Infoprint Server should be considered IBM’s strategic replacement for Communications Server NPF. Significant future enhancements are not planned for Communications Server NPF.</p>

Table 1. Base elements and optional features in z/OS V1R3 and z/OS.e V1R3 (continued)

Name	Function level	Type and description
<p>Communications Server Security Level 3</p>	<p>z/OS V1R2</p>	<p>Type: optional feature, exclusive, unpriced, cannot be dynamically enabled.</p> <p>This feature works in conjunction with the Communications Server base element to provide stronger encryption (greater than 64 bits) than that available without this feature. This feature uses the TDES algorithm for encryption. The actual level of encryption that takes place with this feature installed can be configured to be something less than the maximum level enabled by this feature.</p> <p>This feature was new to OS/390 in R7. It was then known as SecureWay Communications Server Security Level 3. In OS/390 R10 it was renamed IBM Communications Server Security Level 3. In z/OS V1R1 it was renamed Communications Server Security Level 3.</p> <p>This feature is related to the base element Communications Server and to the Firewall Technologies component of the Security Server feature.</p> <p>This feature is worldwide exportable subject to U.S. export regulations.</p>
<p>Cryptographic Services</p>	<p>z/OS V1R3</p>	<p>Type: base element, exclusive.</p> <p>Cryptography is the transformation of data to conceal its meaning. In z/OS and z/OS.e, the base element Cryptographic Services, introduced in OS/390 R7, provides the following base cryptographic functions: data secrecy, data integrity, personal identification, digital signatures, and the management of cryptographic keys. Keys as long as 56 bits are supported by this base element. (Keys longer than 56 bits are supported by the related optional features OCSF Security Level 3 and System SSL Security Level 3.)</p> <p>Cryptographic Services consists of the following components:</p> <ul style="list-style-type: none"> • Integrated Cryptographic Service Facility (ICSF), last changed in z/OS V1R3 and z/OS.e V1R3. • Open Cryptographic Services Facility (OCSF) Base, last changed in z/OS V1R2. • System Secure Sockets Layer (SSL) Base, last changed in z/OS V1R2. <p>As of OS/390 R9, Cryptographic Services includes the functions formerly in optional features OCSF France, OCSF Security Level 1, and OCSF Security Level 2. As of OS/390 R10, Cryptographic Services includes the functions formerly in optional features IBM HTTP Server Export Secure, IBM HTTP Server France Secure, and System SSL Security Level 2. As a result, these optional features were removed from OS/390.</p> <p>OCSF Base uses the RC2/RC4/RC5 40-56 bit and DES 56-bit algorithms for encryption. System SSL Base uses the RC2/RC4 and DES through 56-bit algorithms for encryption.</p>
<p>DCE Application Support (z/OS only)</p>	<p>OS/390 R7</p>	<p>Type: base element, exclusive. This element is supported with z/OS but not with z/OS.e. With z/OS.e, you install the code but it is not functional and you are not licensed to use it.</p> <p>DCE Application Support facilitates the interaction between Distributed Computing Environment (DCE) clients and CICS or IMS regions.</p> <p>As of OS/390 R6, the word “OpenEdition” was dropped from the beginning of this element’s name.</p>

Table 1. Base elements and optional features in z/OS V1R3 and z/OS.e V1R3 (continued)

Name	Function level	Type and description
DCE Base Services	OS/390 R9	<p>Type: base element, exclusive.</p> <p>DCE Base Services provides services for developing and running client/server applications, including remote procedure call, directory, security, and distributed time services. This element is at the Open Group Open Software Foundation (OSF) DCE 1.1 level.</p> <p>As of OS/390 R6, the word “OpenEdition” was dropped from the beginning of this element’s name. As of OS/390 R8, the LDAP Client component was moved to the Security Server feature.</p> <p>As of OS/390 R9, DCE Base Services includes the function formerly in optional features DCE User Data Privacy CDMF and DCE User Data Privacy DES/CDMF. These optional features were removed from OS/390. The function enables data encryption using the commercial data masking facility (CDMF) and data encryption standard (DES) algorithms.</p> <p>DCE Base Services uses the limited DES algorithm for encryption.</p>
DFSMSdfp	z/OS V1R3	<p>Type: base element, exclusive.</p> <p>DFSMSdfp provides storage, data, program, and device management functions. Related optional features are DFSMSrmm, DFSMSdss, and DFSMSHsm.</p> <p>DFSMSdfp was both a component of stand-alone product DFSMS/MVS (5695-DF1) and, in OS/390 R1 through R9, a nonexclusive base element of OS/390. As of OS/390 R10, DFSMSdfp is exclusive.</p> <p>As of z/OS V1R3 and z/OS.e V1R3, the program management binder is moved to the BCP base element.</p>
DFSMSdss	z/OS V1R3	<p>Type: optional feature, exclusive, priced, can be dynamically enabled.</p> <p>DFSMSdss copies and moves data for backup and recovery, and to reduce free-space fragmentation.</p> <p>Prior to DFSMS/MVS, DFSMSdss was a stand-alone product named Data Facility Data Set Services (DFDSS) V2. As of OS/390, DFSMSdss was both a component of stand-alone product DFSMS/MVS (5695-DF1) and, through OS/390 R9, a nonexclusive optional feature of OS/390. As of OS/390 R10, DFSMSdss is exclusive.</p>

Table 1. Base elements and optional features in z/OS V1R3 and z/OS.e V1R3 (continued)

Name	Function level	Type and description
DFSMSHsm (and DFSMSdss)	z/OS V1R3	<p>Type: optional feature, exclusive, priced, can be dynamically enabled.</p> <p>DFSMSHsm provides automated DASD storage management, including space management for low and inactive data, and availability management for accidental data loss caused by local and site disasters. DFSMSHsm also lets you make effective use of tape media.</p> <p>Prior to DFSMS/MVS, DFSMSHsm was a stand-alone product named Data Facility Hierarchical Storage Manager (DFHSM). As of OS/390, DFSMSHsm was both a component of stand-alone product DFSMS/MVS (5695-DF1) and, through OS/390 R9, a nonexclusive optional feature of OS/390. As of OS/390 R10, DFSMSHsm is exclusive.</p> <p>DFSMSHsm requires DFSMSdss. For this reason, DFSMSHsm is not available by itself. If you want to use DFSMSHsm, you must order the DFSMSHsm/DFSMSdss combination. (DFSMSdss is also available by itself for those who don't want DFSMSHsm.)</p>
DFSMSrmm	z/OS V1R3	<p>Type: optional feature, exclusive, priced, can be dynamically enabled.</p> <p>DFSMSrmm helps you manage your removable media as one enterprise-wide library across systems that can share DASD.</p> <p>DFSMSrmm was both a component of stand-alone product DFSMS/MVS (5695-DF1) and, in OS/390 R1 through R9, a nonexclusive optional feature of OS/390. As of OS/390 R10, DFSMSrmm is exclusive.</p>
DFSORT	OS/390 R7	<p>Type: optional feature, exclusive, priced, can be dynamically enabled.</p> <p>DFSORT sorts, merges, and copies data. As of z/OS V1R2, this feature is exclusive; the equivalent stand-alone product, DFSORT V1R14 (5740-SM1), is no longer marketed.</p>

Table 1. Base elements and optional features in z/OS V1R3 and z/OS.e V1R3 (continued)

Name	Function level	Type and description
Distributed File Service	z/OS V1R3	<p>Type: base element, exclusive.</p> <p>Distributed File Service provides:</p> <ul style="list-style-type: none"> • The DCE file serving (DFS) component of the Open Group Open Software Foundation (OSF) DCE. The file serving support (the DFS client and server) is at the OSF 1.2.2 level. • The zSeries File System (zFS). The zFS is a UNIX file system that can be used in addition to the Hierarchical File System (HFS). zFS file systems contain files and directories that can be accessed with the z/OS and z/OS.e hierarchical file system file APIs. zFS file systems can be mounted into the z/OS UNIX System Services hierarchy along with other local (or remote) file system types (such as HFS, TFS, AUTOMNT, and NFS). The zFS does not replace the HFS; it is complementary to the HFS. The HFS is still required for z/OS and z/OS.e installation, and the root file system must be the HFS. <p>The zFS provides significant performance gains in most environments requiring files 8 KB in size or greater that are frequently accessed and updated. The access performance of smaller files is equivalent to the HFS. For all files, the zFS provides a reduced exposure to loss of updates. The zFS is a logging file system with a write pattern to disk that reduces the points of failure after a system outage. For additional information about the zFS, including how to migrate data from the HFS to the zFS, see <i>z/OS Distributed File Service zSeries File System Administration</i>.</p> <ul style="list-style-type: none"> • Server message block (SMB) file/print serving support. The SMB support is based on the X/Open PC Interworking: SMB, Version 2. Included in the support is access to HFS, sequential, PDS, PDSE, and VSAM data sets from Windows 3.11 (Windows for Workgroups), Windows 95, Windows 98, Windows NT 4.0, and Windows 2000 Professional workstations. Windows workstation users can also exploit z/OS and z/OS.e printer capabilities via the SMB file/print server interface to the z/OS or z/OS.e Infoprint Server feature. <p>For the software necessary to use the DFS or SMB file/print serving support, as well as the other Distributed File Service functions, see Appendix B, “Software requirements for z/OS and z/OS.e elements and features” on page 169.</p> <p>Prior to OS/390 R5, this element was named OpenEdition DCE DFS.</p> <p>The DFS and SMB support use the DES 56-bit algorithm for encryption.</p>
Encina Toolkit Executive (z/OS only)	OS/390 R7	<p>Type: base element, exclusive. This element is supported with z/OS but not with z/OS.e. With z/OS.e, you install the code but you are not licensed to use it.</p> <p>Encina Toolkit Executive provides a set of tools for developing client components of distributed transactional applications. This element was new in OS/390 R4.</p>
EREP	OS/390 R1 (EREP MVS V3R5, 5658-260)	<p>Type: base element, nonexclusive.</p> <p>The Environmental Record Editing and Printing Program (EREP) edits and prints reports for the records placed in the error recording data set (ERDS), helping IBM service representatives fix problems.</p>

Table 1. Base elements and optional features in z/OS V1R3 and z/OS.e V1R3 (continued)

Name	Function level	Type and description
ESCON Director Support	OS/390 R1	Type: base element, exclusive. ESCON Director Support enables the reporting of ESCON director device errors to z/OS or z/OS.e. This element was both an orderable feature of MVS/ESA SP V5 and a base element of OS/390. It became exclusive in OS/390 R10, when MVS/ESA SP V5 was no longer marketed.
FFST	OS/390 R2	Type: base element, exclusive. First Failure Support Technology (FFST) provides immediate notification and first failure data capture for software events. As of OS/390 R9, this element is exclusive; the equivalent stand-alone product, FFST/MVS V1R2 (5695-044), is no longer marketed.
GDDM (z/OS only)	OS/390 R2 (GDDM/MVS V3R2, 5695-167)	Type: base element, nonexclusive. This element is supported with z/OS but not with z/OS.e. With z/OS.e, you install the code but it is not functional and you are not licensed to use it. GDDM provides presentation services and device-driving capability. It includes PCLK and REXX code. Related optional features are GDDM-Presentation Graphics Feature and GDDM-REXX. Other GDDM-associated products (IVU, GKS, IMD) are not in z/OS, but are separately orderable with z/OS.
GDDM-PGF (z/OS only)	OS/390 R2 (GDDM/PGF V2R1.3, 5668-812)	Type: optional feature, nonexclusive, priced, can be dynamically enabled. This feature is supported with z/OS but not with z/OS.e. With z/OS.e, you install the code but it is not functional and you are not licensed to use it. GDDM-Presentation Graphics Feature (PGF) is a set of programs for creating presentation material in a variety of styles. This feature is related to the base element GDDM.
GDDM-REXX (z/OS only)	OS/390 R2 (GDDM-REXX/MVS V3R2, 5664-336)	Type: optional feature, nonexclusive, priced, can be dynamically enabled. This feature is supported with z/OS but not with z/OS.e. With z/OS.e, you install the code but it is not functional and you are not licensed to use it. GDDM-REXX is a productivity tool that enables programmers to prototype GDDM applications and to create small routines and utility programs quickly and easily. This feature is related to the base element GDDM.
HCD	OS/390 R9	Type: base element, exclusive. Hardware Configuration Definition (HCD) defines both the operating system configuration and the processor hardware configuration for a system. A related optional feature is HCM.
HCM	OS/390 R9	Type: optional feature, exclusive, priced, can be dynamically enabled. Hardware Configuration Manager (HCM) is a PWS-based client/server interface to the base element HCD. This feature was new in OS/390 R4.
HLASM	OS/390 R10 (HLASM for MVS & VM & VSE V1R4, 5696-234)	Type: base element, nonexclusive. High Level Assembler (HLASM) integrates almost all functions of past assemblers and provides extensions and improvements. A related optional feature is the HLASM Toolkit.

Table 1. Base elements and optional features in z/OS V1R3 and z/OS.e V1R3 (continued)

Name	Function level	Type and description
HLASM Toolkit	OS/390 R10 (Toolkit feature of HLASM for MVS & VM & VSE V1R4, 5696-234)	Type: optional feature, nonexclusive, priced, can be dynamically enabled. HLASM Toolkit provides tools to improve application development, debugging, and recovery. It is related to the base element HLASM.
IBM HTTP Server	OS/390 R10	Type: base element, exclusive. IBM HTTP Server is the Web server for z/OS and z/OS.e. It provides scalable, high performance Web serving for critical e-business applications. It supports Secure Sockets Layer (SSL) secure connections, dynamic caching using the Fast Response Cache Accelerator, multiple IP addresses, proxy authentication, and double-byte character set characters. Prior to OS/390 R4, this element was known as base element Internet Connection Secure Server (ICSS) or Internet Connection Server (ICS). In OS/390 R4, R5, and R6, this element was known as base element Lotus Domino Go Webserver. In OS/390 R7 and R8, this element became known as IBM HTTP Server and became a component of base element WebSphere Application Server. In OS/390 R9, IBM HTTP Server again became a base element (no longer a component of WebSphere Application Server). A related optional feature, IBM HTTP Server NA Secure, provides increased security. As of OS/390 R10, the HTTP Server CA utility is no longer available. See "Elements, features, and functions withdrawn from z/OS and OS/390" on page 20 for further information.
IBM HTTP Server NA Secure	OS/390 R10	Type: optional feature, exclusive, unpriced, cannot be dynamically enabled. IBM HTTP Server NA Secure supports Secure Sockets Layer (SSL) connections using 128-bit encryption. This feature is related to the base element IBM HTTP Server. Before OS/390 R4, this feature was named ICSS North America Secure. As of OS/390 R4 it was rebranded to Lotus Domino Go Webserver North America Secure. As of OS/390 R7 it received its current name. This feature uses the System SSL Base component of base element Cryptographic Services for encryption.
ICKDSF	OS/390 R1 (ICKDSF R16, 5655-257)	Type: base element, nonexclusive. The Device Support Facility (ICKDSF) enables you to perform functions needed for the installation and use of IBM DASD.

Table 1. Base elements and optional features in z/OS V1R3 and z/OS.e V1R3 (continued)

Name	Function level	Type and description
ILM	z/OS V1R1	<p>Type: base element, exclusive.</p> <p>IBM License Manager (ILM), introduced in z/OS V1R1, is a combination of license management tools that you use to manage licenses and check compliance with software terms and conditions. This gives you more direct control over your software licenses and their usage. ILM is based on the industry standard for license management, XOpen Software License Management (XSLM).</p> <p>Note: ILM is not available for use at this time. ILM function is expected to be available at a future date. For information about ILM as it becomes available, see http://www.ibm.com/eserver/zseries/zos/ilm/. For information about software pricing and related activities, see http://www.ibm.com/eserver/zseries/wlc_lm/.</p>
Infoprint Server	z/OS V1R2	<p>Type: optional feature, exclusive, priced, can be dynamically enabled.</p> <p>Infoprint Server allows you to print files on z/OS and z/OS.e printers from any workstation that has TCP/IP access. This feature was named OS/390 Print Server when it first became part of OS/390 in R5. In OS/390 R8 its name was changed to OS/390 Infoprint Server. This feature consists of the following components:</p> <ul style="list-style-type: none"> • IP PrintWay. This component has its roots in the IP PrintWay feature of PSF/MVS V2R2 and the IP PrintWay/NetSpool feature of OS/390 R3. • NetSpool. This component has its roots in the NetSpool feature of PSF/MVS V2R2 and the IP PrintWay/NetSpool feature of OS/390 R3. • Print Interface, new in OS/390 R5. • Printer Inventory Manager, new in OS/390 R8. • SNMP Subagent, new in OS/390 R8. • Transform Manager, new in OS/390 R8. <p>As of z/OS V1R2, Infoprint Server is no longer available in Spanish. Also as of z/OS V1R2, two functions that run on the Windows workstation are no longer available: AFP Printer Driver for Windows and AFP Viewer Plug-in for Windows. Now get the most current versions from the Web:</p> <p>http://www.ibm.com/printers/download.html</p> <p>In z/OS, IBM recommends that you use the Infoprint Server feature rather than the Communications Server NPF feature because the IP PrintWay component of Infoprint Server provides improved function, capacity, performance, and usability over Communications Server NPF. (In z/OS.e, Communications Server NPF is not available for ordering.) In addition, regardless of whether you're a z/OS or z/OS.e customer, IBM recommends that you use Infoprint Server instead of the IP PrintWay and NetSpool features of PSF V3.</p>
ISPF	z/OS V1R2	<p>Type: base element, exclusive.</p> <p>ISPF is a full-screen editor and dialog manager.</p> <p>As of OS/390 R8, the VisualAge for ISPF function was removed. As of z/OS V1R2, the Library Management Facility (LMF) of ISPF was removed.</p>

Table 1. Base elements and optional features in z/OS V1R3 and z/OS.e V1R3 (continued)

Name	Function level	Type and description
JES2	z/OS V1R2	<p>Type: base element, exclusive.</p> <p>JES2 accepts the submission of work for the BCP. JES2 exercises independent control over its job processing functions, whereas JES3 exercises centralized control.</p> <p>Prior levels of JES2 can be used with z/OS V1R3 but not with z/OS.e V1R3. See “Allowable JES-BCP combinations” on page 76.</p>
JES3	z/OS V1R2	<p>Type: optional feature, exclusive, priced, can be dynamically enabled.</p> <p>JES3 accepts the submission of work for the BCP. JES3 exercises centralized control over its job processing functions, whereas JES2 exercises independent control.</p> <p>Prior levels of JES3 can be used with z/OS V1R3 but not with z/OS.e V1R3. See “Allowable JES-BCP combinations” on page 76.</p>
Language Environment	z/OS V1R3	<p>Type: base element, exclusive.</p> <p>Language Environment provides the run-time environment for programs generated with C, C++, COBOL, Fortran, and PL/I.</p> <p>z/OS.e Language Environment does not support (but z/OS Language Environment does support) the following:</p> <ul style="list-style-type: none"> • COBOL, except for execution of precompiled COBOL DB2 stored procedures and other precompiled applications that use the Language Environment preinitialization interface (CEEPIPI). The applications could be compiled on a z/OS or OS/390 system, then run on a z/OS.e system. Stated another way, compiling COBOL programs on z/OS.e is not supported, and only precompiled COBOL DB2 stored procedures and other precompiled applications that use the Language Environment CEEPIPI (no other kinds of COBOL programs) can run on z/OS.e. • Fortran. • PL/I, except for execution of precompiled PL/I applications. As with COBOL, the applications could be compiled on a z/OS or OS/390 system, then run on a z/OS.e system. • Compatibility preinitialization for C and PL/I. • The library routine retention (LRR) function. (In z/OS, LRR can improve the performance of applications and subsystems.) • Run-time library services (RTLS). (In z/OS, RTLS allows you to access different levels of the Language Environment run-time libraries, controlled by run-time options.) <p>Inclusion of Language Environment as a base element in z/OS and z/OS.e does not replace the need for separate compilers.</p> <p>As of OS/390 R9, Language Environment includes the function formerly in optional feature Language Environment Data Decryption. The optional feature was removed from OS/390. The function provides, for certain C functions, decryption of data using the data encryption standard (DES) algorithm.</p> <p>As of z/OS V1R2, Language Environment supports the ISO '98 C++ Standard Library.</p> <p>Language Environment uses the limited DES algorithm for encryption.</p>

Table 1. Base elements and optional features in z/OS V1R3 and z/OS.e V1R3 (continued)

Name	Function level	Type and description
MICR/OCR (z/OS only)	OS/390 R1	<p>Type: base element, exclusive. This element is supported with z/OS but not with z/OS.e. With z/OS.e, you install the code but you are not licensed to use it.</p> <p>This element provides the device support code for various magnetic and optical devices. This element was both an orderable feature of MVS/ESA SP V5 and a base element of OS/390. It became exclusive in OS/390 R10, when MVS/ESA SP V5 was no longer marketed.</p>
msys for Operations	z/OS V1R2	<p>Type: base element, exclusive.</p> <p>Managed System Infrastructure for Operations (msys for Operations) simplifies the day-to-day operation of z/OS and z/OS.e Parallel Sysplex configurations by automating typical operator tasks and events.</p> <p>This element was new in z/OS V1R2.</p> <p>Parts of two stand-alone products are included in msys for Operations: Tivoli NetView for OS/390 V1R4 (5697-B82) and System Automation for OS/390 V2R1 (5645-006). If you already have these stand-alone products installed (at the V1R4 and V2R1 levels, respectively), you can install z/OS V1R3 or z/OS.e V1R3 (including msys for Operations) in the same SMP/E zone as the stand-alone products. However, if you have an earlier or later level of either stand-alone product installed, you will need to move both stand-alone products into a separate zone before installing z/OS V1R3 or z/OS.e V1R3. (Use BUILD MCS to move the stand-alone products or else you will have to reinstall them.) If you intend to install these stand-alone products (to use their full function) but haven't ordered them yet, IBM recommends that you order them with your z/OS V1R3 or z/OS.e V1R3 ServerPac so that you won't have to separately maintain the parts that are the same in msys for Operations and in the stand-alone products. Separate maintenance would involve duplication of service work.</p>

Table 1. Base elements and optional features in z/OS V1R3 and z/OS.e V1R3 (continued)

Name	Function level	Type and description
msys for Setup	z/OS V1R1	<p>Type: base element, exclusive.</p> <p>Managed System Infrastructure for Setup (msys for Setup), introduced in z/OS V1R1, offers a new approach for configuring z/OS, z/OS.e, and products that run on z/OS and z/OS.e. The configuration process is driven by a graphical user interface that greatly facilitates the definition of customization parameters. Updates are under the control of the msys for Setup administrator and are made directly to the system.</p> <p>With each release of z/OS and z/OS.e, additional tasks are supported by msys for Setup:</p> <ul style="list-style-type: none"> • Starting in z/OS V1R1 you could use msys for Setup to set up a Parallel Sysplex resource sharing environment. (For more information, see <i>z/OS MVS Setting Up a Sysplex</i>.) • In z/OS V1R2, usage of msys for Setup was extended to let you: <ul style="list-style-type: none"> – Create the basic IP configuration files – Create the ISPF configuration table keyword file and load module – Perform additional tasks for Parallel Sysplex configuration, such as setting up the system logger – Set up a base sysplex • As of z/OS V1R3 and z/OS.e V1R3: <ul style="list-style-type: none"> – You can use msys for Setup to set limits on your UNIX system resources, such as the maximum number of user IDs that can be concurrent at one time and the maximum number of processes that the system will run at one time. These settings are stored in the z/OS UNIX parmlib member BPXPRMxx. The system will do self-discovery and prime with the values that your system already has, and you can use msys for Setup property sheets to do any ongoing customization of BPXPRMxx. – You can use msys for Setup to configure the default system-wide run-time options for Language Environment. msys for Setup builds the necessary configuration files, through an easy-to-use dialog and accompanying help text, which you then put into production. In addition, you can use msys for Setup to create the region-wide run-time options for both CICS and IMS regions.
Network File System	OS/390 R6	<p>Type: base element, exclusive.</p> <p>Network File System acts as a file server to workstations, personal computers, or other authorized systems in a TCP/IP network. It consists of a client (Network File System Client) and a server (Network File System Server). It supports Berkeley sockets but not TCP/IP sockets.</p> <p>This element is always enabled, even when the alternate base configuration is ordered.</p>

Table 1. Base elements and optional features in z/OS V1R3 and z/OS.e V1R3 (continued)

Name	Function level	Type and description
OCSF Security Level 3	OS/390 R10	<p>Type: optional feature, exclusive, unpriced, cannot be dynamically enabled.</p> <p>This feature works in conjunction with the OCSF Base component of the Cryptographic Services base element to provide stronger encryption (greater than 64 bits) than that available without this feature. This feature uses the TDES, DES, and RC2/RC4/RC5 algorithms for encryption.</p> <p>This feature was new in OS/390 R7.</p> <p>This feature is worldwide exportable subject to U.S. export regulations.</p>
OSA/SF	OS/390 R8 (OSA/SF for OS/390 V2R1, 5655-B57)	<p>Type: base element, nonexclusive.</p> <p>Open Systems Adapter/Support Facility (OSA/SF) provides a user-friendly interface for monitoring and controlling the zSeries Open Systems Adapter feature, which provides zSeries network connectivity directly to local area networks (LANs) and wide area networks (WANs) that support IP and SNA protocols. OS/390 R8 OSA/SF (as well as OSA/SF V2) introduced support for a new Windows-based GUI, as well as support for the new OSA-Express functions, such as QDIO mode. OS/390 R8 and later OSA/SF (and OSA/SF V2) continue to support the OSA-2 function.</p> <p>OSA-Express supports Gigabit Ethernet, ATM, and Fast Ethernet connections. OSA-Express also supports Token Ring connection on a zSeries server. OSA-2 supports Ethernet, Fast Ethernet, Token-Ring, FDDI, and ATM connections. OSA-2 features on the zSeries server require FC 2022 I/O Expansion Cage and support only Token Ring and FDDI connection. Resource availability improvements include multiple IP address and default IP address support for each path through the OSA function, as well as support for primary and secondary routing paths when multiple instances of TCP/IP are used.</p> <p>As of OS/390 R8, OSA-1 function was no longer supported in OS/390. (Likewise, the OSA-1 feature, which is in OSA/SF V1, is not in OSA/SF V2.)</p>
RMF	z/OS V1R2	<p>Type: optional feature, exclusive, priced, can be dynamically enabled.</p> <p>Resource Measurement Facility (RMF) gathers data about z/OS and z/OS.e resource usage and provides reports at any system in a sysplex.</p>
SDSF	z/OS V1R2	<p>Type: optional feature, exclusive, priced, can be dynamically enabled.</p> <p>System Display and Search Facility (SDSF) provides you with information to monitor, manage, and control your z/OS or z/OS.e system.</p> <p>Although prior levels of JES2 may be used with z/OS V1R3, prior levels of SDSF may not. To learn how to use z/OS V1R3 SDSF with a prior level of JES2, see “Using z/OS V1R3 SDSF with your existing JES2” on page 79.</p> <p>In z/OS.e, BookManager help is not available for SDSF SYSLOG messages. This is because BookManager READ is not available in z/OS.e.</p>

Table 1. Base elements and optional features in z/OS V1R3 and z/OS.e V1R3 (continued)

Name	Function level	Type and description
Security Server	z/OS V1R3	<p>Type: optional feature, exclusive, priced, can be dynamically enabled.</p> <p>Security Server lets you control access to protected resources. Security Server consists of the following components:</p> <ul style="list-style-type: none"> • DCE Security Server, last changed in OS/390 R9. This component is at the OSF DCE 1.2.2 level. In OS/390 R5, this component was upgraded to support Kerberos V5.1. • Firewall Technologies, originally part of the OS/390 R4 Firewall Technologies kit, then integrated into OS/390 R5 and last changed in z/OS V1R2. <p>The Internet Security Association and Key Management Protocol (ISAKMP) server and the configuration server of Firewall Technologies are packaged with the Security Server but licensed with the base operating system, and can be used without licensing or enabling the Security Server. The ISAKMP server implements the required elements of Internet Key Exchange (IKE) as defined by Request for Comments (RFC) 2409. The Configuration server communicates with the firewall configuration graphical user interface (GUI) that is shipped within Firewall Technologies.</p> <ul style="list-style-type: none"> • LDAP Server, new in OS/390 R5 and last changed in z/OS V1R2. In OS/390 R8, LDAP Client was removed from base element DCE Base Services and merged into LDAP Server. Also as of OS/390 R8, LDAP Server is licensed with the base operating system and can be used without ordering or enabling Security Server. • Network Authentication Service, new in OS/390 R10 and changed in z/OS V1R2. Network Authentication Service is licensed with the base operating system and can be used without ordering or enabling Security Server. Prior to z/OS V1R2, this component was named Network Authentication and Privacy Service. • Open Cryptographic Enhanced Plug-ins (OCEP), new in OS/390 R8 and last changed in OS/390 R10. As of z/OS V1R3 and z/OS.e V1R3, OCEP is licensed with the base operating system and can be used without ordering or enabling Security Server. • RACF, last changed in z/OS V1R3 and z/OS.e V1R3. • Public Key Infrastructure (PKI) Services, new in z/OS V1R3 and z/OS.e V1R3. This component is licensed with the base operating system and can be used without ordering or enabling Security Server. <p>In OS/390 R9, the word “SecureWay” was added to the beginning of this feature’s name. As of z/OS V1R3 and z/OS.e V1R3, the word “SecureWay” is dropped.</p> <p>DCE Security Server uses the limited DES algorithm for encryption. Firewall Technologies uses the DES algorithm for encryption. LDAP Server uses the System SSL Base component of base element Cryptographic Services for encryption. Network Authentication service uses the DES algorithm for encryption. RACF uses the limited DES and CDM algorithm, and the RC2 40-bit algorithm, for encryption. PKI Services uses RACF, the OCSF Base component of base element Cryptographic Services, and the ICSF component of base element Cryptographic Services for encryption.</p>

Table 1. Base elements and optional features in z/OS V1R3 and z/OS.e V1R3 (continued)

Name	Function level	Type and description
Security Server Network Authentication Service Level 3	z/OS V1R2	<p>Type: optional feature, exclusive, unpriced, cannot be dynamically enabled.</p> <p>This feature works in conjunction with the Network Authentication Service component of the Security Server feature to provide stronger encryption (greater than 64 bits) than that available without this (Level 3) feature. This feature uses the TDES algorithm for encryption.</p> <p>This feature was new in z/OS V1R2.</p> <p>This feature is worldwide exportable subject to U.S. export regulations.</p> <p>As of z/OS V1R3 and z/OS.e V1R3, the word “SecureWay” is dropped from the beginning of this feature’s name.</p>
SMP/E	z/OS V1R2 (SMP/E for z/OS and OS/390 V3R1, 5655-G44)	<p>Type: base element, nonexclusive.</p> <p>SMP/E is a tool for installing and maintaining software, and for managing the inventory of software that has been installed.</p> <p>Prior to z/OS V1R2, SMP/E was an exclusive base element. Beginning with z/OS V1R2, SMP/E is nonexclusive because of the introduction of the SMP/E stand-alone product. The SMP/E stand-alone product allows customers who are currently licensed for an earlier level of z/OS or OS/390 to order and install the latest level of SMP/E without having to upgrade their entire operating system. This allows products that run on z/OS, z/OS.e, or OS/390 to exploit the packaging and installation enhancements of SMP/E without requiring a later level of the operating system. This also allows customers to exploit new electronic delivery and installation technologies in SMP/E sooner. The stand-alone product is available at no additional charge to customers.</p> <p>The Planning and Migration Assistant (PMA), a component of SMP/E, can help you maintain, plan for, and order new releases of z/OS, z/OS.e, and other products. It provides reports that use IBM-supplied data, your SMP/E consolidated software inventory (CSI) data set, and a CustomPac inventory file. The PMA Web site is http://www.ibm.com/eserver/zseries/zos/smpe/pma/.</p>
System SSL Security Level 3	z/OS V1R2	<p>Type: optional feature, exclusive, unpriced, cannot be dynamically enabled.</p> <p>System Secure Sockets Layer (SSL) Security Level 3 works in conjunction with the System SSL Base component of the Cryptographic Services base element to provide stronger encryption (greater than 64 bits) than that available without this feature. This feature uses the RC2/RC4 and TDES algorithms for encryption.</p> <p>This feature was new to OS/390 in R7 and was then named System SSL Crypto. In OS/390 R8 it received its current name.</p> <p>This feature is worldwide exportable subject to U.S. export regulations.</p>

Table 1. Base elements and optional features in z/OS V1R3 and z/OS.e V1R3 (continued)

Name	Function level	Type and description
Text Search	OS/390 R9	Type: base element, exclusive. Text Search is a database and Web search engine. It has two components: <ul style="list-style-type: none"> • IBM Text Search Engine is a database search engine that is also used in several other IBM products, such as Intelligent Miner for Text and DB2 Text Extenders. • NetQuestion Solution extends the IBM Text Search Engine into a search engine for z/OS and z/OS.e Web servers. Text Search includes the function in the former OS/390 R7 base element NetQuestion.
TIOC	OS/390 R1	Type: base element, exclusive. TIOC allows console services and TSO/E to communicate with the terminal hardware. This element was both a component of MVS/ESA SP V5 and a base element of OS/390. It became exclusive in OS/390 R10, when MVS/ESA SP V5 was no longer marketed.
TSO/E	z/OS V1R3	Type: base element, exclusive. Time Sharing Option/Extensions (TSO/E) provides an interactive terminal interface. As in prior releases of TSO/E, this element includes CLISTs and REXX, but does not include a REXX compiler. In z/OS.e, the number of concurrent TSO/E sessions is limited to eight.
z/OS UNIX System Services	z/OS V1R3	Type: base element, exclusive. z/OS UNIX System Services (z/OS UNIX) provides the standard command interface familiar to interactive UNIX users. This element contains four components: <ul style="list-style-type: none"> • Application Services, last changed in z/OS V1R3 and z/OS.e V1R3. This component includes the Shell, Utilities, Debugger, and Parallel Environment. • Connection Manager, last changed in OS/390 R7. • Integrated Call Level Interface (ICLI), last changed in z/OS V1R3 and z/OS.e V1R3. • Process Manager, last changed in OS/390 R7. This element was known as OpenEdition in the past.
3270 PC File Transfer Program	OS/390 R2 (3270 PC File Transfer Program V1R1.1, 5665-311)	Type: base element, nonexclusive. 3270 PC File Transfer Program transfers files from the host to the workstation for offline data manipulation, updating, or correction or for the transfer and storage of local data in the host system. This element was new in OS/390 R2.

Elements, features, and functions withdrawn from z/OS and OS/390

As OS/390 and z/OS have matured, a number of elements and features (in whole or in part) have been removed or are planned to be removed in future releases. You should take this into account as you plan your release migration. This topic lists the removed items starting with the earliest release still in service, along with (in most cases) alternatives you might consider in their place.

Withdrawn as of OS/390 R8 (last delivered in OS/390 R7)

Base elements:

- Base element Application Enabling Technology (AET) is withdrawn.
- From base element Communications Server, the Host On-Demand function is withdrawn. Instead, consider purchasing the stand-alone product SecureWay Host On-Demand V4 (part number 41L1766, 41L1767, 41L1768, 0704820, 0704824, or 0704825). It contains more functions than the former Host On-Demand component.
- From base element ISPF, the VisualAge for ISPF function is withdrawn. ISPF panel source created with VisualAge for ISPF can continue to be used. To maintain the source, use the ISPF PDF editor.
- From base element OSA/SF, the OSA-1 function is withdrawn.

Optional features:

- Optional feature Security Server LDAP Server DES is withdrawn. Instead, use the System SSL Security Level 3 feature.

Withdrawn as of OS/390 R9 (last delivered in OS/390 R8)

Base elements:

- The Japanese version of base element WebSphere Application Server is withdrawn. (The U.S. English version was withdrawn as of the following release.)

Optional features:

- Optional feature DCE User Data Privacy CDMF is withdrawn. The function is now part of the DCE Base Services base element.
- Optional feature DCE User Data Privacy DES/CDMF is withdrawn. The function is now part of the DCE Base Services base element.
- Optional feature Language Environment Data Decryption is withdrawn. The function is now part of the Language Environment base element.
- Optional feature OCSF France is withdrawn. The function is now part of the Cryptographic Services base element.
- Optional feature OCSF Security Level 1 is withdrawn. The function is now part of the Cryptographic Services base element.
- Optional feature OCSF Security Level 2 is withdrawn. The function is now part of the Cryptographic Services base element.

Withdrawn as of OS/390 R10 (last delivered in OS/390 R9)

Base elements:

- Base element Softcopy Print (including DBCS Softcopy Print) is withdrawn. The purpose of the Softcopy Print element was to print BookManager books (or topics) on AFP printers. Migration aids are:
 - Sections of BookManager books (served by BookServer) can be printed from the z/OS Internet Library (<http://www.ibm.com/eserver/zseries/zos/bkserv/>) using the print function of your browser.
 - PDF files of the z/OS books are available for printing. You can obtain the PDFs from the z/OS Internet Library or from the z/OS Collection CD-ROM or DVD.
 - For customers who wish to continue to use the Softcopy Print function to print BookManager books on AFP printers, you need to have the following products installed:
 - For single-byte character set printing (this includes English):
 - AFP Font Collection V2R1 (5648-B33)

- BookMaster V1R4 (5688-015)
- DCF V1R4 (5748-XX9)
- PSF V3R1 for OS/390 (5655-B17) or later

For double-byte character set (DBCS) printing:

- All of the requirements for single-byte printing
- The AFP DBCS fonts for your language
- The DBCS Print Utility, formerly part of Softcopy Print but now part of BookManager READ via PTF UQ99324.
- BookMaster PTF UQ04721 for the DBCS profiles

Note that as of OS/390 R10, a subset of the AFP Font Collection is no longer shipped as part of the base operating system. If you were relying on the use of these fonts for AFP printing, you might need to purchase the AFP Font Collection (5648-B33).

- Base element VisualLift RTE is withdrawn. The equivalent stand-alone product, VisualLift for MVS, VSE, & VM V1R1.2 (5748-109), is withdrawn from marketing.
- The U.S. English version of base element WebSphere Application Server is withdrawn. (The Japanese version was last shipped in OS/390 R8.) Instead, use the stand-alone product WebSphere Application Server V4 for OS/390 and z/OS (5655-F31).
- From base element C/C++ IBM Open Class Library, the C/C++ SOM Enabled Class Library is withdrawn.
- From base element Communications Server, the High Speed Access function is withdrawn. For migration information, see *z/OS Communications Server: IP Migration*.
- From base element Communications Server, the High Speed UDP facility is withdrawn. Instead, use the base TCP/IP stack to obtain equivalent function and performance.
- From base element IBM HTTP Server, the HTTP Server Certificate Authority (CA) utility is withdrawn. This utility enabled an installation to act as a certificate authority. The utility was intended to satisfy certificate requests within an intranet and was not intended for Internet commerce. In its place you can set up your own certificate authority or you can purchase a certificate authority software product. To set up your own certificate authority, use the Public Key Infrastructure (PKI) Services component of optional feature Security Server, functions provided by the z/OS System Secure Sockets Layer (SSL) utility gskkyman, or the RACF RACDCERT command. For more information, see *z/OS HTTP Server Planning, Installing, and Using*; *z/OS Security Server PKI Services Guide and Reference*; *z/OS System Secure Sockets Layer Programming*; and *z/OS Security Server RACF Command Language Reference*.
- From base element LAN Server, the workstation component is withdrawn, initiating the removal of LAN Server. OS/390 R9 was the last release to include both the workstation (on diskettes) and host components. OS/390 R10 and z/OS V1R1 had only the host component. z/OS V1R2 had neither component. LAN Server was removed from z/OS because the prerequisite OS/2 software is no longer available. See the redbook *S/390 File and Print Serving*, SG24-5330, for alternative solutions and migration guidance.

Optional features:

- Optional feature IBM HTTP Server Export Secure is withdrawn. It is no longer needed. The equivalent level of security is provided by the Cryptographic Services base element.

- Optional feature IBM HTTP Server France Secure is withdrawn. It is no longer needed due to change in French import regulations. The equivalent level of security is provided by the Cryptographic Services base element.
- Optional feature System SSL Security Level 2 is withdrawn. The function is now part of the Cryptographic Services base element.
- Optional feature VisualLift ADE is withdrawn. The equivalent stand-alone product, VisualLift for MVS, VSE, & VM V1R1.2 (5748-109), is withdrawn from marketing.

Withdrawn as of z/OS V1R1 (last delivered in OS/390 R10)

None.

Withdrawn as of z/OS V1R2 (last delivered in z/OS V1R1)

Base elements:

- Base element LAN Server withdrawal is complete. OS/390 R9 was the last release to include both the workstation (on diskettes) and host components. OS/390 R10 and z/OS V1R1 had only the host component. z/OS V1R2 had neither component. LAN Server was removed from z/OS because the prerequisite OS/2 software is no longer available. See the redbook *S/390 File and Print Serving*, SG24-5330, for alternative solutions and migration guidance.
- Base element SOMobjects RTL is withdrawn. Object-oriented technology has come a long way since IBM's introduction of SOMobjects in June of 1995. It is now the cornerstone of e-business. SOMobjects provided an introduction to object-oriented technology and a way to build applications that took advantage of everything the emerging technology had to offer, coupled with the advantages of the S/390 platform. As the technology advanced, IBM incorporated those advances into a new line of products named WebSphere, specifically aimed at the e-business environment and its requirements. Given that product direction, IBM has removed SOMobjects ADE and SOMobjects RTL from z/OS. IBM recommends that customers with programs that depend on SOMobjects evaluate the WebSphere family of products for replacement purposes. There is no detailed migration strategy from SOMobjects due to the many changes that have come about in the underlying technology.
- Base element Tivoli Management Framework is withdrawn. This was a nonexclusive base element, available both as a base element of z/OS and the stand-alone product Tivoli Management Framework V3 for OS/390, 5697-D10. As of z/OS V1R2 it is no longer available as a base element of z/OS but continues to be available as a stand-alone product. This will enable earlier access to the most current level of its function in support of the latest level of Tivoli management applications.
- From base element ISPF, Library Management Facility (LMF) services such as LMPROM, LMHIER, LMREVIEW, LMACT, and LMDEACT are withdrawn. They are withdrawn in favor of the better and more modern library function in option 10 SCLM. The other library services, such as LMCOPY, LMMOVE, LMMDISP, and LMMLIST, remain part of ISPF.

Optional features:

- Optional feature Communications Server Security Level 1 is withdrawn. This feature provided Version 4 Kerberos support. However, Version 5 Kerberos support is more current and is already provided by the z/OS Security Server feature. As a result, Communications Server Security Level 1 has been removed from z/OS. You should modify any applications that currently use the Kerberos Version 4 support provided by this feature to use the Kerberos Version 5 support provided by the z/OS Security Server feature. You will need to rewrite Kerberos V4 applications to use the Kerberos V5 application programming interface (API) and data structures. For assistance, see *z/OS SecureWay Security Server*

Network Authentication Service Administration and z/OS SecureWay Security Server Network Authentication Service Programming.

- Optional feature Communications Server Security Level 2 is withdrawn. This feature provided Version 4 Kerberos support. However, Version 5 Kerberos support is more current and is already provided by the z/OS Security Server feature. As a result, Communications Server Security Level 2 has been removed from z/OS. You should modify any applications that currently use the Kerberos Version 4 support provided by this feature to use the Kerberos Version 5 support provided by the z/OS Security Server feature. You will need to rewrite Kerberos V4 applications to use the Kerberos V5 application programming interface (API) and data structures. For assistance, see *z/OS SecureWay Security Server Network Authentication Service Administration and z/OS SecureWay Security Server Network Authentication Service Programming.*
- Optional feature SOMObjects ADE is withdrawn. For details about this feature, see the SOMObjects RTL base element above.
- From optional features C/C++ with Debug Tool and C/C++ without Debug Tool, the GENPCH and USEPCH C/C++ compiler options for Pre-Compiled Header (PCH) files are withdrawn. GENPCH and USEPCH served as a tactical initiative to reduce compile times. IBM is concentrating instead on improving compile times by building the compilers with successively higher levels of optimization from release to release, exploiting the ongoing optimization improvements made in the compilers.
- From optional feature RMF, the RMF Monitor II local 3270 display session option is withdrawn. RMF provides several methods of viewing real-time performance data. The RMF local display session requires a BTAM connection. Since IBM has announced the end of service for BTAM, this RMF display option is withdrawn. You will continue to have access to Monitor II information without an active TSO/TCAS subsystem by means of RMF Client/Server Enabling (RMFCS).
- The Spanish language version of optional feature Infoprint Server is withdrawn.
- From optional feature Infoprint Server, two functions that run on the Windows workstation are no longer shipped with z/OS: AFP Printer Driver for Windows and AFP Viewer Plug-in for Windows. Now get the most current versions from the Web:
<http://www.ibm.com/printers/download.html>

Withdrawn as of z/OS V1R3 (last delivered in z/OS V1R2)

Base elements:

- Base element LANRES is withdrawn. For migration information, see the white paper at:
<http://www.ibm.com/eserver/zseries/library/whitepapers/gm130035.html>
- From base element BCP, workload manager (WLM) compatibility mode is withdrawn. WLM in goal mode continues to grow in its role and importance. Each new release of the operating system and supporting subsystems brings further exploitation of WLM goal mode for improvements and efficiencies in system performance and workload balancing. Goal mode is required to get the most benefit from the new Intelligent Resource Director (IRD) functions in z/OS and z/OS.e. Consequently, goal mode is the only supported mode beginning in z/OS V1R3 and z/OS.e V1R3.

There are two ways to migrate to z/OS V1R3 in goal mode from an earlier z/OS release in compatibility mode:

- Migrate directly to z/OS V1R3. When the V1R3 system is IPLed, it will come up in WLM goal mode. The system uses the default service definition that has been supplied.

- IBM's recommendation: Migrate to WLM goal mode on your current release (that is, before upgrading to z/OS V1R3). This involves setting up the appropriate service definition using response time and velocity data on your current release. Then you would migrate to z/OS V1R3 using the previous service definition established.

You can download a goal mode migration aid tool from:

<http://www.ibm.com/eserver/zseries/zos/rmf/rmfhtmls/rmftools.htm>

- From base element DFSMSdfp, the KEYRANGE specification is withdrawn. The value of keyranges as a feature of VSAM key-sequenced data sets has diminished significantly over the last few years with the introduction of new DASD cached controllers, improved SMS DASD performance parameters, and VSAM data striping. Because of this, the KEYRANGE specification is ignored on the IDCAMS DEFINE and IMPORT commands for any new data sets beginning in z/OS V1R3. The change described here applies to any new data set created by the IDCAMS DEFINE or IMPORT commands. This includes procedures where a reorganization is done using either EXPORT/IMPORT or REPRO, DELETE, DEFINE, REPRO back. Existing keyrange data sets continue to work without change. Note that a DEFINE of a non-keyrange data set (unless it is guaranteed-space) only allocates space on the first volume, while keyrange data sets may allocate space on multiple volumes. Ignoring the keyrange specification without changing the space or volumes specified may therefore result in a change in the space initially allocated.

Additionally, keyrange data sets have been typically used to spread certain portions of a data set over multiple volumes. However, more than one keyrange can be on a volume when the same volume serial number appears twice in the VOLUMES list for the data component. Beginning in z/OS V1R3, when the keyrange parameter is ignored, the DEFINE will fail with message IDC3009I, return code 140, reason code 72. To correct this problem, simply substitute a unique volume serial for the duplicate. If you currently use keyrange data sets for your DFSMSHsm control data sets (CDSs), it is strongly recommended that you begin planning to convert your CDSs to multi-cluster dynamic keyrange (non-keyrange) control data sets. Information on how to perform the conversion can be found in *z/OS DFSMSHsm Implementation and Customization Guide*. For additional detail on how DFSMSHsm space and availability management will process keyrange data and the resulting output from these processes, refer to informational APAR I12896.

Withdrawn as of z/OS V1R4 (last delivered in z/OS V1R3)

This section lists items that IBM has announced will be withdrawn as of z/OS V1R4, that is, they will be in z/OS for the last time in V1R3. You are encouraged to consider these removals when making your plans for system upgrades. These statements represent IBM's current intentions. IBM development plans are subject to change or withdrawal without further notice.

Optional features:

- From optional feature Security Server, the RDBM DB2 backend function of the LDAP Server component is planned to be withdrawn as of z/OS V1R4. You are encouraged to migrate to the enhanced TDBM DB2 backend because of its improved scalability and availability. For instructions, see *z/OS Security Server LDAP Server Administration and Use*.

Withdrawn in a future z/OS release

This section lists items that IBM has announced it intends to withdraw in the future. When a withdrawal date is determined, IBM will announce it through normal channels. You are encouraged to consider these removals when making your plans

for system upgrades. These statements represent IBM's current intentions. IBM development plans are subject to change or withdrawal without further notice.

Base elements:

- From base element C/C++ IBM Open Class Library, the Application Support Class and Collection Class libraries are planned to be removed in the future. New application development involving C++ classes should make use of the C++ Standard Library, shipped with Language Environment, instead of the C/C++ IBM Open Class Library. For additional information, the C/C++ IBM Open Class Library Transition Guide is available at <http://www.ibm.com/software/ad/c390/czos/czosdocs.html>.
- From base element DFSMSdfp, IBM intends to withdraw the DFSMSdfp JOBCAT and STEPCAT facilities in the future. The JOBCAT and STEPCAT facilities have been in existence for many years, predating the introduction of ICF (integrated catalog facility) catalogs. JOBCAT and STEPCAT were designed to address some of the functional shortcomings of VSAM catalogs, such as:
 - VSAM volume ownership, that is, all data sets on a volume having to be in the same VSAM catalog. Multiple catalogs could not point to data sets on the same volume.
 - Performance problems resulting from no multilevel alias support, as well as lack of ability to subset catalog data for recovery purposes.
 - Restrictions in the definition of the catalog SVC interface.

The introduction of ICF catalogs in the mid-1980s and other catalog enhancements (such as the multilevel alias support) directly addressed those problems. In addition, processes were developed for system build to use system specific aliases instead of JOBCAT or STEPCAT. CBIPO introduced these processes and they are used today by offerings such as ServerPac to create data set entries in the new master catalog of the system being built.

At the time ICF catalogs were introduced, the JOBCAT and STEPCAT facilities were functionally stabilized. Neither SMS-managed data sets nor UCBs above the 16 megabyte line may be used with JOBCAT or STEPCAT. ICF catalogs contain sufficient functional capabilities that all functions that previously could only be performed with JOBCAT or STEPCAT can now be done without them.

Furthermore, the use of JOBCAT and STEPCAT can actually cause significant problems. Data sets are generally not cataloged according to the normal predictable search order when JOBCAT or STEPCAT is used. This impacts the ability to do comprehensive installation storage management and can increase staff requirements. For example, interval migration and recall using DFSMSHsm is effectively unusable when the data sets cannot be found using the standard catalog search order. The use of JOBCAT and STEPCAT can also result in noticeable increases in the time required to perform catalog requests.

Until JOBCAT and STEPCAT are withdrawn, a message will be issued when the system detects use of a JOBCAT or STEPCAT. This will allow you to examine and modify the job to remove the need for JOBCAT or STEPCAT. Jobs currently using JOBCAT or STEPCAT will not fail or otherwise be affected.

Optional features:

- From optional features C/C++ with Debug Tool and C/C++ without Debug Tool, IBM intends to withdraw the OS/390 R10 level of the C/C++ compilers in the future. The OS/390 R10 C/C++ compilers are shipped as an aid to migration to

the C/C++ compilers that were introduced in z/OS V1R2. The z/OS V1R2 level of the C++ compiler supports the ISO 1998 Standard level of C++. For information about migrating from the older to the newer level of the compilers, see *z/OS C/C++ Compiler and Run-Time Migration Guide*.

Release cycles

IBM intends to ship new releases of z/OS and z/OS.e every six months. At the end of every March and September, new z/OS and z/OS.e releases become generally available, with shipments starting at the beginning of April and October.

z/OS and z/OS.e are synchronized in terms of release availability, that is, they have the same release number and become available at the same time. For example, the z/OS.e release that corresponds to z/OS V1R3 is z/OS.e V1R3. When z/OS V1R3 becomes available, so does z/OS.e V1R3.

z/OS and z/OS.e are also synchronized in terms of new functions. When new functions are added to a release of z/OS, they are also added to the same release of z/OS.e. However, not every element and feature in a given release will contain new functions. Those elements and features that don't receive new functions will, nevertheless, be delivered with all applicable service. (The level of service included is described in "ServerPac service level" on page 34, "CBPDO service level" on page 34, and "SystemPac service level" on page 35.)

Typically, when a z/OS or z/OS.e release becomes orderable in ServerPac, the previous release is no longer orderable.

Methods of installing z/OS and z/OS.e

Several IBM packages are available for installing z/OS and z/OS.e. Some are entitled with the product (as part of your z/OS or z/OS.e license, at no additional charge), while others are available for an additional fee. This section describes each package.

Rule: Because the base elements and optional features are integrated into a single package with compatible service levels, **you must install, with few exceptions, the entire z/OS or z/OS.e product.** See "Choosing the z/OS or z/OS.e base and optional features" on page 67 for details about this policy.

Tip: You might find that sharing system libraries or cloning an already-installed z/OS or z/OS.e system is faster and easier than installing z/OS or z/OS.e with an IBM installation package. For further information, see "Installing z/OS or z/OS.e without using an installation package" on page 55.

ServerPac (entitled with z/OS and z/OS.e)

ServerPac is an entitled software delivery package consisting of products and service for which IBM has performed the SMP/E installation steps and some of the post-SMP/E installation steps. To install the package on your system and complete the installation of the software it includes, you use the CustomPac Installation Dialog.

Both z/OS and z/OS.e, as well as the products that run on them, are available via ServerPac. Of course, because CICS, IMS, COBOL, Fortran, and PL/I products do not run on z/OS.e, not as many products are available with z/OS.e as with z/OS.

The CustomPac Installation Dialog generates tailored installation jobs and saves detailed definitions of volume, catalog, and data set configurations, which can be tailored, saved, and merged to install subsequent ServerPacs. The CustomPac Installation Dialog is the same dialog that is used for all the CustomPac offerings, including SystemPac (dump-by-data-set format), ProductPac, and RefreshPac. For more information about CustomPac fee offerings, see <http://www.ibm.com/ca/custompac/>.

Two types of ServerPac installation are available to you. (You choose the type when you install, not when you order.)

- A *full system replacement* installs a complete z/OS or z/OS.e system. It installs all the data sets you need to IPL, to log on to the target system, and to run a z/OS or z/OS.e image in order to complete other installation and customization tasks. The installed data sets fall into two major categories:
 1. System software and related data sets (such as distribution and target libraries, SMP/E CSI data sets, and sample libraries)
 2. Operational data sets (such as page data sets, system control files, and a master catalog).

Because IBM creates a working set of operational data sets for you, a full system replacement helps assure a successful first IPL.

Depending on your environment, you might need to merge your existing operational data sets with the data sets created by ServerPac. You can do this before or after first IPL.

- A *software upgrade* installs only system software and related data sets (category 1 above). It does not create new operational data sets (category 2 above). With a software upgrade, all operational data sets are assumed to already exist and to be usable by the new level of software installed. When new operational data sets are required, you must allocate and initialize them before you IPL. For example, you might need to add parameters required by the new software level or change data sets so they will work with both the old and new levels.

A software upgrade uses your existing catalog structure. This includes your existing master catalog (with direct or indirect cataloging references) and user catalogs. In addition, software upgrade allows you to create new user catalogs as part of the installation process.

A software upgrade is possible for both z/OS and z/OS.e but not for the subsystems.

Many operational data sets can be shared between operating systems, that is, between z/OS and z/OS, between z/OS.e and z/OS.e, and between z/OS and z/OS.e.

Among z/OS customers choosing between the two entitled installation packages (ServerPac and CBPDO), most choose ServerPac.

CBPDO (entitled with z/OS, not available with z/OS.e)

CBPDO (Custom-Built Product Delivery Option) is an entitled software delivery package consisting of uninstalled products and unintegrated service. There is no dialog program to help you install, as there is with ServerPac. Following the instructions in the publication *z/OS Program Directory*, you must use SMP/E to install the individual z/OS elements and features, and their service, before you can IPL.

z/OS and all products that run on z/OS are available via CBPDO. z/OS.e is not available via CBPDO, but all products that run on z/OS.e are available via CBPDO.

SystemPac (additional charge with z/OS and z/OS.e)

SystemPac is a software package, available for an additional fee and offered worldwide, that helps you install z/OS, z/OS.e, subsystems (DB2, IMS, CICS, and NCP), and selected ISV products. SystemPac is tailored to your specifications; it is manufactured according to parameters and input/output definition file (IODF) definitions that you supply during order entry. The goal is to have the system tailored to your specifications and have products enabled according to your specified configuration. Parameters are collected by telephone. Using a printed questionnaire as a guide, you tell an IBM representative your responses. Upon completion, a printout showing all the parameters and definitions you specified is sent to you for reference.

SystemPac comes in two formats:

- The *full volume dump* format requires you to install using volume restore. The tapes you receive are in physical volume format (DFSMSdss dumped or Innovation Data Processing FDR dumped, depending on your choice during ordering).
- The *dump-by-data-set* format requires you to install using the CustomPac Installation Dialog. The tapes you receive are in IEBCOPY dump-by-data-set format (not a physical volume dump).

In both formats, selected products, elements, features, and functions (such as z/OS UNIX System Services, Communications Server, IBM HTTP Server, and WLM goal mode) are enabled with IBM defaults to allow you to exploit e-commerce upon IPL once your enterprise connectivity is established.

SystemPac is designed for those who have limited skill or time to install or upgrade z/OS or z/OS.e but who want to install or upgrade to exploit z/OS or z/OS.e functions in e-commerce or other areas.

You can find information about SystemPac on the Web at:

<http://www.ibm.com/ca/custompac/>

Other installation methods (additional charge with z/OS and z/OS.e)

Other fee-based methods (besides SystemPac) for installing z/OS and z/OS.e are:

- The *Entry Server Offering* (available in some countries) is a packaged solution that includes hardware, software, installation services, maintenance and financing to help customers get to current technology.
- Other fee-based offerings include z/OS Select in the United Kingdom, Rapid Migration Offering in Canada, Software Management in Germany, and Express Plus Offering in France. Most of these offerings are based on SystemPac. These offerings vary in scale; they can go as far as to include a total system cutover.
- Other fee-based services include customized solutions, hardware services, and software services.

The scope of this book is limited to the entitled methods (ServerPac and CBPDO) and the SystemPac fee-based method. For information about the other fee-based methods, contact an IBM representative or browse the IBM Global Services Web page at:

<http://www.ibm.com/services/>

National languages in which z/OS and z/OS.e are available

z/OS and z/OS.e are provided in U.S. English. In addition, 16 other languages are supported. However, not all elements and features are available in each of the 16 languages. Table 2 shows the 16 languages and lists which elements and features are available in each.

When you order z/OS or z/OS.e, you receive it in the following languages:

- U.S. English
- Fourteen national languages for base element BookManager BookServer (U.S. English and the 13 languages listed in Table 2)
- Fourteen national languages for base element Text Search (U.S. English and the 13 languages listed in Table 2)

If you want an additional language, you have to specify the national language version (NLV) feature number in your order.

If you order the z/OS or z/OS.e base in a non-English language, you get all priced features (which support dynamic enablement) in English and any priced features that are available in that non-English language. If you order a priced feature in a non-English language, you get it in that language and in English.

The enablement setting is based on whether an element or feature was ordered in **any** language.

Table 2. National languages supported (in addition to U.S. English) and the elements and features available in each language

National language	Base elements	Priced optional features
Brazilian Portuguese	<ul style="list-style-type: none"> • BookManager BookServer (see note) • BookManager READ (z/OS only, not z/OS.e) • GDDM (z/OS only, not z/OS.e) • Text Search (see note) 	<ul style="list-style-type: none"> • BookManager BUILD (z/OS only, not z/OS.e)
Canadian French	<ul style="list-style-type: none"> • BookManager READ (z/OS only, not z/OS.e) • GDDM (z/OS only, not z/OS.e) 	<ul style="list-style-type: none"> • BookManager BUILD (z/OS only, not z/OS.e)
Danish	<ul style="list-style-type: none"> • BookManager BookServer (see note) • BookManager READ (z/OS only, not z/OS.e) • GDDM (z/OS only, not z/OS.e) • Text Search (see note) 	
Dutch	<ul style="list-style-type: none"> • BookManager BookServer (see note) • BookManager READ (z/OS only, not z/OS.e) 	

Table 2. National languages supported (in addition to U.S. English) and the elements and features available in each language (continued)

National language	Base elements	Priced optional features
French	<ul style="list-style-type: none"> • BookManager BookServer (see note) • BookManager READ (z/OS only, not z/OS.e) • GDDM (z/OS only, not z/OS.e) • Text Search (see note) 	<ul style="list-style-type: none"> • BookManager BUILD (z/OS only, not z/OS.e)
German	<ul style="list-style-type: none"> • BookManager BookServer (see note) • BookManager READ (z/OS only, not z/OS.e) • GDDM (z/OS only, not z/OS.e) • ISPF • Text Search (see note) • TSO/E 	<ul style="list-style-type: none"> • BookManager BUILD (z/OS only, not z/OS.e)
Italian	<ul style="list-style-type: none"> • BookManager BookServer (see note) • BookManager READ (z/OS only, not z/OS.e) • GDDM (z/OS only, not z/OS.e) • Text Search (see note) 	
Japanese	<ul style="list-style-type: none"> • BCP (see note) • BookManager BookServer (DBCS) (see note) • C/C++ IBM Open Class Library • DCE Application Support (z/OS only, not z/OS.e) • DCE Base Services • DFSMSdfp • Distributed File Service • Encina Toolkit Executive (z/OS only, not z/OS.e) • GDDM (z/OS only, not z/OS.e) • HCD • IBM HTTP Server • ICKDSF • ISPF • JES2 • Language Environment • SMP/E • SSL Base component of Cryptographic Services • Text Search (see note) • TSO/E • z/OS UNIX System Services 	<ul style="list-style-type: none"> • C/C++ with Debug Tool • C/C++ without Debug Tool • DFSMSdss • DFSMShsm • DFSMSrmm • DFSORT • Infoprint Server • RMF • SDSF • Security Server
Korean	<ul style="list-style-type: none"> • BookManager BookServer (DBCS) (see note) • GDDM (z/OS only, not z/OS.e) • Text Search (see note) 	

Table 2. National languages supported (in addition to U.S. English) and the elements and features available in each language (continued)

National language	Base elements	Priced optional features
Norwegian	<ul style="list-style-type: none"> • BookManager BookServer (see note) • GDDM (z/OS only, not z/OS.e) • Text Search (see note) 	
Simplified Chinese	<ul style="list-style-type: none"> • BookManager BookServer (DBCS) (see note) • GDDM (z/OS only, not z/OS.e) • z/OS UNIX System Services kernel in the BCP • Text Search (see note) • TSO/E • z/OS UNIX System Services 	
Spanish	<ul style="list-style-type: none"> • BookManager BookServer (see note) • BookManager READ (z/OS only, not z/OS.e) • GDDM (z/OS only, not z/OS.e) • Text Search (see note) 	<ul style="list-style-type: none"> • BookManager BUILD (z/OS only, not z/OS.e)
Swedish	<ul style="list-style-type: none"> • BookManager BookServer (see note) • GDDM (z/OS only, not z/OS.e) • Text Search (see note) 	
Swiss German	<ul style="list-style-type: none"> • ISPF 	
Traditional Chinese	<ul style="list-style-type: none"> • BookManager BookServer (DBCS) (see note) • GDDM (z/OS only, not z/OS.e) • Text Search (see note) 	
Uppercase English	<ul style="list-style-type: none"> • ISPF • Text Search (see note) 	
<p>Note: All BookManager BookServer and Text Search national languages, as well as the support for Unicode in the BCP, are provided with the z/OS or z/OS.e base license and therefore do not have to be separately ordered.</p>		

Integration testing by IBM

Each release of z/OS and z/OS.e undergoes integration testing by a team of IBM testers and system programmers. Test systems simulate customer production Parallel Sysplex environments running z/OS, z/OS.e, and many related software products such as DB2, IMS, CICS, MQSeries, and WebSphere Application Server. The team migrates to each new release of z/OS and z/OS.e, puts the system into production, and then verifies that all products applicable to each operating system work together.

The team produces a quarterly report containing test results and advice for customers. The report is entitled *z/OS Parallel Sysplex Test Report* and is available from the z/OS Integration Test Web site:

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

This Web site includes illustrations of the team's hardware, software, networking, and application enablement configurations.

The team follows a process that includes simulating the workload stress levels, transaction rates, and lock contention rates that customers might experience. They stress many of the same areas of the system that customers stress. In their report they include detailed descriptions of their hardware, software, networking, and application enablement configurations, as well as the key operational, performance, and availability characteristics of their Parallel Sysplex environment. They provide recommended recovery procedures, recommended service levels, and a variety of hints and tips distilled from their own experiences. They let you know about the mistakes they make so you can avoid those mistakes.

Service is also tested in this environment. The test system is brought up to the minimum z/OS service level that will be shipped with ServerPac orders. In general, this is the PUT level that was available two months prior to general availability (GA), plus Recommended Service Upgrade (RSU) packages that might also have become available. If testing identifies a need for corrective service, program temporary fixes (PTFs) are added to the system and tested. Each integration-tested PTF is identified with a SOURCEID of ZOSV1R n , where n is the release number.

Note: Both z/OS and z/OS.e use the same SOURCEID for integration-tested PTFs as well as for all other service.

Service

This topic describes IBM's service policy for z/OS and z/OS.e, the level of service that is provided with your order, what PSP information is, the preventive maintenance that you should perform after installing z/OS or z/OS.e, and how preventive and corrective service are distributed.

Service policy

IBM's current policy is to provide maintenance (service) for each release of z/OS and z/OS.e for three years following their general availability (GA) date. However, service on the last release of a version might be extended beyond the intended three-year period. Prior to withdrawing service for any version or release of z/OS, z/OS.e, or OS/390, IBM intends to provide at least 12 months notice. See Table 3 for end-of-service (EOS) dates.

Table 3. Expiration dates for z/OS, z/OS.e, and OS/390 service support. Anticipated dates are based on the three-year service policy.

Version and release	General availability (GA)	End of service (EOS)
OS/390 V1R1	29 March 1996	Occurred 31 January 2001
OS/390 V1R2	27 September 1996	Occurred 31 January 2001
OS/390 V1R3	28 March 1997	Occurred 31 March 2001
OS/390 V2R4	26 September 1997	Occurred 31 March 2001
OS/390 V2R5	27 March 1998	Occurred 31 March 2001
OS/390 V2R6	25 September 1998	Announced to be 31 March 2002
OS/390 V2R7	26 March 1999	Announced to be 31 March 2002
OS/390 V2R8	24 September 1999	Announced to be 30 September 2002

Table 3. Expiration dates for z/OS, z/OS.e, and OS/390 service support. Anticipated dates are based on the three-year service policy. (continued)

Version and release	General availability (GA)	End of service (EOS)
OS/390 V2R9	31 March 2000	Announced to be 31 March 2003
OS/390 V2R10	29 September 2000	Announced to be at least until 30 September 2004
z/OS V1R1	30 March 2001	Anticipated to be March 2004
z/OS V1R2	26 October 2001	Anticipated to be October 2004
z/OS V1R3 and z/OS.e V1R3	29 March 2002	Anticipated to be March 2005

Program temporary fix (PTF) distributions, including Recommended Service Upgrades (RSUs), will continue to be available monthly while a release is current. Service testing for a release will be performed for five quarters after the general availability date for that release.

Note that there is a difference between how long a release is serviced and how long IBM will ensure coexistence. To provide you with release migration flexibility, IBM allows four consecutive releases of z/OS and z/OS.e to coexist. See “Coexistence-Migration-Fallback policy” on page 85 for details.

ServerPac service level

For ServerPac orders, service is integrated with product code according to the following timeline:

- ServerPac is refreshed every month to pick up the most current RSU.
- All products will incorporate high impact or pervasive (HIPER) and PTF-in-error (PE) fixes that are available approximately one week before your order is built.
- All z/OS and z/OS.e elements and features will incorporate additional service that has been through integration testing (SOURCEID ZOSV1R n , where n is the release number).

ServerPac: Installing Your Order, which comes with your order, specifies the integrated service level applicable to your order.

Your ServerPac order will also contain a service tape containing unintegrated service.

CBPDO service level

For CBPDO orders, service is not integrated. You must receive and apply the service during the installation process.

The following service is shipped with default CBPDO orders:

- Service for all products, elements, and features that you ordered.
- Service for all products previously ordered with the same system release identifier (SREL), as reflected in the customer profile for the customer number used when the order was placed. The starting service level is determined in one of the following ways:
 - If you specify a starting service level when ordering CBPDO, you will receive all the service from that level to the current level.

- If you do not specify a starting service level, and you have previously ordered the same CBPDO SREL, you will receive all the service following the ending service level of your previous CBPDO order for the same SREL.
- If you do not specify a starting service level, and your previous order is more than two years old, or if you are ordering a CBPDO SREL for the first time, the starting service level will default to the lowest valid level available at the time your order is placed.

As of September 2000 you have new options that allow you to customize the service provided in your order. See “CBPDO service” on page 39 for details.

The *Memo to Users Extension* that comes with CBPDO orders describes the SOURCEIDs for service delivered on the CBPDO tape. For example, integration-tested PTFs have a SOURCEID of ZOSV1R3 for z/OS V1R3. *z/OS Program Directory* describes the SMP/E SOURCEIDs to be used to install z/OS.

SystemPac service level

For SystemPac orders, service is integrated with product code according to the following timeline:

- SystemPac is refreshed every month to pick up the most current RSU.
- All products will incorporate high impact or pervasive (HIPER) and PTF-in-error (PE) fixes that are available approximately one week before your order is built.
- All z/OS and z/OS.e elements and features will incorporate additional service that has been through integration testing (SOURCEID ZOSV1R n , where n is the release number).
- The service and maintenance incorporated in independent software vendor (ISV) products depends on when the order is manufactured. The service and maintenance can range from current to approximately two months old. Check with your ISV to ensure that you have the most current levels of service available.

Your SystemPac order will also contain a service tape containing unintegrated service (applicable to the products in your order).

PSP information

z/OS, z/OS.e, and most products that run on them provide files containing information that became available after the product books were printed. Kept on IBM's RETAIN system and also available using IBMLink, these files are called preventive service planning (PSP) “buckets”, or just “PSPs”. These terms were chosen when PSP buckets contained only APAR- and PTF-related information, but over time customers asked for a more general repository of important installation-related information, and the role of the PSP bucket has grown.

PSP buckets are identified by an *upgrade* identifier, and specific parts of them are called *subsets*. Each upgrade contains information about a product. Subsets contain information about specific parts of a product. For example, the z/OS PSP bucket has subsets for the BCP, JES2, ServerPac, and others.

For software upgrades for ServerPac and CBPDO installations, refer to *z/OS Program Directory*. For software upgrades for SystemPac installations, the upgrade is CUSTOMPAC and the subsets are SYSPAC/FVD (for full volume dump format) and SYSPAC/DBD (for dump-by-data-set format). For hardware upgrades, refer to “PSP hardware upgrade identifiers” on page 73.

Note: z/OS and z/OS.e use the same PSP buckets.

At the beginning of each PSP bucket is a change index. For each subset, the change index identifies the date of the latest entries in each section. You can quickly determine whether there are new entries you need to read by checking the change index.

Each subset is broken into five sections, numbered 1 through 5:

Section 1

Installation Information. This section contains any changes to installation procedures or information about additional requisite PTFs.

Section 2

This section contains any major changes to product publications.

Section 3

General Section. This section contains important information that does not fit in another section.

Section 4

Service Recommendations. The original purpose of the PSP bucket was to provide this information, which includes a list of HIPER APARs and their fixes, as well as other important service-related information.

Section 5

Cross-Product Dependencies. This section contains information about the levels or service levels of other products you might need to run with the software you intend to install, or service that you might need to install to run other products.

You receive PSP buckets with your order, as members of a data set named *hlq.CPAC.PGMDIR* (for ServerPac and SystemPac) or *hlq.IPO1.PGMDIR* (for CBPDO). You should download the latest PSP buckets using IBMLink or Information/Access, or request them from your IBM Support Center.

Consolidated service testing by IBM

IBM launched the consolidated service test (CST) effort in November 2000 and redefined the Recommended Service Upgrade (RSU) for the OS/390 and z/OS platforms in November 2001. The objective was to provide a consolidated, tested, and recommended set of service for z/OS, z/OS.e, OS/390, and key subsystems on a quarterly basis with published results. This means that you can obtain and install service for z/OS, z/OS.e, OS/390, and key subsystems from one recommended service package, so that you have a tested level of service for all these products.

Note: CST testing does not replace PTF testing performed by each product. CST testing is in addition to individual PTF testing.

The CST team tests in a customer-like production Parallel Sysplex environment in an IBM test lab. It runs batch and data-sharing applications that exploit and stress the latest functions with up to two levels of subsystems on three levels of z/OS, z/OS.e, and OS/390 systems. The CST team is continuously improving the test environment. For more information about the environment, see the quarterly *Consolidated Service Test Report* at the CST Web site:

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

During testing, the team observes how each product runs and how all the products interact in this environment. The team reports problems it finds to the IBM Support Center.

The testing cycle is quarterly. The team begins each quarter by installing all service from the prior quarter and defining test scenarios to exploit new product functions while existing workloads are being run. During the second month of the quarter the team starts running new test scenarios, identifies problems, and applies fixes. In the final month of the quarter the team performs recovery tests and runs workloads in a high stress environment. At the end of the quarter the team publishes results in the *Consolidated Service Test Report*.

At the end of each month, between quarterly recommendations, the CST team provides a delta recommendation for customers whose preventive strategy requires more frequent maintenance updates. The monthly recommendation supports the most recently published CST quarterly recommendation. It includes HIPER and PE fixes that have been installed at the beginning of the month and tested for the duration of the month.

As quarterly and monthly recommendations become available, the team updates the CST Web site.

Maintenance after installation

After you have installed z/OS or z/OS.e, you should install preventive maintenance using Recommended Service Upgrades (RSUs). An RSU is an SMP/E SOURCEID (RSUyyymm) used to identify:

- All PTFs that completed CST testing during the prior quarter, and
- Certain types of PTFs that completed CST testing during the prior month. The types are high impact or pervasive (HIPER) PTFs, PTF-in-error (PE) PTFs, and other recommended PTFs (recommended because of new function, serviceability, installability, security, or integrity).

Note: While all CST-tested PTFs become RSU PTFs, not all RSU PTFs are tested in CST. Only the following products or product families are included in CST testing: z/OS, z/OS.e, OS/390, IMS, DB2, CICS, and MQSeries.

RSUs are available monthly. They are assigned an RSU SOURCEID that reflects when the PTFs in them completed the test cycle and became recommended, not when the PTFs closed. (The PUTyyymm SOURCEID continues to be used to identify when a PTF closes.) Both the monthly and quarterly RSUs use the same RSUyyymm SOURCEID notation. You can identify quarterly RSUs by their month values, which are RSUyy03, RSUyy06, RSUyy09, and RSUyy12. For a better understanding of RSU content and availability, see Table 4 on page 38.

Recommendation: Install an RSU every three months if possible, with the RSU level being the most current month. Also, regularly (weekly if possible) review current HIPER and PE PTFs, and roll these fixes into production at least monthly. If you are unable to install RSU maintenance every three months, then it is more important to review the HIPER and PE fixes on a regular basis.

Table 4. RSU content and RSU SOURCEID for each month of 2002

Month	RSU content	SOURCEID
January 2002	All PTFs that exited CST through the end of September 2001 and are not already in an RSU, plus HIPER and PE-correcting PTFs that exited CST in November 2001	RSU0112
February 2002	HIPER and PE-correcting PTFs that exited CST in December 2001	RSU0201
March 2002	HIPER and PE-correcting PTFs that exited CST in January 2002	RSU0202
April 2002	All PTFs that exited CST through the end of December 2001 and are not already in an RSU, plus HIPER and PE-correcting PTFs that exited CST in February 2002	RSU0203
May 2002	HIPER and PE-correcting PTFs that exited CST in March 2002	RSU0204
June 2002	HIPER and PE-correcting PTFs that exited CST in April 2002	RSU0205
July 2002	All PTFs that exited CST through the end of March 2002 and are not already in an RSU, plus HIPER and PE-correcting PTFs that exited CST in May 2002	RSU0206
August 2002	HIPER and PE-correcting PTFs that exited CST in June 2002	RSU0207
September 2002	HIPER and PE-correcting PTFs that exited CST in July 2002	RSU0208
October 2002	All PTFs that exited CST through the end of June 2002 and are not already in an RSU, plus HIPER and PE-correcting PTFs that exited CST in August 2002	RSU0209
November 2002	HIPER and PE-correcting PTFs that exited CST in September 2002	RSU0210
December 2002	HIPER and PE-correcting PTFs that exited CST in October 2002	RSU0211

One way to review HIPER and PE PTFs is to use Enhanced HOLDDATA. Enhanced HOLDDATA is HOLDDATA with additional information to identify the reason for the hold and a fixing PTF. Enhanced HOLDDATA provides a hold against function SYSMODs (FMIDs) for HIPER and PE PTFs. (Nonenhanced HOLDDATA provides a hold only against PE PTFs.)

To display the Enhanced HOLDDATA, use the SMP/E REPORT ERRSYSMODS command. The SMP/E report, when used with Enhanced HOLDDATA, identifies missing critical service that applies to your specific system. This allows you to identify any missing HIPER and PE fixes for any target zone. Additionally, the report identifies whether a corrective PTF is available, whether the corrective PTF is already in RECEIVE status, and the reason indicator for a HIPER.

Enhanced HOLDDATA is available through ESO packages, with CBPDO orders, through the S/390 Service Update Facility (SUF), and from the World Wide Web. For more information, see the *ESO Memo to Users Extension*, the *CBPDO Memo to Users Extension*, or the Enhanced HOLDDATA Web site at:

<http://service.boulder.ibm.com/390holddata.html>

To perform (or install) service on elements and features, you must minimally meet the driving system requirements for CBPDO Wave 2, which include having an activated OMVS address space with OS/390 UNIX kernel services or z/OS UNIX kernel services operating in full-function mode on the system that is driving the service installation. For CBPDO Wave 2 driving system requirements, see “Driving system Wave 2” on page 65.

Service distribution

Preventive and corrective service are delivered using processes such as ShopzSeries, System/390 Service Update Facility (SUF), CBPDO, Expanded Service Options (ESO), SystemPac follow-on service (SFS), and RefreshPac.

Note: Even though z/OS.e is not installable via CBPDO, you can service it via CBPDO.

The zSeries Technical Support Web site contains information about problem submission, problem review, open and closed APARs, and documentation. The Web address is:

<http://www.ibm.com/eserver/zseries/support/>

ShopzSeries

ShopzSeries is a self-service Internet application you can use to order z/OS and z/OS.e software products and service. Using ShopzSeries, you can order service-only CBPDOs, individual PTFs by PTF or APAR number, and RSUs. Delivery is by physical media. IBM intends to make ShopzSeries the primary ordering and delivery method for software service for the z/OS and OS/390 platforms. The ShopzSeries Web address is:

<https://www14.software.ibm.com/ShopzSeries>

System/390 Service Update Facility (SUF)

S/390 Service Update Facility (SUF) is an Internet-based software service tool for ordering and receiving z/OS, z/OS.e, OS/390, z/VM, VM/ESA, and VSE/ESA software service. SUF allows you to order both corrective and preventive service via the Internet and have it delivered via the Internet or via standard physical media. Because SUF accesses the consolidated software inventory (CSI), the service is tailored; only the service missing from your system is sent.

For details regarding prerequisites, entitlement, how to obtain SUF, and SUF enhancements, refer to the SUF Web site:

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

Note: IBM intends to make ShopzSeries (not SUF) the primary ordering and delivery method for software service for the z/OS and OS/390 platforms.

CBPDO service

CBPDO provides service for all releases of each product licensed under a customer number in an ordered SREL, as well as unintegrated service for the ordered products.

As of September 2000, CBPDO was enhanced to help you avoid receiving more service than you might expect. CBPDO can now optionally provide service for either (1) the ordered products only or, (2) for MVS SREL orders, selected releases. This change allows you to customize the service in your order to your specific needs as well as reduce the overall size of the deliverable. This enhancement is not available with subscription CBPDOs.

The following options are now available when ordering CBPDO:

- Product-only option.

If you intend to install only the products delivered with your CBPDO order, and not to service your entire system, select the option to include service for the ordered products only. This is referred to as the product-only option. Selecting this option will significantly reduce the size of your order. This option can also be used to obtain the equivalent FMID and service content formerly delivered with the stand-alone product and CUM tape. Note that this option is the default when you use ShopzSeries (the Web application for ordering software) to place a CBPDO order that includes one or more products.

Your customer service history will not be updated when using the product-only option. Therefore, your next non-product-only CBPDO order for the same SREL will duplicate some of the service you received on the product-only CBPDO. Likewise, if you receive subscription CBPDOs, you should expect to receive duplicate service if one of these orders follows a product-only CBPDO order for the same SREL.

When ordering z/OS in CBPDO, IBM recommends that you do not include any other products in the same order. If you intend to service your entire system at the same time you install z/OS, consider placing two orders. Include z/OS and service for the ordered products only in one order. Then place a separate order to obtain service for your entitled products. This will limit the volume of data provided for each task to a manageable size.

- Selective service option.

When ordering service for your entitled MVS products, IBM recommends limiting the service provided for the base operating system product (that is, z/OS or z/OS.e) to those releases currently available in your enterprise. This is referred to as the selective service option. Your order will include service only for the releases you select. If you do not use this option, your order will include service for all releases of each version of the base operating system entitled to your customer number, resulting in an extremely large order. Note that this option is required if you order service for your entitled MVS products through ShopzSeries.

Your customer service history will be updated when using the selective service option. Therefore, your next MVS (Z038) CBPDO order will not contain service applicable to the base operating system product for the PUT/RSU levels delivered in your selective service CBPDO order. For this reason, in order to avoid a service gap, IBM recommends that when you use the selective service option you select all z/OS or z/OS.e release levels available in your enterprise. If you choose to intentionally omit any releases, your next order must specify a starting service level in order to obtain the back-level service for the omitted releases.

We recommend keeping your global zone FMID list up to date, as well as using the SMP/E enhanced RECEIVE command in order to screen out additional PTFs that do not need to be received.

CBPDO subscriptions:

- There is a limit of four automatic shipments of service-only CBPDOs per SREL per year.
- For an order to ship during a selected month, your customer profile must be updated by the preceding month.
- The service level of a CBPDO is determined by the last CBPDO ordered in the same SREL, regardless of whether it was a subscription or individual order.

Therefore, if you order a CBPDO prior to receiving your subscription CBPDO, the subscription will contain only new service approved for distribution since the prior CBPDO was created.

- If you have never received a CBPDO for the SREL you are subscribing to, the first order will include the maximum two years of service. As with any product serviced using CBPDO, the SREL cannot be more than two years back-level in service. To avoid receiving two years of service, order a CBPDO (product or service-only) prior to subscribing, using existing methods and specifying a starting service level. Your first subscription order will then include service starting from the latest level received in your prior order.
- If you wish to change the frequency or the particular month (or months) of the subscription CBPDO, delete from your customer profile the subscription CBPDO program number (5751-CS8) containing the subscription (7xxx) feature numbers. Then submit a new subscription CBPDO order.

SystemPac SFS

For SystemPac users, SystemPac follow-on service (SFS) comes free as an option as part of the SystemPac fee offering. You can order a maximum of three SFSs with maximum intervals of 90 days apart. SFSs contain PTFs fixing PEs and HIPERs. They are built according to the copy of the SMP/E consolidated software inventory (CSI) of your system. Thus, these critical services are tailored to fit your environment.

RefreshPac (fee offering)

RefreshPac is a software preventive service offering that is available worldwide for a fee. RefreshPac can update one or all target and DLIB zone pairs residing in a target and DLIB consolidated software inventory (CSI). These zone pairs must belong to the same system release identifier (SREL). RefreshPac is customized by providing input from the customer in the form of a copy of the CSI information that the target and DLIB zone pairs to be serviced resided in. Upon delivery of the RefreshPac, you are entitled to selective follow-on service (SFS). SFSs contain PTFs that fix PE and HIPER fixes that are discovered after the package was shipped to you. By applying SFSs repeatedly, HIPER and PE fixes are flushed out of your system, thus providing a highly available system for your applications.

Education and training

IBM courses are available for z/OS and z/OS.e. For schedules and enrollment:

- Phone enrollment: 1-800-IBM-TEACH
- On the World Wide Web:

<http://www.training.ibm.com/>

Publications

You can learn about the functions provided by z/OS in *z/OS Introduction and Release Guide* and by z/OS.e in *z/OS.e Overview*.

Refer to *z/OS Information Roadmap* for a list of titles and order numbers of all the z/OS and z/OS.e product books, descriptions of the books, information about the media in which they're available (CD-ROM, DVD, printed, or Internet), and how to get copies.

The books previously named, as well as the rest of the z/OS and z/OS.e product books, are online at the z/OS Internet Library site or z/OS.e Internet Library site. The books are provided in BookManager form served up by BookManager

BookServer. You can browse or download them. If you download them, you can browse them on your workstation using any of the BookManager products. The books are also provided in Portable Document Format (PDF) form. You can download them and then print (or browse) them on almost any workstation platform using the Adobe Acrobat Reader, which is available free from the Web. Or, with the Infoprint Server feature of z/OS and z/OS.e, and the Infoprint Server Transforms (5697-F51) product, you can transform PDF files to AFP format on z/OS or z/OS.e and print them on high-speed IBM AFP printers.

The z/OS Internet Library is at:

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

The z/OS.e Internet Library is at:

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

At the z/OS Internet Library and z/OS.e Internet Library you will also find:

- An online book containing DOC (documentation) APARs and ++HOLD for documentation changes from PTF cover letters.
- Wizards. These are interactive assistants that ask you a series of questions about the task you want to do and then custom-build a checklist of steps for you to follow. For customization tasks, the wizards generate output such as:
 - Tailored instructions
 - Jobs, policies, and parmlib members that you can upload to z/OS or z/OS.e and use
- LookAt. LookAt allows you to quickly look up explanations for z/OS and z/OS.e messages, system abends, and some codes.

Two other sources of information are:

- Redbooks, which are developed and published by IBM's International Technical Support Organization (ITSO). These books, named for the color of their covers, are "how to" books written by very experienced IBM professionals from all over the world. You can find redbooks at:
<http://www.ibm.com/redbooks>
- "Flashes", which are articles written by IBM Systems Center personnel. Flashes alert customers and IBM personnel to significant new technical developments and guidance for the installation, use, and maintenance of IBM products. You can find flashes at:
<http://www.ibm.com/support/techdocs>

How z/OS.e differs from z/OS

If you're familiar with z/OS, this topic will help you understand z/OS.e by describing its differences.

Operating system objective: z/OS.e is designed to run new e-business workloads. z/OS can also run these workloads (as well as traditional workloads), but not as inexpensively as z/OS.e can.

Processor supported: The only IBM server on which z/OS.e runs is the IBM @server zSeries 800 (z800) server. (z/OS V1R3 runs on any IBM @server zSeries server.) z/OS.e requires the z800 to run in LPAR mode (not basic mode).

Elements and features supported: Because z/OS.e does not support traditional workloads, some elements and features (listed below) are not supported. They are

included in the z/OS.e code that you receive (z/OS and z/OS.e have identical code), and you install and maintain them, but they are not usable. Various means are employed to make them unusable, depending on the particular element or feature: code that is not functional (“dead code”), a license for use not available, a feature that is not orderable.

The base elements that are supported in z/OS V1R3 but not in z/OS.e V1R3 are:

- BookManager READ (not functional and not licensed for use)
- DCE Application Support (not functional and not licensed for use)
- Encina Toolkit Executive (not licensed for use)
- GDDM (not functional and not licensed for use)
- MICR/OCR (not licensed for use)

The optional features that are supported in z/OS V1R3 but not in z/OS.e V1R3 are:

- BDT File-to-File (not functional and not licensed for use)
- BookManager BUILD (not functional and not licensed for use)
- Communications Server NPF (not orderable)
- GDDM-PGF (not functional and not licensed for use)
- GDDM-REXX (not functional and not licensed for use)

JES level supported: You cannot use a prior JES2 or JES3 level with the current level of the rest of z/OS.e. (With z/OS, it is allowable to use certain prior JES levels as a means of easing a migration to the current level of z/OS.)

Middleware supported: Because z/OS.e does not support traditional workloads, you cannot run CICS, IMS, COBOL, Fortran, and PL/I products on z/OS.e. For a list of supported and unsupported products on z/OS.e, see Appendix C, “Minimum releases of IBM software products that run with z/OS and z/OS.e” on page 183.

Release cycles: The first release of z/OS.e is z/OS.e V1R3. (The first release of z/OS was z/OS V1R1.) Keeping the z/OS and z/OS.e release numbers synchronized makes it easier to keep track of release content. z/OS and z/OS.e are made available at the same time with the same release number with the same content (except for the functions provided by elements and features that are included in z/OS but not in z/OS.e).

Ordering: Because certain products that run on z/OS do not run on z/OS.e, they are not orderable with z/OS.e. None of the products in the CICS and NCP system release identifiers (SRELs), and only some of the products in the MVS and DBS SRELs, are orderable with z/OS.e. (All products in all four SRELs are orderable with z/OS.)

Installation: You cannot install z/OS.e using CBPDO. But you can use any of the other methods supported by z/OS, and you can service z/OS.e using CBPDO.

Administration: With z/OS.e, BookManager help is not available. This is because BookManager READ is not available in z/OS.e.

With z/OS.e, vector graphics in IBM and non-IBM product documentation might not display correctly because GDDM is not supported. If you experience this problem, convert problematic books using the Book Graphics Conversion Utility (TransMogrifier), which is available free of charge as a download from the BookManager Web site at <http://www.ibm.com/software/office/bkmgr/transmog.html>. Converted books have no dependency on GDDM.

Customization: To put your system in z/OS.e mode, you must specify the system parameter LICENSE=z/OS.e. (The default is LICENSE=z/OS, which puts your system in z/OS mode.) You specify LICENSE=z/OS.e as you would other system parameters, that is, in the system parameter list (IEASYSxx) in parmlib or at the operator console during IPL.

When you specify (via HCD) the name of the LPAR in which z/OS.e runs, you must use the form ZOSExxxx for the z/OS.e LPAR name, where xxxx is any valid combination of zero to four characters. Once the LPAR is named ZOSExxxx, you cannot run z/OS in this LPAR. z/OS cannot run on a z800 server in an LPAR named ZOSExxxx. Only z/OS.e can run on a z800 server in an LPAR named ZOSExxxx.

The program number (product number) of z/OS.e is 5655-G52. (For z/OS it's 5694-A01.) Thus, in IFAPRDxx, which is the parmlib member for dynamic enablement, the PRODUCT statement's ID value is 5655-G52 for z/OS.e. The NAME value, however, is 'z/OS', just as it is for z/OS.

Application programming: z/OS.e does not run the following types of applications: CICS, IMS, COBOL (with an exception), Fortran, and PL/I (with an exception). The COBOL exception is that precompiled COBOL DB2 stored procedures and other precompiled applications that use the Language Environment preinitialization interface (CEEPIPI) are supported. The PL/I exception is that precompiled PL/I applications are supported. These COBOL and PL/I applications could be compiled on a z/OS or OS/390 system, then run on a z/OS.e system.

Run-time library services (RTL) is not supported with z/OS.e. (With z/OS, RTL allows you to access different levels of the Language Environment run-time libraries, controlled by run-time options.) In addition, other mechanisms, such as using STEPLIB DD statements or the link list, whereby an older level of Language Environment is used for application execution, are not allowed. Using these mechanisms violates the z/OS.e license agreement.

The Language Environment library routine retention (LRR) function is not supported with z/OS.e. (With z/OS, LRR can improve the performance of applications and subsystems.)

Compatibility preinitialization for C and PL/I is not supported with z/OS.e.

In z/OS.e, you cannot use the C/C++ Run-Time Library functions `__osname()` or `uname()` to find out if the operating system is z/OS.e. The functions do not return a result unique to z/OS.e; they return the same result as in z/OS. To find out if the operating system is z/OS.e, a program must check the CVTZOSE indicator in the CVTOSLV5 field of the communications vector table (CVT). When the indicator is on, the operating system is z/OS.e. The CVT is described in *z/OS MVS Data Areas, Vol 1 (ABEP-DALT)*.

Operation: When you IPL z/OS.e, you receive the message IEA101A SPECIFY SYSTEM PARAMETERS FOR z/OS 01.03.00 HBB7706 even though you are IPLing z/OS.e and not z/OS. After IPL, if you want to make sure you're running a z/OS.e system, you can issue the D IPLINFO command. The response will indicate LICENSE=z/OS.e or LICENSE=z/OS, depending on which system you're running.

z/OS.e can run as a VM guest, but only under z/VM (not VM/ESA), only on a z800 server, only in an LPAR, and only with the LPAR named ZOSExxxx (where xxxx is any valid combination of zero to four characters). This LPAR name restriction

ensures compliance with z/OS.e license terms, which prohibit z/OS and OS/390 from running in a z800 LPAR named ZOSExxxx. (Linux for S/390 and Linux for IBM @server zSeries are the only other operating systems that may run as a guest under z/VM in an LPAR named ZOSExxxx.) z/OS.e licensees are required to submit data to IBM that shows LPAR names. (The ZOSExxxx LPAR name restriction is only applicable to z800 servers, not other servers.)

Ensure that your automation policies, including automatic restart management policies, do not try to use a z/OS.e image to start products that z/OS.e does not support. For example, do not identify a z/OS.e image as a restart target in a Parallel Sysplex configuration that contains a mix of z/OS.e and z/OS images with the z/OS images running IMS, CICS, or DB2 having a requirement for CICS. CICS, IMS, or DB2 using CICS cannot restart on a z/OS.e image, but must restart on a z/OS image.

The number of concurrent TSO/E sessions is limited to eight in z/OS.e

Web site: The z/OS.e Web address is <http://www.ibm.com/eserver/zseries/zose/>.

Summary of changes for the z/OS installation planner

This topic describes the release-to-release differences that affect z/OS installation planning.

Changes in z/OS V1R3

Changed base elements: The following base elements have changed in z/OS V1R3 compared with z/OS V1R2. There could be migration actions for you to take. Refer to “Identifying z/OS and z/OS.e element and feature migration actions” on page 105.

- BCP
- Cryptographic Services
- DFSMSdfp
- Distributed File Service
- Language Environment
- TSO/E
- z/OS UNIX System Services

Changed optional features: The following optional features have changed in z/OS V1R3 compared with z/OS V1R2. There could be migration actions for you to take. Refer to “Identifying z/OS and z/OS.e element and feature migration actions” on page 105.

- DFSMSdss
- DFSMShsm
- DFSMSrmm
- Security Server (formerly known as SecureWay Security Server)

Deleted base elements: The base element LANRES has been withdrawn. For details, including migration advice, see “Withdrawn as of z/OS V1R3 (last delivered in z/OS V1R2)” on page 24.

Deleted functions: Workload manager (WLM) compatibility mode is withdrawn. In addition, the KEYRANGE specification is ignored on the IDCAMS DEFINE and IMPORT commands for any new data sets. For details, including migration advice, see “Withdrawn as of z/OS V1R3 (last delivered in z/OS V1R2)” on page 24.

OCEP now licensed with base: The Open Cryptographic Enhanced Plug-ins (OCEP) component of optional feature Security Server is now licensed with the base operating system and can be used without ordering or enabling Security Server.

Driving system requirements raised: The minimum level of an OS/390 system used as a driving system to install z/OS V1R3 is now OS/390 R8. For z/OS V1R2, it was OS/390 R6.

3590 tape delivery added: z/OS is now available on 3590 tape cartridges for ServerPac and CBPDO orders. Previously, z/OS was available on 3590 tape cartridges for SystemPac orders but not ServerPac or CBPDO orders.

New ServerPac-supplied jobs: Two ServerPac sample jobs are new. CSFSETMK helps you set up ICSF and IWMINSTL helps you set up WLM goal mode.

RSU redefined: The definition of a Recommended Service Upgrade (RSU) has changed. The change affects which PTFs are identified as RSU, when they are assigned RSUyymm SOURCEIDs, and the month used in the SOURCEID. For more information, see “Maintenance after installation” on page 37.

ShopzSeries for ordering service: ShopzSeries service ordering capabilities have been expanded beyond ordering support for service-only CBPDO. You can now order individual PTFs by PTF or APAR number (which you would do for corrective service) and you can order Recommended Service Upgrades (RSUs, which you would order for preventive service).

Binder COMPAT option default changed: The program management binder COMPAT option default has changed from CURRENT to the new option, MIN. For details, see “BCP — binder COMPAT option default change” on page 111.

IFAPRDxx changed: The IFAPRDxx parmlib member shipped by IBM now has statements for z/OS.e as well as for z/OS. The statements are separated by a commented section. The product and features that you ordered are enabled, and the product and features that you did not order are disabled.

More msys for Setup exploiters: In z/OS V1R3 you can use msys for Setup to set limits on your UNIX system resources, such as the maximum number of user IDs that can be concurrent at one time and the maximum number of processes that the system will run at one time. These settings are stored in the z/OS UNIX parmlib member BPXPRMxx. The system will do self-discovery and prime with the values that your system already has, and you can use msys for Setup property sheets to do any ongoing customization of BPXPRMxx.

Also in z/OS V1R3 you can use msys for Setup to configure the default system-wide run-time options for Language Environment. msys for Setup builds the necessary configuration files, through an easy-to-use dialog and accompanying help text, which you then put into production. In addition, you can use msys for Setup to create the region-wide run-time options for both CICS and IMS regions.

Changes in z/OS V1R2

New base element: msys for Operations is a new base element. You'll find a description in Table 1 on page 3, software requirements in Table 15 on page 170, and hardware requirements in Table 17 on page 199.

New optional feature: Security Server Network Authentication Service Level 3 is a new unpriced optional feature. You'll find a description in Table 1 on page 3, software requirements in Table 15 on page 170, and hardware requirements in Table 17 on page 199.

Changed base elements: The following base elements have changed. There could be migration actions for you to take. Refer to the migration table in Chapter 6, "Preparing for migration" on page 101.

- BCP
- BookManager BookServer
- C/C++ IBM Open Class Library
- Communications Server
- Cryptographic Services
- Distributed File Service
- ISPF
- JES2
- Language Environment
- SMP/E
- z/OS UNIX System Services

Changed optional features: The following optional features have changed. There could be migration actions for you to take. Refer to the migration table in Chapter 6, "Preparing for migration" on page 101.

- C/C++ with Debug Tool
- C/C++ without Debug Tool
- Communications Server NPF (FMID change only, no functional change)
- Communications Server Security Level 3
- Infoprint Server
- JES3
- RMF
- SDSF
- Security Server (including the Network Authentication and Privacy Service component renamed to Network Authentication Service)
- System SSL Security Level 3

Deleted base elements: The following base elements have been removed from z/OS. For details, including migration advice, see "Withdrawn as of z/OS V1R2 (last delivered in z/OS V1R1)" on page 23.

- LAN Server
- SOMobjects RTL
- Tivoli Management Framework

Deleted optional features: The following optional features have been removed from z/OS. For details, including migration advice, see "Withdrawn as of z/OS V1R2 (last delivered in z/OS V1R1)" on page 23.

- Communications Server Security Level 1
- Communications Server Security Level 2
- SOMobjects ADE

In addition, there is no upgrade package for z/OS V1R2 as there was for V1R1. The *z/OS V1R1 Upgrade Package for OS/390 V2R10* remains an orderable feature (until 25 June 2002) for those migrating from OS/390 R10 to z/OS V1R1, but there is no such feature for migrating to z/OS V1R2.

Deleted functions: Certain functions within ISPF, the C/C++ compiler, RMF, and Infoprint Server have been removed from z/OS. For details, including migration advice, see “Withdrawn as of z/OS V1R2 (last delivered in z/OS V1R1)” on page 23.

Support for Unicode integrated: Support for Unicode is integrated in the BCP in z/OS V1R2. For z/OS V1R1 (as well as for OS/390 R8, R9, and R10), this support is only available via download from the Internet. Thus, for z/OS V1R2, you don't have to take the extra step of downloading from the Web in order to obtain this support.

More msys for Setup exploiters: Usage of msys for Setup was extended to let you:

- Create the basic IP configuration files
- Create the ISPF configuration table keyword file and load module
- Perform additional tasks for Parallel Sysplex configuration, such as setting up the system logger
- Set up a base sysplex

Stand-alone SMP/E product: SMP/E is now a stand-alone product (5655-G44) as well as a base element of z/OS. Prior to z/OS V1R2, SMP/E was only a base element. The new product allows customers who are licensed for an earlier level of z/OS or OS/390 to order and install the latest level of the SMP/E product without having to upgrade their entire operating system. As a result, new products that run on z/OS or OS/390 can exploit the packaging and installation enhancements of SMP/E without the need for a later level of the operating system.

9345 DASD: The Customized Offerings Driver (5665-343) no longer supports 9345 DASD devices. It continues to support 3380 and 3390 DASD devices. The driver is described in “What is the Customized Offerings Driver?” on page 57.

ServerPac package version: A package version is now printed on the cover of *ServerPac: Installing Your Order*. It helps you determine which PSP entries are applicable to your ServerPac order and which can be ignored because the problems they describe were fixed before your package was built.

Optional source materials: Optional source materials are now distributed in IEBCOPY rather than IEBUPDTE format. With this new format, there is one logical file per tape that contains source modules, and all source modules on the tape are unloaded in a single job step. The tape is now delivered as standard label. Also, optional source materials are no longer distributed on 3420 tapes (written at 6250 bpi). Refer to *z/OS Program Directory* for instructions on how to unload the optional source materials, and parameters to use during assembly.

Coexistence, fallback, and migration: Because of the close relationship between coexistence, fallback, and migration, a single and consistent four-consecutive-release policy has been defined for all three. See “Coexistence-Migration-Fallback policy” on page 85.

Cross-zone requisite checking: You are reminded (in “Separating data from software” on page 132) of the importance of doing cross-zone requisite checking when you install z/OS. Cross-zone requisite checking helps you determine whether any subsystem products need to be upgraded to run with z/OS. With ServerPac, you run the SMPREP job or the REPORT CROSSZONE command. With CBPDO, if you follow the instructions in *z/OS Program Directory*, you should do cross-zone requisite checking during APPLY processing. If you don't follow the instructions, run

a REPORT CROSSZONE command. A good example of the importance of cross-zone requisite checking is the case where certain PTFs must be applied to CICS/ESA V4 (5655-018) and CICS Transaction Server (TS) for OS/390 V1 (5655-147); otherwise, z/OS Language Environment will fail to initialize. To find out the PTF numbers, see Language Environment in Appendix B, “Software requirements for z/OS and z/OS.e elements and features” on page 169.

Product sets: You are reminded (in “Product set for z/OS or z/OS.e and closely-related products” on page 137) that products that install into data sets that cannot be concatenated, such as SYS1.NUCLEUS, should be included in the z/OS product set. PSF is an example of such a product that should be included in the z/OS product set.

No more JES level-dependent qualifiers: Prior to z/OS V1R2, to help you stage your JES2 or JES3 migration (that is, migrate JES2 or JES3 sometime after the rest of the system), IBM added level-dependent qualifiers to JES2 and JES3 data sets. This made it easier to separate your existing JES from the new JES shipped with z/OS. As of z/OS V1R2, the level-dependent qualifiers for JES2 and JES3 are gone, just as they are for the other elements and features. If you want to stage your migration to JES2 or JES3, you must now perform the extra step of renaming (with static names, for example) your existing JES2 or JES3 data sets to avoid conflicts with the new JES names. This topic appears in “Data set names restructured” on page 152.

Changes in z/OS V1R1

New product name: z/OS is the follow-on to OS/390. Throughout the book, references to the operating system name have been changed appropriately.

New and changed elements and features: Two base elements are new: Managed System Infrastructure for Setup (msys for Setup) and IBM License Manager (ILM). (ILM is not yet available for use.) One base element is changed: BCP. No base elements are deleted. No optional features are new, changed, or deleted. You’ll find descriptions of the new base elements in Table 1 on page 3, software requirements in Table 15 on page 170, and hardware requirements in Table 17 on page 199.

z/OS V1R1 Upgrade Package for OS/390 V2R10: This CBPDO-installable deliverable (unpriced feature) is provided exclusively for those migrating from OS/390 R10 to z/OS V1R1. Its purpose is to provide a quick and easy upgrade to the first release of z/OS. It consists of the two new base elements (msys for Setup and ILM, the latter not yet available for use) and the one updated base element (BCP). All the other base elements and optional features are unchanged from OS/390 R10; there’s no need to reinstall them.

Driving system requirements: Driving system requirements have changed as follows. For these and all driving system requirements, see Chapter 3, “Preparing the driving system” on page 57.

- MVS/ESA SP V5 is no longer allowed as a driving system.
- The minimum OS/390 driving system is now OS/390 R6; it used to be OS/390 R4.
- The Customized Offerings Driver (5665-343) is now a subset of an OS/390 R9 system; it used to be a subset of an OS/390 R4 system.
- Because the driving system now requires OS/390 UNIX System Services in full function mode with a working pax command, data sets (both HFS and non-HFS) for ServerPac and dump-by-data-set SystemPac orders must now be unloaded

only from the driving system. Prior releases allowed the HFS data sets to optionally be unloaded from the target system.

Processors supported: z/OS V1R1 exploits architectural enhancements that are implemented on certain processors. Therefore, z/OS V1R1 runs only on certain processors.

- z/OS V1R1 runs on the following new processor (as does OS/390 R10):
 - IBM @server zSeries 900 (z900)
- z/OS V1R1 also runs on the following processors (as does OS/390 R10):
 - IBM S/390 Parallel Enterprise Server – G5 and G6
 - IBM S/390 Multiprise 3000
- z/OS V1R1 does not run on the following processors that OS/390 R10 runs on:
 - IBM Parallel Enterprise Server – R2 and R3 models as well as G3 and G4
 - IBM S/390 Multiprise 2000
 - IBM S/390 Integrated Server
 - IBM PC Server System/390
 - IBM RS/6000 and System/390 Server-on-Board

Processor support is described in “Identifying processor requirements” on page 72. For information about migrating both your processor and operating system, see “Deciding which to migrate first — software (to z/OS) or hardware (to z800 or z900)” on page 101.

Coexistence: OS/390 R10 and z/OS V1R1 are being treated as a single coexistence level, rather than two coexistence levels, due to the unique characteristics of z/OS V1R1 and the z/OS V1R1 Upgrade Package for OS/390 V2R10. For details, see “Coexistence-Migration-Fallback policy” on page 85.

ServerPac, CBPDO, and SystemPac: The following changes were made to the packages you can use to install z/OS:

- The ServerPac and SystemPac offerings are enhanced to help decrease the amount of time spent in the CustomPac Installation Dialog while installing z/OS. These enhancements include:
 - The ability to have all or some target and DLIB data sets assigned to physical volumes automatically. Using the dialog’s Recommended System Layout option, you can quickly configure a system according to z/OS’s recommended system layout.
 - A new View and Change facility to make it easier to change data set attributes and move data sets between volumes.
 - The ability to rename all data sets in the order.
 - Other enhancements satisfying many customer requirements.
- ServerPac and SystemPac are enhanced to include the creation of a monoplex sysplex environment; the enablement of WLM in goal mode; the enablement of the OCSF Base component of the Cryptographic Services element; and the use of the system logger for LOGREC and OPERLOG. Additionally, a security environment will be created to support each of these functions. Finally, SystemPac is enhanced with the enablement of resource recovery services (RRS).
- SystemPac is further enhanced with the default enablement of the following:
 - CICS Transaction Server for OS/390 V1R3 (5655-147) now has the following enabled: CICS log manager, CICS Web support, CICS 3270 bridge, and external CICS interface.

- DB2 Universal Database Server for OS/390 V6R1 (5645-DB2) now has the following enabled: DB2 ODBC, DB2 JDBC, DB2 Net.Data, and WLM-established stored procedures.

HOLDDATA cover letters for ISV products installed using SMP/E are now supported by SystemPac. The cover letters will be delivered using the same mechanism as for IBM products. You will now be able to review the ISV HOLDDATA for the service applied to your SystemPac order without the need to contact ISV support.

More ISV products are now available for ordering through SystemPac, representing an increase in both the number of products and the vendor representation. For a list of available ISVs offered with SystemPac, visit <http://www.ibm.com/ca/custompac/>.

Chapter 2. Choosing the software installation method

You were introduced to the various packages available for installing z/OS and z/OS.e in “Methods of installing z/OS and z/OS.e” on page 27. You learned that ServerPac is entitled (provided as part of your z/OS license) with z/OS and z/OS.e, and that CBPDO is also entitled with z/OS but may not be used to install z/OS.e. Other packages, such as SystemPac, are available for an additional fee. Now it’s time to choose one of the installation packages. This chapter helps you make your decision.

Packages for installing z/OS

If you’re new to z/OS and never had OS/390, or if you’re migrating from an operating system level that is no longer supported (OS/390 R7 and earlier, including any of the MVS operating systems), use one of the following to install z/OS:

- ServerPac using the full system replacement installation path. (ServerPac is entitled.) You will need the Customized Offerings Driver (5665-343) as a driving system. (The Customized Offerings Driver is entitled.)
- SystemPac in full volume dump format. (SystemPac is available for a fee.)
- One of the other fee methods.

If you’re migrating to z/OS from any z/OS release or from OS/390 R8, R9, or R10, use any method (ServerPac, CBPDO, or fee) to install z/OS:

- Of the entitled methods (ServerPac and CBPDO):
 - Use ServerPac if most of the elements and features already installed on your system are not equivalent to the z/OS V1R3 level. Of your two choices within ServerPac, software upgrade is preferable to full system replacement in the following cases:
 - You’re creating a new system image that will share operational data sets (like the master catalog and parmlib) with existing systems.
 - Your new environment will be similar to your old one.
 - Your data set layouts will be the same or similar. (IBM’s recommendations are described in “Placing data sets on specific volumes” on page 135).
 - You prefer to migrate your operational data sets before (not after) IPLing the new system for the first time.
 - Use CBPDO only if most of the elements and features already installed on your system are equivalent to the z/OS V1R3 level, your enterprise has good to excellent product installation skills, and you are within six months of service currency. Otherwise, using ServerPac will probably take significantly less time and effort.
- Of the methods available for a fee (SystemPac full volume dump, SystemPac dump-by-data-set, and the other more-tailored services):
 - Use SystemPac full volume dump if you can. The restore of the system is performed via volume restore. You get an IPLable system within a day. There is no need to use installation dialogs for restoring and customizing. All customizing is performed up front during local order entry, which an IBM technical representative will guide you through.
 - Use SystemPac dump-by-data-set if you want to do a software upgrade instead of a full system replacement. The software upgrade installation path is preferable to a full system replacement for the same reasons as in a ServerPac installation, described above.

- Choose other fee offerings (for example, Select in the United Kingdom, Software Management in Germany, Express Plus Offering in France) if you want to have more than a system replacement done. Some of the additional activities you might want done for you are system automation; production cutover; database and related applications migration; backup and recovery; data management; disaster recovery; parmlib, proclib, and VTAMLST conversion; and on-site support.

Notes:

1. Of the two entitled choices available for installing z/OS, most customers choose ServerPac rather than CBPDO.
2. To find out the driving system software and hardware requirements necessary to install a ServerPac, CBPDO, or SystemPac order, see Chapter 3, “Preparing the driving system” on page 57.
3. Migrating to a new processor could affect your choice of installation method. See “Deciding which to migrate first — software (to z/OS) or hardware (to z800 or z900)” on page 101.

Packages for installing z/OS.e

If you're installing z/OS.e, use one of the following:

- ServerPac. (ServerPac is entitled.) Of your two choices within ServerPac, software upgrade is preferable to full system replacement in the following cases:
 - You're creating a new system image that will share operational data sets (like the master catalog and parmlib) with existing z/OS or z/OS.e systems.
 - Your new environment will be similar to your old one.
 - Your data set layouts will be the same or similar. (IBM's recommendations are described in “Placing data sets on specific volumes” on page 135).
 - You prefer to migrate your operational data sets before (not after) IPLing the new system for the first time.
- One of the methods available for a fee (SystemPac full volume dump, SystemPac dump-by-data-set, and the other more-tailored services):
 - Use SystemPac full volume dump if you can. The restore of the system is performed via volume restore. You get an IPLable system within a day. There is no need to use installation dialogs for restoring and customizing. All customizing is performed up front during local order entry, which an IBM technical representative will guide you through.
 - Use SystemPac dump-by-data-set if you want to do a software upgrade instead of a full system replacement. The software upgrade installation path is preferable to a full system replacement for the same reasons as in a ServerPac installation, described above.
 - Choose other fee offerings (for example, Select in the United Kingdom, Software Management in Germany, Express Plus Offering in France) if you want to have more than a system replacement done. Some of the additional activities you might want done for you are system automation; production cutover; database and related applications migration; backup and recovery; data management; disaster recovery; parmlib, proclib, and VTAMLST conversion; and on-site support.

Note: To find out the driving system software and hardware requirements necessary to install a ServerPac or SystemPac order, see Chapter 3, “Preparing the driving system” on page 57.

Installing z/OS or z/OS.e without using an installation package

You might find that sharing system libraries or cloning an already-installed z/OS or z/OS.e system is faster and easier than installing z/OS or z/OS.e with an IBM installation package such as ServerPac. You won't have to wait for the order to be processed and the package delivered, and you won't have to use the CustomPac Installation Dialog twice. Sharing the system libraries (logical SYSRES volume) may also save DASD and support costs because you only need to install service (or additional products) once.

However, prior to sharing or cloning z/OS or z/OS.e, you must have a license for each z/OS and z/OS.e operating system that you run. If you don't have the appropriate license or licenses, you must contact IBM. Any sharing or cloning of z/OS or z/OS.e without the appropriate licenses is not an authorized use of such programs. On a z800, if you want to run both z/OS and z/OS.e, z/OS requires the appropriate license (zELC or, if in a Parallel Sysplex configuration, PSLC or WLC according to their terms) for the machine on which it runs, and z/OS.e requires a license for the number of engines on which it runs.

In addition, be sure you do the following:

- Make appropriate changes in parmlib members IFAPRDxx and IEASYSxx. In IEASYSxx, specify LICENSE= z/OS for z/OS, or LICENSE=z/OS.e for z/OS.e.
- When running on a z800, use HCD to specify an LPAR name that adheres to the appropriate format, which is ZOSExxxx for z/OS.e and a name other than ZOSExxxx for z/OS. (xxxx is any valid combination of zero to four characters.)

Chapter 3. Preparing the driving system

The *driving system* is the system image (hardware and software) that you use to install the target system. The *target system* is the system software libraries and other data sets that you are installing. You log on to the driving system and run jobs there to create or update the target system. Once the target system is built, it can be IPLed on the same hardware (same LPAR or same processor) or different hardware than that used for the driving system.

This chapter identifies the software and hardware you will need for your driving system. See Chapter 4, "Preparing the target system" on page 67 for the software and hardware you will need for your target system.

Notes:

1. Do not confuse the driving system discussed in this chapter (the installation driving system) with the msys for Setup driving system. To allow the setup of system components in a system that is not currently IPLed, msys for Setup supports a driving system and a target system. The msys for Setup driving system is the system where the msys for Setup code runs. The msys for Setup target system is the system that is being configured. For software requirements for the msys for Setup driving system, see Appendix B, "Software requirements for z/OS and z/OS.e elements and features" on page 169.
2. If your driving system will share resources with your target system after the target system has been IPLed, be sure to install applicable coexistence service (see Chapter 5, "Ensuring coexistence and fallback" on page 83) on the driving system before you IPL the target system. If you don't install the coexistence service, you will probably experience problems due to incompatible data structures (such as incompatible data sets, VTOCs, catalog records, GRS tokens, or APPC bind mappings).

What is the Customized Offerings Driver?

The Customized Offerings Driver (5665-343) is an entitled driving system you can use if (1) you don't have an existing system to use as a driving system or (2) your existing system does not meet driving system requirements and you don't want to upgrade it to meet those requirements. This driver is a subset of an OS/390 R9 system.

The Customized Offerings Driver is in DFSMSdss dump/restore format and supports 3380 and 3390 DASD devices. The Customized Offerings Driver requires a locally attached non-SNA terminal and a system console from the IBM (or equivalent) family of supported terminal types: 317x, 327x, 319x, or 348x. An IBM (or equivalent) supported tape drive is also required to restore the driver.

The Customized Offerings Driver is intended to run in single-system image and monoplex modes only. Its use in multisystem configurations is not supported. The Customized Offerings Driver is intended to be used only to install new levels of z/OS using ServerPac or CBPDO, or new levels of z/OS.e using ServerPac, and to install service on the new software until a copy (clone) of the new system can be made. The use of the Customized Offerings Driver for other purposes is not supported. For example, IBM does not support the use of the Customized Offerings Driver to run any production workload.

The Customized Offerings Driver includes an HFS and the necessary function to use Communications Server (IP Services), Security Server, and the

system-managed storage (SMS) facility of DFSMSdftp, but these items are not customized. However, existing environments can be connected to, and used from, the Customized Offerings Driver system. The Customized Offerings Driver supports non-SMS-managed PDSE and HFS data sets.

Depending on the level of your existing system, the Customized Offerings Driver might be at higher product and service levels. Therefore, as is true of the level of software you plan to install, fallback service might be necessary to let you IPL and use your existing level of software after the Customized Offerings Driver has been IPLed and used in any environment. **You must either (1) use the Customized Offerings Driver in a completely isolated environment or (2) install the needed fallback service on your existing system before the Customized Offerings Driver is IPLed.** A completely isolated environment shares no DASD with any other system and will not be used to IPL any lower level of software.

Installing the service on your existing system, as described in Chapter 5, “Ensuring coexistence and fallback” on page 83, will also satisfy the requirements for falling back from the Customized Offerings Driver. This will allow you to IPL and use your current level of software after using either the Customized Offerings Driver or the new system. (IBM has installed the service on the Customized Offerings Driver to allow it to be IPLed and used (if necessary) after the new system has been IPLed and used.)

Identifying driving system software requirements for installing z/OS or z/OS.e via ServerPac or dump-by-data-set SystemPac

Note: With z/OS (and z/OS.e), ServerPac installation has been simplified in that all data sets (including HFS data sets) are restored from the driving system. In OS/390, HFS data sets could optionally be restored from the target system. This option is not necessary in z/OS and has been removed.

Driving system requirements for installing z/OS or z/OS.e via ServerPac or dump-by-data-set SystemPac are:

- *An operating system:* Use one of the following:
 - z/OS V1R1 or V1R2 with the PTFs in Table 5 on page 60.
 - OS/390 R8, R9, or R10 with the PTFs in Table 5 on page 60.
 - The Customized Offerings Driver (5665-343). This entitled driving system is provided for those (1) who don't have an existing system to use as a driving system or (2) whose existing system does not meet the requirements of a driving system and who choose to not upgrade their driving system. For more information, see “What is the Customized Offerings Driver?” on page 57.
- *A terminal:* A locally-attached or network-attached terminal that can be used to establish a TSO/E session on the IPLed system is required.
- *Proper authority:* Use the RACFDRV installation job to establish the authorization necessary to define system resources.
- *OMVS address space:* For ServerPac only (not SystemPac), an activated OMVS address space with z/OS UNIX kernel services or OS/390 UNIX kernel services operating in full function mode is required.
- *SMS active:* The Storage Management Subsystem (SMS) must be active to allocate HFS and PDSE data sets, whether they are SMS-managed or non-SMS-managed. Also, the use of HFS data sets is supported only when SMS is active in at least a null configuration, even when the data sets are not SMS-managed. Do either of the following:

- To allocate non-SMS-managed HFS and PDSE data sets, you must activate SMS on the driving system in at least a null configuration. (If your driving system is OS/390, it is assumed that you have installed the PTFs for loading data sets, listed above.) You must also activate SMS on the target system.
- To allocate SMS-managed HFS and PDSE data sets, you must activate SMS on the driving system in at least a minimal configuration. Then you must define a storage group, create SMS-managed volumes, and write, translate, and activate a storage class ACS routine that allows the allocation of PDSE and HFS data sets with the names in the ALLOCDS job. You must also activate SMS on the target system.

- *DFSORT*: msys for Setup job XMLGNR8 requires DFSORT or an equivalent sort program on the system on which the XMLGNR8 job is run.
- *First-time installers*: If you are installing a ServerPac or dump-by-data-set SystemPac for the first time, you need to install the CustomPac Installation Dialog on your driving system. See *ServerPac: Using the Installation Dialog* or *SystemPac: CustomPac Dialog Reference* for instructions. For subsequent orders you do not need to reinstall the dialog. IBM ships dialog updates with each order. Version checking is carried out during the receive step, and if necessary, the dialog is updated during the install order step.

You should check the PSP bucket (for example, by using IBMLink) for possible updates to the CustomPac Installation Dialog. For ServerPac, the upgrade is ZOSV1R3 and the subset is SERVERPAC. For SystemPac dump-by-data-set orders, the upgrade is CUSTOMPAC and the subset is SYSPAC/DBD.

- *Service*: In order for you to install service on the target system that you're building, your driving system must minimally meet the driving system requirements for CBPDO Wave 2 (see "Driving system Wave 2" on page 65) and must have the current (latest) levels of the program management binder, SMP/E, and HLASM.

The service jobs generated by the CustomPac Installation Dialog use the target system's (and therefore current) level of the binder, SMP/E, and HLASM. (However, you must install binder PTFs UW85908 and UW86153, and SMP/E PTF UR53536 [service level 31.10].) If you choose to use your own jobs, model them after the jobs provided by ServerPac or dump-by-data-set SystemPac by adding STEPLIB DD statements to access MIGLIB (for the binder and SMP/E) and SASMMOD1 (for HLASM). Be sure that the SASMMOD1 and SYS1.MIGLIB data sets are APF authorized.

Note: If the SCEERUN data set is not in the link list on the driving system, you might have to edit some ServerPac installation jobs to add it to the JOBLIB or STEPLIB DD statement.

Another way to install service is from a copy of your target system.

Table 5. Driving System PTFs for ServerPac, SystemPac (dump-by-data-set), and CBPDO (Wave 1)

OS/390 or z/OS release	PTFs
OS/390 R8	<ul style="list-style-type: none"> • BCP: UW66028, UW80587 • DFSMSdftp: UW62149, UW62253, UW64190, UW65974, UW66947, UW67755, UW68775, UW68805, UW69622, UW72305, UW73004, UW79796, UW79863, UW79888, UW80446, UW85185 • DFSMSdss: UW65985, UW66179, UW66448 • DFSMSHsm: UW66208 • ISPF: UW66121 • OS/390 UNIX System Services: UW68480, UW75984, UW78319 • Security Server: UW76338 • TSO: UW66144
OS/390 R9	<ul style="list-style-type: none"> • BCP: UW66028, UW80589 • The same DFSMSdftp, DFSMSdss, and DFSMSHsm PTFs as for OS/390 R8 • OS/390 UNIX System Services: UW68482, UW75985, UW78322 • Security Server: UW76338 • TSO: UW66144
OS/390 R10 or z/OS V1R1	<ul style="list-style-type: none"> • BCP: UW80588, UW84942 • DFSMSdftp: UW69623, UW72306, UW79797, UW79864, UW79889, UW80447, UW85001, UW85186 • DFSMSdss: UW76514 • OS/390 UNIX System Services: UW75986, UW78320 • Security Server: UW76339 • TSO/E: UW66144, UW72455
z/OS V1R2	<ul style="list-style-type: none"> • BCP: UW84943 • The same DFSMSdftp and DFSMSdss PTFs as for z/OS V1R1 • The same TSO/E PTFs as for z/OS V1R1

Preparing for installation

If you are going to install z/OS or z/OS.e using ServerPac or dump-by-data-set SystemPac, take the following steps:

1. Separate customization data, non-z/OS products, and non-z/OS.e products from your system software as described in “Separating data from software” on page 132. This will minimize your installation and migration workload not only for this installation but for future ones.
2. Plan your data set layout ahead of time. Before running any of the jobs generated by the CustomPac Installation Dialog, decide where (on which volumes) you want to place product libraries and other data sets. You may choose to implement IBM’s recommended layout as described in “Recommended data set placement” on page 138, or you could lay out the same catalog and volume structure of your current system. After completing the installation, you can save the configuration (including layout) and use it in future installations.

The easiest way to implement IBM’s recommended layout is to assign your order’s data sets to DASD volumes automatically, using the dialog’s Create a

Recommended System Layout function. This function helps you configure a target system that complies with the recommended system layout. The alternative is to assign data sets manually using either (1) the View and Change Data Sets by Selected Attributes function or (2) the Summary Display commands on the Modify System Layout Options panel.

As part of layout planning, decide whether you'll want to merge any data sets that have matching attributes in order to create a single panel library, single message library, and so forth. This is most easily done using the View and Change Data Sets by Selected Attributes option. See *ServerPac: Using the Installation Dialog* or *SystemPac: CustomPac Dialog Reference* for information about merging data sets in a ServerPac or dump-by-data-set SystemPac. Be aware that not all data sets that can be merged should be merged.

3. If possible, have empty volumes available onto which you will install your order. Empty volumes make it easier to start over if necessary. But if you choose to place data sets on volumes that are not empty, follow these steps:
 - a. Back up the target volumes.
 - b. Check the names of data sets on the volumes. A data set name on a given volume must not be the same as the name of a data set that you plan to install on that volume. You can use the Report function of the CustomPac Installation Dialog to get a list of data sets in your current configuration.

All data sets are initially allocated with a system-specific alias (SSA). Later during installation they are renamed to remove the SSA. If you are installing onto existing volumes you must ensure that the existing data set names are unique. For example, data set XYZ will be initially allocated as SSA.XYZ. Later during installation it will be renamed to XYZ. Therefore, neither SSA.XYZ nor XYZ can previously exist on the same volume.
4. Make sure that any data sets you choose to SMS-manage will not have names, with or without an SSA, that duplicate the names of existing data sets on your driving system. This is because SMS-managed data sets cannot coexist with like-named data sets in the driving system's catalog structure. Data sets with duplicate names will become inaccessible from your driving system during installation, and installation jobs will fail.
5. If you have decided to do a software upgrade instead of a full system replacement, follow these steps:
 - a. Back up catalogs that will be updated by the installation process. You can use the Defining Alias-to-Catalog Relationships panel in the CustomPac Installation Dialog to determine which catalogs will be updated. Consider using a DASD backup utility such as DFSMSdss or the IDCAMS EXPORT TEMPORARY command. (But don't use the IDCAMS REPRO command. REPRO changes volume ownership for VSAM and SMS-managed data sets from the input catalog to the output catalog.) For information about DFSMSdss, see *z/OS DFSMSdss Storage Administration Guide* and *z/OS DFSMSdss Storage Administration Reference*. For information about backing up catalogs using the EXPORT command, see *z/OS DFSMS: Managing Catalogs* and *z/OS DFSMS Access Method Services for Catalogs*.
 - b. Back up other operational data sets (like parmlib, proclib, and the primary RACF database) that will be updated during the installation.
 - c. When using the CustomPac Installation Dialog's Modify System Layout function, make sure that the data set layout you specify matches your current system's catalog and volume structure (with the exception of new data sets that will be allocated as part of the installation and old data sets that you don't need to keep). If you choose software upgrade, you will run

two installation jobs that report differences between the data set layout you specify and the current system's data set layout.

If you cannot avoid changing the layout, you have to decide whether to change the existing configuration or the new configuration. If the existing catalogs will never be used to IPL a system other than the new target, or the changes will not affect other systems that use the same catalog, you can change the existing configuration. However, if the existing catalogs will be used to IPL other systems and there is a possibility that users of those systems will be adversely impacted by the changes that the new catalog entries introduce, you must change your existing environment before performing the installation, change your planned configuration to make it compatible with your existing environment, or use new catalogs for the installation.

6. Set up parmlib and proclib concatenation as described in *z/OS MVS Initialization and Tuning Reference*. This step will save migration time now and in future installations.
7. If you use indirect cataloging at your site and have chosen to do a full system replacement, you will have some additional migration work to do after installing because the new catalogs created by the installation process use volume/unit referencing, not indirect cataloging. You can do one of the following:
 - Add the new entries to your existing catalogs and connect the new user catalogs to your existing catalogs.
 - Update the new catalogs to use indirect and extended indirect catalog entries.

Identifying driving system software requirements for installing z/OS or z/OS.e via full volume dump SystemPac

For a SystemPac full volume dump installation, there are three possible ways to restore your order:

- With stand-alone utilities.

If you do not have a z/OS or OS/390 driving system, your SystemPac order contains the stand-alone versions of the following utility programs so that you can install your order:

- ICKDSF, to be used to initialize DASD, create VTOCs, and perform other utility functions during system installation
- DFSMSdss, to restore the volume from tape to DASD

The utilities are provided based on selections you make during local order entry. See the *SystemPac Installation Guide* supplied with your order for details about running these utilities.

- With batch JCL.

This is the most common way to install a full volume dump order. If you have a z/OS or OS/390 driving system, you can install your order through a batch job that initializes and restores the DASD volumes. However, you need to have the following software:

- ICKDSF R16
- DFSMSdss V1R4 or later, or Innovation Data Processing's FDR V5.3.44 or later

The JCL to restore the DASD volumes is described in the *SystemPac Installation Guide* supplied with your order.

A full volume dump order is a load-and-go implementation that allows you to IPL your system as it is restored. You can customize after you have brought up your target system. Jobs are “file-tailored” and stored in a library, as described in the *SystemPac Installation Guide*.

- With the CustomPac Installation Dialog.

If you previously installed a ServerPac or dump-by-data-set SystemPac order and you have the CustomPac Installation Dialog installed, you can use the dialog to receive your order from the RIM tape and then use the dialog to install your order. If you use this method, after your DASD volumes are restored and the catalog volume is available, you need to connect the target system master catalog to your driving system. For details, see the *SystemPac Installation Guide* sent with your order.

Identifying driving system software requirements for installing z/OS via CBPDO

When you use the CBPDO method of installing z/OS you install in four stages called *waves*. (Waves 1 and 2, in order to be more manageable, are divided into several tasks called *ripples*.) This section describes the driving system requirements for each wave.

Note: z/OS.e cannot be installed using CBPDO.

Driving system Wave 0

In Wave 0 you install the program management binder (part of the BCP), the HLASM base element, and the SMP/E base element. These items must be installed on (available from) the driving system for subsequent wave installations.

You can use either of the following as the driving system for installing Wave 0:

- OS/390 R8 or later. Also, if you install from 3590 tape, you should have the PTFs for DFSMSdfp APAR OW51956 installed on your driving system. The PTFs are UW85185 for OS/390 R8 and R9, and UW85186 for OS/390 R10, z/OS V1R1, and z/OS V1R2.
- The Customized Offerings Driver (5665-343). This entitled driving system is provided for those (1) who don't have an existing system to use as a driving system or (2) whose existing system does not meet the requirements of a driving system and who choose to not upgrade their driving system. For further information, see “What is the Customized Offerings Driver?” on page 57.

Driving system Wave 1

In Wave 1 you install elements and features that establish (1) IP connectivity and (2) an activated OMVS address space with z/OS UNIX kernel services operating in full function mode.

Driving system requirements for installing Wave 1 are:

- *An operating system:* Use one of the following:
 - z/OS V1R1 or V1R2 with the PTFs in Table 5 on page 60, except that the binder and SMP/E must be at the current (latest) levels.

To satisfy the binder and SMP/E requirements, you can use a STEPLIB DD statement to access the z/OS V1R3 binder and z/OS V1R3 SMP/E in the Wave 0 target system's SYS1.MIGLIB data set. Ensure that the target system's SYS1.MIGLIB data set is APF authorized on the driving system.

Also, ensure that binder PTFs UW85908 and UW86153, and SMP/E PTF UR53536 (service level 31.10), are installed.

- OS/390 R8, R9, or R10, except that the binder, SMP/E, and HLASM must be at the current (latest) levels. Also, the same PTFs are required as in a ServerPac installation; they are listed in Table 5 on page 60.

To satisfy the binder, HLASM, and SMP/E requirements, you can use STEPLIB DD statements to access z/OS V1R3 HLASM in the Wave 0 target system's SASMOD1 data set, and the z/OS V1R3 binder and z/OS V1R3 SMP/E in the Wave 0 target system's SYS1.MIGLIB data set. Ensure that the target system's SASMOD1 and SYS1.MIGLIB data sets are APF authorized on the driving system. Also, ensure that binder PTFs UW85908 and UW86153, and SMP/E PTF UR53536 (service level 31.10), are installed.

- The Customized Offerings Driver (5665-343).
- *Proper authority:* In order for you to install into the HFS, the user ID you use must be one that:
 - Is a superuser (UID=0) or has read access to the BPX.SUPERUSER resource in the RACF facility class.
 - Has read access to facility class resources BPX.FILEATTR.APF and BPX.FILEATTR.PROGCTL (or BPX.FILEATTR.* if you choose to use a generic name for both resources).

In order to define these facility class resources, you can use the following commands (which are also provided in SYS1.SAMPLIB member BPXISEC1 and in the z/OS UNIX Customization Wizard at <http://www.ibm.com/eserver/zseries/zos/wizards/>):

```
SETRPTS CLASSACT(FACILITY) RACLIST(FACILITY)
RDEFINE FACILITY BPX.FILEATTR.APF UACC(NONE)
RDEFINE FACILITY BPX.FILEATTR.PROGCTL UACC(NONE)
```

```
PERMIT BPX.FILEATTR.APF CLASS(FACILITY) ID(your_userid) ACCESS(READ)
PERMIT BPX.FILEATTR.PROGCTL CLASS(FACILITY) ID(your_userid) ACCESS(READ)
SETRPTS RACLIST(FACILITY) REFRESH
```

Or, if you choose to use a generic facility:

```
SETRPTS CLASSACT(FACILITY) GENERIC(FACILITY) RACLIST(FACILITY)
RDEFINE FACILITY BPX.FILEATTR.* UACC(NONE)
```

```
PERMIT BPX.FILEATTR.* CLASS(FACILITY) ID(your_userid) ACCESS(READ)
SETRPTS RACLIST(FACILITY) REFRESH
```

- *SMP/E UTILITY entry:* An SMP/E UTILITY entry for the binder is required. You can specify any of these program names in the UTILITY entry: IEWBLINK, HEWL, IEWL, LINKEDIT, or HEWLH096. (The linkage editor, which uses the names HEWLKED, HEWLF064, IEWLF440, IEWLF880, and IEWLF128, cannot be used.)
- *Language Environment:* You must add SCEERUN (the run-time library provided by Language Environment) to your program search order because many elements and features require it. If you wish, add SCEERUN to your LNKLIST concatenation. If you don't add SCEERUN to your LNKLIST, you access SCEERUN by using STEPLIB DD statements in the individual element and feature procedures that require them. DFSMSdfp is one element that requires a STEPLIB to SCEERUN; the binder has required it since OS/390 R10. This means that you must add the appropriate STEPLIB DD statement to any JCL and procedures (such as SMP/E procedures) that invoke the binder so that processing, such as conversion of long names to short names, is successful. If your driving system is z/OS V1R1 or earlier, you must specify ALL31(ON) and STACK(ANY) as Language Environment run-time options during installation.

These are the defaults as of z/OS V1R2. For more information on specifying run-time options, see *z/OS Language Environment Programming Reference*.

- *OMVS address space*: Before you install the elements and features in Wave 1, you must activate the OMVS address space (in either minimum or full function mode) on the driving system. To activate OMVS, complete the required customization (for example, SMS and RACF setup) as described in *z/OS UNIX System Services Planning*.
- *Target system's HFS*: The target system's HFS must be mounted.

Driving system Wave 2

In Wave 2 you install elements and features that use shell and utility commands now or might use them in the future.

You can use either of the following as the driving system for installing Wave 2:

- A copy of the target system that you installed in Wave 1.
- z/OS or OS/390, as specified in the Wave 1 requirements, as well as the rest of the Wave 1 requirements. See “Driving system Wave 1” on page 63.

Before you install Wave 2, you must activate the OMVS address space in full function mode on the driving system. To activate OMVS, complete the required customization (for example, SMS and RACF setup) as described in *z/OS UNIX System Services Planning*.

If driving system requisites for Wave 2 are satisfied before starting Wave 1, you can combine Waves 1 and 2. But if you do this, be aware that several Wave 2 elements have dependencies on the Wave 1A elements, so be sure to install the elements in Wave 1A prior to or concurrently with (not after) the elements in Wave 2.

Driving system Wave 3

In Wave 3 you install the z/OS V1R3 level of JES2 or JES3. Wave 3 is optional and can be combined with Wave 1 or Wave 2.

The driving system requirements for Wave 3 are the same as for Wave 1. See “Driving system Wave 1” on page 63.

Identifying driving system software requirements for installing subsystems

The driving system software required to install subsystems (DB2, CICS, IMS, and NCP) using ServerPac is the same as the software in “Identifying driving system software requirements for installing z/OS or z/OS.e via ServerPac or dump-by-data-set SystemPac” on page 58.

To use a z/OS or OS/390 release as the driving system for installing subsystems, you might need to apply PTFs to the prior release. Refer to Chapter 5, “Ensuring coexistence and fallback” on page 83 for SMP/E PTFs, and the subsystem program directories for subsystem PTFs. Additionally, turn to the subsystem PSP buckets for any updates. For ServerPac, the upgrade is ZOSV1R3 and the subset is SERVERPAC. For SystemPac dump-by-data-set orders, the upgrade is CUSTOMPAC and the subset is SYSPAC/DBD.

Identifying driving system hardware requirements

In addition to the hardware needed to run a driving system and the DASD required to install the software, you need:

- A TSO terminal, preferably a color terminal if you're doing a ServerPac installation because the ServerPac Installation Dialog uses color to identify key information on panels.
- A tape device capable of reading one of the following:
 - 3420 tapes written at 6250 bpi.
 - 3480 tape cartridges. If you choose 3480 compressed tapes, you must have the Improved Data Recording Capability (IDRC) compression function on your tape drives.
 - 3490 enhanced capacity tape cartridges (for ServerPac and SystemPac orders only).
 - 3590 tape cartridges.

Note: In terms of capacity, one 3590 cartridge = ten 3490 enhanced cartridges = twenty 3480 compressed cartridges = forty 3480 standard cartridges = eighty 3240 tapes.

- Sufficient central storage. For ServerPac and dump-by-data-set SystemPac installations, at least 94 MB of central storage is required for test systems on which there is one interactive TSO/E user and only the RESTFS job will run, or at least 42 MB of central storage for systems supporting other workloads (plus whatever central storage is needed to support the system's normal workload).

Chapter 4. Preparing the target system

As described in the previous chapter, the target system is the system software libraries and other data sets that you are installing. This chapter helps you identify the software and hardware you will need for your target system.

Choosing software products to install and identifying requisites

This task consists of:

- Choosing the z/OS or z/OS.e base and optional features
- Identifying functional requisites for z/OS or z/OS.e elements and features
- Choosing IBM products that you want to run with z/OS or z/OS.e
- Choosing ISV products that you want to run with z/OS or z/OS.e

Choosing the z/OS or z/OS.e base and optional features

Rule: With both z/OS and z/OS.e, because the base elements and optional features are integrated into a single package with compatible service levels, you must install, with few exceptions, the entire z/OS or z/OS.e product.

The z/OS exceptions are:

- Elements and features that are already installed do not have to be reinstalled if both of the following are true: (1) you use the CBPDO installation method to migrate to the current z/OS release and (2) an element or feature has not changed (its FMID did not change), or an element or feature is nonexclusive and you've already installed its functionally-equivalent stand-alone product version. To find out which elements and features have changed in the current release, see Table 1 on page 3.
- Unpriced features that you didn't order do not have to be installed.
- JES2, JES3, and SDSF do not have to be installed in the following cases:
 - You don't have to install JES2 if you are a JES3 customer. ServerPac or SystemPac installers can use jobs provided by IBM to remove JES2 (and SDSF) during the final part of installation. CBPDO installers would just not install JES2.

Another reason why you don't have to install JES2 is if you would rather use the JES2 that you already have installed. However, you should migrate to z/OS V1R3 JES2 as soon as possible to benefit from the new functions in z/OS V1R3 JES2 (compared with z/OS V1R1 JES2 and earlier) and to enable other elements and features to benefit from the new level. See "Using your existing JES2 or JES3 with z/OS V1R3" on page 75 for details about using your older JES2.

- You don't have to install JES3 if you are a JES2 customer. ServerPac or SystemPac installers can use jobs provided by IBM to remove JES3 during the final part of installation. CBPDO installers would just not install JES3.

Another reason why you don't have to install JES3 is if you would rather use the JES3 that you already have installed. However, you should migrate to z/OS V1R3 JES3 as soon as possible to benefit from the new functions in z/OS V1R3 JES3 (compared with z/OS V1R1 JES3 and earlier) and to enable other elements and features to benefit from the new level. See "Using your existing JES2 or JES3 with z/OS V1R3" on page 75 for details about using your older JES3.

- You don't have to install SDSF if you are a JES3 customer. ServerPac and SystemPac installers can use a job provided by IBM to remove SDSF (and JES2) during the final part of installation. CBPDO installers would just not install SDSF.

The z/OS.e exceptions are:

- Unpriced features that you didn't order do not have to be installed.
- JES2, JES3, and SDSF do not have to be installed in the following cases:
 - You don't have to install JES2 if you are a JES3 customer. You can use jobs provided by IBM to remove JES2 (and SDSF) during the final part of ServerPac or SystemPac installation.
 - You don't have to install JES3 if you are a JES2 customer. You can use jobs provided by IBM to remove JES3 during the final part of ServerPac or SystemPac installation.
 - You don't have to install SDSF if you are a JES3 customer. You can use jobs provided by IBM to remove SDSF (and JES2) during the final part of ServerPac or SystemPac installation.

Failure to install the entire z/OS or z/OS.e product, except for the exceptions described above, could result in an unserviceable system until you install the entire product.

You can use the Planning and Migration Assistant (part of SMP/E) to help you determine what software is already on a system from which you're migrating.

Alternate base

Customers may have the ability to replace some of the z/OS or z/OS.e base functions with a commercially available product that provides similar functions. Contact an IBM representative for qualification and pricing information. All z/OS or z/OS.e integrated testing results and performance claims will be voided with such replacement.

The mechanism IBM uses for this accommodation is an alternate base configuration. One alternate base is defined and is supported by the price file and the configurator. This alternate base, which contains the base elements with IP Services (the component of base element Communications Server that provides TCP/IP networking) disabled, is available for customers who have a commercially available product that provides similar functions.

The alternate base, in addition to not supporting IP Services, does not support the following optional features: Communications Server Security Level 3 and Communications Server NPF.

Identifying functional requisites for z/OS and z/OS.e elements and features

The base elements in z/OS or z/OS.e represent an IPLable target system and satisfy most of the dependencies of the base elements and optional features. But some elements and features require other features or IBM products that are not part of the z/OS or z/OS.e base. Moreover, some elements and features have optional dependencies on other features or on IBM products that help you take full advantage of z/OS or z/OS.e capabilities. For a list of required and optional dependencies, see Appendix B, "Software requirements for z/OS and z/OS.e elements and features" on page 169.

Choosing IBM products that you want to run with z/OS or z/OS.e

For a list of products available for ordering with z/OS or z/OS.e, you can do any of the following:

- Use the self-service Internet application ShopzSeries:
<https://www14.software.ibm.com/ShopzSeries>
- Use the product catalogs (order checklists). For z/OS:
<http://www.ibm.com/eserver/zseries/software/swinfo/os390.htm>

For z/OS.e:

<http://www.ibm.com/eserver/zseries/software/swinfo/zose.htm>

- Access the software configurator used in your country, select the z/OS or z/OS.e environment, and then select ServerPac, CBPDO (z/OS only, not z/OS.e), or SystemPac.
- Refer to Appendix C, “Minimum releases of IBM software products that run with z/OS and z/OS.e” on page 183.

If you're migrating to z/OS V1R3 from a prior release, you can find out which products have new levels by using ShopzSeries or by using the SMP/E base element's Planning and Migration Assistant. Both tools use data found on your system as well as the latest IBM software product catalog.

Choosing ISV products that you want to run with z/OS or z/OS.e

For a list of independent software vendors (ISVs) that support z/OS and z/OS.e, as well as announcements, testimonials, and other information, see:

<http://www.ibm.com/eserver/zseries/solutions/s390da/>

For a directory of ISV products that support z/OS and z/OS.e, see the Global Solutions Directory:

<http://www.ibm.com/software/solutions/isv>

Note that you can use SystemPac to get some ISV products on system delivery vehicles with IBM products. For a list of selectable ISVs with SystemPac, see:

<http://www.ibm.com/ca/custompac/>

Ordering z/OS, z/OS.e, and related IBM products

Depending on the installation method you've chosen, order z/OS, z/OS.e, and related IBM products as follows:

- **ServerPac (for z/OS, z/OS.e, and IBM products that run on them):**
Use the self-service Internet application ShopzSeries, use IBMLink, or contact an IBM representative. You can find ShopzSeries at:
<https://www14.software.ibm.com/ShopzSeries>

An order can be for products in only one system release identifier (SREL). The SRELs are MVS, DBS, CICS, and NCP. (CICS and NCP are not supported with z/OS.e.) IBM recommends that you order all products that you intend to install, migrate, and maintain on the same schedule as z/OS or z/OS.e (the “z/OS product set”) in the same ServerPac. (See “Product sets” on page 136 for a description of product sets.) If you need to order from multiple SRELs, place multiple orders (and you will receive multiple ServerPacs).

Parts of two stand-alone products are included in msys for Operations: Tivoli NetView for OS/390 V1R4 (5697-B82) and System Automation for OS/390 V2R1 (5645-006). If you intend to install these products (to use their full function) but haven't ordered them yet, IBM recommends that you order them with your z/OS V1R3 or z/OS.e V1R3 ServerPac so that you won't have to separately maintain the parts that are the same in msys for Operations and in the stand-alone products. Separate maintenance would involve duplication of service work.

When ordering upgrades to software products for which you're currently licensed, you can generate an SMP/E report of installed software to be upgraded, and upload the report to ShopzSeries. ShopzSeries selects upgrades and performs technical requisite checking. ShopzSeries then lets you submit the order and track it through delivery.

- **CBPDO (for z/OS, IBM products that run on z/OS, and IBM products that run on z/OS.e, but not for z/OS.e itself):**

Use the self-service Internet application ShopzSeries, use IBMLink, or contact an IBM representative. You can find ShopzSeries at:

<https://www14.software.ibm.com/ShopzSeries>

An order can be for products in one or more of the four SRELs (MVS, DBS, CICS, and NCP). The order will result in one set of CBPDO tapes for each SREL. IBM recommends that you order z/OS using the CBPDO product-only option. (This is the default.) If you need to order other products in the same SREL as z/OS (which is the MVS SREL), place a separate CBPDO order for them. This will significantly reduce the number of tape mounts required to install z/OS (as well as the other products) due to the fact that z/OS is a large product that spans many tapes.

When ordering upgrades to software products for which you're currently licensed, you can generate an SMP/E report of installed software to be upgraded, and upload the report to ShopzSeries. ShopzSeries selects upgrades and performs technical requisite checking. ShopzSeries then lets you submit the order and track it through delivery.

You can specify a desired starting service level. You can also customize the service provided in your order. See "CBPDO service" on page 39.

If the equivalent level of a nonexclusive optional priced feature is currently running on your system, and a CBPDO installation is planned for the next release with the intent of not replacing that equivalent level of the feature during the installation, then the z/OS level of that feature must be ordered, even if it will not be installed, to ensure that the appropriate product policy statements are shipped for that feature.

- **SystemPac (for z/OS, z/OS.e, IBM products that run on them, and selected ISV products that run on them):**

Use an order checklist, which is available on the Internet (<http://www.ibm.com/eserver/zseries/software/swinfo/os390.htm>), on IBMLink via the configurator, or from an IBM representative. Unlike a ServerPac order, a SystemPac order can be for multiple SRELs. IBM recommends that you order in the same SystemPac all products that you intend to install, migrate, and maintain on the same schedule as z/OS or z/OS.e. The order checklist contains both IBM and selected independent software vendor (ISV) products.

When you place your SystemPac order, be sure to select the selective follow-on services (SFSs) as well. You can specify a maximum of three SFSs at intervals of 30, 60, or 90 days apart. SFSs contain PTFs fixing PE and HIPER PTFs that

are discovered after your system is built. SFSs are tailored to the SMP/E CSI of your system. The goal of SFSs is to stabilize your system over time, thus improving its availability. SFSs are delivered on the same media type as your original order.

Upon placing the order, an IBM representative will contact you to provide additional help to have your order enriched. Enrichment is an important part of SystemPac. Through a local order entry tool, your system's parameters (such as volume serials, DASD types, catalog names, SMP/E definitions, and SMS definitions) are collected. This enables the SystemPac to be built exactly the way you specified, eliminating the need for customizing upon system restore. This also enables IBM to enable subsystems and products according to your specifications (for example, z/OS UNIX System Services in full function mode according to your SMS specifications).

You also need to send a copy of your IODF to the IBM manufacturing center. Your SystemPac will be built according to your IODF input. You can send the IODF electronically or via physical media.

Note: Print Services Facility (PSF) for OS/390 V3 (5655-B17) should be treated as part of the z/OS product set. (Product sets are discussed in "Product sets" on page 136.) If you want to use PSF and you plan to install with ServerPac or SystemPac, include PSF in your product order.

IBM updates the orderable product lists for ServerPac and SystemPac once a month. However, the lists might not contain the most current releases of all products that run on z/OS and z/OS.e. If the release of the product you want is not currently available in ServerPac or SystemPac, and you cannot delay your order, IBM recommends that you:

1. Order ServerPac or SystemPac, omitting products not at the appropriate level.
2. Order CBPDO or ProductPac with those products you omit from ServerPac or SystemPac.
3. Install the ServerPac or SystemPac order, and then install the products from the CBPDO or ProductPac.

IBM recommends that you select the largest-capacity distribution tapes that your tape system can handle. 3590 tapes have the most capacity, followed by 3490 enhanced capacity tapes, then 3480 compressed tapes, and finally 3480 standard tapes. Reducing the number of tapes you receive reduces both the number of tapes you have to handle and the processing time required to read the tapes. For comparison, the quantities of tape cartridges required to fulfill the average ServerPac order are:

- 3480 standard tape: about 35 cartridges
- 3480 compressed tape: about 18 cartridges
- 3490 enhanced capacity tape: about 8 cartridges
- 3590 tape: about 3 cartridges

Identifying hardware requirements for the target system

This task consists of:

- Identifying processor requirements.
- Identifying DASD space requirements.
- Identifying I/O device requirements.
- Identifying additional hardware needed by z/OS and z/OS.e elements and features. See Appendix D, "Hardware requirements for z/OS and z/OS.e elements and features" on page 199.

Note: For general information about requirements for a Parallel Sysplex configuration, see the z/OS Parallel Sysplex Customization Wizard at: <http://www.ibm.com/eserver/zseries/zos/wizards/>

Identifying processor requirements

z/OS V1R3 runs on all IBM @server zSeries servers, which are:

- IBM 2066 @server zSeries 800 (z800).
- IBM 2064 @server zSeries 900 (z900).
- IBM 7060 S/390 Multiprise 3000 Enterprise Server.
- IBM 9672 S/390 Parallel Enterprise Server – Generation 5 (G5) and Generation 6 (G6). Driver 26 (licensed internal code version 1.6.2) or later is required to support architectural enhancements required by z/OS, which are shown below.

Note: The G5, G6, and Multiprise 3000 servers are now considered zSeries servers.

z/OS.e V1R3 runs on the following IBM server:

- IBM 2066 @server zSeries 800 (z800). The z800 must run in LPAR mode (not basic mode).

z/OS requires certain architectural enhancements that are integral to all z800, z900, and Multiprise 3000 servers but not all G5 and G6 servers. G5 and G6 servers require driver 26 (licensed internal code version 1.6.2) or later for these enhancements. If the enhancements are not installed, a wait state could occur during IPL. The enhancements are:

- Checksum
- Compare and Move Extended
- Compression
- Immediate-and-Relative Instruction
- Lock Page
- Perform Locked Operation
- Set Address Space Control Fast
- Storage-Protection Override
- String Instruction
- Subspace Group
- Suppression on Protection with Virtual-Address Enhancement

Also:

- Compare and Swap and Purge (also called broadcasted purging)
- Branch and Set Authority
- Store System Information
- Extended TOD Clock
- Extended Translation Facility (Convert Unicode to UTF-8, Convert UTF-8 to UNICODE, Translate Extended)

Defining the capacity at which you'll run z/OS.e

z/OS.e must run in LPAR mode (not basic mode) on the z800 server and it must run at a particular maximum capacity that you define. You define the capacity in terms of millions of service units per hour (MSUs), as follows:

1. Use z/OS.e HCD to define the processor, I/O resources, and logical partitions (LPARs) you will use. For guidance, refer to *z/OS HCD User's Guide*. When you define the name of the LPAR, you **must** use the form ZOSExxxx, where xxxx is any valid combination of zero to four characters.
2. Use the z800 hardware management console (HMC) to create an activation profile. In the profile you specify the processors and memory allocated to each

LPAR, as well as the MSU capacity available for each LPAR. For information about using the HMC application, see *Hardware Management Console Operations Guide*, an online book that ships with the HMC. For information about z800 MSU capacity, see *z800 Software Pricing Configuration Technical Paper* at

<http://www.ibm.com/eserver/zseries/library/techpapers/pdf/gm130121.pdf>.

3. Configure your system to send Transmit System Availability Data (TSAD) using the Remote Support Facility (RSF) available on the z800 processor. The IBM service representative can enable RSF for you when your z800 is installed, or you can set it yourself either during or after installation. For more information about sending TSAD, see the Customize Scheduled Operations task for the Hardware Management Console or the Scheduled Operations task for the support element in *Hardware Management Console Operations Guide*.

Processor storage

Expanded storage is not supported in z/Architecture. Thus, you must configure your LPAR to use only central storage (and not expanded storage).

The minimum processor storage required to IPL z/OS or z/OS.e depends on a number of factors, including the number of devices in the I/O configuration, the amount of storage configured, the number of address spaces created, the types of applications supported, and the products and subsystems supported in the IPLed system. Nevertheless, we can make the following statements about the minimum processor storage required to IPL:

- It does not usually change from OS/390 release to OS/390 release, or z/OS release to z/OS release.
- It increases when you make the jump from OS/390 to z/OS. This is due to the change in architecture (from 31-bit ESA/390 architecture to 64-bit z/Architecture) when you run z/OS on a z800 or z900 server.
- It should be the same for z/OS.e as for z/OS.

In IPL studies at IBM, 24 MB were required to IPL the last three OS/390 releases (R8, R9, and R10). Also in the studies, 35 MB were required to IPL the first two z/OS releases (V1R1 and V1R2). The systems in the studies were IPLed to the point of completing JES initialization. The systems had I/O configurations defined with the following devices:

Device Quantity

3270	32
3390	1152
3490	16

In additional studies with different I/O devices, 40 MB were required to IPL z/OS V1R2 and z/OS V1R3. The systems in the studies were IPLed to the point of completing JES initialization. The systems had I/O configurations defined with the following devices:

Device Quantity

3270	32
3390	3280
3490	16
OSA	32

PSP hardware upgrade identifiers

For the latest hardware dependencies related to z/OS and z/OS.e, including any APARs required for specific processor models, obtain current PSP information (from

PSP “buckets”). You can obtain PSP information using IBMLink or Information/Access, or request it from your IBM Support Center.

The PSP hardware upgrade identifiers are:

- 2064DEVICE for the z900 server
- 2066DEVICE for the z800 server
- 9672DEVICE for the S/390 Parallel Enterprise Server
- 7060DEVICE for the S/390 Multiprise 3000 Enterprise Server

Identifying DASD space requirements

The DASD required for z/OS or z/OS.e includes:

- All elements
- All features that support dynamic enablement, regardless of your order
- All unpriced features that you ordered.

The storage requirements for z/OS and z/OS.e are shown in Table 6. Products that run on z/OS or z/OS.e will require additional storage.

Table 6. DASD storage requirements for z/OS V1R3 and z/OS.e V1R3 elements and features

Data sets or storage	3390 cylinders
Target data sets listed in the space table in <i>z/OS Program Directory</i>	5244
Distribution data sets listed in the space table in <i>z/OS Program Directory</i>	6268
HFS root (/) file system (primary, secondary)	2200, 220
HFS /etc file system (primary, secondary)	50, 10
SMP/E data sets (excluding SMPPTS) listed in the space table in <i>z/OS Program Directory</i>	1932
The size of the SMPPTS data set depends on factors including the number of products previously ordered, the number of products and optional unpriced features in this order, and the date the order was placed.	
z/OS only (not z/OS.e): SMPTLIB data sets allocated during SMP/E RECEIVE processing for z/OS FMIDs shipped on a CBPDO (but note that optional features and national language FMIDs require additional storage)	7162

Identifying I/O device requirements

z/OS and z/OS.e support FICON (Fiber Connection), ESCON (Enterprise Systems Connection), and ESA/390 (Enterprise Systems Architecture/390) devices. The most commonly-used I/O devices supported by z/OS and z/OS.e are listed in *z/OS DFSMS Migration*. If you have a question about support for a device not listed, contact your IBM representative.

Use of the IBM Enterprise Storage Server (2105) with z/OS or z/OS.e requires the 2105 microcode to be at EC fix level F25584 or later. This EC level fixes a problem caused by software exploitation of the SII/RND CCW commands.

For a table summary of device information, see *z/OS MVS Device Validation Support*. The table shows the order that z/OS and z/OS.e use when they attempt to satisfy a request for a device.

Identifying service needed for the target system

Before you IPL the target system for the first time, you should determine whether your target system software is at the appropriate service level, and apply fixes if it is not. This section explains the additional service that you might need to apply.

See “Service” on page 33 for background information on the service that is shipped with ServerPac, CBPDO, and SystemPac orders. See “Maintenance after installation” on page 37 for guidance on applying maintenance to your z/OS or z/OS.e system after you have finished installing it.

If you are installing a z/OS or z/OS.e ServerPac order...

If you install your ServerPac order shortly after it arrives, you should not need to install additional RSU service. It should already be included in your order.

But if more than a few weeks have passed since your order arrived:

- Consult *ServerPac: Installing Your Order*, in the topic about service included in your order, to find the service level of the system as shipped.
- Order a service package using the service delivery vehicle you prefer, such as SUF, ESO, RefreshPac, or service-only CBPDO. Use a starting service level one month later than the level identified in *ServerPac: Installing Your Order*.

If you are installing a z/OS CBPDO order...

If you ordered z/OS as a CBPDO package:

- Install all PTFs with a SOURCEID of ZOSV1R3. In addition, install all PTFs with a SOURCEID of HIPER or PRP provided they are not in a PTF-in-error (PE) chain.
- Consult *Memo to Users Extension* to find the service level of the system as shipped.
- If more than a few weeks have passed since your order arrived, there should be a service package available; order and apply it in accordance with the guidelines in “Maintenance after installation” on page 37. Use the service delivery vehicle that you prefer, such as CBPDO, ESO, or SUF.

If you are installing a z/OS or z/OS.e SystemPac order...

IBM strongly recommends that you select, during order entry, the optional follow-on services (SFSs) that come with the SystemPac. SFSs contain critical service information: PTFs that resolve PEs and HIPERs that are discovered after your system is built. The SFSs you get are tailored to the image of the SMP/E CSI of the system that IBM shipped to you earlier. By installing repeating SFSs (at most 90 days apart, maximum of three), you stabilize the system you installed, thus enabling you to have a system with higher availability for your applications.

SFSs can be installed via the CustomPac Installation Dialog or via batch JCL.

Using your existing JES2 or JES3 with z/OS V1R3

We recommend that you migrate to the JES2 or JES3 that comes comprehensively-tested with z/OS V1R3 at the same time you migrate to the rest of z/OS V1R3, or as soon as possible thereafter. In this way, you benefit directly from the new functions in the z/OS V1R3 level of JES2 or JES3 (compared with z/OS V1R1 JES2 or JES3 and earlier) and enable other elements and features to benefit from this level. However, because such a migration is not always practical, certain

prior levels of JES2 and JES3 are supported with z/OS V1R3 so that you can stage your migration to z/OS V1R3 (that is, migrate your JES2 or JES3 later).

Note: Prior (existing) JES levels are not allowed with z/OS.e. You must use the level of JES2 or JES3 that is delivered with your z/OS.e.

The rest of this section describes the levels of JES2 and JES3 that are supported, the service they require, and other details required to use your current JES2 or JES3 with z/OS V1R3 until you can migrate to z/OS V1R3 JES2 or JES3.

Allowable JES-BCP combinations

For z/OS, the JES levels supported by a given release are the same as the JES levels that may coexist in the same multi-access spool (MAS) or multisystem complex with the JES delivered in that z/OS release. That is, the JES levels that may run on the latest z/OS release (when run on either a single system or on individual systems participating in a multisystem configuration) are the four most recent JES levels.

Thus, the JES releases you can use with the z/OS V1R3 BCP are:

- For JES2:
 - z/OS V1R2 JES2 and z/OS V1R3 JES2 (both are functionally equivalent)
 - OS/390 R10 JES2 and z/OS V1R1 JES2 (both are functionally equivalent)
 - OS/390 R8 JES2 and OS/390 R9 JES2 (both are functionally equivalent)
- For JES3:
 - z/OS V1R2 JES3 and z/OS V1R3 JES3 (both are functionally equivalent)
 - OS/390 R10 JES3 and z/OS V1R1 JES3 (both are functionally equivalent)
 - OS/390 R9 JES3
 - OS/390 R8 JES3

As of z/OS V1R2, compliance to the allowable JES-BCP combinations is enforced. Therefore, failure to use one of the above JES releases with the z/OS V1R3 BCP results in an abend and subsequent termination of the JES address space.

For z/OS.e, you cannot use a prior JES2 or JES3 level with the current level of the BCP. Thus, the JES releases you can use with the z/OS.e V1R3 BCP are z/OS.e V1R3 JES2 and z/OS.e V1R3 JES3.

For an explanation of the coexistence policy as it pertains to JES2 and JES3, see “Coexistence-Migration-Fallback policy” on page 85.

JES data compatibility

Data created by one JES level can be used and manipulated by a later level, and vice versa. The spool and queue control constructs are compatible between any two supported releases of JES2 or JES3 for at least $n-5$ releases of the operating system, where n is the current release. (This is **not** $n-5$ JES FMIDs.) Thus, you are assured that data created by the following JES2 releases can be used and manipulated by z/OS V1R3 JES2 or z/OS.e V1R3 JES2: z/OS V1R2 JES2, z/OS V1R1 JES2, OS/390 R10 JES2, OS/390 R9 JES2, and OS/390 R8 JES2. Likewise, data created by the following JES3 releases can be used and manipulated by z/OS V1R3 JES3 or z/OS.e V1R3 JES3: z/OS V1R2 JES3, z/OS V1R1 JES3, OS/390 R10 JES3, OS/390 R9 JES3, and OS/390 R8 JES3.

Note that this statement of data compatibility has nothing to do with determining which levels of JES can access the data at the same time; that is governed by the coexistence policy (see “Coexistence-Migration-Fallback policy” on page 85). Also note that there is no guarantee that you will be able to move back to an earlier release if you have used new functionality in the later release.

ServerPac and SystemPac delivery of JES2, JES3, and SDSF

Only the latest levels of JES2, SDSF, and JES3 are delivered in ServerPac and SystemPac (and CBPDO). In ServerPac and SystemPac, JES2 and SDSF are distributed in separate target and DLIB zones from z/OS; JES3 is also distributed in separate target and DLIB zones from z/OS. Optional jobs are provided in the CustomPac Installation Dialog (used by ServerPac and SystemPac) so that when you install z/OS you can merge JES2 and SDSF, or JES3, into the z/OS zone. This zone structure allows you to use the new JES2 and SDSF, or JES3, or your existing levels of JES2 and SDSF, or JES3.

With ServerPac or SystemPac, JES2 customers can use a ServerPac or SystemPac job (during installation) to delete the JES3 zone and data sets. Similarly, JES3 customers can use a ServerPac or SystemPac job (during installation) to delete JES2 and SDSF. If you intend to run any of these jobs, you cannot run the ServerPac or SystemPac job to merge the JES zone you intend to delete.

z/OS V1R3 SDSF comes assembled with the latest JES2 macros; JES2 and JES3 come as shipped by IBM. If you do source maintenance on your JES, you might have to reassemble it using the macros that come with z/OS. See the topic about reassembling existing JES2/JES3 modules in *z/OS Program Directory* for information on the macro levels that are used by IBM to create and service JES2 and JES3.

Placing your existing JES2 or JES3 in a separate zone

To use your existing (earlier than z/OS V1R3) JES2 or JES3 with z/OS V1R3, you must consider SMP/E zone structure and SMP/E SYSLIB concatenation, and their impact on:

- Integrity of other load modules in the z/OS environment
- Your maintenance procedures
- Your ability to upgrade from your existing JES to the latest z/OS level of JES
- Your ability to upgrade to a new z/OS level while continuing to use your existing level of JES

We recommend that you not install an earlier level of JES2 or JES3 in the same zones as z/OS. If you intend to use a previously-installed level of JES, you should place it in separate SMP/E target and DLIB zones. In this way, you are well-positioned to:

- Ensure integrity of both the JES and non-JES load modules
- Eliminate manual post-install assemblies for maintenance (especially for SDSF users)
- Upgrade your existing JES to z/OS V1R3 JES
- Continue to run your existing JES while upgrading z/OS to a later level

Use the following procedure to separate your existing JES2 or JES3 from its existing SMP/E environment. Use this procedure only if your existing JES is not already in a separate zone.

1. Follow the installation procedures in the program directory supplied with your level of JES2, using any corrections listed in the PSP upgrade and subset it identifies for the JES2 component.

2. ACCEPT (or RESTORE) all unaccepted service and USERMODS for JES2 or JES3.
3. Use the SMP/E BUILD MCS command to create an SMP/E installable image of your existing JES
 The BUILD MCS command builds an SMP/E installable image from information in the target and distribution zones and the code in the distribution libraries. Therefore all code must be ACCEPTed (or RESTOREd and then re-APPLYed).
4. Define new SMP/E zones for JES2 or JES3
5. Allocate separate target and distribution libraries for JES2 or JES3.
 z/OS levels of JES2 and JES3 provide sample allocation jobs which can be used to allocate that level of the libraries or as a model for non-z/OS levels of JES.
6. Define SMP/E DDDEFs for the new target and distribution libraries for JES2 and JES3.
 z/OS levels of JES2 and JES3 provide sample DDDEF jobs which can be used to define those levels of the libraries or as a model for non-z/OS levels of JES.
7. If you do source-code maintenance (++SRC/++SRCUPD) rather than object-code maintenance (++MOD) for JES, define the SYSLIB macro concatenation for new zones.

The macro concatenation to be used for assemblies in the new zone must be defined to SMP/E. You have three choices of which macro libraries to use:

- Use the z/OS V1R3 macro libraries and your existing JES macro libraries.
- Continue to use the BCP, DFSMSdftp, and Communications Server–SNA Services macro libraries that your existing JES2 or JES3 is using.
- Use the macro levels that are used by IBM to create and service JES2 and JES3. See the *z/OS Program Directory* for additional considerations for this option.

IBM recommends that you use the same level of macros for all production systems in your complex using the existing JES level. That is, the JES2 used on all systems in a JES2 MAS environment should be assembled with the same operating system macros (the lowest level BCP, DFSMS/MVS, and VTAM macros should be used). You must never assemble JES2 with macro levels lower than those it was originally assembled with by IBM (higher is acceptable). If you follow this recommendation you can use the same load libraries on all systems. You can use different libraries for assemblies (and different target libraries) during migration or testing. Once all systems have migrated to z/OS V1R3, you should consider reassembling using the z/OS V1R3 macros. If you reassemble one module, you must reassemble the entire element. (Sample SMP/E USERMODS are provided.) For more information on assembling JES2 or JES3, see the post-installation steps in the *z/OS Program Directory*.

If you do object-code maintenance (++MOD) rather than source-code maintenance (++SRC/++SRCUPD) for JES, the only assembling you need to be concerned with is assembling your exit routines. You need to make sure that:

- You use the same SPLEVEL to assemble your exit routines that IBM used to assemble JES.

- The release level used to assemble your exit routines isn't below the release level used to assemble JES. (For example, you can't use OS/390 R9 BCP macros to assemble z/OS V1R3 JES2 exit routines.)
8. RECEIVE, APPLY and ACCEPT the SMP/E installable image built by the BUILD MCS command into the new separate zones.
 9. If you chose to do the RESTORE in Step 1, reAPPLY any service that was RESTORED.
 10. Make the necessary updates to use the copy of JES2 or JES3 in the new libraries:
 - Update the catalog or catalogs with the names of the existing JES new data sets
 - Update PROGxx (or LNKLSTxx and IEAAPFxx) members of parmlib
 - Update the JES2/JES3 cataloged procedure, if STEPLIBs are used
 - Add the JES parmlib to the system's parmlib concatenation, or copy the IPCS parmlib members from the JES parmlib to the system parmlib.
 - If you are using JES3, add the modules in the SIATLPA library to LPA or dynamic LPA by updating an LPA or dynamic LPA by updating an LPA or dynamic LPA member of parmlib. (If you choose to use dynamic LPA for JES3 modules, the SET PROG command used to add them must complete before JES3 initialization begins.)

Applying service required to use your existing JES2 or JES3

If you plan to use your existing (earlier than z/OS V1R3) JES2 or JES3 with z/OS V1R3, apply the same PTFs that are required for coexistence service. See "JES2 coexistence and fallback service" on page 99 or "JES3 coexistence and fallback service" on page 99. Apply the PTFs before you IPL z/OS.

Using z/OS V1R3 SDSF with your existing JES2

To use z/OS V1R3 SDSF with your existing (earlier than z/OS V1R3) JES2, you have to copy the new SDSF from the JES2 zone (as distributed in ServerPac and SystemPac) using the BUILD MCS command. No extra steps are required to use z/OS V1R3 SDSF with the new JES2.

Use the following procedure to copy z/OS V1R3 SDSF from the distributed JES2 zone to your existing JES2 SMP/E environment. Use this procedure only if you want to use z/OS V1R3 SDSF with your existing JES2.

1. ACCEPT (or RESTORE) all service and USERMODS for SDSF (if any service or customization was performed)
2. Use the SMP/E BUILD MCS command to create an SMP/E installable image of the new SDSF
3. Allocate separate target and distribution libraries for SDSF; a sample job is provided.
4. Define SMP/E DDDEFs for the new target and distribution libraries for SDSF; a sample job is provided.
5. Add the SDSF macro library to the SYSLIB macro concatenation of your existing JES2 zone.

SDSF needs the SISFSRC macro library in the target zone SYSLIB concatenation for assemblies. SDSF needs the AISFSRC macro library in the DLIB zone SYSLIB concatenation for assemblies.
6. RECEIVE, APPLY and ACCEPT the SMP/E installable image built by the BUILD MCS command into your existing JES2 SMP/E zone.

SDSF will be assembled during the APPLY. Therefore, make sure that different load libraries are used in this zone than the ones that were distributed with ServerPac or SystemPac.

7. If you chose to do the RESTORE in Step 1, reAPPLY any service that was RESTORED.
8. Make the necessary updates to use the copy of SDSF in the new libraries:
 - Update the catalog or catalogs with the names of the new SDSF data sets
 - Add the modules in the SISFLPA library to LPA or dynamic LPA by updating an LPALSTxx or PROGxx member of parmlib.
 - Add the new SISFLINK library to the link list in a LNKLSTxx or PROGxx member of SYS1.PARMLIB
 - Add the new SISFLINK and SISFLOAD libraries to the APF List in a PROGxx or IEAAPFxx member of SYS1.PARMLIB
 - Update the TSO logon cataloged procedures to include new SDSF libraries.
9. Automate SDSF reassembly during installation of JES2 service.

SDSF provides sample UCLIN jobs that cause SMP/E to reassemble SDSF whenever maintenance affects JES2 macros. There is a sample job for each JES2 environment provided in the SISFJCL library.

Migrating your existing JES2 or JES3 to z/OS V1R3 level

To migrate from your existing (earlier than z/OS V1R3) JES2 or JES3 to z/OS V1R3 JES2 or JES3, follow these steps:

1. Customize the z/OS V1R3 JES2 or JES3, reworking USERMODS and exits, and making sure service is not regressed.
2. Update operational procedures to use z/OS V1R3 JES2 or JES3.

To use the libraries for z/OS V1R3 JES2 or JES3:

 - a. Update the catalog or catalogs with the names of the existing JES2 or JES3 new data sets.
 - b. Update PROGxx (or LNKLSTxx and IEAAPFxx) members of parmlib.
 - c. Update the JES2 or JES3 cataloged procedure, if STEPLIBs are used.
 - d. Add the new SIATPARM or SHASPARM data set to the parmlib concatenation, or copy the IPCS parameter members from SIATPARM or SHASPARM to a parmlib already in the concatenation.
 - e. If you are using JES3, add the modules in the SIATLPA library to LPA or dynamic LPA by updating an LPALSTxx or PROGxx member of parmlib. (If you choose to use dynamic LPA for JES3 modules, the SET PROG command used to add them must complete before JES3 initialization begins.)
3. When you are sure z/OS V1R3 JES2 or JES3 works, remove the zone or zones that hold your existing JES, deleting the old libraries, removing pointers to old JES data sets from your parmlib members, catalog or catalogs, and IPCS settings.
4. If you plan to migrate to subsequent releases of JES2 or JES3 when you migrate to the next level of z/OS, then IBM recommends you run the job provided in ServerPac or SystemPac to merge the JES2 (and SDSF) or JES3 elements into the z/OS zone. If you plan continue to stagger your z/OS and JES migrations, you should **not** run this job.

See also “JES2 migration action for pre-release 4 mode” on page 113.

Putting NetView and System Automation in the correct zone

Parts of two stand-alone products are included in msys for Operations: Tivoli NetView for OS/390 V1R4 (5697-B82) and System Automation for OS/390 V2R1 (5645-006). If you already have these stand-alone products installed (at the V1R4 and V2R1 levels, respectively), you can install z/OS V1R3 or z/OS.e V1R3 (including msys for Operations) in the same SMP/E zone as the stand-alone products. However, if you have an earlier or later level of either stand-alone product installed, you will need to move both stand-alone products into a separate zone before installing z/OS V1R3 or z/OS.e V1R3. (Use BUILD MCS to move the stand-alone products or else you will have to reinstall them.)

Chapter 5. Ensuring coexistence and fallback

Coexistence and fallback play an important part in planning for migration to the latest release. This chapter explains what coexistence and fallback are, describes IBM's policy regarding the releases that are supported for coexistence and fallback (as well as migration), and lists service (PTFs) that you can apply to ensure that coexistence and fallback are successful.

While coexistence and fallback might at first seem unrelated, they are very much related in that both deal with an earlier level of a system being able to tolerate changes made by a later level.

Understanding coexistence

*Coexistence*¹ occurs when two or more systems at different software levels share resources. The resources could be shared at the same time by different systems in a multisystem configuration, or they could be shared over a period of time by the same system in a single-system configuration. Examples of coexistence are two different JES releases sharing a spool, two different service levels of DFSMSdfp sharing catalogs, multiple levels of SMP/E processing SYSMODs packaged to exploit the latest enhancements, or an older level of the system using the updated system control files of a newer level (even if new function has been exploited in the newer level).

The sharing of resources is inherent in multisystem configurations that involve Parallel Sysplex implementations. But other types of configurations can have resource sharing too. Examples of configurations where resource sharing can occur are:

- A single processor that is time-sliced to run different levels of the system, such as during different times of the day
- A single processor running multiple images by means of logical partitions (LPARs)
- Multiple images running on several different processors
- Parallel Sysplex or non-Parallel Sysplex configurations

Note: The term coexistence does not refer to z/OS or z/OS.e residing on a single system along with VSE/ESA, VM/ESA, or z/VM in an LPAR or as a VM guest.

z/OS V1R3 and z/OS.e V1R3 systems can coexist with specific prior releases of z/OS and OS/390 systems. (The releases are listed in "Applying the coexistence-migration-fallback policy to V1R3" on page 86.) This is important because it gives you flexibility to migrate systems in a multisystem configuration to z/OS V1R3 or z/OS.e V1R3 using rolling IPLs rather than requiring a systems-wide IPL. (See "Rolling z/OS or z/OS.e across a multisystem configuration" on page 84.) The way in which you make it possible for earlier-level systems to coexist with z/OS V1R3 or z/OS.e V1R3 is to install coexistence service (PTFs) on the earlier-level systems.

You should complete the migration of all earlier-level coexisting systems to z/OS V1R3 or z/OS.e V1R3 as soon as you can. Keep in mind that the objective of

1. In some documentation you might find the terms "compatibility" or "toleration" used instead of "coexistence".

coexistence PTFs is to allow existing functions to continue to be used on the earlier-level systems when run in a mixed environment that contains later-level systems. Coexistence PTFs are not aimed at allowing new functions provided in later releases to work on earlier-level systems.

Rolling z/OS or z/OS.e across a multisystem configuration

A *rolling IPL* is the IPL of one system at a time in a multisystem configuration. You might stage the IPLs over a few hours or a few weeks. The use of rolling IPLs allows you to migrate each z/OS or z/OS.e system to a later release, one at a time, while allowing for continuous application availability.

For example, data sharing applications offer continuous availability in a Parallel Sysplex configuration by treating each z/OS system as a resource for processing the workload. The use of rolling IPLs allows z/OS systems running these applications to be IPLed one at a time, to migrate to a new release of z/OS, while the applications continue to be processed by the other z/OS systems that support the workload. By using LPAR technology, you can use rolling IPLs to upgrade your systems without losing either availability or capacity.

You can use rolling IPLs when both of the following are true:

- The release to which you're migrating falls within four consecutive releases of the releases running on the other systems (or within the range of releases supported by special provisions, where available). See "Applying the coexistence-migration-fallback policy to V1R3" on page 86 for the releases that are supported.
- The appropriate coexistence PTFs have been installed on the other systems in the multisystem configuration.

Even when you're using applications that do not support data sharing, rolling IPLs often make it easier to schedule z/OS and z/OS.e software upgrades. It can be very difficult to schedule a time when all applications running on all the systems in a multisystem configuration can be taken down to allow for a complex-wide or Parallel Sysplex-wide IPL.

The use of rolling IPLs not only enables continuous availability from an end-user application point of view, but it also eliminates the work associated with migrating all z/OS and z/OS.e systems in a multisystem configuration at the same time.

Understanding fallback

Fallback (backout) is a return to the prior level of a system. Fallback can be appropriate if you migrate to z/OS V1R3 or z/OS.e V1R3 and, during testing, encounter severe problems that can be resolved by backing out the new release. By applying fallback PTFs to the "old" system before you migrate, the old system can tolerate changes that were made by the new system during testing.

Note: z/OS.e-to-z/OS.e fallback is not yet possible because z/OS.e V1R3 has no prior releases. However, it is possible to fall back from z/OS.e V1R3 to a prior z/OS or OS/390 release that is supported by the coexistence-migration-fallback policy.

Fallback is relevant in all types of configurations, that is, single-system or multisystem, with or without resource sharing.

As an example of fallback, consider a single system that shares data or data structures, such as user catalogs, as you shift the system image from production

(on the “old” release) to test (on the new release) and back again (to the old release). The later-level test release might make changes that are incompatible with the earlier-level production release. Fallback PTFs on the earlier-level release can allow it to tolerate changes made by the later-level release.

As a general reminder, always plan to have a backout path when installing new software by identifying and installing any service required to support backout.

Fallback is at a system level, rather than an element or feature level, except for z/OS JES2 and z/OS JES3. That is, except for z/OS JES2 and z/OS JES3, you can't back out an element or feature; you can only back out the entire z/OS or z/OS.e product. z/OS JES2 and z/OS JES3 fallback can be done separately as long as the level of JES is supported with the release of z/OS and any necessary fallback PTFs are installed.(z/OS.e differs from z/OS in that separate staging of JES2 or JES3 is not allowed. You migrate to the level of JES provided with your order at the same time you migrate to the rest of z/OS.e. Therefore, for z/OS.e, fallback is at a system level for all elements and features including JES2 and JES3.)

Note: Keep in mind that new functions can require that all systems be at z/OS V1R3 level before the new functions can be used. Therefore, be careful not to exploit new functions until you are fairly confident that you will not need to back out your z/OS V1R3 systems, as fallback maintenance is not available in these cases. You should consult the appropriate z/OS element or feature documentation to determine the requirements for using a particular new function.

If your fallback plans include making a clone, refer to Appendix E, “Making a copy of your system software (cloning)” on page 213.

Coexistence-Migration-Fallback policy

Coexistence, migration, and fallback are so closely related that a single policy governs all three. The policy is the same for both z/OS and z/OS.e. The policy is:

- **For all elements and features except JES2 and JES3:** Four consecutive releases of z/OS (including its predecessor, OS/390) and z/OS.e are supported for coexistence, migration, and fallback. This means that three consecutive releases may coexist with the current release, that the earlier-level release to which you back out must be within three consecutive releases of the current release, and that the release from which you migrate must be within three consecutive releases of the current release.

Thus, the normal period for coexistence, migration, and fallback is a maximum of two years, based on the current six-month release cycle. However, there is an exception. Due to a special provision, OS/390 R10 and z/OS V1R1 are treated as a single coexistence-migration-fallback level rather than two levels, because of the unique relationship between OS/390 R10 and z/OS V1R1.

Example: The four consecutive releases that may coexist with z/OS V1R3 or z/OS.e V1R3 are (1) z/OS V1R3 or z/OS.e V1R3, (2) z/OS V1R2, (3) OS/390 R10 and z/OS V1R1 (both are treated as a single level), and (4) OS/390 R9.

- **For JES2 and JES3:** While the four-consecutive-release policy also applies to JES2 and JES3, the way in which four consecutive releases is determined is different than for the rest of the operating system. If a JES2 or JES3 release is functionally equivalent to its predecessor (that is, its FMID is the same), then from a coexistence-migration-fallback standpoint the release is considered to be the same JES release.

As of z/OS V1R2, compliance to the coexistence-migration-fallback policy for JES2 and JES3 is enforced. A migration to a JES2 or JES3 release level that is not supported by the policy results in the following:

- For JES2: If the JES2 release level for a system that is initializing is not compatible with the other active systems in the JES2 MAS, message HASP710 is issued and the JES2 address space for the initializing system is terminated.
- For JES3: If the JES3 release level for a local is not compatible with the global in a JES3 multisystem complex, message IAT2640 is issued and the JES3 local is not allowed to connect to the global.

IBM performs integration testing and will provide service as necessary to support the z/OS and z/OS.e coexistence-migration-fallback policy.

Notes:

1. **Policy applies to operating system only.** The z/OS and z/OS.e coexistence-migration-fallback policy applies to the elements and features of z/OS, z/OS.e, and OS/390, not to customer-developed applications, vendor-developed applications, or IBM products that run on z/OS, z/OS.e, or OS/390. For coexistence, migration, and fallback considerations that apply to IBM products that run on z/OS, z/OS.e, or OS/390, consult their planning and migration publications. For a list of the IBM products, see Appendix C, “Minimum releases of IBM software products that run with z/OS and z/OS.e” on page 183. For information related to application development on multiple levels of z/OS, z/OS.e, or OS/390, see “Application development environment migration actions” on page 117.
2. **Service length is not the same as coexistence-migration-fallback length.** There is a difference between how long IBM will ensure coexistence, migration, and fallback, and how long a release is serviced. For information about the latter, see “Service policy” on page 33. You will notice that service support is provided for three years following a release’s availability; coexistence-migration-fallback support is provided for two years (based on the four-consecutive-release policy and a six-month release cycle). This allows those who order a release near the end of a two-year coexistence-migration-fallback period enough time to roll out the release across their enterprise without service expiring.

Applying the coexistence-migration-fallback policy to V1R3

This section applies the coexistence-migration-fallback policy to the current release, telling you which specific releases are supported for coexistence, migration, and fallback relative to z/OS V1R3 and z/OS.e V1R3.

For all elements and features except JES2 and JES3:

- The following releases may *coexist* with z/OS V1R3 or z/OS.e V1R3:
 - z/OS V1R3 and z/OS.e V1R3 (both are at the same level)
 - z/OS V1R2
 - OS/390 R10 and z/OS V1R1 (both are treated as a single level)
 - OS/390 R9

For a historical perspective of coexisting releases, see Table 7 on page 88.

- *Migration* from the following releases to z/OS V1R3 or z/OS.e V1R3 is supported:
 - z/OS V1R2
 - OS/390 R10 and z/OS V1R1 (both are treated as a single level)
 - OS/390 R9
- *Fallback* from z/OS V1R3 or z/OS.e V1R3 to the following releases is supported:
 - z/OS V1R2

- OS/390 R10 and z/OS V1R1 (both are treated as a single level)
- OS/390 R9

For JES2:

- The following JES2 releases may *coexist* with z/OS V1R3 JES2 or z/OS.e V1R3 JES2 in the same multi-access spool (MAS):
 - z/OS V1R2 JES2, z/OS V1R3 JES2, and z/OS.e V1R3 JES2 (all are functionally equivalent)
 - OS/390 R10 JES2 and z/OS V1R1 JES2 (both are functionally equivalent)
 - OS/390 R8 JES2 and OS/390 R9 JES2 (both are functionally equivalent)

Note: The coexistence policy would allow OS/390 R7 JES2 to coexist but service support for OS/390 R7 has expired. Expiration of service support supersedes coexistence support.

- *Migration* from the following JES2 releases to z/OS V1R3 JES2 or z/OS.e V1R3 JES2 is supported:
 - OS/390 R10 JES2 and z/OS V1R1 JES2 (both are functionally equivalent)
 - OS/390 R8 JES2 and OS/390 R9 JES2 (both are functionally equivalent)

Note: Migration from z/OS V1R2 JES2 to z/OS V1R3 JES2 is supported by the policy but not shown because these two JES2 releases are functionally equivalent. Also, OS/390 R7 JES2 is not a supported migration path because service support has expired for OS/390 R7.

- *Fallback* from z/OS V1R3 JES2 or z/OS.e V1R3 JES2 to the following releases is supported:
 - OS/390 R10 JES2 and z/OS V1R1 JES2 (both are functionally equivalent)
 - OS/390 R8 JES2 and OS/390 R9 JES2 (both are functionally equivalent)

Note: Fallback from z/OS V1R3 JES2 to z/OS V1R2 JES2 is supported by the policy but not shown because these two JES2 releases are functionally equivalent. In addition, OS/390 R7 JES2 is not supported for fallback because service support has expired for OS/390 R7. Also, fallback from the z/OS.e JES2 element means this is a fallback for the entire z/OS.e release, since separate staging of JES2 is not allowed. Finally, refer to *z/OS JES2 Migration* for information about JES2 mode and other issues relevant to JES2 fallback.

For JES3:

- The following JES3 releases may *coexist* with z/OS V1R3 JES3 or z/OS.e V1R3 JES3 in the same multisystem complex:
 - z/OS V1R2 JES3, z/OS V1R3 JES3, and z/OS.e V1R3 JES3 (all are functionally equivalent)
 - OS/390 R10 JES3 and z/OS V1R1 JES3 (both are functionally equivalent)
 - OS/390 R9 JES3
 - OS/390 R8 JES3
- *Migration* from the following JES3 releases to z/OS V1R3 JES3 or z/OS.e V1R3 JES3 is supported:
 - OS/390 R10 JES3 and z/OS V1R1 JES3 (both are functionally equivalent)
 - OS/390 R9 JES3
 - OS/390 R8 JES3

Note: Migration from z/OS V1R2 JES3 to z/OS V1R3 JES3 is supported by the policy but not shown because these two JES3 releases are functionally equivalent.

- *Fallback* from z/OS V1R3 JES3 or z/OS.e V1R3 JES3 to the following releases is supported:
 - OS/390 R10 JES3 and z/OS V1R1 JES3 (both are functionally equivalent)
 - OS/390 R9 JES3
 - OS/390 R8 JES3

Note: Fallback from z/OS V1R3 JES3 to z/OS V1R2 JES3 is supported by the policy but not shown because these two JES3 releases are functionally equivalent. Also, fallback from the z/OS.e JES3 feature means this is a fallback for the entire z/OS.e release, since separate staging of JES3 is not allowed.

Table 7. Past OS/390 and z/OS, present z/OS and z/OS.e, and projected future z/OS and z/OS.e releases that may coexist

Release (see note 1)	General availability (GA) of the release in column one (see note 2)	End of service (EOS) of the release in column one (see note 3)	OS/390, z/OS, and z/OS.e releases that may coexist with the release in column one (see note 1)
OS/390 R1	29 March 1996	Occurred 31 January 2001	R1
OS/390 R2	27 September 1996	Occurred 31 January 2001	R1, R2
OS/390 R3	28 March 1997	Occurred 31 March 2001	R1, R2, R3
OS/390 R4	26 September 1997	Occurred 31 March 2001	R1, R2, R3, R4
OS/390 R5	27 March 1998	Occurred 31 March 2001	R2, R3, R4, R5
OS/390 R6	25 September 1998	Announced to be 31 March 2002	R2, R3, R4, R5, R6 (see note 4)
OS/390 R7	26 March 1999	Announced to be 31 March 2002	R4, R5, R6, R7
OS/390 R8	24 September 1999	Announced to be 30 September 2002	R5, R6, R7, R8
OS/390 R9	31 March 2000	Announced to be 31 March 2003	R6, R7, R8, R9
OS/390 R10	29 September 2000	Announced to be at least until 30 September 2004	R6, R7, R8, R9, R10 (see note 5)
z/OS R1	30 March 2001	Anticipated to be March 2004	R6, R7, R8, R9, R10 and z/OS R1 (see notes 5 and 6)
z/OS R2	26 October 2001	Anticipated to be October 2004	R8, R9, R10 and z/OS R1, z/OS R2 (see note 6)
z/OS R3 or z/OS.e R3	29 March 2002	Anticipated to be March 2005	R9, R10 and z/OS R1, z/OS R2, z/OS R3, z/OS.e R3 (see note 6)
z/OS R4 or z/OS.e R4	Anticipated to be September 2002	Anticipated to be September 2005	R10 and z/OS R1, z/OS R2, z/OS R3, z/OS.e R3, z/OS R4, z/OS.e R4 (see note 6)

Table 7. Past OS/390 and z/OS, present z/OS and z/OS.e, and projected future z/OS and z/OS.e releases that may coexist (continued)

Release (see note 1)	General availability (GA) of the release in column one (see note 2)	End of service (EOS) of the release in column one (see note 3)	OS/390, z/OS, and z/OS.e releases that may coexist with the release in column one (see note 1)
z/OS R5 or z/OS.e R5	Anticipated to be March 2003	Anticipated to be March 2006	z/OS R2, z/OS R3, z/OS.e R3, z/OS R4, z/OS.e R4, z/OS R5, z/OS.e R5
z/OS R6 or z/OS.e R6	Anticipated to be September 2003	Anticipated to be September 2006	z/OS R3, z/OS.e R3, z/OS R4, z/OS.e R4, z/OS R5, z/OS.e R5, z/OS R6, z/OS.e R6
<p>Notes:</p> <ol style="list-style-type: none"> For readability, the version numbers have been omitted from the releases shown. Future releases (later than z/OS V1R3) are projections; they have not been formally announced and are listed in the table only as an aid to understanding the coexistence policy. In column four, OS/390 is the assumed product name where none is shown. Future GA dates are projections based on a six-month release cycle. Future EOS dates are projections based on the current service policy. For a description of the service policy, see "Service policy" on page 33. Because of a special provision, coexistence of OS/390 V1R2 with OS/390 V2R6 is supported. Because of a special provision, coexistence of OS/390 V2R6 with OS/390 V2R10 is supported. Because of a special provision, OS/390 V2R10 and z/OS V1R1 are treated as one coexistence level. 			

OS/390 R9 coexistence and fallback service

Apply, on OS/390 R9 systems, the coexistence and fallback service that is shown in Table 8.

Table 8. Coexistence and fallback service (PTFs) needed on OS/390 R9 systems

Element or feature, and reason service is needed	OS/390 R9 PTFs
BCP: Supports the coexistence of prior levels of the console services components with z/OS V1R2 and later	UW80194
BCP: PTF UW70740 (APAR OW36418) provides corrective service for GRS (global resource serialization) contention management processing. PTF UW70734 (APAR OW43304) provides compatibility support to allow systems in a Parallel Sysplex configuration to migrate to the corrected GRS contention management processing without requiring a sysplex-wide IPL. Therefore, install PTF UW70734 on <i>every</i> system in the sysplex before installing PTF UW70740 on <i>any</i> system in the sysplex. The correction to contention management processing will not be fully available until both PTFs have been propagated to <i>every</i> system in the sysplex. A sysplex-wide IPL is <i>not</i> required to install either PTF.	UW70734, UW70740

Table 8. Coexistence and fallback service (PTFs) needed on OS/390 R9 systems (continued)

Element or feature, and reason service is needed	OS/390 R9 PTFs
<p>BCP: Allows GRS RNLs (resource name lists) to continue to be consistent across a Parallel Sysplex configuration when falling back from z/OS V1R2 or later to OS/390 R9. z/OS V1R2 introduced wildcard RNL function. If you roll out z/OS V1R2 or later across a sysplex and implement the new function, then have to back off, without the PTF you would have to do a sysplex-wide IPL at OS/390 R9 level to allow all the systems to be restarted, because the new function is not supported by OS/390 R9. (If a system that does not support wildcard RNLs is IPLed into a sysplex that is using them, the system that is not using them will be waitstated by the other systems to maintain consistency of RNLs across the sysplex.)</p>	UW82055, UW84679
<p>BCP: Allows the logger to do multiple reads from large buffers for log data. This PTF does not have to be installed on all systems within a Parallel Sysplex before z/OS is IPLed into the sysplex.</p>	UW71045
<p>BCP: Allows the logger to issue an explicit error message when a LOGR couple data is in use that is at a later level than the current system supports.</p>	UW78270
<p>BCP: As of OS/390 R10, there is new 32 KB block size support and unit affinity support. This scheduler PTF allows jobs that do not request the new functions to run successfully when the jobs are submitted on OS/390 R10 or later but routed by JES3 for execution on earlier OS/390 levels.</p>	UW69770
<p>BCP: Allows RRS to coordinate a cascaded transaction that crosses multiple systems in a Parallel Sysplex configuration</p>	UW79664, UW79667, UW79670, UW79673, UW80858, UW83146
<p>BCP: Supports the coexistence of prior levels of the console services components with z/OS V1R1 and later systems in a Parallel Sysplex configuration</p>	UW77470 or, if Japanese, UW77474
<p>BCP: Supports the coexistence of prior levels of WLM with OS/390 R10 and later systems in a Parallel Sysplex configuration</p>	UW71003
<p>BDT: Changes five-digit JES3 job numbers to eight-character job identifiers in BDT messages.</p>	UW79523 (for BDT base element), UW79524 (for BDT SNA NJE feature)
<p>Cryptographic Services: Allows pre-OS/390 R10 systems to share an ICSF cryptographic key data set (CKDS) with an OS/390 R10 or later system (once key types of IMPORTER, EXPORTER, PINGEN, PINVER, IPINEC, or OPINENC, which have non-CCF control vectors, are added to the CKDS). Without this PTF applied, ICSF services invoked with a key containing a non-CCF control vector executing on pre-OS/390 R10 systems might appear to execute successfully, with a return code of 0 and a reason code of 0 or 4, but the output from the services is useless.</p>	UW73742

Table 8. Coexistence and fallback service (PTFs) needed on OS/390 R9 systems (continued)

Element or feature, and reason service is needed	OS/390 R9 PTFs
Cryptographic Services: Provides an interface to allow the Trusted Key Entry (TKE) administrator to enable and disable access control points in the default role in TKE 3.x. As new access control points are added, existing TKE users must enable these new access control points to allow access to the corresponding ICSF callable service. The access control points are not automatically enabled in the default role.	UW76270
Cryptographic Services: Provides support for ICSF users who share public key data sets (PKDSs) between pre-z/OS V1R2 systems and z/OS V1R2 and later systems.	UW83670
Cryptographic Services: Provides support for new cryptographic hardware on pre-z/OS V1R2 versions of ICSF.	UW83639
DFSMSdfp: Allows pre-OS/390 R10 systems to tolerate records created on OS/390 R10 and later systems with block sizes greater than 32 KB	UW61954, UW62977, UW63366
DFSMSdfp: Enables VSAM data sets to be striped across multiple volumes	UW67759
DFSMSdfp: Allows coexistence of object access method (OAM) multiple object backup function in z/OS V1R3 with prior releases	UW83214
DFSMSdfp: Allows systems prior to z/OS V1R3 to tolerate z/OS V1R3 systems that cache VSAM record-level sharing (RLS) data set control intervals greater than 4 KB	UW79855, UW82211, UW83024
DFSMSdfp: The large volume support in z/OS V1R3 DFSMSdfp (and in OS/390 R10, z/OS V1R1, and z/OS V1R2 via new function PTFs) allows configured volumes up to 32b760 cylinders on an IBM Enterprise Storage Server volume to come online. The coexistence PTF applied to OS/390 R9 prevents a volume configured with more than 10b017 cylinders from coming online on OS/390 R9, which doesn't have the large volume support.	UW81155
DFSMSdfp: Allows the directory entries for PO4 format program objects created by the z/OS V1R3 program management binder to be accessed on an OS/390 R9 system.	UW79796
DFSMShsm: Allows pre-OS/390 R10 systems to tolerate records created on OS/390 R10 and later systems with block sizes greater than 32 KB	UW68028
DFSMShsm: Supports up to 64 concurrent command data set backups to either ML1 DASD or tape. This enhancement increases the rate at which DFSMShsm can perform command data set backups and allows more batch applications to take advantage of it.	UW80683

Table 8. Coexistence and fallback service (PTFs) needed on OS/390 R9 systems (continued)

Element or feature, and reason service is needed	OS/390 R9 PTFs
DFSMSHsm: The DFSMSHsm support for large volumes changes the format of certain DFSMSHsm control data set records. The support was added to OS/390 R10, z/OS V1R1, and z/OS V1R2 via PTF UW83221 and integrated in z/OS V1R3. z/OS V1R3 has built-in support for large volumes. If this support will be used, then UW83221 must be applied on all OS/390 R10, z/OS V1R1, and z/OS V1R2 systems. The OS/390 R9 DFSMSHsm coexistence PTF enables OS/390 R9 DFSMSHsm hosts to coexist with OS/390 R10 and later DFSMSHsm hosts that are managing large volumes.	UW83220
DFSMSHsm: Allows pre-z/OS V1R3 systems to utilize CAPACITYMODE(EXTENDED) tapes created by IBM 3590 tape units in 3490 emulation mode. z/OS V1R3 has built-in support for CAPACITYMODE(EXTENDED) tapes.	UW99377, UW99379, UW99381, UW99387
DFSMSrmm: Allows pre-OS/390 R10 systems to use the import/export function when sharing a virtual tape server (VTS) with import/export function enabled	UW57640
DFSMSrmm: Allows pre-OS/390 R10 systems to share the same DFSMSrmm control data set with OS/390 R10 and later systems using the D/T3494 VTS advanced function support	UW61562
DFSMSrmm: Allows toleration of the extended volume and bin records in the DFSMSrmm control data set introduced with the enhanced bin management support. The support was added to OS/390 R10, z/OS V1R1, and z/OS V1R2 via APAR OW49863 and integrated in z/OS V1R3.	UW78507
Language Environment: Allows downward compatibility , that is, developing applications on OS/390 R10 or later releases and running them on earlier releases	UQ39535, UQ39540, UQ39550, UQ40404, UQ41304, UQ46034, UQ52704
SDSF: Allows OS/390 R9 SDSF to coexist with z/OS V1R2 and later	UQ53587, UQ53592
Security Server: Lets OS/390 R9 systems in a Parallel Sysplex configuration tolerate the larger RACF ENVR objects that OS/390 R10 and later consoles might pass them	UW66593
Security Server: Allows lower-level systems in a Parallel Sysplex configuration to recognize a new cross-system coupling facility (XCF) signal used by z/OS V1R2 and later RACF to improve control of deletion of cached accessor environment elements (ACEEs) from the virtual lookaside facility (VLF).	UW82521
Security Server: Enforces z/OS UNIX file system security across a Parallel Sysplex configuration when access control lists (ACLs) are used.	UW82571, UW83147, UW85646, UW87240
SMP/E: Allows OS/390 R9 SMP/E to tolerate enhancements introduced in z/OS V1R2 SMP/E.	UR52665
TSO/E: Allows toleration of the new (introduced in z/OS V1R3) BROADCAST keyword of the SEND statement in parmlib member IKJTsoxx. Also, if LOGNAME(*) is coded in the SEND statement in parmlib member IKJTsoxx, it will be correctly interpreted as LOGNAME(SYS1.BROADCAST) by the lower-level system.	UW83401

Table 8. Coexistence and fallback service (PTFs) needed on OS/390 R9 systems (continued)

Element or feature, and reason service is needed	OS/390 R9 PTFs
z/OS UNIX System Services: Verifies the shared HFS version of each system that is configured for shared HFS capability in a Parallel Sysplex configuration to ensure that the initializing system is compatible with the active sysplex configuration.	UW81559
z/OS UNIX System Services: When starting a colony address space outside of JES2 or JES3, if your BPXPRMxx parmlib member is shared with other systems in a Parallel Sysplex configuration, this PTF must be installed.	UW83387

OS/390 R10 coexistence and fallback service

Apply, on OS/390 R10 systems, the coexistence and fallback service that is shown in Table 9.

Table 9. Coexistence and fallback service (PTFs) needed on OS/390 R10 systems

Element or feature, and reason service is needed	OS/390 R10 PTFs
BCP: Supports the coexistence of prior levels of the console services components with z/OS V1R2 and later	UW80195
BCP: PTF UW70741 (APAR OW36418) provides corrective service for GRS (global resource serialization) contention management processing. PTF UW70735 (APAR OW43304) provides compatibility support to allow systems in a Parallel Sysplex configuration to migrate to the corrected GRS contention management processing without requiring a sysplex-wide IPL. Therefore, install PTF UW70735 on <i>every</i> system in the sysplex before installing PTF UW70741 on <i>any</i> system in the sysplex. The correction to contention management processing will not be fully available until both PTFs have been propagated to <i>every</i> system in the sysplex. A sysplex-wide IPL is <i>not</i> required to install either PTF.	UW70735, UW70741
BCP: Allows GRS RNLs (resource name lists) to continue to be consistent across a Parallel Sysplex configuration when falling back from z/OS V1R2 or later to OS/390 R10. z/OS V1R2 introduced wildcard RNL function. If you roll out z/OS V1R2 or later across a sysplex and implement the new function, then have to back off, without the PTF you would have to do a sysplex-wide IPL at OS/390 R10 level to allow all the systems to be restarted, because the new function is not supported by OS/390 R10. (If a system that does not support wildcard RNLs is IPLed into a sysplex that is using them, the system that is not using them will be waitstated by the other systems to maintain consistency of RNLs across the sysplex.)	UW82056, UW84680
BCP: Allows RRS to coordinate a cascaded transaction that crosses multiple systems in a Parallel Sysplex configuration.	UW79665, UW79668, UW79671, UW79674, UW83144
BCP: Supports the coexistence of prior levels of the console services components with z/OS V1R1 and later systems in a Parallel Sysplex configuration.	UW77471 or, if Japanese, UW77476
BCP: Allows the logger to issue an explicit error message when a LOGR couple data is in use that is at a later level than the current system supports.	UW78271

Table 9. Coexistence and fallback service (PTFs) needed on OS/390 R10 systems (continued)

Element or feature, and reason service is needed	OS/390 R10 PTFs
BCP: Provides support so that program objects created for z/OS V1R3 or later, with features such as AMODE 64 and 8-byte adcons, can be tolerated on OS/390 R10.	UW84942
BDT: Changes five-digit JES3 job numbers to eight-character job identifiers in BDT messages.	UW79523 (for BDT base element), UW79524 (for BDT SNA NJE feature)
Communications Server: Supports the coexistence of OS/390 R10 Communications Server with z/OS V1R2 and later in a Parallel Sysplex configuration.	UQ50307
Cryptographic Services: Provides an interface to allow the Trusted Key Entry (TKE) administrator to enable and disable access control points in the default role in TKE 3.x. As new access control points are added, existing TKE users must enable these new access control points to allow access to the corresponding ICSF callable service. The access control points are not automatically enabled in the default role.	UW76271
Cryptographic Services: Provides support for ICSF users who share public key data sets (PKDSs) between pre-z/OS V1R2 systems and z/OS V1R2 and later systems.	UW83671
Cryptographic Services: Provides support for new cryptographic hardware on pre-z/OS V1R2 versions of ICSF.	UW83640
DFSMSdftp: Allows coexistence of object access method (OAM) multiple object backup function in z/OS V1R3 with prior releases	UW83215
DFSMSdftp: Allows systems prior to z/OS V1R3 to tolerate z/OS V1R3 systems that cache VSAM record-level sharing (RLS) data set control intervals greater than 4 KB	UW79856, UW82212
DFSMSdftp: The large volume support in z/OS V1R3 DFSMSdftp (and in OS/390 R10, z/OS V1R1, and z/OS V1R2 via new function PTFs) allows configured volumes up to 32b760 cylinders on an IBM Enterprise Storage Server volume to come online. If you have not installed the large volume support on OS/390 R10 (via new function PTF), install the coexistence PTF on OS/390 R10 to prevent a volume configured with more than 10b017 cylinders from coming online on OS/390 R10.	UW81156
DFSMSdftp: Allows the directory entries for PO4 format program objects created by the z/OS V1R3 program management binder to be accessed on an OS/390 R10 system.	UW79797, UW85001
DFSMShsm: Allows pre-z/OS V1R3 systems to utilize CAPACITYMODE(EXTENDED) tapes created by IBM 3590 tape units in 3490 emulation mode. z/OS V1R3 has built-in support for CAPACITYMODE(EXTENDED) tapes.	UW99378, UW99380, UW99383, UW99388
Language Environment: Allows downward compatibility , that is, developing applications on z/OS V1R2 or later releases and running them on earlier releases	UQ46035, UQ54234
SDSF: Allows OS/390 R10 SDSF to coexist with z/OS V1R2 and later	UQ53588, UQ53590, UQ54028

Table 9. Coexistence and fallback service (PTFs) needed on OS/390 R10 systems (continued)

Element or feature, and reason service is needed	OS/390 R10 PTFs
Security Server: Allows lower-level systems in a Parallel Sysplex configuration to recognize a new cross-system coupling facility (XCF) signal used by z/OS V1R2 and later RACF to improve control of deletion of cached accessor environment elements (ACEEs) from the virtual lookaside facility (VLF).	UW82522
Security Server: Allows OS/390 R10, z/OS V1R1, z/OS V1R2, and z/OS V1R3 LDAP servers in a Parallel Sysplex configuration to understand the same supported schema elements.	UW81066, UW84685
Security Server: Enforces z/OS UNIX file system security across a Parallel Sysplex configuration when access control lists (ACLs) are used.	UW82572, UW83148, UW85647, UW87241
SMP/E: Allows OS/390 R10 SMP/E to tolerate enhancements introduced in z/OS V1R2 SMP/E.	UR52665
TSO/E: Allows toleration of the new (introduced in z/OS V1R3) BROADCAST keyword of the SEND statement in parmlib member IKJTSOxx. Also, if LOGNAME(*) is coded in the SEND statement in parmlib member IKJTSOxx, it will be correctly interpreted as LOGNAME(SYS1.BROADCAST) by the lower-level system.	UW83401
z/OS UNIX System Services: Verifies the shared HFS version of each system that is configured for shared HFS capability in a Parallel Sysplex configuration to ensure that the initializing system is compatible with the active sysplex configuration.	UW81557
z/OS UNIX System Services: When starting a colony address space outside of JES2 or JES3, if your BPXPRMxx parmlib member is shared with other systems in a Parallel Sysplex configuration, this PTF must be installed.	UW82162

z/OS V1R1 coexistence and fallback service

Apply, on z/OS V1R1 systems, the coexistence and fallback service that is shown in Table 10.

Table 10. Coexistence and fallback service (PTFs) needed on z/OS V1R1 systems

Element or feature, and reason service is needed	z/OS V1R1 PTFs
BCP: Supports the coexistence of prior levels of the console services components with z/OS V1R2 and later	UW80197
BCP: PTF UW70741 (APAR OW36418) provides corrective service for GRS (global resource serialization) contention management processing. PTF UW70735 (APAR OW43304) provides compatibility support to allow systems in a Parallel Sysplex configuration to migrate to the corrected GRS contention management processing without requiring a sysplex-wide IPL. Therefore, install PTF UW70735 on <i>every</i> system in the sysplex before installing PTF UW70741 on <i>any</i> system in the sysplex. The correction to contention management processing will not be fully available until both PTFs have been propagated to <i>every</i> system in the sysplex. A sysplex-wide IPL is <i>not</i> required to install either PTF.	UW70735, UW70741

Table 10. Coexistence and fallback service (PTFs) needed on z/OS V1R1 systems (continued)

Element or feature, and reason service is needed	z/OS V1R1 PTFs
<p>BCP: Allows GRS RNLs (resource name lists) to continue to be consistent across a Parallel Sysplex configuration when falling back from z/OS V1R2 or later to z/OS V1R1. z/OS V1R2 introduced wildcard RNL function. If you roll out z/OS V1R2 or later across a sysplex and implement the new function, then have to back off, without the PTF you would have to do a sysplex-wide IPL at z/OS V1R1 level to allow all the systems to be restarted, because the new function is not supported by z/OS V1R1. (If a system that does not support wildcard RNLs is IPLed into a sysplex that is using them, the system that is not using them will be waitstated by the other systems to maintain consistency of RNLs across the sysplex.)</p>	UW82056, UW84680
<p>BCP: Allows RRS to coordinate a cascaded transaction that crosses multiple systems in a Parallel Sysplex configuration.</p>	UW79665, UW79668, UW79671, UW79674, UW83144
<p>BCP: Allows the logger to issue an explicit error message when a LOGR couple data is in use that is at a later level than the current system supports.</p>	UW78271
<p>BCP: Provides support so that program objects created for z/OS V1R3 or later, with features such as AMODE 64 and 8-byte adcons, can be tolerated on z/OS V1R1.</p>	UW84942
<p>BDT: Changes five-digit JES3 job numbers to eight-character job identifiers in BDT messages.</p>	UW79523 (for BDT base element), UW79524 (for BDT SNA NJE feature)
<p>Communications Server: Supports the coexistence of z/OS V1R1 Communications Server with z/OS V1R2 and later in a Parallel Sysplex configuration.</p>	UQ50307
<p>Cryptographic Services: Provides support for ICSF users who share public key data sets (PKDSs) between pre-z/OS V1R2 systems and z/OS V1R2 and later systems.</p>	UW83671
<p>Cryptographic Services: Provides support for new cryptographic hardware on pre-z/OS V1R2 versions of ICSF.</p>	UW83640
<p>Cryptographic Services: Provides an interface to allow the Trusted Key Entry (TKE) administrator to enable and disable access control points in the default role in TKE 3.x. As new access control points are added, existing TKE users must enable these new access control points to allow access to the corresponding ICSF callable service. The access control points are not automatically enabled in the default role.</p>	UW76271
<p>DFSMSdftp: Allows coexistence of object access method (OAM) multiple object backup function in z/OS V1R3 with prior releases</p>	UW83215
<p>DFSMSdftp: Allows systems prior to z/OS V1R3 to tolerate z/OS V1R3 systems that cache VSAM record-level sharing (RLS) data set control intervals greater than 4 KB</p>	UW79856, UW82212

Table 10. Coexistence and fallback service (PTFs) needed on z/OS V1R1 systems (continued)

Element or feature, and reason service is needed	z/OS V1R1 PTFs
DFSMSdfp: The large volume support in z/OS V1R3 DFSMSdfp (and in OS/390 R10, z/OS V1R1, and z/OS V1R2 via new function PTFs) allows configured volumes up to 32b760 cylinders on an IBM Enterprise Storage Server volume to come online. If you have not installed the large volume support on z/OS V1R1 (via new function PTF), install the coexistence PTF on z/OS V1R1 to prevent a volume configured with more than 10b017 cylinders from coming online on z/OS V1R1.	UW81156
DFSMSdfp: Allows the directory entries for PO4 format program objects created by the z/OS V1R3 program management binder to be accessed on a z/OS V1R1 system.	UW79797, UW85001
DFSMShsm: Allows pre-z/OS V1R3 systems to utilize CAPACITYMODE(EXTENDED) tapes created by IBM 3590 tape units in 3490 emulation mode. z/OS V1R3 has built-in support for CAPACITYMODE(EXTENDED) tapes.	UW99378, UW99380, UW99383, UW99388
Language Environment: Allows downward compatibility , that is, developing applications on z/OS V1R2 or later releases and running them on earlier releases	UQ46035, UQ54234
SDSF: Allows z/OS V1R1 SDSF to coexist with z/OS V1R2 and later	UQ53588, UQ53590, UQ54028
Security Server: Allows lower-level systems in a Parallel Sysplex configuration to recognize a new cross-system coupling facility (XCF) signal used by z/OS V1R2 and later RACF to improve control of deletion of cached accessor environment elements (ACEEs) from the virtual lookaside facility (VLF).	UW82522
Security Server: Allows OS/390 R10, z/OS V1R1, z/OS V1R2, and z/OS V1R3 LDAP servers in a Parallel Sysplex configuration to understand the same supported schema elements.	UW81066, UW84685
Security Server: Enforces z/OS UNIX file system security across a Parallel Sysplex configuration when access control lists (ACLs) are used.	UW82572, UW83148, UW85647, UW87241
SMP/E: Allows z/OS V1R1 SMP/E to tolerate enhancements introduced in z/OS V1R2 SMP/E.	UR52665
TSO/E: Allows toleration of the new (introduced in z/OS V1R3) BROADCAST keyword of the SEND statement in parmlib member IKJTsoxx. Also, if LOGNAME(*) is coded in the SEND statement in parmlib member IKJTsoxx, it will be correctly interpreted as LOGNAME(SYS1.BROADCAST) by the lower-level system.	UW83401
z/OS UNIX System Services: Verifies the shared HFS version of each system that is configured for shared HFS capability in a Parallel Sysplex configuration to ensure that the initializing system is compatible with the active sysplex configuration.	UW81557
z/OS UNIX System Services: When starting a colony address space outside of JES2 or JES3, if your BPXPRMxx parmlib member is shared with other systems in a Parallel Sysplex configuration, this PTF must be installed.	UW82162

z/OS V1R2 coexistence and fallback service

Apply, on z/OS V1R2 systems, the coexistence and fallback service that is shown in Table 11.

Table 11. Coexistence and fallback service (PTFs) needed on z/OS V1R2 systems

Element or feature, and reason service is needed	z/OS V1R2 PTFs
BCP: Allows GRS RNLs (resource name lists) to continue to be consistent across a Parallel Sysplex configuration when falling back from z/OS V1R3 or later to z/OS V1R2. z/OS V1R2 introduced wildcard RNL function. If you roll out z/OS V1R3 or later across a sysplex and implement the new function, then have to back off, without the PTF you would have to do a sysplex-wide IPL at z/OS V1R1 level to allow all the systems to be restarted, because this maintenance is now required for the function. (If a system that does not support wildcard RNLs is IPLed into a sysplex that is using them, the system that is not using them will be waitstated by the other systems to maintain consistency of RNLs across the sysplex.)	UW82057, UW84681
BCP: Allows an installation to have connections to the same log stream from z/OS V1R2 and z/OS V1R3 systems when pending updates are established at the z/OS V1R3 level. The PTF does not provide for an UPDATE LOGSTREAM request to mark any new attributes as pending when the log stream is already in use, but honors the pending updates so the logger can operate on the same information at both release levels.	UW82732
BCP: Provides support so that program objects created for z/OS V1R3 or later, with features such as AMODE 64 and 8-byte adcons, can be tolerated on z/OS V1R2.	UW84943
DFSMSdftp: Allows coexistence of object access method (OAM) multiple object backup function in z/OS V1R3 with prior releases	UW83215
DFSMSdftp: Allows systems prior to z/OS V1R3 to tolerate z/OS V1R3 systems that cache VSAM record-level sharing (RLS) data set control intervals greater than 4 KB	UW79856, UW82212
DFSMSdftp: The large volume support in z/OS V1R3 DFSMSdftp (and in OS/390 R10, z/OS V1R1, and z/OS V1R2 via new function PTFs) allows configured volumes up to 32b760 cylinders on an IBM Enterprise Storage Server volume to come online. If you have not installed the large volume support on z/OS V1R2 (via new function PTF), install the coexistence PTF on z/OS V1R2 to prevent a volume configured with more than 10b017 cylinders from coming online on z/OS V1R2.	UW81156
DFSMSdftp: Allows the directory entries for PO4 format program objects created by the z/OS V1R3 program management binder to be accessed on a z/OS V1R2 system.	UW79797, UW85001
DFSMShsm: Allows pre-z/OS V1R3 systems to utilize CAPACITYMODE(EXTENDED) tapes created by IBM 3590 tape units in 3490 emulation mode. z/OS V1R3 has built-in support for CAPACITYMODE(EXTENDED) tapes.	UW99378, UW99380, UW99383, UW99388
Security Server: Allows OS/390 R10, z/OS V1R1, z/OS V1R2, and z/OS V1R3 LDAP servers in a Parallel Sysplex configuration to understand the same supported schema elements.	UW81067, UW84686

Table 11. Coexistence and fallback service (PTFs) needed on z/OS V1R2 systems (continued)

Element or feature, and reason service is needed	z/OS V1R2 PTFs
Security Server: Enforces z/OS UNIX file system security across a Parallel Sysplex configuration when access control lists (ACLs) are used.	UW82573, UW83149, UW85648, UW87242
TSO/E: Allows toleration of the new (introduced in z/OS V1R3) BROADCAST keyword of the SEND statement in parmlib member IKJTSoxx. Also, if LOGNAME(*) is coded in the SEND statement in parmlib member IKJTSoxx, it will be correctly interpreted as LOGNAME(SYS1.BROADCAST) by the lower-level system.	UW83401
z/OS UNIX System Services: Verifies the shared HFS version of each system that is configured for shared HFS capability in a Parallel Sysplex configuration to ensure that the initializing system is compatible with the active sysplex configuration.	UW81558
z/OS UNIX System Services: When starting a colony address space outside of JES2 or JES3, if your BPXPRMxx parmlib member is shared with other systems in a Parallel Sysplex configuration, this PTF must be installed.	UW82163

JES2 coexistence and fallback service

The following PTFs are required for prior levels of JES2 to run with z/OS V1R3 JES2 in a multi-access spool (MAS):

On this release:	Install these PTFs:
OS/390 R8-R9 JES2	UW69012, UW99362
OS/390 R10-z/OS V1R1 JES2	UW99363

JES3 coexistence and fallback service

The following PTFs are required for prior levels of JES3 to run with z/OS V1R3 JES3 in a multisystem complex:

On this release:	Install these PTFs:
OS/390 R8 JES3	UW66542, UW69091, UW70046, UW70366, UW90713
OS/390 R9 JES3	UW66543, UW69092, UW70367, UW90714
OS/390 R10-z/OS V1R1 JES3	UW90715

Chapter 6. Preparing for migration

A *migration* is a move to a changed operating environment, usually from an older level of a product to a more current one. This chapter helps you decide which to migrate first when you migrate to z/OS V1R3: software (to z/OS) or hardware (to a zSeries server). It then identifies (for both z/OS and z/OS.e) whether you need to take any software migration actions based on the z/OS or OS/390 release from which you're migrating, either pointing to where you can find the actions or actually describing the actions. Finally, it briefly discusses migration actions for ISV products.

Migration policy

The migration policy is the same as the coexistence and fallback policy. That is, the release you are migrating *from* must be within four consecutive releases of the release you are migrating *to*. For additional information, see "Coexistence-Migration-Fallback policy" on page 85.

Deciding which to migrate first — software (to z/OS) or hardware (to z800 or z900)

Only when you run z/OS on a zSeries 800 (z800) or zSeries 900 (z900) server can you achieve all that this software/hardware combination has to offer, that is, 64-bit real storage support, the Intelligent Resource Director (to dynamically manage resources across LPARs), and HiperSockets (high speed TCP/IP communication between LPARs). In order for you to migrate to this environment, you'll have to upgrade software (from OS/390 to z/OS), hardware (to a z800 or z900 server), and architecture (from S/390 to z/Architecture). In addition, you'll find a change in terms and conditions — from Parallel Sysplex License Charges (PSLC) pricing to Workload License Charges (WLC) pricing. To help you migrate to this new environment, this section presents some recommendations.

As you will see, there is a lot of migration flexibility when migrating to z/OS on a z800 or z900 server. The optimal migration path depends on your choice of migrating hardware or software first, how much change you are willing to make at once, and other considerations such as those described below. As a result, different customers will choose different paths.

Factors to consider when deciding whether to upgrade your software or hardware first are:

- Existing plans and commitments.
- Timing of capacity requirements and new functions (hardware and software).
- Once a z800 or z900 server is installed, how soon you want to exploit the new architecture and how prepared you are for WLC pricing. (Refer to *z/OS Planning for Workload License Charges*.)
- The level of existing software.
- The level of existing hardware.
- Your test environment.
- Your disaster recovery environment.

Also consider how much change (and risk) you want to make (or accept) at any given upgrade. Some factors to consider are:

- The ability to schedule multiple upgrade windows. If scheduling upgrades is not a problem for your applications, you might want to minimize the amount of change (risk) and make several small hardware or software changes. However, if because of testing, application availability, or other factors you get only two upgrade windows a year, you might want to limit those to one hardware and one software change.
- The ability to back out from a given change. While it is normal to plan for backout from a processor change, architecture change, or a new operating system level, you might not want to do more than one at a time.
- How important it is to you to have similar test and production environments, and a similar disaster recovery environment (for example, in terms of hardware, software, and architecture levels).

As mentioned previously, migrating from OS/390 on an S/390 server to z/OS on a z800 or z900 server requires a change in architecture level. Table 12 shows you the architecture mode supported on each release and server. For example, the table shows you that z/OS V1R3 does not support the S/390 Parallel Enterprise Server G4, supports only ESA/390 mode on an S/390 Parallel Enterprise Server G5, and supports only z/Architecture mode on a z900 server.

Table 12. Architecture mode supported by release and server

OS/390 or z/OS release	Architecture mode supported by S/390 Parallel Enterprise Server R2, R3, G3, and G4; S/390 Multiprise 2000; S/390 Integrated Server; PC Server S/390; and RS/6000 with S/390 Server-on-Board	Architecture mode supported by S/390 Parallel Enterprise Server G5 and G6, and S/390 Multiprise 3000	Architecture mode supported by zSeries 800 (z800) and zSeries 900 (z900)
OS/390 R9	ESA/390	ESA/390	ESA/390
OS/390 R10	ESA/390	ESA/390	ESA/390 and z/Architecture
All z/OS releases	Not supported	ESA/390	z/Architecture

Regardless of when you change from ESA/390 architecture to z/Architecture, you should do the following before you make the switch:

- Check the z800 or z900 PSP bucket for IBM maintenance needed for 64-bit addressing (or other hardware-related functions). The upgrade identifiers are 2066DEVICE for the z800 and 2064DEVICE for the z900.
- Check with your vendors to ensure that they support z/Architecture.
- Verify that any locally developed code is not affected by the new architecture.
- When you are ready to switch to z/Architecture, reconfigure the LPAR to use only central storage rather than expanded storage.

Recommendations: Even though each customer situation is unique, we can make the following general recommendations regarding the timing of software and hardware migration, based on the release you are currently running:

- **If you are currently running OS/390 R8 or earlier**, you are running a level that is unsupported from either a service standpoint or coexistence standpoint, or both. Take the following steps:

1. *If you are currently running OS/390 R7 or earlier*, you are running a level that is neither service supported nor coexistence supported with z/OS V1R3. Migrate your software to OS/390 R10 by contracting to have IBM Global Services assess whether a direct migration to OS/390 R10 is possible and, if it is, have them help you through the migration. (If a direct migration is not possible, contact your IBM representative to understand what alternatives might be available.) Assuming a direct migration to OS/390 R10 is assessed as possible, order OS/390 R10 via a ServerPac or SystemPac. (CBPDO could be used instead but is not recommended because of the large number of elements and features that need to be installed.)

If you are currently running OS/390 R8, you are running a level that is service supported but not coexistence supported with z/OS V1R3. Migrate your software to OS/390 R10 by using ServerPac or SystemPac.

2. Order, install, and migrate to a z800 or z900 server. Initially, use the z800 or z900 server with OS/390 R10 in ESA/390 (31-bit) mode, then migrate to 64-bit real addressing.
3. Migrate to z/OS V1R3. Use ServerPac, CBPDO, or SystemPac to install it.

Note: OS/390 R10 will remain orderable until 17 December 2002.

By migrating to OS/390 R10 first, you minimize the risk of migrating to a new level of the operating system and a new architecture at the same time. OS/390 R10 supports both architectures (ESA/390 and z/Architecture). Thus, by using OS/390 R10 as a migration step to z/OS and by placing your test image on a z800 or z900 server, running OS/390 R10 gives you the flexibility to test your applications and ISV products with either architecture while having the ability to fall back to ESA/390 if a problem is encountered. This full bimodality of OS/390 R10 is provided as a migration bridge to z/OS on a z800 or z900 server. (Note: If the test image is running OS/390 R10 or z/OS on a G5, G6, or Multiprise 3000 server rather than a z800 or z900 server, your test environment is limited to ESA/390 architecture and 31-bit mode.)

- **If you are currently running OS/390 R9 on a server that is not supported by z/OS**, upgrade your hardware first. The servers supported by z/OS are the G5, G6, and Multiprise 3000 (and, of course, the z800 and z900). Take the following steps:

1. Order, install, and migrate to a z800 or z900 server. You must do this first because the hardware you currently have is not supported by z/OS (or OS/390 R10). OS/390 R9 is supported on the z800 or z900 server. The system remains in 31-bit mode.
2. Upgrade to z/OS V1R3 via ServerPac or SystemPac. (CBPDO could be used instead but is not recommended because of the large number of elements and features that must be installed).

There is no need to go through OS/390 R10. However, because z/OS is required to run in 64-bit mode on a z800 or z900 server, there is an implied architecture level change (and licensing change) when first migrating to z/OS on a z800 or z900 server. If you wish to avoid changing your operating system and architecture level at the same time, take the intermediate migration step of migrating to OS/390 R10 followed by an upgrade to z/OS V1R3.

Note: OS/390 R10 will remain orderable until 17 December 2002.

This path enables you to initially take advantage of the z800 or z900 capabilities that OS/390 can support, while providing a single software migration to get to z/OS to be in position to exploit 64-bit real addressing, Intelligent Resource Director (IRD), and Workload License Charges (WLC). Furthermore, this path minimizes the number of testing and upgrade periods.

- **If you are currently running OS/390 R9 on a G5, G6, or Multiprise 3000 server (which are all supported by z/OS)**, upgrade your software first, as follows:

1. Order, install, and migrate to z/OS V1R3 via a ServerPac or SystemPac. (CBPDO could be used instead but is not recommended because of the large number of elements and features that must be installed).

There is an implied architecture level change when first migrating to z/OS on a z800 or z900 server. If you wish to avoid changing your operating system and architecture level at the same time, take the intermediate migration step of migrating to OS/390 R10, then upgrading to a z800 or z900 server, followed by upgrading to z/OS.

Note: OS/390 R10 will remain orderable until 17 December 2002.

2. Prepare for Intelligent Resource Director (IRD) by customizing the system and exploiting WLM.
3. Order, install, and migrate to a z800 or z900 server.

This path enables you to have a single software migration and use that system to customize the required components needed by IRD, so that you are in position to exploit this function after the migration to the z800 or z900 server is complete.

- **If you are currently running OS/390 R10**, upgrade your hardware first, as follows:

1. Order, install, and migrate to a z800 or z900 server. Initially, use the z800 or z900 server with OS/390 R10 in ESA/390 (31-bit) mode, then migrate to 64-bit real addressing.
2. Migrate to z/OS V1R3. Use ServerPac, CBPDO, or SystemPac to install it.

This path minimizes the risk of migrating to new levels of the operating system and new architecture at the same time.

While you can run z/OS V1R3 in a mixed hardware environment that includes G5, G6, Multiprise 3000, z800, and z900 servers, if you are concerned about having your test and production environments as similar as possible (for example, capable of supporting similar architecture and addressing mode), you might consider placing your test image on a z800 or z900 server during step 1 above. OS/390 R10 supports both architectures (ESA/390 and z/Architecture). Thus, by using OS/390 R10 as a migration step to z/OS and by placing your test image on a z800 or z900 server, running OS/390 R10 gives you the flexibility to test your applications and ISV products with either architecture while having the ability to fall back to ESA/390 if a problem is encountered. This full bimodality of OS/390 R10 is provided as a migration bridge to z/OS on a z800 or z900 server. (Note: If the test image is running OS/390 R10 or z/OS on a G5, G6, or Multiprise 3000 server rather than a z800 or z900 server, your test environment is limited to ESA/390 architecture and 31-bit mode.)

- **If you are currently running z/OS V1R1 or V1R2**, use one of the normal installation methods (ServerPac, CBPDO, or SystemPac) to install z/OS V1R3. There is no Upgrade Package for z/OS V1R3 as there was for z/OS V1R1. If you are not running z/OS on a z800 or z900 server, you can migrate to the z800 or

z900 either before or after installing z/OS V1R3. Remember, there is an architecture level change (ESA/390 to z/Architecture) when migrating to a z800 or z900 server.

Disaster recovery environments should mirror as closely as possible their associated production environments. Therefore, plans for your disaster recovery systems should include upgrading the hardware to support the new architecture once your production environment supports it.

Identifying z/OS and z/OS.e element and feature migration actions

This section contains a table that tells you, for each element and feature, whether there are any migration actions and where you can find information about the migration actions. Following the table, some of the more important migration actions are described. (These actions are discussed in the element and feature books as well, but are repeated here because of their importance.)

Note: Because z/OS.e V1R3 is a new product, migration to z/OS.e V1R3 from an earlier release of z/OS.e is not possible. However, this section includes migration to z/OS.e in addition to z/OS because it is possible to use operational data sets (as well as other types of data sets) from an earlier release of z/OS or OS/390 when building a z/OS.e system, rather than starting from scratch. (Installation of z/OS.e via the ServerPac software upgrade installation path uses the operational data sets from your previous system.) You must understand whether there are migration actions that pertain to these data sets.

Migration table

The following migration paths to z/OS V1R3 and z/OS.e V1R3 are supported:

- From OS/390 R9
- From OS/390 R10
- From z/OS V1R1
- From z/OS V1R2

For each migration path, Table 13 on page 106 identifies whether there are any migration actions to perform and, if there are, where you can find the migration actions.

Notes:

1. Exploitation of new functions might require you to take migration actions. However, such migration actions are not considered in the table. The table only addresses migration of existing functions.
2. It is assumed that appropriate small programming enhancements (SPEs) and PTFs have been added to the releases from which you are migrating. However, SPEs and PTFs are not considered in the table.
3. Dynamically enabling any priced features that were not previously enabled is not considered a migration action.
4. The table no longer tells CBPDO installers, as in previous editions of this book, whether each element and feature has changed and therefore requires installation. To find out which elements and features have changed since you last installed them, see Table 1 on page 3. For installation instructions, see *z/OS Program Directory*.

Table 13. Directory of migration actions by element and feature

Element or feature	Are there migration actions to z/OS V1R3 or z/OS.e V1R3 from...				Notes (including where to look for migration actions)
	OS/390 R9	OS/390 R10	z/OS V1R1	z/OS V1R2	
BCP	Yes	Yes	Yes	Yes	See “BCP — binder COMPAT option default change” on page 111 and <i>z/OS MVS Migration</i> .
BDT	No	No	No	No	
BDT File-to-File	No	No	No	No	BDT File-to-File is not supported in z/OS.e.
(z/OS only)					
BDT SNA NJE	No	No	No	No	
BookManager BookServer	Yes	Yes	Yes	No	See “BookManager BookServer migration actions” on page 111.
BookManager BUILD	No	No	No	No	BookManager BUILD is not supported in z/OS.e.
(z/OS only)					
BookManager READ	No	No	No	No	BookManager READ is not supported in z/OS.e.
(z/OS only)					
C/C++ IBM Open Class Library	Yes	Yes	Yes	Yes	See “C/C++ migration actions” on page 112 and <i>z/OS C/C++ Compiler and Run-Time Migration Guide</i> .
C/C++ with Debug Tool	Yes	Yes	Yes	Yes	See “C/C++ migration actions” on page 112 and <i>z/OS C/C++ Compiler and Run-Time Migration Guide</i> .
C/C++ without Debug Tool	Yes	Yes	Yes	Yes	See “C/C++ migration actions” on page 112 and <i>z/OS C/C++ Compiler and Run-Time Migration Guide</i> .
Communications Server	Yes	Yes	Yes	No	See <i>z/OS Communications Server: IP Migration</i> and <i>z/OS Communications Server: SNA Migration</i> .
Communications Server NPF	No	No	No	No	Communications Server NPF is not supported in z/OS.e.
(z/OS only)					
Communications Server Security Level 1	Yes	Yes	Yes	Not applicable	This feature, formerly named SecureWay Communications Server Security Level 1, was removed from the operating system as of z/OS V1R2 (last delivered in z/OS V1R1). This feature provided Version 4 Kerberos support. However, Version 5 Kerberos support is more current and is already provided by the z/OS Security Server feature. You should modify any applications that currently use the Kerberos Version 4 support provided by this feature to use the Kerberos Version 5 support provided by the z/OS Security Server feature. You will need to rewrite Kerberos V4 applications to use the Kerberos V5 application programming interface (API) and data structures. For assistance, see <i>z/OS SecureWay Security Server Network Authentication Service Administration</i> and <i>z/OS SecureWay Security Server Network Authentication Service Programming</i> .

Table 13. Directory of migration actions by element and feature (continued)

Element or feature	Are there migration actions to z/OS V1R3 or z/OS.e V1R3 from...				Notes (including where to look for migration actions)
	OS/390 R9	OS/390 R10	z/OS V1R1	z/OS V1R2	
Communications Server Security Level 2	Yes	Yes	Yes	Not applicable	This feature, formerly named SecureWay Communications Server Security Level 2, was removed from the operating system as of z/OS V1R2 (last delivered in z/OS V1R1). This feature provided Version 4 Kerberos support. However, Version 5 Kerberos support is more current and is already provided by the z/OS Security Server feature. You should modify any applications that currently use the Kerberos Version 4 support provided by this feature to use the Kerberos Version 5 support provided by the z/OS Security Server feature. You will need to rewrite Kerberos V4 applications to use the Kerberos V5 application programming interface (API) and data structures. For assistance, see <i>z/OS SecureWay Security Server Network Authentication Service Administration</i> and <i>z/OS SecureWay Security Server Network Authentication Service Programming</i> .
Communications Server Security Level 3	No	No	No	No	
Cryptographic Services	Yes	Yes	Yes	Yes	From all releases, see <i>z/OS ICSF System Programmer's Guide</i> . From all releases except z/OS V1R2, see <i>z/OS System Secure Sockets Layer Programming</i> .
DCE Application Support (z/OS only)	No	No	No	No	DCE Application Support is not supported in z/OS.e.
DCE Base Services	No	No	No	No	
DFSMSdfp	Yes	Yes	Yes	Yes	See <i>z/OS DFSMS Migration</i> .
DFSMSdss	Yes	Yes	Yes	Yes	See <i>z/OS DFSMS Migration</i> .
DFSMSHsm	Yes	Yes	Yes	Yes	See <i>z/OS DFSMS Migration</i> .
DFSMSrmm	Yes	Yes	Yes	Yes	See <i>z/OS DFSMS Migration</i> .
DFSORT	No	No	No	No	Migration might be from the OS/390 or z/OS feature, or from the stand-alone product. Regardless, there are no migration actions.
Distributed File Service	No	No	No	No	
Encina Toolkit Executive (z/OS only)	No	No	No	No	Encina Toolkit Executive is not supported in z/OS.e.
EREP	No	No	No	No	
ESCON Director Support	No	No	No	No	
FFST	No	No	No	No	

Table 13. Directory of migration actions by element and feature (continued)

Element or feature	Are there migration actions to z/OS V1R3 or z/OS.e V1R3 from...				Notes (including where to look for migration actions)
	OS/390 R9	OS/390 R10	z/OS V1R1	z/OS V1R2	
GDDM (z/OS only)	No	No	No	No	GDDM is not supported in z/OS.e.
GDDM-PGF (z/OS only)	No	No	No	No	GDDM-PGF is not supported in z/OS.e.
GDDM-REXX (z/OS only)	No	No	No	No	GDDM-REXX is not supported in z/OS.e.
HCD	Yes	Yes	Yes	Yes	If you are running in a Parallel Sysplex, you might need to update your HCD channel definitions. The coupling facility channel types on the z800 and z900 are not the same as on prior processors, and you might need to update the channel definitions to get connectivity. For more information, see <i>z/OS HCD Planning</i> .
HCM	No	No	No	No	
HLASM	No	No	No	No	Migration from OS/390 R9 might be from the OS/390 or z/OS base element, or from the stand-alone product. Regardless, there are no migration actions.
HLASM Toolkit	No	No	No	No	Migration from OS/390 R9 might be from the OS/390 or z/OS feature, or from the stand-alone product feature. Regardless, there are no migration actions.
IBM HTTP Server	Yes	No	No	No	See <i>z/OS HTTP Server Planning, Installing, and Using</i> .
IBM HTTP Server Export Secure	No	Not applicable	Not applicable	Not applicable	Removed from the operating system as of OS/390 R10 (last delivered in OS/390 R9). It is no longer needed; the equivalent level of security is provided by base element Cryptographic Services.
IBM HTTP Server France Secure	No	Not applicable	Not applicable	Not applicable	Removed from the operating system as of OS/390 R10 (last delivered in OS/390 R9). It is no longer needed; the equivalent level of security is provided by base element Cryptographic Services.
IBM HTTP Server NA Secure	No	No	No	No	
ICKDSF	No	No	No	No	
ILM	Not applicable	Not applicable	No	No	ILM was new in z/OS V1R1.
Infoprint Server	Yes	Yes	Yes	No	Migration might be from the OS/390 or z/OS feature, the IP PrintWay feature of PSF V3, or the NetSpool feature of PSF V3. Migration actions are in <i>z/OS Infoprint Server Migration</i> .
ISPF	Yes	Yes	Yes	No	For host-based services, see <i>z/OS ISPF Planning and Customizing</i> . For client-server services, see <i>z/OS ISPF User's Guide</i> .

Table 13. Directory of migration actions by element and feature (continued)

Element or feature	Are there migration actions to z/OS V1R3 or z/OS.e V1R3 from...				Notes (including where to look for migration actions)
	OS/390 R9	OS/390 R10	z/OS V1R1	z/OS V1R2	
JES2	Yes	Yes	Yes	Yes	See “JES2 migration action for pre-release 4 mode” on page 113, “JES2 and JES3 migration actions for changed job ID format” on page 113, and <i>z/OS JES2 Migration</i> .
JES3	Yes	Yes	Yes	Yes	See “JES2 and JES3 migration actions for changed job ID format” on page 113 and <i>z/OS JES3 Migration</i> .
LAN Server	Yes	Yes	Yes	Not applicable	OS/390 R9 was the last release to include both the workstation and host components. OS/390 R10 and z/OS V1R1 had only the host component. As of z/OS V1R2, neither component is available. See the redbook <i>S/390 File and Print Serving</i> , SG24-5330, for alternative solutions and migration guidance.
Language Environment	Yes	Yes	Yes	Yes	See “Language Environment migration actions” on page 114 and: <ul style="list-style-type: none"> • <i>z/OS Language Environment Run-Time Migration Guide</i> • <i>z/OS C/C++ Compiler and Run-Time Migration Guide</i> • <i>COBOL for OS/390 & VM Compiler and Run-Time Migration Guide</i> • <i>Language Environment for MVS & VM Fortran Run-Time Migration Guide</i> • <i>PL/I for MVS & VM Compiler and Run-Time Migration Guide</i> • <i>VisualAge PL/I for OS/390 Compiler and Run-Time Migration Guide</i> <p>Migration might be from the OS/390 or z/OS Language Environment base element, or from the following pre-Language Environment run-time libraries:</p> <ul style="list-style-type: none"> • C/370 V1 and V2 • OS/VS COBOL • VS COBOL II • VS FORTRAN V1 and V2 • OS PL/I V1 and V2 <p>Note: The listed products contain both a compiler and a run-time library. The object programs produced by the compilers are supported running under z/OS Language Environment, although not all of the compilers themselves are still supported.</p>
LANRES	Yes	Yes	Yes	Yes	Removed from the operating system as of z/OS V1R3 (last delivered in z/OS V1R2). For migration information, see the white paper at http://www.ibm.com/eserver/zseries/library/whitepapers/gm130035.html .
MICR/OCR (z/OS only)	No	No	No	No	MICR/OCR is not supported in z/OS.e.

Table 13. Directory of migration actions by element and feature (continued)

Element or feature	Are there migration actions to z/OS V1R3 or z/OS.e V1R3 from...				Notes (including where to look for migration actions)
	OS/390 R9	OS/390 R10	z/OS V1R1	z/OS V1R2	
msys for Operations	Not applicable	Not applicable	Not applicable	No	msys for Operations was new in z/OS V1R2.
msys for Setup	Not applicable	Not applicable	No	No	msys for Setup was new in z/OS V1R1.
Network File System	No	No	No	No	
OCSF Security Level 3	No	No	No	No	
OSA/SF	No	No	No	No	
RMF	Yes	Yes	Yes	No	See <i>z/OS RMF User's Guide</i> .
SDSF	Yes	Yes	Yes	No	See <i>z/OS SDSF Operation and Customization</i> .
Security Server	Yes	Yes	Yes	Yes	See <i>z/OS Security Server RACF Migration</i> , <i>z/OS Security Server LDAP Server Administration and Use</i> , and <i>z/OS SecureWay Security Server Firewall Technologies</i> .
Security Server Network Authentication Service Level 3	Not applicable	Not applicable	Not applicable	No	Security Server Network Authentication Service Level 3 was new in z/OS V1R2.
SMP/E	Yes	Yes	Yes	No	See "SMP/E migration actions for data sets" on page 116 and <i>SMP/E User's Guide</i> .
Softcopy Print	Yes	Not applicable	Not applicable	Not applicable	Removed from the operating system as of OS/390 R10. See "Withdrawn as of OS/390 R10 (last delivered in OS/390 R9)" on page 21.
SOMobjects ADE	Yes	Yes	Yes	Not applicable	Removed from the operating system as of z/OS V1R2 (last delivered in z/OS V1R1). Instead, consider the WebSphere line of products.
SOMobjects RTL	Yes	Yes	Yes	Not applicable	Removed from the operating system as of z/OS V1R2 (last delivered in z/OS V1R1). Instead, consider the WebSphere line of products.
System SSL Security Level 2	No	Not applicable	Not applicable	Not applicable	Removed as an optional feature as of OS/390 R10. The function was merged into the Cryptographic Services base element.
System SSL Security Level 3	No	No	No	No	
Text Search	No	No	No	No	
TIOC	No	No	No	No	
Tivoli Management Framework	Yes	Yes	Yes	Not applicable	Removed from the operating system as of z/OS V1R2 (last delivered in z/OS V1R1). Instead, consider the stand-alone product Tivoli Management Framework V3 for OS/390, 5697-D10.
TSO/E	No	No	No	No	

Table 13. Directory of migration actions by element and feature (continued)

Element or feature	Are there migration actions to z/OS V1R3 or z/OS.e V1R3 from...				Notes (including where to look for migration actions)
	OS/390 R9	OS/390 R10	z/OS V1R1	z/OS V1R2	
VisualLift ADE	No	Not applicable	Not applicable	Not applicable	Removed from the operating system as of OS/390 R10 (last delivered in OS/390 R9).
VisualLift RTE	No	Not applicable	Not applicable	Not applicable	Removed from the operating system as of OS/390 R10 (last delivered in OS/390 R9).
WebSphere Application Server	Yes	Not applicable	Not applicable	Not applicable	Removed from the operating system as of OS/390 R10 (last delivered in OS/390 R9). Instead, consider the stand-alone product WebSphere Application Server V4 for OS/390 and z/OS (5655-F31).
z/OS UNIX System Services	Yes	Yes	Yes	Yes	See <i>z/OS UNIX System Services Planning</i> .
3270 PC File Transfer Program	No	No	No	No	

BCP — binder COMPAT option default change

The program management binder COMPAT option lets you specify the compatibility level of the binder. As of z/OS V1R3 and z/OS.e V1R3, the default is changed from CURRENT to the new option, MIN. The old default, CURRENT, specifies that the binder output is defined for the current level of the binder. For example, a system running at the z/OS V1R3 level with a specification of COMPAT=CURRENT will get the z/OS V1R3 PM4 program object format. The new default, MIN, specifies that the binder will choose the earliest format supporting all of the binder features in use. This means that a system at the z/OS V1R3 level specifying or defaulting to COMPAT=MIN will get the program object format appropriate to the binder features in use, rather than the current one.

Certain tools, such as the z/OS UNIX System Services c89 utility, and the C/C++ CXXBIND EXEC and CBCB procedure, explicitly specify COMPAT=CURRENT, thus overriding the binder default. Applications built with tools that explicitly set the COMPAT option to CURRENT must be overridden to specify MIN, or a specific program object level, in order for those applications to be successfully executed or rebound on systems earlier than z/OS V1R3.

For complete information on the COMPAT option, see *z/OS MVS Program Management: User's Guide and Reference*.

BookManager BookServer migration actions

As of z/OS V1R2 BookManager BookServer, the DOCNUMS directory (default location .../cgi-bin/docnums) and the DOCNUMS= parameter of the bookmgr.80 (or your equivalent) configuration file are no longer used. We recommend that you delete your DOCNUMS directory and remove the DOCNUMS= parameter from your bookmgr.80 (or equivalent) configuration file. If you have specified an alternate DOCNUMS directory on the DOCNUMS= parameter, you should delete it too. However, failure to delete the DOCNUMS directory or remove the DOCNUMS= parameter will not cause any problems.

There is a potential migration action for customers who have implemented PDF support as introduced in APAR PQ40691. Relocating certain PDF files might be necessary. See *z/OS Program Directory* for details.

With z/OS.e, vector graphics in IBM and non-IBM product documentation might not display correctly because GDDM is not supported. If you experience this problem, convert the book using the Book Graphics Conversion Utility (TransMogrifier), which is available free of charge as a download from the BookManager Web site at <http://www.ibm.com/software/office/bkmgr/transmog.html>. Converted books have no dependency on GDDM.

C/C++ migration actions

Two C++ compilers ship with z/OS V1R3 and z/OS.e V1R3. One, the ISO C++ compiler, first shipped in z/OS V1R2 and supports the ISO C++ 1998 Standard language level. The other, the non-ISO C++ compiler, is the older compiler (known as the OS/390 R10 C++ compiler) and does not support the ISO C++ 1998 Standard language level. There are incompatibilities between the language levels supported by the two compilers. Because IBM intends to withdraw the non-ISO C++ compiler from a future release, you should migrate to the ISO C++ compiler. While the ISO C++ compiler provides limited compatibility (controlled by compiler options) to ease migration, you will generally need to make code changes. For details, see *z/OS C/C++ Compiler and Run-Time Migration Guide*.

The C/C++ IBM Open Class Library Application Support Class and Collection Class libraries are planned to be removed in the future. New application development involving C++ classes should make use of the C++ Standard Library, shipped with Language Environment, instead of the C/C++ IBM Open Class Library. For additional information, the C/C++ IBM Open Class Library Transition Guide is available at <http://www.ibm.com/software/ad/c390/czos/czosdocs.html>.

The z/OS V1R2 and later (including z/OS.e) C compiler is a straightforward follow-on to the OS/390 R10 C compiler.

If you develop C/C++ applications on systems running a later level of z/OS or z/OS.e than the production centers that run these applications, you might encounter “downward compatibility” problems even though these applications are not using new functions of the later-level C/C++ Compiler or class libraries. Solutions to the downward compatibility problem are as follows:

- C/C++ Compiler: You can use the TARGET option to instruct the compiler to generate object code that will run on earlier releases. For a detailed description of the TARGET option, see *z/OS C/C++ User's Guide*.
- C/C++ class libraries: Link-editing applications on a later level of class libraries and then executing these applications on an earlier level of class libraries might produce errors, and therefore is not supported. In order to allow you to continue with this type of application development environment and also to allow you to roll in new releases of z/OS or z/OS.e, IBM has documented a tactical solution in informational APAR II11576.

IBM's tactical solution for this downward compatibility problem is to have customers with this type of application development environment save the older levels of the C/C++ Compiler (if not using the TARGET option) and class libraries, and to use them for development. Specifically, you should maintain, on your application development machine, your earliest level of the C/C++ Compiler (if not using the TARGET option) and class libraries currently active in your production centers, and point to these data sets during the compilation and link-edit phases of application development. This method does not allow you to

exploit new functions provided on the later-level z/OS or z/OS.e system, but it does allow you to build an application on one level of the system and run the application on an earlier level. For a detailed description of the APAR, see:

<http://www.ibm.com/software/ad/c390/service/ii11576.html>

As of z/OS V1R3 and z/OS.e V1R3, you cannot use the C/C++ Run-Time Library functions `__osname()` or `uname()` to determine whether the operating system is z/OS or z/OS.e. The functions return the same result for both operating systems. To find out if the operating system is z/OS.e, a program must check the CVTZOSE indicator in the CVTOSLV5 field of the communications vector table (CVT). When the indicator is on, the operating system is z/OS.e. The CVT is described in *z/OS MVS Data Areas, Vol 1 (ABEP-DALT)*.

JES2 migration action for pre-release 4 mode

JES2 pre-Release 4 mode (not “\$ACTIVATED”) is supported by the JES2 element available with OS/390 R4 through R9. However, starting with OS/390 R10, JES2 does not support running in pre-release 4 mode. To avoid a cold start, customers wishing to migrate directly to OS/390 R10 or later JES2 must migrate to JES2 release 4 mode (available in OS/390 R4 JES2 through OS/390 R9 JES2) prior to installing OS/390 R10 or later JES2. For further migration information about JES2 pre-release 4 mode, see *z/OS JES2 Migration*.

JES2 and JES3 migration actions for changed job ID format

As of z/OS V1R2, JES2 and JES3 support up to 200 000 jobs and 999 999 job numbers. As a result, the format of the JES job identifier (ID) has changed. If the valid range of job numbers exceeds 99 999, then the job ID format changes from JOB12345 to J0123456. Similarly, STC12345 becomes S0123456 and TSU12345 becomes T0123456.

In JES2, the new job ID format is used for all jobs if the job number range (JOBDEF RANGE=) exceeds 99 999. If the range is 99 999 or less, then the new format is only used for jobs assigned numbers above 99 999 (jobs from NJE).

In JES3, the new job ID format is used for any job that is assigned a job number above 99 999. Jobs with numbers less than 100 000 will always use the old format job ID.

As part of this support, JES2 has introduced two modes of operation:

- z2 mode, which supports the new limits
- r4 mode, which uses the old data structures and can coexist in a MAS with earlier releases of JES2

The following areas have potential impacts: JES2 and JES3 exit routines, WTO-processing exit routines, SDSF-like products, message-based automation, status monitors, batch job schedulers, SMF record processors, TSO applications (especially ones that use the TSO STATUS, CANCEL, SUBMIT, or OUTPUT commands), and SYSLOG processors. In addition, the larger limits might impact applications that refer to JES2 internal data areas. (A list of fields that are affected is in *z/OS JES2 Migration*.)

Security product profiles and rules for the JESSPOOL class have a job ID in them. Installations might have profiles or rules based on a generic specification of JOB* or JOB%%%%%. These do not match the new job ID format. Converting these to J* or J%%%%%% will provide equivalent function and support the new job ID format.

The following is a list of fields that contain JES job IDs that may be used by local applications. This is not intended as a complete list but rather a starting point to help determine if any local applications are affected: HCLJOBID, HCRJOBID, JSABJBID, JSABPREF, MDBCJOBID, R84JBID, SMF24JID, SMF24CJD, SMF26JID, SMF26NJB, SMF57JID, SMF57CJD, SMF6JBID, SMF90T30_JOBID, SSCSJOBID, SSCSARID, SSSOJOBID, SSPJJBID, SSS2JBIR, SSS2OJBI, STTRJID, STTROJID, WLMENF56_JOBID, WQEOJBID, WMJMOJBI.

In addition, the job ID is output from the IAZXJSAB macro, both as JOBID= and with JES2 PREFIX=. It is also passed on the PSO, SAPI, extended status, and other SSI functions. It is part of the JES2 data set name that is input to spool browse function (DALDSNAM) and available in the JFCB (JFCBDSNM).

What you should do: Before moving to the new level of JES, do the following:

- Review the appropriate migration manual for details of the job ID changes (*z/OS JES2 Migration* or *z/OS JES3 Migration*). Also, review the PSP buckets for last-minute updates.
- Verify that all your JES exit routines support the job ID changes. Areas to check are listed above. In the case of JES2, you need to rework some exit routines just to support JES2 in r4 mode.
- Apply maintenance to, or upgrade, IBM products as required to work with the new JES level. Refer to the JES2 and JES3 software requirements in Table 15 on page 170.
- Contact vendors to confirm that the correct level of code is installed for all your vendor products and applications.
- Test as much as possible using greater than 99 999 job numbers. Be aware that some problems might be subtle, such as the application picking up only five digits of a job number.

If you are running JES2, you can use the following procedure during testing to flush out problems with the new job ID formats. To start, ensure that you are running in z2 mode (use the \$D ACTIVATE command). If you aren't, issue the \$ACTIVATE,LEVEL=Z2 command. Then, set the job number range to include high job numbers. The command to do this is \$T JOBDEF,RANGE=(low,high). At first you may want to try only a few jobs above 99 999 (that is, RANGE=(1,100010)). Later you could try having all the jobs above the range RANGE=(100000,999999). The command \$T NUM,BASE=99999 causes the next job number to be assigned to be 100 000 (99999 +1). This gets the job numbers up into the high range without having to run a lot of jobs.

If you find problems, you can issue \$ACTIVATE,LEVEL=R4 to return to compatibility mode. This also resets the JOBDEF RANGE (if it is 1,nnnnn) to have an upper limit of 65 534. Before issuing the command, ensure that there are no jobs with job numbers above 65 534.

Language Environment migration actions

This section presents several important Language Environment migration considerations. Refer to *z/OS Language Environment Run-Time Migration Guide* for more comprehensive Language Environment coverage.

Making the Language Environment run-time library available to z/OS or z/OS.e

Many elements and features, such as Communications Server and z/OS UNIX System Services, require the run-time library that Language Environment provides. This means that you must make the Language Environment data sets SCEERUN and SCEERUN2 available as part of the libraries that are searched by z/OS or

z/OS.e. The best way to do this is by adding these data sets to the link list. However, adding these data sets to the link list could adversely affect other applications that have dependencies on pre-Language Environment run-time libraries.

If you cannot add the SCEERUN and SCEERUN2 data sets to the link list, add them (through STEPLIB) to cataloged procedures for those z/OS or z/OS.e elements and features that require Language Environment. As an alternative in z/OS (but not in z/OS.e), use run-time library services (RTLS) to access the run-time library. All of these environments are tested and supported by IBM.

See *z/OS Program Directory* for the list of z/OS elements and features that require Language Environment. See the element and feature publications for how these elements and features can access SCEERUN and SCEERUN2 when they are not in the link list.

All z/OS and z/OS.e elements and features that require Language Environment must use the current (latest) level of the Language Environment run-time libraries. Use of earlier levels of the SCEERUN and SCEERUN2 data sets is not supported for these programs. Additionally, because Language Environment is a base element of z/OS and z/OS.e, running a later level of Language Environment on an earlier release of z/OS or z/OS.e is unsupported and violates z/OS and z/OS.e service policy.

Functions not supported by z/OS.e

z/OS.e Language Environment does not support COBOL (with an exception), Fortran, and PL/I (with an exception) applications. The COBOL exception is that precompiled COBOL DB2 stored procedures and other precompiled applications that use the Language Environment preinitialization interface (CEEPIPI) are supported. The PL/I exception is that precompiled PL/I applications are supported. These COBOL and PL/I applications could be compiled on a z/OS or OS/390 system, then run on a z/OS.e system.

Compatibility preinitialization for C and PL/I is not supported by z/OS.e.

The Language Environment library routine retention (LRR) function is not supported by z/OS.e. (With z/OS, LRR can improve the performance of applications and subsystems.)

Language Environment's use of run-time library services (RTLS) is not supported by z/OS.e. (With z/OS, RTLS allows you to access different levels of the Language Environment run-time libraries, controlled by run-time options. See *z/OS Language Environment Customization* for details.) In addition, other mechanisms, such as using STEPLIB DD statements or the link list, whereby an older level of Language Environment is used for application execution, are not allowed. Using these mechanisms violates the z/OS.e license agreement.

Developing applications with Language Environment

OS/390 R10 and later (including z/OS and z/OS.e) Language Environment provides downward compatibility support. Assuming that required programming guidelines and restrictions (documented in *z/OS Language Environment Programming Guide*) are observed, this support enables programmers to develop applications on later releases and run the applications on earlier releases. For example, you could use z/OS V1R3 (and Language Environment) on a development system where

applications are coded, link-edited, and tested, while using any supported earlier release of OS/390 (and Language Environment) on your production systems where the finished application modules are run.

Downward compatibility support is not the rollback of new function to prior releases of OS/390. Applications that make use of the downward compatibility support must not use Language Environment function that is unavailable on the earlier release of OS/390 where the application will run. The downward compatibility support includes coexistence (toleration) PTFs for earlier releases of OS/390 to assist in diagnosis of applications that violate the programming requirements for this support. See Chapter 5, “Ensuring coexistence and fallback” on page 83 for PTF numbers.

The downward compatibility support provided by z/OS and z/OS.e, and by the coexistence PTFs, does not change Language Environment’s upward compatibility. That is, applications coded and link-edited on one release of z/OS or z/OS.e Language Environment will continue to run on later releases of z/OS or z/OS.e Language Environment without the need to be recompiled and relink-edited.

Migration consideration for 31-bit applications

As of z/OS V1R2, Language Environment includes an enhancement to better support 31-bit applications. (The enhancement also applies to z/OS.e V1R3 and later.) The goals of this enhancement are to reduce initialization/termination path length and reduce below-the-line storage usage. Reducing the use of below-the-line storage will improve scalability for multiprocess and multithreaded applications. The enhancement changes the default non-CICS installation-wide run-time options (CEEDOPT), introducing migration concerns for non-CICS applications that invoke an AMODE 24 routine during application processing. See *z/OS Language Environment Run-Time Migration Guide* for the areas of concern and the recommended actions.

SMP/E migration actions for data sets

SMP/E data sets can be shared by coexisting systems. For example, a z/OS V1R3 system and an OS/390 R10 system can access the same CSI data set. But this sharing leads to a potential problem. The format of data stored in the CSI data set changed in z/OS V1R2 SMP/E, and the new format is incompatible with previous releases. To avoid problems, do the following:

- Once you’ve updated any SMP/E data set using z/OS V1R2 or later SMP/E, do not attempt to update the data set using an earlier-level SMP/E (z/OS V1R1 or OS/390). The update might corrupt the data set.
- Install SMP/E coexistence PTF UR52665 on earlier-level systems (OS/390 R8, OS/390 R9, OS/390 R10, z/OS V1R1). With the PTF installed, if you attempt to update the CSI data set using an earlier-level SMP/E, SMP/E will issue a warning message and stop processing instead of corrupting the data set.

Identifying z/OS and z/OS.e system-level migration actions

This section describes migration actions that cross element and feature boundaries.

/etc and /var migration actions

Migration of system control files includes the migration of members of parmlib and proclib as well as files in the /etc and /var directories.

During installation, IBM defines directories in the /etc directory but does not install files there. Because the configuration and customization data in your existing /etc directory might not be correct for the new system, you might need to make changes

to the files in your new /etc directory. IBM recommends that you make these changes before the first IPL of the new system.

During the installation of the OCSF Base component of the Cryptographic Services base element, files are created in the /var directory. If you have other files under your existing /var directory, then you will have to merge the old and new files under /var. The easiest way to do this is to create a copy of your current /var HFS and then copy the new /var files into the copy.

For steps to make copies of your existing /etc and /var directories, see *z/OS Program Directory*. For information about changes you should make to /etc before the first IPL, see the various element and feature migration books listed in Table 13 on page 106.

Application development environment migration actions

Before OS/390, you were able to migrate your application development environment independent of your production system upgrade schedule. In addition, a common practice was to upgrade application development systems with the newest level of the operating system, exposing application developers to the newest level and allowing them to be “testers” to help uncover as many problems as possible before cutover to production. If you use these same techniques in the z/OS or z/OS.e environment, so that your applications are compiled and link-edited on a later level of z/OS or z/OS.e than the level of the production systems that run the applications, you could encounter the “downward compatibility” problem.

The “downward compatibility” problem is really an incompatibility problem that stems from the integration of certain application development environments into z/OS and z/OS.e, such as Language Environment, the C/C++ Compiler, and the C/C++ IBM Open Class Library. It can occur if you develop applications on systems running a later level of z/OS or z/OS.e than the production centers running these applications. It can occur even though the applications are not using any of the new functions provided in the later-level application development environment.

As a general recommendation, customer-written applications that make use of application development environments provided with z/OS or z/OS.e should be developed (assembled, compiled, or link-edited) using the lowest level of that application development environment. This ensures that the applications will successfully execute on any system at that level or later.

For information about cases where IBM has done specific things to assist you, see “C/C++ migration actions” on page 112 and “Developing applications with Language Environment” on page 115.

Couple data set migration actions

System-managed coupling facility (CF) structure duplexing is a function that provides a general-purpose, hardware-assisted, easy-to-exploit mechanism for duplexing coupling facility structure data. The function was introduced in z/OS V1R2 after its general availability (via PTF) and is integrated in z/OS V1R3 and z/OS.e V1R3. To use this function you must format coupling facility resource management (CFRM) couple data sets using the new keyword SMDUPLEX.

Once the CFRM couple data sets that support system-managed CF structure duplexing are in use, no systems at a release earlier than z/OS V1R2 can use the CFRM function in the sysplex. Also note that if it is necessary to revert or fall back to a CFRM couple data set that does not have the capability of supporting

system-managed CF structure duplexing, a sysplex-wide IPL is required for all systems using the CFRM function. (However, it is unlikely that fallback will ever be necessary from a CFRM couple data set that supports SMDUPLEX to one that does not. An alternative to doing this would simply be to disable duplexing for structures by changing the policy to one that specifies or defaults to DUPLEX(DISABLED) for the appropriate structures, or some desired subset of structures.)

For details about system-managed CF structure duplexing, see *z/OS MVS Setting Up a Sysplex*. For software requirements, see the BCP requirements in Table 15 on page 170. For hardware requirements, see the BCP requirements in Table 17 on page 199.

IFAPRDxx migration actions

Migration actions for dynamic enablement member IFAPRDxx can include the following:

- Add the IFAPRD00 member to one of your PARMLIB data sets to be used to IPL z/OS V1R3 or z/OS.e V1R3. IFAPRD00 is shipped with z/OS and z/OS.e.
- Ensure that the IEASYSxx to be used to IPL z/OS or z/OS.e points to the IFAPRD00 member that was shipped with z/OS or z/OS.e (that is, IEASYSxx specifies PROD=00). IEASYSxx can also point to additional IFAPRDxx members, if appropriate.
- Change any existing OS/390 IFAPRDxxx members, which you created based on special needs, to reflect z/OS or z/OS.e values:
 - Change the ID value from 5647-A01 (for OS/390 V2) to 5694-A01 (for z/OS V1) or 5655-G52 (for z/OS.e V1).
 - Change the NAME value from OS/390 to 'z/OS' (for both z/OS and z/OS.e).
- Change any COMMNDxx or automated SET commands to reflect new IFAPRDxx members.
- If you ordered z/OS V1R3 Infoprint Server and you had OS/390 Print Server enabled prior to R8, update your IFAPRDxx member to add an entry with FEATURENAME('INFOPRINT SERVER') and remove entries with FEATURENAME('IP PRINTWAY'), FEATURENAME('NETSPOOL'), and FEATURENAME('PRINT INTERFACE').
- If you are enabling an optional feature that was not in your original order, the feature's load libraries will not be in the LPA list or link list, ISPF data sets will not be specified in the logon procedure, and APF authorizations will not have been properly set up. Before you use the feature, you must make sure that these tasks are completed.

For a complete discussion of dynamic enablement, see “Using dynamic enablement” on page 121.

LOADxx migration action

The ARCHLVL statement of parmlib member LOADxx has an architecture mode specification. However, do not use it. z/OS (as of z/OS V1R2) and z/OS.e automatically run in the proper architecture mode based on the processor on which they are IPLed. z/OS runs in z/Architecture (64-bit) mode on a z800 or z900 server, and in ESA/390 (31-bit) mode on a G5, G6, or Multiprise 3000 server. z/OS.e, which runs only on the z800 server, runs in z/Architecture (64-bit) mode.

ServerPac and SystemPac migration actions

- ServerPac and SystemPac use the PROGxx parmlib member to specify LNKLST concatenation. Using PROGxx allows exploitation of the z/OS or z/OS.e dynamic link list function. You should define the link list using either LNKLSTxx or PROGxx, but not both. The system will ignore LNKLSTxx members of parmlib during IPL if you specify a PROGxx that contains a LNKLST ACTIVATE statement, and will replace the link list defined in LNKLSTxx with the one defined in PROGxx if it processes a LNKLST ACTIVATE statement after IPL. For more information, see *z/OS MVS Initialization and Tuning Reference*.

If you do not currently use PROGxx to define your LNKLST concatenation and you intend to use your existing LNKLSTxx parmlib members with the ServerPac-provided or SystemPac-provided parmlib, you can use the conversion aid CSVLNKPR to migrate your existing LNKLSTxx parmlib member to a PROGxx parmlib member. Refer to *z/OS MVS Migration* for details about CSVLNKPR.

- Beginning with OS/390 R7, the shipped JES2/SDSF and JES3 zones are consistently named. In some previous releases, IBM shipped the JES2/SDSF elements in the MVST111 and MVSD111 zones, and the JES3 feature in the MVST110 and MVSD110 zones. In OS/390 R7 and later, however, this relationship is reversed: JES2 is shipped in the MVST110 and MVSD110 zones, and JES3 is shipped in the MVST111 and MVSD111 zones.

If you use an element-name-related naming convention for SMP/E data sets, you will need to rename the data sets after the merge configuration to maintain this convention. Rename the data sets in each of the four SMP/E zones. For example, in the previous releases, if your SMPLTS data set in the MVST110 zone was JES3.SMPLTS, merging that same data set with OS/390 R7 or later leaves the data set name unchanged as JES3.SMPLTS. You must rename this data set to JES2.SMPLTS to maintain your naming convention.

Virtual storage migration considerations

You need to consider the impact on your virtual storage settings caused by the release to which you're migrating. Your usage of common area virtual storage below 16 MB will increase when you include libraries containing RMODE(24) modules in the LPA list. Depending on what you include and the common virtual storage boundaries, this might or might not result in reducing the private area available below 16 MB. The following libraries, identified by DDDEF name and element or feature name, contain RMODE(24) LPA-eligible modules:

- ISAMLPA (DFSMSdfp)
- SBDTLPA (BDT)
- SEZALPA (Communications Server)
- SIATLPA (JES3)
- SICELPA (DFSORT)
- SISFLPA (SDSF)
- SISPLPA (ISPF)
- SORTLPA (DFSORT)

Load modules for some elements are installed in SYS1.LPALIB, while load modules for other elements that are eligible for placement in LPA (including ELPA) are installed in other, element-specific libraries. The amount of common area virtual storage required to run z/OS or z/OS.e will depend in large part on how many of the modules in element-specific libraries you choose to place in LPA. This, in turn, will affect how much PLPA or common page data set space will be required, and can also affect how much private area will be available above and below 16 megabytes.

Load modules in element-specific libraries that are eligible for placement in LPA will increase the common area storage required only if you include them in LPA. If you place these libraries in the LPA list or in dynamic LPA, less virtual storage might be available for the private areas above and below 16 megabytes. For this reason, you should usually place modules from element-specific libraries in LPA only if you use the elements.

If you later decide to enable a disabled feature, and the feature requires you to place its modules in LPA or you decide to place them in LPA for best performance, you can either add them to dynamic LPA and issue a SET command or add them to the LPA list and IPL to activate them. (Similarly, you can add libraries to the link list dynamically or with an IPL.) For more information about dynamic LPA, see the topic about PROGxx in *z/OS MVS Initialization and Tuning Reference*.

The impact on virtual storage as you migrate to z/OS or z/OS.e varies and needs to be understood based upon what exists on the system now and what will be the net product increase with z/OS or z/OS.e. In addition, you must understand what new products, elements, and features will be activated in the new z/OS or z/OS.e system.

For more information about what you should consider when deciding how to activate a z/OS or z/OS.e feature (or another product), and about how those decisions affect applications, system performance, and the use of virtual and real storage, see the topic about placing modules in the system's search order for programs in *z/OS MVS Initialization and Tuning Guide*.

Identifying migration actions needed for ISV products

First, check to make sure that your level of the product supports the z/OS or z/OS.e environment. Ask the ISV how z/OS or z/OS.e affects the use of the product. If the product does not intersect with z/OS or z/OS.e, place the products in their own sets of libraries and SMP/E zones. This means that, unless you have to change product code, such as applying PTFs, or obtain a new level of the product, you will not need to reinstall it after you install a new ServerPac or SystemPac.

For those using SystemPac, if the ISV products are selectable in the SystemPac shopping list, configure them such that they are placed on a separate volume and in their own SMP/E zones. You can either (1) place all the selectable ISV products in one SMP/E zone, separate from IBM products, or (2) separate ISV products even further by placing products from different vendors in their own unique zone. Use the Local Order Entry tool during order placement to perform the separation. For details about the tool, refer to:

<http://www.ibm.com/ca/custompac/>

For the addresses of World Wide Web sites dealing with ISV products, see "Choosing ISV products that you want to run with z/OS or z/OS.e" on page 69.

Chapter 7. Preparing for customization and test

You complete your installation by customizing and testing the new system. To help you prepare, this chapter discusses some of the relevant activities: using dynamic enablement and scheduling test activities.

Using dynamic enablement

As explained in Chapter 1, “Learning about z/OS and z/OS.e”, the priced features support dynamic enablement. This means that the priced features that you order are shipped enabled and are ready to use after you install and customize them. The priced features that you don’t order are shipped disabled; even though you install them, you can’t use them. Later on, if you decide to use them, you enable them dynamically.

While priced features are the main focus of dynamic enablement, several related items can also be dynamically enabled should you decide to use them with z/OS or z/OS.e:

- The stand-alone product versions of z/OS and z/OS.e nonexclusive features.
- The IP PrintWay and NetSpool features of stand-alone product PSF V3 for OS/390 (5655-B17).
- The stand-alone product Document Composition Facility (DCF) (5748-XX9).
- The stand-alone product Infoprint Server Transforms for OS/390 (5697-F51).
- IP Services, one of the components of base element Communications Server, which is shipped enabled when you order the standard z/OS or z/OS.e base but disabled when you order the alternate base configuration. Note that “TCP/IP” is the name used for dynamic enablement of this component.

In brief, the steps required to dynamically enable are:

1. Notify IBM that you are starting to use the feature, stand-alone product, or TCP/IP on a specific processor (as identified by a specific processor serial number).
2. Update parmlib. IBM supplies a SYS1.PARMLIB member, IFAPRD00, that is tailored to your order. IFAPRD00 contains entries that enable the priced features, stand-alone products, or TCP/IP that you ordered for a specific processor. To make the parmlib update, copy the contents of IFAPRD00 to an IFAPRDxx member that will be active on the processor for which your z/OS or z/OS.e order was placed, and modify IFAPRDxx appropriately.
3. Establish the active parmlib member through the PROD parameter in IEASYSxx or the SET PROD operator command. If you are on a z800 or z900 server, you must also verify that the IEASYSxx ILMODE parameter is set to ILMODE=NONE.

The rest of this section helps you decide whether you need to use dynamic enablement, describes in detail the three steps to do it, and explains how to disable should you want to. Topics are:

- “Deciding whether to dynamically enable” on page 122
- “Dynamic enablement Step 1: Notify IBM” on page 124
- “Dynamic enablement Step 2: Update parmlib” on page 124
- “Dynamic enablement Step 3: Establish the active parmlib member” on page 128
- “Disabling what was enabled” on page 129.

A related section is “IFAPRDxx migration actions” on page 118. Read it if you’re migrating from OS/390 to z/OS or z/OS.e, or from one z/OS or z/OS.e release to another.

Deciding whether to dynamically enable

By describing the situations that require dynamic enablement, this section helps you decide whether you need to dynamically enable.

A priced feature was not in your original order for a specific processor (as identified by a specific processor serial number) but you now want to use it on that processor. If this is the case, then follow the steps starting with “Dynamic enablement Step 1: Notify IBM” on page 124. The priced features are:

- BDT File-to-File (z/OS only, not z/OS.e)
- BDT SNA NJE
- BookManager BUILD (z/OS only, not z/OS.e)
- C/C++ without Debug Tool
- C/C++ with Debug Tool
- DFSMSdss
- DFSMShsm
- DFSMSrmm
- DFSORT
- GDDM-PGF (z/OS only, not z/OS.e)
- GDDM-REXX (z/OS only, not z/OS.e)
- HCM
- HLASM Toolkit
- Infoprint Server
- JES3
- RMF
- SDSF
- Security Server

You are licensed for a stand-alone product that is also a nonexclusive priced feature and the license is on a processor other than the one to which your z/OS or z/OS.e order applies. To allow your installation flexibility as you migrate to z/OS or z/OS.e, you can run the stand-alone product versions of the z/OS or z/OS.e nonexclusive priced features (or, in one case, a component of a nonexclusive priced feature). Running the stand-alone product version of such a z/OS or z/OS.e feature means you do not have to order and install the z/OS or z/OS.e feature.

The stand-alone products that are also z/OS nonexclusive priced features are:

- BookManager BUILD/MVS. The corresponding z/OS feature is BookManager BUILD.
- Debug Tool component of several language products. In z/OS, the Debug Tool is a component of the C/C++ with Debug Tool feature.
- GDDM-PGF. The corresponding z/OS feature is GDDM-PGF.
- HLASM Toolkit feature of HLASM. The corresponding z/OS feature is HLASM Toolkit.

For z/OS.e, one stand-alone product feature is also a z/OS.e nonexclusive priced feature:

- HLASM Toolkit feature of HLASM. The corresponding z/OS.e feature is HLASM Toolkit.

If your order included stand-alone product versions of these features, the stand-alone versions are enabled in the IBM-supplied IFAPRD00 member. If you are licensed for such stand-alone products on a processor other than the one to which your z/OS or z/OS.e order applies, you must specifically enable them because the IBM-supplied IFAPRD00 does not. Follow the steps starting with “Dynamic enablement Step 1: Notify IBM” on page 124.

You are licensed for PSF V3 on a processor other than the one to which your z/OS or z/OS.e order applies and you want to use the PSF V3 IP PrintWay and NetSpool features with z/OS or z/OS.e. The stand-alone product PSF V3 for OS/390 (5655-B17) contains the IP PrintWay and NetSpool features. The z/OS or z/OS.e Infoprint Server feature contains the IP PrintWay and NetSpool components. Although IP PrintWay and NetSpool in z/OS and z/OS.e are functionally superior to IP PrintWay and NetSpool in PSF V3, you could use PSF V3’s IP PrintWay and NetSpool instead of z/OS or z/OS.e Infoprint Server’s IP PrintWay and NetSpool.

If your order included the PSF V3 features IP PrintWay and NetSpool, these features are enabled in the IBM-supplied IFAPRD00 member. If you are licensed for PSF V3 on a processor other than the one to which your z/OS or z/OS.e order applies, you must specifically enable the PSF V3 IP PrintWay and NetSpool features because the IBM-supplied IFAPRD00 does not. Follow the steps starting with “Dynamic enablement Step 1: Notify IBM” on page 124. In either case, also see the program directories for the PSF V3 IP PrintWay and NetSpool features to read about installation and other considerations.

You are licensed for DCF on a processor other than the one to which your z/OS or z/OS.e order applies, or not licensed at all. The stand-alone product DCF (5748-XX9) can be dynamically enabled. To use DCF, you must do one of the following:

- If you are already licensed for DCF on a specific processor, you must explicitly enable it in the IFAPRDxx member that is active on that processor in order to continue to use it with z/OS or z/OS.e. Follow the steps starting with “Dynamic enablement Step 1: Notify IBM” on page 124.
- If you are not licensed for DCF on a specific processor and would like to use it, you must purchase a license for that processor, receive and install DCF, and then follow the steps starting with “Dynamic enablement Step 1: Notify IBM” on page 124 to enable it in the IFAPRDxx member that is active on that processor. (It is a violation of your license agreement with IBM to enable DCF on a processor if you are not licensed for it on that processor.)

You are licensed for Infoprint Server Transforms on a processor other than the one to which your z/OS or z/OS.e order applies, or not licensed at all. The stand-alone product Infoprint Server Transforms for OS/390 (5697-F51) is closely related to z/OS and z/OS.e; it enhances the function available in the Infoprint Server feature of z/OS or z/OS.e. Infoprint Server Transforms can be dynamically enabled. To use Infoprint Server Transforms, you must do one of the following:

- If you are already licensed for Infoprint Server Transforms on a specific processor, you must explicitly enable it in the IFAPRDxx member that is active on that processor in order to continue to use it with z/OS or z/OS.e. Follow the steps starting with “Dynamic enablement Step 1: Notify IBM” on page 124.
- If you are not licensed for Infoprint Server Transforms on a specific processor and would like to use it, you must obtain a license for that processor, receive and install Infoprint Server Transforms, and then follow the steps starting with “Dynamic enablement Step 1: Notify IBM” on page 124 to enable it in the IFAPRDxx member that is active on that processor. (It is a violation of your

license agreement with IBM to enable Infoprint Server Transforms on a processor if you are not licensed for it on that processor.)

You are licensed for the alternate base but now want to use the standard base. IP Services, the component of element Communications Server that supports TCP/IP networking, supports dynamic enablement because of the z/OS or z/OS.e alternate base configuration. (Refer to “Alternate base” on page 68.) IP Services is shipped enabled if you order the standard z/OS or z/OS.e base but disabled if you order the alternate base. Thus, if you’re licensed for the alternate base but now want to be licensed to use the standard base, you must enable IP Services (using the name TCP/IP). Follow the steps starting with “Dynamic enablement Step 1: Notify IBM”.

Dynamic enablement Step 1: Notify IBM

Ask your asset manager to contact your IBM representative to alert IBM that you are starting to use the feature or stand-alone product or TCP/IP on a specific processor (as identified by a specific processor serial number). Because the z/OS or z/OS.e license is processor-based, you need to contact IBM only once when multiple z/OS or z/OS.e systems execute in LPAR mode on that processor.

Use of (and enablement of) the feature, stand-alone product, or TCP/IP is subject to the z/OS or z/OS.e license terms and conditions and must be done with the knowledge of your asset manager according to the terms and conditions for z/OS or z/OS.e. For additional license terms and conditions, see the Usage Restriction section of *z/OS Licensed Program Specifications* or *z/OS.e Licensed Program Specifications*.

Dynamic enablement Step 2: Update parmlib

The IBM-supplied SYS1.PARMLIB member that defines the product enablement policy for a system is IFAPRD00. IFAPRD00 contains a PRODUCT statement for each item (feature, stand-alone product, or TCP/IP) that can be dynamically enabled, set to an enablement state determined by your order. Copy IFAPRD00 to an IFAPRDxx of your choosing and edit IFAPRDxx, if necessary, so that it contains the correct form of PRODUCT statements to enable each feature, product, or TCP/IP that should be enabled, as described in the sections starting with “z/OS and z/OS.e priced features, and TCP/IP”.

If you use the order that IBM ships to you to clone systems for use on other processors, you must ensure that the IFAPRDxx member used on each processor enables only the z/OS or z/OS.e priced features and stand-alone products that are licensed to that processor. A single shared copy of IFAPRDxx might or might not be suitable for use by all of the processors.

Note the following:

- DFSMSdss, DFSMSrmm, and DFSMSHsm do not use the IGDDFPKG parmlib member for enablement.
- GDDM-REXX does not use the ERXTENAB JCL member of the GDDM SADMSAM data set.

z/OS and z/OS.e priced features, and TCP/IP

For each priced feature that you want to enable, or to enable TCP/IP, ensure that there is a PRODUCT statement (or, for TCP/IP, multiple PRODUCT statements) having one of the following forms. For z/OS:

```

PRODUCT OWNER('IBM CORP')
        NAME('z/OS')
        FEATURENAME(name)
        ID(5694-A01)
        STATE(ENABLED)

```

For z/OS.e:

```

PRODUCT OWNER('IBM CORP')
        NAME('z/OS')
        FEATURENAME(name)
        ID(5655-G52)
        STATE(ENABLED)

```

NAME specifies the operating system. Note that it is the same for z/OS and z/OS.e.

The variable *name* on the FEATURENAME parameter identifies the feature, or TCP/IP, that you want to enable. Refer to Table 14 for possible values.

ID specifies the program number for z/OS or z/OS.e.

The VERSION RELEASE MOD parameter should be omitted or specified with asterisks, as follows:

```
VERSION(*) RELEASE(*) MOD(*)
```

Table 14. FEATURENAME values for z/OS and z/OS.e priced features, and TCP/IP. (With z/OS.e, trying to enable the features that are not supported will not make them operational.)

Name	FEATURENAME value
BDT File-to-File (z/OS only, not z/OS.e)	BDTFTF
BDT SNA-NJE	BDTNJE
BookManager BUILD (z/OS only, not z/OS.e)	BOOKMGR BUILD (see note 1)
C/C++ without Debug Tool	C/C++ (see note 2)
C/C++ with Debug Tool	C/C++/DEBUG (see note 2)
DFSMSdss	DFSMSDSS
DFSMSHsm	DFSMSHSM
DFSMSrmm	DFSMSRMM
DFSORT	DFSORT
GDDM-PGF (z/OS only, not z/OS.e)	GDDM-PGF
GDDM-REXX (z/OS only, not z/OS.e)	GDDM-REXX
HCM	HCM
HLASM Toolkit	TOOLKIT DEBUGGER (see note 1)
Infoprint Server	INFOPRINT SERVER (see note 1)
JES3	JES3
RMF	RMF
SDSF	SDSF
Security Server	SECURITY SERVER (see note 1)

Table 14. FEATURENAME values for z/OS and z/OS.e priced features, and TCP/IP (continued). (With z/OS.e, trying to enable the features that are not supported will not make them operational.)

Name	FEATURENAME value
TCP/IP (includes the components TCP/IP Base, TCP/IP CICS, and TCP/IP IMS)	TCP/IP BASE TCP/IP CICS TCP/IP IMS (see notes 1, 3, and 4)
Notes: <ol style="list-style-type: none"> 1. To specify a FEATURENAME value that contains a blank, either replace the blank with an underscore (as in SECURITY_SERVER) or enclose the name in single quotation marks (as in 'SECURITY SERVER'). 2. To specify a FEATURENAME value that contains a +, enclose the name in single quotation marks (as in 'C/C++'). 3. You must specify multiple PRODUCT statements. 4. If your installation ordered the standard z/OS or z/OS.e base, TCP/IP is shipped enabled. Otherwise, it is shipped disabled. 	

Stand-alone product BookManager BUILD/MVS (z/OS only, not z/OS.e)

To enable the BookManager BUILD/MVS stand-alone product to run with z/OS, the following entry must be in the IFAPRDxx parmlib member:

```
PRODUCT OWNER ('IBM CORP')
      NAME('BOOKMGR BUILD')
      ID(5695-045)
      VERSION(*) RELEASE(*) MOD(*)
      FEATURENAME('BOOKMGR BUILD')
      STATE(ENABLED)
```

A sample BookManager BUILD/MVS entry appears in the EOYIFAPR member of the SEOYSAMP library.

Debug Tool component of several stand-alone products (z/OS only, not z/OS.e)

The Debug Tool is available as a component of the z/OS C/C++ with Debug Tool feature and as a component of several stand-alone language products.

If you order the z/OS C/C++ with Debug Tool feature, there is no need to also order the C/C++ without Debug Tool feature. The IBM-supplied IFAPRD00 member enables the use of C/C++ and the Debug Tool.

If you order C/C++ with Debug Tool and then later decide to order C/C++ without Debug Tool, explicitly enable the C/C++ feature name as follows (and disable the C/C++/DEBUG feature name):

```
PRODUCT OWNER ('IBM CORP')
      NAME('z/OS')
      ID(5694-A01)
      VERSION(*) RELEASE(*) MOD(*)
      FEATURENAME('C/C++')
      STATE(ENABLED)
```

If you order C/C++ without Debug Tool and then later decide to order C/C++ with Debug Tool, explicitly enable the C/C++/DEBUG feature name as follows. (This statement allows use of both C/C++ and the Debug Tool; you can then disable the C/C++ without Debug Tool feature.)

```

PRODUCT OWNER ('IBM CORP')
NAME('z/OS')
ID(5694-A01)
VERSION(*) RELEASE(*) MOD(*)
FEATURENAME('C/C++/DEBUG')
STATE(ENABLED)

```

The stand-alone products that use the Debug Tool are:

- IBM COBOL for OS/390 & VM
- IBM CODE/370
- IBM VisualAge PL/I for OS/390 Version 2
- IBM PL/I for MVS & VM

If you order any of these products with z/OS, the IBM-supplied IFAPRD00 member that IBM ships with your order contains the required PRODUCT statements. Otherwise, you must explicitly enable the product when you run it with z/OS. The following list identifies the entry you are required to include in the IFAPRDxx parmlib member.

Stand-alone product

IBM COBOL for OS/390 & VM (5648-A25)

IFAPRDxx entry

```

PRODUCT OWNER('IBM CORP')
NAME('IBM COBOL OS/390')
ID(5648-A25)
VERSION(*) RELEASE(*) MOD(*)
FEATURENAME(COBOL-DEBUG)
STATE(ENABLED)

```

IBM CODE/370 (5688-194)

```

PRODUCT OWNER('IBM CORP')
NAME('IBM CODE/370')
ID(5688-194)
VERSION(*) RELEASE(*) MOD(*)
FEATURENAME(CODE/370-DEBUG)
STATE(ENABLED)

```

IBM VisualAge PL/I for OS/390 V2 (5655-B22)

```

PRODUCT OWNER('IBM CORP')
NAME('IBM VAPLI/390')
ID(5655-B22)
VERSION(*) RELEASE(*) MOD(*)
FEATURENAME(VAPLI-DEBUG)
STATE(ENABLED)

```

IBM PL/I for MVS & VM (5688-235)

```

PRODUCT OWNER('IBM CORP')
NAME('IBM PL/I MVS/VM')
ID(5688-235)
VERSION(*) RELEASE(*) MOD(*)
FEATURENAME(PL/I-DEBUG)
STATE(ENABLED)

```

Stand-alone product GDDM-PGF (z/OS only, not z/OS.e)

To enable the GDDM-PGF stand-alone product to run with z/OS, the following entry must be in the IFAPRDxx parmlib member:

```

PRODUCT OWNER('IBM CORP')
NAME(GDDM-PGF)
ID(5668-812)
VERSION(*) RELEASE(*) MOD(*)
FEATURENAME(GDDM-PGF)
STATE(ENABLED)

```

Stand-alone product HLASM toolkit

To enable the High Level Assembler (HLASM) Toolkit feature of the HLASM stand-alone product to run with z/OS or z/OS.e, the following entry must be in the IFAPRDxx parmlib member:

```

PRODUCT OWNER ('IBM CORP')
NAME('HI LVL ASSEMBLER')
ID(5696-234)
VERSION(*) RELEASE(*) MOD(*)
FEATURENAME('TOOLKIT DEBUGGER')
STATE(ENABLED)

```

IP PrintWay feature of PSF V3

To enable the IP PrintWay feature of stand-alone product PSF V3 to run with z/OS or z/OS.e, the following entry must be in the IFAPRDxx parmlib member:

```

PRODUCT OWNER('IBM CORP')
NAME('PSF FOR OS/390')
ID(5655-B17)
VERSION(*) RELEASE(*) MOD(*)
FEATURENAME('IP PRINTWAY')
STATE(ENABLED)

```

NetSpool feature of PSF V3

To enable the NetSpool feature of stand-alone product PSF V3 to run with z/OS or z/OS.e, the following entry must be in the IFAPRDxx parmlib member:

```

PRODUCT OWNER('IBM CORP')
NAME('PSF FOR OS390')
ID(5655-B17)
VERSION(*) RELEASE(*) MOD(*)
FEATURENAME('NETSPOOL')
STATE(ENABLED)

```

Stand-alone product DCF

To enable the Document Composition Facility (DCF) stand-alone product to run with z/OS or z/OS.e, the following entry must be in the IFAPRDxx parmlib member:

```

PRODUCT OWNER('IBM CORP')
NAME(DCF)
ID(5748-XX9)
VERSION(*) RELEASE(*) MOD(*)
FEATURENAME(DCF)
STATE(ENABLED)

```

Stand-alone product Infoprint Server Transforms

To enable the Infoprint Server Transforms stand-alone product to run with z/OS or z/OS.e, the following entry must be in the IFAPRDxx parmlib member:

```

PRODUCT OWNER('IBM CORP')
NAME('INFOPRINT XFORMS')
ID(5697-F51)
VERSION(*) RELEASE(*) MOD(*)
FEATURENAME('TRANSFORM TO AFP')
STATE(ENABLED)

```

Dynamic enablement Step 3: Establish the active parmlib member

To dynamically activate the updated enablement policy without an IPL, place the updated PRODUCT statements in the appropriate IFAPRDxx member of the active SYS1.PARMLIB data set. You can then issue the SET PROD operator command to specify the IFAPRDxx member that defines the enablement policy. See *z/OS MVS System Commands* for more information.

The enablement policy change takes place immediately but does not affect any instances of features, stand-alone products, or TCP/IP that are already executing. Also, activating a new enablement policy does not start any of the enabled features, stand-alone products, or TCP/IP. They will only run when explicitly started by some other action, such as a START command.

Be sure to change the PROD system parameter in IEASYSxx to point to the appropriate IFAPRDxx member; no IFAPRDxx member is activated by default. This change ensures that the next IPL activates the correct policy. For more information about using IFAPRDxx, see *z/OS MVS Initialization and Tuning Reference*.

Note: If you are on a z800 or z900 server, you must also verify that the IEASYSxx ILMODE parameter is set to ILMODE=NONE.

Disabling what was enabled

If, after you use an enabled feature, stand-alone product, or TCP/IP, you want to discontinue its use, you must disable it — again using the IFAPRDxx member to define the policy change and the SET PROD command to activate the changed policy.

Because disabling the feature, stand-alone product, or TCP/IP in the enablement policy does not stop it from running, you might have to explicitly stop it. For example, you might have to:

- Issue a command provided by the feature, stand-alone product, or TCP/IP.
- Issue the MVS MODIFY or MVS STOP command, as appropriate.

Or, you might decide that the least disruptive way to stop a long-running feature, stand-alone product, or TCP/IP is to IPL the system without it.

After you disable a feature, stand-alone product, or TCP/IP, ask your asset manager to contact your IBM representative to alert IBM that you are discontinuing its use on a specific processor. See the Usage Restriction section of *z/OS Licensed Program Specifications* or *z/OS.e Licensed Program Specifications* for additional license terms and conditions.

Scheduling test activities

IPL the new release in a production environment after you have tested the new release with a simulated production workload that includes all applications and all non-IBM products, and that ensures that service level agreements can be met.

IPL in a shared resource environment after you have installed any coexistence PTFs.

If you're using a zSeries server and your production workload will require greater than 2 GB of central storage, be sure to use greater than 2 GB on your test image. In fact, the more storage you use above the 2 GB line on your test image, the greater the chance that pages will be backed up there, and the greater the odds of exposing problems during test rather than during production.

Perform function and stress test. IBM's testing does not replace the need for this testing in your own environment. Testing might include:

- Initializing the system
- Initializing JES2 or JES3
- Logging on to TSO/E
- Running the IVPs
- Submitting a job
- Checking the job's output
- Starting customization of z/OS or z/OS.e
- If CICS or IMS is installed, initializing a region and signing on to a terminal
- Bringing your ISV products into the test environment

- Running critical production jobs
- Supporting a representative interactive workload
- Communicating with all networks
- Testing critical functions in applications
- Checking some of the paths not often taken
- Checking for completeness of accounting records
- Testing all non-IBM product functions
- Bringing your applications into the test environment
- Ensuring that performance goals stated in service level agreements can be met.

Don't complicate your testing by exploiting the new function that z/OS or z/OS.e provides. Save that task until after you are successfully running in production.

You should have a fallback (backout) plan in case problems occur during testing and you have to fall back to your previous level.

Chapter 8. Preparing for future installations

When you build a z/OS or z/OS.e system, you must balance the needs of your installation to build a system that meets its needs well. While this will sometimes mean compromise, it more often means finding ways to build a flexible system that is easy to install, easy to migrate, easy to extend, and easy to change. z/OS and z/OS.e provide tremendous flexibility in installation and customization. When applied using a well-planned structure, this flexibility can minimize the time it takes to install and migrate new systems or new software levels throughout an installation.

Adopting a well-planned structure for your installation provides the foundation for controlling workload during future installations and migrations. Depending on how your system is structured today, doing this can be very easy, requiring little investment, or quite difficult, requiring many system programming hours. However, the long-term benefits of a well-planned structure are quite clear.

This chapter helps you prepare for future installations. Many of the techniques discussed in this chapter, if you are not using them today, could take considerable time to implement. It can be difficult or even impossible to attempt to do all these things during a single build and migration cycle, for any number of reasons.

A phased approach will often prove most feasible and can begin to control the installation and migration workload in the least time. This provides you benefits, starting with the next installation and migration cycle, while controlling the work involved in implementation. As you implement each technique, more time to implement the remainder should be available during future system builds and migrations.

Note: Some of the SystemPac-related techniques discussed in this chapter are applicable only to SystemPac dump-by-data-set format. SystemPac full volume dump format employs a very different philosophy, requiring far fewer actions on your part.

System and installation requirements

Creating an installation plan helps you make sure the software you install is able to meet your installation's requirements for software function. However, software function alone will not meet all the needs of your business, and there are other things you should consider when planning to build a system, such as:

- Achieving efficient virtual storage mapping
- Achieving best application performance
- Building a minimum number of system software configurations
- Reducing installation and migration time
- Reducing the opportunities for error during migration
- Making it easy to manage the system after it is in production
- Minimizing migration actions for the people who use the system.

How you choose to meet all of these requirements can have a significant effect on how much work is required to perform the tasks associated with each stage. Keep these requirements in mind while reading this chapter.

Separating data from software

When you separate your data from your system software, you eliminate many tasks that would otherwise need to be performed each time you upgrade or replace your system software. An effective way to separate data from software is to use different DASD volumes for each.

You will minimize your installation and migration workload if you try to satisfy these objectives:

- All system software volumes for the same product set at the same product and service levels should be identical.
- All differentiation between systems should happen during or after IPL.
- Only system software (and SMP/E data pertaining to it) should reside on system software volumes.

If you have not previously used a system replacement method to install software, you will find that it makes the installation considerably easier. Most of the work involves separating the following kinds of data from z/OS or z/OS.e software:

- Customization data, including most system control files
- Non-IBM software
- IBM products that run on z/OS or z/OS.e
- User exits
- User data.

Your goal is to make it easier to replace the volumes that contain z/OS or z/OS.e software, which are supplied by ServerPac or SystemPac (dump-by-data-set format). This allows you to more easily keep the other software and data you will need to use with z/OS or z/OS.e across migrations.

What to do with the non-ServerPac or non-SystemPac code

1. Ask if the code is still required. If not, don't carry it forward; if so, go to the next step.
2. Determine the usefulness and effectiveness of this code:
 - Does it need to be updated for the new function in z/OS or z/OS.e? If it does, you might need to upgrade a product or change the code.
3. If this code can be separated from the code delivered with ServerPac or SystemPac, place it in another product set. The product set should be placed on another volume so that future ServerPac or SystemPac installations will not overlay it. This requires moving it into separate libraries and SMP/E zones.
4. If the code cannot be separated from the code delivered with ServerPac or SystemPac, then it must be reinstalled in the same zones and libraries delivered with ServerPac or SystemPac. One way to do this is with the SMP/E BUILD MCS command.
5. Enable the useful and effective code to work with z/OS or z/OS.e. This might mean using concatenation, reinstalling the code, or possibly reassembling it.

As you face the task of where to place the various types of code in your installation and enabling the code to work with z/OS or z/OS.e, keep in mind the following advice:

- Use SMP/E to install all modules you use with the operating system; place comments in each module that identify its function.
- Where possible, use IBM-supplied exit points to control the system rather than changing the source or object code.
- Where possible, use the dynamic exits service. This service allows you to refresh exits without losing availability. For information about the dynamic exits service, see *z/OS MVS Installation Exits*.
- Where possible, place your exit code in libraries placed on different volumes from IBM code. This allows compatible exits to stay in place when you start to use a new level of the operating system, and reduces migration time.

The following list includes the different kinds of code found in an installation, and describes actions that ensure that the code you want to use with z/OS or z/OS.e survives the installation process and is enabled to run with z/OS or z/OS.e. The list includes the ways you insert customer-written code into an operating system environment or change the operating system code:

- **IBM products that run on z/OS or z/OS.e:** This category includes the following:
 - Products that are no longer marketed. Such products are not available through ServerPac. To avoid having to reinstall these products every time you reinstall a z/OS or z/OS.e ServerPac order, place these products, if possible, in separate product sets with separate libraries or SMP/E zones. Also, to make sure that these products still run on z/OS or z/OS.e, be sure to check Appendix C, “Minimum releases of IBM software products that run with z/OS and z/OS.e” on page 183.

Note: SMP/E provides the BUILD MCS command to copy a product from one zone to another. For example, if you have an existing image of a vendor product in your current MVS zone, and it does not need to be installed in that zone, you can use BUILD MCS to move it to another zone before you install z/OS or z/OS.e. In that way you avoid having the ServerPac overlay the vendor product. For the information you need to use the BUILD MCS command and restrictions on its use, see *SMP/E Commands*.

Products that are no longer marketed but are still service supported are available for selection in the SystemPac shopping list. Where appropriate, when you order a SystemPac, have these products separated into their own SMP/E zone or volume via the Local Order Entry tool.

- Available MVS SREL products, such as PSF or NetView. You can order these products in the same ServerPac or SystemPac as z/OS or z/OS.e.
- Non-MVS SREL products, such as the subsystems (DB2, CICS, IMS, and NCP). Check to make sure that these products do not need to be upgraded to run with z/OS or z/OS.e by doing cross-zone requisite checking. For ServerPac, run the SMPREP job or the REPORT CROSSZONE command. For CBPDO, you should have done cross-zone requisite checking during APPLY processing, as described in *z/OS Program Directory*. If you didn't, run a REPORT CROSSZONE command. For information about the REPORT CROSSZONE command, see *SMP/E Commands*. For information about the SMPREP job, see *ServerPac: Installing Your Order*.

If you need to upgrade a non-MVS SREL product, order it in a separate ServerPac or use SystemPac. SystemPac provides the option of integrated subsystems. The package you order can include z/OS or z/OS.e and no more than one of the subsystems (DB2, CICS, IMS, or NCP). The deliverable is shipped to you integrated and requires just one installation, via either the CustomPac Installation Dialog or a full volume restore.

Should you choose to order subsystems with z/OS or z/OS.e in one single SystemPac order, separate your subsystems from the z/OS or z/OS.e SREL products to gain maximum flexibility in the future. The Local Order Entry tool enables you to do so. For a description of the Local Order Entry tool, refer to:

<http://www.ibm.com/ca/custompac/>

- **User modifications:** This category includes:
 - User exits
 - Updates to source code
 - Zaps
 - Changes to ISPF elements, such as panels, CLISTs, and EXECs.

Isolate this code from the IBM code when possible by:

- Placing it in a separate library that can be concatenated ahead of the IBM libraries
- Using the dynamic exits service and placing the code in separate libraries.

One simple way to tell whether user modifications must be reworked for the new level of software is to try to reapply them and see how many of them SMP/E will install. Those that SMP/E will not install will need to be changed for the new level of software. This method works if you have followed IBM's advice about using SMP/E to install the code.

If your user modifications have been installed using SMP/E, you can get the list of user modifications you now have installed by running a LIST SYSMODS USERMODS command against each of your existing target zones. You will need to evaluate each user modification to determine whether it is still needed and whether it needs to be reworked to be reinstalled.

To save time, you can run SMP/E REPORT SYSMODS commands, specifying each existing target zone on the INZONE keyword and each corresponding new target zone on the COMPAREDTO keyword. SMP/E will create SYSMODS Comparison Reports that identify user modifications that are installed in the old zones and are applicable to FMIDs in the new zone. It will also create a job in the SMPPUNCH data set to reinstall them (and any applicable PTF and APAR SYSMODs) in the new ServerPac or SystemPac system's target zone.

Some of your user modifications might be listed by the LIST commands but not included in the SYSMODS Comparison Reports. These user modifications apply to FMIDs that are not installed on your new system. Some FMIDs might have been replaced by others, in which case you will have to rework applicable user modifications before reinstalling them. The others might have no replacements and their user modifications are almost certainly no longer needed.

For FMIDs that have changed, evaluate the usermods and rework them, if necessary.

Keep the source for all user modifications in a single data set, and document each modification. Such documentation often includes:

- The name of the part (for example the module) affected by the usermod
- The business justification for the usermod
- When the usermod can be eliminated
- The purpose of the usermod
- Instructions for reworking or reinstalling the usermod
- The product and current FMID to which the usermod is applied.

You might need to rework and reinstall source updates and zaps.

Some actions not only make a ServerPac or SystemPac (dump-by-data-set format) installation easier, but can also organize code and data so that other tasks are easier. Here are some recommended actions:

- **SYSRES:** Some SYSRES volumes are not large enough to hold all the z/OS or z/OS.e target libraries. If you have such a volume you can move some of the data sets off SYSRES. For help in determining which ones to move, see “Recommended data set placement” on page 138.
- **Parmlib and proclib:**
 - Don’t make changes to the parmlib and proclib data sets that you use for production until you have seen what IBM sends in the copies that IBM ships with z/OS or z/OS.e. Compare the IBM copy to your production copy or use the IBM library in your production concatenation and decide which of IBM’s parmlib and proclib specifications apply to your environment and manually make the changes. Copy any new parmlib and proclib members into your production copy. Then, tailor your production copy, as needs require.
 - In a multisystem environment, try to have SYSRES, master catalog, and system-type libraries (such as IODF, SYS1.DAE, and RACF data) common to as many systems as is practical. Use symbolic substitution to reduce the number of parmlib and proclib members that are unique to specific systems. Using symbols in parmlib members makes it easier to share a parmlib member across multiple systems. z/OS and z/OS.e provide a tool that helps you to verify that your system symbolics work successfully in your own configuration before you put the parmlib member into production. This tool, called the parmlib symbolic preprocessor, runs as an ISPF dialog to interactively display the results of symbol substitution before you IPL the system and use the symbols. You can find the tool in members SPPINST and SPPPACK in SYS1.SAMPLIB. Information about setting up and using the tool appears in the prolog of the SPPINST member.

Use parmlib concatenation to separate your tailored parmlib members from the IBM-supplied parmlib members. See information about parmlib concatenation in the description of the LOADxx parmlib member in *z/OS MVS Initialization and Tuning Reference*.

Placing data sets on specific volumes

With the ability to define very large volume sizes on certain hardware, it is possible that all your target and DLIB libraries could fit on a single volume. IBM recommends that, if possible, you use a large enough volume for your target libraries so that you will not need multiple SYSRES logical extension volumes. However, some SYSRES volume types, such as the 3390-3, are not big enough to hold all the target libraries for a z/OS or z/OS.e system, with the result that you have to move some data sets to SYSRES logical extension volumes (overflow volumes). This section describes considerations for placing data sets on specific volumes. These considerations try to minimize your migration actions, taking into account:

- Your ability to use a system (or subsystem) replacement
- Data set and system availability
- System performance
- System cloning and servicing techniques
- Sysplex/multisystem operations
- Your ability to exploit new technologies
- Sharing of data sets
- Backup and recovery
- Disaster recovery.

Using the guidelines in this section, you will have to determine which data set placements work best in your environment, probably making trade-offs in order to achieve your business goals.

Product sets

Introducing product sets

A *product set* is a set of products that you should install, maintain, and migrate as a group. Everyone has at least one product set that includes z/OS or z/OS.e. The judicious grouping of your other system software products into product sets can help you avoid reinstalling software you have already installed, give you greater flexibility during migrations, control the amount of DASD used for system software, and make it easier to have different groups maintain different sets of products.

Well-chosen product sets let you treat most system software in a logical, modular way. When different images have different sets of requirements, you can use product sets as modular building blocks to make the entire needed set of software available on each image. Specific recommendations for placement of each product set's data sets are discussed in "Recommended data set placement" on page 138.

Characteristics of a product set

A product set is a group of products that is logically separate from any other group of products. Each product set is an entity that can be installed, maintained, and migrated by itself. Each product set has its own data sets, typically on separate DASD volumes, and its own SMP/E target and DLIB zones. Which products you should place in each product set depends on how you plan to install, maintain, and use software from different vendors.

When planning the number and content of product sets to be used in your installation, consider:

- Software installation requirements.

Some products must be installed in data sets and SMP/E zones shared with other products in order to work. Such products cannot be considered as candidates for placement in different product sets. However, the remaining products are potential candidates.

- Migration cycles.

Do you install and migrate all your software products at the same time (for example, once a year)? Or do you install and migrate groups of products separately? Software often installed or migrated separately includes subsystems, software from vendors, and application software.

Any software installed or migrated on a cycle different from other software is itself a candidate product set.

- Organizational requirements.

Does a single person or group of people do all software installations and migrations? Or do different people maintain different products? Note that some installations that once had separate organizations install and maintain different product sets now have one group install all of them and others make the software operational (including customization). This lets them include more products in each product set and reduce the number of product sets.

Examples of software often maintained by different groups include application development software (such as compilers and debuggers), database products (such as IMS Database Manager and DB2), transaction processing products (such as CICS and IMS Transaction Manager), and networking products (such as ACF/NCP and NCP/SSP).

Software products maintained by different groups are sometimes candidates for inclusion in separate product sets.

- Sharing boundaries.

Software can often be shared among multiple system images. There are many considerations for sharing system software, and more information about this can be found in *Parallel Sysplex - Managing Software for Availability*, SG24-5451.

The boundaries on which you choose to share different products can vary, depending on which products are being used.

When some products are shared among some sets of images and other products are shared among different sets of images, they are candidates for inclusion in different product sets.

Note: You should generally not separate products to control access to them on different images for licensing reasons, unless the terms and conditions of your licensing agreements require you to do so. Most often, access to particular programs is better controlled using your security product.

- Product availability.

Some of the products you use might no longer be available from a particular software vendor. They might originally have been placed in product sets with other products. Depending on how the product is installed, it might become a candidate for inclusion in a product set separate from the vendor's other products. Moving these products to separate product sets can sometimes let you avoid reinstalling them each time you rebuild the product sets in which they were originally placed.

Which product sets are appropriate?

One or more product sets, as described below, will be appropriate for your installation. Any of these product sets can be merged with any other, as required by your business needs. (The result of merging two product sets is considered to be a single product set.) Any product set described below can also be split into two or more product sets, if this is what's needed to meet your installation's requirements. Product sets can be built at the same time or different times, and migrated together or separately to different images as your business requires.

Each installation's requirements usually lead to a unique number of product sets and to unique content in each set. Remember that your objective in choosing the number and composition of product sets is to control workload while providing the amount of flexibility you need to manage your software easily. If you have either too many or too few product sets, you will do more work during some phase of installation or migration, and your system software will be harder to manage.

Product set for z/OS or z/OS.e and closely-related products: The z/OS product set or z/OS.e product set consists of all z/OS or z/OS.e elements and features and other products that either must be installed with z/OS or z/OS.e, or that you choose to install with z/OS or z/OS.e. Some products must be installed with z/OS or z/OS.e because they share load modules with z/OS or z/OS.e load modules. Others can be installed separately but are difficult to maintain separately because of frequent service dependencies or local installation policies. Products in these two categories should always be part of the z/OS or z/OS.e product set.

Note: Remember to add products to the z/OS or z/OS.e product set that install into data sets that cannot be concatenated, such as SYS1.NUCLEUS. For example, the PSF product should be treated as part of the z/OS product set because it installs into SYS1.NUCLEUS.

Other products within the MVS SREL need not be installed with z/OS or z/OS.e and are not difficult to maintain separately. However, unless your installation has a reason to place them in a separate product set, you should consider including them in the z/OS or z/OS.e product set.

Subsystem product sets: Subsystem software includes database software, transaction processing software, and some network software. This software is often installed using different installation methods, is usually migrated on different cycles, is usually shared on different boundaries, and is often maintained by different groups. These products are usually good candidates for different product sets.

Licensed product sets: If your migration cycles, organizational requirements, and sharing of boundaries make it appropriate, you should consider creating a separate product set for some products. Generally, such products should be reasonably stable and easy to install, maintain, and migrate separately. Examples of such products include compilers, automation products, and products that can no longer be ordered.

Vendor product sets: You should consider creating one or more product sets for each vendor's products.

Recommended data set placement

Data set placement recommendations are **not** mandatory. The use of any or all of this layout is strictly optional. The recommended layout provides a good foundation for many recent functional and system management enhancements (such as sharing a master catalog, indirect volume serial support, z/OS UNIX System Services, and Parallel Sysplex). It can be used to suggest how you might place data sets or as a set of objectives to which you can evolve.

To help you decide whether to follow the recommendations, ask yourself the following questions. Positive answers indicate that at least some of the recommended actions would be beneficial to you.

- Will you require additional SYSRES logical extension volumes? Some SYSRES volume types, such as the 3390-3, are not big enough to hold all the z/OS or z/OS.e target libraries. Therefore, you might have to move some data sets to SYSRES logical extension volumes.

Note: A z/OS image can share the SYSRES and SYSRES logical extension volumes with a z/OS.e image.

- Do you plan to use indirect volume serial support? If so, the recommended layout fits nicely with this support. See "Using indirect catalog entries" on page 153 for more information.
- Do you plan to use ServerPac or SystemPac (dump-by-data-set format) for future installations? ServerPac replaces at least your target and distribution libraries, so using the layout recommended in this section makes it easier to lay down the ServerPac or SystemPac (dump-by-data-set format) libraries.
- Do you plan to share master catalogs? The recommended layout provides a good foundation if you do.
- Do you plan to move your volumes across systems? If so, the recommended placement of user catalogs creates more-portable volumes and reduces migration workload. Also, the master catalog alias resolution support in DFSMSdfp allows system symbols to be used for the user catalog name. See *z/OS DFSMS: Managing Catalogs* for details.

Based on these factors, you should determine which data sets to place on each volume based on data set type, not based on element, feature, or product. There are five types of data sets in the recommended data set layout. Each type is placed on a separate (logical) volume. The types of data sets and their volumes are:

- **SMP/E global-shared data sets**, on a volume shared by all systems in the complex that need access to SMP/E global information. See “SMP/E global data sets” on page 140 for details.
- **Target libraries (TLIBs) for product sets**, on the following volumes:
 - TLIB volume 1 (TVOL1)
 - TLIB volume 2 (TVOL2) through TLIB volume n (TVOLn)
 - HFS target volume
 - Licensed product set volume (for those licensed programs not installed with the z/OS or z/OS.e product set)
 - Vendor product set target volume
 - Subsystem product set target volume

See “Target libraries (TLIBs)” on page 140 for details.

- **Distribution libraries (DLIBs) for product sets**, on the following volumes:
 - DLIB volumes for target volumes (which include TVOL1, TVOL2-n, and HFS)
 - DLIB volume for the licensed product sets
 - DLIB volume for the vendor product sets
 - DLIB volumes for the subsystem product sets

See “Distribution libraries (DLIBs)” on page 144 for details.

- **Image-related data sets**, on the following volumes:
 - Page data sets volume 1
 - Page data sets volume 2 through n
 - HFS customization volume

See “Image-related data sets” on page 145 for details.

- **Cluster-related data sets**, on the following volumes:
 - Master catalog volume (you can also choose to make this an image-related volume)
 - JES checkpoint volume
 - JES spool volume
 - Sysplex volume 1
 - Sysplex volume 2
 - Softcopy volumes

See “Cluster-related data sets” on page 147 for details.

Many volumes on your system will contain data sets that are not supplied by ServerPac or SystemPac (dump-by-data-set format). Keeping such volumes separate from those that ServerPac or SystemPac (dump-by-data-set format) will replace, or that you will replace when migrating the new system to other system images, makes it easier to prevent overlaying data sets that you want to keep. Volumes that contain non-ServerPac or non-SystemPac data sets might include, but are not limited to, the volumes identified below in the data set descriptions, as well as volumes for assorted data sets (dumps that were dynamically taken, logger logstreams, and so forth). Note that you can install your ServerPac or SystemPac (dump-by-data-set) order on volumes with existing data sets. See “Preparing for installation” on page 60 for the steps to follow when your target volumes contain data that you want to preserve.

The rest of this section contains details about the five types of data sets and volumes outlined above. As you're reading, keep the following in mind:

- Volumes can be combined in order to conserve DASD. Combine volumes based on like characteristics. For example, consolidating two SMS-managed volumes with the same SMS constructs (Storage Class, Management Class and in the same Storage Group) is more appropriate than consolidating a non-SMS-managed volume and an SMS-managed volume.
- Although ServerPac and SystemPac (dump-by-data-set format) considerations are mentioned specifically, this recommended system layout is equally applicable to CBPDO users and will save time when the new system is migrated to other images.

SMP/E global data sets

These data sets contain SMP/E global system information. For the sake of organization, and ease of backup and recovery, it's a good idea to keep them together on a volume shared by all systems that use SMP/E in your complex. If you maintain multiple global zones for subsystems or vendors, the global zone described here should contain ZONEINDEX references to all other zones. This will assist you in cross-zone conditional requisite checking without requiring any changes to your installation's maintenance procedures.

The recommended types of data sets for this volume are:

- SMP/E global CSI
- SMPPTS (this data set alone might fill a volume)
- SMP/E global logs (SMPLOG/A)

Target libraries (TLIBs)

These data sets are SMP/E target libraries for products sets mentioned in "Which product sets are appropriate?" on page 137.

If you want to take advantage of indirect volume serial support, do not SMS-manage the target data sets that reside on volumes TVOL1 through TVOLn.

TVOL1 through TVOLn may be shared with other systems (for IPCS or WLM migrations, for example). If TVOL1 does not contain enough space to hold all the data sets listed for your system, then the criterion for a split (between TVOL1A and TVOL1B, for instance) would be that the IPCS and change migration libraries should be kept together on the first volume (TVOL1A).

If you support more than one language and are short of space on TVOL1, you might choose to put your primary language on TVOL1A and your secondary languages on TVOL1B. An additional criterion for a TVOL1A and TVOL1B split is to keep together those data sets that are less critical to the system and that do not affect existing catalog structures (for instance, data sets that are new to z/OS and are not critical to system usage).

IBM recommends that when you install using ServerPac or dump-by-data set SystemPac, you take advantage of the Recommended System Layout enhancement. This function takes into consideration the volume space available and the data set sizes in your order, and places the data sets accordingly. If you are a CBPDO customer, you might have to calculate available space for the data set types on target volumes to ensure that it is sufficient. Depending on the volume type, you might have to add another target volume.

TVOL1 through TVOLn contain the z/OS or z/OS.e product set target libraries, except for HFS files.

TLIB volume 1 (TVOL1): TVOL1 is the first target library volume and the system residence (IPL) volume. It contains many of the z/OS or z/OS.e target libraries. Be sure to leave enough free space to allow for future growth. TVOL1 allows you to IPL if one or more TVOL2 through TVOLn volumes are temporarily not available.

TVOL1 contains some or all of the non-HFS target libraries for the z/OS or z/OS.e product set. (See “Product set for z/OS or z/OS.e and closely-related products” on page 137 for more information on the z/OS and z/OS.e product sets.) This does not include the licensed product set, which you install separate from z/OS or z/OS.e (on licensed program volumes), or the subsystem product set (on the subsystem target volumes).

The recommended types of TVOL1 data sets are given below. The type of a data set is known within the Recommended System Layout function in ServerPac and dump-by-data set SystemPac. The data set type can also be found within the product’s program directory.

- **Load libraries.**
- **Change migration libraries.** These libraries are used, or might be used, during migration from one level of software to another.
- **Help libraries.**
- **Panel libraries.**
- **Message libraries.**
- **Skeleton libraries.**
- **Table libraries.**
- **Fixed-block CLIST and EXEC libraries (if possible).** If you don’t use fixed-block CLIST and EXEC data sets, then TVOL1 should contain your variable-block CLISTS and EXECs and TVOL2 would contain your fixed-block CLISTS and EXECs. (In other words, put the kind of CLISTS and EXECs you use on TVOL1.)
- **Data libraries.** Some data libraries should go on TVOL2.
- **SMP/E managed PARMLIB.** This data set is the one pointed to by the PARMLIB DDDEF, which will be used to store parmlib members supplied by products you install. If you copy the SMP/E-managed PARMLIB data set into your own system control data set, then the SMP/E-managed parmlib should be placed on TVOL2-n. The placement of this PARMLIB data set makes it easier to use concatenated PARMLIB support to reduce migration workload.
- **SMP/E managed PROCLIB.** This data set is the one pointed to by the PROCLIB DDDEF, which will be used to store JCL procedures supplied by products you install. If you copy the SMP/E-managed PROCLIB data set into your own procedure library, then the SMP/E-managed PROCLIB data set should be placed on TVOL2-n. The placement of this PROCLIB data set makes it easier to use concatenated PROCLIB support to reduce migration workload.

Reasons to put these data sets on TVOL1 are:

- These data sets are critical to basic system function and are required for recovery. Should some TVOLn volumes be lost or become inaccessible, the system is less likely to fail if the most critical data sets are all on a single volume. Also, in the event that all TVOLn volumes are lost or become inaccessible, the ability to IPL, log on, and use basic system functions after recovering TVOL1 can speed the recovery of other volumes and greatly simplify the process of restoring full function. (For example, restoring additional volumes from backup tapes can be done in parallel, using cataloged tape data set names.)

- These data sets will be overlaid by a system replacement. By keeping them together, you can more easily separate what will and will not be overlaid.
- The SMP/E DDDEFed PARMLIB and PROCLIB are on TVOL1 so that TVOL1 can be IPLed in a minimum setup (without TVOL2 through TVOLn) and still have the SMP/E-installed defaults available. The members stored by SMP/E in the PARMLIB pointed to by the PARMLIB DDDEF, and those stored in the PROCLIB pointed to by the PROCLIB DDDEF, are not sufficient to IPL by themselves; a minimum set of system control parameters and JCL procedures are required to IPL and use the system. You can either concatenate your own PARMLIB and PROCLIB data sets to these data sets (which IBM recommends) or add your own members to these data sets.

TLIB volume 2 (TVOL2) through TLIB volume n (TVOLn): TVOL2 through TVOLn are volumes used for data sets that do not fit on TVOL1. They are for the z/OS or z/OS.e product set; see “Product set for z/OS or z/OS.e and closely-related products” on page 137 for more information about the z/OS and z/OS.e product sets. Products you want to install separately should be placed instead on licensed program volumes or subsystem volumes.

The recommended types of TVOL2 through TVOLn data sets are given below. The type of a data set is known within the Recommended System Layout function in ServerPac and dump-by-data set SystemPac. The data set type can also be found within the product’s program directory.

- **Fixed-block CLIST and EXEC libraries** (only if variable-block CLIST and EXEC libraries were used on TVOL1).
- **Sample and JCL libraries.**
- **Source libraries.**
- **Macro libraries.**
- **Workstation libraries** (which are combined in the data libraries).
- **Softcopy libraries into which SMP/E installs.**
- **Font and printing libraries.**
- **Text libraries.**
- **Flat files that SMP/E cannot manage** (interface repositories and so forth, excluding books).
- **MMS-compiled and MMS-source data sets.** MMS-source data sets are those data sets that are used as input into the MMS compiler.
- **SMP/E target CSI.**
- **SMP/E target data sets:** SMPLTS, SMPMTS, SMPSTS, SMPSCDS.
- **User catalog for the SMP/E target CSI and MMS-compiled data sets.**

If you find that just one volume (TVOL2) is not enough, and you require other volumes (TVOL3 for instance), you could place groups of data sets (rather than individual data sets) on one volume or the other. Some examples of groupings are:

- Operational data sets, such as flat files, font and printing libraries, MMS-compiled libraries, and user catalogs.
- VSAM data sets, such as the target CSI, MMS-compiled clusters, and user catalog.
- SMP/E work data sets, such as SMPLTS, SMPSCDS, SMPMTS, and SMPSTS.

Remember that these data sets are overlaid by a subsequent ServerPac or SystemPac (dump-by-data-set format) installation and associated customization.

HFS target volume: This is a user-maintained volume and may be SMS-managed. This volume is not overlaid when unloading the ServerPac or SystemPac (dump-by-data-set format) HFS data sets. However, the data in the HFS will be overwritten by the installation of service or the installation of z/OS with CBPDO. Therefore, you must ensure that you have a copy of your HFS filesystem before you install into it. See *z/OS UNIX System Services Planning* for more information about installing service into the HFS.

The recommended types of data sets (filesystems) for the HFS target volume are:

- HFS data sets for z/OS and z/OS.e elements or features that install into an HFS
- HFS data sets for products that run on z/OS or z/OS.e, except data sets containing customization data (which would be on the HFS customization volume)
- User catalog for HFS data sets on this volume

With the non-SMS HFS support available in the fourth quarter of 1999, you can combine the HFS target volume and your TVOL2-n volumes if you wish. You might want to combine them if the products they share are migrated on the same boundary and there is enough space on the TVOL2-n volumes for the HFS data sets.

Licensed product target volume: The libraries on this volume consist of the licensed product set that you might not have in a system-replacement order and you want to keep separate. The data sets on this volume are not overlaid by a system replacement and the content is decided on by the user. There can be any number of this type of volume on a system.

The recommended types of data sets for this volume are:

- Licensed program target libraries
- SMP/E target CSI
- SMP/E target data sets: SMPLTS, SMPMTS, SMPSTS, SMPSCDS
- User catalog. The SMP/E target CSI should be defined using this catalog. Except for any data sets you choose to catalog in the master catalog, all the licensed program target libraries should also be cataloged in this user catalog, and ALIAS entries should be defined in the master catalog to relate their high-level qualifiers to this user catalog.

Reasons to put these data sets on this volume are:

- To keep data sets that cannot be system-replaced (no longer marketed by IBM, older product levels, and so forth) on volumes other than TVOL1-TVOLn, so they are not overlaid by a system replacement.
- To keep together licensed programs that have dependencies on each other.
- To facilitate data set sharing between systems and maintain data sets in one place.

Vendor product target volume: The libraries on this volume consist of the vendor product set that you might not have in a system-replacement order and you want to keep separate. There can be any number of this type of volume on a system.

The recommended types of data sets for this volume are:

- Vendor target libraries (that can be separated)
- SMP/E target CSI
- SMP/E target data sets: SMPLTS, SMPMTS, SMPSTS, SMPSCDS

- User catalog for the SMP/E target CSI. Unless a data set must be in the master catalog, all the vendor product target libraries should be cataloged in the user catalog.

The reason to put these data sets on this volume is to keep the data sets off volumes that are overlaid by a system replacement.

You will need to contact your vendors to determine whether their products need to be updated for each z/OS or z/OS.e release and whether the updates can be made ahead of time. To access the vendor's information through the World Wide Web, see:

<http://www.ibm.com/eserver/zseries/solutions/s390da/>

Subsystem target volume: The libraries on this volume consist of the subsystem product sets (CICS, DB2, IMS, or NCP). There can be any number of this type of volume on a system.

The recommended types of data sets for this volume are:

- Subsystem target libraries.
- Alternate subsystem SMP/E global CSI, if applicable.
- SMP/E target CSI
- SMP/E target data sets: SMPLTS, SMPMTS, SMPSTS, SMPSCDS
- User catalog for the SMP/E global and target CSIs. Unless a data set must be in the master catalog, all the subsystem target libraries should be cataloged in the user catalog.

Reasons to put these data sets on this volume are:

- To keep these data sets off volumes that are overlaid by a system replacement.
- To keep the subsystem together on the same volume.
- To facilitate data set sharing between systems and maintain data sets in one place.

A subsystem product set might need to be serviced before it can be used with a new z/OS or z/OS.e system. However, service updates usually can be made prior to the z/OS or z/OS.e migration.

Distribution libraries (DLIBs)

You should place data sets on the DLIB volumes wherever they fit. There need not be a correlation between TVOL1 and the DLIB volume for TVOL1, or between TVOL2 and the DLIB volume for TVOL2, and so forth. It is possible, but not necessary, to SMS-manage the data sets.

Keep in mind how other systems will use the distribution libraries when you are deciding where to place them. There might be cases where you don't want or need a set of distribution libraries available on certain packs. These cases include:

- Distributing software to sites that don't use SMP/E or need the distribution libraries
- Having multiple target zones connected to a DLIB zone.

When allocating the distribution libraries you might have to use more than one DLIB volume. See Table 6 on page 74 for an estimate of how much space the distribution libraries in z/OS and z/OS.e will use.

If space allows, any of the following DLIB volumes can be combined with their corresponding target volumes: DLIB volume for licensed products, DLIB volume for vendor products, and DLIB volume for subsystems.

If you choose to catalog your distribution library data sets, IBM recommends that you catalog them in the user catalog used for the DLIB zone CSI. This makes it easier to move the DLIB volumes into other environments, to switch between different levels of DLIB volumes, and to have more than one level available at a time. It also reduces the amount of update activity required for the master catalog.

DLIB volumes for TVOL1, TVOL2 through TVOLn, and HFS: These distribution libraries are the ones that are replaced by ServerPac or SystemPac (dump-by-data-set format) for your z/OS or z/OS.e product set. By keeping the distribution libraries on the same volumes it will be easier to avoid overlaying data sets.

- DLIBs for TVOL1, TVOL2 through TVOLn, and TVOLH

The DLIB CSI should be placed on one of the DLIB volumes, along with a user catalog for the DLIB CSI.

DLIB volume for licensed products: These are the distribution libraries that correspond to the target libraries for TVOLP (the licensed product set). These are data sets that would not be overlaid in a system replacement.

- DLIBs for TVOLP
- SMP/E DLIB CSI
- User catalog for the SMP/E DLIB CSI

DLIB volume for vendor products: These are the distribution libraries that correspond to the target libraries for TVOLV (the vendor product set). These are data sets that would not be overlaid in a system replacement.

- DLIBs for TVOLV
- SMP/E DLIB CSI
- User catalog for the SMP/E DLIB CSI

DLIB volumes for subsystems: These distribution libraries are the ones that will be replaced by ServerPac or SystemPac (dump-by-data-set format) for a subsystem product set. By keeping the distribution libraries on the same volumes it will be easier to avoid overlaying data sets.

- DLIBs for TVOLS
- SMP/E DLIB CSI
- User catalog for the SMP/E DLIB CSI

Image-related data sets

These data sets contain nonshareable system image information. Although the recommendation is that they be put on separate volumes, as described below, if DASD is scarce you can combine them at the expense of performance or availability, or both.

Image-related data sets should use system symbolics in their names for easier maintainability. For more information on system symbolics, see *z/OS MVS Initialization and Tuning Reference*.

Page data set volume 1: The recommended types of data sets for this volume are:

- PLPA (1-cylinder allocation)
- Common

Unless your system is central-storage constrained, and has significant PLPA paging activity, there is little or no performance impact to combining the PLPA and COMMON page data sets. The PLPA data set should be allocated first, as a 1-cylinder data set. The COMMON data set should be allocated second, immediately following the PLPA data set on the volume. The COMMON data set's size should be large to contain both PLPA and COMMON pages.

This causes the vast majority of PLPA pages to be written to the COMMON page data set during IPL. This allows the operating system to use chained CCWs within a single data set and improves performance when both data sets are on the same volume.

Note: A warning message (ILR005E) is issued during IPL when PLPA pages overflow into the COMMON page data set during CLPA processing. This message is intended to alert you to the possibility that PLPA pages might have to be retrieved from data sets on different volumes (which would negatively affect performance if there was significant PLPA paging). When PLPA and COMMON page data sets are on the same volume, this message can be ignored.

Page data set volumes 2-n: The recommended types of data sets for these volumes are:

- Local
- SMF
- RMF reporting
- STGINDEX data sets (if used)
- Image-related LOGREC data set (if used)

Considerations when setting up a page data set volume are:

- Where possible, each local page data set should be placed on a dedicated volume connected to a control unit that is not used for other paging volumes, and on channel paths that are not used for other paging volumes. Although paging rates to DASD might be low, given sufficient central and expanded storage, increasing workloads might eventually cause significant paging. If this happens, locating local page data sets as suggested provides the best performance. Additionally, a large number of page data sets yields better performance than a small number if there is significant paging to DASD.

IBM does not recommend placing other data sets on the volumes used for page data sets. However, if you must place other data on local page data set volumes, choose data with the lowest frequency of reference possible to minimize contention with paging.

- As one might expect, the I/O activity to SMF data sets is proportional to the amount of SMF data you record from your specified SMF parmlib member.
- I/O to STGINDEX data sets is only done when a job stream does batch checkpoints to save status (to allow the job stream to be restarted) or obtains restart status; therefore, this data set has relatively low I/O. If your installation always IPLs using CVIO or CLPA (which implies CVIO), there is no reason to have a STGINDEX data set. In this case, specify VIODSN=IGNORE in IEASYSxx. For more information, see *z/OS MVS Initialization and Tuning Reference*.
- For information on choosing the LOGREC recording medium, see "Recording Logrec Error Records" in *z/OS MVS Diagnosis: Tools and Service Aids*. I/O activity is typically low for the image-related LOGREC data set.
- Dynamic dumps are recommended, so SVC dump data sets are not listed above.

HFS customization volume: This is an installation-maintained volume. The data sets on this volume will not be overlaid by system replacement. This volume is separate from the HFS target volume because it may contain unshareable HFS files that will generally need to be mounted MODE(RDWR).

The recommended types of data sets for this volume are:

- HFS data sets that must be in write mode (for instance, /etc, /u, /var) and contain customized information.
- A user catalog to own the HFS data sets (optional). This makes the volume portable using dump and restore, catalog services (IMPORT CONNECT), and SMS definition changes.

Reasons to put these data sets on this volume are:

- To keep customer HFS customization filesystems separate so that they can be mounted under the file system provided in a system replace.
- To improve system performance. The number of HFS data sets that must be in write mode should be minimized to just what is required.
- To keep installation-maintained HFS data sets (which may be SMS-managed) together on the same volume for easier management.

Cluster-related data sets

These are shareable data sets used in a multisystem environment. Cluster-related data sets should use system symbolics in their names for easier maintainability. For more information on system symbolics, see *z/OS MVS Initialization and Tuning Reference*.

While all cluster-related data sets can be combined on the same volume, it is usually preferable to separate certain data sets from others for performance or availability reasons. For example, the following data sets should usually not be placed on the same volume:

- Primary and secondary RACF databases
- JES spool and checkpoint data sets
- Primary and backup SMS data sets
- Primary and secondary couple data sets

Note: You should also consider placing the primary RACF database in the coupling facility.

Master catalog volume: The recommended types of data sets for this cluster-related volume are:

- Master catalog
- BROADCAST
- Customer parmlib concatenation (not the SMP/E DDDEFed PARMLIB)
- Customer proclib concatenation (not the SMP/E DDDEFed PROCLIB)
- UADS (if used)
- VTAMLST
- SMS ACDS, CDS, model DSCB, HSM, RMM, and so forth
- APPC VSAM data sets (side information, TP profile)
- System control files (TCP/IP configurations and so forth)
- Primary RACF database
- IODF
- SYS0.IPLPARM
- UCATs
- SYS1.DDIR sysplex dump directory data set
- DAE data set

Considerations when setting up the master catalog volume are:

- BROADCAST (when individual user BROADCAST data sets are in use), LOGREC, parmlib, proclib, UADS, IODF, and DAE are low-activity data sets.
- Customer parmlib and customer proclib should be concatenated with other parmlibs and proclibs. For information on using system symbolics in concatenated parmlibs, see *z/OS MVS Initialization and Tuning Reference*.

JES2 checkpoint volume: For maximum performance and reduced contention, place the primary JES2 checkpoint data set on its own dedicated volume. The JES2 checkpoint primary data set may be on a coupling facility.

JES2 spool volume: Except in the case of a single-system MAS complex, you should dedicate JES2 spool volumes to spool data sets, with no other data sets on the volumes. A system can have many spool volumes.

The JES2 checkpoint duplex data set may be on a coupling facility.

Sysplex-related volume 1: This is a user-maintained volume and does not contain data sets overlaid by a system replacement.

The recommended types of data sets for this volume are:

- SYSPLEX primary
- CFRM alternate
- ARM primary
- WLM primary
- LOGR primary

Considerations when setting up sysplex-related volume 1 are:

- Couple data sets should not be placed on volumes that have high I/O activity, are subject to RESERVEs, have page data sets, contain SYS1.DUMPnn data sets, or are eligible for allocation of data sets dynamically allocated for SVC dumps.
- The CFRM primary and SYSPLEX primary should be on different volumes attached to different control units. All other primary couple data sets can reside on the same volume, and all other alternate couple data sets can reside on a different volume.

You can find more guidelines for placement of couple data sets in *z/OS MVS Setting Up a Sysplex*.

Sysplex-related volume 2: This is a user-maintained volume and does not contain data sets overlaid by a system replacement.

The recommended types of data sets for this volume are:

- SYSPLEX alternate
- CFRM primary
- ARM alternate
- WLM alternate
- LOGR alternate
- Secondary RACF database

Couple data sets should not be placed on volumes that have high I/O activity, are subject to RESERVEs, have page data sets, contain SYS1.DUMPnn data sets, or are eligible for allocation of data sets dynamically allocated for SVC dumps.

You can find more guidelines for placement of couple data sets in *z/OS MVS Setting Up a Sysplex*.

Softcopy volume: This volume holds softcopy books and related data sets.

There can be any number of this type of volume on a system. This is a user-maintained volume and does not contain data sets overlaid by a system replacement.

The recommended types of data sets for this volume are:

- Books
- Bookshelves
- Bookindexes

The data sets on the softcopy volume are recommended to be SMS-managed. This allows the hierarchical storage manager (HSM) to migrate any unused or infrequently-used data sets or books.

Implementing the recommended data set placements

As you plan how you will implement the recommended data set placements, be sure to include the following activities:

- Decide whether to merge data sets.
- Determine which data sets to move and where to move them.
- Choose a volume serial naming convention if you plan to use indirect volume serial support.
- Decide whether to use your existing master catalog.
- Move data sets to appropriate volumes.
- Update SMP/E DDDEFs.
- Update catalog entries to point to appropriate volumes.
- Update IEASYMxx in your parmlib, using volume naming conventions.
- If using ServerPac or SystemPac (dump-by-data-set format), save your configuration for the next release.
- Update any environmentals that are applicable.

Decide whether to merge data sets

During a ServerPac or SystemPac (dump-by-data-set format) installation you can merge data sets while you modify the shipped order's configuration. This makes it possible to consolidate data sets that are used in the same ways. For example, you might merge ISPF panel libraries to create a smaller number of panel libraries. The merged data set configuration remains available for your use during subsequent installations.

The CustomPac Installation Dialog shows the data sets that are eligible for merging with a data set that you select. Not all data sets can be merged, however. The Dialog allows you to merge data sets only when they share all of the following attributes with the target data set:

- Same record format (RECFM)
- Same logical record size (LRECL)
- Same data set type (DLIB or target library)
- A data set organization of PO (DSORG=PO).

The candidate list is merely a reflection of the merge rules; you should not simply merge all eligible data sets. Instead, base your merge decisions on logical groupings and similarity of content (for example, all panel libraries). Further, take

extra care if you choose to merge system-critical data sets, such as those listed in the LNKLST, LPALST, and APFLST parmlib members; merging such data sets could prevent the system from IPLing properly.

Determine which data sets to move and where to move them

You can move data sets manually or you can use the CustomPac Installation Dialog's Create a Recommended System Layout function to assign them automatically.

Understand the effects of this move on your environment. Do you have any applications that refer to the data sets specifying a UNIT and VOLUME? If references to the moved data sets use the catalog, and the catalog has been updated, then moving the data sets should have minimal impact. However, if the catalog is shared with other systems, then the impact would be greater.

You should also review your backup and recovery procedures for the data sets you plan to move.

Choose a volume serial naming convention if you plan to use indirect volume serial support

If you follow a naming convention for your SYSRES logical extension volumes, you can use a single SYMDEF statement in your IEASYMxx parmlib member. For more information about indirect cataloging, see "Using indirect catalog entries" on page 153.

Decide whether to use your existing master catalog

Is your current master catalog shared between several images? If so, will all images in your system use the same layout?

IBM recommends that all images use the same layout in order to share the master catalog. If all systems will not use the same layout, then IBM recommends that the master catalog not be shared. In this situation, a separate master catalog for the system that has been converted to the layout must be used because the same data set cannot be cataloged on two different volumes.

Keep in mind that a catalog that contains extended indirect catalog entries cannot be used by a system where the support is not available. If you plan on sharing your master catalog with a down-level system that does not provide this function, you must decide if you will:

- Upgrade the down-level system to the minimum required for extended indirect cataloging
- Not use extended indirect cataloging until each image has the minimum required
- Use a separate master catalog on the later system, and discontinue sharing master catalogs.

Move data sets to appropriate volumes

If you are implementing the recommended data set placements during your ServerPac or SystemPac (dump-by-data-set format) installation, once you have configured your system data sets you do not have to move any data sets on the global, target, distribution, image, and some cluster volumes. The data sets will already be restored from the ServerPac or SystemPac (dump-by-data-set format) in the configuration you have chosen.

Remember that dump directory, SMS, sysplex, and system logger data sets are not provided in ServerPac or SystemPac (dump-by-data-set format). These data sets will still need to be moved to the appropriate volumes.

If you are implementing the recommended data set placements outside of a ServerPac or SystemPac (dump-by-data-set format) installation, move the data sets you researched onto the appropriate volumes. You might need some spare DASD space into order to move the data sets to a temporary location in order to do a swap. How much space you'll need will depend on how many data sets you're moving.

Update SMP/E DDDEFs

If you are implementing the recommended data set placements during your ServerPac or SystemPac (dump-by-data-set format) installation, once you have configured your system data sets you do not update your SMP/E DDDEFs to reflect the configuration. The DDDEFs will correctly identify the data sets for the configuration you have chosen.

If you are implementing the recommended data set placements outside of a ServerPac or SystemPac (dump-by-data-set format) installation, update your DDDEFs to identify the appropriate volumes. You can use the SMP/E ZONEEDIT command. If your data sets are cataloged, you won't have to update the UNIT and VOLUME. You should verify that the data sets you moved are correct in their DDDEFs.

Update catalog entries to point to appropriate volumes

If you are implementing the recommended data set placements during your ServerPac or SystemPac (dump-by-data-set format) installation, once you have configured your system data sets, the catalog your ServerPac or SystemPac provides will correctly reflect your configuration.

If you are implementing the recommended data set placements outside of a ServerPac or SystemPac (dump-by-data-set format) installation, update your catalog to identify the appropriate volumes.

Import the user catalogs created to manage the HFS and VSAM (including CSI) data sets, and define the necessary aliases.

If you are using extended indirect cataloging, your catalog should reflect the SYSRES logical extension volumes by using your system symbols. It is recommended that &SYSR2 be used as the first SYSRES logical extension symbol when using extended indirect cataloging.

Update IEASYMxx in your parmlib

Update your parmlib member to reflect the system symbols that you used in your catalog for extended indirect cataloging. Your IEASYMxx member must match your catalog entries in order for your data sets to be found.

If using ServerPac or SystemPac (dump-by-data-set format), save your configuration for the next release

Because ServerPac or SystemPac (dump-by-data-set format) can save your configuration and reuse it for your next ServerPac or SystemPac, it is recommended that you use this function. Once your configuration is defined, you will not have to reconfigure the same data sets again.

Update any environmentals that are applicable

If you have any customization, applications, or parameters in your environment that have to be updated to reflect your new layout, these need to be updated.

Choosing a naming convention for data sets

Choosing the right naming conventions for system software data sets can save you considerable time during installation and migration.

Some data sets are associated with only one system in a multisystem environment. Choose names for these data sets that reflect the name of the specific system. Names of system operational data sets, such as page and swap data sets, should include the system name. You can accomplish this using the IBM-supplied system symbol &SYSNAME.

Remember that once you go into production with a set of naming conventions, you cannot easily change them.

Using symbolic substitution

Using symbolic substitution involves carefully establishing naming conventions for such things as:

- Parmlib and proclib members
- Data sets
- System images
- HCD definitions
- Network definitions
- Subsystems.

Data set names restructured

In order to ease your migration to a new release, IBM has removed the level-dependent qualifiers (VnRnMn) from default data set names for all elements and features except one. The removal has occurred over many releases. As of z/OS V1R2, the level-dependent qualifiers remain only for msys for Operations data sets that are shared with stand-alone products that use level-dependent qualifiers. Specifically, the msys for Operations data sets that are shared with the Tivoli NetView and System Automation products still have middle-level qualifiers.

The absence of level-dependent qualifiers preserves much of your existing JCL, system procedures, parmlib and other system control file contents, and security system definitions across upgrades, saving you time and reducing the opportunity for error because updates will be limited to just the data sets in which the low-level qualifiers were changed. IBM recommends that you use the new names. For a list of the old and new names, refer to *z/OS Program Directory*.

If you are installing z/OS or z/OS.e using ServerPac or SystemPac (dump-by-data-set format), you can remove additional level-dependent qualifiers and your changes will be remembered (after you save your configuration and then merge) for future ServerPac or SystemPac installations. If you do rename additional data sets, you must also update operational procedures to reflect the new names.

Prior to z/OS V1R2, to help you stage your JES2 or JES3 migration (that is, migrate JES2 or JES3 sometime after the rest of the system), IBM **added** level-dependent qualifiers to JES2 and JES3 data sets. This made it easier to separate your existing JES from the new JES shipped with z/OS. As of z/OS V1R2, the level-dependent qualifiers for JES2 and JES3 are gone, just as they are for the other elements and features (except for msys for Operations, as stated previously). If you want to stage your migration to JES2 or JES3, you must now perform the extra step of renaming (with static names, for example) your existing JES2 or JES3 data sets to avoid conflicts with the new JES names.

Using indirect catalog entries

Indirect cataloging, also known as *indirect volume serial support*, allows the system to dynamically resolve volume and device type information for non-VSAM, non-SMS-managed data sets that reside on the system residence (IPL) volume when accessed through the catalog. This allows you to change the volume serial number or device type of the system residence volume without also having to recatalog the non-VSAM data sets on that volume.

Extended indirect volume serial support allows catalog entries to be resolved using system symbols defined in an IEASYMxx member of parmlib, so that indirect references can be made to one or more logical extensions to the system residence volume. Like indirect catalog support, this support lets you change the volume serial numbers or device types of system software target volumes without having to recatalog their non-VSAM data sets. Therefore, you can have multiple levels of z/OS or z/OS.e data sets residing on multiple sets of volumes with different names and device types, and use them with the same master catalog.

Furthermore, extended indirect volume serial support includes a system-defined static symbol, &SYSR1. The value of &SYSR1 is automatically set to the volume serial of the IPL volume. If you name your system residence volumes and their extensions according to a pattern, you can use substrings of the &SYSR1 symbol to assign substitution text to symbols for the other volumes.

Using indirect catalog entries, together with the extended support, allows you to share master catalogs among multiple images that use different volumes with different names for the system residence volumes and their extensions. You can also do this using a single SYMDEF for all images in a shared parmlib data set. Thus, once set up, no future updates should be needed to continue using this support.

For details about how to use indirect volume serial support, see *z/OS MVS Initialization and Tuning Reference*.

Using parmlib concatenation (logical parmlib)

You can concatenate up to 10 data sets to SYS1.PARMLIB, in effect creating a “logical parmlib”. You define the concatenation in the LOADxx member of SYS1.PARMLIB or SYSn.IPLPARM. Programs can use the IEFPRMLB macro to obtain the parmlib concatenation data set list, allocate and open the parmlib data sets, read a specified parmlib member, and close and unallocate the parmlib data sets. In addition, the operator, if desired, can use a SETLOAD command to switch from one logical parmlib to another without an IPL.

The overriding benefit of using parmlib concatenation is that it gives you greater flexibility in managing parmlib. Specifically, it lets you:

- Separate IBM-supplied members from locally-customized ones
- Separate members based on job responsibility and security requirements
- Separate members for change-management purposes.

If you install using ServerPac or SystemPac, the IBM-supplied defaults cause the following concatenated parmlib data sets to be searched in the order shown when you IPL the target system:

1. SYS1.PARMLIB (either the SYS1.PARMLIB supplied by IBM and edited by you or your original SYS1.PARMLIB updated appropriately)

2. CPAC.PARMLIB (supplied by IBM and customized for your ServerPac or SystemPac order)
3. SYS1.IBM.PARMLIB (supplied by IBM).

For further information about specifying parmlib concatenation, see *z/OS MVS Initialization and Tuning Reference*.

DASD space utilization and performance

The space required by system software data sets, except for PDSE data sets, is affected by the block sizes you choose for those data sets. Generally, data sets with larger block sizes use less space to store the same data than those with smaller block sizes. Data sets that store more data in less space usually offer better DASD performance than those that use more space to store the same data.

There are some exceptions to the general rule that larger block sizes result in better space utilization. For example, fixed block (FB) record format data sets should not be allocated with block sizes larger than half the track length of the DASD they are allocated on. Doing so will cause considerable DASD space to be wasted, because current DASD track lengths are less than twice the maximum block size of 32,760 bytes. However, some data sets are best allocated using specific block sizes. When this is true of system software data sets, IBM recommends specific block sizes for them.

Note: Block sizes listed in the data set space tables in program directories are not generally recommended unless they are explicitly identified as recommended. You should treat the recommendations in this chapter as though they apply to all the system software data sets you allocate unless the product specifically says to do otherwise.

Generally, system-determined block sizes (SDB) makes the best choice for block size for fixed block (FB), variable blocked (VB), and variable-block spanned (VBS) record format data sets. You should use SDB for all system software data sets with these record formats except those for which IBM specifically recommends other block sizes. One way to do this is specifying `BLKSIZE=0` in the DCB parameter of a DD statement when allocating new data sets using JCL. For details about how to specify system-determined block sizes, see *z/OS MVS JCL Reference*.

Note that system determination of block sizes affects the block size and number of blocks used. It does not affect the amount of space allocated in a data set. The amount of space is defined by IBM (in sample jobs and program directories).

Undefined record format data sets

Data sets with undefined (U) record formats do not follow the same rules as those with other record formats. In particular, most load libraries in partitioned data sets (not PDSEs) will require less space (often as much as 20% less) and offer better performance at increasing block sizes right up to the block size limit of 32,760 bytes. This is because the program management binder, linkage editor, and IEBCOPY's COPYMOD command use the data set block size only to set the maximum block length they will use. They will write a block whenever the space available on a track is greater than the minimum block size (over which you have no control) and less than or equal to the maximum block size.

Allocate all load libraries using a block size of 32,760 bytes unless you plan to move your system software data sets from the device types on which they were

originally allocated to device types with shorter track lengths, or plan to move them between device types having different track lengths without using IEBCOPY COPYMOD. A block size of 32,760 bytes will optimize space utilization and performance for all system software load libraries.

Using recommended block sizes for z/OS and z/OS.e data sets

For most efficient use of DASD, IBM recommends that you allocate z/OS and z/OS.e data sets using the following block sizes:

- Use the system-determined block size for most non-RECFM U data sets (for example, code BLKSIZE=0 in JCL).
- For RECFM U data sets, use BLKSIZE=32760. (Note that 32760 is optimum because all supported DASD types have track lengths greater than 32,760 bytes.)
- If you use a UADS data set for TSO/E, you should generally use the same block size you currently use to allocate a new one. *Do not allocate the UADS data set with a system-determined block size. This will result in very poor DASD space utilization.* Instead, model your new UADS from your existing UADS or start with a small block size and increase the block size if a significant number of user ID entries are split into multiple members. For details about allocating a UADS data set and optimizing its block size, see *z/OS TSO/E Customization*.
- The AFP font libraries should not be allocated with system-determined block sizes. The correct block size for the font libraries is 12288. The font data sets will take up more space if system-determined block sizes are used and will result in very poor DASD space utilization.

For details about the conditions under which the system can determine the optimum block size for a data set, look for information about system-determined block sizes in *z/OS DFSMS: Using Data Sets*.

Appendix A. Installation plan skeleton

An installation plan is a record of the actions you need to take to install z/OS or z/OS.e. This appendix contains a skeleton of a sample installation plan to help you get started creating your own installation plan.

Installing: _____ (Product version and release)

Migrating from: _____ (Product version and release)

Installation method:

- _____ ServerPac
- _____ CBPDO
- _____ SystemPac (full volume dump format)
- _____ SystemPac (dump-by-data-set format)

Project manager: _____

Project objectives:

Examples: target completion date and resource assumptions

Learn about z/OS or z/OS.e

Action	Start	End	Who does	Information source
Learn about the new product release.				<i>z/OS and z/OS.e Planning for Installation</i> (Chapter 1, "Learning about z/OS and z/OS.e" on page 1), <i>z/OS Introduction and Release Guide</i> , <i>z/OS.e Overview</i>
Become familiar with product documentation.				<i>z/OS Information Roadmap</i> , z/OS publications at http://www.ibm.com/eserver/zseries/zos/bkserv/ , z/OS.e publications at http://www.ibm.com/eserver/zseries/zose/bkserv/
Schedule education.				For IBM courses, call 1-800-IBM-TEACH or visit http://www.training.ibm.com/

In the following table, list the formal and informal educational classes that will prepare I/S staff, application programmers, and end users for the new system.

Course name	Course ID	Vendor	Dates	Staff to enroll

Prepare the driving system

Note: Skip this section if you're doing a full volume dump SystemPac installation. Such an installation does not require a driving system. Installation is done by using ICKDSF to do the initialization, and Innovation FDR or DFDSS to perform the pack restore. These programs can exist on your driving system or, if you do not have a driving system, you can restore them from the stand-alone tape that came with your SystemPac order. Refer to *SystemPac Installation Guide* for details regarding the installation.

Action	Start	End	Who does	Information source
Review software and hardware PSP buckets for changes to planning information.				IBMLink
Identify driving system software requirements.				<i>z/OS and z/OS.e Planning for Installation</i> ("Identifying driving system software requirements for installing z/OS or z/OS.e via ServerPac or dump-by-data-set SystemPac" on page 58 or "Identifying driving system software requirements for installing z/OS via CBPDO" on page 63)
Identify driving system hardware requirements.				<i>z/OS and z/OS.e Planning for Installation</i> ("Identifying driving system hardware requirements" on page 66)
Complete the "Driving System Components" sections below.				
Order driving system hardware.				Completed "Driving System Components: Hardware" section
Order driving system software				Completed "Driving System Components: Software" section
Install or update driving system hardware.				Related product documentation
Install or update driving system software.				Related product documentation

Driving system components: Software

Check one:

- All requirements are satisfied by currently installed software
- Order the Customized Offerings Driver (IBM Product 5665-343)
- Order the following additional software:

Driving system components: Hardware

Check one:

- All requirements are satisfied by currently installed hardware
 Order the following additional hardware:

Prepare target system hardware and software

Action	Start	End	Who does	Information source
Choose software to install on the target system: <ul style="list-style-type: none"> • z/OS or z/OS.e optional features • Products required by z/OS or z/OS.e • Additional IBM products • ISV products 				<i>z/OS and z/OS.e Planning for Installation</i> (“Choosing software products to install and identifying requisites” on page 67)
Choose the JES level that you want to run (z/OS only, not z/OS.e).				<i>z/OS and z/OS.e Planning for Installation</i> (“Using your existing JES2 or JES3 with z/OS V1R3” on page 75)
Choose target system hardware to install or upgrade.				<i>z/OS and z/OS.e Planning for Installation</i> (“Identifying hardware requirements for the target system” on page 71)
Complete the “Target System Components” section below.				
Order new target system software.				Completed “Target System Components” section
Order new target system hardware.				Completed “Target System Components” section
Install or upgrade target system hardware.				Related product documentation
Receive software shipment and verify contents.				Packing lists in shipment

Target system components: Software

Check when complete:

- ServerPac, CBPDO, or SystemPac product order checklist attached
 List of additional IBM software products attached
 List of ISV products attached

Target system components: Hardware

Check one:

- All requirements are satisfied by currently installed hardware
 Order additional hardware (Attach order form; consider processor, DASD, tape, networking, and printer requirements)

Ensure coexistence and fallback

Identify the service you must apply to ensure that other systems or older levels of software will continue to run correctly with the new level of software, and that you can safely back out the new system if necessary.

Action	Start	End	Who does	Information source
Identify coexistence and fallback service needed.				<i>z/OS and z/OS.e Planning for Installation</i> (Chapter 5, "Ensuring coexistence and fallback" on page 83) and other sources such as PSP buckets and <i>z/OS Parallel Sysplex Test Report</i>
Identify additional coexistence and fallback actions needed.				Sources such as PSP buckets and <i>z/OS Parallel Sysplex Test Report</i>
Install coexistence and fallback maintenance on existing system software.				"Coexistence and fallback" section of this plan

Coexistence and fallback service required

APAR/PTF number	Receiving system name	Comments

Additional coexistence and fallback actions required

Action	Receiving system name	For instructions, refer to...

Action	Receiving system name	For instructions, refer to...

Prepare for migration

Identify the actions you must take to migrate existing system software to the new software level. You should consider not only z/OS or z/OS.e elements and features such as the BCP and JES, but other IBM products such as subsystems and ISV products as well.

Action	Start	End	Who does	Information source
Identify migration actions for z/OS or z/OS.e elements and features.				<i>z/OS and z/OS.e Planning for Installation</i> (Chapter 6, "Preparing for migration" on page 101) and element-specific migration guides
Identify migration actions for other IBM and ISV products.				Product-specific migration guides
Complete the "Migration Actions" section of this plan.				

Pre-IPL migration actions

List the migration actions to perform prior to IPLing the target system for the first time. (SystemPac actions are applicable to dump-by-data-set SystemPac orders only. For full volume dump SystemPac orders, most of the activities below are done for you during the production of your system based on specifications you provide during local order entry.)

Action	For instructions, refer to...
Create IPL text.	If ServerPac: <i>ServerPac: Installing Your Order</i> If CBPDO: <i>z/OS Program Directory</i> If SystemPac: <i>SystemPac Installation Guide</i>
Build stand-alone dump text.	If ServerPac: <i>ServerPac: Installing Your Order</i> If CBPDO: <i>z/OS Program Directory</i> If SystemPac: <i>SystemPac Installation Guide</i>
Format any new DASD data sets to be used for stand-alone dump.	<i>z/OS MVS Diagnosis: Tools and Service Aids</i>
Create or update an IODF.	If ServerPac: <i>ServerPac: Installing Your Order</i> If CBPDO: <i>z/OS Program Directory</i> If SystemPac: <i>SystemPac Installation Guide</i>
Set up a new IPCS environment.	<i>z/OS MVS IPCS Customization</i>
Update the TSO logon procedure.	If CBPDO: <i>z/OS Program Directory</i>
Update system control files (for example, parmlib, proclib, and /etc files).	<i>z/OS MVS Migration</i> and other product publications

Action	For instructions, refer to...

Post-IPL migration actions

List the migration actions to perform after the target system has been IPLed and verified.

Action	For instructions, refer to...
Rework and install user modifications and SVCs needed to IPL.	Product publications
Reconnect subsystems (DB2, CICS, IMS, NCP).	Product publications
Update operational procedures, including automation.	Product message and command manuals
Update administrative procedures.	Product publications
Update security procedures.	Security product publications
Update backup and recovery procedures.	Product publications

Build and verify the target system

The actions you take for this task depend on the installation method you use. Samples are provided for the following installation methods:

- ServerPac or dump-by-data-set SystemPac
- CBPDO
- SystemPac full volume dump

Build and verify the target system (ServerPac or dump-by-data-set SystemPac installation)

Action	Start	End	Who does	Information source
Prepare target system volumes for ServerPac or SystemPac (dump-by-data-set format) installation.				<i>z/OS and z/OS.e Planning for Installation</i> ("Preparing for installation" on page 60)
Review PSP buckets for latest installation information.				IBMLink

Action	Start	End	Who does	Information source
Receive the ServerPac or SystemPac (dump-by-data-set) order.				If ServerPac: <i>ServerPac: Using the Installation Dialog</i> If SystemPac: <i>SystemPac: CustomPac Dialog Reference</i>
Tailor the work configuration.				If ServerPac: <i>ServerPac: Using the Installation Dialog</i> If SystemPac: <i>SystemPac: CustomPac Dialog Reference</i>
Run installation jobs.				If ServerPac: <i>ServerPac: Installing Your Order</i> If SystemPac: <i>SystemPac Installation Guide</i> (dump-by-data-set format)
Review system HOLDS.				
Run element-specific post-installation jobs on the driving system.				If ServerPac: <i>ServerPac: Installing Your Order</i> If SystemPac: <i>SystemPac Installation Guide</i> (dump-by-data-set format)
Perform pre-IPL migration and customization tasks.				"Pre-IPL Migration Actions" section of this plan
IPL the target system and log on.				If ServerPac: <i>ServerPac: Installing Your Order</i> If SystemPac: <i>SystemPac Installation Guide</i> (dump-by-data-set format)
Run element-specific post-installation jobs on the target system.				If ServerPac: <i>ServerPac: Installing Your Order</i> If SystemPac: <i>SystemPac Installation Guide</i> (dump-by-data-set format)
Run installation verification programs (IVPs).				If ServerPac: <i>ServerPac: Installing Your Order</i> If SystemPac: <i>SystemPac Installation Guide</i>
Download client code to workstations if applicable.				Element-specific documentation
Apply maintenance to target system software if necessary.				<i>z/OS and z/OS.e Planning for Installation</i> ("Identifying service needed for the target system" on page 75)
Complete migration activities.				"Post-IPL Migration Actions" section of this plan
Save the customized configuration.				If ServerPac: <i>ServerPac: Using the Installation Dialog</i> If SystemPac: <i>SystemPac: CustomPac Dialog Reference</i>

Action	Start	End	Who does	Information source
Update the ServerPac order inventory.				If ServerPac: <i>ServerPac: Using the Installation Dialog</i> If SystemPac: <i>SystemPac: CustomPac Dialog Reference</i>
Back up the system.				<i>z/OS and z/OS.e Planning for Installation</i> (Appendix E, "Making a copy of your system software (cloning)" on page 213) and local procedures.

Build and verify the target system (CBPDO installation)

Action	Start	End	Who does	Information source
Review PSP buckets.				IBMLink
Clone the system.				<i>z/OS and z/OS.e Planning for Installation</i> (Appendix E, "Making a copy of your system software (cloning)" on page 213)
Update SMP/E zone entries.				<i>z/OS Program Directory</i>
Create FMIDSETs for each wave.				<i>z/OS Program Directory</i>
Install wave 0: <ul style="list-style-type: none"> • Receive wave 0 elements and service. • Prepare to install wave 0. • APPLY wave 0. • Receive the rest of the CBPDO. 				<i>z/OS Program Directory</i>
Install wave 1: <ul style="list-style-type: none"> • Prepare to install wave 1. • APPLY wave 1. • Do post-APPLY work. • Migrate and customize wave 1 elements. • IPL and verify wave 1. • Accept waves 0 and 1. • Run cleanup jobs. 				<i>z/OS Program Directory</i>
Install wave 2: <ul style="list-style-type: none"> • Prepare to install the wave. • APPLY wave 2. • Do post-APPLY work. • Migrate and customize wave 2 elements. • IPL and verify wave 2. • Accept wave 2. • Run cleanup jobs. 				<i>z/OS Program Directory</i>

Action	Start	End	Who does	Information source
Install wave 3: <ul style="list-style-type: none"> • Prepare to install the wave. • APPLY wave 3. • Do post-APPLY work. • Migrate and customize wave 3 elements. • Verify wave 3. • Accept wave 3. • Run cleanup jobs. 				<i>z/OS Program Directory</i>
Download client code to workstations if applicable.				Element-specific documentation
Apply maintenance to target system software if necessary.				<i>z/OS and z/OS.e Planning for Installation</i> (“Identifying service needed for the target system” on page 75)
Complete the migration.				“Migration Actions” section of this plan
Back up the system.				<i>z/OS and z/OS.e Planning for Installation</i> (Appendix E, “Making a copy of your system software (cloning)” on page 213) and local procedures.

Build and verify the target system (SystemPac full volume dump installation)

Action	Start	End	Who does	Information source
Prepare target system volumes for restore.				<i>z/OS and z/OS.e Planning for Installation</i>
Review PSP buckets for latest installation information.				IBMLink
Initialize volumes.				<i>SystemPac Installation Guide</i>
Unload the tapes to the initialized volumes.				<i>SystemPac Installation Guide</i>
IPL the system and log on.				<i>SystemPac Installation Guide</i>
Run post-installation jobs after IPL.				<i>SystemPac Installation Guide</i>
Verify installation.				<i>SystemPac Installation Guide</i>

Customize and test the system

Action	Start	End	Who does	Information source
Identify customization needed on the new system.				<i>z/OS and z/OS.e Planning for Installation</i> (Chapter 7, “Preparing for customization and test” on page 121) and product-specific customization guides
Complete the “Customization Actions” section below.				

Action	Start	End	Who does	Information source
Make optimum use of DASD space.				<i>z/OS and z/OS.e Planning for Installation</i> ("DASD space utilization and performance" on page 154)

Appendix B. Software requirements for z/OS and z/OS.e elements and features

The base elements of z/OS or z/OS.e represent an IPLable target system and satisfy most of the dependencies of the base elements and features. But some elements and features require other features or IBM products that are not part of the z/OS or z/OS.e base. Moreover, some elements and features have optional dependencies on other features or on IBM products that help you take full advantage of z/OS or z/OS.e capabilities. This appendix lists the required and the optional dependencies.

z/OS can run as a VM guest. Requirements are:

- If a z800 or z900 server: VM must be z/VM (not VM/ESA), and z/VM and z/OS must operate in 64-bit mode.
- If a G5, G6, or Multiprise 3000 server: VM may be z/VM or VM/ESA V2R4 (or later), and z/VM and z/OS must operate in 31-bit mode.

z/OS.e can run as a VM guest. The server must be a z800, VM must be z/VM, z/VM and z/OS.e must operate in z/Architecture (64-bit) mode, z/VM and z/OS.e must run in a logical partition (LPAR), and the LPAR must be named ZOSExxxx (where xxxx is any valid combination of zero to four characters). The LPAR name restriction ensures compliance with z/OS.e license terms, which prohibit z/OS and OS/390 from running in a z800 LPAR named ZOSExxxx. (Linux for S/390 and Linux for IBM @server zSeries are the only other operating systems that may run as a guest under z/VM in an LPAR named ZOSExxxx.) z/OS.e licensees are required to submit data to IBM that shows LPAR names. (The ZOSExxxx LPAR name restriction is only applicable to z800 servers, not other servers.)

Notes:

1. This book does not describe program requirements related to systems in a sysplex using the coupling facility. For that information, see the z/OS Parallel Sysplex Customization Wizard at <http://www.ibm.com/eserver/zseries/zos/wizards/>.
2. Requirements listed in this appendix reflect the minimum levels.
3. Some IBM products, z/OS elements and features, and z/OS.e elements and features have comparable non-IBM equivalents. This appendix reflects only IBM software.

Table 15. Software requirements for z/OS V1R3 and z/OS.e V1R3 elements and features

Element or feature	Required z/OS or z/OS.e optional features or stand-alone products
BCP	<p>For the latest information and service related to 64-bit real storage support, see the zSeries PSP bucket. The PSP upgrade identifier is 2066DEVICE for the z800 and 2064DEVICE for the z900.</p> <p>Automatic restart manager requirements:</p> <ul style="list-style-type: none"> • System Automation for OS/390 (5645-005) is required if you want to further automate automatic restart manager enabled programs. <p>Dynamic APF requirements:</p> <ul style="list-style-type: none"> • The z/OS or z/OS.e Security Server feature is required if you want to use the RACF data security monitor program (DSMON) to produce reports for APF-authorized programs. <p>Job support for started tasks requirements:</p> <ul style="list-style-type: none"> • The z/OS or z/OS.e Security Server feature is required if you plan to use dynamic security control for started tasks. <p>Messages displayed in non-English languages:</p> <ul style="list-style-type: none"> • The z/OS or z/OS.e Security Server feature is required if you use this function because RACF is used to obtain language information for users. <p>Operations log (OPERLOG) requirements:</p> <ul style="list-style-type: none"> • The z/OS or z/OS.e Security Server feature is required if you want to protect the operlog log stream. • The z/OS or z/OS.e SDSF feature is required if you want to use the log browser facility for the operlog log stream. <p>Run-time library services (RTLS) requirement in z/OS:</p> <ul style="list-style-type: none"> • The z/OS Security Server feature is required if you want to check a user's access to libraries that are defined to RTLS and protected by security profiles. (RTLS is not supported in z/OS.e.) <p>S/390 Fiber Channel (FICON) requirements:</p> <ul style="list-style-type: none"> • To simplify configuration definition tasks when migrating to FICON, use the z/OS or z/OS.e HCM feature. • To report on the measurement data generated for FICON CHPIDs, use the z/OS or z/OS.e RMF feature. • To exploit the architecture enhancements, use the following: <ul style="list-style-type: none"> – OS/390 R8 JES3 feature with the PTF to APAR OW41500, or OS/390 R9 or later JES3 feature – PSF V3 for OS/390 (5655-B17) – System Automation for OS/390 (5645-005) – On z/OS (not z/OS.e): IMS/ESA V6 (5655-158) or later

Table 15. Software requirements for z/OS V1R3 and z/OS.e V1R3 elements and features (continued)

Element or feature	Required z/OS or z/OS.e optional features or stand-alone products
BCP (continued)	<p>System-managed coupling facility (CF) structure duplexing capability can be exploited by the following products and components:</p> <ul style="list-style-type: none"> • System logger, the JES2 checkpoint, WLM for multisystem enclaves and IRD, VTAM GR and multinode persistent sessions (MNPS), and BatchPipes for OS/390 V2 (5655-D45) enable system-managed CF structure duplexing through APAR PQ49953. • IRLM V2.1 enables system-managed CF structure duplexing for the IRLM lock structure for IMS data sharing and DB2 through APAR PQ48823. Additionally, PQ48996 is required for the DB2 data sharing environment. • DB2 Universal Database Server for OS/390 and z/OS V7 (5675-DB2) supports system-managed CF structure duplexing for its system communication area. DB2 has supported user-managed CF structure duplexing for its group buffer pools since DB2 V5 and OS/390 R3 with supporting APARs. • MQSeries enables system-managed CF structure duplexing for shared queues in MQSeries for OS/390 V5R2 (5655-F10). • On z/OS (not z/OS.e): CICS shared temporary storage queues, coupling facility data tables, and named counters are protected by system-managed CF structure duplexing in CICS Transaction Server (TS) for z/OS V2R2 (5697-E93). To enable system-managed rebuild for the CICS structures on systems prior to z/OS V1R2, APAR OW39892 is required. • On z/OS (not z/OS.e): IMS supports system-managed CF structure duplexing function for IMS shared message queue structures and IMS fast path expedited message handler (EMH) structures. This support is provided through the IMS V7 (5655-B01) service process and is enabled by APAR PQ47642. IMS also supports z/OS's system-managed CF structure duplexing function for IMS fast path virtual storage option (VSO) structures. This support is provided through the IMS V7 service process through APAR PQ50661. This support also enables the system-managed rebuild and automatic altering of the VSO structure size. <p>TSO consoles used as extended MCS consoles:</p> <ul style="list-style-type: none"> • The z/OS or z/OS.e Security Server feature is required if you want to use this function because RACF is used to obtain console security attributes. <p>Workload manager (WLM) requirements:</p> <ul style="list-style-type: none"> • The z/OS or z/OS.e Security Server feature is required if you want to use DSOM support. • DB2 for MVS/ESA V4 (5695-DB2) or DB2 Server for OS/390 V5 (5655-DB2) is required if you want to use WLM to manage parallelized DB2 queries (V4) or use WLM to automatically start and stop server address spaces for DB2 stored procedures (V5). • On z/OS (not z/OS.e): CICS/ESA V4 (5685-018) is required if you want to manage CICS transactions using response time goals or obtain detailed response time breakdowns in the RMF Workload Activity report. • On z/OS (not z/OS.e): CICSplex System Manager (SM) V1R3 (5695-081) is required if you are using average response time goals for CICS transactions and want CICSplex SM to distribute transactions to AORs based on the goals of the work. • On z/OS (not z/OS.e): IMS/ESA V6 (5655-158) or later is required if you want to manage IMS transactions with response time goals or want detailed response time breakdowns in the RMF Workload Activity report. <p>z/OS UNIX System Services kernel requirements:</p> <ul style="list-style-type: none"> • The z/OS or z/OS.e Security Server feature is required if any address space wants to make a call to a z/OS UNIX System Services kernel service.
BDT	One or both of the BDT features (BDT File-to-File or BDT SNA NJE).
BDT File-to-File (z/OS only)	None
BDT SNA NJE	Any supported JES3 level.

Table 15. Software requirements for z/OS V1R3 and z/OS.e V1R3 elements and features (continued)

Element or feature	Required z/OS or z/OS.e optional features or stand-alone products
BookManager BookServer	None
BookManager BUILD (z/OS only)	<p>Required: Document Composition Facility (DCF) R4.</p> <p>Optional: To build documents using source files marked up with BookMaster tags, you need IBM Publishing Systems BookMaster (5688-015) R4 with PTFs UQ03271 and UQ04721.</p>
BookManager READ (z/OS only)	<p>The Softcopy Print element was available in OS/390 R4 through R9. To continue to use the Softcopy Print function to print BookManager books on AFP printers, you need to have the following products installed.</p> <p>For single-byte character set printing (this includes English):</p> <ul style="list-style-type: none"> • AFP Font Collection V2R1 (5648-B33) • BookMaster V1R4 (5688-015) • DCF V1R4 (5748-XX9) • PSF V3R1 for OS/390 (5655-B17) or later <p>For double-byte character set (DBCS) printing:</p> <ul style="list-style-type: none"> • All of the requirements for single-byte printing • The AFP DBCS fonts for your language • The DBCS Print Utility, formerly part of Softcopy Print but now part of BookManager READ via PTF UQ99324. • BookMaster PTF UQ04721 for the DBCS profiles
C/C++ IBM Open Class Library	None
C/C++ with Debug Tool	None
C/C++ without Debug Tool	None

Table 15. Software requirements for z/OS V1R3 and z/OS.e V1R3 elements and features (continued)

Element or feature	Required z/OS or z/OS.e optional features or stand-alone products
Communications Server	<p>IP Services has the following software requirements:</p> <ul style="list-style-type: none"> • For NCPROUTE server: SNALINK LU0 and ACF/NCP V7R1 (5648-063) or later • For X.25 interface support: X.25 NPSI V3R4 (5688-035) or later for 3745 or 3720, or X.25 NPSI V2R1 (5668-719) for 3725, and the corresponding level of NCP that supports NPSI • For SNMP NetView client support: NetView for MVS/ESA V3R1 (5655-007) or later, or Tivoli NetView for OS/390 (5697-B82) • For file access protection for FTP: z/OS or z/OS.e Security Server feature • For FTP DB2 query: DB2 V4R1 (5695-DB2) or later • For user-written programs in Pascal that interface to a TCP, UDP, or IP boundary: IBM VS Pascal Compiler and Library (5668-767) • For CICS sockets on z/OS: CICS/ESA V4 (5655-018) or later • For IMS sockets on z/OS: IMS/ESA V6R1 (5655-158) or later • For Network Print Facility support: ACF/NCP V7R1 (5648-063) or later • For user-written programs in C that interface to an X Window System client, Remote Procedure Call, TCP or UDP protocol boundary, DPI, IP, or z/OS UNIX feature (Rcommands, RPC, or X Window System): z/OS or z/OS.e C/C++ with Debug Tool feature or C/C++ without Debug Tool feature • For TCP/IP functions written in C (C sample programs, Network Database System client and server, Network Computing System, Remote Procedure Call, non-z/OS UNIX X Window System) or z/OS UNIX features (ONC/RPC, X Window System): z/OS or z/OS.e C/C++ with Debug Tool feature or C/C++ without Debug Tool feature • For SNMP OSA-Express performance data support, OSA/SF PTF UW75791 is required. • If you want to use the FTP JES support (specifying JESINTERFACELEVEL 2) introduced in OS/390 R10 and you are running OS/390 R8-R9 JES2, PTF UW65418 is required. If you are running OS/390 R8, R9, or R10 JES3, the PTFs to APARs OW36022, OW34753, and OW35435 are required. • The TCP/IP msys for Setup function does not impose any prerequisites on the target system being configured. However, the user will need to manually copy the generated configuration files to the target system if it does not share DASD with the msys for Setup driving system. <p>SNA Services has the following software requirements:</p> <ul style="list-style-type: none"> • To use NetView Performance Monitor V2 (5655-043) R2, R3, or R4: the PTF for APAR OW37396. • To use APPC/MVS: the PTF for APAR OW30425. • For HPR Border Node and HPR network management: Tivoli NetView for OS390 (5697-B82) • For High Performance Routing (HPR), automatic network routing in composite network node: NCP V7R3 (5648-063) • To use the Performance Monitor Interface: NetView Performance Monitor V2R2 (5655-043) with PTF UW19341 • To exploit VTAM topology agent and CMIP services: NetView V3 (5655-007). Some VTAM changes in topology agent can only be exploited with Netview V1R4. These changes include reporting the IP address, port number, and DNS name for TN3270E clients, and reporting the MAC/SAP address for workstations on a token ring or Ethernet LAN downstream from a DLUR. Note that Netview V1R3 will still work with VTAM but won't be able to show the new VTAM information. Netview V1R3 also needs PTF OW40949 to accommodate another fix in VTAM R10 topology agent (new LU state). This prerequisite was announced with the VTAM release and may have been integrated in later NetView deliveries. • To use Spare SDLC lines: NCP V7R2 (5648-063) and NTuneMON V2 (5648-141)
<p>Communications Server NPF (z/OS only)</p>	<p>One of the following:</p> <ul style="list-style-type: none"> • Any supported JES2 level • Any supported JES3 level • NCP V7 (5648-063)

Table 15. Software requirements for z/OS V1R3 and z/OS.e V1R3 elements and features (continued)

Element or feature	Required z/OS or z/OS.e optional features or stand-alone products
Communications Server Security Level 3	To create certificates with public/private keys larger than 512 bits, the z/OS or z/OS.e optional feature System SSL Security Level 3 must be available.
Cryptographic Services	To write application programs using the DCE programming interface, you need the z/OS or z/OS.e C/C++ with Debug Tool, or z/OS or z/OS.e C/C++ without Debug Tool feature.
(z/OS only)	For Transactional RPC (TRPC), IMS/ESA V6R1 or later is required. For transaction processing (without Transactional RPC), CICS/ESA or IMS/ESA is required.
DCE Base Services	To use the Global Directory Agent (GDA) portion of DCE Base Services, you need the z/OS Security Server feature in order to have access to the LDAP client function in its LDAP Server component. To write application programs using the DCE programming interface, you need the z/OS C/C++ with Debug Tool or z/OS C/C++ without Debug Tool feature.
DFSMSdfp	DD limit on z/OS (not z/OS.e): The IMS level required to expand the DD limit to 10 KB is IMS/ESA V6 (5655-158) or later. Distributed FileManager (DFM/MVS) DataAgent and the DFM target server: To check the authorization of remote systems to connect to z/OS or z/OS.e and to access specific data sets, the z/OS or z/OS.e Security Server feature (RACF component) is required. DFSMSdss can be used as the data mover to move data sets associated with this function. Object access method (OAM) Parallel Sysplex support: To use this function, DB2 for MVS/ESA V4 (5695-DB2) or later is required. Object access method (OAM) resource measurement facility (RMF) transaction recording: To use this function, the z/OS or z/OS.e RMF feature is required. VSAM record level sharing (RLS): To use this function, you need the z/OS or z/OS.e Security Server feature (RACF component); global resource serialization (GRS) or an equivalent function for multisystem serialization; and appropriate levels of COBOL, PL/I, FORTRAN, and Language Environment run-time libraries for batch applications that will use VSAM RLS data access.
DFSMSdss	IMS backup-while-open support on z/OS (not z/OS.e): To use this function, the Database Manager feature of IMS/ESA V6 (5655-158) or later is required. Snapshot and virtual concurrent copy support: To use this function, IBM Extended Facilities Product (IXFP) V2 (5648-A17) with a minimum PTF level of L170019 is required. VSAM record level sharing (RLS): To use this function, you need the z/OS or z/OS.e Security Server feature (RACF component); global resource serialization (GRS) or an equivalent function for multisystem serialization; and appropriate levels of COBOL, PL/I, FORTRAN, and Language Environment run-time libraries for batch applications that will use VSAM RLS data access.
DFSMSHsm	Control data set (CDS) record level sharing (RLS) serialization: To use this function, global resource serialization (GRS) or an equivalent function is required. DFSMSHsm secondary host promotion: To use this function, a cross-system coupling facility (XCF) must be configured and running in multisystem mode. VSAM record level sharing (RLS): To use this function, you need the z/OS or z/OS.e Security Server feature (RACF component); global resource serialization (GRS) or an equivalent function for multisystem serialization; and appropriate levels of COBOL, PL/I, FORTRAN, and Language Environment run-time libraries for batch applications that will use VSAM RLS data access.

Table 15. Software requirements for z/OS V1R3 and z/OS.e V1R3 elements and features (continued)

Element or feature	Required z/OS or z/OS.e optional features or stand-alone products
DFSMSrmm	None
DFSORT	DFSORT's Performance Booster for The SAS System requires enabling support from SAS Institute Inc. If you specify COBEXIT=COB2 on the installation macro or if you use DFSORT LOCALE support, the Language Environment run-time library must be accessible at execution time.
Distributed File Service	The z/OS or z/OS.e Security Server feature must be operational. The IP Services component of the z/OS or z/OS.e Communications Server base element must be operational. DFS client and server support requires the z/OS or z/OS.e DCE Base Services base element to be operational. SMB file/print serving support requires the z/OS or z/OS.e DCE Base Services base element to be installed (but it does not have to be operational). SMB print serving support requires the z/OS or z/OS.e Infoprint Server feature to be operational. SMB password encryption requires the OCSF Base component of the z/OS or z/OS.e Cryptographic Services base element to be operational to use hardware encryption capabilities. Supported SMB clients include Windows 2000 Professional, Windows 95, Windows 98, Windows NT 4.0 Workstation, and Windows 3.11 (Windows for Workgroups).
Encina Toolkit Executive (z/OS only)	None
EREP	None
ESCON Director Support	None
FFST	None
GDDM (z/OS only)	None
GDDM-PGF (z/OS only)	None
GDDM-REXX (z/OS only)	None
HCD	To migrate from a saved ESCON Manager file or from the active switch configuration or to activate a switch configuration, ESCON Manager V1R2 with PTF UN90108 or System Automation for OS/390 is required. To perform the verification/priming function of the active I/O configuration, ESCON Manager V1R3 with PTFS UN94223 and UN94761 or System Automation for OS/390 is required.

Table 15. Software requirements for z/OS V1R3 and z/OS.e V1R3 elements and features (continued)

Element or feature	Required z/OS or z/OS.e optional features or stand-alone products
HCM	<p>Operating system (PWS):</p> <ul style="list-style-type: none"> • Windows 95 or later, or • Windows NT Version 4.0 or later • Windows 2000 <p>Note: As of OS/390 R7, OS/2, WIN-OS/2, and Windows 3.x are no longer supported.</p> <p>Host communication:</p> <ul style="list-style-type: none"> • APPC communication: PCOMM for Windows NT and Windows 95 (Version 4.11 or later). • TCP/IP: TCP/IP networking protocol must be installed (delivered with Windows 95 and Windows NT). • HCM installation: A method to download the code from the host to the PWS is required (for example, FTP or PCOMM). <p>If you want to use the support for Tivoli Inventory (5697-INV), you need the following:</p> <ul style="list-style-type: none"> • The HCM workstation must be made a PC Managed Node of a Tivoli Management Region (TMR). The appropriate PC agent and the Tivoli Inventory PC Scanning Program must be installed to make the HCM workstation a PC Managed Node. • You need Tivoli Framework and Tivoli Inventory Version 3.2. The following patches must be installed: 3.2-TMP-0023 and 3.2-INV-0001.
HLASM	None
HLASM Toolkit	None
IBM HTTP Server	<p>A Web browser must be installed on a networked workstation.</p> <p>Communications Server IP connectivity must be established.</p>
IBM HTTP Server NA Secure	None
ICKDSF	None
ILM	None

Table 15. Software requirements for z/OS V1R3 and z/OS.e V1R3 elements and features (continued)

Element or feature	Required z/OS or z/OS.e optional features or stand-alone products
Infoprint Server	<p>The z/OS or z/OS.e Security Server feature is required.</p> <p>To print output from Infoprint Server using AFP printers, PSF V3 for OS/390 (5655-B17) is required. If you want PSF to exploit the Printer Inventory Manager and SNMP Subagent components of Infoprint Server, and you're using R1 of PSF V3, PTF UW64475 is required and AFP Font Collection V2 (5648-B33) is recommended.</p> <p>If you want to use the IPP server function of Infoprint Server, you need Developer Kit for OS/390, Java 2 Technology Edition (5655-D35) at SDK level 1.3 with PTF UQ59962.</p> <p>Infoprint Server Transforms for OS/390 (5697-F51) can be used with the Transform Manager component of Infoprint Server to perform data stream conversion:</p> <ul style="list-style-type: none"> • They can convert PCL, PostScript, PDF, or SAP print data to AFP format for printing by PSF V3 for OS/390 (5655-B17). • They can convert AFP data streams to PCL, PostScript, or PDF print data. <p>To print on printers controlled by z/OS or z/OS.e Communications Server SNA Services, the Coax Printer Support feature of the Infoprint Server Transforms product (5697-F51) with PTF UW74922 is required.</p> <p>The Infoprint Server SNMP Subagent requires IBM Network Printer Manager for the Web, which you can download from: http://www.ibm.com/printers/download.html</p> <p>The Network Printer Manager for the Web server requires the following software on a Windows NT workstation or server:</p> <ul style="list-style-type: none"> • Windows NT Version 3.51 or Version 4.0, with TCP/IP protocol network software installed • A Web server running under Windows NT • Java Virtual Machine software Version 1.1 <p>The administrator GUI provided by Network Printer Manager for the Web can run on the same or different system as the Network Printer Manager for the Web server and requires a Java 1.1 enabled Web browser. The browser can be either Netscape Communicator 4.04 (or later) or Microsoft Internet Explorer 4.0 (or later).</p>
ISPF	<p>To use ISPF's Software Configuration and Library Manager (SCLM), the z/OS or z/OS.e Security Server feature is recommended, but not required, to ensure data integrity.</p> <p>For TCP/IP communication, ISPF Client/Server requires the IP Services component of Communications Server on the host and one of the following operating systems on the workstation, using the TCP/IP included in the workstation operating system:</p> <ul style="list-style-type: none"> • Windows NT 4.0 • Windows 95 • Windows 98 • Windows 2000 • IBM AIX V4.1.5 with X11R5 Motif V1.2 • HP/UX V9.03 or later with X11R5 Motif V1.2 • Solaris V 2.5.1 with X11R5 Motif V1.2 <p>On an msys for Setup target system (the system that is configured using msys for Setup), ISPF must be at the same level as the driving system (the system from which the configuration is done).</p>

Table 15. Software requirements for z/OS V1R3 and z/OS.e V1R3 elements and features (continued)

Element or feature	Required z/OS or z/OS.e optional features or stand-alone products
JES2	<p>To monitor and control jobs, output, devices, and system resources from TSO/E, you need the z/OS or z/OS.e SDSF feature.</p> <p>To use Advanced Function Presentation, you need PSF V3 for OS/390 (5655-B17).</p> <p>If you use the Tivoli Operations Planning and Control (OPC) V2 (5697-OPC) product, you will not be able to use JES2 in full function mode (\$ACTIVATE LEVEL=z2). Use of JES2 in full function mode with the Tivoli product's function requires the follow-on Tivoli product, which is Tivoli Workload Scheduler for z/OS Version 8.1 (5697-WSZ). But if you want to continue to use the Tivoli OPC V2 product (without JES2 in full function mode), you must apply toleration PTFs. On Tivoli OPC V2R2, apply PTFs UQ56459 and UQ57856. On Tivoli OPC V2R3, apply PTFs UQ56468 and UQ57857.</p>
JES3	<p>To report correct JMF data for devices that have 4-digit device numbers, SLR V3R3.1 (5665-397) with PTF UN68145 is required.</p> <p>To monitor JES3 activity, z/OS or z/OS.e RMF is required.</p> <p>To report correct JMF data, the following are required:</p> <ul style="list-style-type: none"> • SLR V3R3.1 (5665-397) • EPDM/MVS V1R2 (5695-101) <p>To use Advanced Function Presentation, you need PSF V3 for OS/390 (5655-B17).</p> <p>If you use the Tivoli Operations Planning and Control (OPC) V2 (5697-OPC) product, you will not be able to use the JES3 support for greater than 65b534 jobs. Use of that support with the Tivoli product's function requires the follow-on Tivoli product, which is Tivoli Workload Scheduler for z/OS Version 8.1 (5697-WSZ). But if you want to continue to use the Tivoli OPC V2 product (without the JES3 support for greater than 65b534 jobs), you must apply toleration PTFs. On Tivoli OPC V2R2, apply PTFs UQ56459 and UQ57856. On Tivoli OPC V2R3, apply PTFs UQ56468 and UQ57857.</p>
Language Environment	<p>On z/OS (not z/OS.e): If you plan to use CICS/ESA V4 (5655-018) or CICS Transaction Server (TS) for OS/390 V1 (5655-147), install the following PTFs or else Language Environment will fail to initialize:</p> <ul style="list-style-type: none"> • On CICS/ESA V4R1, install PTFs: <ul style="list-style-type: none"> – UQ43781 (Language Environment initialization) – UQ51747 (transaction dump processing) • On CICS TS V1R2, install PTFs: <ul style="list-style-type: none"> – UQ43784 (Language Environment initialization) – UQ51836 (transaction dump processing) • On CICS TS V1R3, install PTFs: <ul style="list-style-type: none"> – UQ43786 (Language Environment initialization) – UQ51840 (transaction dump processing) – UQ47893 and UQ51885 (AUTODST parameter)
MICR/OCR (z/OS only)	None
msys for Operations	None

Table 15. Software requirements for z/OS V1R3 and z/OS.e V1R3 elements and features (continued)

Element or feature	Required z/OS or z/OS.e optional features or stand-alone products
msys for Setup	<p>The msys for Setup environment contains the following parts:</p> <ul style="list-style-type: none"> • A workstation for the msys for Setup workplace running Windows NT 4.0 with fixpack 4 or later, or Windows 2000 Professional. TCP/IP must be configured and active. • An OS/390, z/OS, or z/OS.e LDAP server. The LDAP server can be on a separate OS/390, z/OS, or z/OS.e image or on the msys for Setup driving or target system. The msys for Setup workplace and the msys for Setup driving system need to have a TCP/IP connection to the LDAP server. If you have a DB2 system, you may want to consider running the LDAP server on that system. The LDAP server requires: <ul style="list-style-type: none"> – OS/390 R8 or later, z/OS (any release), or z/OS.e (any release). Note that the LDAP Server component in OS/390, z/OS, and z/OS.e is packaged as part of the Security Server optional feature but is licensed with the base operating system and can be used without enabling the Security Server feature. – DB2 Server for OS/390 V5 (5655-DB2) with PTF UQ16836, or DB2 Universal Database Server for OS/390 V6 (5645-DB2) with PTF UW41616, or DB2 Universal Database Server for OS/390 and z/OS V7 (5675-DB2). – Approximately 300 MB of DB2 backend storage for the management directory on the LDAP system. – The use of the TDBM backend of LDAP, as provided in OS/390 R10, z/OS (any release), or z/OS.e (any release). The LDAP server provides (via PTF) automated setup scripts for the TDBM backend that greatly facilitate the setup of the z/OS or z/OS.e management directory as needed by msys for Setup. If the LDAP server is used exclusively for the z/OS or z/OS.e management directory, the TDBM backend can also be used on an OS/390 R8 or R9 system, if this system can access the OS/390 R10 LDAP server code libraries. If you intend to add non-msys for Setup directory data to the LDAP server, you must run the LDAP server with TDBM on an OS/390 R10 or later system. If TDBM is used with an OS/390 R8 or R9 system, the following LDAP server functions are not available: SSL communications and password encryption support. • An msys for Setup driving system (the system on which msys for Setup runs), which requires: <ul style="list-style-type: none"> – OS/390 R8 or later, z/OS (any release), or z/OS.e (any release) – Developer Kit for OS/390, Java 2 Technology Edition (5655-D35) at SDK level 1.3 with PTF UQ59962. <p>If the msys for Setup driving system is not a z/OS or z/OS.e system, at least one of the msys for Setup target systems must be running z/OS or z/OS.e, the HFS containing the msys for Setup code on the msys for Setup target system must be mountable from the msys for Setup driving system, and the z/OS or z/OS.e target libraries must be accessible from the msys for Setup driving system.</p> <ul style="list-style-type: none"> • An msys for Setup target system (the system that is configured using msys for Setup). For the configuration of a Base Sysplex or Parallel Sysplex, the requirement is OS/390 R8 with PTF UW63195 or later, z/OS (any release), or z/OS.e (any release). The target system requirements for other exploiters of msys for Setup are described with their software requirements.

Table 15. Software requirements for z/OS V1R3 and z/OS.e V1R3 elements and features (continued)

Element or feature	Required z/OS or z/OS.e optional features or stand-alone products
msys for Setup (continued)	<p>The msys for Setup driving system and the msys for Setup target system can be the same OS/390, z/OS, or z/OS.e image, or two separate images. If you use two separate images for the configuration of a base sysplex or Parallel Sysplex:</p> <ul style="list-style-type: none"> • Both systems must be in the sysplex that is being configured. • Both systems must share DASD for parmlib and couple data set creation. • If RACF is used as security manager, it is recommended that both systems have a shared RACF security database. See the software requirements of other exploiters of msys for Setup for their requirements if you use a separate target system for their configuration. <p>The environment described above requires at least one z/OS or z/OS.e system as msys for Setup driving system, msys for Setup target system, or both. If the z/OS system was not installed using ServerPac or SystemPac, it must have been upgraded from one of the following:</p> <ul style="list-style-type: none"> • An OS/390 R10 system that was installed using ServerPac or SystemPac and then upgraded to z/OS using the z/OS V1R1 Upgrade Package for OS/390 V2R10 • An OS/390 R9 system that was installed using ServerPac or SystemPac, then upgraded to OS/390 R10 via CBPDO, and then upgraded to z/OS using the z/OS V1R1 Upgrade Package for OS/390 V2R10
Network File System	<p>Network File System Client and Network File System Server both require:</p> <ul style="list-style-type: none"> • z/OS or z/OS.e Communications Server - IP Services • z/OS or z/OS.e Security Server feature
OCSF Security Level 3	<p>To write application programs using the DCE programming interface, you need the z/OS or z/OS.e C/C++ with Debug Tool, or z/OS or z/OS.e C/C++ without Debug Tool feature.</p>
OSA/SF	<p>To meet the SAF of the host operating system on which OSA/SF is running, the z/OS or z/OS.e Security Server feature is required.</p> <p>To handle alerts that OSA reports when the SNA mode is active on an OSA and issue OSA/SF for MVS commands from NetView, NetView for MVS/ESA 1.3 (5685-152) is required.</p> <p>ESCON Manager 1.3 (5688-008) Workstation feature with PTF UN75973 is required to view OSA channel and device status. ESCON Manager commands can reconfigure an OSA channel path and vary an OSA device</p> <p>The z/OS or z/OS.e RMF feature is required to obtain resource utilization data about OSA channels.</p> <p>To access OSA/SF at a workstation, use Microsoft Windows 95 4.00.950B (OSR2) or later, or Microsoft Windows NT 4.0 with Service Pack 3 or later.</p> <p>The OSA/SF GUI for Windows is shipped in a self-extracting file.</p> <p>To establish GUI-to-server communication, one of the following is required:</p> <ul style="list-style-type: none"> • For TCP/IP workstation-to-server communication: IP Services component of z/OS or z/OS.e Communications Server • For APPC workstation-to-server communication: Personal Communications/3270 V4R2 (with the PTF for APAR IC22680) or later, and SNA Services component of z/OS or z/OS.e Communications Server • For SNA workstation-to-server communication: Personal Communications/3270 V4R2 (with the PTF for APAR IC22680) or later, and EHLLAPI (3270) — SNA Services component of z/OS or z/OS.e Communications Server

Table 15. Software requirements for z/OS V1R3 and z/OS.e V1R3 elements and features (continued)

Element or feature	Required z/OS or z/OS.e optional features or stand-alone products
RMF	<p>The RMF Spreadsheet Reporter requires the following software:</p> <ul style="list-style-type: none"> • Operating System <ul style="list-style-type: none"> – Windows 95 – Windows 98 – Windows NT Version 4 • Spreadsheet Program <p>You can use any spreadsheet program that can read Lotus files with an extension of WK1. However, in order to be able to run the supported examples without any difficulties, one of the following products can be used:</p> <ul style="list-style-type: none"> – Lotus 1-2-3 Version 5 (International English Version) – Microsoft Excel Version 5 or later <p>Using RMF Performance Monitoring (RMF PM) requires:</p> <ul style="list-style-type: none"> • Windows 95, Windows 98, or Windows NT with Service Pack 3 • Direct Draw 5.0 or later • Netscape Navigator 4.6 or later, or Microsoft Internet Explorer 5.0 or later <p>The RMF Client/Server requires the following software:</p> <ul style="list-style-type: none"> • Host software: a z/OS or z/OS.e Communications Server network connection from the workstation to the host. If APPC is used, the connection must be capable of supporting parallel LU 6.2 sessions. • Workstation software: any operating system that supports the z/OS or z/OS.e ISPF Client/Server.
SDSF	<p>To use the SAF security feature of SDSF, the z/OS or z/OS.e Security Server feature is required.</p> <p>The z/OS or z/OS.e RMF feature is required to:</p> <ul style="list-style-type: none"> • Use the RMF support provided by the DA display • View sysplex wide data on the DA display • View both the MVS and LPAR view of CPU use on the DA display <p>To display printer intervention conditions, PSF V3R1 for OS/390 (5655-B17) is required.</p> <p>For sysplex-wide data on the device displays (PR, INIT, LI, NO, RDR, PUN, SO, ENC, and PS), and for sysplex support in browse, MQSeries for OS/390 V2 (5655-A95) or later is required.</p>
Security Server	<p>If the LDAP Server component will be used as a general LDAP directory server, DB2 is required; use DB2 V5 with PTF UQ16836 or DB2 V6 with PTF UW41616. If the LDAP Server component will be used only to provide LDAP access to USER and GROUP profiles stored in RACF, or only to provide LDAP access to configuration data stored in an IODF via HCD, DB2 is not required.</p> <p>To run the RACF remove ID utility (IRRRID00) or the RACF report writer, the z/OS or z/OS.e DFSORT feature is required.</p> <p>For enhanced IP security (packet filtering, tunnels, and NAT), the Firewall Technologies component requires the z/OS or z/OS.e Communications Server Security Level 3 feature.</p> <p>To write application programs using the Kerberos or GSS-API programming interface, you need the z/OS or z/OS.e C/C++ with Debug Tool, or z/OS or z/OS.e C/C++ without Debug Tool feature.</p>
Security Server Network Authentication Service Level 3	None

Table 15. Software requirements for z/OS V1R3 and z/OS.e V1R3 elements and features (continued)

Element or feature	Required z/OS or z/OS.e optional features or stand-alone products
SMP/E	Installing software products and service directly from a network source (such as the Internet) requires the ICSF component of base element Cryptographic Services to be operational.
System SSL Security Level 3	To write application programs using the DCE programming interface, you need the z/OS or z/OS.e C/C++ with Debug Tool, or z/OS or z/OS.e C/C++ without Debug Tool feature.
Text Search	None
TIOC	None
TSO/E	<p>For language support service or for TSO/E to save the user's console command profile, the z/OS or z/OS.e Security Server feature is required.</p> <p>To use security labels in TSO/E, the following are required:</p> <ul style="list-style-type: none"> • z/OS or z/OS.e Security Server feature • PSF V3 for OS/390 (5655-B17).
z/OS UNIX System Services	<p>To write application programs using the C or C++ language application programming interface, you need the z/OS or z/OS.e C/C++ with Debug Tool, or z/OS or z/OS.e C/C++ without Debug Tool feature.</p> <p>To run reports to audit z/OS UNIX System Services, you need SLR V3R3 (5665-397) with PTF UN25722.</p>
3270 PC File Transfer Program	Compatible 3270 terminal emulation software, such as IBM Personal Communications/3270 and IBM Communications Manager/2, is required.

Appendix C. Minimum releases of IBM software products that run with z/OS and z/OS.e

This appendix lists the minimum (earliest) releases of IBM stand-alone software products (licensed programs) that run with z/OS V1R3 and z/OS.e V1R3. Check the list for products installed on your z/OS or z/OS.e target system. For these products, you must migrate to at least the releases shown so that the products can run on z/OS V1R3 or z/OS.e V1R3.

Notes:

1. All of the products listed in this appendix run on z/OS V1R3, but not all of them run on z/OS.e V1R3. Those that don't run on z/OS.e V1R3 are identified as "z/OS only".
To see the most up-to-date list of products that are orderable to run on z/OS.e V1R3, see the z/OS.e ServerPac product catalog (order checklist) at <http://www.ibm.com/eserver/zseries/software/swinfo/zose.htm>. The product catalog is updated more frequently than this appendix.
2. Although some products might no longer be marketed, they were still service supported at the time this book was initially published. Because the marketing and service support status for the products listed will change over time, you should consult the appropriate IBM announcement letters to determine whether the products of interest are marketed or service supported in the timeframe you are considering. You can find IBM announcement letters at <http://www.ibm.com/ibmlink/>.
3. Products that are no longer marketed are not available through ServerPac. If you have any of these products, see "Separating data from software" on page 132 for information about ways to avoid having to reinstall them after installation of a ServerPac order.
4. For some products, PTFs are listed. These are not necessarily all the PTFs required but they are important ones.

For further reference:

- To find out the levels of products that you currently have on your system, use the SMP/E Planning and Migration Assistant.
- To find the current versions and releases of products, check the Preventive Service Planning (PSP) facility of the IBM Customer Support Center.

Table 16. Minimum levels of products that run with z/OS V1R3 and z/OS.e V1R3

Product (and product number)	Minimum release
4700 FCS Controller Resource Manager V2 (5668-753)	R4.5
4700 Host Support Program V1 (5668-989)	R9.6
ACF/NCP V4 (5668-854)	R3.1
(z/OS only)	
ACF/NCP V5 (5668-738)	R4
(z/OS only)	
ACF/NCP V6 (5688-231)	R3
(z/OS only)	

Table 16. Minimum levels of products that run with z/OS V1R3 and z/OS.e V1R3 (continued)

Product (and product number)	Minimum release
ACF/NCP V7 (5648-063) (z/OS only)	R3
ACF/SSP V3 (5665-338) (z/OS only)	R9
ACF/SSP V4 (5655-041) (z/OS only)	R3
AD/Cycle C/370 V1 (5688-216) (z/OS only) Note: To find out if your C programs need to be re-link edited with Language Environment, see <i>z/OS Language Environment Run-Time Migration Guide</i> and <i>z/OS C/C++ Compiler and Run-Time Migration Guide</i> .	R2
AFP Century Schoolbook Font V1 (5771-ADJ) (z/OS only)	R1
AFP Font Collection V1 (5648-113)	R1
AFP Font Collection V2 (5648-B33)	R1
AFP Math and Science Font V1 (5771-ADT) (z/OS only)	R1
AFP Toolbox for MVS V1 (5655-A25)	R1 with PTF UQ11500
APL2 Fonts V1 (5771-ADB) (z/OS only)	R1.2
APL2 V2 (5688-228) (z/OS only)	R2 with PTFs UN80106, UN96394, UQ05988, UQ27746, UQ32641, UQ39101, UQ44309, UQ48814, UQ51028
APL2 Application Environment V2 (5688-229) (z/OS only)	R2 with PTFs UN80106, UN96394, UQ05988, UQ27746, UQ32641, UQ39101, UQ44309, UQ48814, UQ51028
Application Map Generator for 4700 Finance Communication System V1 (5668-934)	R3.1
Application Support Facility V3 (5655-002)	R2
Application Test Collection V2 (5655-B97)	R1
Batchpipes for OS/390 V2 (5655-D45)	R1
BookManager BookServer for World Wide Web for MVS/ESA V2R2 (5655-A20) Note: 5655-A20 is a stand-alone product. Don't use it. In z/OS or z/OS.e, use the base element BookManager BookServer.	z/OS V1R3 BookManager BookServer element

Table 16. Minimum levels of products that run with z/OS V1R3 and z/OS.e V1R3 (continued)

Product (and product number)	Minimum release
BookManager BUILD/MVS V1 (5695-045) Note: 5695-045 is a stand-alone product. Don't use it. In z/OS, use the optional feature BookManager BUILD. In z/OS.e, the function is not available because the BookManager BUILD feature is not supported.	z/OS V1R3 BookManager BUILD feature
BookManager READ/MVS V1 (5695-046) Note: 5695-046 is a stand-alone product. Don't use it. In z/OS, use the base element BookManager READ. In z/OS.e, the function is not available because the BookManager READ element is not supported.	z/OS V1R3 BookManager READ element
Breeze for Software Configuration and Library Manager (SCLM) for OS/390 V1 (5697-G58)	R1
BTLS (Basic Tape Library Support) V1 (5655-056)	R7
C/370 Compiler V2 (5688-187) (z/OS only) Note: To find out if your C programs need to be re-link edited with Language Environment, see <i>z/OS Language Environment Run-Time Migration Guide</i> and <i>z/OS C/C++ Compiler and Run-Time Migration Guide</i> .	R1
C/370 Library V2 (5688-188) (z/OS only) Note: To find out if your C programs need to be re-link edited with Language Environment, see <i>z/OS Language Environment Run-Time Migration Guide</i> and <i>z/OS C/C++ Compiler and Run-Time Migration Guide</i> .	R2
C/C++ Productivity Tools V1 (5655-B85)	R1
CCCA (COBOL and CICS Command Level Conversion Aid) for OS/390 & MVS & VM V2 (5648-B05) (z/OS only)	R1
CICS Interdependency Analyzer for z/OS and OS/390 V1 (5655-G76) (z/OS only)	R1
CICS Performance Analyzer (PA) for OS/390 V1.1 (5655-F38) (z/OS only)	R1
CICS Transaction Server (TS) for OS/390 V1 (5655-147) (z/OS only)	R2
CICS Transaction Server (TS) for z/OS V2 (5697-E93) (z/OS only)	R1
CICS VSAM Recovery MVS/ESA V2 (5695-010) (z/OS only)	R3
CICS/ESA V4 (5655-018) (z/OS only)	R1 with PTFs UQ23910, UQ28415, UQ43781

Table 16. Minimum levels of products that run with z/OS V1R3 and z/OS.e V1R3 (continued)

Product (and product number)	Minimum release
CICSplex SM (System Manager) V1 (5695-081) (z/OS only)	R3
Classic Connect V2 (5655-B73) (IMS feature is z/OS only)	R1.1
Cloud 9 for Software Configuration and Library Manager (SCLM) for OS/390 V1 (5697-G57)	R1
Cloud 9 for Software Configuration and Library Manager (SCLM) for z/OS V2 (5655-G93)	R1
COBOL for OS/390 & VM V2 (5648-A25) (z/OS only) Note: To find out if your OS/VS COBOL or VS COBOL II compiled and link-edited programs need to be recompiled with this compiler or re-link edited with Language Environment, see <i>COBOL for OS/390 & VM and COBOL for MVS & VM Compiler and Run-Time Migration Guide</i> .	R1
COBOL Report Writer Library V1 (5798-DZX), COBOL Report Writer Precompiler and Libraries V1 (5798-DYR) (z/OS only)	R4
COBOL Structuring Facility V3 (5696-737) (z/OS only)	R1
CODE/370 (CoOperative Development Environment/370) V1 (5688-194) (z/OS only)	R2
Content Manager OnDemand for OS/390 V2 (5655-A88) (z/OS only)	R1
Content Manager OnDemand for z/OS and OS/390 V7 (5655-H39) (z/OS only)	R1
CPCS (Check Processing Control System) V1 (5734-F11) (z/OS only)	R11
CSFI (Communications Subsystem for Interconnection) V1 (5688-132) (z/OS only)	R3
Data1 Fonts V1 (5771-ADA) (z/OS only)	R1.2
DataInterchange MVS V3 (5655-B29)	R1
DataInterchange MVS/CICS V3 (5655-B30) (z/OS only)	R1
DataRefresher V1 (5696-703)	R1
DB2 Administration Tool for MVS/ESA V2 (5655-D52)	R1

Table 16. Minimum levels of products that run with z/OS V1R3 and z/OS.e V1R3 (continued)

Product (and product number)	Minimum release
DB2 Administration Tools V2 (5655-E70)	R1
DB2 Administration Tool for z/OS V3 (5655-E64)	R1
DB2 Archive Log Compression Tool for z/OS V1 (5655-F54)	R1
DB2 Automated Utility Generator V1 (5695-077)	R3
DB2 Automation Tool for z/OS V1 (5697-G63)	R1
DB2 Bind Manager V1 (5655-D38)	R1
DB2 Bind Manager V2 (5655-E43)	R1
DB2 Buffer Tool Analyzer for z/OS V1 (5655-E54)	R1
DB2 Buffer Pool Tool V1 (5697-D16)	R1
DB2 Change Accumulation Tool for z/OS V1 (5655-F55)	R1
DB2 Data Export Facility for z/OS V1 (5655-E46)	R1
DB2 DataPropagator V7 (5655-E60)	R1
DB2 Diagnostic and Recovery Utilities V7 (5655-E62)	R1
DB2 Forms for OS/390 V1 (5697-F09)	R1
DB2 High Performance Unload V1 (5697-F44)	R1
DB2 High Performance Unload for z/OS V1 (5655-E69)	R1
DB2 Log Analysis Tool for z/OS V1 (5655-E66)	R1
DB2 Object Comparison Tool for z/OS V1 (5697-G64)	R1
DB2 Object Restore for z/OS V1 (5655-E72)	R1
DB2 OLAP Server for OS/390 V1 (5640-OLP)	R1
DB2 OLAP Server for OS/390 V7 (5655-OLP)	R1
DB2 Operational Utilities V7 (5655-E63)	R1
DB2 Path Checker V1 (5655-E39)	R1
DB2 PM (Performance Monitor) for OS/390 V7 (5655-E61)	R1
DB2 Query Monitor for OS/390 V1 (5655-E67)	R1
DB2 Recovery Manager V1 (5697-F56)	R1
DB2 Row Archive Manager for OS/390 V1 (5655-A31)	R1
DB2 Row Archive Manager V1 (5655-E65)	R1
DB2 SQL Performance Analyzer for z/OS V1 (5697-F57)	R1
DB2 Server for OS/390 V5 (5655-DB2)	R1 with PTFs UQ47203, UQ48804
DB2 Table Editor for z/OS V4 (5697-G65)	R1
DB2 Universal Database Server for OS/390 V6 (5645-DB2) Note: z/OS.e does not support the QMF Host and QMF HPO features.	R1 with PTFs UQ42540, UQ48805
DB2 Universal Database Server for OS/390 and z/OS V7 (5675-DB2) Note: z/OS.e does not support the QMF Host and QMF HPO features.	R1
DB2 Utilities Suite V7 (5697-E98)	R1
DB2 Web Query Tool for z/OS V1 (5655-E71)	R2

Table 16. Minimum levels of products that run with z/OS V1R3 and z/OS.e V1R3 (continued)

Product (and product number)	Minimum release
DBICF (Data Base Integrity Control Facility) V6 (5697-B92)	R1
DCF (Document Composition Facility) V1 (5748-XX9)	R4 with PTFs UN92385, UN92386, UN92387 (for DBCS)
Developer Kit for OS/390, Java 2 Technology Edition V1 (5655-D35)	SDK level 1.3 with PTF UQ59962
DFSMS/MVS V1 (5695-DF1) Note: 5695-DF1 is a stand-alone product. Don't use it. In z/OS or z/OS.e, use the base element DFSMSdfp and optional features DFSMSdss, DFSMShsm, and DFSMSrmm.	z/OS V1R3 DFSMSdfp element and DFSMSdss, DFSMShsm, and DFSMSrmm features
DFSMS Optimizer for OS/390 and MVS/ESA V1 (5655-OPT)	R2
DFSORT V1 (5740-SM1) Note: 5740-SM1 is a stand-alone product. Don't use it. In z/OS or z/OS.e, use the optional feature DFSORT.	z/OS V1R3 DFSORT feature
DISOSS/370 V3 (5665-290) (z/OS only)	R4
DISOSS Library Services - Extended (DLSE) V3 (5787-EDJ) (z/OS only)	R1.2
DisplayWrite/370 V2 (5685-101) (z/OS only)	R2
DITTO/ESA for MVS V1 (5655-103)	R3
Document Connect for Lotus Domino for z/OS V2 (5639-I31)	R1
Document Library Facility V1 (5748-XXE)	R3
Dynamic Resource Control (DRC) Facility for IMS/ESA V1 (5697-D14) (z/OS only)	R1
Electronic Service Agent for IBM @server zSeries and IBM S/390 Servers V1 (5655-F17)	R1 with the PTF for APAR PQ54751
Emulation Program V1 (5735-XXB) (z/OS only)	R2
Enterprise COBOL for z/OS and OS/390 V3 (5655-G53) (z/OS only)	R1
Enterprise PL/I for z/OS and OS/390 V3 (5655-H31) (z/OS only)	R1
Expedite/CICS for MVS V4 (5655-092) (z/OS only)	R5
Expedite Base/MVS V4 (5695-EDI)	R5

Table 16. Minimum levels of products that run with z/OS V1R3 and z/OS.e V1R3 (continued)

Product (and product number)	Minimum release
Extended Terminal Options Support for IMS/ESA (ETO Support) V1 (5697-D68) (z/OS only)	R1
Fault Analyzer for OS/390 V1 (5697-F19)	R1
Fault Analyzer for z/OS and OS/390 V2 (5655-G74)	R1
File Exchange/MVS User Interface V1 (5785-EEX)	R3
File Manager for OS/390 V1 (5697-F20)	R1
File Manager for z/OS and OS/390 V2 (5655-G75)	R1
Fortran. See <i>z/OS Language Environment Run-Time Migration Guide</i> .	
GAM/SP (Graphics Access Method/SP) V1 (5668-978) (z/OS only)	R3.1 and informational APAR II10939
GDDM/GKS V1 (5668-802) (z/OS only)	R1.3
GDDM/IMD V2 (5668-801) (z/OS only)	R1.3
GDDM/IVU V1 (5668-723) (z/OS only)	R1.3
GDDM-PGF V2 (5668-812) Note: 5668-812 is a stand-alone product. Don't use it. In z/OS, use the optional feature GDDM-PGF. In z/OS.e, the function is not available because the GDDM-PGF feature is not supported.	z/OS V1R3 GDDM-PGF feature
GDDM V3 (5695-167) Note: 5695-167 is a stand-alone product. Don't use it. In z/OS, use the base element GDDM. In z/OS.e, the function is not available because the GDDM element is not supported.	z/OS V1R3 GDDM element
GDQF (Graphical Display and Query Facility) V2 (5688-169) (z/OS only)	R2.1
geoManager V1 (5685-105)	R1.6
HCF (Host Command Facility) V2 (5668-985)	R1
HLASM for MVS & VM & VSE V1 (5696-234) and HLASM Toolkit feature Note: 5696-234 is a stand-alone product. Don't use it. In z/OS or z/OS.e, use the base element HLASM and the optional feature HLASM Toolkit.	z/OS V1R3 HLASM element, z/OS V1R3 HLASM Toolkit feature
ICSF/MVS (Integrated Cryptographic Service Facility/MVS) V2 (5655-120) Note: 5655-120 is a stand-alone product. Don't use it. In z/OS or z/OS.e, use the exclusive base element Cryptographic Services.	z/OS V1R3 Cryptographic Services element
IGES Processor V3 (5648-001)	R1.2

Table 16. Minimum levels of products that run with z/OS V1R3 and z/OS.e V1R3 (continued)

Product (and product number)	Minimum release
ImagePlus Folder Application Facility (IPFAF) V3 (IPFAF) (5655-A27) (z/OS only)	R1
ImagePlus Object Distribution Manager (IODM) V3 (5655-A26) (z/OS only)	R1
IMS/ESA ADF Tool Pak for MVS V1 (5655-A21) (z/OS only)	R1
IMS/ESA BTS (Batch Terminal Simulator) V2 (5655-A14) (z/OS only)	R1
IMS/ESA Database Control Suite for OS/390 V1 (5697-D15) (z/OS only)	R1
IMS/ESA DEDB (Data Entry Databases) Fast Recovery V1 (5655-109) (z/OS only)	R1
IMS/ESA Message Requeuer (IMS MRQ) for MVS/ESA V3 (5655-136) (z/OS only)	R1
IMS/ESA Partition Support Product for MVS/ESA (Partition DB) V1 (5697-A06) (z/OS only)	R1
IMS/ESA Partition Support Product for MVS/ESA (Partition DB) V2 (5697-D85) (z/OS only)	R1
IMS/ESA Recovery Saver for MVS/ESA V1 (5655-A68) (z/OS only)	R1
IMS/ESA Year 2000 Exit Tool V1 (5697-E04) (z/OS only)	R1
IMS/ESA V6 (5655-158) (z/OS only)	R1 with PTFs UQ48303 and UQ48822
IMS V7 (5655-B01) (z/OS only)	R1 with PTFs UQ48304 and UQ48823
IMS Advanced ACB Generator V1 (5655-E05) (z/OS only)	R1
IMS Application Development Facility (IMSADF) II V2 (5665-348) (z/OS only)	R2.1

Table 16. Minimum levels of products that run with z/OS V1R3 and z/OS.e V1R3 (continued)

Product (and product number)	Minimum release
IMS Command Control Facility V1 (5655-F40) (z/OS only)	R1
IMS Compression - Extended V1 (5655-085) (z/OS only)	R2
IMS Connect for z/OS V1 (5655-E51) (z/OS only)	R1
IMS Database Control Suite for z/OS V2 (5655-F76) (z/OS only)	R1
IMS Data Base Integrity Control Facility V7 (5697-F61) (z/OS only)	R1
IMS DataPropagator V2 (5696-705) (z/OS only)	R2
IMS ETO (Extended Terminal Option) Support for z/OS V2 (5655-E12) (z/OS only)	R1
IMS Data Base Integrity Control Facility V7 (5697-F61) (z/OS only)	R1
IMS Database Repair Facility V1 (5655-E03) (z/OS only)	R1
IMS DataPropagator for z/OS V3 (5655-E52) (z/OS only)	R1
IMS Fast Path Basic Tools for z/OS V1 (5655-E30) (z/OS only)	R1
IMS Fast Path Online Tools for z/OS V2 (5655-F78) (z/OS only)	R1
IMS Hardware Data Compression - Extended V2 (5655-E02) (z/OS only)	R1
IMS High Performance Change Accumulation Utility for z/OS V1 (5655-F59) (z/OS only)	R1
IMS High Performance Load V1 (5655-E07) (z/OS only)	R1
IMS High Performance Pointer Checker V1 (5655-E09) (z/OS only)	R1

Table 16. Minimum levels of products that run with z/OS V1R3 and z/OS.e V1R3 (continued)

Product (and product number)	Minimum release
IMS High Performance Prefix Resolution V1 (5655-E08) (z/OS only)	R1
IMS High Performance Sysgen Tools for z/OS V1 (5655-F43) (z/OS only)	R1
IMS High Performance Upload V1 (5655-E06) (z/OS only)	R1
IMS Image Copy Extensions V1 (5655-E10) (z/OS only)	R1
IMS Index Builder V2 (5655-E24) (z/OS only)	R1
IMS Library Management Utilities V1 (5655-E04) (z/OS only)	R1
IMS Message Format Services Reversal Utilities V1 (5655-F45) (z/OS only)	R1
IMS Network Compression Facility for z/OS V1 (5655-E41) (z/OS only)	R1
IMS Online Recovery Service for z/OS V1 (5655-E50) (z/OS only)	R1
IMS PA (Performance Analyzer) V2 (5697-F02) (z/OS only)	R1
IMS Parallel Change Accumulation for IMS/ESA V1 (5697-E32) (z/OS only)	R1
IMS Parallel Reorganization for z/OS V2 (5655-F74) (z/OS only)	R1
IMS Performance Analyzer for OS/390 V3 (5655-E15) (z/OS only)	R1
IMS Program Restart Facility V2 (5655-E14) (z/OS only)	R1
IMS Queue Control Facility for OS/390 V1 (5697-E99) (z/OS only)	R1
IMS Recovery Saver V2 (5655-E16) (z/OS only)	R1
IMS Sequential Randomizer Generator V1 (5655-E11) (z/OS only)	R1

Table 16. Minimum levels of products that run with z/OS V1R3 and z/OS.e V1R3 (continued)

Product (and product number)	Minimum release
IMS System Utilities/Data Base Tools (DBT) V2 (5685-093) (z/OS only)	R3
Infoprint Server Transforms for OS/390 V1 (5697-F51) Note: The PTFs are necessary for enablement checking to function correctly on z/OS. You need not install all the PTFs; install only those that correspond to the features of Infoprint Server Transforms that you are using.	R1.1 with PTFs UW80243 and UW80244, and enablement checking PTFs UW74473, UW74922, UW75973, UW75974, UW75975, UW75999
Item Capture Support (ICS) for MVS/ESA and OS/390 V1 (5655-B23)	R1
IXFP (IBM Extended Facilities Product) V2 (5648-A17)	R1
JES/328X Print Facility V3 (5785-BAZ)	R2
Lotus Domino for S/390 V5 (5655-B86)	R5.0.7
MERVA ESA V4 (5648-B29) (z/OS only)	R1
MERVA Extended Connectivity for MVS/ESA V3 (5655-110) (z/OS only)	R2
Millenium Runtime Windowing Tool for MVS and OS/390 V1 (5697-E07) (z/OS only)	R1
MPSX/370 (Mathematical Programming System Extended/370) V2 (5668-739)	R2
MQSeries for MVS/ESA V1 (5695-137) Note: The PTFs are necessary in order for the distributed queuing feature to function correctly when it is used with the IP Services component of z/OS V1R3 Communications Server. You need not install all the distributed queuing PTFs; install only those that correspond to the optional features of MQSeries that you are using.	R2 with PTFs UQ16203, UQ16210, UQ48985, UQ48986, UQ48991, UQ48992
MQSeries for OS/390 V2 (5655-A95)	R1
MQSeries for OS/390 V5 (5655-F10)	R2
MQSeries Integrator for OS/390 and DB2 V1 (5697-F45)	R1
MQSeries Integrator Agent (MQSI) for CICS Transaction Server V1 (5655-F25) (z/OS only)	R1
MQSeries Link R/3 for OS/390 V1 (5655-F39)	R2
MQSeries Workflow for z/OS V3 (5655-BPM)	R3
NETDA (Network Design and Analysis) V2 (5685-045) (z/OS only)	R2
Network Security Processor MVS Support Program V2 (5655-A16) (z/OS only)	R1

Table 16. Minimum levels of products that run with z/OS V1R3 and z/OS.e V1R3 (continued)

Product (and product number)	Minimum release
NetView Access Services for MVS V2 (5695-036)	R1
NetView Distribution Manager for MVS V1 (5685-016)	R7
NetView FTP for MVS V2 (5685-108)	R2.1
NetView Performance Monitor (NPM) V1 (5665-333)	R6
NetView Performance Monitor (NPM) V2 (5655-043)	R2
Network Data Couplers for MVS/ESA and OS/390 V1 (5655-A99)	R1
NRF (Network Routing Facility) V1 (5668-963)	R3.3
NSI (Non-SNA Interconnection) V1 (5668-951)	R6
NTO (Network Terminal Option) V1 (5735-XX7)	R2.1
(z/OS only)	
NTuneMON V2 (5648-141)	R1
(z/OS only)	
NTuneMON V3 (5648-D72)	R1
(z/OS only)	
OGL/370 (Overlay Generation Language/370) V1 (5688-191)	R1
OpenEdition DCE Application Support for MVS/ESA V1 (5655-064) Note: 5655-064 is a stand-alone product. Don't use it. In z/OS, use the base element DCE Application Support. In z/OS.e, the function is not available because the DCE Application Support element is not supported.	z/OS V1R3 DCE Application Support element
OS/VS DB/DC Data Dictionary V1 (5740-XXF)	R6
(z/OS only)	
OS PL/I Compiler, Library, and Interactive Test Facility V2 (5668-909, 5668-910, and 5668-911)	R3 with PTF UL95133
(z/OS only) Note: To find out if your PL/I programs need to be re-link edited with Language Environment, see <i>z/OS Language Environment Run-Time Migration Guide</i> and <i>PL/I for MVS & VM Compiler and Run-Time Migration Guide</i> .	
OSI/CS (Communications Subsystem) for MVS V1 (5685-014)	R1.1
OSI/FS (File Services) for MVS V1 (5685-046)	R1
OSL (Optimization Subroutine Library) V1 (5688-137)	R2
(z/OS only)	
OV/MVS (OfficeVision/MVS) V1 (5685-106)	R3
(z/OS only)	
Payment Gateway for OS/390 V2 (5655-C57)	R1
PCF (Programmed Cryptographic Facility) V1 (5740-XY5)	R1
(z/OS only)	
Pi and Specials Fonts V1 (5771-ABC)	R1.1
(z/OS only)	

Table 16. Minimum levels of products that run with z/OS V1R3 and z/OS.e V1R3 (continued)

Product (and product number)	Minimum release
PL/I for MVS & VM V1 (5688-235) (z/OS only) Note: To find out if your PL/I compiled and link-edited programs need to be recompiled with this compiler or re-link edited with Language Environment, see <i>z/OS Language Environment Run-Time Migration Guide</i> and <i>PL/I for MVS & VM Compiler and Run-Time Migration Guide</i> .	R1.1
Policy Director Authorization Services for z/OS and OS/390 V1 (5655-F95)	R1
PPFA/370 (Page Printer Formatting Aid/370) V1 (5688-190)	R1
Print Management Facility/MVS V1 (5665-307) (z/OS only)	R1.1
Program Restart Facility for IMS V1 (5697-F18)	R1
PSF (Print Services Facility) for OS/390 V3 (5655-B17) Note: The PTF is required to exploit the Printer Inventory Manager and SNMP Subagent components of Infoprint Server.	R1 with PTF UW64475
Publishing Systems BookMaster V1 (5688-015) (z/OS only)	R4 with PTFs UQ04721 and UQ47802
QMF (Query Management Facility) V3 (5706-254) (z/OS only)	R3
Repository Manager/MVS V1 (5665-461) (z/OS only)	R1
REXX/370 Compiler V1 (5695-013), REXX/370 Library V1 (5695-014)	R3
RMDS (Report Management and Distribution System) V1 (5665-310) (z/OS only)	R4 with PTF UQ26351
RMDS (Report Management and Distribution System) V2 (5648-048) (z/OS only)	R3
Runtime Analyzer for MVS and OS/390 V1 (5697-E06)	R1
SDF II (Screen Definition Facility II) V1 (5665-366) (z/OS only)	R4
SDSF/MVS (System Display and Search Facility/MVS) V1 (5665-488) Note: 5665-488 is a stand-alone product. Don't use it. In z/OS or z/OS.e, use the optional feature SDSF.	z/OS V1R3 SDSF feature
SearchManager/370 V1 (5695-070)	R3
SecureWay Host Publisher for OS/390 V2 (5639-I45)	R1
SMP/E for z/OS and OS/390 V3 (5655-G44)	R1
SnapShot (IBM RAMAC SnapShot for MVS/ESA) V1 (5648-A12)	R2

Table 16. Minimum levels of products that run with z/OS V1R3 and z/OS.e V1R3 (continued)

Product (and product number)	Minimum release
Sonoran Sans Serif Condensed Font V1 (5771-AFL) (z/OS only)	R1.1
Sonoran Sans Serif Expanded Font V1 (5771-AFN) (z/OS only)	R1.1
Sonoran Sans Serif Font V1 (5771-ABB) (z/OS only)	R1.2
Sonoran Sans Serif Headliner Font V1 (5771-ADX) (z/OS only)	R1.1
Sonoran Serif Font V1 (5771-ABA) (z/OS only)	R1.2
Sonoran Serif Headliner Font V1 (5771-ADW) (z/OS only)	R1.1
StorWatch DFSMSHsm Monitor V1 (5655-SWT)	R1
System Automation for OS/390 V1 (5645-005) Note: You must move this product into a separate zone before installing z/OS or z/OS.e. See "Putting NetView and System Automation in the correct zone" on page 81.	R3
System Automation for OS/390 V2 (5645-006)	R1
Tivoli Business Systems Manager V1 (5698-BSM)	R5
Tivoli Data Exchange V1 (5698-TDE)	R1
Tivoli Data Protection for Lotus Domino V1 (5698-DPD)	R1
Tivoli Decision Support for OS/390 V1 (5698-TD9)	R5
Tivoli Decision Support for OS/390 Accounting Feature V1 (5698-TDW)	R5
Tivoli Information Management for z/OS V7.1 (5697-SD9)	R1
Tivoli Inventory for OS/390 V3 (5698-INV)	R6.2
Tivoli Management Framework for OS/390 V3 (5697-D10)	R6.1
Tivoli Management Framework for OS/390 V3 (5698-FRA)	R7.0
Tivoli Manager for MQSeries for OS/390 V2 (5697-D30)	R2
Tivoli NetView for OS/390 V1 (5697-B82)	R1
Tivoli NetView Performance Monitor for OS/390 V2 (5698-NPM)	R6
Tivoli NetView Performance Monitor for TCP/IP (NPM/IP) V1 (5698-PMI)	R1
Tivoli OPC (Operations Planning and Control) V2 (5697-OPC) Note: The PTFs are required for toleration of the greater than 65 536 job number support introduced in z/OS V1R2 JES2 and JES3. (z/OS only)	R2 with PTFs UQ56458 and UQ57855
Tivoli Performance Reporter for OS/390 V1 (5695-101)	R5
Tivoli Policy Director for MQSeries V3 (5698-PDM)	R8.0

Table 16. Minimum levels of products that run with z/OS V1R3 and z/OS.e V1R3 (continued)

Product (and product number)	Minimum release
Tivoli Security Management for OS/390 V3 (5697-SCM)	R6
Tivoli Service Desk for OS/390 V1 (5648-142)	R1
Tivoli Software Distribution for OS/390 V3 (5697-F03)	R6.1
Tivoli Storage Management Set, S/390 Edition (5697-TS9)	R1
Tivoli Storage Manager V4 (5698-TSM)	R1
Tivoli User Administration for OS/390 V3 (5697-ADM)	R6
Tivoli Workload Scheduler V8.1 (5698-WKB) Note: z/OS.e does not support the GRAPH command. This command uses ISPF panels to provide a graphical view of jobs and their dependencies.	R1
Tivoli Workload Scheduler for z/OS V8.1 (5697-WSZ) Note: z/OS.e does not support the GRAPH command. This command uses ISPF panels to provide a graphical view of jobs and their dependencies.	R1
TPNS (Teleprocessing Network Simulator) V3 (5688-121)	R5
VisualAge COBOL Millenium Language Extensions for MVS & VM V1 (5654-MLE) (z/OS only)	R1
VisualAge COBOL Millenium Language Extensions for OS/390 & VM V1 (5648-MLE) (z/OS only)	R1
VisualAge Generator Server V1 (5648-B02)	R2
VisualAge PL/I for OS/390 V2 (5655-B22) (z/OS only)	R2
VisualAge PL/I Millenium Language Extensions for MVS & VM V1 (5648-MLX) (z/OS only)	R1
VisualAge Smalltalk Server for OS/390 V4 (5655-B14) (z/OS only)	R5
VS FORTRAN Compiler/Library/Interactive Debug V2 (5668-806), VS FORTRAN Compiler/Library V2 (5688-087), VS FORTRAN Library V2 (5668-805) (z/OS only) Note: To find out if your Fortran programs need to be re-link edited with Language Environment, see <i>z/OS Language Environment Run-Time Migration Guide</i> and <i>Language Environment for MVS & VM Fortran Run-Time Migration Guide</i> .	R6
VS Pascal Library V1 (5668-717), VS Pascal Compiler and Library V1 (5668-767) (z/OS only)	R2
WebSphere Application Server for OS/390 V3.5 Standard Edition (5655-A98)	

Table 16. Minimum levels of products that run with z/OS V1R3 and z/OS.e V1R3 (continued)

Product (and product number)	Minimum release
WebSphere Application Server V4.0.1 for OS/390 and z/OS (5655-F31)	
WebSphere Commerce Suite, Pro Edition for OS/390, V4 (5697-G05)	R1
WebSphere Host On-Demand V6.0 (29P4270 in 5733-A57)	R0
WebSphere Host Publisher V2 for OS/390 (5655-D70)	R2 with the PTFs for APARs OW47698, OW50049, and OW50050
WebSphere MQ Integrator for z/OS V2 (5655-G97)	R1
WebSphere Studio Asset Analyzer for z/OS V1 (5655-D92)	R1
WLR (Workload Router) V2 (5697-B87)	R1
(z/OS only)	
X.25 NPSI (NCP Packet Switching Interface) V2 (5668-719)	R1
(z/OS only)	
X.25 NPSI (NCP Packet Switching Interface) V3 (5688-035)	R4
(z/OS only)	
X.25 SNA Interconnection V1 (5685-005)	R2
(z/OS only)	
X.25 SNA Interconnection V2 (5685-035)	R4
(z/OS only)	
X.25 SNA NSF (Network Supervisory Function) V1 (5685-003)	R5
(z/OS only)	
XML Toolkit for OS/390 V1 (5655-D44)	R2

Appendix D. Hardware requirements for z/OS and z/OS.e elements and features

Hardware requirements for a target system are discussed in “Identifying hardware requirements for the target system” on page 71. Beyond these basic requirements, certain elements and features have additional hardware requirements. This appendix describes the additional requirements.

Note: For general information about requirements for a Parallel Sysplex configuration, see the z/OS Parallel Sysplex Customization Wizard at <http://www.ibm.com/eserver/zseries/zos/wizards/>.

Table 17. Hardware requirements for z/OS V1R3 and z/OS.e V1R3 elements and features

Element or feature	Additional hardware required beyond the basic hardware requirements for z/OS V1R3 or z/OS.e V1R3
BCP	<p>An IBM @server zSeries 800 (z800) or 900 (z900) server is required to take advantage of the following BCP functions: 64-bit real storage support, Intelligent Resource Director (IRD), CPU LPAR management, I/O priority queuing, and variable Workload License Charging.</p> <p>Automatic tape switching requirements:</p> <ul style="list-style-type: none"> • 3480, 3490, or 3590 tape drives. Note that a single I/O device should have a single device number (defined through HCD) across the entire sysplex, and that number should not be reused for any other device. <p>For ease of management, IBM recommends that you use the same device number on all systems to represent an automatically switchable device. If an automatically switchable device is a 3480 without the 'Read Configuration Data Capable' function, you must use the same device number on all systems. Note that, if you have not already applied C05566E, device numbers must be the same.</p> <p>For coupling facility requirements, refer to <i>S/390 Processor Resource/Systems Manager Planning Guide</i>, GA22–7236, or <i>zSeries 900 Processor Resource/Systems Manager Planning Guide</i>, SB10–7033.</p> <p>Global resource serialization (GRS) requirements:</p> <ul style="list-style-type: none"> • If all systems in a GRS complex are also in a sysplex, global resource serialization uses XCF signalling services to communicate between the systems. (Systems are in the same sysplex if they share the same sysplex couple data set.) • If any systems are in the GRS complex but not in the sysplex, GRS uses 3088s or basic mode CTCs to communicate with those systems. <p>System-managed coupling facility (CF) structure duplexing capability requires Coupling Facility Control Code (CFCC) LEVEL 10 LIC running on an IBM @server zSeries 800 (z800) or 900 (z900) server, S/390 Parallel Enterprise Server (Model G5 or G6), or R06 Coupling Facility.</p>

Table 17. Hardware requirements for z/OS V1R3 and z/OS.e V1R3 elements and features (continued)

Element or feature	Additional hardware required beyond the basic hardware requirements for z/OS V1R3 or z/OS.e V1R3
BCP (continued)	<p>XCF (cross-system coupling facility) requirements in a sysplex configuration with one processor:</p> <ul style="list-style-type: none"> • A Sysplex Timer (9037) is not required. However, to provide timing for all members of the sysplex, one of the following must be true: <ul style="list-style-type: none"> – The sysplex is a single-system sysplex on one processor. – The sysplex runs in multiple logical partitions on a single CPC. – The sysplex runs as a set of VM guests on the same VM image. • Unless your system is running in XCF-local mode, a sysplex couple data set is required. • If you have more than one system image in the sysplex, XCF signalling connectivity is required between each system in the sysplex. <p>In a sysplex configuration with two or more processors, XCF requires all of the following:</p> <ul style="list-style-type: none"> • A Sysplex Timer (9037). <p>Note: If multiple z/OS or z/OS.e systems are running on two or more processors, XCF requires the processors in the sysplex to be connected to the same Sysplex Timer.</p> • Shared DASD for the sysplex couple data set. Certain functions require multiple couple data sets. For more information, see <i>z/OS MVS Setting Up a Sysplex</i>. • XCF signalling connectivity between each system in the sysplex and every other system in the sysplex. <p>This signalling connectivity may be established using several different hardware means. The signaling mechanisms that are supported are:</p> <ul style="list-style-type: none"> – IBM 3088 Multisystem Channel Communication Units – ESCON Channels that are used as extended mode CTCs – Coupling facility channels connected to a coupling facility with the use of XCF signalling structures
BDT	None
BDT File-to-File (z/OS only)	None
BDT SNA NJE	None
BookManager BookServer	None
BookManager BUILD (z/OS only)	None
BookManager READ (z/OS only)	None
C/C++ IBM Open Class Library	None
C/C++ with Debug Tool	None
C/C++ without Debug Tool	None
Communications Server	See “Hardware Requirements for Communications Server” on page 209.
Communications Server NPF (z/OS only)	None

Table 17. Hardware requirements for z/OS V1R3 and z/OS.e V1R3 elements and features (continued)

Element or feature	Additional hardware required beyond the basic hardware requirements for z/OS V1R3 or z/OS.e V1R3
Communications Server Security Level 3	<p>If hardware cryptography is available, it is used by Communications Server Security Level 3.</p> <p>The use of hardware cryptography by Communications Server Security Level 3 requires the Cryptographic Coprocessor hardware feature, which is available on the IBM @server zSeries 800 (z800) and 900 (z900) servers, and the S/390 Parallel Enterprise Server (Model G5 or G6).</p>
Cryptographic Services	<p>In order for ICSF to provide cryptographic services, the Cryptographic Coprocessor hardware feature is required. The feature is available on the IBM @server zSeries 800 (z800) and 900 (z900) servers, and the S/390 Parallel Enterprise Server (Model G5 or G6). The PCI Cryptographic Coprocessor (PCICC) hardware feature can be used to supplement the Cryptographic Coprocessor feature with added functions and performance. It is available on those same processors.</p>
DCE Application Support (z/OS only)	<p>For Transactional RPC (TRPC), a coupling facility is required.</p>
DCE Base Services	<p>None</p>

Table 17. Hardware requirements for z/OS V1R3 and z/OS.e V1R3 elements and features (continued)

Element or feature	Additional hardware required beyond the basic hardware requirements for z/OS V1R3 or z/OS.e V1R3
DFSMSdfp	<p>Catalog sharing enhancements (ECS) for Parallel Sysplex environments: To use this function, a coupling facility is required.</p> <p>Data compression: For optimal performance, this support uses the data compression feature that is available on some system processors. If the hardware is not available, it uses the software compression facility to compress data.</p> <p>Defining and accessing extended format sequential data sets through BSAM and QSAM: Extended format data sets must reside on DASD attached through cached storage controls and an ESCON or FICON channel adapter.</p> <p>Extended remote copy (XRC): When migrating data with XRC, the primary storage device must be attached to a remote copy-capable storage subsystem, such as an Enterprise Storage Server.</p> <p>OAM object tape support: To use this function, an IBM Tape Library Dataserver is required.</p> <p>OAM optical library support: To use this function, an IBM 3995 Optical Library Dataserver is required.</p> <p>OAM Parallel Sysplex support: To use this function, cross-system coupling facility (XCF) hardware is required.</p> <p>OAM virtual tape server support: To use this function, a virtual tape server subsystem in an automated tape library (Magstar 3494 Tape Library) is required.</p> <p>PDSE cross-system sharing support: If sharing PDSEs in a parallel sysplex environment, cross-system coupling facility (XCF) hardware is required.</p> <p>Storage management subsystem 32-name support: When defining more than 16 systems in an SMS complex, you must allocate the ACDS and the COMMDS on DASD volumes that are capable of attaching to more than 16 systems.</p> <p>Virtual Tape Server (VTS) export/import support: Requires a Virtual Tape Server model B18 library that includes the extended high performance option (EHPO) feature, a minimum of four 3590 native devices, and the convenience I/O station installed.</p> <p>VSAM extended addressability: To use this function, an extended format KSDS must be defined on DASD attached to a cached storage subsystem.</p> <p>VSAM record level sharing (RLS): To use this function, a coupling facility is required.</p>

Table 17. Hardware requirements for z/OS V1R3 and z/OS.e V1R3 elements and features (continued)

Element or feature	Additional hardware required beyond the basic hardware requirements for z/OS V1R3 or z/OS.e V1R3
DFSMSdss	<p>Concurrent copy: To use this function, data must reside on DASD volumes attached through a concurrent copy-capable storage subsystem.</p> <p>Defining and accessing extended format sequential data sets through BSAM and QSAM: Extended format data sets must reside on DASD attached through cached storage controls and an ESCON or FICON channel adapter.</p> <p>Snapshot and virtual concurrent copy: To use this function, a snapshot-capable storage device is required.</p> <p>Storage management subsystem 32-name support: When defining more than 16 systems in an SMS complex, you must allocate the ACDS and the COMMDS on volumes that are capable of attaching to more than 16 systems.</p> <p>VSAM extended addressability: To use this function, an extended format KSDS must be defined on DASD attached to a cached storage subsystem.</p> <p>VSAM record level sharing (RLS): A coupling facility (at least one) must be connected to all systems capable of VSAM RLS. For multiple coupling facilities, select one facility with global connectivity to contain the master lock structure. The coupling facility must be at control level 2. It must be large enough to contain either a lock or a cache structure, or both, and have enough surplus space to allow the structures to be modified. The cache structures must be defined to SMS to enable it for VSAM RLS.</p>
DFSMShsm	<p>Control data set extended addressability: To use this function, a coupling facility is required.</p> <p>Control data set (CDS) record level sharing (RLS) serialization: To use this function, a coupling facility is required.</p> <p>Defining and accessing extended format sequential data sets through BSAM and QSAM: Extended format data sets must reside on DASD attached through cached storage controls and an ESCON or FICON channel adapter.</p> <p>Storage management subsystem 32 name support: When defining more than 16 systems in an SMS complex, you must allocate the ACDS and the COMMDS on volumes that are capable of attaching to more than 16 systems.</p> <p>Storage management subsystem system groups: Some SMS complex configurations might require DASD with enhanced connectivity. Because all systems in an SMS complex share the same configuration data sets, the ACDS and the COMMDS must reside on DASD devices that are accessible to the system activating the configuration.</p> <p>VSAM extended addressability: To use this function, an extended format KSDS must be defined on DASD attached to a cached storage subsystem.</p> <p>VSAM partial release: To use this function, extended format data sets must reside on DASD attached through cached storage subsystems.</p> <p>VSAM record level sharing (RLS): A coupling facility (at least one) must be connected to all systems capable of VSAM RLS. For multiple coupling facilities, select one facility with global connectivity to contain the master lock structure. The coupling facility must be at control level 2. It must be large enough to contain either a lock or a cache structure, or both, and have enough surplus space to allow the structures to be modified. The cache structures must be defined to SMS to enable it for VSAM RLS.</p>
DFSMSrmm	None
DFSORT	If Japanese DFSORT/ISPF and DFSORT/ISMF panels are installed, the workstations must support double-byte character set (DBCS) data (for example, IBM 5550 System).

Table 17. Hardware requirements for z/OS V1R3 and z/OS.e V1R3 elements and features (continued)

Element or feature	Additional hardware required beyond the basic hardware requirements for z/OS V1R3 or z/OS.e V1R3
Distributed File Service	None
Encina Toolkit Executive (z/OS only)	None
EREP	None
ESCON Director Support	None
FFST	None
GDDM (z/OS only)	<p>GDDM supports devices that use the 3270 Extended Data Stream, the architected extensions to SNA character string (SCS), or IPDS. GDDM supports any other terminal or terminal-attached printer and provides graphics and image functions if it is upwardly compatible with the supported device. Certain non-IBM ASCII displays are supported through the 3174 Controller or on an upgraded older model 3174 Controller.</p> <p>GDDM host graphics are supported for viewing, printing, and plotting on OS/2 through CM/2 1.11 solely, IBM Personal Communications/3270 for OS/2 V4, or GDDM/MVS V3 download for GDDM-OS/2 Link in addition to CM/2. For MS Windows, use either IBM Personal Communications/3270 V3 or V4, the latter providing a native graphics emulator.</p> <p>GDDM host graphics are supported on DOS for viewing and printing/plotting to GDDM-PCLK supported devices through IBM Personal Communications/3270 V2 or later, and download of GDDM-PCLK from GDDM/MVS V3.</p> <p>GDDM host graphics are supported for viewing on AIX terminals through the X3270 emulator or the TCP/IP GDDMXD facility.</p>
GDDM-PGF (z/OS only)	None
GDDM-REXX (z/OS only)	None
HCD	None
HCM	<p>Hardware that can be used to establish an APPC or TCP/IP connection from the workstation to the z/OS or z/OS.e host is required.</p> <p>Workstation (PWS) requirements:</p> <ul style="list-style-type: none"> • Processor: 133 MHz Pentium® • Memory: 32 MB • Disk space: about 50 MB • Network adapter • SVGA adapter
HLASM	<p>To display or enter double-byte data, any of the following are required:</p> <ul style="list-style-type: none"> • DBCS 3270 emulation on RS/6000 or PS/55 • DBCS non-programmable terminal <p>To print double-byte data, any of the following are required:</p> <ul style="list-style-type: none"> • Advanced Function Printing (AFP) printers • 3270 remote printing on RS/6000 or PS/55
HLASM Toolkit	None
IBM HTTP Server	A networked workstation with a web browser is required.

Table 17. Hardware requirements for z/OS V1R3 and z/OS.e V1R3 elements and features (continued)

Element or feature	Additional hardware required beyond the basic hardware requirements for z/OS V1R3 or z/OS.e V1R3
IBM HTTP Server NA Secure	If hardware encryption is desired, cryptographic hardware is required.
ICKDSF	None
ILM	None
Infoprint Server	<p>Printer and connectivity requirements depend on the function to be performed:</p> <ul style="list-style-type: none"> • To print output using IP PrintWay, a printer connected via the z/OS or z/OS.e Communications Server base element (either IP Services or SNA Services) is required. An IP connection requires a printer that supports the LPR protocol, the IPP protocol, or TCP/IP direct sockets. A SNA connection requires a printer that supports the SCS or DSC/DSE data streams. • To print AFP data streams, an IPDS (Intelligent Printer Data Stream) printer supported by PSF V3 is required, with the appropriate hardware attachment (channel, SNA, or TCP/IP) for the printer. • Line data can be printed on any printer supported by JES2 or JES3. • To receive LPR print requests from a remote host, a TCP/IP connection is required from the remote host to the z/OS or z/OS.e host. <p>A workstation capable of running Windows 95, Windows 98, Windows NT, or Windows 2000 is required to use the Infoprint Port Monitor. The Infoprint Port Monitor also requires a TCP/IP connection from the workstation to the z/OS or z/OS.e host.</p> <p>The SNMP Subagent component requires IBM Network Printer Manager running on a Windows NT workstation or Windows NT server. The minimum server hardware is:</p> <ul style="list-style-type: none"> • IBM-compatible personal computer with 100 MHz Pentium processor (133 MHz or greater is recommended) • Network interface card • 16 MB RAM (32 MB or more is recommended) • 7 MB free hard disk space <p>The following printers are supported directly by Network Printer Manager:</p> <ul style="list-style-type: none"> • IBM Infoprint 20, 21, 32, 40, and 2000 • IBM Infoprint Color 8 • IBM Network Printer 12, 17, 24, and 24PS • IBM 4400 thermal printer • IBM 6400 line matrix printer • Other manufacturers' network printers that comply with RFC1759, such as Hewlett-Packard LaserJet 5Si or Lexmark Optra N

Table 17. Hardware requirements for z/OS V1R3 and z/OS.e V1R3 elements and features (continued)

Element or feature	Additional hardware required beyond the basic hardware requirements for z/OS V1R3 or z/OS.e V1R3
ISPF	<p>The ISPF base implementation requires a full-screen display terminal that supports 3270 data stream and provides a minimum interactive screen of 24 lines by 80 characters and a maximum interactive screen of 62 lines by 160 characters.</p> <p>On the host, the ISPF Client/Server (ISPF C/S) implementation requires the following:</p> <ul style="list-style-type: none"> • A TCP/IP or APPC network connection from the workstation to the z/OS or z/OS.e host <p>On the programmable workstation, the ISPF C/S implementation requires one of the following:</p> <ul style="list-style-type: none"> • Any personal computer capable of running Windows 95, Windows 98, Windows 2000, Windows NT, or OS/2 with 5 MB of available disk storage to contain the ISPF C/S software and a VGA or higher resolution color display. The minimum recommended processor type is a Pentium processor. The minimum memory required is 48 MB. • Any RS/6000 machine capable of running AIX Version 4.1.5 with 8 MB of available disk storage to contain the ISPF C/S software and a display device or x-station capable of running Motif 1.2. • Any HP/700 machine capable of running HP-UX Version 9.03 with 20 MB of available disk storage to contain the ISPF C/S software and a display device or x-station capable of running Motif 1.2. • Any SPARC workstation capable of running Solaris Version 2.5.1 with 8 MB of available disk storage space to contain the ISPF C/S software and a display device or x-station capable of running Motif 1.2 or OpenLook.
JES2	A JES2 MAS with multiple z/OS or z/OS.e images using multiple central processors requires a Sysplex Timer to synchronize time across the processors.
JES3	A JES3 complex with multiple z/OS or z/OS.e images using multiple central processors requires a Sysplex Timer to synchronize time across the processors.
Language Environment	None
MICR/OCR	None
(z/OS only)	
msys for Operations	None
msys for Setup	<p>Minimum workstation requirements:</p> <ul style="list-style-type: none"> • Processor: 266 MHz • Memory: 128 MB (192 MB recommended) • Disk space: 100 MB • Screen resolution: 800 x 600 (1024 x 768 recommended) <p>Host requirements: none</p>
Network File System	None
OCSF Security Level 3	None

Table 17. Hardware requirements for z/OS V1R3 and z/OS.e V1R3 elements and features (continued)

Element or feature	Additional hardware required beyond the basic hardware requirements for z/OS V1R3 or z/OS.e V1R3
OSA/SF	<p>Foremost, OSA/SF requires an OSA. For information about the requirements for an OSA, see <i>z900: OSA-2 Planning Guide</i> and <i>z900: OSA-Express Customer's Guide and Reference</i>. However, note that:</p> <ul style="list-style-type: none"> • OSA-1 is not supported on the IBM @server zSeries 800 (z800) or 900 (z900) server. The only OSA-2 features supported on the z800 or z900 are the token ring and FDDI features. All OSA-Express features are supported on the z800 and z900. However, the FENET feature does not run in HPDT MPC mode on the z800 or z900. • Any OSA can be run in the TCP/IP Passthru and SNA modes except OSA-Express Gigabit Ethernet. • Only a FDDI OSA-2 can be run in HPDT MPC mode on the z800 or z900 server. • Only the OSA-Express features (Gigabit Ethernet, Fast Ethernet, Token-Ring, and ATM running Ethernet LAN emulation) support IP traffic using QDIO architecture working with the IP Services component of z/OS or z/OS.e Communications Server. • Only an Asynchronous Transfer Mode (ATM) OSA-2 or an ATM OSA-Express feature can be run in ATM Native mode. Only ATM OSA-2 can be run in ATM IP Forwarding mode. <p>If its OS/2 or Windows (GUI) interface is to be used, OSA/SF requires:</p> <ul style="list-style-type: none"> • A workstation with a Pentium 200 Mhz (or equivalent) processor, 32 MB RAM, and an SVGA display with a resolution of 1024x768x16 colors is recommended. You might be satisfied with OSA/SF GUI performance on the minimum processor required by your OS/2 or Windows operating system, but the GUI might not display correctly at a lesser resolution. • One of the following communication adapters that are supported by OS/2 and the microprocessor: <ul style="list-style-type: none"> – EHLLAPI for 3270 communications protocol – TCP/IP communications protocol – APPC, or CPI-C, protocol for a node that supports LU 6.2
RMF	<p>For all RMF workstation functions:</p> <ul style="list-style-type: none"> • A workstation with a Pentium II or later processor • A graphics adapter and monitor with a configured resolution of at least 1024x768 pixels • At least 32 MB RAM, but for RMF Performance Monitoring (RMF PM) at least 96 MB RAM is required
SDSF	None
Security Server	<p>If you run in data sharing mode in a Parallel Sysplex configuration, a coupling facility must be configured for RACF's use.</p> <p>Firewall Technologies uses either the DES or triple-DES functions available with the Cryptographic Coprocessor hardware feature (on a zSeries server) and the z/OS or z/OS.e Cryptographic Services software feature to provide firewall encryption "tunneling", which creates virtual private networks (VPNs) in intranet or Internet environments.</p>
Security Server Network Authentication Service Level 3	None
SMP/E	<p>Installing software products and service directly from a network source (such as the Internet) requires the Cryptographic Coprocessor feature, which is available on the IBM @server zSeries 800 (z800) and 900 (z900) servers, and the S/390 Parallel Enterprise Server (Model G5 or G6).</p>

Table 17. Hardware requirements for z/OS V1R3 and z/OS.e V1R3 elements and features (continued)

Element or feature	Additional hardware required beyond the basic hardware requirements for z/OS V1R3 or z/OS.e V1R3
System SSL Security Level 3	None
Text Search	None
TIOC	None
TSO/E	<p>These requirements apply to interactive use of TSO/E, not to batch use. Any terminal supported by base element Communications Server, or ACF/TCAM V2R4 (5735-RC3) or later, is required. The full-screen LOGON, TRANSMIT and RECEIVE commands, the Session Manager, and the Information Center Facility, which need a minimum screen size of 24 by 80, require one of the following terminals:</p> <ul style="list-style-type: none"> • IBM 3270 Information Display System Terminals <ul style="list-style-type: none"> – 3275 Models 2 and 12 – 3276 Models 2, 3, 4, 12, 13, and 14 – 3277 Model 2 – 3278 Models 2, 3, 4, and 5 (monochrome) – 3279 Models 2A, 2B, 2X, 3A, 3B, 3X, S2A, S2B, and S3G (base color mode) • IBM 3472 Family • IBM 3178 Display Terminal Models C1, C2, C3, and C4 • IBM 3179 Display Terminal Model 1 and Model G (alphanumeric mode) • IBM 3180 Display Terminal Models 100 and 110 • IBM 3191 Display Terminal Models A30, A40, B30, B40, D, E, and L • IBM 3192 Color Display Terminal Models A, B, C, D, F, G, L, and W • IBM 3194 Display Terminal • IBM 3290 Information Panel • IBM PS/2 family (configured for 3270 support) • IBM Personal Computer (configured for 3278/79 support) • IBM PS/55 family (configured for 3270 support) • IBM 5550 family (configured for 3270 support) • Any other terminal that functions in compatibility mode with the terminals listed above. <p>The VM/PC servers (spool, disk, and file) available with the MVSSERV command processor require the IBM Personal Computer Models XT/370 or AT/370 with an IBM 3278/79 Device Emulation Adapter.</p>

Table 17. Hardware requirements for z/OS V1R3 and z/OS.e V1R3 elements and features (continued)

Element or feature	Additional hardware required beyond the basic hardware requirements for z/OS V1R3 or z/OS.e V1R3
z/OS UNIX System Services	<p>The extended user interface support allows existing hardware (such as terminals and workstations) and existing telecommunications software (such as VTAM and TCP/IP) that run on z/OS or z/OS.e to be used.</p> <p>For 3270 support, most 3270 type terminals or 3270 emulators in a z/OS or z/OS.e network from which a user can interactively log on to TSO/E are supported by z/OS UNIX services and include:</p> <ul style="list-style-type: none"> • Real and emulated 3270s in a VTAM SNA network which satisfy the following. <ul style="list-style-type: none"> – The minimum screen size is 24x80. – The terminal must be known to TSO/E and VTAM as a full-screen device. z/OS UNIX services use full-screen mode. – The terminal must support uppercase and lowercase characters. – A minimum of 12 PF keys are required. • UNIX workstations and other workstations in a TCP/IP network that supports the TELNET 3270 (TN3270) client function. • The OMVS command supports customized PF keys to scroll backward/forward, display HELP, hide input typed into the command line, refresh the screen, retrieve previous commands, and enter TSO/E commands. <p>For ASCII control sequence support from 3270 Displays, the OMVS command, with the pseudoterminal functions, maps and transforms a 3270 TSO/E terminal interface and user externals to the POSIX 1003.1 defined terminal interface expected by POSIX compliant user processes, including the POSIX 1003.2 Shell. This mapping consists of:</p> <ul style="list-style-type: none"> • Use of 3270 key sequences to emulate ASCII terminal control is supported. <ul style="list-style-type: none"> A set of system-defined 3270 default key sequences that map to ASCII escape control values is supplied. The user can tailor the system defaults. • Execution in canonical (line-oriented) mode only. • Conversion tables that map the 3270 data stream to a pseudoterminal device driver for both control and data are provided. Users can customize these tables. <p>For ASCII Terminal Interface, UNIX workstations and other workstations in a TCP/IP network that support the telnet or rlogin virtual terminal protocols can directly login to the z/OS Shell through Communications Server. The supported ASCII terminal interface conforms to X/OPEN Issue 4, Version 2.</p>
3270 PC File Transfer Program	An IBM or compatible PC with with appropriate communications device, such as a LAN adapter or modem, is required.

Hardware Requirements for Communications Server

Hardware requirements for Communications Server are in two sections:

- “IP Hardware Requirements”
- “SNA Hardware Requirements” on page 212.

IP Hardware Requirements

The z/OS or z/OS.e Communications Server provides direct LAN communication and provides for point-to-point communication over S/390 channels (ESCON and/or Block Multiplex) to several IBM and equivalent other vendor devices.

Direct LAN communication is provided by:

- IBM Open Systems Adapter - Express
- IBM Open Systems Adapter
- IBM 3172 Interconnect Controller
- IBM 8232 LAN Channel Station

Point-to-point communication over zSeries or S/390 channels is supported with the following devices:

- IBM RS/6000
- IBM Channel-to-Channel Adapter
- IBM 374X Communications Controller
- IBM 2216 Multiaccess Connector
- IBM Netfinity Server
- Cisco 7200 and 7500-series Channel Attached Routers
- NSC Hyperchannel A220

Network Attachments

To attach TCP/IP to the network you need one of the following network processors and associated components or their equivalents:

2216 Multiaccess Connector Model 400

- To attach to the 2216 using MPC+ or LCS, an ESCON or parallel channel adapter is required. For details, refer to *2216 ESCON Adapter Setup*.

IBM 3172 Interconnect Controller with the Interconnect Controller Program (ICP)

- IBM 3172 Interconnect Controller Model 001, 002, or 003
- IBM Interconnect Controller Program (5601-433 or 5621-425)
- One of the following types of adapters:
 - 3172 Interconnect Controller Token-Ring Adapter (#2215)
 - 3172 Interconnect Controller Ethernet Adapter (#2220)
 - 3172 Interconnect Controller Ethernet Adapter (#2225)
 - Auto LANStreamer MC 32 Adapter (#2235)
 - EtherStreamer MC 32 Adapter (#2245)
 - 3172 Interconnect Controller FDDI A Station Adapter (#2250)
 - 3172 Interconnect Controller Network Baseband Adapter/A (#2270)
 - 3172 Interconnect Controller Network Adapter II/A (#2271)
 - 3172 Interconnect Controller Network Adapter II/A Frequency 2 (#2272)
 - 3172 Interconnect Controller Network Adapter II/A Frequency 3 (#2273)
 - 3172 Interconnect Controller FDDI Adapter (#2300)
 - TURBOWAYS 100 ATM Adapter for the 3172 Model 3 (#2310) (LAN emulation for Token-Ring and Ethernet)
- One of the following channel adapters:
 - PCA adapter (#2501)
 - ESCON adapter (#2800)
- Standard System/370 I/O Channel Interface Cable

Note: The Pentium P90 Processor is supported.

IBM 8232 LAN Channel Station for LANs

- IBM 8232 LAN Channel Station Model 001 or 002
- One or more adapters for Token Ring, PC Network, or Ethernet
- Standard System/370 I/O Interface cable

IBM RISC System/6000 Channel Attachment

- To attach to the RISC System/6000 using CLAW, the following items are required:
 - IBM RISC System/6000 with the Block Multiplexer Channel Adapter (#2755)
 - AIX V3R2.3 (5756-030), or later, with feature (#5056)

- Standard ESCON Adapter
- To attach to the RISC System/6000 using MPCPTP, the following items are required:
 - AIX 4.3 (or later)
 - PCI ESCON Control Unit Connectivity Version 2.1

IBM Open Systems Adapter (OSA) Feature

- OSA-2 Feature supporting FDDI, Ethernet, Fast Ethernet, Token Ring, and ATM connections
- OSA-Express supporting Gigabit Ethernet, Fast Ethernet, Token Ring, and ATM connections

z/OS or z/OS.e Communications Server Gigabit Ethernet support requires the OSA-Express adapter.

For additional information about OSA, refer to the following publications:

- *OSA-2: OSA Planning and z900: OSA-2 Planning Guide*
- *OSA-Express:S/390: OSA-Express Customer's Guide and Reference and z900: OSA-Express Customer's Guide and Reference*

IBM 37xx family of communication controllers for X.25, Systems Network Architecture, and IP over Channel Data Link Control

- IBM 3745 Communication Controller for:
 - X.25
 - Ethernet
 - Token Ring
 - Frame Relay
- A microcode engineering change (EC) is required for the IP Dynamics (with Ethernet) capabilities:
 - C38006 for models 130, 150, 160, 170, and 17A
 - C37967 for models 210, 310, 410, and 610
 - C39888 for models 21A, 31A 41A, and 61A
- IBM 3746 or 3746–900 Communication Controller for:
 - X.25
 - ATM
 - Token Ring
 - Frame Relay
- A microcode engineering change (EC) is required for the IP-over-Channel (CDLC) for the 3746

The 3746-900 requires microcode EC number D22510 at microcode change level ECA 142 for communication across an ESCON channel. The microcode level is shipped automatically with new 3746-900s. For installed machines running an earlier level of microcode, microcode ECA 142 can be ordered by the service representative.
- Standard System/370 I/O Channel Interface Cable

HYPERchannel A220 Processor Adapter 42990007

- HYPERchannel Series A devices

- HYPERchannel Series DX devices, provided they function as Series A devices (For additional information, refer to the appropriate Network Systems Corporation documentation.)
- Standard System/370 I/O Interface cable

The ATTENTION+BUSY and unit check conditions are normally handled in the background and can affect performance without any visible evidence. The recommendations on Hyperchannel A222 and A223 Mode Switch Settings follow:

- The Disable Attentions setting on the Hyperchannel box eliminates the ATTENTION+BUSY status in response to read commands. This setting reduces overhead.
- The Enable Command Retry setting reduces the number of unit checks needed because of a trunk connection. This setting improves performance because it eliminates the need to perform sense operations and retry commands.

SNA Hardware Requirements

For communication with remote resources, one or more of the following products, or their equivalent, is required:

- Channel-to-channel adapter
- FICON channel-to-channel adapter
- IBM 2216 N Ways Multiaccess Connector
- IBM 3088 Multisystem Channel Communication Unit
- IBM 3172 N ways Interconnect Controller
- IBM 3174 Establishment Controller
- IBM 3720, 3725, or 3745 Communication Controller
- IBM 3746 N ways Multiprotocol Controller
- IBM Cross-System Coupling Facility (XCF)
- IBM Enterprise System Connection (ESCON) channel
- IBM Open Systems Adapter-Express
- IBM Open Systems Adapter

APPN over native ATM requires:

- OSA-2 adapter
- 9672 Parallel Enterprise Server Model R2 or later processor
- ATM external private or public equipment, for example, IBM 8260 N Ways Multiprotocol Intelligent Switching Hub

Multinode Persistent Sessions support requires a coupling facility with a minimum of CFLEVEL=1.

VTAM Generic Resource support requires a coupling facility with a minimum of CFLEVEL=0.

VTAM cryptographic enhancements, when used with the extended recovery facility (XRF) and Transaction Security System (TSS) family of products (4755), require 4755 Model 23 and later.

SNA triple DES (TDES) session level encryption requires an S/390 Parallel Enterprise Server Model G5 or later with the Cryptographic Coprocessor.

To use 64-bit real support or HiperSockets support, an IBM @server zSeries 800 (z800) or 900 (z900) server is required.

Appendix E. Making a copy of your system software (cloning)

At some point after you have finished installing z/OS or z/OS.e you will probably need to make a copy of it (“clone” it). Some reasons are:

- For backup. A backup copy is a copy of the z/OS product set or z/OS.e product set (z/OS or z/OS.e and other products you have installed on the same set of volumes using the same SMP/E zones) that:
 - Resides on different volumes with different volume labels
 - Includes copies of the associated SMP/E zones with different names that point to the data sets on the new volumes
 - Includes copies of the associated catalogs with different names
 - Can be IPLed in place of the original copy when the necessary setup has been done after making the copy.
- To move the software to another system.
- To create another SMP/E-serviceable copy for installing service or other products.

This appendix describes how to make a copy of the system software in the z/OS or z/OS.e product set on different DASD volumes with different volume serials. To make a copy, you must perform a number of tasks. The number and nature of the tasks depend on how your system has been configured. In addition, many of the tasks can be done using different techniques, and differing local standards and practices add more variations to the process. Some of the factors that can affect the way you copy your system are:

- Catalog-sharing boundaries (such as whether shared master catalogs are in use)
- Use of direct, indirect, or extended indirect catalog referencing
- Local versus central maintenance
- System software volume-sharing boundaries and their relationship to catalog and sysplex boundaries
- Naming conventions
- Whether new data sets affect the existing environment
- Testing and migration procedures
- Whether the copy will be used in an existing environment or a new one.

The information in this appendix is based on the system layout described in “Recommended data set placement” on page 138. However, you should find this appendix useful even if your system is configured differently. The techniques shown here are designed to minimize the amount of work required to migrate software into existing environments that use the recommended system layout. They will make a complete copy of the software that can be serviced using SMP/E.

The topics in this appendix, which correspond to the steps involved in making a copy of your system software, are:

- “Choosing names” on page 214
- “Initializing the new volumes” on page 215
- “Setting up SMS” on page 216
- “Defining new catalogs and CSI data sets” on page 216
- “Copying the software data sets” on page 216
- “Copying the SMP/E zones” on page 218

- “Making the copy usable” on page 219
- “Testing” on page 219
- “Migrating to another system” on page 220

This appendix refers to the following jobs in SYS1.SAMPLIB:

- IEACLNIN, which initializes volumes
- IEACLNSM, which converts an HFS volume to SMS management
- IEACLNCS, which defines catalogs and creates CSI data sets
- IEACLNCV, which copies volumes
- IEACLNMT, which creates a mount point directory and mounts the HFS at it
- IEACLNCZ, which copies zones

If you are migrating your software to another system and you can use the same volume, catalog, and data set names, you need only one of the procedures in this appendix. Use the full-volume physical dumps and restores to make the copy, and then follow the steps in “Migrating to another system” on page 220.

Note: If you plan to clone your ServerPac or SystemPac system to a different set of volumes for IPLing and you intend to use msys for Setup, you will have to change product home definitions. See *z/OS Managed System Infrastructure for Setup User's Guide* for the required actions when installing product homes for a cloned system.

Choosing names

The first step in preparing to make a copy of your system is choosing new names. You must choose new names for:

- The new DASD volumes that will be the target of the copy:
 - The IPL volume (TVOL1)
 - The second and any other target library volumes (TVOL2-n)
 - The HFS volume
 - The DLIB volumes, if you are also copying the distribution libraries

Choose names that allow you to define system symbols for each target volume based on the name of the IPL volume. For example, the name for TVOL1 might be 0S260 and the name for TVOL2 might be 0S260X, using the scheme OS rrr for TVOL1 and OS $rrrX$ for TVOL2, where rrr is a level identifier and the system symbols are `&SYSR2.='&SYSR1(1:5).X'`.

- User catalogs to manage the VSAM files, HFS files, and DLIB data sets. These catalogs are:
 - One for the second target library volume (TVOL2), to own the target zone CSI data set and any MMS-compiled VSAM files
 - One for the HFS volume, to own the HFS data sets
 - One for the first DLIB volume, to catalog the distribution libraries.

Choose names using a convention that avoids having two catalogs with the same name in the same catalog environment at the same time. IBM recommends that you choose a naming convention based on the volume serial of a TVOLn volume. You should pick one or more installation-wide high-level qualifiers and reserve them for catalog naming. This prevents catalog names from conflicting with any existing alias entry names. One example of such a convention is `USERCAT.volser`. In this example, the high-level qualifier `USERCAT` is reserved for naming catalogs.

- The SMP/E CSI data sets and SMP/E zones:
 - Target zone CSI data set
 - DLIB zone CSI data set
 - Target zone
 - DLIB zone

You should choose the CSI data set names using different high-level qualifiers because they will be cataloged in different catalogs. You must pick currently-unused high-level qualifiers to be able to define them as aliases and access the CSI data sets without using JOBCAT or STEPCAT. IBM recommends that you choose a high-level qualifier for CSI data set names based on the volume serial of a TVOLn volume. For example, you might use 0S26TZ.CSI as the name of a target zone CSI data set.

- MMS data sets.

If you use MMS data sets, you should choose their names using different high-level qualifiers because they will be cataloged in different catalogs. You must pick currently-unused high-level qualifiers to be able to define them as aliases and access the MMS data sets. The high-level qualifier you choose can be defined as a system symbol to avoid other parmlib changes.

IBM recommends that you choose a high-level qualifier for MMS data sets that is derived from the volume serial of a TVOLn volume. If you do, you will be able to define a single symbol for all MMS data sets in the z/OS or z/OS.e product set that will not need to be updated in the future. For example, if:

- the MMS data sets are placed on TVOL2
- and the name of TVOL2 is derived from the name of TVOL1 (by defining a system symbol for TVOL2 based on a substring of the system-supplied symbol for the IPL volume label)
- and you choose a high-level qualifier based on the name of TVOL2 for the MMS data sets

then you can define a system symbol based on the name of TVOL2 in an IEASYMxx member of parmlib. This symbol would be resolved to the high-level qualifier you used, and could be used as part of the data set name in an MMSLSTxx member of parmlib to allocate the MMS data sets associated with the IPL volume.

- HFS data sets.

HFS data sets can be optionally SMS-managed. They must be cataloged and their names must be unique within the file system structure in order to be mounted. In the IBM cloning samples, the HFS data sets are SMS-managed.

- Distribution libraries.

You can choose to use volume serials on the DLIB zone DDDEFs, or to name the data sets differently and locate them through the user catalog on the first DLIB volume. If you choose to locate them by name using the catalog, you must rename them using a new high-level qualifier.

Initializing the new volumes

To initialize the new volumes, use ICKDSF. See the **IEACLNIN** job in SYS1.SAMPLIB.

The size and location of the VTOCs specified will be changed on some of the new volumes by full-volume copy operations when sizes and locations of the VTOCs on

the volumes they are copied from are different. The VTOC size and location remains as specified for new volumes that are not copied using full-volume physical copy.

Because system software target volumes are crucial to system operation, IBM recommends that you perform surface checking on all such volumes. Different procedures are used for different DASD types. For more information about surface checking, see *Device Support Facilities User's Guide and Reference*.

Setting up SMS

Because SMS must be active and the HFS data sets must be cataloged in order to mount the HFS, some SMS setup is needed to prepare for copying the HFS volumes. The **IEACLNSM** job in SYS1.SAMPLIB does a DFSMSdss CONVERTV to convert the volume to an SMS-managed volume. The first step creates a VTOC index, which is required for all SMS-managed volumes. The second step converts the volume to an SMS-managed volume. Access to the STGADMIN.ADR.CONVERTV facility class profile or to a higher-level profile (such as STGADMIN.*) is required to run CONVERTV.

Defining new catalogs and CSI data sets

The next step in making the copy is allocating new user catalogs to manage the VSAM files, HFS files, and distribution libraries. The **IEACLNCS** job in SYS1.SAMPLIB defines three user catalogs:

- A user catalog on TVOL2 to own the SMP/E target zone CSI data set and MMS data sets
- A user catalog on the HFS volume to own the HFS
- A user catalog on the first DLIB volume to manage the DLIB zone CSI data set and distribution libraries.

The user catalogs are defined using IDCAMS commands. These catalogs will not contain a large number of entries, so it is not necessary to allocate very much space for them.

Alias entries are defined to relate the new high-level qualifiers you chose for the VSAM files, HFS files, and distribution libraries to the new catalogs. This will establish the new catalogs as the owning catalogs for the VSAM and HFS files, making the volumes with their catalogs and data sets portable to other systems.

Next, new CSI data sets are defined, using the source data sets as models for allocating the new ones.

Because SMP/E CSI data sets must be initialized with the GIMZPOOL record before SMP/E can process them, both must be primed using the REPRO command:

Copying the software data sets

The previous steps created the environment needed to copy the data on the z/OS or z/OS.e volumes. All the data except that in the SMP/E CSIs is copied using DFSMSdss. The job in SYS1.SAMPLIB for copying volumes is **IEACLNCV**.

The PARALLEL parameter is used to let DFSMSdss multitask the copy and dump operations so they can be done more quickly. The SERIAL parameter is used to make sure that the HFS volume dump completes before the HFS volume restore.

Access to the STGADMIN.ADR.STGADMIN.COPY facility class profile, or to a higher-level profile (such as STGADMIN.*), is required to use the ADMINISTRATOR keyword. If you do not use the ADMINISTRATOR keyword, UPDATE or higher access to all the data sets on the volume is required.

The data on each volume is copied differently, depending on the volume being copied and its content:

- Because TVOL1 has no VSAM or SMS-managed data sets, it can be copied using full-volume physical copy.

Note: Physical copy preserves the IPL text on TVOL1, so no steps are needed to replace it. If you are copying the system software between volumes on different device types, you will need to use copy-by-data-set rather than full-volume copy. Copy-by-data-set does not preserve the IPL text, so you have to replace the IPL text whenever you copy TVOL1 to a different device type.

- TVOL2 contains a user catalog and VSAM data sets (the target zone CSI data set and any MMS-compiled data sets). It is copied by data set, excluding the user catalog, VTOC Index, SMP/E target zone CSI data set, and VSAM Volume Data Set (VVDS). The VSAM data sets are renamed using the new high-level qualifiers you chose.

The SMP/E CSI data sets are copied later using SMP/E commands.

Note: The RECATALOG parameter catalogs all the data sets during the copy of TVOL2 in the user catalog on TVOL2. However, only the SMP/E CSI, SMP/E non-VSAM, and MMS-compiled data sets will actually be accessed using this catalog, because extended indirect cataloging is used to find them in the normal catalog search order.

- The HFS volume cannot be copied because DFSMSdss does not support logical copy for an HFS. Instead, it is dumped to a temporary dump data set on DASD and restored. It is renamed using the new high-level qualifier you chose earlier during the restore operation, and cataloged in the user catalog on the volume. Remember that all HFS data sets that are associated with a particular system should be cloned. This includes the root as well as the /etc and /var file systems. When your clone system is IPLed, you will also need unique /dev and /tmp file systems.
- The first DLIB volume is copied by data set, similar to the way TVOL2 is copied, because it contains the DLIB zone CSI data set and user catalog. Its data sets are renamed during the copy using the new high-level qualifier you chose. If you prefer not to rename the data sets, remove the RENAMEU parameter.
- The second DLIB volume is copied by data set. Its data sets are renamed during the copy using the new high-level qualifier you chose. If you prefer not to rename the data sets, remove the RENAMEU parameter.

Note: The RECATALOG parameter catalogs all the data sets during the copies of the DLIB volumes in the user catalog on DLIB1. However, only the SMP/E CSI and SMP/E non-VSAM data sets will actually be accessed using this catalog.

If you're making a clone for the purpose of creating an SMP/E-serviceable copy, make the HFS files accessible by mounting the filesystems at the mount point you chose. To do this, you must first create the directory by issuing the MKDIR command. For example, you could issue `mkdir /service` to create a directory named SERVICE. Then, you could issue MOUNT commands from a TSO user ID to mount the filesystems. The user ID must have superuser authority (either UID(0) or READ access to an applicable RACF UNIXPRIV class profile) to issue the MOUNT command. For more information about the MKDIR and MOUNT commands, see *z/OS UNIX System Services Command Reference*. For a sample job, see IEACLNMT in SYS1.SAMPLIB.

Copying the SMP/E zones

The SMP/E zones are copied using ZONECOPY rather than IDCAMS REPRO so that both the zones and the CSI data sets can be renamed. This makes it possible to use both the old and new target and DLIB zones with a single global zone. The **IEACLNCZ** job in SYS1.SAMPLIB shows how to do a ZONECOPY.

Before the zones are copied, the global zone's ZONEINDEX entry must be updated with the new CSI data set and zone names.

Next, the zones are copied using ZONECOPY commands. Because the SMP/E boundary is already set to do the ZONECOPY, the ZONEEDIT commands to change the DDDEFs to reflect new volume serials (and data set names, for the DLIB zone) can be issued at the same time.

If you have copied an existing cataloged data set that does not have the VOLUME defined to the new target system using the same name, you must use an ADD DDDEF for the new target data set. If this is not done, the new code will be installed into the existing cataloged data set and not the new target data set.

REP TARGETZONE(newtgt) RELATED(newdlb) is an optional command, to be added only if the DLIBs and DLIB zone will be copied at the same time as the target libraries and zone.

As a rule, you should not install service or products on the same copy of the system software that the system is using. This includes those parts of the system software that reside in an HFS. The way to update a copy of an HFS is to mount it on another mount point. The system will continue to use its own level of the HFS, and the copy will be accessible using the other mount point.

Before making any updates to the copy with SMP/E, you should change the HFS path DDDEFs to point to another directory, usually called a service directory, and mount the copy's HFS filesystems on that directory's mount point. This assures that SMP/E will update the correct HFS when products and service are installed.

To change the DDDEFs, use the SMP/E ZONEEDIT command. For example, the following commands will add /service to the beginning of all HFS paths:

```
SET BDY(NEWTGT) .  
  
ZONEEDIT DDDEF .  
  
CHANGE PATH(*,'/service'*) .  
  
ENDZONEEDIT .
```

Note that the HFS remains usable for backup no matter where the DDDEFs point. If you IPL using a BPXPRMxx member that mounts the copy's HFSs at their normal mount points (not the service mount points), the system will function normally. The DDDEFs only affect where SMP/E searches for or stores parts that reside in an HFS.

For more information about servicing elements in the HFS, see the topic about installing service with the Hierarchical File System in *z/OS UNIX System Services Planning*.

Making the copy usable

Once you have completed the preceding steps, you have a backup copy of the z/OS or z/OS.e product set. If you have used the recommended system layout (described in "Recommended data set placement" on page 138), used indirect and extended indirect cataloging (described in "Using indirect catalog entries" on page 153), used a consistent TVOLn naming convention that lets you use system symbols to derive the names of TVOL2-n, and avoided the use of explicit volume serials in the link, LPA, and APF lists, there should be very few other actions you need to take to use the copy as a backup suitable for IPL. Because the SMP/E zones were copied with the software, you can also query the level of any SMP/E-maintained part of this copy of the system at any time.

The one thing you will have to do is create another BPXPRMxx member of parmlib to point to the new HFS data sets.

If you have not followed the recommendations mentioned above, you will have additional work to do. For example:

- If you didn't use indirect cataloging, you need to create a copy of the master catalog to IPL with the new backup volumes. For information about creating a copy of your master catalog, see *z/OS DFSMS: Managing Catalogs*.
- If you coded volume serials for z/OS or z/OS.e product set volumes in the link, LPA, or APF lists, you need to create new parmlib members.
- If your clone is for a new image, you need to copy image-related data sets. See "Image-related data sets" on page 145 for information.
- If your clone is for a sysplex, you need to copy sysplex-related data sets. See "Cluster-related data sets" on page 147 for information.

Testing

Never assume that the backup copy will work until it has been tested. Schedule a test time on the system to be backed up to make sure that the copying process was successful and that backup procedures work. If this isn't possible, a slightly more risky alternative is using a test system with copies of the production system's operational data sets.

Migrating to another system

Note!

This section only lists actions you need to take to move a copy of software from one system to another. It does not list the actions needed to install and migrate new levels of software. See other sections of this book, *z/OS MVS Migration*, and other z/OS or z/OS.e elements' installation planning and migration books for that information.

If you want to move the copy to another system that also uses the recommended system layout, there are only a few things left to do:

- If you chose to SMS-manage your HFS data sets, define the HFS volume to SMS on the other system if the volume is not in the same SMS-plex. You can define the HFS volume using ISMF, the same way it was defined in "Setting up SMS" on page 216.
- Import the user catalogs and define the data set aliases if the target system for migration is not sharing its master catalog with the system from which you made the copy.
- Create a new BPXPRMxx member of parmlib on the other system to point to the copy's HFS files.

Copy the active BPXPRMxx member of parmlib to a new member. Also, update the ROOT FILESYSTEM and MOUNT FILESYSTEM statements to point to the copy's HFS data sets.

- Install any system-specific usermods. Also, install any system-specific exits that cannot be installed separately from the system software.
- Specify the master catalog name in LOADxx rather than in SYSCATxx members of the NUCLEUS data set. This is IBM's recommendation. However, if you choose to specify it using SYSCATxx, you must add or update this member to reflect the name of the intended image's master catalog.

To import the user catalogs and define the aliases, use IDCAMS:

```
IMPORT -
CONNECT -
  OBJECTS((usercat.newhfs VOLUMES(newhfs) DEVT(3390)))

IMPORT -
CONNECT -
  OBJECTS((usercat.newtv2 VOLUMES(newtv2) DEVT(3390)))

IMPORT -
CONNECT -
  OBJECTS((usercat.newd11 VOLUMES(newd11) DEVT(3390)))

DEFINE -
ALIAS -
  (NAME(hfsnew) -
  RELATE (usercat.newhfs))

DEFINE -
ALIAS -
  (NAME(newtarg) -
  RELATE (usercat.newtv2))

DEFINE -
ALIAS -
  (NAME(newmms) -
```

```
RELATE (usercat.newtv2)
DEFINE -
ALIAS -
(NAME(newlib) -
RELATE (usercat.newd11))
```

Appendix F. OS/390 R8 migration and fallback

Most customer environments already comply with the single, consistent, four-consecutive-release policy for coexistence, migration, and fallback, described in “Coexistence-Migration-Fallback policy” on page 85. However, those migrating a stand-alone system from OS/390 R8 to z/OS V1R3 are in a unique situation. Migration of a stand-alone system from OS/390 R8 to z/OS V1R3, and corresponding fallback, are allowed. However, the policy does not allow coexistence of OS/390 R8 systems with z/OS V1R3 systems. The effect is that OS/390 R8 migration and fallback are allowed only for single-system environments, not multisystem environments.

If you are migrating from OS/390 R8 in a single-system environment, refer to this appendix for fallback service required on your OS/390 R8 system, and to determine whether there are any migration actions for each element and feature.

In the future

When you migrate *from* OS/390 R10 or from any subsequent release, the release *to* which you migrate must be within four consecutive releases in order to be fully supported. That is, migration forward as well as backout must be made within four consecutive releases. This policy is applicable to all configurations, whether single-system or multisystem.

OS/390 R8 fallback service

Prior to migrating from OS/390 R8 to z/OS V1R3, apply the service shown in Table 18.

Table 18. Fallback service (PTFs) needed on OS/390 R8 systems

Element or feature, and reason service is needed	OS/390 R8 PTFs
BCP: Supports the coexistence of prior levels of the console services components with z/OS V1R2 and later	UW80194
BCP: Lets OS/390 R8 systems tolerate the automatic restart management (ARM) support for Transactional Services for VSAM introduced in OS/390 R9	UW73393
BCP: PTF UW70740 (APAR OW36418) provides corrective service for GRS (global resource serialization) contention management processing. PTF UW70734 (APAR OW43304) provides compatibility support to allow systems in a Parallel Sysplex configuration to migrate to the corrected GRS contention management processing without requiring a sysplex-wide IPL. Therefore, install PTF UW70734 on <i>every</i> system in the sysplex before installing PTF UW70740 on <i>any</i> system in the sysplex. The correction to contention management processing will not be fully available until both PTFs have been propagated to <i>every</i> system in the sysplex. A sysplex-wide IPL is <i>not</i> required to install either PTF.	UW70734, UW70740

Table 18. Fallback service (PTFs) needed on OS/390 R8 systems (continued)

Element or feature, and reason service is needed	OS/390 R8 PTFs
<p>BCP: Allows GRS RNLs (resource name lists) to continue to be consistent across a Parallel Sysplex configuration when falling back from z/OS V1R2 or later to OS/390 R8. z/OS V1R2 introduced wildcard RNL function. If you roll out z/OS V1R2 or later across a sysplex and implement the new function, then have to back off, without the PTF you would have to do a sysplex-wide IPL at OS/390 R8 level to allow all the systems to be restarted, because the new function is not supported by OS/390 R8. (If a system that does not support wildcard RNLs is IPLed into a sysplex that is using them, the system that is not using them will be waitstated by the other systems to maintain consistency of RNLs across the sysplex.)</p>	UW82055, UW84679
<p>BCP: Allows the logger to do multiple reads from large buffers for log data. This PTF does not have to be installed on all systems within a Parallel Sysplex before z/OS is IPLed into the sysplex.</p>	UW71045
<p>BCP: Allows the logger to issue an explicit error message when a LOGR couple data is in use that is at a later level than the current system supports.</p>	UW78270
<p>BCP: Allows OS/390 R8 systems in a Parallel Sysplex configuration to participate in sysplex-wide monitoring that may be triggered by an OS/390 R10 or later system that supports structure full monitoring</p>	UW63195 or, if Japanese, UW63528
<p>BCP: Ensures compatibility with the RRS cascaded transaction support introduced in OS/390 R9</p>	UW67818
<p>BCP: Allows RRS to coordinate a cascaded transaction that crosses multiple systems in a Parallel Sysplex configuration.</p>	UW79663, UW79666, UW79669, UW79672, UW80857
<p>BCP: As of OS/390 R10, there is new 32 KB block size support and unit affinity support. This scheduler PTF allows jobs that do not request the new functions to run successfully when the jobs are submitted on OS/390 R10 or later but routed by JES3 for execution on earlier OS/390 levels.</p>	UW69770
<p>BCP: Supports the coexistence of prior levels of the console services components with z/OS V1R1 and later systems in a Parallel Sysplex configuration.</p>	UW77470 or, if Japanese, UW77474
<p>BCP: Supports the coexistence of prior levels of WLM with OS/390 R10 and later systems in a Parallel Sysplex configuration</p>	UW71000
<p>BDT: Changes five-digit JES3 job numbers to eight-character job identifiers in BDT messages.</p>	UW79523 (for BDT base element), UW79524 (for BDT SNA NJE feature)
<p>Cryptographic Services: Allows pre-OS/390 R10 systems to share an ICSF cryptographic key data set (CKDS) with an OS/390 R10 or later system (once key types of IMPORTER, EXPORTER, PINGEN, PINVER, IPINEC, or OPINENC, which have non-CCF control vectors, are added to the CKDS). Without this PTF applied, ICSF services invoked with a key containing a non-CCF control vector executing on pre-OS/390 R10 systems might appear to execute successfully, with a return code of 0 and a reason code of 0 or 4, but the output from the services is useless.</p>	UW73741

Table 18. Fallback service (PTFs) needed on OS/390 R8 systems (continued)

Element or feature, and reason service is needed	OS/390 R8 PTFs
Cryptographic Services: Provides an interface to allow the Trusted Key Entry (TKE) administrator to enable and disable access control points in the default role in TKE 3.x. As new access control points are added, existing TKE users must enable these new access control points to allow access to the corresponding ICSF callable service. The access control points are not automatically enabled in the default role.	UW76269
Cryptographic Services: Provides support for ICSF users who share public key data sets (PKDSs) between pre-z/OS V1R2 systems and z/OS V1R2 and later systems.	UW83669
DFSMSdfp: Allows pre-OS/390 R10 systems to tolerate records created on OS/390 R10 and later systems with block sizes greater than 32 KB	UW61954, UW62977, UW63366
DFSMSdfp: Enables VSAM data sets to be striped across multiple volumes	UW67759
DFSMSdfp: Allows coexistence of object access method (OAM) multiple object backup function in z/OS V1R3 with prior releases	UW83214
DFSMSdfp: Allows systems prior to z/OS V1R3 to tolerate z/OS V1R3 systems that cache VSAM record-level sharing (RLS) data set control intervals greater than 4 KB	UW79855
DFSMSdfp: The large volume support in z/OS V1R3 DFSMSdfp (and in OS/390 R10, z/OS V1R1, and z/OS V1R2 via new function PTFs) allows configured volumes up to 32b760 cylinders on an IBM Enterprise Storage Server volume to come online. The coexistence PTF applied to OS/390 R8 prevents a volume configured with more than 10b017 cylinders from coming online on OS/390 R8, which doesn't have the large volume support.	UW81155
DFSMSdfp: Allows the directory entries for PO4 format program objects created by the z/OS V1R3 program management binder to be accessed on an OS/390 R8 system.	UW79796
DFSMSShsm: Allows pre-OS/390 R10 systems to tolerate records created on OS/390 R10 and later systems with block sizes greater than 32 KB	UW68028
DFSMSShsm: Supports up to 64 concurrent command data set backups to either ML1 DASD or tape. This enhancement increases the rate at which DFSMSShsm can perform command data set backups and allows more batch applications to take advantage of it.	UW73892
DFSMSShsm: The DFSMSShsm support for large volumes changes the format of certain DFSMSShsm control data set records. The support was added to OS/390 R10, z/OS V1R1, and z/OS V1R2 via PTF UW83221 and integrated in z/OS V1R3. z/OS V1R3 has built-in support for large volumes. If this support will be used, then UW83221 must be applied on all OS/390 R10, z/OS V1R1, and z/OS V1R2 systems. The OS/390 R8 DFSMSShsm coexistence PTF enables OS/390 R8 DFSMSShsm hosts to coexist with OS/390 R10 and later DFSMSShsm hosts that are managing large volumes.	UW83220

Table 18. Fallback service (PTFs) needed on OS/390 R8 systems (continued)

Element or feature, and reason service is needed	OS/390 R8 PTFs
DFSMSHsm: Allows pre-z/OS V1R3 systems to utilize CAPACITYMODE(EXTENDED) tapes created by IBM 3590 tape units in 3490 emulation mode. z/OS V1R3 has built-in support for CAPACITYMODE(EXTENDED) tapes.	UW99377, UW99379, UW99381, UW99387
DFSMSrmm: Allows pre-OS/390 R10 systems to use the import/export function when sharing a virtual tape server (VTS) with import/export function enabled	UW57640
DFSMSrmm: Allows pre-OS/390 R10 systems to share the same DFSMSrmm control data set with OS/390 R10 and later systems using the D/T3494 VTS advanced function support	UW61562
DFSMSrmm: Allows toleration of the extended volume and bin records in the DFSMSrmm control data set introduced with the enhanced bin management support. The support was added to OS/390 R10, z/OS V1R1, and z/OS V1R2 via APAR OW49863 and integrated in z/OS V1R3.	UW78507
Language Environment: Allows downward compatibility , that is, developing applications on OS/390 R10 or later releases and running them on earlier releases	UQ39534, UQ39549, UQ40403, UQ41303, UQ46033, UQ47771, UQ48119, UQ52703
SDSF: Allows OS/390 R8 SDSF to coexist with z/OS V1R2 and later	UQ53587, UQ53592
Security Server: Lets OS/390 R8 systems in a Parallel Sysplex configuration tolerate the larger RACF ENVR objects that OS/390 R10 and later consoles might pass them	UW66593
Security Server: Allows lower-level systems in a Parallel Sysplex configuration to recognize a new cross-system coupling facility (XCF) signal used by z/OS V1R2 and later RACF to improve control of deletion of cached accessor environment elements (ACEEs) from the virtual lookaside facility (VLF).	UW79592, UW82521
Security Server: Enforces z/OS UNIX file system security across a Parallel Sysplex configuration when access control lists(ACLs) are used.	UW82571, UW83147, UW85646, UW87240
SMP/E: Allows OS/390 R8 SMP/E to tolerate enhancements introduced in z/OS V1R2 SMP/E.	UR52665
TSO/E: Allows toleration of the new (introduced in z/OS V1R3) BROADCAST keyword of the SEND statement in parmlib member IKJTSOxx. Also, if LOGNAME(*) is coded in the SEND statement in parmlib member IKJTSOxx, it will be correctly interpreted as LOGNAME(SYS1.BROADCAST) by the lower-level system.	UW83401
z/OS UNIX System Services: Provides support to simultaneously run Parallel Environment jobs using different releases of OS/390	UW64384

Identifying OS/390 R8 – to – z/OS V1R3 migration actions

Table 19 on page 227 helps you migrate from the OS/390 R8 levels of elements and features by telling you whether there are any migration actions to perform and, if there are, where you can find the migration actions.

Table 19. Elements and features that have migration actions in a migration from OS/390 R8 to z/OS V1R3

Element or feature	Are there migration actions from OS/390 R8 to z/OS V1R3?	Notes (including where to look for migration actions)
BCP	Yes	See <i>z/OS MVS Migration</i> .
BDT	No	
BDT File-to-File (z/OS only)	No	
BDT SNA NJE	No	
BookManager BookServer	Yes	See “BookManager BookServer migration actions” on page 111.
BookManager BUILD (z/OS only)	No	
BookManager READ (z/OS only)	No	
C/C++ IBM Open Class Library	Yes	See “C/C++ migration actions” on page 112 and <i>z/OS C/C++ Compiler and Run-Time Migration Guide</i> .
C/C++ with Debug Tool	Yes	See “C/C++ migration actions” on page 112 and <i>z/OS C/C++ Compiler and Run-Time Migration Guide</i> .
C/C++ without Debug Tool	Yes	See “C/C++ migration actions” on page 112 and <i>z/OS C/C++ Compiler and Run-Time Migration Guide</i> .
Communications Server	Yes	See <i>z/OS Communications Server: IP Migration</i> and <i>z/OS Communications Server: SNA Migration</i> .
Communications Server NPF (z/OS only)	No	
Communications Server Security Level 1	Yes	This feature, formerly named SecureWay Communications Server Security Level 1, was removed from the operating system as of z/OS V1R2 (last delivered in z/OS V1R1). This feature provided Version 4 Kerberos support. However, Version 5 Kerberos support is more current and is already provided by the z/OS Security Server feature. You should modify any applications that currently use the Kerberos Version 4 support provided by this feature to use the Kerberos Version 5 support provided by the z/OS Security Server feature. You will need to rewrite Kerberos V4 applications to use the Kerberos V5 application programming interface (API) and data structures. For assistance, see <i>z/OS SecureWay Security Server Network Authentication Service Administration</i> and <i>z/OS SecureWay Security Server Network Authentication Service Programming</i> .

Table 19. Elements and features that have migration actions in a migration from OS/390 R8 to z/OS V1R3 (continued)

Element or feature	Are there migration actions from OS/390 R8 to z/OS V1R3?	Notes (including where to look for migration actions)
Communications Server Security Level 2	Yes	This feature, formerly named SecureWay Communications Server Security Level 2, was removed from the operating system as of z/OS V1R2 (last delivered in z/OS V1R1). This feature provided Version 4 Kerberos support. However, Version 5 Kerberos support is more current and is already provided by the z/OS Security Server feature. You should modify any applications that currently use the Kerberos Version 4 support provided by this feature to use the Kerberos Version 5 support provided by the z/OS Security Server feature. You will need to rewrite Kerberos V4 applications to use the Kerberos V5 application programming interface (API) and data structures. For assistance, see <i>z/OS SecureWay Security Server Network Authentication Service Administration</i> and <i>z/OS SecureWay Security Server Network Authentication Service Programming</i> .
Communications Server Security Level 3	No	
Cryptographic Services	Yes	See <i>z/OS ICSF System Programmer's Guide</i> .
DCE Application Support (z/OS only)	No	
DCE Base Services	No	
DCE User Data Privacy CDMF	No	Removed as an optional feature as of OS/390 R9. The function was merged into the DCE Base Services base element.
DCE User Data Privacy DES/CDMF	No	Removed as an optional feature as of OS/390 R9. The function was merged into the DCE Base Services base element.
DFSMSdfp	Yes	See <i>z/OS DFSMS Migration</i> .
DFSMSdss	Yes	See <i>z/OS DFSMS Migration</i> .
DFSMShsm	Yes	See <i>z/OS DFSMS Migration</i> .
DFSMSrmm	Yes	See <i>z/OS DFSMS Migration</i> .
DFSORT	No	Migration might be from the OS/390 or z/OS feature, or from the stand-alone product. Regardless, there are no migration actions.
Distributed File Service	No	
Encina Toolkit Executive (z/OS only)	No	
EREP	No	
ESCON Director Support	No	
FFST	No	
GDDM (z/OS only)	No	
GDDM-PGF (z/OS only)	No	

Table 19. Elements and features that have migration actions in a migration from OS/390 R8 to z/OS V1R3 (continued)

Element or feature	Are there migration actions from OS/390 R8 to z/OS V1R3?	Notes (including where to look for migration actions)
GDDM-REXX (z/OS only)	No	
HCD	Yes	If you're migrating to a z800 or z900 processor, there are migration actions. See <i>z/OS HCD Planning</i> .
HCM	No	
HLASM	No	Migration might be from the OS/390 or z/OS base element, or from the stand-alone product. Regardless, there are no migration actions.
HLASM Toolkit	No	Migration might be from the OS/390 or z/OS feature, or from the stand-alone product feature. Regardless, there are no migration actions.
IBM HTTP Server	Yes	See <i>z/OS HTTP Server Planning, Installing, and Using</i> . In OS/390 R8, IBM HTTP Server was a component of the base element WebSphere Application Server.
IBM HTTP Server Export Secure	No	Removed from the operating system as of OS/390 R10. It is no longer needed; the equivalent level of security is provided by base element Cryptographic Services.
IBM HTTP Server France Secure	No	Removed from the operating system as of OS/390 R10. It is no longer needed; the equivalent level of security is provided by base element Cryptographic Services.
IBM HTTP Server NA Secure	No	
ICKDSF	No	
ILM	No	New in z/OS V1R1
Infoprint Server	Yes	Migration might be from the OS/390 or z/OS feature, the IP PrintWay feature of PSF V3, or the NetSpool feature of PSF V3. Migration actions are in <i>z/OS Infoprint Server Migration</i> .
ISPF	Yes	For host-based services, see <i>z/OS ISPF Planning and Customizing</i> . For client-server services, see <i>z/OS ISPF User's Guide</i> .
JES2	Yes	See "JES2 migration action for pre-release 4 mode" on page 113 and <i>z/OS JES2 Migration</i> .
JES3	Yes	See <i>z/OS JES3 Migration</i> .
LAN Server	Yes	OS/390 R9 was the last release to include both the workstation and host components. OS/390 R10 and z/OS V1R1 had only the host component. As of z/OS V1R2, neither component is available. See the redbook <i>S/390 File and Print Serving</i> , SG24-5330, for alternative solutions and migration guidance.

Table 19. Elements and features that have migration actions in a migration from OS/390 R8 to z/OS V1R3 (continued)

Element or feature	Are there migration actions from OS/390 R8 to z/OS V1R3?	Notes (including where to look for migration actions)
Language Environment	Yes	<p>Migration actions are in “Language Environment migration actions” on page 114, <i>z/OS Language Environment Run-Time Migration Guide</i>, and:</p> <ul style="list-style-type: none"> • <i>z/OS C/C++ Compiler and Run-Time Migration Guide</i> • <i>COBOL for OS/390 & VM Compiler and Run-Time Migration Guide</i> • <i>Language Environment for MVS & VM Fortran Run-Time Migration Guide</i> • <i>PL/I for MVS & VM Compiler and Run-Time Migration Guide</i> • <i>VisualAge PL/I for OS/390 Compiler and Run-Time Migration Guide</i> <p>Migration might be from the OS/390 or z/OS Language Environment base element, or from the following pre-Language Environment run-time libraries:</p> <ul style="list-style-type: none"> • C/370 V1 and V2 • OS/VS COBOL • VS COBOL II • VS FORTRAN V1 and V2 • OS PL/I V1 and V2 <p>Note: The listed products contain both a compiler and a run-time library. The object programs produced by the compilers are supported running under z/OS Language Environment, although not all of the compilers themselves are still supported.</p>
Language Environment Data Decryption	No	Removed as an optional feature as of OS/390 R9. The function was merged into the Language Environment base element.
LANRES	No	Removed from the operating system as of z/OS V1R3 (last delivered in z/OS V1R2). For migration information, see the white paper at http://www.ibm.com/eserver/zseries/library/whitepapers/gm130035.html .
MICR/OCR (z/OS only)	No	
msys for Operations	No	New in z/OS V1R2
msys for Setup	No	New in z/OS V1R1
Network File System	No	
OCSF France	No	Removed as an optional feature as of OS/390 R9. The function was merged into the Cryptographic Services base element.
OCSF Security Level 1	No	Removed as an optional feature as of OS/390 R9. The function was merged into the Cryptographic Services base element.
OCSF Security Level 2	No	Removed as an optional feature as of OS/390 R9. The function was merged into the Cryptographic Services base element.
OCSF Security Level 3	No	
OSA/SF	No	
RMF	Yes	See <i>z/OS RMF User's Guide</i> .
SDSF	Yes	See <i>z/OS SDSF Operation and Customization</i> .

Table 19. Elements and features that have migration actions in a migration from OS/390 R8 to z/OS V1R3 (continued)

Element or feature	Are there migration actions from OS/390 R8 to z/OS V1R3?	Notes (including where to look for migration actions)
Security Server	Yes	See <i>z/OS Security Server RACF Migration</i> , <i>z/OS Security Server LDAP Server Administration and Use</i> , and <i>z/OS SecureWay Security Server Firewall Technologies</i> .
Security Server Network Authentication Service Level 3	No	New in z/OS V1R2
SMP/E	Yes	See <i>SMP/E User's Guide</i> .
Softcopy Print	Yes	Removed from the operating system as of OS/390 R10. See Softcopy Print in "Elements, features, and functions withdrawn from z/OS and OS/390" on page 20.
SOMobjects ADE	Yes	Removed from the operating system as of z/OS V1R2. Instead, consider the WebSphere line of products.
SOMobjects RTL	Yes	Removed from the operating system as of z/OS V1R2. Instead, consider the WebSphere line of products.
System SSL Security Level 2	No	Removed as an optional feature as of OS/390 R10. The function was merged into the Cryptographic Services base element.
System SSL Security Level 3	No	
Text Search	No	
TIOC	No	
Tivoli Management Framework	Yes	Removed from the operating system as of z/OS V1R2. Instead, consider the stand-alone product Tivoli Management Framework V3 for OS/390, 5697-D10.
TSO/E	No	
VisualLift ADE	No	Removed from the operating system as of OS/390 R10.
VisualLift RTE	No	Removed from the operating system as of OS/390 R10.
WebSphere Application Server	Yes	Removed from the operating system as of OS/390 R10. Instead, consider the stand-alone product WebSphere Application Server for OS/390 V3 (5655-A98).
z/OS UNIX System Services	Yes	See <i>z/OS UNIX System Services Planning</i> .
3270 PC File Transfer Program	No	

Appendix G. Accessibility

Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, to use software products successfully. The major accessibility features in z/OS and z/OS.e enable users to:

- Use assistive technologies such as screen-readers and screen magnifier software
- Operate specific or equivalent features using only the keyboard
- Customize display attributes such as color, contrast, and font size

Using assistive technologies

Assistive technology products, such as screen-readers, function with the user interfaces found in z/OS and z/OS.e. Consult the assistive technology documentation for specific information when using it to access z/OS or z/OS.e interfaces.

Keyboard navigation of the user interface

Users can access z/OS and z/OS.e user interfaces using TSO/E or ISPF. Refer to *z/OS TSO/E Primer*, *z/OS TSO/E User's Guide*, and *z/OS ISPF User's Guide Volume 1* for information about accessing TSO/E and ISPF interfaces. These guides describe how to use TSO/E and ISPF, including the use of keyboard shortcuts or function keys (PF keys). Each guide includes the default settings for the PF keys and explains how to modify their functions.

Additional accessibility features may be included as part of the user interface of a particular z/OS or z/OS.e element. Check the individual element's documentation for any additional information about accessibility.

Notices

This information was developed for products and services offered in the U.S.A. IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

IBM Director of Licensing
IBM Corporation
North Castle Drive
Armonk, NY 10504-1785
USA

For license inquiries regarding double-byte (DBCS) information, contact the IBM Intellectual Property Department in your country or send inquiries, in writing, to:

IBM World Trade Asia Corporation
Licensing
2-31 Roppongi 3-chome, Minato-ku
Tokyo 106, Japan

The following paragraph does not apply to the United Kingdom or any other country where such provisions are inconsistent with local law:

INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Licensees of this program who wish to have information about it for the purpose of enabling: (i) the exchange of information between independently created programs and other programs (including this one) and (ii) the mutual use of the information which has been exchanged, should contact:

IBM Corporation
Mail Station P300
2455 South Road
Poughkeepsie, NY 12601-5400
USA

Such information may be available, subject to appropriate terms and conditions, including in some cases, payment of a fee.

The licensed program described in this information and all licensed material available for it are provided by IBM under terms of the IBM Customer Agreement, IBM International Program License Agreement, or any equivalent agreement between us.

If you are viewing this information softcopy, the photographs and color illustrations may not appear.

Trademarks

The following terms are trademarks of the IBM Corporation in the United States, other countries, or both:

- 3090
- 3890/XP
- AD/Cycle
- Advanced Function Presentation
- Advanced Function Printing
- AFP
- AIX
- AnyNet
- APL2
- APPN
- AT
- BatchPipes
- BookManager
- BookMaster
- C/MVS
- C/370
- CallPath
- CallPath CICS/MVS
- CICS
- CICS/ESA
- CICS/MVS
- CICSplex
- COBOL/370
- DataPropagator
- DataRefresher
- DB2
- DB2 OLAP Server
- DB2 Universal Database
- DFS
- DFSMS/MVS
- DFSMSdfp
- DFSMSdss
- DFSMSHsm
- DFSMSrmm
- DFSORT
- DisplayWrite
- DPI
- Electronic Service Agent
- Encina
- Enterprise Storage Server
- Enterprise Systems Architecture/390

- Enterprise System/3090
- Enterprise System/4381
- Enterprise System/9000
- Enterprise Systems Architecture/370
- ES/3090
- ES/4381
- ES/9000
- ESCON
- @server
- EtherStreamer
- Extended Services
- FFST
- FICON
- First Failure Support Technology
- FlowMark
- FunctionPac
- GDDM
- geoManager
- IBM
- IBMLink
- ImagePlus
- IMS
- IMS/ESA
- Infoprint
- Intelligent Miner
- Intelligent Printer Data Stream
- IP PrintWay
- IPDS
- Language Environment
- LANStreamer
- Magstar
- Micro Channel
- MQSeries
- Multiprise
- MVS
- MVS/ESA
- Net.Data
- Netfinity
- NetSpool
- Network Station
- Nways
- OfficeVision/MVS
- Open Class
- OpenEdition
- OS/2
- OS/390
- Parallel Sysplex
- PR/SM
- Print Services Facility
- Processor Resource/Systems Manager
- ProductPac
- PS/2
- QMF
- RACF
- RAMAC
- Redbooks

- Resource Measurement Facility
- RETAIN
- RISC System/6000
- RMF
- RS/6000
- S/370
- S/390
- S/390 Parallel Enterprise Server
- SAA
- SecureWay
- SOM
- SOMobjects
- SP
- SQL/DS
- StorWatch
- Sysplex Timer
- System/370
- System/390
- SystemPac
- SystemView
- TURBOWAYS
- VisualAge
- VisualGen
- VisualLift
- VM/ESA
- VSE/ESA
- VTAM
- WebSphere
- WIN-OS/2
- XT
- z/Architecture
- z/OS
- z/OS.e
- z/VM
- zSeries

1-2-3, Domino, and Lotus are trademarks of Lotus Development Corporation in the United States, other countries, or both.

NetView, Tivoli, Tivoli Management Framework, and Tivoli Manager are trademarks of International Business Machines Corporation or Tivoli Systems Inc. in the United States, other countries, or both.

Java and all Java-based trademarks and logos are trademarks or registered trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.

Microsoft, Windows, Windows NT, and the Windows logo are trademarks of Microsoft Corporation in the United States, other countries, or both.

Pentium is a trademark of Intel Corporation in the United States, other countries, or both. (For a complete list of Intel trademarks, see <http://www.intel.com/tradmarx.htm>.)

UNIX is a registered trademark of The Open Group in the United States and other countries.

Other company, product, and service names may be trademarks or service marks of others.

Index

Special characters

- /etc directory
 - migrating files 116
- /var directory
 - migrating files 116

Numerics

- 3270 PC File Transfer Program
 - base element 20
 - hardware requirements 209
 - migration actions from OS/390 R8 231
 - migration actions from OS/390 R9 and later 111
 - software requirements 182
- 4700 FCS Controller Resource Manager
 - minimum version and release requirements 183
- 4700 Host Support Program
 - minimum version and release requirements 183
- 64-bit
 - introduction 1
 - required mode on server 102

A

- accessibility features 233
- ACF/NCP
 - minimum version and release requirements 183, 184
- ACF/SSP
 - minimum version and release requirements 184
- AD/Cycle C/370
 - minimum version and release requirements 184
- AET
 - removed from the operating system 21
- AFP Century Schoolbook Font
 - minimum version and release requirements 184
- AFP Font Collection
 - minimum version and release requirements 184
- AFP Math and Science Font
 - minimum version and release requirements 184
- AFP Toolbox for MVS
 - minimum version and release requirements 184
- alternate base
 - description 68
- APL2
 - minimum version and release requirements 184
- APL2 Application Environment
 - minimum version and release requirements 184
- APL2 Fonts
 - minimum version and release requirements 184
- application development environment
 - migrating 117
- Application Enabling Technology (AET)
 - removed from the operating system 21
- Application Map Generator
 - minimum version and release requirements 184

- Application Support Facility V3
 - minimum version and release requirements 184
- Application Test Collection
 - minimum version and release requirements 184
- architecture
 - release and server requirement 102
 - z/Architecture introduction 1
- ARCHLVL
 - migration action 118
- automatic tape switching
 - hardware requirements 199

B

- backout
 - description of 84
- base elements
 - introduction to 2
 - list of 2
 - removed from OS/390 and z/OS 20
- Basic Tape Library Support
 - minimum version and release requirements 185
- Batchpipes
 - minimum version and release requirements 184
- BCP
 - base element 3
 - hardware requirements 199
 - migration actions from OS/390 R8 227
 - migration actions from OS/390 R9 and later 106
 - software requirements 170
- BDT
 - base element 3
 - hardware requirements 200
 - migration actions from OS/390 R8 227
 - migration actions from OS/390 R9 and later 106
 - software requirements 171
- BDT File-to-File
 - hardware requirements 200
 - migration actions from OS/390 R8 227
 - migration actions from OS/390 R9 and later 106
 - optional feature 4
 - software requirements 171
- BDT SNA NJE
 - hardware requirements 200
 - migration actions from OS/390 R8 227
 - migration actions from OS/390 R9 and later 106
 - optional feature 4
 - software requirements 171
- binder
 - COMPAT default change 111
- block sizes
 - for z/OS data sets 155
- BookManager BookServer
 - base element 4
 - hardware requirements 200
 - migration actions 111
 - migration actions from OS/390 R8 227
 - migration actions from OS/390 R9 and later 106

BookManager BookServer <i>(continued)</i>	
minimum version and release requirements	184
software requirements	172
BookManager BUILD	
enabling	126
hardware requirements	200
migration actions from OS/390 R8	227
migration actions from OS/390 R9 and later	106
minimum version and release requirements	185
optional feature	4
software requirements	172
BookManager READ	
base element	4
hardware requirements	200
migration actions from OS/390 R8	227
migration actions from OS/390 R9 and later	106
minimum version and release requirements	185
software requirements	172
BookMaster	
minimum version and release requirements	195
books	
for z/OS and z/OS.e	41
redbooks	42
Breeze for SCLM	
minimum version and release requirements	185
BTLS	
minimum version and release requirements	185
BUILDMCS command	
description	133
use of	133

C

C/370 Compiler	
minimum version and release requirements	185
C/370 Library	
minimum version and release requirements	185
C/C++ IBM Open Class Library	
base element	5
hardware requirements	200
migration actions	112
migration actions from OS/390 R8	227
migration actions from OS/390 R9 and later	106
software requirements	172
C/C++ Productivity Tools	
minimum version and release requirements	185
C/C++ with Debug Tool	
enabling	126
hardware requirements	200
migration actions	112
migration actions from OS/390 R8	227
migration actions from OS/390 R9 and later	106
optional feature	5
software requirements	172
C/C++ without Debug Tool	
enabling	126
hardware requirements	200
migration actions	112
migration actions from OS/390 R8	227
migration actions from OS/390 R9 and later	106
optional feature	5

C/C++ without Debug Tool <i>(continued)</i>	
software requirements	172
capacity, server	
for z/OS.e	72
CBPDO	
deciding if it's for you	53
driving system software requirements	63
how you order	69
introduction to	28
product-only option	40
selective service option	40
CCCA	
minimum version and release requirements	185
CDMF algorithm	
in DCE Base Services	8
CF structure duplexing, system-managed	
hardware requirements	199
migration actions	117
software requirements	171
changes, summary of	
between z/OS and z/OS.e	42
OS/390 R10 to z/OS V1R1	49
to this book	xiii
z/OS V1R1 to z/OS V1R2	46
z/OS V1R2 to z/OS V1R3	45
CICS Interdependency Analyzer	
minimum version and release requirements	185
CICS Performance Analyzer	
minimum version and release requirements	185
CICS Transaction Server	
minimum version and release requirements	185
CICS VSAM Recovery MVS/ESA V2	
minimum version and release requirements	185
CICS/ESA	
driving system software requirements	65
minimum version and release requirements	185
CICSPlex SM	
minimum version and release requirements	186
Classic Connect	
minimum version and release requirements	186
cloning your system	213
licensing considerations	55
Cloud 9 for SCLM	
minimum version and release requirements	186
cluster-related data sets	
recommended placement	147
COBOL for OS/390 & VM	
minimum version and release requirements	186
COBOL minimum version and release requirements	
Enterprise	188
OS/390 & VM	186
COBOL Report Writer	
minimum version and release requirements	186
COBOL Structuring Facility	
minimum version and release requirements	186
CODE/370	
minimum version and release requirements	186
coexistence	
description of	83
IBM's policy	85

- coexistence service
 - JES2 99
 - JES3 99
 - OS/390 R10 93
 - OS/390 R9 89
 - z/OS V1R1 95
 - z/OS V1R2 98
 - Communications Server
 - base element 6
 - hardware requirements 209
 - migration actions from OS/390 R8 227
 - migration actions from OS/390 R9 and later 106
 - software requirements 173
 - Communications Server NPF
 - hardware requirements 200
 - migration actions from OS/390 R8 227
 - migration actions from OS/390 R9 and later 106
 - optional feature 6
 - software requirements 173
 - Communications Server Security Level 1
 - migration actions from OS/390 R8 227
 - migration actions from OS/390 R9 and later 106
 - removed from z/OS 23
 - Communications Server Security Level 2
 - migration actions from OS/390 R8 228
 - migration actions from OS/390 R9 and later 107
 - removed from z/OS 24
 - Communications Server Security Level 3
 - hardware requirements 201
 - migration actions from OS/390 R8 228
 - migration actions from OS/390 R9 and later 107
 - optional feature 7
 - software requirements 174
 - COMPAT option
 - default change 111
 - compatibility
 - See* coexistence
 - compatibility mode, WLM
 - removed from z/OS 24
 - compatibility, data
 - JES2 76
 - JES3 76
 - CONSOLE command
 - saving user's profile 182
 - consolidated service test (CST) 36
 - copying your system 213
 - couple data sets
 - migration actions 117
 - coupling facility
 - processor requirements 199
 - coupling facility structure duplexing, system-managed
 - hardware requirements 199
 - migration actions 117
 - software requirements 171
 - CPCS
 - minimum version and release requirements 186
 - Cryptographic Services
 - base element 7
 - hardware requirements 201
 - migration actions from OS/390 R8 228
 - migration actions from OS/390 R9 and later 107
 - Cryptographic Services *(continued)*
 - software requirements 174
 - CS z/OS
 - See* Communications Server
 - CSFI
 - minimum version and release requirements 186
 - CST (consolidated service test) 36
 - Customized Offerings Driver
 - introduction to 57
 - CustomPac Installation Dialog
 - installing 59
 - introduction to 28
 - cycles, release
 - for shipping z/OS and z/OS.e 27
- ## D
- DASD
 - placement discussion 135
 - space utilization and performance 154
 - storage requirements 74
 - data compatibility
 - JES2 76
 - JES3 76
 - Data Dictionary, OS/VS DB/DC
 - minimum version and release requirements 194
 - data sets
 - names restructured 152
 - placement discussion 135
 - Data1 Fonts
 - minimum version and release requirements 186
 - DataInterchange
 - minimum version and release requirements 186
 - DataPropagator, DB2
 - minimum version and release requirements 187
 - DataPropagator, IMS
 - minimum version and release requirements 191
 - DataRefresher
 - minimum version and release requirements 186
 - DB2
 - driving system software requirements 65
 - minimum version and release requirements 187
 - DB2 Administration Tool
 - minimum version and release requirements 186, 187
 - DB2 Administration Tools
 - minimum version and release requirements 187
 - DB2 Archive Log Compression Tool
 - minimum version and release requirements 187
 - DB2 Automated Utility Generator
 - minimum version and release requirements 187
 - DB2 Automation Tool
 - minimum version and release requirements 187
 - DB2 Bind Manager
 - minimum version and release requirements 187
 - DB2 Buffer Pool Tool
 - minimum version and release requirements 187
 - DB2 Buffer Tool Analyzer
 - minimum version and release requirements 187
 - DB2 Change Accumulation Tool
 - minimum version and release requirements 187

DB2 Data Export Facility		
minimum version and release requirements	187	
DB2 DataPropagator		
minimum version and release requirements	187	
DB2 Diagnostic and Recovery Utilities		
minimum version and release requirements	187	
DB2 Forms for OS/390		
minimum version and release requirements	187	
DB2 High Performance Unload		
minimum version and release requirements	187	
DB2 Log Analysis Tool		
minimum version and release requirements	187	
DB2 Object Comparison Tool		
minimum version and release requirements	187	
DB2 Object Restore		
minimum version and release requirements	187	
DB2 OLAP Server		
minimum version and release requirements	187	
DB2 Operational Utilities		
minimum version and release requirements	187	
DB2 Path Checker		
minimum version and release requirements	187	
DB2 PM		
minimum version and release requirements	187	
DB2 Query Monitor		
minimum version and release requirements	187	
DB2 Recovery Manager		
minimum version and release requirements	187	
DB2 Row Archive Manager		
minimum version and release requirements	187	
DB2 SQL Performance Analyzer		
minimum version and release requirements	187	
DB2 Table Editor		
minimum version and release requirements	187	
DB2 Utilities Suite		
minimum version and release requirements	187	
DB2 Web Query Tool		
minimum version and release requirements	187	
DBICF		
minimum version and release requirements	188	
DCE Application Support		
base element	7	
hardware requirements	201	
migration actions from OS/390 R8	228	
migration actions from OS/390 R9 and later	107	
software requirements	174	
DCE Base Services		
base element	8	
hardware requirements	201	
migration actions from OS/390 R8	228	
migration actions from OS/390 R9 and later	107	
software requirements	174	
DCE Security Server		
part of Security Server feature	18	
DCE User Data Privacy CDMF		
migration actions from OS/390 R8	228	
removed from the operating system	21	
DCE User Data Privacy DES/CDMF		
migration actions from OS/390 R8	228	
removed from the operating system	21	
DCF		
enabling	128	
minimum version and release requirements	188	
Debug Tool		
enabling	126	
part of C/C++ with Debug Tool feature	5	
deleted from OS/390 and z/OS		
elements and features	20	
deleting		
JES2	67	
JES3	67	
SDSF	67	
DES algorithm		
in DCE Base Services	8	
Developer Kit for OS/390		
minimum version and release requirements	188	
device		
I/O device support for z/OS	74	
DFSMS Optimizer for OS/390 and MVS/ESA		
minimum version and release requirements	188	
DFSMS/MVS Network File System		
now named Network File System	16	
DFSMSdfp		
base element	8	
hardware requirements	202	
migration actions from OS/390 R8	228	
migration actions from OS/390 R9 and later	107	
software requirements	174	
DFSMSdss		
hardware requirements	203	
migration actions from OS/390 R8	228	
migration actions from OS/390 R9 and later	107	
optional feature	8	
software requirements	174	
DFSMShsm		
hardware requirements	203	
migration actions from OS/390 R8	228	
migration actions from OS/390 R9 and later	107	
optional feature	9	
software requirements	174	
DFSMSrmm		
hardware requirements	203	
migration actions from OS/390 R8	228	
migration actions from OS/390 R9 and later	107	
optional feature	9	
software requirements	175	
DFSORT		
hardware requirements	203	
migration actions from OS/390 R8	228	
migration actions from OS/390 R9 and later	107	
minimum version and release requirements	188	
optional feature	9	
software requirements	175	
differences		
between z/OS and z/OS.e	42	
in this book	xiii	
OS/390 R10 to z/OS V1R1	49	
z/OS V1R1 to z/OS V1R2	46	
z/OS V1R2 to z/OS V1R3	45	
disability, help for those with physical	233	

- disabling
 - what was enabled 129
- DISOSS Library Services - Extended
 - minimum version and release requirements 188
- DISOSS/370
 - minimum version and release requirements 188
- DisplayWrite/370
 - minimum version and release requirements 188
- Distributed File Service
 - base element 10
 - hardware requirements 204
 - migration actions from OS/390 R8 228
 - migration actions from OS/390 R9 and later 107
 - software requirements 175
- distribution data sets
 - storage requirement 74
- distribution libraries (DLIBs)
 - recommended placement 144
- DITTO/ESA for MVS
 - minimum version and release requirements 188
- DLIBs
 - recommended placement 144
- DOC APARs
 - on World Wide Web 42
- Document Connect for Lotus Domino
 - minimum version and release requirements 188
- Document Library Facility
 - minimum version and release requirements 188
- documentation
 - for z/OS and z/OS.e 41
 - from IBM Systems Centers 42
- Domino Go Webserver
 - now named IBM HTTP Server 12
- downward compatibility 115
- DRC Facility for IMS/ESA
 - minimum version and release requirements 188
- driving system, installation
 - software requirements for CBPDO 63
 - software requirements for ServerPac 58
 - software requirements for SystemPac
 - dump-by-data-set 58
 - software requirements for SystemPac full volume
 - dump 62
- driving system, msys for Setup
 - software requirements 179
- dump-by-data-set SystemPac
 - introduction 29
- duplexing, system-managed CF structure
 - hardware requirements 199
 - migration actions 117
 - software requirements 171
- dynamic APF
 - software requirements 170
- dynamic enablement
 - migration action 118
 - procedures 121
 - relationship to national language 30
- dynamic exits service
 - use in positioning to use ServerPac install
 - method 133

- Dynamic Resource Control Facility for IMS/ESA
 - minimum version and release requirements 188

E

- education
 - for z/OS and z/OS.e 41
 - IBM Learning Services Web site 41
 - phone enrollment 41
- Electronic Service Agent
 - minimum version and release requirements 188
- elements
 - introduction to 2
 - list of 2
 - removed from OS/390 and z/OS 20
- Emulation Program
 - minimum version and release requirements 188
- enablement of priced features
 - migration action 118
 - procedures 121
- Encina Toolkit Executive
 - base element 10
 - hardware requirements 204
 - migration actions from OS/390 R8 228
 - migration actions from OS/390 R9 and later 107
 - software requirements 175
- eNetwork Communications Server
 - now named Communications Server 6
- Enhanced HOLDDATA 38
- Enterprise COBOL
 - minimum version and release requirements 188
- Enterprise PL/I
 - minimum version and release requirements 188
- Enterprise Server, S/390 Parallel
 - models not supported 50
 - models supported by z/OS 72
- Entry Server Offering
 - for installing 29
- EREP
 - base element 10
 - hardware requirements 204
 - migration actions from OS/390 R8 228
 - migration actions from OS/390 R9 and later 107
 - software requirements 175
- ESA/390 architecture
 - release and server requirement 102
- ESCON devices
 - supported by z/OS 74
- ESCON Director Support
 - base element 11
 - hardware requirements 204
 - migration actions from OS/390 R8 228
 - migration actions from OS/390 R9 and later 107
 - software requirements 175
- ESO (Expanded Service Options)
 - for service delivery 39
- etc directory
 - migrating files 116
- ETO Support
 - minimum version and release requirements 189

- exclusive element or feature
 - introduction to 2
- Expanded Service Options (ESO)
 - for service delivery 39
- expanded storage
 - not supported in z/Architecture 73
- Expedite Base/MVS
 - minimum version and release requirements 188
- Expedite/CICS
 - minimum version and release requirements 188
- exploiters
 - of msys for Setup 16
- Express Plus Offering
 - for installing 29
- extended indirect cataloging
 - use of 153
- extended indirect volume serial support
 - use of 153
- Extended Terminal Options Support for IMS/ESA
 - minimum version and release requirements 189

F

- fallback
 - description of 84
 - IBM's policy 85
- fallback service
 - JES2 99
 - JES3 99
 - OS/390 R10 93
 - OS/390 R8 223
 - OS/390 R9 89
 - z/OS V1R1 95
 - z/OS V1R2 98
- Fault Analyzer
 - minimum version and release requirements 189
- features
 - introduction to 2
 - list of 2
 - removed from OS/390 and z/OS 20
- fee installation methods
 - other 29
 - SystemPac 29
- FFST
 - base element 11
 - hardware requirements 204
 - migration actions from OS/390 R8 228
 - migration actions from OS/390 R9 and later 107
 - software requirements 175
- FICON devices
 - supported by z/OS 74
- File Exchange/MVS User Interface
 - minimum version and release requirements 189
- File Manager
 - minimum version and release requirements 189
- Firewall Technologies
 - hardware requirements 207
 - part of Security Server feature 18
 - software requirements 181
- flashes, IBM Systems Center
 - URLs 42

- four-digit device support
 - software requirements 178
- full system replacement
 - introduction to 28
- full volume dump SystemPac
 - introduction 29

G

- G5
 - as a z/OS processor 72
- G6
 - as a z/OS processor 72
- GAM/SP
 - minimum version and release requirements 189
- GDDM
 - base element 11
 - hardware requirements 204
 - migration actions from OS/390 R8 228
 - migration actions from OS/390 R9 and later 108
 - minimum version and release requirements 189
 - software requirements 175
- GDDM-PGF
 - enabling 127
 - hardware requirements 204
 - migration actions from OS/390 R8 228
 - migration actions from OS/390 R9 and later 108
 - minimum version and release requirements 189
 - optional feature 11
 - software requirements 175
- GDDM-REXX
 - hardware requirements 204
 - migration actions from OS/390 R8 229
 - migration actions from OS/390 R9 and later 108
 - optional feature 11
 - software requirements 175
- GDDM/GKS
 - minimum version and release requirements 189
- GDDM/IMD
 - minimum version and release requirements 189
- GDDM/IVU
 - minimum version and release requirements 189
- GDQF
 - minimum version and release requirements 189
- geoManager
 - minimum version and release requirements 189
- global data sets, SMP/E
 - recommended placement 140
- global resource serialization complex
 - hardware dependencies 199
 - XCF signalling 199
- Global Services, IBM
 - Web page 29
- guest, VM
 - z/OS as 169
 - z/OS.e as 169

H

- hardware requirements
 - for each element and feature 199

hardware requirements *(continued)*
 minimum for driving system 66
 target system 71

HCD
 base element 11
 hardware requirements 204
 migration actions from OS/390 R8 229
 migration actions from OS/390 R9 and later 108

HCM
 hardware requirements 204
 migration actions from OS/390 R8 229
 migration actions from OS/390 R9 and later 108
 optional feature 11
 software requirements 176

HFS customization volume
 recommended data sets on 147

HFS target volume
 recommended data sets on 143

High Speed Access function
 removed from the operating system 22

High Speed UDP facility
 removed from the operating system 22

HLASM
 base element 11
 hardware requirements 204
 migration actions from OS/390 R8 229
 migration actions from OS/390 R9 and later 108
 software requirements 176

HLASM Toolkit
 enabling 127
 hardware requirements 204
 migration actions from OS/390 R8 229
 migration actions from OS/390 R9 and later 108
 optional feature 12
 software requirements 176

HOLDDATA 38

Host On-Demand
 minimum version and release requirements 198
 removed from the operating system 21

I

I/O device support
 for z/OS 74

IBM Communications Server
 now named Communications Server 6

IBM Global Services
 Web page 29

IBM HTTP Server
 base element 12
 hardware requirements 204
 migration actions from OS/390 R8 229
 migration actions from OS/390 R9 and later 108
 software requirements 176

IBM HTTP Server Export Secure
 migration actions from OS/390 R8 229
 migration actions from OS/390 R9 and later 108
 removed from the operating system 22

IBM HTTP Server France Secure
 migration actions from OS/390 R8 229
 migration actions from OS/390 R9 and later 108

IBM HTTP Server France Secure *(continued)*
 removed from the operating system 23

IBM HTTP Server NA Secure
 hardware requirements 205
 migration actions from OS/390 R8 229
 migration actions from OS/390 R9 and later 108
 optional feature 12
 software requirements 176

IBM Learning Services 41

IBM License Manager
 base element 13
 hardware requirements 205
 migration actions from OS/390 R8 229
 migration actions from OS/390 R9 and later 108
 software requirements 176

ICKDSF
 base element 12
 hardware requirements 205
 migration actions from OS/390 R8 229
 migration actions from OS/390 R9 and later 108
 software requirements 176

ICLI (Integrated Call Level Interface)
 in z/OS UNIX System Services 20

ICS
 now named IBM HTTP Server 12

ICSF
 minimum version and release requirements 189
 part of Cryptographic Services 7

ICSS
 now named IBM HTTP Server 12

IFAPRDxx parmlib member
 how to activate 128
 how to update for dynamic enablement 124
 migration actions for dynamic enablement 118

IGES Processor
 minimum version and release requirements 189

ILM (IBM License Manager)
 base element 13
 hardware requirements 205
 migration actions from OS/390 R8 229
 migration actions from OS/390 R9 and later 108
 software requirements 176

image-related data sets
 recommended placement 145

ImagePlus Folder Application Facility
 minimum version and release requirements 190

ImagePlus Object Distribution Manager
 minimum version and release requirements 190

IMS
 minimum version and release requirements 190

IMS Advanced ACB Generator
 minimum version and release requirements 190

IMS Application Development Facility II
 minimum version and release requirements 190

IMS Command Control Facility
 minimum version and release requirements 191

IMS Compression - Extended
 minimum version and release requirements 191

IMS Connect
 minimum version and release requirements 191

IMS Data Base Integrity Control Facility		IMS/ESA ADF Tool Pak	
minimum version and release requirements	191	minimum version and release requirements	190
IMS Database Control Suite		IMS/ESA BTS	
minimum version and release requirements	191	minimum version and release requirements	190
IMS Database Repair Facility		IMS/ESA Database Control Suite	
minimum version and release requirements	191	minimum version and release requirements	190
IMS DataPropagator		IMS/ESA DEDB Fast Recovery	
minimum version and release requirements	191	minimum version and release requirements	190
IMS ETO Support		IMS/ESA Partition Support Product	
minimum version and release requirements	191	minimum version and release requirements	190
IMS Fast Path Basic Tools		IMS/ESA Recovery Saver	
minimum version and release requirements	191	minimum version and release requirements	190
IMS Fast Path Online Tools		IMS/ESA Year 2000 Exit Tool	
minimum version and release requirements	191	minimum version and release requirements	190
IMS Hardware Data Compression - Extended		IMSADF II	
minimum version and release requirements	191	minimum version and release requirements	190
IMS High Performance Change Accumulation Utility		indirect cataloging	
minimum version and release requirements	191	use of	153
IMS High Performance Load		indirect volume serial support	
minimum version and release requirements	191	use of	153
IMS High Performance Pointer Checker		Infoprint Server	
minimum version and release requirements	191	hardware requirements	205
IMS High Performance Prefix Resolution		migration actions from OS/390 R8	229
minimum version and release requirements	192	migration actions from OS/390 R9 and later	108
IMS High Performance Sysgen Tools		optional feature	13
minimum version and release requirements	192	software requirements	177
IMS High Performance Upload		Infoprint Server Transforms for OS/390	
minimum version and release requirements	192	enabling	128
IMS Image Copy Extensions		minimum version and release requirements	193
minimum version and release requirements	192	Information Management, Tivoli	
IMS Index Builder		minimum version and release requirements	196
minimum version and release requirements	192	installation plan skeleton	157
IMS Library Management Utilities		installing	
minimum version and release requirements	192	definition of install	ix
IMS Message Format Services Reversal Utilities		elements you must install	67
minimum version and release requirements	192	entitled methods	
IMS MRQ		CBPDO	28
minimum version and release requirements	190	ServerPac	27
IMS Network Compression Facility		features you must install	67
minimum version and release requirements	192	fee methods	
IMS Online Recovery Service		Entry Server Offering	29
minimum version and release requirements	192	Express Plus Offering	29
IMS Parallel Change Accumulation		other	29
minimum version and release requirements	192	Rapid Migration Offering	29
IMS Parallel Reorganization		Software Management	29
minimum version and release requirements	192	SystemPac	29
IMS Performance Analyzer		z/OS Select	29
minimum version and release requirements	192	IBM's recommendations	53
IMS Program Restart Facility		Integrated Call Level Interface (ICLI)	
minimum version and release requirements	192	in z/OS UNIX System Services	20
IMS Queue Control Facility		Integrated Server, S/390	
minimum version and release requirements	192	not supported	50
IMS Recovery Saver		integration testing by IBM	
minimum version and release requirements	192	explanation of	32
IMS Sequential Randomizer Generator		Web site	33
minimum version and release requirements	192	Intelligent Resource Director (IRD)	
IMS System Utilities/DBT		hardware requirements	199
minimum version and release requirements	193	introduction	1
IMS/ESA		Internet address	
driving system software requirements	65	for downloading Enhanced HOLDDATA	39
minimum version and release requirements	190	for IBM education information	41

Internet address (*continued*)
 for IBM Global Services 29
 for IBM Systems Center flashes 42
 for ISV products 69
 for product catalogs 69
 for product publications 42
 for reader comments ii
 for redbooks 42
 for S/390 Service Update Facility 39
 for ShopzSeries 69
 for SMP/E Planning and Migration Assistant 19
 for wizard edition of this book ix
 for z/OS integration test 33
 for zSeries service information 39
 summary of addresses in this book x

IODM
 minimum version and release requirements 190

IP PrintWay
 part of Infoprint Server 13

IP PrintWay feature of PSF
 enabling 128

IP PrintWay/NetSpool
 formerly in OS/390 13

IP Security - TDES
 now in Communications Server Security Level 3 7

IP Services
 hardware requirements 209
 part of Communications Server element 6
 software requirements 173

IPFAF
 minimum version and release requirements 190

IPL, rolling
 preparing for 84

IRD (Intelligent Resource Director)
 hardware requirements 199
 introduction 1

ISPF
 base element 13
 hardware requirements 206
 migration actions from OS/390 R8 229
 migration actions from OS/390 R9 and later 108
 software requirements - with ISPF client/server 177

ISV products
 choosing 69
 list on World Wide Web 69
 migrating 120

Item Capture Support
 minimum version and release requirements 193

ITSO
 redbooks 42

IXFP
 minimum version and release requirements 193

J

JES/328X Print Facility V3
 minimum version and release requirements 193

JES2
 base element 14
 coexistence and fallback service 99
 coexistence-fallback-migration policy 85

JES2 (*continued*)
 data compatibility 76
 deleting 67
 hardware requirements 206
 job ID format change 113
 levels supported with BCP 76
 migrating to current level of z/OS 80
 migration actions from OS/390 R8 229
 migration actions from OS/390 R9 and later 109
 placing existing JES2 in separate zone 77
 placing existing level in same zone with z/OS 77
 pre-Release 4 mode 113
 Release 4 mode 113
 ServerPac and SystemPac delivery of 77
 software requirements 178
 using existing level with z/OS V1R3 75

JES2 checkpoint volume
 recommended data sets on 148

JES2 spool volume
 recommended data sets on 148

JES3
 coexistence and fallback service 99
 coexistence-fallback-migration policy 85
 data compatibility 76
 deleting 67
 hardware requirements 206
 job ID format change 113
 levels supported with BCP 76
 migrating to current level of z/OS 80
 migration actions from OS/390 R8 229
 migration actions from OS/390 R9 and later 109
 optional feature 14
 placing existing JES3 in separate zone 77
 ServerPac and SystemPac delivery of 77
 software requirements 178
 using existing level with z/OS V1R3 75

job ID
 format change 113

K

kernel, z/OS UNIX System Services
 in BCP 3

keyboard shortcuts 233

KEYRANGE specification
 removed from z/OS 25

L

LAN Server
 migration actions from OS/390 R8 229
 migration actions from OS/390 R9 and later 109
 removed from z/OS 23

Language Environment
 base element 14
 hardware requirements 206
 migration actions 114
 migration actions from OS/390 R8 230
 migration actions from OS/390 R9 and later 109
 software requirements 178

- Language Environment Data Decryption
 - migration actions from OS/390 R8 230
 - removed from the operating system 21
- LANRES
 - migration actions from OS/390 R8 230
 - migration actions from OS/390 R9 and later 109
 - removed from z/OS 24
- LDAP Server
 - part of Security Server feature 18
- Learning Services, IBM 41
- License Manager, IBM
 - base element 13
 - hardware requirements 205
 - software requirements 176
- licensed product DLIB volume
 - recommended data sets on 145
- licensed product target volume
 - recommended data sets on 143
- licensed products
 - minimum levels 183
- licensed programs
 - minimum levels 183
- licensing considerations
 - when sharing or cloning 55
 - z/OS.e as VM guest 169
- LOADxx
 - migration action 118
- logical parmlib
 - use of 153
- LookAt message retrieval tool 42
- Lotus Domino
 - minimum version and release requirements 193
- Lotus Domino Go Webserver
 - now named IBM HTTP Server 12

M

- maintenance, preventive
 - using RSUs 37
- Managed System Infrastructure for Operations
 - base element 15
- Managed System Infrastructure for Setup
 - base element 16
- marketed, products no longer
 - reinstalling 133
- MAS
 - coexistence and fallback PTFs 99
- master catalog
 - changes to use ServerPac 135
- master catalog volume
 - recommended data sets on 147
- MERVA
 - minimum version and release requirements 193
- MERVA Extended Connectivity for MVS/ESA
 - minimum version and release requirements 193
- message retrieval tool, LookAt 42
- MICR/OCR
 - base element 15
 - hardware requirements 206
 - migration actions from OS/390 R8 230
 - migration actions from OS/390 R9 and later 109

- MICR/OCR (*continued*)
 - software requirements 178
- migration
 - actions from OS/390 R8 226
 - actions from OS/390 R9 and later 106
 - application development actions 117
 - BookServer actions 111
 - C/C++ actions 112
 - etc actions 116
 - hardware planning 101
 - IBM's policy 85
 - IFAPRDxx actions 118
 - JES2 actions 113
 - JES3 actions 113
 - Language Environment actions 114
 - ServerPac and SystemPac actions 119
 - SMP/E data sets 116
 - table for OS/390 R8 226
 - table for OS/390 R9 and later 106
 - tables 101
 - var actions 116
 - virtual storage considerations 119
- Millenium Runtime Windowing Tool
 - minimum version and release requirements 193
- MPSX/370
 - minimum version and release requirements 193
- MQSeries
 - minimum version and release requirements 193
- MQSeries Integrator
 - minimum version and release requirements 193
- MQSeries Integrator Agent for CICS Transaction Server
 - minimum version and release requirements 193
- MQSeries Link
 - minimum version and release requirements 193
- MQSeries Workflow
 - minimum version and release requirements 193
- MSUs
 - for z/OS.e 72
- msys for Operations
 - base element 15
 - hardware requirements 206
 - migration actions from OS/390 R8 230
 - migration actions from OS/390 R9 and later 110
 - software requirements 178
- msys for Setup
 - base element 16
 - driving system requirements 179
 - exploiters 16
 - hardware requirements 206
 - migration actions from OS/390 R8 230
 - migration actions from OS/390 R9 and later 110
 - software requirements 179
- Multiprise, S/390
 - as a z/OS processor 72
- multisystem configuration
 - resource sharing inherent in 83

N

- national language support
 - in z/OS and z/OS.e 30

- national language support (*continued*)
 - relationship to dynamic enablement 30
 - NCP
 - driving system software requirements 65
 - minimum version and release requirements 183, 184
 - NETDA
 - minimum version and release requirements 193
 - NetQuestion
 - now a component of Text Search 20
 - NetSpool
 - part of Infoprint Server 13
 - NetSpool feature of PSF
 - enabling 128
 - NetView Access Services for MVS
 - minimum version and release requirements 194
 - NetView Distribution Manager for MVS
 - minimum version and release requirements 194
 - NetView FTP
 - minimum version and release requirements 194
 - NetView Performance Monitor
 - minimum version and release requirements 194
 - NetView, Tivoli
 - minimum version and release requirements 196
 - ordering consideration 70
 - zone consideration 81
 - network attachments
 - hardware requirements 210
 - Network Authentication and Privacy Service
 - now named Network Authentication Service 18
 - Network Authentication Service
 - part of Security Server feature 18
 - Network Data Couplers
 - minimum version and release requirements 194
 - Network File System
 - base element 16
 - hardware requirements 206
 - migration actions from OS/390 R8 230
 - migration actions from OS/390 R9 and later 110
 - software requirements 180
 - Network Security Processor MVS Support Program
 - minimum version and release requirements 193
 - Networking Systems Center flashes 42
 - NLS (national language support)
 - in z/OS and z/OS.e 30
 - relationship to dynamic enablement 30
 - NLV support
 - in z/OS and z/OS.e 30
 - relationship to dynamic enablement 30
 - non-IBM products
 - choosing 69
 - nonexclusive element or feature
 - introduction to 2
 - Notices 235
 - NRF
 - minimum version and release requirements 194
 - NSI
 - minimum version and release requirements 194
 - NTO
 - minimum version and release requirements 194
 - NTuneMON
 - minimum version and release requirements 194
- O**
- OCEP (Open Cryptographic Enhanced Plug-ins)
 - part of Security Server feature 18
 - OCSF Base
 - part of Cryptographic Services 7
 - OCSF France
 - migration actions from OS/390 R8 230
 - removed from the operating system 21
 - OCSF Security Level 1
 - migration actions from OS/390 R8 230
 - removed from the operating system 21
 - OCSF Security Level 2
 - migration actions from OS/390 R8 230
 - removed from the operating system 21
 - OCSF Security Level 3
 - hardware requirements 206
 - migration actions from OS/390 R8 230
 - migration actions from OS/390 R9 and later 110
 - optional feature 17
 - software requirements 180
 - OGL/370
 - minimum version and release requirements 194
 - OnDemand
 - minimum version and release requirements 186
 - Open Cryptographic Enhanced Plug-ins (OCEP)
 - part of Security Server feature 18
 - OpenEdition DCE Application Support
 - minimum version and release requirements 194
 - now named DCE Application Support 7
 - OpenEdition DCE Base Services
 - now named DCE Base Services 8
 - OpenEdition DCE DFS
 - now named Distributed File Service 10
 - optional features
 - introduction to 2
 - list of 2
 - removed from OS/390 and z/OS 20
 - order checklist
 - for SystemPac orders 70
 - order period 27
 - OS PL/I
 - minimum version and release requirements 194
 - OS/390 Print Server
 - now named Infoprint Server 13
 - OS/VS DB/DC Data Dictionary
 - minimum version and release requirements 194
 - OSA/SF
 - base element 17
 - hardware requirements 207
 - migration actions from OS/390 R8 230
 - migration actions from OS/390 R9 and later 110
 - software requirements 180
 - OSI/CS
 - minimum version and release requirements 194
 - OSI/FS
 - minimum version and release requirements 194

OSL
 minimum version and release requirements 194

OV/MVS
 minimum version and release requirements 194

P

Package for OS/390 V2R10, Upgrade 49

page data set volume 1
 recommended data sets on 145

page data set volume 2
 recommended data sets on 146

Parallel Enterprise Server, S/390
 models not supported 50
 models supported by z/OS 72

Parallel Environment
 in z/OS UNIX System Services 20

Parallel Sysplex
 rolling z/OS or z/OS.e across systems 84

parmlib
 changes to use ServerPac 135

parmlib concatenation
 control parmlib data sets 135
 use of 153

parmlib symbolic preprocessor tool
 verify symbols 135

Payment Gateway for OS/390
 minimum version and release requirements 194

PC Server System/390
 not supported 50

PCF
 minimum version and release requirements 194

PDF files
 of z/OS publications 42

Pi and Specials Fonts
 minimum version and release requirements 194

PKI Services
 part of Security Server feature 18

PL/I minimum version and release requirements
 Enterprise 188
 for MVS & VM 195
 OS 194
 VisualAge 197

Planning and Migration Assistant, SMP/E
 description 19
 used to plan order 69

Policy Director Authorization Services
 minimum version and release requirements 195

policy, IBM's
 coexistence 85
 fallback 85
 installing all elements and features 67
 migration 85
 service 33

PPFA/370
 minimum version and release requirements 195

pre-Release 4 mode, JES2 113

preventive maintenance
 using RSUs 37

preventive service planning
 See PSP

priced features
 introduction to 2

Print Interface
 part of Infoprint Server 13

Print Management Facility/MVS
 minimum version and release requirements 195

Print Server, OS/390
 now named Infoprint Server 13

Printer Inventory Manager
 part of Infoprint Server 13

processor storage requirements
 minimum to IPL 73

processors
 not supported 50
 supported by z/OS and z/OS.e 72

proclib
 changes to use ServerPac 135

product set
 definition of 136

product-only CBPDO 40

products no longer marketed
 reinstalling 133

program management binder
 COMPAT default change 111

Program Restart Facility for IMS
 minimum version and release requirements 195

PSF
 minimum version and release requirements 195

PSP
 buckets 35
 hardware upgrade identifiers 73
 software upgrade identifiers 35

PTFs
 JES3 coexistence and fallback 99
 MAS coexistence and fallback 99
 OS/390 R10 coexistence 93
 OS/390 R10 coexistence and fallback 93
 OS/390 R8 fallback 223
 OS/390 R9 coexistence 89
 OS/390 R9 coexistence and fallback 89
 to use existing JES2 79
 z/OS V1R1 coexistence 95
 z/OS V1R1 coexistence and fallback 95
 z/OS V1R2 coexistence 98
 z/OS V1R2 coexistence and fallback 98

Public Key Infrastructure (PKI) Services
 part of Security Server feature 18

publications
 for z/OS and z/OS.e 41
 redbooks 42

Publishing Systems BookMaster
 minimum version and release requirements 195

Q

QMF
 minimum version and release requirements 195

R

RACF
part of Security Server feature 18

Rapid Migration Offering
for installing 29

Recommended Service Upgrade (RSU)
description of 37
in integration testing 34
in ServerPac order 34
in SystemPac order 35

redbooks
from IBM ITSO 42

RefreshPac 41

Release 4 mode, JES2 113

release cycles
for shipping z/OS and z/OS.e 27

removed from OS/390 and z/OS
elements and features 20

removing
JES2 67
JES3 67
SDSF 67

Repository Manager/MVS
minimum version and release requirements 195

requirements
DASD 74
driving system
(SystemPac dump-by-data-set) 58
(SystemPac full volume dump) 62
CBPDO 63
hardware 66
ServerPac 58
hardware 199
minimum software product levels 183
software 169
storage to IPL 73
supported servers 72

restructured data set names 152

REXX/370
minimum version and release requirements 195

ripple
definition of 63

RMDS
minimum version and release requirements 195

RMF
hardware requirements 207
migration actions from OS/390 R8 230
migration actions from OS/390 R9 and later 110
optional feature 17
software requirements 181

rolling IPL
preparing for 84

RS/6000 and System/390 Server-on-Board
not supported 50

RSU
description of 37
in integration testing 34
in ServerPac order 34
in SystemPac order 35

RTLS
software requirements 170

Runtime Analyzer
minimum version and release requirements 195

S

S/390 Integrated Server
not supported 50

S/390 Multiprise
as a z/OS processor 72

S/390 Parallel Enterprise Server
models not supported 50
models supported by z/OS 72

S/390 servers
supported by z/OS 72

S/390 Service Update Facility
for target system service 75
introduction 39

SDF II
minimum version and release requirements 195

SDSF
deleting 67
hardware requirements 207
migration actions from OS/390 R8 230
migration actions from OS/390 R9 and later 110
minimum version and release requirements 195
optional feature 17
ServerPac and SystemPac delivery of 77
software requirements 181
using current SDSF with old JES2 79

SDSF/MVS
minimum version and release requirements 195

SearchManager/370
minimum version and release requirements 195

SecureWay Communications Server
now named Communications Server 6

SecureWay Host Publisher
minimum version and release requirements 195

SecureWay Security Server
now named Security Server 18

Security Server
hardware requirements 207
migration actions from OS/390 R8 231
migration actions from OS/390 R9 and later 110
optional feature 18
software requirements 181

Security Server LDAP Server DES
removed from the operating system 21

Security Server Network Authentication Service Level 3
migration actions from OS/390 R8 231
migration actions from OS/390 R9 and later 110
optional feature 19
software requirements 181, 207

Select, z/OS
for installing 29

selective service CBPDO 40

server capacity
for z/OS.e 72

server message block (SMB) 10
software requirements 175

ServerPac
deciding if it's for you 53

- ServerPac (*continued*)
 - driving system software requirements 58
 - full system replacement 28
 - how you order 69
 - introduction to 27
 - migration actions 119
 - SMS active for allocation 58
 - software upgrade 28
 - target system preparation 60
- servers
 - not supported 50
 - supported by z/OS and z/OS.e 72
- service
 - distribution 39
 - driving system requirement (ServerPac and SystemPac) 59
 - Enhanced HOLDDATA Web site 39
 - for target system 75
 - IBM's policy 33
 - level for CBPDO orders 34
 - level for ServerPac orders 34
 - level for SystemPac orders 35
 - preventive maintenance 37
 - RefreshPac 41
 - S/390 Service Update Facility 39
 - to use existing JES2 79
 - Web page for information 39
- Service Update Facility, S/390
 - for target system service 75
 - introduction 39
- service, coexistence
 - JES2 99
 - JES3 99
 - OS/390 R10 93
 - OS/390 R9 89
 - z/OS V1R1 95
 - z/OS V1R2 98
- service, fallback
 - JES2 99
 - JES3 99
 - OS/390 R10 93
 - OS/390 R8 223
 - OS/390 R9 89
 - z/OS V1R1 95
 - z/OS V1R2 98
- shipping z/OS and z/OS.e
 - frequency 27
- ShopzSeries
 - for choosing products 69
 - for ordering products 69
 - for ordering service 39
- shortcut keys 233
- size
 - of blocks for best performance 154
 - of DASD required 74
- skeleton installation plan 157
- SMB (server message block) 10
 - software requirements 175
- SMP/E
 - base element 19
 - hardware requirements 207
- SMP/E (*continued*)
 - migration actions from OS/390 R8 231
 - migration actions from OS/390 R9 and later 110
 - migration consideration for data sets 116
 - software requirements 182
- SMP/E data sets
 - storage requirement 74
- SMP/E global data sets
 - recommended placement 140
- SMP/E Planning and Migration Assistant
 - description 19
 - used to plan order 69
- SMPPTS data set
 - storage requirement 74
- SMPTLIB data sets
 - storage requirement 74
- SMS
 - active for allocation 58
- SNA Services
 - hardware requirements 212
 - part of Communications Server element 6
 - software requirements 173
- SnapShot
 - minimum version and release requirements 195
- SNMP Subagent
 - part of Infoprint Server 13
- softcopy books
 - on World Wide Web
 - product 42
 - redbooks 42
- Softcopy Print
 - migration actions from OS/390 R8 231
 - migration actions from OS/390 R9 and later 110
 - removed from the operating system 21
- softcopy volume
 - recommended data sets on 149
- Software Management
 - for installing 29
- software requirements
 - driving system for CBPDO 63
 - driving system for ServerPac 58
 - driving system for SystemPac dump-by-data-set 58
 - driving system for SystemPac full volume dump 62
 - for each element and feature 169
- software upgrade
 - introduction to 28
- SOMobjects ADE
 - migration actions from OS/390 R8 231
 - migration actions from OS/390 R9 and later 110
 - removed from z/OS 24
- SOMobjects RTL
 - migration actions from OS/390 R8 231
 - migration actions from OS/390 R9 and later 110
 - removed from z/OS 23
- Sonoran Sans Serif Cond Font
 - minimum version and release requirements 196
- Sonoran Sans Serif Expand Font
 - minimum version and release requirements 196
- Sonoran Sans Serif Font
 - minimum version and release requirements 196

- Sonoran Sans Serif Head Font
 - minimum version and release requirements 196
- Sonoran Serif Font
 - minimum version and release requirements 196
- Sonoran Serif Headline Font
 - minimum version and release requirements 196
- space requirements
 - DASD 74
 - DASD utilization and performance 154
 - minimum processor storage required to IPL 73
 - virtual storage migration considerations 119
- SREL
 - in CBPDO order 70
 - in ServerPac order 70
 - in SystemPac order 70
- SSL Base, System
 - part of Cryptographic Services 7
- stand-alone products
 - minimum levels 183
- storage requirements
 - DASD 74
 - DASD space utilization and performance 154
 - minimum processor storage required to IPL 73
 - virtual storage migration considerations 119
- StorWatch DFSMSHsm Monitor
 - minimum version and release requirements 196
- subsystem DLIB volume
 - recommended data sets on 145
- subsystem target volume
 - recommended data sets on 144
- subsystems
 - driving system software requirements 65
- SUF
 - for target system service 75
 - introduction 39
- summary of changes
 - between z/OS and z/OS.e 42
 - OS/390 R10 to z/OS V1R1 49
 - to this book xiii
 - z/OS V1R1 to z/OS V1R2 46
 - z/OS V1R2 to z/OS V1R3 45
- sysplex
 - rolling z/OS or z/OS.e across systems 84
- sysplex-related volume 1
 - recommended data sets on 148
- sysplex-related volume 2
 - recommended data sets on 148
- SYSRES
 - changes to use ServerPac 135
 - handling overflow 138
 - indirect cataloging 153
 - indirect volume serial support 153
 - logical extension volumes 153
- System Automation
 - minimum version and release requirements 196
 - ordering consideration 70
 - zone consideration 81
- System Secure Sockets Layer (SSL) Base
 - part of Cryptographic Services 7
- System SSL Base
 - part of Cryptographic Services 7

- System SSL Crypto
 - now named System SSL Security Level 3 19
- System SSL Security Level 2
 - migration actions from OS/390 R8 231
 - migration actions from OS/390 R9 and later 110
 - removed from the operating system 23
- System SSL Security Level 3
 - hardware requirements 208
 - migration actions from OS/390 R8 231
 - migration actions from OS/390 R9 and later 110
 - optional feature 19
 - software requirements 182
- system symbolics
 - with indirect volume serial support 153
- system-managed CF structure duplexing
 - hardware requirements 199
 - migration actions 117
 - software requirements 171
- SystemPac
 - deciding if it's for you 53
 - driving system software requirements (dump-by-data-set) 58
 - driving system software requirements (full volume dump) 62
 - for installing 29
 - how you order 69
 - SMS active for allocation 58
 - target system preparation 60
- Systems Center, IBM
 - flashes 42
 - publications 42

T

- target data sets
 - storage requirement 74
- target libraries (TLIBs)
 - recommended placement 140
- TCP/IP
 - part of Communications Server 6
- TCP/IP for MVS CICS Sockets
 - software requirements 173
- TCP/IP for MVS IMS Sockets
 - software requirements 173
- testing a new release 129
- Text Search
 - base element 20
 - hardware requirements 208
 - migration actions from OS/390 R8 231
 - migration actions from OS/390 R9 and later 110
 - software requirements 182
- TIOC
 - base element 20
 - hardware requirements 208
 - migration actions from OS/390 R8 231
 - migration actions from OS/390 R9 and later 110
 - software requirements 182
- Tivoli Business Systems Manager
 - minimum version and release requirements 196
- Tivoli Data Exchange
 - minimum version and release requirements 196

- Tivoli Data Protection
 - minimum version and release requirements 196
- Tivoli Decision Support
 - minimum version and release requirements 196
- Tivoli Information Management
 - minimum version and release requirements 196
- Tivoli Inventory
 - minimum version and release requirements 196
- Tivoli Management Framework
 - migration actions from OS/390 R8 231
 - migration actions from OS/390 R9 and later 110
 - minimum version and release requirements 196
 - removed from z/OS 23
- Tivoli Manager for MQSeries
 - minimum version and release requirements 196
- Tivoli NetView
 - minimum version and release requirements 196
 - ordering consideration 70
 - zone consideration 81
- Tivoli NetView Performance Monitor for OS/390
 - minimum version and release requirements 196
- Tivoli NetView Performance Monitor for TCP/IP
 - minimum version and release requirements 196
- Tivoli OPC
 - minimum version and release requirements 196
- Tivoli Performance Reporter for OS/390
 - minimum version and release requirements 196
- Tivoli Policy Director for MQSeries
 - minimum version and release requirements 196
- Tivoli Security Management
 - minimum version and release requirements 197
- Tivoli Service Desk for OS/390
 - minimum version and release requirements 197
- Tivoli Software Distribution for OS/390
 - minimum version and release requirements 197
- Tivoli User Administration
 - minimum version and release requirements 197
- Tivoli Workload Scheduler
 - minimum version and release requirements 197
- TLIBs
 - recommended placement 140
- toleration
 - See coexistence
- TPNS
 - minimum version and release requirements 197
- training
 - for z/OS and z/OS.e 41
 - IBM Learning Services Web site 41
 - phone enrollment 41
- Transform Manager
 - part of Infoprint Server 13
- TSO/E
 - base element 20
 - hardware requirements 208
 - migration actions from OS/390 R8 231
 - migration actions from OS/390 R9 and later 110
 - software requirements 182
- TVOL1
 - recommended data sets on 141
- TVOL2
 - recommended data sets on 142

- TVOLn
 - recommended data sets on 142

U

- uninstalling
 - JES2 67
 - JES3 67
 - SDSF 67
- UNIX
 - See z/OS UNIX
- unpriced features
 - introduction to 2
- Upgrade Package for OS/390 V2R10 49
- upgrades
 - hardware identifiers 73
 - software identifiers 35
- URL
 - for downloading Enhanced HOLDDATA 39
 - for IBM education information 41
 - for IBM Global Services 29
 - for IBM Systems Center flashes 42
 - for ISV products 69
 - for product catalogs 69
 - for product publications 42
 - for reader comments ii
 - for redbooks 42
 - for S/390 Service Update Facility 39
 - for ShopzSeries 69
 - for SMP/E Planning and Migration Assistant 19
 - for wizard edition of this book ix
 - for z/OS integration test 33
 - for zSeries service information 39
 - summary of URLs in this book x
- user exits
 - positioning to use ServerPac 134
- user modifications
 - positioning to use ServerPac 134

V

- var directory
 - migrating files 116
- vendor product DLIB volume
 - recommended data sets on 145
- vendor product target volume
 - recommended data sets on 143
- vendor products
 - choosing 69
- virtual storage required
 - migration considerations 119
- VisualAge COBOL Millenium Language Extensions for MVS & VM
 - minimum version and release requirements 197
- VisualAge COBOL Millenium Language Extensions for OS/390 & VM
 - minimum version and release requirements 197
- VisualAge Generator Server
 - minimum version and release requirements 197
- VisualAge PL/I
 - minimum version and release requirements 197

- VisualAge PL/I Millenium Language Extensions
 - minimum version and release requirements 197
- VisualAge Smalltalk Server
 - minimum version and release requirements 197
- VisualLift ADE
 - migration actions from OS/390 R8 231
 - migration actions from OS/390 R9 and later 111
 - removed from the operating system 23
- VisualLift RTE
 - migration actions from OS/390 R8 231
 - migration actions from OS/390 R9 and later 111
 - removed from the operating system 22
- VM guest
 - z/OS as 169
 - z/OS.e as 169
- volume serial support, indirect
 - use of 153
- volumes
 - apportioning data sets to 138
- VS FORTRAN
 - minimum version and release requirements 197
- VS Pascal
 - minimum version and release requirements 197
- VTAM
 - part of Communications Server 6

W

- Washington Systems Center flashes 42
- waves
 - definition of 63
 - Wave 0 requirements 63
 - Wave 1 requirements 63
 - Wave 2 requirements 65
 - Wave 3 requirements 65
- Web address
 - for downloading Enhanced HOLDDATA 39
 - for IBM education information 41
 - for IBM Global Services 29
 - for IBM Systems Center flashes 42
 - for ISV products 69
 - for product catalogs 69
 - for product publications 42
 - for reader comments ii
 - for redbooks 42
 - for S/390 Service Update Facility 39
 - for ShopzSeries 69
 - for SMP/E Planning and Migration Assistant 19
 - for wizard edition of this book ix
 - for z/OS integration test 33
 - for zSeries service information 39
 - summary of addresses in this book x
- WebSphere Application Server
 - migration actions from OS/390 R8 231
 - migration actions from OS/390 R9 and later 111
 - minimum version and release requirements 198
 - removed from the operating system 22
- WebSphere Commerce Suite
 - minimum version and release requirements 198
- WebSphere Host On-Demand
 - minimum version and release requirements 198

- WebSphere Host Publisher
 - minimum version and release requirements 198
- WebSphere MQ Integrator
 - minimum version and release requirements 198
- WebSphere Studio Asset Analyzer
 - minimum version and release requirements 198
- withdrawn products (from marketing)
 - reinstalling 133
- wizards 42
- WLC (Workload License Charges) 101
- WLM compatibility mode
 - removed from z/OS 24
- WLR
 - minimum version and release requirements 198
- Workload License Charges (WLC) 101
- World Wide Web address
 - for downloading Enhanced HOLDDATA 39
 - for IBM education information 41
 - for IBM Global Services 29
 - for IBM Systems Center flashes 42
 - for ISV products 69
 - for product catalogs 69
 - for product publications 42
 - for reader comments ii
 - for redbooks 42
 - for S/390 Service Update Facility 39
 - for ShopzSeries 69
 - for SMP/E Planning and Migration Assistant 19
 - for wizard edition of this book ix
 - for z/OS integration test 33
 - for zSeries service information 39
 - summary of addresses in this book x

X

- X.25 NPSI
 - minimum version and release requirements 198
- X.25 SNA Interconnection
 - minimum version and release requirements 198
- X.25 SNA NSF
 - minimum version and release requirements 198
- XCF (cross-system coupling facility)
 - hardware requirements 200
 - XCF signalling in a global resource serialization complex 199
- XML Toolkit for OS/390
 - minimum version and release requirements 198

Z

- z/Architecture
 - introduction 1
 - release and server requirement 102
- z/OS Select
 - for installing 29
- z/OS UNIX System Services
 - base element 20
 - hardware requirements 209
 - kernel 3
 - migration actions from OS/390 R8 231
 - migration actions from OS/390 R9 and later 111

- z/OS UNIX System Services *(continued)*
 - software requirements 182
- z/OS UNIX System Services Application Services
 - in z/OS UNIX System Services 20
- z/OS V1R1 Upgrade Package for OS/390 V2R10 49
- z/OS.e differences
 - summary of 42
- z/VM guest
 - z/OS as 169
 - z/OS.e as 169
- zFS 10
- zSeries servers
 - BCP functions that require 199
 - migrating to 101
 - supported by z/OS and z/OS.e 72

Readers' Comments — We'd Like to Hear from You

**z/OS and z/OS.e
Planning for Installation
Version 1 Release 3**

Publication No. GA22-7504-06

Overall, how satisfied are you with the information in this book?

	Very Satisfied	Satisfied	Neutral	Dissatisfied	Very Dissatisfied
Overall satisfaction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

How satisfied are you that the information in this book is:

	Very Satisfied	Satisfied	Neutral	Dissatisfied	Very Dissatisfied
Accurate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Complete	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Easy to find	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Easy to understand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Well organized	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Applicable to your tasks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please tell us how we can improve this book:

Thank you for your responses. May we contact you? Yes No

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

Name

Address

Company or Organization

Phone No.



Fold and Tape

Please do not staple

Fold and Tape



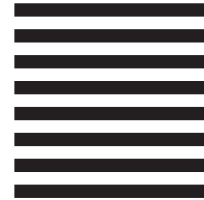
NO POSTAGE
NECESSARY
IF MAILED IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST-CLASS MAIL PERMIT NO. 40 ARMONK, NEW YORK

POSTAGE WILL BE PAID BY ADDRESSEE

IBM Corporation
Department 55JA, Mail Station P384
2455 South Road
Poughkeepsie, NY 12601-5400



Fold and Tape

Please do not staple

Fold and Tape



Program Number: 5694-A01, 5655-G52

Printed in U.S.A.

GA22-7504-06

