

z/OS



Migration from z/OS V1R13 and z/OS V1R12 to z/OS V2R1

Version 2

Note:

Before using this information and the product it supports, be sure to read the general information under “Notices” on page 465.

This edition applies to version 2 release 1 modification 0 of IBM z/OS (product number 5650-ZOS) and to all subsequent releases and modifications until otherwise indicated in new editions.

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About this document

This document describes how to migrate to z/OS® Version 2 Release 1 (V2R1) from the following releases:

- z/OS V1R13
- z/OS V1R12

The document is arranged in parts with chapters 1 and 2 as an introduction for everyone who performs z/OS migration actions regardless of the migration path and migration paths for hardware, chapter 3 for those customers migrating from z/OS V1R13, and chapter 4 for those customers migrating from z/OS V1R12. For chapters 3 and 4 only those actions for the specific migration path are documented. See “How this document is organized.”

This document does not explain how to exploit new functions in z/OS. For that information, see the many publications that pertain to the z/OS base elements and optional features.

Who should read this document

This document is intended for system analysts, system programmers, system administrators, security administrators, network administrators, database administrators, and other members of an information technology team who have experience installing and managing z/OS, and want to plan for and implement the installation of z/OS V2R1.

How this document is organized

This document is organized into the following parts:

- Chapter 1, “Migration: Introduction,” on page 1 is general in scope and for all users, that is, not devoted to a specific z/OS base element or optional feature, or specific migration path. It includes the following topics:
 - “Typical migration steps” on page 1
 - “EPSPT replaced by FIXCAT and REPORT MISSINGFIX” on page 2.
 - “Using IBM Health Checker for z/OS for migration checking” on page 2.
 - “z/OS Management Facility” on page 5.
 - “Elements and features that do not have migration actions” on page 5
- Chapter 2, “General migration actions for everyone migrating to z/OS V2R1,” on page 7 is general in scope and for all users, that is, not devoted to a specific z/OS base element or optional feature. It includes the following topics:
 - “Migration actions for everyone moving to z/OS V2R1” on page 7
 - “Migration actions for everyone before installing z/OS V2R1” on page 8.
 - “Migration actions for everyone after the first IPL of z/OS V2R1” on page 41.
 - “Hardware migration actions” on page 41.
- Chapter 3, “Migration from z/OS V1R13,” on page 89 is a customized path for migration from z/OS V1R13 to z/OS V2R1. It includes topics devoted to the specific elements and features that have migration actions, with one element or feature per chapter. These topics are in alphabetic order — from BCP (“BCP migration actions” on page 94) to z/OS UNIX (“z/OS UNIX migration actions” on page 220). Within each topic, the following standard organization is used:

- Migration actions to perform *before installing z/OS V2R1*
- Migration actions to perform *before the first IPL of z/OS V2R1*
- Migration actions to perform *after the first IPL of z/OS V2R1*
- Chapter 4, “Migration from z/OS V1R12,” on page 237 is a customized path for migration from z/OS V1R12 to z/OS V2R1. It includes topics devoted to the specific elements and features that have migration actions, with one element or feature per chapter. These topics are in alphabetic order — from BCP (“BCP migration actions” on page 243) to z/OS UNIX (“z/OS UNIX migration actions” on page 438). Within each topic, the following standard organization is used:
 - Migration actions to perform *before installing z/OS V2R1*
 - Migration actions to perform *before the first IPL of z/OS V2R1*
 - Migration actions to perform *after the first IPL of z/OS V2R1*

How to use this document

Use this document as your initial source for z/OS migration information. Where appropriate, this document refers you to other documents for additional information.

Within this document, read Chapter 1, “Migration: Introduction,” on page 1 and Chapter 2, “General migration actions for everyone migrating to z/OS V2R1,” on page 7 regardless of your particular migration path from an earlier release. When you have completed Chapter 1 and Chapter 2, read one of the subsequent chapters, based on the release from which you are migrating. You should choose either Chapter 3 or Chapter 4. You do not need to read both chapters, as the material in each chapter has been customized for that migration path.

If you are migrating from z/OS V1R13, go to Chapter 3, “Migration from z/OS V1R13,” on page 89 and proceed sequentially through the subsequent topics or in whatever order you prefer based on element or feature interest. The topics are in alphabetic order by name of element or feature, once you pass the topic on migration actions for everyone, the topic on hardware migration actions, and the topic on sysplex migration actions

If you are migrating from z/OS V1R12, go to Chapter 4, “Migration from z/OS V1R12,” on page 237 and proceed sequentially through the subsequent topics or in whatever order you prefer based on element or feature interest.

The topics in are in alphabetic order by name of element or feature, once you pass the topic on migration actions for everyone, the topic on hardware migration actions, and the topic on sysplex migration actions.

Another way to proceed is to concentrate first on preinstall migration actions within each topic for the appropriate migration path, then pre-IPL migration actions, and then post-IPL migration actions. These actions are clearly identified by major headings within each topic in the appropriate chapter.

Conventions and terminology used in this document

When this document refers to **IBM® System z®** servers without stating a specific server, it refers to all of the following servers:

- IBM zEnterprise BC12 (zBC12)
- IBM zEnterprise EC12 (zEC12)
- IBM zEnterprise™ 114 (z114)

- IBM zEnterprise™ 196 (z196)
- IBM System z10™ Enterprise Class (z10 EC)
- IBM System z10 Business Class (z10 BC)
- IBM System z9® Enterprise Class (z9 EC), formerly the IBM System z9 109 (z9-109)
- IBM System z9 Business Class (z9 BC)
- IBM eServer™ zSeries 990 (z990)
- IBM eServer zSeries 890 (z890)
- IBM eServer zSeries 900 (z900)
- IBM eServer zSeries 800 (z800)

Important terms you should understand are:

- **Migration.** Migration is the first of two stages in an upgrade to a new release of z/OS. (The second stage is exploitation.) During this stage you install your new system with the objective of making it functionally compatible with the previous system. After a successful migration, the applications and resources on the new system function the same way (or similar to the way) they did on the old system or, if that is not possible, in a way that accommodates the new system differences so that existing workloads can continue to run. Migration does not include exploitation of new functions except for new functions that are now required.
- **Exploitation.** Exploitation is the second of two stages in an upgrade to a new release of z/OS. (The first stage is migration.) During this stage you do whatever customizing and programming are necessary to take advantage of (exploit) the enhancements available in the new release.
- **Coexistence.** Coexistence is the situation in which 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 in either Parallel Sysplex or non-Parallel Sysplex configurations

The way in which you make it possible for earlier-level systems to coexist with the most current level is to install coexistence and fallback PTFs on the earlier-level systems.

- **Fallback.** Fallback is a return to the prior level of a system. Fallback can be appropriate if you migrate to a new release and, during testing, encounter severe problems that can be resolved by backing out the new release. By installing coexistence and fallback PTFs on the “old” system before you migrate, the old system can tolerate changes that were made by the new system during testing.

To identify the timing of migration actions, this document uses three types of headings:

- **Actions to perform before installing z/OS V2R1.** These are migration actions that you perform on your current system, either because they require the current system or because they are possible on the current system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made. Examples are installing coexistence and fallback PTFs on your current system, discontinuing use of hardware or software that will no longer be supported, and starting to use existing functions that were optional on prior releases but required in z/OS V2R1.
- **Actions to perform before the first IPL of z/OS V2R1.** These are migration actions that you perform after you have installed z/OS V2R1 but before the first time you IPL. These actions require the z/OS V2R1 level of code to be installed but do not require it to be active. That is, you need the z/OS V2R1 programs, utilities, and samples in order to perform the migration actions, but the z/OS V2R1 system does not have to be IPLed in order for the programs to run. Examples are running sysplex utilities and updating the RACF® database template.

It is possible to perform some of the migration actions in this category even earlier. If you prepare a system on which you will install z/OS V2R1 by making a clone of your old system, you can perform migration actions that involve customization data on this newly prepared system before installing z/OS V2R1 on it. Examples of such migration actions are updating configuration files and updating automation scripts.

- **Actions to perform after the first IPL of z/OS V2R1.** These are migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions. An example is issuing RACF commands related to new functions. Note that the term “first IPL” does not mean that you have to perform these actions after the very first IPL, but rather that you need z/OS V2R1 to be active to perform the task. You might perform the task quite a while after the first IPL.

Each migration action within the headings described is presented using the following standard format:

- A title that identifies the migration action.
- **Description.** This is a brief description of the functional change that caused the migration action.
- **Element or feature.** This is the name of the base element or optional feature that changed.
- **When change was introduced.** This is the z/OS release in which the change was introduced.
- **Applies to migration from.** The migration action is relevant if you are migrating from this release.
- **Timing.** This is when you should perform the migration action. There are three categories: before installing z/OS, before first IPL, or after first IPL. (For SMP/E there are two categories: after installing SMP/E but before starting to use it, and after starting to use SMP/E.)
- **Is the migration action required?** This question refers to the migration action identified by the title. The answer can be one of the following:
 - Yes. The migration action is required in all cases.
 - Yes, if... The migration action is required only in a certain case. Most of the migration actions in this document are in this category.

- *No, but recommended...* The migration action is not required but is recommended because it is a good programming practice, because it will be required in the future, or because it resolves unacceptable system behavior (such as poor usability or poor performance) even though resolution might require a change in behavior.
- **Target system hardware requirements.** This is hardware required by the functional change. It could be processor and peripheral devices; drivers, engineering changes, or patches needed; or specific hardware functions that must be active.
- **Target system software requirements.** This is software required by the functional change. It could be z/OS optional features, software products, and PTFs that are needed on the target system, as well as specific software functions that must be active.
- **Other system (coexistence or fallback) requirements.** These are requirements placed on an earlier release by the functional change in the new release. The earlier release could be running on a system that shares resources (coexists) with the new system or it could be the release from which you are migrating (and to which you might want to fall back).
- **Restrictions.** These are any known limits on how the function can be used.
- **System impacts.** These are any known impacts of using the function, such as increased storage or more time required to run.
- **Related IBM Health Checker for z/OS check.** These are IBM Health Checker for z/OS checks available for the migration action.
- **Steps to take.** This is what you have to do to perform the migration action.
- **Reference information.** This is a pointer to additional information that helps you perform the migration action.

The order in which the migration actions are presented does not imply importance or chronology.

z/OS information

This information explains how z/OS references information in other documents and on the web.

When possible, this information uses cross-document links that go directly to the topic in reference using shortened versions of the document title. For complete titles and order numbers of the documents for all products that are part of z/OS, see *z/OS Information Roadmap*.

To find the complete z/OS library, including the z/OS Information Center, see z/OS Internet Library (<http://www.ibm.com/systems/z/os/zos/bkserv/>).

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Summary of changes

See important information about “Exploitation of the Flash Express feature.”

The following publications explain the enhancements made to z/OS Version 2 Release 1:

- *z/OS Summary of Message and Interface Changes**
- *z/OS Introduction and Release Guide*
- *z/OS Planning for Installation*
- *z/OS Migration*

Exploitation of the Flash Express feature

IBM intends to provide exploitation of the Flash Express feature on IBM zEnterprise EC12 (zEC12) and zBC12 servers with CFLEVEL 19 for certain coupling facility list structures in the first half of 2014. This new function is designed to allow list structure data to migrate to Flash Express memory as needed, when the consumers of data do not keep pace with its creators for some reason, and migrate it back to real memory to be processed. When your installation uses WebSphere MQ for z/OS Version 7 (5655-R36), this new capability is expected to provide significant buffering against enterprise messaging workload spikes and provide support for storing large amounts of data in shared queue structures, potentially allowing several hours' data to be stored without causing interruptions in processing. In addition, z/OS V2R1 Resource Measurement Facility (RMF) is planned to provide measurement data and reporting capabilities for Flash Express when it is used with coupling facilities. Information about externals and interfaces that are related to this planned capability are being made available in z/OS V2R1 for early planning and development purposes only.

Changes made to z/OS V2R1 Migration

This is a new version of the publication *z/OS Migration*, GA32-0889:

Changes made in z/OS Version 2 Release 1:

This document contains information previously presented in GA22-7499-21, which supports z/OS Version 1 Release 13 and later modifications.

New information: The following information is new. For migration actions, only actions that did not appear in the previous level of the document are listed.

New general migration actions:

- “Ensure your CustomPac Installation Dialog is updated” on page 13
- “Verify your IFAPRDxx Product ID is correct for z/OS Version 2” on page 38

New hardware:

- “Migrate to an IBM zEnterprise EC12 server or IBM zEnterprise BC12 server” on page 41
- “Ensure you are running on supported servers and storage controllers” on page 84

New BCP actions:

- “Plan to move from SHARED mode to DISTRIBUTED mode for consoles” on page 96
- “Make accommodations for RACROUTE AUTH check for SLIP command” on page 96
- “Update Capacity Provisioning Manager parameters to use CIM Client for Java Version 2” on page 97
- “Migrate from SNMP to z/OS BCPii for communication to the HMC or SE for z/OS Capacity Provisioning support” on page 98
- “Remove the REPORTCOMPLETIONS option from the IEAOPTxx member” on page 99
- “Move BCPii API calls into your application instead of in BCPii ENF exits” on page 100
- “Remove policies for the PFA_FRAMES_AND_SLOTS_USAGE check” on page 101
- “Update code that invokes the IOSSPOF macro in a PSW key of 0-7” on page 101
- “Move from the console tracking facility to the Generic Tracker” on page 105
- “Convert your existing IBM Health Checker for z/OS set-up for automatic start-up” on page 106
- “Consider the new default value for the LOADxx DYNCPADD keyword that indicates how many CPUs z/OS is prepared to dynamically add” on page 108
- “Plan for the increase of the maximum number of supported CPUs to 256” on page 110
- “Plan for the new default TRACKDIRLOAD in PROGxx” on page 111
- “Update automation that handles messages IEE302I, IEE303I, IEE1302I, IEE1303I, and IOS566I” on page 112
- “Plan for new entries AXRINIT and AXRRXTSS in the program properties table” on page 113
- “Plan for security changes to EXECIO restricting the REXX exec for allocating an internal reader” on page 113
- “Accommodate the SETLOAD xx,IEASYM command to update system symbols without initiating an IPL” on page 116
- “Use the z/OSMF Capacity Provisioning task to define z/OS MVS Capacity Provisioning policies rather than the Windows-based Capacity Provisioning Control Center (CPCC)” on page 117

New BookManager action:

- “Plan for the removal of support for the optional feature BookManager BUILD” on page 118

New CIM action:

- “Update to SBLIM CIM Client for Java Version 2” on page 120

New Communication Server actions:

- “Configuration assistant: Migrate to the Configuration Assistant for Communications Server in the z/OS Management Facility (z/OSMF)” on page 121
- “IP Services: Ensure FTP is listed in the AUTHCMD and AUTHPGM NAMES section of your IKJTSOxx member of SYS1.PARMLIB” on page 122

- “IP Services: Understand the change in the support provided by the DVIPSEC parameter on the IPSEC statement in the TCP/IP profile” on page 123
- “IP Services: Be aware of IP Fragment attack type of the Intrusion Detection Services (IDS) enhancements to monitor both IPv4 and IPv6 traffic” on page 124
- “IP Services: Relink NMI applications using the 64-bit TMI copy buffer function (EZBTMIC4)” on page 125
- “IP Services: Review XL C/C++ applications that use the GetProfile request of the TCP/IP callable network management interface (NMI)” on page 125
- “IP Services: Prepare for the addition of IPv6 support for policy-based routing” on page 126
- “IP Services: Replace any GATEWAY statements in the TCP/IP profile with equivalent BEGINROUTES statements” on page 127
- “IP Services: Allow the IKE daemon and the NSS daemon access to the CSFIQF resource of the CSFSERV class if ICSF is to be used with IP security” on page 129
- “IP Services: Ensure ICSF is active before starting the NSS daemon in FIPS 140 mode” on page 129
- “IP Services: Ensure ICSF is active before starting the IKE daemon in FIPS 140 mode” on page 130
- “IP Services: Allow users of AT-TLS access to CSFIQA and CSFRNG resources of the CSFSERV class if ICSF will be used with AT-TLS” on page 131
- “IP Services: Ensure ICSF is active before starting the Policy Agent when AT-TLS groups are configured in FIPS 140 mode” on page 131
- “IP Services: Update automation on D TCPIP,tnproc,<Telnet>,CONN for the expanded EN TY column in message EZZ6064I” on page 132
- “IP Services: Update automation to monitor resolver address space initialization completion messages” on page 133
- “IP Services: Update OMPROUTE configuration procedures for OMPROUTE_OPTIONS” on page 134
- “IP Services: Check the values specified for TCP related configuration statements.” on page 135
- “IP Services: Make changes for Netstat enhancements” on page 136

New Cryptographic Services actions:

- “ICSF: Detect any coprocessor that that will not become active when HCR77A1 is started.” on page 138
- “ICSF: Run HCR77A1 on a supported server” on page 139
- “ICSF: Detect TKDS objects that are too large for the new record format in HCR77A1” on page 140
- “System SSL: Ensure ICSF is available when running System SSL in FIPS 140-2 mode” on page 144
- “System SSL: Modify automated scripts running the gskkyman utility to interact with new menus” on page 147
- “System SSL: Ensure all RACF user IDs that start SSL applications in non-FIPS mode can access the CSFRNG resource of the CSFSERV class” on page 148
- “ICSF: Accommodate the TRACEENTRY option deprecation in the installation options data set” on page 150

New DFSMS actions:

- “DFSMSdftp: Obtain descriptive text in messages for Open/Close/End of Volume ABENDs” on page 153
- “DFSMSdftp: Remove SMA fields from the SMS storage group construct IGDSGD and from ISMF panels” on page 154
- “DFSMSdftp: Do not use IEBCOPYO” on page 157
- “DFSMSdftp: Examine and update program calls to IEBCOPY” on page 158
- “DFSMSdftp: Specify new option to suppress the message IGD17054I” on page 159
- “DFSMSdss: Review changes to the messages that result from a COPY or RESTORE operation with COPYVOLID” on page 161
- “DFSMSShsm: Update applications that depend on LIST command output” on page 162
- “DFSMSShsm: Accommodate default value change for dump VTOC copies” on page 163
- “DFSMSRmm: Check how you control your RACF tape profile processing” on page 163
- “DFSMSdftp: Configure clusters and storage groups for SMS volume selection” on page 164
- “DFSMSdss: Accommodate new default behavior for full-volume and track restore operations” on page 166

New DFSORT actions:

- “Update automation for changed DFSORT messages” on page 168
- “Use TUNE=OLD option to prevent balancing resources for concurrent sort applications” on page 169
- “Use EXPOLD=MAX and EXPRES=0 to prevent changed defaults” on page 170

New z/OS Distributed File Service actions:

- “Determine whether to accept the new default values for certain zFS variables in the zFS IOEFSPRM configuration file” on page 171
- “Remove usage of zFS clone function” on page 172
- “zFS: Copy data from zFS multi-file system aggregates to zFS compatibility mode aggregates” on page 173
- “z/FS: Ensure that the zFS kernel is active when using the batch utility ioagfmt” on page 174

New HCD action:

- “Migrate security definitions for HCM users” on page 175

New HLASM action:

- “Accommodate new assembler mnemonics for new machine instructions” on page 177

New IBM HTTP Server action:

- “Plan for the removal of support for IBM HTTP Server” on page 178

New InfoPrint actions:

- “Discontinue use of the Infoprint Server SNMP subagent” on page 179
- “Migrate from IP PrintWay basic mode to extended mode” on page 181

New JES2 actions:

- “Change JESJOBS profiles” on page 185
- “Remove BRODCAST= from the OUTDEF initialization statement” on page 189
- “Remove JCLERR= from the JOBDEF initialization statement” on page 189

New JES3 actions.

- “Change JES3 release level format” on page 191
- “Remove DUMP=JES and DUMP=MVS from the OPTIONS initialization statement” on page 192
- “Remove SDI from the OPTIONS initialization statement” on page 192

New Language Environment actions:

- “Convert to CEEPRMxx to set system-level default runtime options” on page 194
- “Determine if the region-level runtime option JCL requires changes” on page 197
- “Update programs that read the Language Environment options report” on page 197
- “Accommodate removal of samples provided for system-level runtime usermods” on page 198

New Library Server action:

- “Reconfigure Library Server InfoCenters” on page 201

New RMF actions:

- “Control the invocation of data reduction exit routines” on page 202
- “Check your GPMSERVE and GPM4CIM options for TCP/IP address regular expressions” on page 203
- “Define the RACF definitions to enable the GPMSERVE Started Task for Authorization Code zero (AC=0)” on page 204
- “Monitor the zFS file system activity” on page 206
- “Determine need of SMF data collection for Postprocessor PCIE Activity report based on SMF 74.9 record.” on page 206

New SDSF action:

- “Control how SDSF handles extended consoles” on page 211

New Security Server actions:

- “Determine whether you define CHOWN.UNRESTRICTED in the UNIXPRIV class.” on page 213

New TSO/E action:

- “Consider what can happen when you read from a DD concatenation containing an empty data set with EXECIO under REXX for TSO/E” on page 216

New action for the new z/OS element z/OS Font Collection:

- “Stop using old fonts and start using the fonts from the z/OS Font Collection” on page 219

New actions for z/OS UNIX System Services:

- “Remove ICLI component from z/OS” on page 220

- “Ensure that your applications do not use removed z/OS UNIX APIs” on page 221
- “Use the BPX.UNIQUE.USER profile instead of BPX.DEFAULT.USER” on page 222
- “Accommodate the new Shell and Utilities version of the zlsf utility” on page 223
- “Migrate from HFS file systems to zFS file systems” on page 224
- “Update applications that use SMF type 92 subtype 11 close records” on page 229
- “Determine if any sticky bit files or external links in your z/OS UNIX file system are involved with link-edited MVS programs with AC=1 (Part 1 before the first IPL of V2R1)” on page 229
- “Determine whether any of your installed products include z/OS UNIX set-user-ID or set-group-ID privileged programs that invoke other z/OS UNIX executable programs” on page 231

Changed information: All information for existing migration actions carried over from the previous release are marked with a | in the left margin. Highlights include:

- “Update your check customization for modified IBM Health Checker for z/OS checks” on page 27
- “Remove deleted data sets, paths, and references” on page 29
- “Add references to new data sets and paths” on page 35
- “Accommodate new address spaces” on page 39

Deleted information: A number of migration actions that no longer apply to z/OS V1R13 or z/OS V1R12 have been removed.

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This chapter is an introduction to z/OS migration for both z/OS V1R12 and z/OS V1R13 users who are migrating to z/OS V2R1.

Typical migration steps

It is possible to make migration changes at the same time you make the changes necessary to exploit new functions in the new release. However, the more prudent approach is to do your migration first and then exploit new functions. The typical steps to accomplish this are:

1. Learn about z/OS V2R1. Good sources of information are *z/OS Introduction and Release Guide*, *z/OS Planning for Installation*, and <http://www.ibm.com/eserver/zseries/zos/>.
2. Perform as many of the migration actions as you can on your existing (“old”) system so that you have fewer actions to perform after you install z/OS V2R1. In this information, the actions you can perform on your existing system are identified by headings that say **Actions to perform before installing z/OS V2R1**. (Note that not all of the actions are required. Some depend on your environment, configuration, and workload, and are identified accordingly.) These actions should be made to, or copied (cloned) to, all existing systems that will be migrated to z/OS V2R1.

Use IBM Health Checker for z/OS to assist with some migration actions. See “Using IBM Health Checker for z/OS for migration checking” on page 2.

3. Order and install coexistence and fallback service for any system that will share resources with a z/OS V2R1 system. (See “Install coexistence and fallback PTFs” on page 9.) This service needs to be installed on all systems that will coexist with z/OS V2R1 and all systems that will be migrated to z/OS V2R1 (and which you might fall back to).
4. Prepare the driving system. For driving system requirements, see the topic about preparing the driving system in *z/OS Planning for Installation*.
5. Order and install z/OS V2R1. If you use a ServerPac, refer to *ServerPac: Installing Your Order*. If you use a CBPDO, refer to *z/OS Program Directory*.
6. Prepare target system hardware and software. During this step, perform the migration actions identified by headings that say **actions to perform before the first IPL of z/OS V2R1**. (Again, not all of the actions are required. Some depend on your environment, configuration, and workload, and are identified accordingly.)
7. IPL the new z/OS V2R1 system with your updated customization and configuration files.
8. Perform any migration actions identified by headings that say **actions to perform after the first IPL of z/OS V2R1**. (Again, not all of the actions are required. Some depend on your environment, configuration, and workload, and are identified accordingly.)

z/OS Migration process: an introduction

Use IBM Health Checker for z/OS to assist with some migration actions. See “Using IBM Health Checker for z/OS for migration checking.”

9. Deploy z/OS V2R1 to other systems within a sysplex, data center, and enterprise.

The migration is now complete.

10. When you are confident that a system, or in some cases all systems in a sysplex, are not going to fall back to z/OS V1R13 or z/OS V1R12 exploit the functions introduced in z/OS V2R1.
11. Deploy this exploitation on other systems (again within a sysplex, data center, and eventually enterprise).

EPSPT replaced by FIXCAT and REPORT MISSINGFIX

IBM removed the Enhanced PSP Tool (EPSPT), host compare program, and the associated extract files from the IBM Technical Support web site (<http://www14.software.ibm.com/webapp/set2/psp/srchBroker>), effective 31 December 2010. The Enhanced PSP Tool's function has been replaced by the addition of FIXCAT (fix category) information to Enhanced HOLDDATA and the REPORT MISSINGFIX function introduced in z/OS V1R10 SMP/E, which offers distinct advantages over the Enhanced PSP Tool. This SMP/E function is also available for all supported releases of z/OS in SMP/E for z/OS V3R6 (5655-G44), which you can order separately.

Using IBM Health Checker for z/OS for migration checking

Beginning with z/OS V1R10, the IBM Health Checker for z/OS infrastructure is being exploited for migration purposes. Checks are being added to help you determine the applicability of various migration actions. Before you migrate to your new z/OS release, you should use these new checks to assist with migration planning. After you migrate, you should rerun them to verify that the migration actions were successfully performed. As with any IBM Health Checker for z/OS check, no updates are made to the system. These new migration checks only report on the applicability of specific migration actions on a system, and only on the currently active system.

Note: As of z/OS V2R1, the IBM Health Checker for z/OS is started automatically at initialization. For information, see “Accommodate new address spaces” on page 39 and “Convert your existing IBM Health Checker for z/OS set-up for automatic start-up” on page 106.

The migration checks are very similar to the other checks provided by IBM Health Checker for z/OS. The only differences are:

- The names of migration checks follow the convention **ZOSMIGVvvRrr_component_program_name** (or, for ICSF, **ICSMIGnnnn_component_program_name**). Notice the “MIG” characters followed immediately by the release identifier. This convention tells you that the check helps with migration and it tells you the release in which the migration action was introduced. If the release in which the migration action was introduced is not known, the name will be ZOSMIGREC.
- By default, migration checks are inactive. This is because you might not want to know about migration actions during nonmigration periods.

System REXX health check considerations:

All exploiters of the System REXX support in z/OS require that the System REXX customization be performed. Using the IBM Health Checker for z/OS health checks is one example of possible System REXX exploitation. In particular, any compiled REXX execs must have the proper runtime support available from the Alternate Library for REXX (available in z/OS since V1R9) or from the IBM Library for REXX on zSeries (5695-014). Several IBM Health Checker for z/OS migration health checks have been written in compiled System REXX. These health checks rely upon the System REXX customization and runtime activities being completed. If System REXX (and the security environment that System REXX requires) have not been properly customized, then System REXX health checks will not execute successfully.

- For System REXX customization activities, see "System REXX" in *z/OS MVS Programming: Authorized Assembler Services Guide*.
- For compiled REXX exec runtime availability, see "Alternate Library for REXX Customization Considerations" in *z/OS Program Directory*, or refer to product documentation accompanying IBM Library for REXX on zSeries.

Remember that migration checks are intended to be used on your current z/OS release and then again after you have migrated to your new z/OS release. The steps you might follow in each of these two scenarios are listed.

On your current z/OS release:

1. *Install the latest migration checks.* Review all the latest health checks (for both best practices and migration) by using the functional PSP bucket HCHECKER (which is SMP/E FIXCAT IBM.Function.HealthChecker). If you want to see all IBM Health Checker for z/OS checks see http://www.ibm.com/systems/z/os/zos/hchecker/check_table.html.

You might want to install the PTFs during a regular service window so that an IPL is scheduled afterwards. Checks are often added by a function when it is started or restarted, so you might find that installing the PTFs before a scheduled IPL works best for you. Additional migration checks can be added at different times, so having all the latest ones installed before making your migration plans is recommended.

2. *Activate the migration checks appropriate to your migration path.* Because the naming convention for migration checks indicates which release introduced the corresponding migration actions, you can activate just the checks appropriate for your migration path. Using SDSF (or another method for viewing checks, such as filters), you can view ahead of time which migration checks you have available on your system. For example, if you are migrating from z/OS V1R12 to z/OS V2R1 you need to activate the migration checks for changes that occurred in both z/OS V1R13 and z/OS V2R1. If you are migrating from z/OS V1R13 to z/OS V2R1, you only need to activate the migration checks for changes that occurred in z/OS V2R1. There are many ways to make a check active, as well as many ways of using wildcards to include specific checks. Here are some examples of using the MODIFY command to make checks active:

- F HZSPROC,ACTIVATE,CHECK=(IBM*,*MIG*)
- F HZSPROC,ACTIVATE,CHECK=(IBM*,ICSFMIG*)
- F HZSPROC,ACTIVATE,CHECK=(IBM*,ZOSMIGV2R1)

Remember that for z/OS, two naming conventions are used: one for ICSF (that starts with ICSFMIGnnnn) and one for the rest of z/OS (that starts with ZOSMIGVvvRrr). Use a wildcard filter that includes the intended migration checks.

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3. *Review the migration check output and rerun checks as appropriate.* Any exceptions should be addressed in your migration plan. If you can complete the migration action before moving to the new z/OS release, you can rerun the check to verify that it was completed correctly on your current system.
4. *Deactivate the migration checks if you desire.* If you no longer desire to have the migration checks active, you can deactivate them similar to the way you activated them. For example:
 - F HZSPROC,DEACTIVATE,CHECK=(IBM*,*MIG*)
 - F HZSPROC,DEACTIVATE,CHECK=(IBM*,ICSMIG*)
 - F HZSPROC,DEACTIVATE,CHECK=(IBM*,ZOSMIGV2R1)

After you have migrated to the new z/OS version and release, the steps are similar:

1. *Install the latest migration checks.* New migration checks might be available for your new z/OS system since you installed it. Therefore, review all the latest health checks (for both best practices and migration) by using the functional PSP bucket HCHECKER (which is SMP/E FIXCAT IBM.Function.HealthChecker). If you want to see **all** IBM Health Checker for z/OS checks that are available, see http://www.ibm.com/systems/z/os/zos/hchecker/check_table.html.
2. *Activate the migration checks appropriate to your migration path.* For migration verification, activate the checks appropriate on the release you are migrating from, migrating through, and migrating to. For example, if you are migrating from z/OS V1R12 to z/OS V2R1, you need to activate the migration checks for changes that occurred in both z/OS V1R13 and z/OS V2R1. If you are migrating from z/OS V1R13 to z/OS V2R1, you only need to activate the migration checks for changes that occurred in z/OS V2R1. Here are some examples of using the MODIFY command to make checks active. (These are the same activation commands shown previously.)
 - F HZSPROC,ACTIVATE,CHECK=(IBM*,*MIG*)
 - F HZSPROC,ACTIVATE,CHECK=(IBM*,ICSMIG*)
 - F HZSPROC,ACTIVATE,CHECK=(IBM*,ZOSMIGV2R1)
3. *Review the migration check output and rerun checks as appropriate.* Any exceptions, which could indicate that a migration action was not performed correctly, should be addressed. Rerun the check after the corrections have been made.
4. *Deactivate the migration checks.* Once your migration verification is complete, deactivate the migration checks similar to the way you activated them. For example (using the same deactivation commands shown previously):
 - F HZSPROC,DEACTIVATE,CHECK=(IBM*,*MIG*)
 - F HZSPROC,DEACTIVATE,CHECK=(IBM*,ICSMIG*)
 - F HZSPROC,DEACTIVATE,CHECK=(IBM*,ZOSMIGV2R1)

Within this document, the migration actions that have checks are clearly identified within the migration actions. All of the checks are made by IBM Health Checker for z/OS but, as stated earlier, some of the checks are the new migration checks (identified by names that start with ZOSMIGVvvRrr or ICSFMIGnnnn) and others are regular health checks.

Note that not all migration actions in this document are addressed by checks; many migration actions do not lend themselves to programmatic checking. Therefore, use this document to prepare your migration plan and do not rely solely on checks.

z/OS Management Facility

IBM z/OS Management Facility (z/OSMF) provides system programmers with a framework for managing various aspects of a z/OS system through a web browser interface. By streamlining some traditional tasks and automating others, z/OSMF can help to simplify the day-to-day operations and administration of a z/OS system. For more information about z/OSMF, see www.ibm.com/systems/z/os/zos/zosmf/.

For information about z/OSMF migration steps, see "Migrating from an earlier release of z/OSMF" in *IBM z/OS Management Facility Configuration Guide*.

Elements and features that do not have migration actions

The following z/OS V2R1 elements and features do not have migration actions and thus are not discussed:

- Alternate Library for REXX
- BDT
- BDT File-to-File
- BDT SNA NJE
- BookManager® READ
- Communications Server Security Level 3
- EREP
- ESCON® Director Support
- FFST
- GDDM
- GDDM-PGF
- GDDM-REXX
- HCM
- HLASM Toolkit
- ICKDSF
- Integrated Security Services
- Metal C Runtime Library
- MICR/OCR
- NFS
- Runtime Library Extensions
- SMP/E
- TIOC
- z/OS IBM TDS
- z/OS Security Level 3
- 3270 PC File Transfer Program

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This chapter contains general z/OS migration actions for both z/OS V1R12 and z/OS V1R13 users who are migrating to z/OS V2R1.

Migration actions for everyone moving to z/OS V2R1

This topic describes general migration actions that apply to everyone, regardless of which elements and features you use.

Migration actions for everyone before installing z/OS V2R1

This topic describes general migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

Review PSP buckets

Description: You should check the preventive service planning (PSP) “buckets” for important software and hardware installation and maintenance information that occurs too late in the development cycle to be included in the product publications. Included are PTFs for both service and small programming enhancements (SPEs).

Element or feature:	Multiple
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

1. Identify which PSP buckets to review. For this task you will need to know:
 - PSP bucket upgrade IDs (or “upgrades”). The most relevant upgrades are those related to z/OS V2R1 and its servers. The z/OS V2R1 upgrade is ZOSV2R1; the server upgrades are shown in Table 1 on page 9.
 - FIXCAT values if you use the SMP/E REPORT MISSINGFIX command in conjunction with the FIXCAT type of HOLDDATA (as mentioned in the tip below). The FIXCAT values are shown in Table 1 on page 9.

Note:

- The values shown are for the minimum support necessary for the servers. If you exploit additional functions on a server, the FIXCAT value will have additional qualifiers.
 - You must run z/OS V2R1 on a z9 EC or z9 BC or later. See “Ensure you are running on supported servers and storage controllers” on page 84.
2. Obtain the PSP buckets from <http://www14.software.ibm.com/webapp/set2/psp/srchBroker> or from IBMLink.
 3. Review the PSP buckets and take whatever actions are prescribed.

Tip: To simplify finding the appropriate PSP bucket and identifying which PTFs listed in the PSP bucket need to be installed on your system, you can use SMP/E FIXCATs and the REPORT MISSINGFIX command. (The FIXCAT values are shown in Table 1 on page 9.)

Table 1. Servers, upgrades, and FIXCAT values. Table 1. Servers, upgrades, and FIXCAT values

Server	Upgrade	FIXCAT value
zBC12	2828DEVICE	IBM.Device.Server.zBC12-2828
zEC12	2827DEVICE	IBM.Device.Server.zEC12-2827
z114	2818DEVICE	IBM.Device.Server.z114-2818
z196	2817DEVICE	IBM.Device.Server.z196-2817
z10 EC	2097DEVICE	IBM.Device.Server.z10-EC-2097
z10 BC	2098DEVICE	IBM.Device.Server.z10-BC-2098
z9 EC	2094DEVICE	IBM.Device.Server.z9-EC-2094
z9 BC	2096DEVICE	IBM.Device.Server.z9-BC-2096

Reference information: See the following information:

- For z/OS subsets, see *z/OS Program Directory*.
- For details about the SMP/E REPORT MISSINGFIX command, see *SMP/E for z/OS Commands*.

Install coexistence and fallback PTFs

Description: Coexistence and fallback PTFs installed on pre-z/OS V2R1 systems allow those systems to coexist with z/OS V2R1 systems during your migration, and allow backout from z/OS V2R1 to the previous systems if necessary. Coexistence and fallback are important because they allow you to migrate systems in a multisystem configuration to z/OS V2R1 using rolling IPLs (one system at a time), allowing for continuous application availability.

Element or feature:	Multiple.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	Install the appropriate PTFs.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Before introducing z/OS V2R1 into your environment, install coexistence and fallback PTFs on all pre-z/OS V2R1 systems with which your z/OS V2R1 system will coexist.

Use the SMP/E REPORT MISSINGFIX command in conjunction with the FIXCAT type of HOLDDATA as follows:

1. Acquire and RECEIVE the latest HOLDDATA onto your pre-z/OS V2R1 systems. Use your normal service acquisition portals or download the

General migration actions for everyone

HOLDDATA directly from <http://service.software.ibm.com/holddata/390holddata.html>. Ensure that you select **Full** from the Download NOW column to receive the FIXCAT HOLDDATA, as the other files do not contain FIXCATs.

2. Run the SMP/E REPORT MISSINGFIX command on your pre-z/OS V2R1 systems and specify a Fix Category (FIXCAT) value of "IBM.Coexistence.z/OS.V2R1". The report will identify any missing coexistence and fallback PTFs for that system. For complete information about the REPORT MISSINGFIX command, see *SMP/E for z/OS Commands*.
3. Periodically, you might want to acquire the latest HOLDDATA and rerun the REPORT MISSINGFIX command to find out if there are any new coexistence and fallback PTFs.

Reference information: For an explanation of the z/OS coexistence-migration-fallback policy, see the coexistence and fallback topic in *z/OS Planning for Installation*.

Use zSoftCap to identify the effect of capacity changes

Description: The zSoftware Migration Capacity Planning Aid (zSoftCap) is a PC-based tool that evaluates the effects of software release migrations.

Element or feature:	Multiple.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	No, but recommended to help in assessing processor capacity and available resources when migrating to new software levels.
Target system hardware requirements:	This tool runs on your workstation. Requirements are: <ul style="list-style-type: none">• A dual-core technology, or faster, processor.• An SVGA display 1024 x 768 or better.• Approximately 5 MB of hard disk space for the zSoftCap application and user's guide, plus 80 MB for the IBM Java 1.6 runtime environment.
Target system software requirements:	This tool runs on your workstation. Requirements are: <ul style="list-style-type: none">• Windows 7 or Windows XP.• IBM Java™ 1.6, or later, runtime environment. This environment is available with the tool.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

- Download zSoftCap from one of the following web sites:
 - Customers: <http://www.ibm.com/support/techdocs/atmastr.nsf/WebIndex/PRS268>.
 - Business partners: https://www.ibm.com/partnerworld/wps/servlet/ContentHandler/tech_PRS1762. Note that this requires an ID on PartnerWorld®.
- Run zSoftCap to determine your expected increase in CPU utilization (if any).

Reference information: *zSoftCap User's Guide*, which is provided with the tool.

Add or change volumes to keep your z/OS root file system in a single data set

Description: Because of release enhancements and service, the size of the z/OS root file system (or “version root file system”) continues to grow from release to release. The size of the z/OS root file system, whether HFS or zFS, is expected to closely approach, if not exceed, the limit of 3339 cylinders on a 3390-3 device.

It is advisable to have the z/OS root file system within a single data set for ease of management.

Note: As of z/OS V2R1 there is another file system delivered with z/OS, the font file system. See *z/OS Planning for Installation* about the size and contents of this file system.

Element or feature:	Multiple.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	No, but recommended for ease of management if your z/OS root file system resides on a 3390-3 volume (or another DASD volume that is close to the 3390-3 limit of 3339 cylinders).
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	Use IBM Health Checker for z/OS check CHECK(IBMUSS, ZOSMIGREC_ROOT_FS_SIZE) to determine if a volume has enough space for the z/OS root file system.

Steps to take: To keep the z/OS root file system in a single data set, do one of the following:

- Move your z/OS root file system to a larger DASD volume geometry.
- Use multiple volumes for the z/OS root file system data set.

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If your z/OS root data set cannot fit on the volume or volumes you have defined for it, divide the z/OS root, with the smaller file systems being managed together.

Remember that all systems to which you deploy the z/OS root file system need sufficient DASD space to hold the z/OS root.

Tip:

- File systems for subsystems and products other than the z/OS product itself might also increase in size. When examining the volume for how much space your z/OS file system is using, check other product file system sizes too.

Reference information: For more information about multivolume data sets, see *z/OS DFSMS Implementing System-Managed Storage*.

Verify that you have enough XCF groups in your CDS and enough XCF members in your XCF groups

Description: Over time, as various z/OS functions and applications exploit XCF services, you must ensure that there is enough space in the sysplex couple data set for all the XCF groups and members that are to be defined by the exploiters. It is possible that your sysplex couple data set could contain an inadequate number of XCF groups or members.

Note: Starting with z/OS V1R13, JES2 is using new XCF groups for its spool migration enhancement. JES spool migration utilizes tasks on all members of a MAS to manage the migration of a spool volume's data and the access to that migrating or migrated data. These various tasks communicate using messages sent through JESXCF services. The JESXCF services utilize one XCF group for each active migration to identify what messages are for which active migration. XCF groups are a limited system resource, so JES2 limits the number of concurrent active migrations to five. If you plan to perform spool migrations, verify that you have up to five XCF groups available if you intend to have up to five spool migrations active at any given time. JES2 will only utilize the number of XCF groups available, up to five, for spool migrations.

Element or feature:	Multiple.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	No, but recommended to ensure that you have an adequate number of XCF groups and members formatted in your sysplex couple data sets.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.

Related IBM Health Checker for z/OS check:	Use IBM Health Checker for z/OS check XCF_SYSPLEX_CDS_CAPACITY, which checks the adequacy of the number of groups, members, and systems for which a sysplex CDS is formatted.
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Steps to take: Follow these steps:

1. Issue the DISPLAY XCF,COUPLE command on your current system. Notice the values of MAXGROUP and PEAK for your sysplex couple data sets. These values show you the maximum number of XCF groups that the couple data sets can support, and the peak number of XCF groups ever in use in the sysplex. Also notice the values of MAXMEMBER and PEAK for your sysplex couple data sets. These values show you the maximum number of members that the couple data set can support in one group, and the greatest number of members ever in use in the largest group in the sysplex.
2. If your peak member value is close to the maximum member value, you might want to reformat your sysplex couple data sets to support a larger maximum number of members to be used by any one group.

Reference information: See the following information:

- For information about formatting sysplex couple data sets with the MAXGROUP and MAXMEMBER parameters, see *z/OS MVS Setting Up a Sysplex*.
- For information about the DISPLAY XCF command, see *z/OS MVS System Commands*.

Ensure your CustomPac Installation Dialog is updated

Description: ServerPac has made changes that require you to use an updated RECEIVE job. You must update the CustomPac Installation Dialog to level 26.00.00 or higher in order to support Secure FTP (FTP using Secure Sockets Layer or FTPS) and removal of the BookManager format of the IYO. You can determine the level of the CustomPac Installation Dialog you are using by checking the upper right hand corner of the primary panel CPPPPOLI.

If you plan to use FTPS, IBM recommends that you visit the Connectivity Test website to verify your system setup well in advance. No change is required for Download Director with encryption; however, you can also verify Download Director with the Connectivity Test. The Connectivity Test can be found at the following web site: https://www14.software.ibm.com/webapp/iwm/web/preLogin.do?lang=en_US&source=cbct

This action ensures that the RECEIVE job JCL is generated and no longer references the Bookmanager file of the Installing Your Order (IYO) document. The document *Installing Your Order (IYO)* is no longer available in BookManager format.

Note: In releases before z/OS V2R1 the RECEIVE job references the BookManager version of the IYO; therefore, you must update the dialog level to level 26.00.00 or higher before receiving your order.

Element or feature:	Customized Offerings for z/OS
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When change was introduced:	General migration action not tied to a specific release. The change is introduced with z/OS V2R1 as of October 1, 2013; however, it also applies to z/OS V1R13 as long as that release remains orderable.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if your existing CustomPac Dialog is not at level 26.00.00 or higher.
Target system hardware requirements:	None.
Target system software requirements:	See "Identifying driving system software requirements for installing z/OS using ServerPac or dump-by-data-set SystemPac" in <i>z/OS Planning for Installation</i>
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	Failure to update the CustomPac Installation Dialog to level 26.00.00 or higher results in the RECEIVE job failing.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

For **ServerPac customers**, see the topic "Updating your dialogs" in *ServerPac: Using the Installation Dialog*. You will need to refer to the section for your order's delivery media (that is, tape, DVD, or internet delivery) to determine the steps to take.

For **CustomPac customers**, see the topic "Updating your dialogs" in *CustomPac: Using the Installation Dialog*. You will need to refer to the section for your order's delivery media (that is, tape, DVD, or internet delivery) to determine the steps to take.

Reference information: See the following information:

- For more information about the internet delivery method to choose for downloading your ServerPac or CustomPac (SystemPac, ProductPac, FunctionPac) Internet Delivery order, see "Choosing the Internet download method: direct or intermediate" in *z/OS Planning for Installation*.
- For ServerPac customers who want more information about updating your CustomPac Installation Dialog, see "Updating Your Dialogs" in *ServerPac: Using the Installation Dialog*. You will need to refer to the section for your order's delivery media (.).
- For ServerPac customers who want more information about receiving an order from a server using the CustomPac Installation Dialog, see "Receiving an Order from an FTP Server" in *ServerPac: Using the Installation Dialog*. You will need to refer to the section for your order's delivery media (.).
- For CustomPac customers who want more information about updating your CustomPac Installation Dialog, see "Updating Your Dialogs" in *CustomPac: Installation Dialog Reference Manual*.

- For CustomPac customers who want more information about receiving an order from a server using the CustomPac Installation Dialog, see “Receiving an Order from an FTP Server” in *CustomPac: Installation Dialog Reference Manual*.
- See the README and Checklist documents on the Shopz download pages for your order.

Migration actions for everyone before the first IPL of z/OS V2R1

This topic describes general migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

Set up an IPCS environment

Description: The interactive problem control system (IPCS) is a tool in the BCP that provides formatting and analysis support for dumps and traces. You must set up an IPCS environment so that you can process any dumps taken on the newly-built z/OS system.

Element or feature:	Multiple.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if the target system cannot be used for native IPCS and usage of IPCS for information produced by the target system is necessary.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	<p>The version and release level of IPCS must match the level of the system that produced the dump. You must use the z/OS MVS libraries of IPCS code, for example, to analyze a dump or trace produced by that level of the z/OS MVS system.</p> <p>Tip: If it is necessary to have unique IPCS data set names for your current system (because you already have the IPCS data sets with similar names on your earlier system), you can create a unique alias in your catalog that resolves to the current IPCS data sets. This will allow you to have “duplicately”-named IPCS data sets, which are uniquely referenced.</p> <p>When using unique aliases, remember that you might have to update the security definition for the unique high-level qualifier used in the catalog.</p>
Restrictions:	None.
System impacts:	None.

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Related IBM Health Checker for z/OS check: None.

Steps to take: Set up an IPCS environment. For guidance, use the information listed in “Reference information” below. During setup, ensure that your logon procedure points to the target system's level of IPCS data sets, which are shown in Table 2.

Note: As of z/OS V1R13, it is enforced that GTF data cannot be properly formatted or used on a system that is different from the system on which it was gathered. Plan on using the IPCS level associated with the GTF data that you collect.

Table 2. IPCS data set requirements for a logon procedure or DD name allocation

DD name	Data set name	Notes [®]
IATTABL	SYS1.SIATTBL0, if applicable	This is a JES3 data set.
IPCS Parm Note: This DD name is needed if one of the following is true: <ul style="list-style-type: none"> The system on which the dump was taken has different BCP and JES levels than the system on which the dump will be examined using IPCS. You have not specified these data sets in your system's parmlib concatenation. 	SYS1.PARMLIB	This is the data set that contains all the shipped z/OS V2R1 parmlib IPCS members. If the copies of BLSCECT and all the other IPCS members are not at z/OS V2R1 level, then IPCS might fail when you attempt to use it.
IPCS Parm	SYS1.SHAS Parm, if applicable	This is a JES2 data set.
IPCS Parm	SYS1.SIAT Parm, if applicable	This is a JES3 data set.
ISPMLIB	SYS1.SBLSMSG0	
ISPMLIB	SYS1.SIATMSG0, if applicable	This is a JES3 data set.
ISPPLIB	SYS1.SBLSPNL0	
ISPPLIB	SYS1.SHASPNL0, if applicable	This is a JES2 data set.
ISPPLIB	SYS1.SIATPNL0, if applicable	This is a JES3 data set.
ISPSLIB	SYS1.SBLSKEL0	
ISPTLIB	SYS1.SBLSTBL0	
STEPLIB Note: This DD name is needed if the system on which the dump was taken has different BCP and JES levels than the system on which the dump will be examined using IPCS.	SYS1.MIGLIB	

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Table 2. IPCS data set requirements for a logon procedure or DD name allocation (continued)

DD name	Data set name	Notes [®]
STEPLIB	SYS1.SIEAMIGE	This data set was added in z/OS V1R7. It is a PDSE data set that complements SYS1.MIGLIB. This data set is used along with SYS1.MIGLIB for IPCS.
STEPLIB	SYS1.SHASMIG, if applicable	This is a JES2 data set.
STEPLIB	SYS1.SIATMIG, if applicable	This is a JES3 data set.
SYSEXEC	SYS1.SIATCLI0, if applicable	This is a JES3 data set.
SYSPROC	SYS1.SBLSCLI0	

Reference information: See the following information:

- For more information about IPCS, see *z/OS MVS IPCS Customization*.
- For more information about the correct logon procedure updates, see the *z/OS Program Directory*.
- For information about setting up the JES2 IPCS environment, see *z/OS JES2 Diagnosis*.
- For information about setting up the JES3 IPCS environment, see *z/OS JES3 Diagnosis*.
- For information about running different levels of IPCS, see "Running Different Levels of IPCS" in *z/OS MVS IPCS User's Guide*.
- For additional information, see *z/OS Communications Server: IP Diagnosis Guide*.

Use IBM-supplied parmlib and proclib members

Description: Ensure that all new and changed parmlib and proclib members that are shipped in z/OS V2R1 are updated in your parmlib and proclib concatenations.

Element or feature:	Multiple.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

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- For parmlib, add the data set pointed to by the z/OS V2R1 PARMLIB DDDEF to your parmlib concatenation. The data set should generally be added last in the concatenation, and you should make sure that the other data sets in the concatenation do not have members with the same names as IBM-supplied members. If you place the data set on the system residence volume and use an indirect catalog entry, future migrations will not require this particular migration step.
- For proclib:
 1. Ensure that the default proclib members have been copied to your default proclib to pick up the new and changed members.
 2. Update individual sample members provided and ensure they are accessible to the system, as shown in the table of proclib member updates in *z/OS Program Directory*.
 3. Ensure that the procedure libraries listed in the table of libraries to be added to the proclib concatenation in *z/OS Program Directory* have been placed in the necessary procedure library concatenations and are available to the system.

Reference information: For lists of parmlib and proclib members that are shipped, see *z/OS Program Directory*.

Migrate /etc and /var system control files

Description: The /etc and /var directories contain system control files. The /etc directory contains customization data that you maintain and the /var directory contains customization data that IBM maintains.

The following elements and features use /etc:

- BCP (Predictive Failure Analysis).
- CIM.
- Communications Server (IP Services component). See “IP Services: Update /etc configuration files” on page 136.
- Cryptographic Services (PKI Services and System SSL components).
- DFSMSrmm.
- Distributed File Service. The SMB server uses /etc/dfs.
- IBM HTTP Server.
- z/OS IBM TDS (LDAP server component) uses /etc/ldap.
- Infoprint Server. See “Remount the Printer Inventory and copy files that were customized” on page 183.
- Library Server. See “Library Server actions to perform before the first IPL of z/OS V2R1” on page 412.
- z/OS UNIX.

The following elements and features use /var:

- Cryptographic Services (OCSF component). See “OCSF: Migrate the directory structure” on page 142.
- DFSMSrmm.
- z/OS IBM TDS (LDAP server component) uses /var/ldap.
- Infoprint Server. See “Remount the Printer Inventory and copy files that were customized” on page 183.
- Integrated Security Services. The Network Authentication Service component uses /var/skrb.

During installation, subdirectories of /etc and /var are created. If you install z/OS using ServerPac, some files are loaded into /etc and /var because of the customization performed in ServerPac. You have to merge the files in /etc and /var with those on your previous system. If you install z/OS using CBPDO, you should copy the files from your old system to the z/OS V2R1 /etc and /var subdirectories.

After merging or copying the contents of /etc and /var, you have to inspect and modify the files as necessary to reflect z/OS V2R1 requirements.

Element or feature:	Multiple.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Copy files from your old system to the z/OS V2R1 /etc and /var subdirectories, and then modify the files as necessary to reflect z/OS V2R1 requirements. 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 clone of your current /var file system and then copy the new /var files into the clone.

Many z/OS UNIX utilities are available for comparing and copying directory structures and files. Two that are especially helpful for /etc and /var migration work are:

- **diff** (with the **-r** option, for recursion): This utility is very useful for comparing the path structures and file contents, and has many options available. The **dircmp** utility has fewer options for directory comparisons, and the **cmp** utility stops after the first difference in a file comparison and has output that is more cumbersome.
- **pax**: The **-rw** option works like a copy (instead of making or extracting from a single file archive) for directories, symbolic links, and files. Consider the **-pe** option for saving the attributes when doing the copy. The **-k** option prevents overwriting of existing files.

To determine what you need to migrate, first compare the ServerPac's /etc and /var file systems with your existing /etc and /var file systems. Mount a copy of your existing /etc and /var file systems to a location outside the ServerPac file system. For instance, you might have your ServerPac file systems at /ServerPac/zOS_Rx/etc and /ServerPac/zOS_Rx/var, and your existing file systems at /Service/ImageX/etc and /Service/ImageX/var. You might have several file systems to mount that are copies of each of your image's /etc and /var file

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systems (ImageX, ImageY, and ImageZ, for instance). To compare the ServerPac and existing system's /etc and /var, you can run two z/OS UNIX commands, such as:

```
diff -r /ServerPac/zOS_Rx/etc /Service/ImageX/etc
diff -r /ServerPac/zOS_Rx/var /Service/ImageX/var
```

These command results will give you a list of the changes that your existing system's /etc and /var file systems are missing—both the structure differences and the file content differences.

Once you know the directories, symbolic links, and files you are missing from your existing system, there are several ways to propagate the ServerPac information forward:

- You could use the **pax** command (with the **-k** option) to copy from the ServerPac /etc and /var file systems to each of your existing system's /etc and /var file systems. For example:

```
cd /ServerPac/zOS_Rx/etc
pax -rvwk -pe * /Service/ImageX/etc
```

Another example:

```
cd /ServerPac/zOS_Rx/var
pax -rvwk -pe * /Service/ImageX/var
```

The **pax** command is a good choice because it copies all files, directories, and symbolic links for each file system from the ServerPac system using a single command without overlaying any existing files.

- You could rerun the product-supplied MKDIR jobs to recreate the directories and symbolic links on each of your existing system's /etc and /var file systems. (A list of the MKDIR jobs is found in *z/OS Program Directory* and the other program directories for the products that were in your ServerPac order.) MKDIR jobs are designed to be run multiple times without damaging your existing file system. For the files under /var/ocsf, rerun the OCSF-supplied ocsf_install_crypto installation script. Or, you can combine these jobs and script them into a single batch job to make the execution more consolidated and repeatable.

After you have made the changes to a copy of your existing image's /etc and /var file systems, you can unmount them and use them for your deployment of the ServerPac system, as your schedule indicates. Remember, you are using *copies* of your existing /etc and /var file systems, and you are *preserving* what you had previously by modifying copies, so your customization for those specific existing images is not lost.

Reference information: None.

Update automation and procedures for changed and deleted messages

Description: Every release, many messages change and some are deleted. If you use automation programs to handle messages, or you have operator or other procedures that deal with messages, you should update the programs or procedures appropriately.

Element or feature:	Multiple.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.

General migration actions for everyone

Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you use automation programs or other procedures to handle messages.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Review the lists of changed and deleted messages at in *z/OS Summary of Message and Interface Changes*. Update programs that automate on these messages and make other necessary accommodations.

Also, see the following migration actions, which have greater detail about some of the message changes:

- “DFSORT migration actions” on page 367
- “Migrate from IP PrintWay basic mode to extended mode” on page 181
- “Modify code that depends on the format of suppressed split messages in the DLOG” on page 402
- “Modify automation that references output from D XCF,SYSPLEX console commands” on page 272
- “Update automation that handles messages IEE302I, IEE303I, IEE1302I, IEE1303I, and IOS566I” on page 112
- “IP Services: Update automation to monitor resolver address space initialization completion messages” on page 133
- “IP Services: Update automation on D TCPIP,tnproc,<Telnet>,CONN for the expanded EN TY column in message EZZ6064I” on page 132
- “Update automation that handles message IAT3100” on page 404
- “Check your automation for Monitor III messages ERB812I and ERB813I” on page 417

Reference information: For a list of changed and deleted messages, see *z/OS Summary of Message and Interface Changes*.

Rework and install user modifications

Description: A user modification is a change constructed by a user to modify an existing function, add to an existing function, or add a user-defined function. Common types of user modifications are:

- User-written and vendor-written exit routines.
- User-written and vendor-written SVCs.
- User-written and vendor-written termination routines.
- Modifications of IBM source code.
- Unit information modules (UIMs) for non-IBM hardware.
- User-written and vendor-written modules that are listed in a NUCLSTxx parmlib member.

General migration actions for everyone

- Updates to default modules to set site defaults differently than the IBM-supplied defaults, such as for the following element and features:
 - XL C/C++
 - DFSORT. Consider using ICEPRMxx parmlib members, introduced in z/OS V1R10, to eliminate the assembler language installation option modules.
 - HLASM.
 - ISPF (specifically, the ISPF configuration table).
 - Language Environment®. Consider using the CEEROPT module, which can be used to specify runtime options for CICS®, IMS™ LRR, and other LRR users. Beginning in z/OS V2R1, for other assembler language runtime option modules, you must migrate to use the CEEPRMxx parmlib member. See “Convert to CEEPRMxx to set system-level default runtime options” on page 194 for more information about CEEPRMxx.
 - SDSF. See “Use dynamic statements for ISFPARMS to avoid reassembly” on page 208 for further information.

If you made any user modifications, you have to determine which ones need to be reworked and which ones just need to be reinstalled.

Element or feature:	Multiple.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1
Is the migration action required?	Yes, if you made any user modifications.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Use the z/OS SMP/E Planning and Migration Assistant to help determine which user modifications need to be reworked and which just have to be reinstalled. The Top or New Intermediate Product Migration Changes Report uses data found on your system, combined with IBM-supplied information from the Software Information Base, to show you the current levels of products available as well as product migration and functional changes using a comparison of FMIDs. You can use this report to determine the product migration impacts by reviewing the “changed” FMIDs. This can help you assess how many user modifications have to be reworked if you issued the LIST SYSMOD USERMOD FORFMID (listing the “changed” FMIDs) command. All other user modifications can be reinstalled without having to be reworked.

Note: IBM recommends using exit routines for any user modifications where possible, and installing the exit routines with SMP/E. By using SMP/E, it is easier to bring forward modifications to the z/OS release you are installing.

Reference information: See the following information.

- For information about SDSF customization, see *z/OS SDSF Operation and Customization*.
- For information about XL C/C++ customization, see *z/OS XL C/C++ User's Guide*.
- For information about DFSORT customization, see *z/OS DFSORT Installation and Customization*.
- For information about HLASM customization, see *HLASM Installation and Customization Guide*.
- For information about ISPF customization, see *z/OS ISPF Planning and Customizing*.
- For information about Language Environment customization, see *z/OS Language Environment Customization* or *z/OS V2R1.0 Language Environment Customization*.

Reconnect non-IBM products

Description: If you use any independent software vendor (ISV) products, you need to make them usable with the new system.

Element or feature:	Multiple.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you use any ISV products and need to reconnect them after performing a ServerPac installation.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Check with your ISVs to make sure the product levels you are using support the new z/OS release, and then reconnect your ISV products to the new release of z/OS following the instructions provided by the ISVs. If any ISV products do not need to be installed in the same libraries and zones as z/OS, place them in their own sets of libraries and SMP/E zones. This means that, unless you have to change ISV product code, such as installing PTFs, or obtain a new level of the product, you will not need to reinstall it after you install a new ServerPac.

Reference information: See the following information:

- For a list of independent software vendors (ISVs) that support z/OS, as well as announcements, testimonials, and other information, see <http://www.ibm.com/systems/z/solutions/isv/>.
- For a directory of ISV products that support z/OS, see the Global Solutions Directory at <http://www.ibm.com/software/solutions/isv/>.

General migration actions for everyone

Reconnect subsystems

Description: If you use subsystems, you need to make them usable with the new system.

Element or feature:	Multiple.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you will use CICS, DB2®, IMS, or NCP on your new system.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Ensure that any required target system PTFs are installed before using the subsystem with the new z/OS system, as well as any required SVCs, system modifications, parmlib setup, and proclib setup. Follow the instructions for the subsystem that you need to reconnect.

Tip: IBM PTFs that are required for z/OS V2R1 are identified with the FIXCAT IBM.TargetSystem-RequiredService.z/OS.V2R1

Reference information:

- For information about SDSF customization, see *z/OS SDSF Operation and Customization*.
- For information about XL C/C++ customization, see *z/OS XL C/C++ User's Guide*.
- For information about DFSORT customization, see *z/OS DFSORT Installation and Customization*.
- For information about HLASM customization, see *HLASM Installation and Customization Guide*.
- For information about ISPF customization, see *z/OS ISPF Planning and Customizing*.
- For information about Language Environment customization, see *z/OS Language Environment Customization* z/OS V2R1.0 Language Environment Customization.

Update operational and other procedures

Description: Depending on which method you used to install (ServerPac, CBPDO, or other deliverable), and which functions you plan to exploit, you might need to update the operation, automation, administration, security, backup, and recovery procedures for your site.

Element or feature:	Multiple.
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General migration actions for everyone

When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Review your operation, automation, administration, security, backup, and recovery procedures, and make any necessary changes depending on how you installed and which functions you plan to exploit. Some possible changes are:

- Allowing applicable users access to new high-level qualifiers. The default new high-level qualifiers are shown in “Add references to new data sets and paths” on page 35.
- Updating and testing your backup and recovery procedures to accommodate the new target system.
- Updating and testing any disaster recovery procedures.
- Updating and testing any automation procedures to take advantage of new functions.
- Updating security system definitions, such as defining new users and resources, permitting users to use new resources, and defining new profiles in the RACF FACILITY class.

Reference information: For the RACF FACILITY class profiles that were added for z/OS UNIX, see *z/OS UNIX System Services Planning*.

Verify that virtual storage limits are set properly

Description: Virtual storage requirements usually grow from release to release. You should review the virtual storage limits you want to set. Generally, there are two areas of concern: common areas (above and below the 16 MB line) and individual address spaces. An increase in virtual storage for common areas reduces the virtual storage size of all address spaces. An increase in virtual storage for individual address spaces impacts only the individual address spaces.

Element or feature:	Multiple.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes.
Target system hardware requirements:	None.
Target system software requirements:	None.

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Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	Use IBM Health Checker for z/OS to help determine whether your virtual storage limits are set properly. The check RSM_MEMLIMIT checks the current setting for the MEMLIMIT parameter in SMFPRMxx, which affects the amount of virtual storage above the 2 GB bar that is available to jobs. This check verifies that a nonzero MEMLIMIT value is in use.

Steps to take: Determine how much virtual storage use to allow above the 2 GB bar. While there is no practical limit to the number of virtual addresses an address space can request above the bar, the system can limit the amount of virtual storage above the bar that an address space is allowed to use. The amount of virtual storage above the bar is determined as follows. The MEMLIMIT parameter in parmlib member SMFPRMxx sets the default system-wide limit, which defaults to 2 GB as of z/OS V1R10 (and zero before z/OS V1R10). However, the system-wide default MEMLIMIT can be overridden by specifying REGION=0M or MEMLIMIT on JOB or EXEC statements in JCL. To set a limit on the use of virtual storage above the bar, use the SMF exit IEFUSI. For more information, see "Limiting the use of memory objects" in *z/OS MVS Programming: Extended Addressability Guide*.

If you want to control the use of virtual storage above the 2 GB bar, do one or more of the following:

- The MEMLIMIT default is 2 GB. If this 2 GB default value is acceptable to you, no change to SMFPRMxx is necessary. (Before z/OS V1R10, the default MEMLIMIT was zero, and you had to specify a nonzero MEMLIMIT in an active SMFPRMxx member of parmlib to establish a system default other than zero for available virtual storage above 2 GB.)
- You can specify MEMLIMIT explicitly in JCL to override the system default that was set (or allowed to default) in SMFPRMxx.
- You can specify REGION=0M on the job statement in JCL to implicitly set MEMLIMIT to NOLIMIT, which also overrides the system default (from SMFPRMxx).
- You can use IEFUSI both to establish a system default MEMLIMIT for different classes of work (for example, JOB, TSO, STC) and limit the amount of virtual storage that can be used above the bar, provided that an explicit or implicit nonzero MEMLIMIT is in effect from JCL or SMFPRMxx. As of z/OS V1R10, keyword HONORIEFUSIREGION | NOHONORIEFUSIREGION is available in SCHEDxx to identify if the region and MEMLIMIT settings specified through or otherwise affected by the IEFUSI exit are to take effect for a program. If you are overriding the attribute of HASJES20 (JES2) in SCHEDxx parmlib member, specify NOHONORIEFUSIREGION explicitly so the default of HONORIEFUSIREGION is not used for this program.

Reference information: See the following information:

- Information about how to evaluate the real storage configuration can be found in the Washington Systems Center white paper *z/OS Performance: Managing Processor Storage in an all "Real" Environment* at <ftp://public.dhe.ibm.com/software/mktsupport/techdocs/allreal.pdf>. (Search for "WP100269".)

- For more information about controlling region size and region limits using the IEFUSI exit, see *z/OS MVS Initialization and Tuning Guide*.
- For more information about the HONORIEFUSIREGION keyword, see *z/OS MVS Initialization and Tuning Reference*.

Back virtual storage with sufficient real and auxiliary storage

Description: As you exploit additional virtual storage by defining additional address spaces or by exploiting memory objects, ensure that you have defined sufficient real and auxiliary storage.

Element or feature:	Multiple.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Using an RMF™ report, determine whether additional real or auxiliary storage is needed by checking the following real storage concentration indicators:

- UIC and average available frames
- Demand page rates
- Percentage of auxiliary slots in use

Reference information: For more information about memory objects, see *z/OS MVS Programming: Extended Addressability Guide* and Washington Systems Center flash 10165 at <http://www.ibm.com/support/techdocs>. (Search for “flash10165”.)

Update your check customization for modified IBM Health Checker for z/OS checks

Description: Changes that IBM makes to the checks provided by IBM Health Checker for z/OS can affect any updates you might have made.

The checks that are new in z/OS V2R1 are:

- CATALOG_RNLS
- ICSF_COPROCESSOR_STATE_NEGCHANGE
- ICSF_MASTER_KEY_CONSISTENCY
- ICSFMIG_DEPRECATED_SERV_WARNINGS
- IOS_IORATE_MONITOR
- IOS_FABRIC_MONITOR
- RACF_AIM_STAGE

General migration actions for everyone

- RACF_CERTIFICATE_EXPIRATION
- RACF_UNIX_ID
- SUP_SYSTEM_SYMBOL_TABLE_SIZE. See “Accommodate the SETLOAD xx,IEASYM command to update system symbols without initiating an IPL” on page 116.
- SYSTRACE_MODE
- SYSTRACE_BRANCH
- OCE_XTIOT_CHECK
- USS_KERNEL_PVTSTG_THRESHOLD
- USS_KERNEL_STACKS_THRESHOLD
- VLF_MAXVIRT
- XCF_CF_STR_SCM_UTILIZATION
- XCF_CF_SCM_UTILIZATION
- XCF_CF_STR_MAXSCM
- XCF_CF_STR_MAXSPACE
- XCF_CF_STR_SCM_MAXSIZE
- ZOSMIGV2R1_CS_GATEWAY
- ZOSMIGV2R1_DEFAULT_UNIX_ID

The checks that were changed by IBM in z/OS V2R1 are:

- ASM_LOCAL_SLOT_USAGE
- ASM_PLPA_COMMON_USAGE
- ASM_PLPA_COMMON_SIZE
- CATALOG_IMBED_REPLICATE
- RACF_classname_ACTIVE
- RACF_SENSITIVE_RESOURCES
- SLIP_PER
- VSM_CSA_LARGEST_FREE
- VSM_CSA_THRESHOLD
- VSM_SQA_THRESHOLD
- ZOSMIGV1R11_CS_DNSBIND

The checks that were deleted by IBM in z/OS V2R1 are:

- CEE_USING_LE_PARMLIB
- PFA_FRAMES_AND_SLOTS_USAGE

The following check was new in z/OS V1R13:

- ZOSMIGV1R13_RO_SYMLINKS

The checks that were changed by IBM in z/OS V1R13 are:

- SUP_HiperDispatch
- XCF_SFM_CFSTRHANGTIME

The checks that were deleted by IBM in z/OS V1R13 are:

- CSVTAM_VIT_DSPSIZE
- CSVTAM_VIT_SIZE

Element or feature:	Multiple.
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General migration actions for everyone

When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	No, but recommended to ensure that your checks continue to work as you intend them to work.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	See Steps to take: below.

Steps to take: Follow these steps:

1. Look at the updated checks in *IBM Health Checker for z/OS: User's Guide*.
2. Review changes you made for those checks, in HZSPRMxx parmlib members, for example.
3. Make any further updates for the checks to ensure that they continue to work as intended.

Reference information: For complete information about updating checks, see "Customizing and managing checks" in *IBM Health Checker for z/OS: User's Guide*.

Remove deleted data sets, paths, and references

Description: Data sets and paths are routinely removed from z/OS for reasons such as consolidation of data sets and removal of elements and features. You must determine whether these changes affect your environment.

Element or feature:	Multiple.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

General migration actions for everyone

Steps to take: Using Table 3 and Table 4 as a guide, remove data sets and paths that do not exist in the current release (z/OS V2R1). Also, remove references to them. You might find references in the following places:

- Parmlib
- Proclib
- Logon procedures
- Catalogs
- Security definitions, including program control definitions
- DFSMS ACS routines
- /etc/profile
- SMP/E DDDEF entry
- Backup and recovery procedures, as well as any references to them

In the tables, the data sets are identified as distribution library (DLIB) data sets or target library data sets.

*Table 3. Data sets and paths **deleted** from z/OS V2R1 (in alphabetic order by DDDEF name)*

DDDEF	Data set name or path (high-level qualifiers are defaults)	DLIB or target	From element or feature	When deleted	Why deleted
AEPHGIF	EPH.AEPHGIF DLIB	DLIB	Library Server	z/OS V2R1	Not needed for z/OS V2R1
AFOMDATA	SYS1.AFOMDATA	DLIB	z/OS UNIX	z/OS V2R1	ICLI removed from z/OS
SFOMDATA	SYS1.SFOMDATA	Target	z/OS UNIX	z/OS V2R1	ICLI removed from z/OS
SFOMEHFS	/usr/lpp/icli/IBM	Target	z/OS UNIX	z/OS V2R1	ICLI removed from z/OS
SFOMESBN	/usr/lpp/icli/sbin/IBM	Target	z/OS UNIX	z/OS V2R1	ICLI removed from z/OS

*Table 4. Data sets and paths **deleted** from z/OS V1R13 (in alphabetic order by DDDEF name) Data sets and paths **deleted** from z/OS V1R13 (in alphabetic order by DDDEF name)*

DDDEF	Data set name or path (high-level qualifiers are defaults)	DLIB or target	From element or feature	When deleted	Why deleted
ABPAHFS	BPA.ABPAHFS	DLIB	z/OS UNIX System Services	z/OS V1R13	z/OS UNIX System Services Connection Manager removed from z/OS
ACMXDBRM	CMX.ACMXDBRM	DLIB	z/OS UNIX System Services	z/OS V1R13	z/OS UNIX System Services Connection Manager removed from z/OS
ACMXHFS	CMX.ACMXHFS	DLIB	z/OS UNIX System Services	z/OS V1R13	z/OS UNIX System Services Connection Manager removed from z/OS
AEUVACF	EUV.AEUVACF	DLIB	DCE	z/OS V1R13	DCE removed from z/OS.
AEUVDBRM	EUV.AEUVDBRM	DLIB	DCE	z/OS V1R13	DCE removed from z/OS.

General migration actions for everyone

Table 4. Data sets and paths **deleted** from z/OS V1R13 (in alphabetic order by DDDEF name) Data sets and paths **deleted** from z/OS V1R13 (in alphabetic order by DDDEF name) (continued)

DDDEF	Data set name or path (high-level qualifiers are defaults)	DLIB or target	From element or feature	When deleted	Why deleted
AEUVEXEC	EUV.AEUVEXEC	DLIB	DCE	z/OS V1R13	DCE removed from z/OS.
AEUVEXP	EUV.AEUVEXP	DLIB	DCE	z/OS V1R13	DCE removed from z/OS.
AEUVHDR	EUV.AEUVHDR	DLIB	DCE	z/OS V1R13	DCE removed from z/OS.
AEUVHDRK	EUV.AEUVHDRK	DLIB	DCE	z/OS V1R13	DCE removed from z/OS.
AEUVHDCP	EUV.AEUVHDCP	DLIB	DCE	z/OS V1R13	DCE removed from z/OS.
AEUVHETC	EUV.AEUVHETC	DLIB	DCE	z/OS V1R13	DCE removed from z/OS.
AEUVHINC	EUV.AEUVHINC	DLIB	DCE	z/OS V1R13	DCE removed from z/OS.
AEUVHJPN	EUV.AEUVHJPN	DLIB	DCE	z/OS V1R13	DCE removed from z/OS.
AEUVHLBR	EUV.AEUVHLBR	DLIB	DCE	z/OS V1R13	DCE removed from z/OS.
AEUVHTCL	EUV.AEUVHTCL	DLIB	DCE	z/OS V1R13	DCE removed from z/OS.
AEUVHXMP	EUV.AEUVHXMP	DLIB	DCE	z/OS V1R13	DCE removed from z/OS.
AEUVIDL	EUV.AEUVIDL	DLIB	DCE	z/OS V1R13	DCE removed from z/OS.
AEUVLIB	EUV.AEUVLIB	DLIB	DCE	z/OS V1R13	DCE removed from z/OS.
AEUVLIBK	EUV.AEUVLIBK	DLIB	DCE	z/OS V1R13	DCE removed from z/OS.
AEUVLIBS	EUV.AEUVLIBS	DLIB	DCE	z/OS V1R13	DCE removed from z/OS.
AEUVLINK	EUV.AEUVLINK	DLIB	DCE	z/OS V1R13	DCE removed from z/OS.
AEUVMMSG	EUV.AEUVMMSG	DLIB	DCE	z/OS V1R13	DCE removed from z/OS.
AEUVMMSGJ	EUV.AEUVMMSGJ	DLIB	DCE	z/OS V1R13	DCE removed from z/OS.
AEUVPNL	EUV.AEUVPNL	DLIB	DCE	z/OS V1R13	DCE removed from z/OS.
AEUVPNLJ	EUV.AEUVPNLJ	DLIB	DCE	z/OS V1R13	DCE removed from z/OS.
AEUVPRC	EUV.AEUVPRC	DLIB	DCE	z/OS V1R13	DCE removed from z/OS.

General migration actions for everyone

Table 4. Data sets and paths **deleted** from z/OS V1R13 (in alphabetic order by DDDEF name) Data sets and paths **deleted** from z/OS V1R13 (in alphabetic order by DDDEF name) (continued)

DDDEF	Data set name or path (high-level qualifiers are defaults)	DLIB or target	From element or feature	When deleted	Why deleted
AIOELMOD	IOE.AIOELMOD	DLIB	DFS	z/OS V1R13	No load modules are installed in these libraries as of z/OS V1R13.
AIOEMSGE	IOE.AIOEMSGE	DLIB	DFS	z/OS V1R13	English message library is no longer provided as of z/OS V1R13.
AIOEMSGJ	IOE.AIOEMSGJ	DLIB	DFS	z/OS V1R13	Japanese message library is no longer provided in z/OS V1R13.
AIOEPNLE	IOE.AIOEPNLE	DLIB	DFS	z/OS V1R13	English panel library is no longer provided in z/OS V1R13.
AIOEPNLJ	IOE.AIOEPNLJ	DLIB	DFS	z/OS V1R13	Japanese panel library is not provided in z/OS V1R13.
SBPABIN	/usr/lpp/bpa/bin/IBM/	Target	z/OS UNIX System Services	z/OS V1R13	z/OS UNIX System Services Connection Manager removed from z/OS.
SBPAINC	/usr/lpp/bpa/include/IBM/	Target	z/OS UNIX System Services	z/OS V1R13	z/OS UNIX System Services Connection Manager removed from z/OS.
SBPALIB	/usr/lpp/bpa/lib/IBM/	Target	z/OS UNIX System Services	z/OS V1R13	z/OS UNIX System Services Connection Manager removed from z/OS.
SBPAMSC	/usr/lpp/bpa/nls/msg/C/IBM/	Target	z/OS UNIX System Services	z/OS V1R13	z/OS UNIX System Services Connection Manager removed from z/OS.
SBPAMJPN	/usr/lpp/bpa/nls/msg/Ja_JP/IBM/	Target	z/OS UNIX System Services	z/OS V1R13	z/OS UNIX System Services Connection Manager removed from z/OS.
SBPASAMP	/usr/lpp/bpa/samples/IBM/	Target	z/OS UNIX System Services	z/OS V1R13	z/OS UNIX System Services Connection Manager removed from z/OS.
SCEEUMAP	CEE.SCEEUMAP	Target	Language Environment	z/OS V1R12	The SCEEUMAP data set will no longer be shipped.
SCMXBIN	/usr/lpp/cmz/bin/IBM/	Target	z/OS UNIX System Services	z/OS V1R13	z/OS UNIX System Services Connection Manager removed from z/OS.

General migration actions for everyone

Table 4. Data sets and paths **deleted** from z/OS V1R13 (in alphabetic order by DDDEF name) Data sets and paths **deleted** from z/OS V1R13 (in alphabetic order by DDDEF name) (continued)

DDDEF	Data set name or path (high-level qualifiers are defaults)	DLIB or target	From element or feature	When deleted	Why deleted
SCMXDBRM	CMX.SCMXDBRM	Target	z/OS UNIX System Services	z/OS V1R13	z/OS UNIX System Services Connection Manager removed from z/OS.
SCMXINC	/usr/lpp/cmx/include/IBM/	Target	z/OS UNIX System Services	z/OS V1R13	z/OS UNIX System Services Connection Manager removed from z/OS.
SCMXLIB	/usr/lpp/cmx/lib/IBM/	Target	z/OS UNIX System Services	z/OS V1R13	z/OS UNIX System Services Connection Manager removed from z/OS.
SCMXMJP	/usr/lpp/cmx/nls/msg/Ja_JP/IBM/	Target	z/OS UNIX System Services	z/OS V1R13	z/OS UNIX System Services Connection Manager removed from z/OS.
SCMXMSC	/usr/lpp/cmx/nls/msg/C/IBM/	Target	z/OS UNIX System Services	z/OS V1R13	z/OS UNIX System Services Connection Manager removed from z/OS.
SCMXSAMP	/usr/lpp/cmx/samples/IBM/	Target	z/OS UNIX System Services	z/OS V1R13	z/OS UNIX System Services Connection Manager removed from z/OS.
SEUVACF	EUV.SEUVACF	Target	DCE	z/OS V1R13	DCE removed from z/OS.
SEUVDBRM	EUV.SEUVDBRM	Target	DCE	z/OS V1R13	DCE removed from z/OS.
SEUVEXEC	EUV.SEUVEXEC	Target	DCE	z/OS V1R13	DCE removed from z/OS.
SEUVEXP	EUV.SEUVEXP	Target	DCE	z/OS V1R13	DCE removed from z/OS.
SEUVHBIN	/usr/lpp/dce/bin/IBM/	Target	DCE	z/OS V1R13	DCE removed from z/OS.
SEUVHDCP	/usr/lpp/dce/dcecp/IBM/	Target	DCE	z/OS V1R13	DCE removed from z/OS.
SEUVHDR	EUV.SEUVHDR	Target	DCE	z/OS V1R13	DCE removed from z/OS.
SEUVHDRK	EUV.SEUVHDRK	Target	DCE	z/OS V1R13	DCE removed from z/OS.
SEUVHETC	/usr/lpp/dce/etc/IBM/	Target	DCE	z/OS V1R13	DCE removed from z/OS.
SEUVHINC	/usr/lpp/dce/share/include/IBM/	Target	DCE	z/OS V1R13	DCE removed from z/OS.
SEUVHJPN	/usr/lpp/dce/lib/nls/msg/Ja_JP/IBM/	Target	DCE	z/OS V1R13	DCE removed from z/OS..

General migration actions for everyone

Table 4. Data sets and paths **deleted** from z/OS V1R13 (in alphabetic order by DDDEF name) Data sets and paths **deleted** from z/OS V1R13 (in alphabetic order by DDDEF name) (continued)

DDDEF	Data set name or path (high-level qualifiers are defaults)	DLIB or target	From element or feature	When deleted	Why deleted
SEUVHLBR	/usr/lpp/dce/lib/IBM/	Target	DCE	z/OS V1R13	DCE removed from z/OS.
SEUVHTCL	/usr/lpp/dce/tcl/IBM/	Target	DCE	z/OS V1R13	DCE removed from z/OS.
SEUVHXMP	/usr/lpp/dce/examples/IBM/	Target	DCE	z/OS V1R13	DCE removed from z/OS.
SEUVLIB	EUV.SEUVLIB	Target	DCE	z/OS V1R13	DCE removed from z/OS.
SEUVLIBK	EUV.SEUVLIBK	Target	DCE	z/OS V1R13	DCE removed from z/OS.
SEUVLIBS	EUV.SEUVLIBS	Target	DCE	z/OS V1R13	DCE removed from z/OS.
SEUVIDL	EUV.SEUVIDL	Target	DCE	z/OS V1R13	DCE removed from z/OS.
SEUVLINK	EUV.SEUVLINK	Target	DCE	z/OS V1R13	DCE removed from z/OS.
SEUVLPA	EUV.SEUVLPA	Target	DCE	z/OS V1R13	DCE removed from z/OS.
SEUVMMSG	EUV.SEUVMMSG	Target	DCE	z/OS V1R13	DCE removed from z/OS.
SEUVMMSGJ	EUV.SEUVMMSGJ	Target	DCE	z/OS V1R13	DCE removed from z/OS.
SEUVPNL	EUV.SEUVPNL	Target	DCE	z/OS V1R13	DCE removed from z/OS.
SEUVPNLJ	EUV.SEUVPNLJ	Target	DCE	z/OS V1R13	DCE removed from z/OS.
SEUVPRC	EUV.SEUVPRC	Target	DCE	z/OS V1R13	DCE removed from z/OS.
SIOELMOD	IOE.SIOELMOD	Target	DFS	z/OS V1R13	No load modules are installed in these libraries as of z/OS V1R13.
SIOEMSGE	IOE.SIOEMSGE	Target	DFS	z/OS V1R13	English message library is no longer provided as of z/OS V1R13.
SIOEMSGJ	IOE.SIOEMSGJ	Target	DFS	z/OS V1R13	Japanese message library is no longer provided in z/OS V1R13.
SIOEPNLE	IOE.SIOEPNLE	Target	DFS	z/OS V1R13	English panel library is no longer provided in z/OS V1R13.
SIOEPNLJ	IOE.SIOEPNLJ	Target	DFS	z/OS V1R13	Japanese panel library is not provided in z/OS V1R13.

General migration actions for everyone

Table 4. Data sets and paths **deleted** from z/OS V1R13 (in alphabetic order by DDDEF name) Data sets and paths **deleted** from z/OS V1R13 (in alphabetic order by DDDEF name) (continued)

DDDEF	Data set name or path (high-level qualifiers are defaults)	DLIB or target	From element or feature	When deleted	Why deleted
None. See comments in Why deleted .	/etc/dce	Target	DCE	z/OS V1R13	These entries do not have DDDEFs associated with the directories; all files and directories can be removed. Note that if /krb5 is a symbolic link to the /etc/dce directory, deleting /etc/dce removes it as well. Ensure that when you delete /etc/dce you are not removing anything for /krb5 that is defined for Kerberos.

Note:

1. Ensure that references to the DCE target library EUV.SEUVLINK and DFS target library IOE.SIOELMOD have been removed from your LNKLST concatenation. Ensure that any reference to DCE target library EUV.SEUVLPA has been removed from the LPALST concatenation.
2. Do not remove any data sets, paths, or references that are needed by earlier-level systems until those systems no longer need them.

Reference information: None.

Add references to new data sets and paths

Description: New data sets and paths are routinely added to z/OS for reasons such as consolidation of data sets and addition of new elements and features. You must determine whether these additions affect your environment.

Element or feature:	Multiple.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

General migration actions for everyone

Steps to take: Using Table 5 as a guide, add references in the following places for data sets and paths that have been added to z/OS:

- Parmlib
- Proclib
- Logon procedures
- Catalogs
- Security definitions, including program control definitions
- DFSMS ACS routines
- Any backup and recovery procedures.

Rules: Some of the data sets shipped with z/OS are PDSEs and are most likely in your link list. If one or more are in your link list and on your system residence volume, adhere to the following PDSE sharing rules to avoid data set corruption:

- If you specified PDSESHARING(NORMAL), do not share PDSE data sets beyond the scope of the global resource serialization complex.
- If you specified PDSESHARING(EXTENDED), do not share PDSE data sets beyond the scope of the sysplex.

Table 5. Data sets added to z/OS V2R1 and z/OS V1R13 (in alphabetic order by DDDEF name)

DDDEF	Data set name (high-level qualifiers are defaults) or path	DLIB or target	To element or feature	When added	Why added
AEPHPLIB	EPH.AEPHPLIB	DLIB	Library Server	z/OS V2R1	New data set for Library Server.
AEPHTAB	EPH.AEPHTAB	DLIB	Library Server	z/OS V2R1	New data set for Library Server.
AFNT300	SYS1.AFNT300	DLIB	z/OS Font Collection	z/OS V2R1	Previously existing non-z/OS data set now ships with the z/OS product as of z/OS V2R1. Previously owned by AFP Font Collection.
AFNTDLIB	SYS1.AFNTDLIB	DLIB	z/OS Font Collection	z/OS V2R1	Previously existing non-z/OS data set now ships with the z/OS product as of z/OS V2R1. Previously owned by AFP Font Collection.
AFNTILIB	SYS1.AFNTILIB	DLIB	z/OS Font Collection	z/OS V2R1	Previously existing non-z/OS data set now ships with the z/OS product as of z/OS V2R1. Previously owned by General Font Library.
AFNTLIB	SYS1.AFNTLIB	DLIB	z/OS Font Collection	z/OS V2R1	Previously existing non-z/OS data set now ships with the z/OS product as of z/OS V2R1. Previously owned by Compatibility Fonts feature.

General migration actions for everyone

Table 5. Data sets added to z/OS V2R1 and z/OS V1R13 (in alphabetic order by DDDEF name) (continued)

DDDEF	Data set name (high-level qualifiers are defaults) or path	DLIB or target	To element or feature	When added	Why added
AFNTLIBB	SYS1.AFNTLIBB	DLIB	z/OS Font Collection	z/OS V2R1	Previously existing non-z/OS data set now ships with the z/OS product as of z/OS V2R1. Previously owned by AFP Font Collection.
AFONTHFS	SYS1.AFONTHFS	DLIB	z/OS Font Collection	z/OS V2R1	New data set as of z/OS V2R1
FONT300	SYS1.FONT300	Target	z/OS Font Collection	z/OS V2R1	Previously existing non-z/OS data set now ships with the z/OS product as of z/OS V2R1. Previously owned by AFP Font Collection
FONTLIB	SYS1.FONTLIB	Target	z/OS Font Collection	z/OS V2R1	Previously existing non-z/OS data set now ships with the z/OS product as of z/OS V2R1. Previously owned by Compatibility Fonts feature.
FONTLIBB	SYS1.FONTLIBB	Target	z/OS Font Collection	z/OS V2R1	Previously existing non-z/OS data set now ships with the z/OS product as of z/OS V2R1. Previously owned by AFP Font Collection.
SEPHPLIB	/usr/lpp/booksrv/plugins/IBM/	Target	Library Server	z/OS V2R1	New path for Library Server.
SERBHFS	/usr/lpp/gpm/IBM	Target	RMF	z/OS V1R13	New RMF file system path for RMF XP.
SFNTILIB	SYS1.SFNTILIB	Target	z/OS Font Collection	z/OS V2R1	Previously existing non-z/OS data set now ships with the z/OS product as of z/OS V2R1. Previously owned by General Font Library.
SFNTWTYP	/usr/lpp/fonts/worldtype/IBM/	Target	z/OS Font Collection	z/OS V2R1	New path as of z/OS V2R1.
SFONDLIB	SYS1.SFONDLIB	Target	z/OS Font Collection	z/OS V2R1	Previously existing non-z/OS data set now ships with the z/OS product as of z/OS V2R1. Previously owned by AFP Font Collection.
SHZCINC	/usr/lpp/hzc/include/IBM/	Target	z/OS UNIX	z/OS V2R1	New file system path for zEnterprise Data Compression (zEDC).

General migration actions for everyone

Table 5. Data sets added to z/OS V2R1 and z/OS V1R13 (in alphabetic order by DDDEF name) (continued)

DDDEF	Data set name (high-level qualifiers are defaults) or path	DLIB or target	To element or feature	When added	Why added
SHZCLIB	/usr/lpp/hzc/lib/IBM/	Target	z/OS UNIX	z/OS V2R1	New file system path for zEnterprise Data Compression (zEDC).

Reference information: None.

Verify your IFAPRDxx Product ID is correct for z/OS Version 2

Description: Because z/OS has changed from Version 1 (V1) to Version 2 (V2), the IFAPRDxx parmlib member Product ID should reflect the new program number for z/OS. The Feature, Release, and Modification values also found in IFAPRDxx should be specified as "*", so those values do not have to change; only the Product ID is affected by this change.

Element or feature:	Multiple.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	If you are sharing the IFAPRDxx parmlib member between z/OS V1 and V2 systems, keep the V1 Product ID statements (for 5694-A01). You can have both the V1 Product ID and the V2 Product ID statements in the same IFAPRDxx parmlib member. After you have completed your migration to z/OS V2, you can remove the V1 Product ID statement from your IFAPRDxx parmlib member.
Restrictions:	None.
System impacts:	Failure to update IFAPRDxx with the correct Product ID statement for z/OS V2 will result in various initialization failures. An example of one of these failures is the following: IFA104I REGISTRATION HAS BEEN DENIED FOR PRODUCT WITH OWNER=IBM CORP NAME=z/OS FEATURE=TCP/IP BASE VERSION=.. ID=5650-ZOS
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

- If you use ServerPac, the customized IFAPRDxx parmlib member has been shipped to you in CPAC.PARMLIB. Verify that you are either using that parmlib member, or have copied its contents to a parmlib member you are using.

- If you are using CBPDO, use provided job ZOSREG in the RIMLIB, to place a customized IFAPRD00 member into your parmlib.

Note: Customers must ensure that the policy in IFAPRDxx enables only the version/release at which they are licensed. Use of and enablement of z/OS features is subject to the z/OS license terms and conditions and must be done with the knowledge of your asset manager according to the terms and conditions for z/OS. For additional license terms and conditions, see the "Usage Restriction" section of the *z/OS Licensed Program Specifications* .

Reference information: See the following information:

- *z/OS MVS Initialization and Tuning Reference*
- *z/OS Planning for Installation*
- *z/OS Program Directory*

Accommodate new address spaces

Description: The MAXUSER value in parmlib member IEASYSxx specifies a value that the system uses to limit the number of jobs and started tasks that can run concurrently during a given IPL. You might want to increase your MAXUSER value to take new address spaces into account.

The following address spaces are new for z/OS V2R1:

- PCIE (PCI Express) and FPGHWAM (Hardware Accelerator Manager). They provide the infrastructure for PCI Express I/O and hardware accelerator activities. These address spaces are started automatically during z/OS initialization, if the appropriate z/OS PCIE facilities hardware is installed. They are persistent address spaces.

If the PCIE address space is successfully initialized, the message is displayed:

```
IQP002I PCIE INITIALIZATION COMPLETE
```

If the required hardware is not installed, the following message is written to the hardcopy log:

```
IQP031I REQUESTED SERVICE IS UNSUPPORTED BY HARDWARE
```

For information about the PCIE messages, see *z/OS MVS System Messages, Vol 9 (IGF-IWM)*. For information about the FPGHWAM (Hardware Accelerator Manager) messages, see *z/OS MVS System Messages, Volume 5 (EDG-GFS)*.

PCIE and FPGHWAM do not require any security customization.

- IBM Health Checker for z/OS. As of z/OS V2R1 the system starts IBM Health Checker for z/OS address space automatically during system initialization. For information, see "Convert your existing IBM Health Checker for z/OS set-up for automatic start-up" on page 106.
- JES2 Converter/Interpreter. A new persistent address space is used when the interpretation process is performed for a job during the JES2 conversion phase. The address space is only created when INTERPRET=JES is specified on JOBDEF. The number of address spaces used depends on the CISUB_PER_AS setting on JOBDEF. The number of conversion processes (PCEDEF CNVTNUM=) divided by the number of subtasks per address space (CISUB_PER_AS) gives the number of address spaces created. The default number of created address spaces is 2 and the maximum number is 25.

The name of the address spaces are jesxCInn where jesx is the JES2 subsystem name and xx is a number (from 01 to 25) to create uniqueness. This address space accesses the PROCLIB data sets defined in the JES2 start PROC and using the JES2 dynamic PROCLIB service.

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You must ensure that a proper user ID is assigned to the address space (presumably the same user ID that is assigned to the JES2 address space) using entries in either the started procedures table (ICHRIN03) or that a STARTED class profile has been defined that matches each new address space names. If you prefer, both the started procedures table and STARTED class profile might be in place. This action ensures that the correct user ID is assigned.

- Generic Tracker (GTZ). As of z/OS V2R1, GTZ replaces the Console Tracking Facility with enhanced capabilities to track use of system functions. For information, see “Move from the console tracking facility to the Generic Tracker” on page 105.

There are two new address spaces in z/OS V1R13.

- GPM4CIM is an address space to be used for cross-platform performance management with RMF XP. You can start it by using procedure SYS1.PROCLIB(GPM4CIM) from the console, as started task, with the following command:

```
s gpm4cim[.identifier],os=A|X|Z
```

Since you can run multiple GPM4CIM instances simultaneously, it is recommended to assign an identifier that you can use for subsequent STOP or MODIFY commands. You may already have created the userID GPMSERVE as owner of the GPMSERVE procedure. The GPM4CIM started task can be assigned to the same userID with the following command:

```
RDEFINE STARTED GPM4CIM.* STDATA(USER(GPMSERVE) TRUSTED(YES))
```

- As of z/OS V1R13 the Runtime Diagnostics address space HZR will be a persistent address space. When the HZR address space is started with the START command S HZR,SUB=MSTR, it will remain active until stopped with the STOP command P HZR. To analyze a system, enter the MODIFY HZR,ANALYZE command. See “Start Runtime Diagnostics at system initialization” on page 271.

Element or feature:	BCP, JES, and RMF.
When change was introduced:	<ul style="list-style-type: none"> • z/OS V1R13 for GPM4CIM and HZR • z/OS V2R1 for the following: <ul style="list-style-type: none"> – BCP PCIE (PCI Express) and FPGHWAM (Hardware Accelerator Manager). – IBM Health Checker for z/OS – JES2 – GTZ
Applies to migration from:	z/OS V1R11 and z/OS V1R10.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	No, but recommended to ensure that your MAXUSER value in parmlib member IEASYSxx is adequate.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.

Related IBM Health Checker for z/OS check:	None.
---	-------

Steps to take: If necessary, increase your MAXUSER value in parmlib member IEASYSxx to take the new address spaces into account. One way to find out how many address spaces you use is to issue the DISPLAY A,L command and total the address spaces in the IEE114I and IEE115I messages on the old and new systems.

Note:

- A modest overspecification of MAXUSER should not affect system performance.
- The number of total address spaces is the sum of M/S, TS USERS, SYSAS, and INITS.
- If you change your MAXUSER value, you must re-IPL to make the change effective.

Reference information: For more information about the MAXUSER parameter, see *z/OS MVS Initialization and Tuning Reference*.

Migration actions for everyone after the first IPL of z/OS V2R1

This topic describes migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

None.

Hardware migration actions

This topic describes hardware migration actions. The information in this topic is not specifically related to migrating to z/OS V2R1; it only applies if you are changing hardware. Therefore, this topic does not categorize the actions in terms of when they should be performed (before installing, before the first IPL, or after the first IPL).

Migrate to an IBM zEnterprise EC12 server or IBM zEnterprise BC12 server

Description: An IBM zEnterprise EC12 (zEC12) and IBM zEnterprise BC12 (zBC12) server can include the following in a zEnterprise environment:

- IBM zEnterprise EC12 server Central Processing Complex (CPC) or IBM zEnterprise BC12 server CPC
- zEnterprise BladeCenter Extension (zBX) Model 003 with its integrated optimizers or select IBM blades
- zEnterprise Unified Resource Manager (Unified Resource Manager)

The zEC12 and zBC12 are the newest IBM System z servers and distinct from the earlier zEnterprise and other servers. In this publication the IBM zEnterprise EC12 server is referred to as the model zEC12 server and the IBM zEnterprise BC12 server is referred to as the model zBC12 server.

In a Parallel Sysplex you can include the following servers:

- zEC12 and zBC12 servers
- zEnterprise servers (z196 or z114)

General migration actions: Hardware

- z10 EC and z10 BC servers.

The specific zEC12 and zBC12 functions including base support that are exploited by z/OS depend on the z/OS release. Availability and other restrictions are noted in the **Notes** column. PTFs might be required for many of these functions. See “Actions you can take before you order a zEC12 or zBC12 server” on page 50 for information about finding the appropriate PTFs.

Table 6. zEC12 and zBC12 server functions included in the base support for z/OS V1R12, z/OS V1R13, and z/OS V2R1

zEC12 and zBC12 function included in base z/OS support: • Y=Yes • N=No	R12 ¹	R13 ¹	V2R1 ¹
Base support	Y	Y	Y
OSA-Express4S (GbE LX and SX, 1000BASE-T, 10 GbE LR and SR)	Y	Y	Y
OSA-Express5S (GbE LX and SX, 1000BASE-T, 10 GbE LR and SR)	Y	Y	Y
FICON Express 8S (CHPID FC)	Y	Y	Y
High Performance FICON (zHPF)	Y	Y	Y
Parallel Sysplex InfiniBand (PSIFB) Coupling Link	Y	Y	Y
CPU measurement facility	Y	Y	Y
New z/Architecture instructions: XL C/C++ ARCH(10) and TUNE(10) parameters	Y	Y	Y
Crypto Express3 Toleration (if carried forward)	Y	Y	Y
IBM zEnterprise United Resource Manager	Y	Y	Y
IBM zEnterprise BladeCenter Extension (zBX) Model 3	Y	Y	Y
GRS FICON CTC toleration	Y (requires additional PTFs for exploitation) ²	Y (requires additional PTFs for exploitation) ²	Y

Note:

1. PTFs for base support have a fix category of either:
 - For zEC12: IBM.Device.Server.zEC12-2827
 - For zBC12: IBM.Device.Server.zBC12-2828
2. PTFs for exploitation have a fix category of either:
 - For zEC12: IBM.Device.Server.zEC12-2827.Exploitation
 - For zBC12: IBM.Device.Server.zEC12-2828.Exploitation
3. PTFs for zEDC exploitation or software decompression have a fix category of either:
 - For zEC12: IBM.Device.Server.zEC12-2827.zEnterpriseDataCompression
 - For zBC12: IBM.Device.Server.zBC12-2828.zEnterpriseDataCompression

Table 7. Exploitation of zEC12 and zBC12 server functions supported by z/OS V1R12, z/OS V1R13, and z/OS V2R1

zBC12 functional exploitation of z/OS support: • Y=Yes • N=No	R12 ²	R13 ²	V2R1 ²
Coupling Facility Control Code (CFCC) Level 18	Y	Y	Y
Coupling Facility Control Code (CFCC) Level 19	Y	Y	Y
Coupling Facility Control Code (CFCC) Level 19 Coupling thin interrupt support	Y	Y	Y
Crypto Express4S (#0865) exploitation including Enterprise Security PKCS #11-Hardware Security Module (HSM), DUKPT for MAC and Data Encryption, Cipher Text Translate CCA Verb, PKDS/TKDS Constraint Relief, Random Number Cache, FIPS on Demand, and Wrapping Keys with Strong Keys	Y (requires Cryptographic Support for z/OS V1R12-V1R13 Web deliverable (FMID HCR77A0) or higher)	Y (requires Cryptographic Support for z/OS V1R12-V1R13 Web deliverable (FMID HCR77A0) or higher)	Y
Crypto Express4S CCA enhancements including: Export TDES key under AES transport key, Diversified Key Generation CBC, IPEK, RKX key wrapping method, and Integration of UDX into CCA	N	Y (requires the Cryptographic Support for z/OS V1R13-z/OS V2R1 Web deliverable (FMID HCR77A1) .	Y (requires the Cryptographic Support for z/OS V1R13-z/OS V2R1 Web deliverable (FMID HCR77A1)
Crypto Express4S: EP11 enhancements when the Crypto Express4S PCIe adapter is configured as an EP11 coprocessor including: (PKCS #11 v2.1 PSS, EP11 Key agreement algorithms, and Offload Generation of Domain Parameters)	N	Y (requires the Cryptographic Support for z/OS V1R13-z/OS V2R1 Web deliverable (FMID HCR77A1)	Y (requires the Cryptographic Support for z/OS V1R13-z/OS V2R1 Web deliverable (FMID HCR77A1)
Flash Express (Storage Class Memory or SCM)	N	Y (requires the z/OS V1R13 RSM Enablement Offering Web deliverable)	Y
Pageable 1 MB Large Page Support.	N	Y (requires the z/OS V1R13 RSM Enablement Offering Web deliverable)	Y
Dynamic reconfiguration support for Flash Express.	N	Y (requires the z/OS V1R13 RSM Enablement Offering Web deliverable)	Y
2 GB Large Page support.	N	Y (requires the z/OS V1R13 RSM Enablement Offering Web deliverable)	Y

General migration actions: Hardware

Table 7. Exploitation of zEC12 and zBC12 server functions supported by z/OS V1R12, z/OS V1R13, and z/OS V2R1 (continued)

zBC12 functional exploitation of z/OS support: • Y=Yes • N=No	R12 ²	R13 ²	V2R1 ²
Optional PLPA/common page data set support.	N	Y (requires the z/OS V1R13 RSM Enablement Offering Web deliverable and additional PTFs)	Y
10GbE RoCE Express	N	N	Y
Java Exploitation of Transactional Execution (requires Java7 SR3)	N	Y (intended for testing environments)	Y
IBM System Advanced Workload Analysis Reporter (IBM zAware)	N	Y (requires additional PTFs for exploitation)	Y
New z/Architecture instructions: XL C/C++ ARCH(10) and TUNE(10) parameters	N	Y	Y
New z/Architecture Assembler Language instruction mnemonic	N	N	Y
zEDC capability using zEDC Express	N ³ (toleration support provided for software decompression)	N ³ (toleration support provided for software decompression)	Y ³ (requires the z/OS zEDC software feature to be enabled)

Note:

- PTFs for base support have a fix category of either:
 - For zEC12: IBM.Device.Server.zEC12-2827
 - For zBC12: IBM.Device.Server.zBC12-2828
- PTFs for exploitation have a fix category of either:
 - For zEC12: IBM.Device.Server.zEC12-2827.Exploitation
 - For zBC12: IBM.Device.Server.zEC12-2828.Exploitation
- PTFs for zEDC exploitation or software decompression have a fix category of either:
 - For zEC12: IBM.Device.Server.zEC12-2827.zEnterpriseDataCompression
 - For zBC12: IBM.Device.Server.zBC12-2828.zEnterpriseDataCompression

Element or feature:	Multiple.
When change was introduced:	<ul style="list-style-type: none"> IBM zEnterprise EC12, which first shipped September 2012. IBM zEnterprise BC12 (zBC12), which first shipped September 2013.
Applies to migration from:	z/OS V2R1, z/OS V1R13 and z/OS V1R12.
Timing:	Anytime before you introduce a zEC12 or zBC12 server into your environment.

Is the migration action required?	Yes, if you want to run z/OS V2R1, z/OS V1R13 and V1R12 on a zEC12 or zBC12 server, or if you want to run a Coupling Facility on a zEC12 or zBC12 server. If you will run only a Coupling Facility on a zEC12 or zBC12 system, then only the sysplex-related actions are relevant.
Target system hardware requirements:	<ul style="list-style-type: none">• A zEC12 or zBC12• Additional hardware required for specific functions.<ul style="list-style-type: none">– IBM devices previously attached to IBM System z10, z196 and zSeries servers are supported for attachment to zEC12 channels, unless otherwise noted. The subject I/O devices must meet FICON architecture requirements– IBM zAware requires the IBM zAware server firmware (FC #0011, #0101, and #0102)– Flash Express requires FC #0402– zEDC Express requires FC #0420– 10 GbE RoCE Express FC #0411– Use of IBMWebSphere DataPower Integration Appliance XI50 for zEnterprise (DataPower XI50z) or select IBM BladeCenter PS701 Express blades or IBM BladeCenter HX5 blades requires a zEnterprise BladeCenter Extension (zBX) Model 003

General migration actions: Hardware

Target system software requirements:	<ol style="list-style-type: none">1. See the list of PTFs in the Software Service Level section of the PSP buckets and use the SMP/E Fix Categories:<ul style="list-style-type: none">• For zEC12 base support: IBM.Device.Server.zEC12-2827• For zBC12 base support: IBM.Device.Server.zBC12-2828• For zEC12 exploitation: IBM.Device.Server.zEC12-2827.Exploitation• For zBC12 exploitation: IBM.Device.Server.zBC12-2828.Exploitation• For zEC12 zEDC exploitation or toleration: IBM.Device.Server.zEC12-2827.zEnterpriseDataCompression• For zBC12 zEDC exploitation or toleration: IBM.Device.Server.zBC12-2828.zEnterpriseDataCompression2. See Support is delivered by service, z/OS features, and web deliverables described in “General recommendations and considerations for a zEC12 and zBC12 server” on page 47 and Install the necessary z/OS service, as indicated in PSP buckets described in “Actions you can take before you order a zEC12 or zBC12 server” on page 50
Other system (coexistence or fallback) requirements:	<ul style="list-style-type: none">• It is recommended that you install and run the zEnterprise required service on your existing server. This will enable you to fall back from a hardware perspective, yet maintain your software level.• If you haven't installed the preconditioning and exploitation PTFs for CFCC Level 17, Note that those PTFs are required to be installed throughout your sysplex before implementing CFCC Level 18 or 19.• If you plan to implement zEDC, you should install the z/OS toleration PTFs on systems that will access data that has been compressed using zEDC Express on a zEC12 or zBC12 server.
Restrictions:	See “Restrictions for a zEC12 or zBC12 server” on page 48.
System impacts:	None.
Related IBM Health Checker for z/OS check:	IBM Health Checker for z/OS check, SUP_HiperDispatchCPUConfig, is added to z/OS V1R12 with APAR OA30476. This check will verify that HiperDispatch is enabled on a z196 or later system.

Steps to take: Follow the “General recommendations and considerations for a zEC12 and zBC12 server” on page 47, adhere to the “Restrictions for a zEC12 or zBC12 server” on page 48, and perform the tasks described in the following topics.

General recommendations and considerations for a zEC12 and zBC12 server

As you plan your migration to a zEnterprise® server, consider the following:

1. **Relatively few migration actions are new when coming from a z196 or z114 server.** Migration to an IBM zEnterprise EC12 or zEnterprise BC12 server has, as its base, a migration to the z196 or z114 servers. This means that if you are migrating to a zEnterprise server from a z196 or z114 server, and have performed the migration actions associated with the z196 or z114, you have fewer migration actions than if you were migrating from an earlier generation server and have not yet performed the migration actions associated with these servers. There are, in fact, very few new migration actions to perform on z/OS for a zEnterprise zEC12 or zBC12 server if you have already migrated to a z196 or z114 server. It is important to note that you can migrate directly to a zEC12 or zBC12 server without installing the intermediate servers, but you still need to ensure that any migration considerations are satisfied for the servers that you “skipped.” To read about z196, z114, z10 EC and z10 BC server migration actions, see “Migrate to an IBM zEnterprise z196 or z114 server” on page 57 and “Migrate to a System z10 server” on page 74.
2. **Support is delivered by service, z/OS features, and web deliverables.** The base support for an zEC12 or zBC12 server is delivered by service (PTFs).
 - The PSP bucket that contains the required list of PTFs for zBC12 is: Upgrade 2828DEVICE, Subset 2828/ZOS and is identified by the following SMP/E Fix Category IBM.Device.Server.zBC12-2828.
 - The PSP bucket that contains the required list of PTFs for zEC12 is: Upgrade 2827DEVICE, Subset 2827/ZOS

and is identified by the following SMP/E Fix Category
IBM.Device.Server.zEC12-2827.

For Flash Express® support (including dynamic reconfiguration support and optional PLPA/COMMON page data set support), pageable 1 MB Large Page support, and 2 GB Large Page Support, a separate web deliverable for z/OS V1R13 (the z/OS V1R13 RSM Enablement Offering web deliverable) is required. (See “Decide on the steps you will take for your migration to a zEC12 or zBC12 server” in “Actions you can take before you order a zEC12 or zBC12 server” on page 50 for further information.)

3. **Larger coupling facility structure sizes might be necessary.** When you change coupling facility control code (CFCC) levels, your coupling facility structure sizes might change. zEC12 servers that are ordered before September 2013 initially ship with CFCC level 18, zEC12 or zBC12 models ordered after September 2013 initially ship with CFCC level 19. If, as part of your migration to a zEC12 or zBC12 server, you change CFCC levels, you might have larger structure sizes than you did previously. If your CFCC levels are identical, structure sizes are not expected to change when you migrate from a previous server to a newer generation server. In addition, similar to CF Level 17 and later, ensure that the CF LPAR has at least 512MB of storage. CFLEVEL 19 introduces support for storage-class (flash) memory in the CF and Coupling thin interrupt support. CF structures that exploit SCM may require significantly more CF real storage than they did before storage class memory exploitation.
4. **Use the same software level throughout a sysplex.** Having members of a sysplex at the same software level (other than during brief migration periods) is good software management policy.
5. **Migrate hardware and software at different times.** To minimize the amount of change (and therefore risk) that you experience at one time, do not migrate your software release level at the same time that you migrate your hardware.

General migration actions: Hardware

6. **Update SCRT to latest version.** If you use SCRT, make sure it is at the latest level. This is a requirement for sub-capacity pricing, as well as when you upgrade servers. The latest level of SCRT can be downloaded from the SCRT web site at <http://www.ibm.com/eserver/zseries/swprice/scrt/>.

Restrictions for a zEC12 or zBC12 server

Restrictions associated with zEnterprise servers are:

1. **Functional limitations:** Not all zEC12 or zBC12 functions are available in every z/OS release. See the following and for a list of the zEC12 and zBC12 functions available in each z/OS release.:
 - Table 6 on page 42
 - Table 7 on page 43

Some functions have migration or exploitation considerations (see “Actions you can take before you order a zEC12 or zBC12 server” on page 50 and “Migration and exploitation considerations for zEC12 and zBC12 server functions” on page 53.) Many functions are enabled or disabled, based on the presence or absence of the required hardware and software. If you wish to position yourself to exploit any new zEC12 or zBC12 functions, you can install the software and hardware in either order; that is, there is no requirement to install either software or hardware first to exploit a specific function. However, because of outage windows and testing considerations, you might want to consider installing all the required software first, then upgrading the hardware and, finally, updating your customization to exploit the new functions.

2. **zEC12 and zBC12 servers in a sysplex:**

- A Parallel Sysplex that contains an zEC12 or zBC12 server either for a z/OS image or a CF image can only contain other zEC12 or zBC12 servers or zEnterprise z196, z114, z10 EC, or z10 BC servers.

If you are running z/OS on any servers earlier than a z10 EC or z10 BC server, you cannot add a zEC12 or zBC12 server to that sysplex; that is, you will not be able to perform rolling IPLs to introduce a zEC12 or zBC12 server if you have any of the earlier servers either as z/OS images or coupling facility images in the sysplex.

The earlier servers in the sysplex must be upgraded to System z10 or later to have zEC12 or zBC12 servers supported in the sysplex. If you have any z/OS images or coupling facility images on an earlier server, and you intend to introduce a zEC12 or zBC12 server into that sysplex, you must migrate those images to a System z10 (or later) server before introducing the zEC12 or zBC12 server.

If you are currently using ESCON CTCs for GRS ring configurations within a sysplex, consider using XCF signalling in a GRS ring configuration. XCF sysplex signalling is preferred instead of GRS CTC connections. Note that ESCON CTCs are not supported on a zEC12 or zBC12 server and if you choose not to convert to XCF signalling, you will have to install toleration maintenance to enable GRS to use FICON[®] for GRS ring configurations. This support does not enhance the robustness of GRS-managed CTCs and the toleration must be installed across GRS complex. See “Migrate to GRS-managed FICON CTCs” on page 283.

- The Integrated Cluster Bus 4 (ICB-4) Coupling Links are not supported on a zEC12 or zBC12 CPC. Use 12x InfiniBand coupling links, which are designed to replace Integrated Cluster Bus 4 (ICB-4), and to complement 1x InfiniBand and ISC-3 on a zEC12 or zBC12 server. InfiniBand coupling can provide

significantly improved service times compared to ISC-3s for distances up to 150 meters. You can read about InfiniBand coupling links in *IBM System z Connectivity Handbook* (SG24-5444).

- The zEC12 or zBC12 server **cannot** be connected to a Sysplex Timer (9037-002). The Server Time Protocol (STP) feature is the follow-on to the Sysplex Timer. STP is designed to allow multiple servers and coupling facilities to maintain time synchronization with each other without requiring a Sysplex Timer. STP is a hardware feature of the zEC12, zBC12, z196, z114, z10 EC, and z10 BC. To implement STP, see the STP web site and the publications and other resources listed there. The STP web site is at <http://www.ibm.com/systems/z/advantages/pso/stp.html>.

The STP design introduced a concept called Coordinated Timing Network (CTN). A CTN is a collection of servers and coupling facilities that are time-synchronized to a time value called Coordinated Server Time. A CTN can be configured in two ways:

- STP-only CTN, which does not require a Sysplex Timer.
- Mixed-CTN (External Time Reference and STP), which does require a Sysplex Timer.

The Sysplex Timer provides the timekeeping information in a Mixed-CTN. Even though the zEC12 or zBC12 servers do not support attachment to a Sysplex Timer, they can participate in a Mixed-CTN that has a z10 server synchronized to the Sysplex Timer. This maintains the capability for enterprises to concurrently migrate from an existing External Time Reference (ETR) to a Mixed-CTN and from a Mixed-CTN to an STP-only CTN.

Note: The zEC12 and zBC12 will be the last high-end servers to support connections to an STP Mixed-CTN. All servers in the network must be configured in STP-only mode. Consider migrating your servers that require time synchronization, such as to support a base or Parallel Sysplex(R), to the Server Time Protocol (STP).

3. For a list of functions on the zEC12 or zBC12 server that are planned to be discontinued on future servers, see “Accommodate functions for the zEC12 and zBC12 servers to be discontinued on future servers” on page 55
4. **Unsupported hardware features:** The following hardware features **cannot** be ordered and cannot be carried forward from an upgrade on an earlier server to the zEC12 or zBC12 server.
 - Power[®] Sequence Controller (PSC).
 - FICON Express. You should begin migrating to FICON Express8S channels.
 - FICON Express2. You should begin migrating to FICON Express8S channels.
 - FICON Express4 4KM LX. You should begin migrating to FICON Express8S channels.
 - OSA Express2. You should begin migrating to OSA-Express4S (GbE LX and SX, 1000BASE-T, 10 GbE LR and SR).
 - ESCON. You should begin migrating to FICON Express8S channels.
 - Dial up modems. The currently available Network Time Protocol (NTP) server option for ETS, as well as Internet time services available using broadband connections, can be used to provide the same degree of accuracy as dial-up time services. You should begin migrating from dial-up modems to broadband for RSF connections

General migration actions: Hardware

Carry forward hardware features: The following hardware features are not orderable on zEC12 or zBC12 servers. If they are installed on your existing server at the time of an upgrade to a zEC12 or zBC12 server, they may be retained or carried forward.

- ISC-3. You should begin migrating from ISC-3 features (#0217, #0218, #0219) to 12x InfiniBand (#0163 - HCA2-O or #0171- HCA3-O fanout) or 1x InfiniBand (#0168 - HCA2-O LR or #0170 - HCA3-O LR fanout) coupling links.
- FICON Express4 10KM LX. You should begin migrating to FICON Express8S channels.
- FICON Express4 SX. You should begin migrating to FICON Express8S channels
- Crypto Express3

Also, see “Ensure you are running on supported servers and storage controllers” on page 84

Actions you can take before you order a zEC12 or zBC12 server

You can perform the following migration actions before you order or install a zEC12 or zBC12 server:

1. **Review the sysplex configuration in which the zEC12 or zBC12 server will participate.** See “Restrictions for a zEC12 or zBC12 server” on page 48 for a description of the limitations when using zEC12 or zBC12 servers with certain earlier servers in a Parallel Sysplex.
2. **Implement STP (or a Mixed-CTN) timing network.** This action is necessitated because Sysplex Timers (9037-002) are not supported on zEC12 or zBC12 servers.
3. **Migrate from ICB-4 to InfiniBand coupling links.** This action is necessitated because ICB-4 links are not supported on zEC12 or zBC12 servers. If desired, you can take this action after you order a zEC12 or zBC12 server, as you upgrade to the new server.
4. **Migrate from unsupported hardware features to newer technology.** This action is necessitated because FICON Express, FICON Express2, Crypto Express2, and OSA-Express2 10 GbE LR are not supported on zEnterprise servers. See “Restrictions for a zEC12 or zBC12 server” on page 48, “Replace unsupported devices” on page 85, and “Provide for new device installations” on page 86.
5. **Install the necessary z/OS service, as indicated in PSP buckets.**
 - For an IBM zEnterprise BC12 CPC, PTFs are identified in the in the 2828DEVICE PSP bucket (Subset 2828/ZOS).
 - For an IBM zEnterprise EC12 CPC, PTFs are identified in the 2827DEVICE PSP bucket (Subset 2827/ZOS).
 - For an IBM zEnterprise BladeCenter[®] Extension (zBX) attached to your zEC12 CPC or zBC12 CPC, the PTFs are identified in the 2458DEVICE PSP bucket (Subset 2458/ZOS).

In each PSP bucket, the content is dependent on the z/OS release you will run on the zEnterprise server. If you reviewed the PSP buckets some time ago, review them again to ensure that any newly identified z/OS service has been installed. To assist you in determining if you have the recommended service (identified in these PSP buckets) installed on your system, you can use the SMP/E REPORT MISSINGFIX command in conjunction with the FIXCAT type of HOLDDATA, as follows:

- a. Acquire and RECEIVE the latest HOLDDATA onto your z/OS system(s). Use your normal service acquisition portals or download the two (2) year HOLDDATA directly from <http://service.software.ibm.com/holddata/390holddata.html>. Ensure you select **Full** from the Download NOW column (last 730 days) to receive the FIXCAT HOLDDATA, as the other files do not contain FIXCAT HOLDDATA.
- b. Run the SMP/E REPORT MISSINGFIX command on your z/OS systems and specify one or more of the following Fix Categories (FIXCAT):
 - IBM.Device.Server.zEC12-2827
 - IBM.Device.Server.zEC12-2827.Exploitation
 - IBM.Device.Server.zEC12-2827.ParallelSysplexInfiniBandCoupling
 - IBM.Device.Server.zEC12-2827.ServerTimeProtocol
 - IBM.Device.Server.zEC12-2827.zHighPerformanceFICON
 - IBM.Device.Server.zEC12-2827.UnifiedResourceManager
 - IBM.Device.Server.zEC12-2827.zEnterpriseDataCompression
 - IBM.Device.Server.zBC12-2828
 - IBM.Device.Server.zEC12-2828.Exploitation
 - IBM.Device.Server.zBC12-2828.ParallelSysplexInfiniBandCoupling
 - IBM.Device.Server.zBC12-2828.ServerTimeProtocol
 - IBM.Device.Server.zBC12-2828.zHighPerformanceFICON
 - IBM.Device.Server.zBC12-2828.UnifiedResourceManager
 - IBM.Device.Server.zBC12-2828.zEnterpriseDataCompressionThe report will identify any missing coexistence and fallback PTFs for that system. For complete information about the REPORT MISSINGFIX command, see *SMP/E for z/OS Commands*.
- c. Periodically, you might want to acquire the latest HOLDDATA and rerun the REPORT MISSINGFIX command to find out if there are any new PTFs recommended for the zEnterprise servers.

Note:

- a. You can also use Service Link's PSP Service Extraction tool.
 - b. Because the Enhanced PSP Tool (EPSPT) was removed the end of 2010, you can no longer use that tool to identify missing PSP bucket service. You should use SMP/E's Fix Category support, which is fully integrated into SMP/E procedures and IBM product and service deliverables.
6. **Run CFSIZER and Sizer tools.** If you are moving your coupling facilities and the coupling facility structures will be on higher CFCC levels than they were previously, run the Coupling Facility Structure Sizer (CFSIZER) tool to find out if you have to increase coupling facility structure sizes. Run the Sizer utility, an authorized z/OS program that you can download, to evaluate structure size changes. The Sizer utility is distinct from CFSizer, and should be run after the new hardware (CFLEVEL) is installed but before any CF LPAR on the new hardware is populated with structures.

If ordered before September 2013, zEC12 servers initially ship with CFCC Level 18. For zEC12 and zBC12 servers ordered after September 2013, the servers ship with CFCC Level 19; prepare to make the necessary changes as indicated by the tool.

You can find the CFSIZER tool at <http://www.ibm.com/systems/support/z/cfsizer/>. Also see "Update your CFRM policy with coupling facility structure size changes" on page 87.

General migration actions: Hardware

You can find the Sizer utility at <http://www.ibm.com/systems/support/z/cfsizer/altsize.html>.

7. **Decide on the steps you will take for your migration to a zEC12 or zBC12 server.** In addition to the steps listed here in “Actions you can take before you order a zEC12 or zBC12 server” on page 50, as a guide, also see “Migration and exploitation considerations for zEC12 and zBC12 server functions” on page 53. Also, note the following web deliverables considerations.

The level of function provided for cryptographic support differs by z/OS release and the ICSF web deliverable that is installed. Toleration PTFs are also available for some cryptographic web deliverables:

For **z/OS V2R1** consider the following:

- If you require the **cryptographic enhancements support for CCA** (including: Export TDES key under AES transport key, Diversified Key Generation CBC, IPEK, RKX key wrapping method, and integration of UDX into CCA), you must install the web deliverable **Cryptographic Support for z/OS V1R13-z/OS V2R1 (FMID HCR77A1)**. You must also perform the required ICSF migration actions. “Cryptographic Services migration actions” on page 137
- **PTFs for coexistence:** For ICSF FMIDs HCR7770 and later, Coexistence PTFs are required to be installed on older levels of ICSF. To assist in identifying the coexistence service, you can use the following Fix Categories: :
 - IBM.Coexistence.ICSF.z/OS_V1R9-V1R11-HCR7770
 - IBM.Coexistence.ICSF.z/OS_V1R10-V1R12-HCR7780
 - IBM.Coexistence.ICSF.z/OS_V1R11-V1R13-HCR7790
 - IBM.Coexistence.ICSF.z/OS_V1R12-V1R13-HCR77A0
 - IBM.Coexistence.ICSF.z/OS_V1R13-V2R1-HCR77A1

If you intend to use the **zEDC Express data compression feature**, then similar to what you might be doing today to enable other z/OS priced features, you need to notify IBM that you are starting to use the feature, update the IFAPRDxx PARMLIB member to specify that the z/OS ZEDC software feature is ENABLED, and follow the z/OS V2R1 documentation to customize the exploiting functions. You should also ensure that all z/OS V1R12 or z/OS V1R13 systems that will access zEDC compressed data have the required toleration maintenance installed to enable software decompression.

8. **Review the new mnemonics introduced for the zEC12 or zBC12 server.** The new mnemonics might collide with (be identical to) the names of assembler macro instructions you use or provide. In the event of such collisions, the HLASM’s default opcode table (UNI) will treat specification of these names as instructions when APAR PM49761 and PM86821 are installed. This will probably cause assembler error messages and possibly cause generation of incorrect object code.

If you write programs in Assembler Language, you should compare the list provided in *z/Architecture Principles of Operation*, SA22-7832, to the names of assembler macro instructions you use or provide, to identify any such conflicts or collisions that would occur following installation of HLASM APAR PM49761 and PM86821. If a conflict is identified, take one of the following actions:

- Change the name of your macro instruction.
- Specify PARM=’...OPTABLE(YOP)...’ (or some other earlier opcode table).
- Specify a separate ASMAOPT file containing assembler options, such as in the previous method (this method requires no changes to source code or JCL).

- Add, as the first statement of your source program, *PROCESS OPTABLE(YOP).
- Specify the PROFILE option either in JCL or the ASMAOPT file, and the specified or default member of the SYSLIB data set is copied into the front of the source program.
- If you must use both a new instruction and a macro with the same name in an assembly, you can use the following technique (where XXX is a sample mnemonic):

```
Assume the default OPTABLE(UNI) is in effect
XXX  a,b      new instruction
PUSH ACONTROL save current optable definition
ACONTROL OPTABLE(YOP) switch optable dynamically
XXX  r,s,t    macro invocation
POP  ACONTROL restore previous definition
XXX  c,d      new instruction
```

For more information about HLASM opcode table, see *HLASM Programmer's Guide*.

9. Plan for changes to your global resource serialization complex with the zEC12 or zBC12 server.

If you use a global resource serialization ring complex that spans more systems than is part of the sysplex or does not use sysplex signalling for communications within the complex, you need to take migration actions. Instead of using global resource serialization ring, consider using the global resource serialization star configuration in a sysplex. You can take the following actions before you install the zEC12 or zBC12 server:

- Migrate to a Parallel Sysplex that uses the recommended global resource serialization star complex.
- Convert to a basic sysplex that uses XCF sysplex signalling with global resource serialization ring instead of GRS-managed channel-to-channel (CTC) communications.

Optionally, you can install maintenance for the zEC12 or zBC12 server that provides toleration for FICON-based CTC communications, but understand that this toleration does not improve the robustness of GRS-managed CTC communications, and you must install the toleration maintenance on all systems in the GRS complex. See "Migrate to GRS-managed FICON CTCs" on page 283.

Migration and exploitation considerations for zEC12 and zBC12 server functions

Consider the number of CPU measurement facility counters for zEC12 or zBC12. The number of CPU measurement facility counters for zEC12 and zBC12 is increased to 80. More extended counters mean more internal storage is required. While the structure of the SMF 113 Record does not change, the values, interpretations, and frequency of certain sections do change; therefore, current tools using the data need to be updated for zEC12 or zBC12. For example, consider the following SMF record fields:

- SMF113_2_CtrVN1 identifies how to interpret the Basic and Problem counter sets. As described in *The IBM CPU Measurement Facility Extended Counters Definition for z10 and z196, SA23-2260*, this field is set to 1 (for z10, z196, and z114) or 2 (for zEC12 and zBC12).
- SMF113_2_CtrVN2 identifies how to interpret the Crypto and Extended counter sets. As described in *The IBM CPU Measurement Facility Extended Counters Definition for z10 and z196, SA23-2260*, this field is set to 1 (for z10), 2 (for z196 or z114), or 3 (for zEC12 and zBC12).

General migration actions: Hardware

Note: As of z/OS V2R1, if you use the CPU Measurement Facility, you are encouraged to use SMF 113 subtype 1 records (instead of the subtype 2 records).

The following zEC12 and zBC12 functions are available on z/OS V2R1. For PTF information, see **Notes** to Table 7 on page 43:

1. **CFCC Level 19 Coupling thin interrupt support.** With PTFs CFCC Level 19 provides coupling thin interrupt support that allows a shared logical coupling facility partition to be dispatched by PR/SM if not already dispatched and allows for more timely processing of events to which the CF must respond. It is designed to improve service times for shared engine coupling facilities, and to help improve the response time for asynchronous CF operations. This function requires CFCC Level 19.
2. **Cryptographic Enhancements.** Cryptographic enhancements for z/OS V2R1 on the zEC12 and zBC12 servers include:
 - Crypto Express4S CCA enhancements when the PCIe adapter is configured as CCA coprocessor including: Export TDES key under AES transport key, Diversified Key Generation CBC, IPEK, RKX key wrapping method, and Integration of UDX into CCA requires z/OS V2R1 with the Cryptographic Support for z/OS V1R13-z/OS V2R1 Web deliverable (FMID HCR77A1) installed.
 - Crypto Express4S EP11 enhancements when the Crypto Express4S PCIe adapter is configured as an EP11 coprocessor including: (PKCS #11 V2R1 PSS, EP11 Key agreement algorithms, and Offload Generation of Domain Parameters) and requires z/OS V2R1 with the Cryptographic Support for z/OS V1R13-z/OS V2R1 Web deliverable (FMID HCR77A1) to be installed.
 - Crypto Express4S (#0865) exploitation including Enterprise Security PKCS #11-Hardware Security Module (HSM), DUKPT for MAC and Data Encryption, Cipher Text Translate CCA Verb, PKDS/TKDS Constraint Relief, Random Number Cache, FIPS on Demand, and Wrapping Keys with Strong Keys.

See **Decide on the steps you will take for your migration to a zEC12 or zBC12 server** in “Actions you can take before you order a zEC12 or zBC12 server” on page 50

3. **zEDC capability using zEDC Express.** zEDC provides IBM zEnterprise data compression/decompression capability. For z/OS V2R1, the zEDC software feature must be enabled with your product enablement policy (IFAPRDxx); then follow the z/OS V2R1 documentation to customize the exploiting functions. See “Verify your IFAPRDxx Product ID is correct for z/OS Version 2” on page 38
4. **IBM zAware system.** IBM zAware is designed to offer a near real-time, continuous learning, and diagnostics capability intended to help you pinpoint and resolve potential problems quickly enough to minimize impacts to your business. After you order a zEC12 or zBC12 you can prepare to set up an IBM zAware environment by defining the IBM zAware logical partition, defining and using OPERLOG log streams, and network definitions to connect the z/OS LPAR to the zAware LPAR. For more information, see *IBM System z Advanced Workload Analysis Reporter (IBM zAware) Guide*, (SC27-2623) and *z/OS MVS Setting Up a Sysplex*.
5. **Java Exploitation of Transactional Execution (requires Java 7 SR3).** This function provides support for Java exploitation of the Transaction Execution Facility on IBM zEnterprise zEC12 or zBC12. Transactional Execution will offer increased scalability and parallelism to drive higher transaction throughput. Java exploitation is planned with IBM 31-bit SDK for z/OS, Java technology

Edition, V7.0.0 (5655-W43) and SDK 7 IBM 64-bit SDK for IBM SDK for z/OS, Java Technology Edition, V7 (5655-W44). Also note that the z/OS V1R13 and later XL C/C++ compiler when ARCH(10) is specified will provide hardware built-in functions to enable applications to use the Java Transactional Execution Facility.

6. **Flash Express (Storage Class Memory or SCM).** This support includes pageable 1 MB Large Page support, dynamic reconfiguration support of SCM, and optional PLPA/COMMON page data set usage. This support requires the Flash Express hardware feature.
7. **2GB Large Page support.** This support includes support for 2 GB large fixed pages.
8. **CFCC Level 19 Flash Express.** This exploitation will provide improved resilience for MQ shared queues. The function requires CFCC Level 19 and is planned to be available in a future update.
9. **New z/Architecture instructions: XL C/C++ ARCH(10) and TUNE(10) parameters.** This function provides new zArchitecture instructions.
10. **Shared Memory Communications using RDMA (SMC-R) exploitation.** Shared Memory Communication using RDMA (Remote Direct Memory Access) enables transparent exploitation of RDMA technology for TCP/IP sockets based applications. It requires the 10GbE RoCE Express hardware feature.
11. **24k subchannels per channel (port) for the FICON Express features.** This is planned to help facilitate growth as well as continuing to enable server consolidation. You will be able to define more devices per FICON channel, which includes primary, secondary, and alias devices. This support applies to the FICON Express8S, FICON Express8, and FICON Express4 features when defined as CHPID type FC.
12. **OSA-Express5S.** OSA-Express5S provides a new generation of Ethernet features for use in the PCIe I/O drawer and continues to be supported by the 8 Gbps PCIe Gen2 host bus. This support includes: 1000BASE-T Ethernet for copper environments, in addition to 10 Gigabit Ethernet (10 GbE) and Gigabit Ethernet (GbE) for single-mode and multimode fiber optic environment.

Accommodate functions for the zEC12 and zBC12 servers to be discontinued on future servers

Description: The following changes in hardware support could affect your environment. Make appropriate changes as needed.

- **Removal of support for connections to an STP Mixed CTN:** The zEC12 and zBC12 are the last System z servers to support connections to an STP Mixed CTN. This also includes the Sysplex Timer (9037). After the zEC12 and the zBC12, servers that require Time synchronization, such as to support a base or Parallel Sysplex, will Require Server Time Protocol (STP) and all servers in that network must be configured in STP-only mode.
- **Removal of support for Ethernet half-duplex operation and 10 Mbps link data rate.** The OSA-Express4S 1000BASE-T Ethernet feature is planned to be the last copper Ethernet feature to support half-duplex operation and a 10 Mbps link data rate. The zEC12 and zBC12 servers are planned to be the last IBM System z servers to support half-duplex operation and a 10 Mbps link data rate for copper Ethernet environments. Any future 1000BASE-T Ethernet feature will support full-duplex operation and auto-negotiation to 100 or 1000 Mbps exclusively. This hardware statement of direction is fulfilled with the delivery of OSA-Express5S.
- **Removal of ISC-3 support on System z.** The zEC12 and zBC12 are planned to be the last System z servers to offer support of the InterSystem Channel-3 (ISC-3) for Parallel Sysplex environments at extended distances. ISC-3 will not be

General migration actions: Hardware

supported on future System z servers as carry forward on an upgrade. Previously we announced that the IBM zEnterprise 196 (z196) and IBM zEnterprise 114 (z114) servers were the last to offer ordering of ISC-3. Enterprises should continue migrating from ISC-3 features (#0217, #0218, #0219) to 12x InfiniBand (#0171 - HCA3-O fanout) or 1x InfiniBand (#0170 - HCA3-O LR fanout) coupling links.

- **Removal of OSA-Express3 support on System z.** The zEC12 and zBC12 servers are planned to be the last System z servers to offer support of the Open System Adapter-Express3 (OSA-Express3 #3362, #3363, #3367, #3370, #3371) family of features. OSA-Express3 will not be supported on future System z servers as carry forward on an upgrade. Enterprises should continue migrating from the OSA-Express3 features to the OSA-Express4S (#0404, #0405, #0406, #0407, #0408) and OSA-Express5S features (#0413, #0414, #0415, #0416, #0417).
- **Removal of FICON Express4 support on System z.** The zEC12 and zBC12 servers are planned to be the last System z servers to offer support of the FICON Express4 features (#3321, #3322). FICON Express4 will not be supported on future System z servers as carry forward on an upgrade. Enterprises should continue migrating from the FICON Express4 features to the FICON Express8S features (#0409, #0410).
- **Removal of Crypto Express3 support on System z.** The zEC12 and zBC12 servers are planned to be the last System z servers to offer support of the Crypto Express3 features (#0864 and #0871 - zBC12). Crypto Express3 will not be supported on future System z servers as carry forward on an upgrade. Enterprises should continue migrating from the Crypto Express3 features to the Crypto Express4S feature (#0865).
- **IBM System z Integrated Information Processor (zIIP) and IBM System z Application Assist Processor (zAAP) simplification:** The zEC12 and zBC12 are planned to be the last System z servers to offer support for zAAP specialty engine processors. IBM intends to continue support for running zAAP workloads on zIIP processors ("zAAP on zIIP"). This is intended to help simplify capacity planning and performance management, while still supporting all the currently eligible workloads.
- **Removal of support for the HCA2-O fanouts for 12x IFB and 1x IFB InfiniBand coupling links:** The zEC12 and zBC12 are planned to be the last System z servers to support the following features as carry forward on an upgrade: HCA2-O fanout for 12x IFB coupling links (#0163) and HCA2-O LR fanout for 1x IFB coupling links (#0168). Enterprises should continue migrating to the HCA3-O fanout for 12x IFB (#0171) and the HCA3-O LR fanout for 1x IFB (#0170).
- **Removal of support for IEEE 802.3 Ethernet frame types:** The zEC12 and zBC12 are planned to be the last System z servers to support IEEE 802.3 Ethernet frame types. All OSA-Express features supported on future System z servers are planned to support DIX Version 2 (DIX V2) exclusively.

Note: IBM's statements regarding its plans, directions, and intent are subject to change or withdrawal without notice at IBM's sole discretion. Information regarding potential future products is intended to outline our general product direction and it should not be relied on in making a purchasing decision. The information mentioned regarding potential future products is not a commitment, promise, or legal obligation to deliver any material, code, or functionality. Information about potential future products may not be incorporated into any contract. The development, release, and timing of any future features or functionality described for our products remains at our sole discretion

Element or feature:	Multiple.
When change was introduced:	<ul style="list-style-type: none"> • 28 August 2012 in U.S. Announcement Letter for the zEC12. • 23 July 2013 in U.S. Announcement Letter for the zBC12.
Applies to migration from:	z/OS V2R1, V1R13 and z/OS V1R12.
Timing:	Before migrating to a zEC12 or zBC12 server.
Is the migration action required?	No, but recommended if you are using a zEC12 or zBC12 server because this is the last server that will support the changes mentioned in "Description" above.
Target system hardware requirements:	See "Description" above.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Take into account the statements in “Description” above as you migrate to zEC12 or zBC12.

Migrate to an IBM zEnterprise z196 or z114 server

Description: An IBM zEnterprise System includes a Central Processing Complex (CPC), either the IBM zEnterprise 196 (z196) server or the IBM zEnterprise 114 (z114) server, or both, the zEnterprise BladeCenter Extension (zBX) with its integrated optimizers or select IBM blades, and the zEnterprise Unified Resource Manager (Unified Resource Manager).

The z114 is an entry-level enterprise server with a smaller mainframe footprint than the IBM zEnterprise 196 (z196).

The specific zEnterprise functions including base support that are exploited by z/OS depend on the z/OS release, Table 8 lists the z/OS functions that are included in the base support for the release. Table 9 on page 58 lists new functions that can be exploited by the release. For appropriate PTFs that might be required, see “Actions you can take before you order a z196 and z114 server” on page 64.

Table 8. zEnterprise functions included in base z/OS supported for z/OS V1R12, z/OS V1R13, and z/OS V2R1

zEnterprise function included in the base support • Y=Yes • N=No	V1R12	V1R13	V2R1	Notes
Base support	Y	Y	Y	
OSA-Express3 (GbE LX and SX, 1000BASE-T, 10 GbE LR and SR)	Y	Y	Y	
InfiniBand Coupling Links	Y	Y	Y	

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Table 8. zEnterprise functions included in base z/OS supported for z/OS V1R12, z/OS V1R13, and z/OS V2R1 (continued)

zEnterprise function included in the base support • Y=Yes • N=No	V1R12	V1R13	V2R1	Notes
New z/Architecture® instructions	Y	Y	Y	Support differs by release. z/OS V1R12, z/OS V1R13, and higher, include XL C/C++ support for ARCH(9) and TUNE(9) options.
Up to 128 Coupling Links CHPIDs	Y	Y	Y	
FICON Express8 (CHPID FC)	Y	Y	Y	
IFAURP reporting	Y	Y	Y	
Greater than 64 CPs per server	Y (z196 only)	Y (z196 only)	Y (z196 only)	
Crypto toleration	Y	Y	Y	Support differs depending on level of ICSF installed. PTF required.
OSA-Express3 (CHPID type OSD) with or without exploitation of two ports per CHPID	Y	Y	Y	
Up to 32 HiperSockets™	Y	Y	Y	
RMF postprocessor crypto activity report - 4096 bit	Y	Y	Y	
CPU measurement facility (HIS)	Y	Y	Y	
Greater than 64 CPs per LPAR	Y (z196 only)	Y (z196 only)	Y (z196 only)	
HiperDispatch cache and affinity node changes	Y	Y	Y	
HiperDispatch serviceability	Y	Y	Y	Support differs by release.
LE high register resolution	Y	Y	Y	

Table 9. zEnterprise functions exploited by z/OS V1R12, z/OS V1R13, and z/OS V2R1

zEnterprise function: exploitation of z/OS support • Y=Yes • N=No	V1R12	V1R13	V2R1
Power save mode	Y (z196 only)	Y (z196 only)	Y (z196 only)
OSA-Express4S (GbE LX and SX, and 10 GbE LR and SR)	Y	Y	Y
OSA-Express4S improved port granularity	Y	Y	Y

Table 9. zEnterprise functions exploited by z/OS V1R12, z/OS V1R13, and z/OS V2R1 (continued)

zEnterprise function: exploitation of z/OS support	V1R12	V1R13	V2R1
<ul style="list-style-type: none"> • Y=Yes • N=No 			
FICON Express8S support of zHPF single track operations	Y	Y	Y
FICON Express8S support of zHPF multi-track operations	Y	Y	Y
Coupling Facility Control Code (CFCC) Level 17	Y	Y	Y
Three subchannel sets	Y (z196 only)	Y (z196 only)	Y (z196 only)
IPL from alternate subchannel set	Y	Y	Y
IBM zEnterprise Unified Resource Manager	Y	Y	Y
IBM zEnterprise BladeCenter Extension (zBX) (Support for OSA CHPID types OSM and OSX.)	Y	Y	Y
Crypto exploitation of ANSI X9.8 Pin security, enhanced Common Cryptographic Architecture (CCA), 64 Bit, CP Assist for Cryptographic Function (CPACF) enhancements, Secure Keyed-Hash Message Authentication Code (HMAC), CKDS Constraint Relief, PCI Audit, Elliptical Curve Cryptography (ECC) Digital Signature Algorithm, and CBC Key Wrap, PKA RSA OAEP with SHA-256.	Y (requires z/OS V1R12 requires Cryptographic Support for z/OS V1R10-V1R12 [FMID HCR7780] Web deliverable). HMAC support requires additional PTF at HCR7780. PKA RSA OAEP with SHA-256 algorithm support also requires additional PTF at HCR7780.	Y (requires z/OS V1R12 requires Cryptographic Support for z/OS V1R10-V1R12 [FMID HCR7780] Web deliverable). HMAC support requires additional PTF at HCR7780. PKA RSA OAEP with SHA-256 algorithm support also requires additional PTF at HCR7780.	Y
Crypto exploitation. For Crypto Express3 feature when defined as a coprocessor: expanded support for AES algorithm, enhanced ANSI TR-31 Secure Key Exchange, PIN block decimalization table protection, and PKA RSA OAEP with SHA-256 algorithm, additional Elliptic Curve Cryptography (ECC) functions.	Y (requires Cryptographic Support for z/OS V1R11-V1R13 [FMID HCR7790 Web deliverable available September 2011]).	Y (requires Cryptographic Support for z/OS V1R11-V1R13 [FMID HCR7790 Web deliverable available September 2011]).	Y
FICON Express8S (CHPID type FC)	Y	Y	Y
zHPF performance improvements for FICON Express8S	Y	Y	Y
z/OS Discovery and AutoConfiguration (zDAC) support	Y	Y	Y
New OSA display command	Y	Y	Y
OSA-Express3 and OSA-Express4S Inbound Workload Queuing (IWQ)	Y	Y	Y

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Table 9. zEnterprise functions exploited by z/OS V1R12, z/OS V1R13, and z/OS V2R1 (continued)

zEnterprise function: exploitation of z/OS support • Y=Yes • N=No	V1R12	V1R13	V2R1
Inbound workload queuing for Enterprise Extender for the OSA-Express4S and OSA-Express3 features when defined as CHPID types OSD or OSX	N	Y	Y
OSA-Express4S checksum offload for LPAR-to-LPAR traffic for IPv4 and IPv6 packets (CHPID type OSD or OSX)	N	Y	Y
OSA-Express4S large send for IPv6 packets (CHPID types OSD and OSX)	N	Y	Y

Element or feature:	Multiple.
When change was introduced:	<ul style="list-style-type: none"> • The IBM zEnterprise 114 (z114), which shipped in September 2011. • The IBM zEnterprise 196 (z196), which first shipped in September 2010. • The IBM zEnterprise BladeCenter Extension (zBX), which shipped November 2010.
Applies to migration from:	z/OS V2R1, z/OS V1R13, and z/OS V1R12.
Timing:	Anytime before you introduce a z114 or z196 server into your environment.
Is the migration action required?	Yes, if you want to run z/OS V2R1, V1R13, or V1R12 on a z114 or z196 server, or if you want to run a Coupling Facility on a zEnterprise server. If you will run only a Coupling Facility on a z114 or z196 serversystem, then only the sysplex-related actions are relevant.
Target system hardware requirements:	<ul style="list-style-type: none"> • A z196 or a z114 server. • Additional hardware required for specific functions. <ul style="list-style-type: none"> – zDAC requires: <ul style="list-style-type: none"> - Up-to-date controller microcode - Up-to-date switch microcode – IBM zEnterprise Blade Center Extension (zBX) is required for the IBM Smart Analytics Optimizer for DB2 for z/OS V1.1, the IBM WebSphere DataPower Integration Appliance XI50 for zEnterprise (DataPower XI50z), and select POWER7 and IBM System x blades. – An IBM System Storage® DS5020 is required for IBM Smart Analytics Optimizer.
Target system software requirements:	<ol style="list-style-type: none"> 1. See the list of PTFs in the Software Service Level section of the PSP buckets. 2. See Install the necessary z/OS service, as indicated in PSP buckets described in “General recommendations and considerations for z196 and z114 servers” on page 61.

Other system (coexistence or fallback) requirements:	<ul style="list-style-type: none"> • It is recommended that you install and run the z114 or z196 required service on your existing server. This will enable you to fall back from a hardware perspective, yet maintain your software level. • The PTFs to support CFCC Level 17 have coexistence (or sysplex preconditioning) PTFs that are required to be installed throughout your sysplex before implementing CFCC Level 17.
Restrictions:	See “Restrictions for a z196 or z114 server” on page 62.
System impacts:	None.
Related IBM Health Checker for z/OS check:	<p>IBM Health Checker for z/OS check, SUP_HiperDispatchCPUConfig, is added to z/OS V1R12 and available on z/OS V1R11. This check will verify that HiperDispatch is enabled on a zEnterprise system. (For more information, see “HiperDispatch cache and affinity node changes” in “Migration and exploitation considerations for z196 and z114 server functions” on page 67).</p> <p>Note: The default of HIPERDISPATCH option in IEAOPTxx parmlib member was changed in z/OS V1R13 as follows:</p> <ul style="list-style-type: none"> • For IBM zEnterprise 196 (and follow-on processors): YES • For IBM System z10 processors: NO

Steps to take: Follow the “General recommendations and considerations for z196 and z114 servers,” adhere to the “Restrictions for a z196 or z114 server” on page 62, and perform the tasks described in the following topics.

General recommendations and considerations for z196 and z114 servers

As you plan your migration to a zEnterprise server, consider the following:

1. **Relatively few migration actions are new when coming from a z10 EC or a z10 BC server.** Migration to a zEnterprise server has, as its base, a migration to the z10 EC or z10 BC servers. This means that if you are migrating to a zEnterprise server from a z10 EC or z10 BC server, and have performed the migration actions associated with the z10 EC or z10 BC, you have fewer migration actions than if you were migrating from a server prior to the z10 EC or z10 BC and have not yet performed the migration actions associated with these servers. There are, in fact, very few new migration actions to perform on z/OS for a zEnterprise server if you have already migrated to a z10 EC or z10 BC server. It is important to note that you can migrate directly to a zEnterprise server without installing the intermediate servers, but you still need to ensure that any migration considerations are satisfied for the servers that you “skipped.” To read about z10 EC and z10 BC server migration actions, see “Migrate to a System z10 server” on page 74.
2. **Support is delivered by service (and FMID web deliverables for ICSF).** The delta (from a z10 EC or z10 BC) support for a zEnterprise server, excluding cryptographic support, is delivered by service (PTFs). The cryptographic support for the zEnterprise server continues to be FMIDs, many of which are still available in web deliverables. Different ICSF web deliverables, providing different levels of support, are available for different releases of z/OS. (See “Decide on the steps you will take for your migration to a zEnterprise server” in “Actions you can take before you order a z196 and z114 server” on page 64 for further information.)
3. **Larger coupling facility structure sizes might be necessary.** When you change coupling facility control code (CFCC) levels, your coupling facility structure

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sizes might change. zEnterprise servers initially ship with CFCC level 17. If, as part of your migration to a zEnterprise server, you change CFCC levels (either by placing a coupling facility on the zEnterprise server or by moving the coupling facility to a z10 EC or z10 BC at a later CFCC level), you might have larger structure sizes than you did previously. If your CFCC levels are identical, structure sizes are not expected to change when you migrate from a previous server to a newer generation server.

4. **Use the same software level throughout a sysplex.** Having members of a sysplex at the same software level (other than during brief migration periods) is good software management policy.
5. **Migrate hardware and software at different times.** To minimize the amount of change (and therefore risk) that you experience at one time, do not migrate your software release level at the same time that you migrate your hardware.
6. **Update SCRT to latest version.** If you use SCRT, make sure it is at the latest level. This is a requirement for vWLC, as well as when you upgrade servers. The latest level of SCRT can be downloaded from the SCRT web site at <http://www.ibm.com/eserver/zseries/swprice/scrt/>.

Restrictions for a z196 or z114 server

Restrictions associated with zEnterprise servers are:

1. **Functional limitations:** Not all zEnterprise functions are available in every z/OS release. See Table 8 on page 57 and Table 9 on page 58 for a list of the zEnterprise functions available in each z/OS release. Some functions have migration or exploitation considerations (see “Migration and exploitation considerations for z196 and z114 server functions” on page 67). Many functions are enabled or disabled, based on the presence or absence of the required hardware and software. If you wish to position yourself to exploit any new zEnterprise functions, the software and hardware may be installed in either order. That is, there is no requirement to install either software or hardware first to exploit a specific function. However, due to outage windows and testing considerations, you might want to consider installing all the required software first, then upgrading the hardware and, finally, updating your customization to exploit the new functions.
2. **zEnterprise servers in a sysplex:**
 - zEnterprise servers z196 and z114 are supported in a Parallel Sysplex with other zEnterprise z196 and z114 servers, z10 EC and z10 BC servers, and z9 EC and z9 BC servers. If you introduce zEC12 or zBC12 into a sysplex with z196 or z114, ensure that you have satisfied the zEC12 or zBC12 sysplex restrictions in “Restrictions for a zEC12 or zBC12 server” on page 48. If you are running z/OS on zSeries z900, z800, z990, or z890 servers, then you cannot add a zEnterprise z196 and z114 server to that sysplex. That is, you will not be able to perform rolling IPLs to introduce a zEnterprise z196 and z114 server if you have any of the earlier (pre-System z) servers either as z/OS images or coupling facility images in the sysplex. The earlier servers in the sysplex must be upgraded to System z9 or later to have zEnterprise z196 and z114 servers supported in the sysplex. If you have any z/OS images or coupling facility images on an earlier server, and you intend to introduce a zEnterprise z196 and z114 server into that sysplex, you must migrate those images to System z9 (or later) server before introducing the zEnterprise z196 and z114 server.
 - The Integrated Cluster Bus 4 (ICB-4) Coupling Links are not supported on a zEnterprise CPC. Use 12x InfiniBand coupling links, which are designed to replace Integrated Cluster Bus 4 (ICB-4), and to complement 1x InfiniBand and ISC-3 on a zEnterprise server. InfiniBand coupling can provide

significantly improved service times compared to ISC-3s for distances up to 150 meters. You can read about InfiniBand coupling links in *IBM System z Connectivity Handbook* (SG24-5444).

- The zEnterprise servers **cannot** be connected to a Sysplex Timer (9037-002). The Server Time Protocol (STP) feature is the follow-on to the Sysplex Timer. STP is designed to allow multiple servers and coupling facilities to maintain time synchronization with each other without requiring a Sysplex Timer. STP is a hardware feature of the zEnterprise, z10 EC, z10 BC, z9 EC, z9 BC, z990, and z890 servers. To implement STP, see the STP web site and the publications and other resources listed there. The STP web site is at <http://www.ibm.com/systems/z/advantages/pso/stp.html>.

The STP design introduced a concept called Coordinated Timing Network (CTN). A CTN is a collection of servers and coupling facilities that are time-synchronized to a time value called Coordinated Server Time. A CTN can be configured in two ways:

- STP-only CTN, which does not require a Sysplex Timer.
- Mixed-CTN (External Time Reference and STP), which does require a Sysplex Timer.

The Sysplex Timer provides the timekeeping information in a Mixed-CTN. Even though the zEnterprise servers do not support attachment to a Sysplex Timer, they can participate in a Mixed-CTN that has either a z10 or z9 server synchronized to the Sysplex Timer. This maintains the capability for enterprises to concurrently migrate from an existing External Time Reference (ETR) to a Mixed-CTN and from a Mixed-CTN to an STP-only CTN.

3. **Unsupported hardware features:** The following hardware features that were available on System z10 (and some earlier) servers **cannot** be ordered (and cannot be carried forward on an upgrade to a z114) server with zEnterprise servers. You must migrate to the newer technology available on zEnterprise servers.

- FICON Express
- FICON Express2
- Crypto Express2
- OSA-Express2 10 GbE LR

The following hardware features are not orderable on z196 servers. If they are installed on your existing server at the time of an upgrade to a z196 server, they may be retained.

- FICON Express4 10KM LX
- FICON Express4 SX
- FICON Express4 4KM LX
- OSA-Express2 GbE LX
- OSA-Express2 GbE SX
- OSA-Express2 1000BASE-T

The following hardware features are not orderable on z114 servers. If they are installed on your existing server at the time of an upgrade to a z114 server, they may be retained.

- FICON Express4 10KM LX
- FICON Express4 SX
- FICON Express4 4KM LX
- FICON Express4-2C 4KM LX

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- FICON Express4-2C SX
- OSA-Express2 GbE LX
- OSA-Express2 GbE SX
- OSA-Express2 1000BASE-T

Actions you can take before you order a z196 and z114 server

You can perform the following migration actions before you order or install a z196 or z114 server:

1. **Review the sysplex configuration in which the z196 or z114 server will participate.** See “Restrictions for a z196 or z114 server” on page 62 for a description of the limitations when using IBM zEnterprise EC12 servers with zEnterprise z196 or z114 servers or with other earlier servers in a Parallel Sysplex.
2. **Implement STP (or a Mixed-CTN) timing network.** This action is necessitated because Sysplex Timers (9037-002) are not supported on zEnterprise servers.
3. **Migrate from ICB-4 to InfiniBand coupling links.** This action is necessitated because ICB-4 links are not supported on zEnterprise servers. If desired, you can take this action after you order a zEnterprise server, as you upgrade to the new server.
4. **Migrate from unsupported hardware features to newer technology.** This action is necessitated because FICON Express, FICON Express2, Crypto Express2, and OSA-Express2 10 GbE LR are not supported on zEnterprise servers.
5. **Install the necessary z/OS service, as indicated in PSP buckets.** For a zEnterprise 196 CPC, PTFs are identified in the 2817DEVICE PSP bucket (Subset 2817/ZOS). For a zEnterprise 114 CPC, PTFs are identified in the 2818DEVICE PSP bucket (Subset 2818/ZOS). For an IBM zEnterprise BladeCenter Extension (zBX) attached to your z196 CPC or to your z114 CPC, the PTFs are identified in the 2458DEVICE PSP bucket (Subset 2458/ZOS). In each PSP bucket, the content is dependent on the z/OS release you will run on the zEnterprise server. If you reviewed the PSP buckets some time ago, review them again to ensure that any newly identified z/OS service has been installed. To assist you in determining if you have the recommended service (identified in these PSP buckets) installed on your system, you can use the SMP/E REPORT MISSINGFIX command in conjunction with the FIXCAT type of HOLDDATA, as follows:
 - a. Acquire and RECEIVE the latest HOLDDATA onto your z/OS system(s). Use your normal service acquisition portals or download the two (2) year HOLDDATA directly from <http://service.software.ibm.com/holddata/390holddata.html>. Ensure you select **Full** from the Download NOW column (last 730 days) to receive the FIXCAT HOLDDATA, as the other files do not contain FIXCAT HOLDDATA.
 - b. Run the SMP/E REPORT MISSINGFIX command on your z/OS systems and specify one or more of the following Fix Categories (FIXCAT):
 - IBM.Device.Server.z196-2817
 - IBM.Device.Server.z196-2817.ParallelSysplexInfiniBandCoupling
 - IBM.Device.Server.z196-2817.ServerTimeProtocol
 - IBM.Device.Server.z196-2817.zHighPerformanceFICON
 - IBM.Device.Server.z114-2818
 - IBM.Device.Server.z114-2818.ParallelSysplexInfiniBandCoupling
 - IBM.Device.Server.z114-2818.ServerTimeProtocol
 - IBM.Device.Server.z114-2818.zHighPerformanceFICON

- IBM.Device.Server.z114-2818.UnifiedResourceManager
- IBM.Device.Server.zBX-2458
- IBM.Device.Server.zBX-2458.ISAOPT

The report will identify any missing coexistence and fallback PTFs for that system. For complete information about the REPORT MISSINGFIX command, see *SMP/E for z/OS Commands*.

- c. Periodically, you might want to acquire the latest HOLDDATA and rerun the REPORT MISSINGFIX command to find out if there are any new PTFs recommended for the zEnterprise servers.

Note:

- a. You can also use Service Link's PSP Service Extraction tool.
 - b. Because the Enhanced PSP Tool (EPSPT) was removed the end of 2010, you can no longer use that tool to identify missing PSP bucket service. You should use SMP/E's Fix Category support, which is fully integrated into SMP/E procedures and IBM product and service deliverables.
6. **Run CFSIZER and Sizer tools.** If you are moving your coupling facilities and the coupling facility structures will be on higher CFCC levels than they were previously, run the Coupling Facility Structure Sizer (CFSIZER) tool to find out if you have to increase coupling facility structure sizes. Run the Sizer utility, an authorized z/OS program that you can download, to evaluate structure size changes. The Sizer utility is distinct from CFSizer, and should be run after the new hardware (CFLEVEL) is installed but before any CF LPAR on the new hardware is populated with structures. z196 or z114 servers are initially shipped with CFCC Level 17; prepare to make the necessary changes as indicated by the tool. You can find the CFSIZER tool at <http://www.ibm.com/systems/support/z/cfsizer/>.
 7. **Plan for the fixed HSA enhancement on a zEnterprise server.** On zEnterprise (and z10) servers, preplanning requirements are minimized by offering a fixed HSA and introduction of the ability to seamlessly include such events as creation of LPARs, inclusion of logical subsystems, changing logical processor definitions in an LPAR, and introduction of cryptography into an LPAR.
 8. **Decide on the steps you will take for your migration to a z196 or z114 server.** As a guide, see "Recommended migration steps for a z196 and z114 server" on page 67. Also, note the following:
 - You should compare the cryptographic support you currently have installed with the support required for the functions you plan to use on the zEnterprise z196 and z114 server. Several cryptographic support web deliverables have been made available for various z/OS releases. The newer cryptographic web deliverables include the previous function (when applicable) for that particular z/OS level. Note that you can use the newer cryptographic web deliverables on servers before the zEnterprise servers, that is, on z10 and z9 (or earlier) servers.
 - The level of function provided for cryptographic support differs by z/OS release and the ICSF web deliverable that is installed. For z/OS V1R12 and later, exploitation of zEnterprise z196 and z114 cryptographic support is provided by Cryptographic Support for z/OS V1R11-V1R13 (FMID HCR7790) web deliverable. The z/OS Lifecycle Extension for z/OS V1.11 (5657-A01) is required for support after September 2012. Note that this level of ICSF is **not** integrated in z/OS V1R13 and will need to be downloaded and installed even after ordering a z/OS V1R13 ServerPac.
For z/OS V1R12, exploitation of the original zEnterprise cryptographic enhancements was provided by the Cryptographic Support for z/OS

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V1R10-V1R12 web deliverable (FMID HCR7780), which is integrated into z/OS V1R13 orders. The Cryptographic web deliverables are available at <http://www-03.ibm.com/systems/z/os/zos/downloads/>

- Coexistence PTFs are available for all supported z/OS releases and all existing supported ICSF web deliverables.
- For z/OS V1R12 and later releases: See Table 8 on page 57
- **PTFs for coexistence:** ICSF for HCR7770 and higher require coexistence PTFs to be installed on earlier levels of ICSF if they share keys in their sysplex. To assist in identifying the coexistence service, you can use the following Fix Categories:
 - IBM.Coexistence.ICSF.z/OS_V1R9-V1R11-HCR7770
 - IBM.Coexistence.ICSF.z/OS_V1R10-V1R12-HCR7780
 - IBM.Coexistence.ICSF.z/OS_V1R11-V1R13-HCR7790
 - IBM.Coexistence.ICSF.z/OS_V1R12-V1R13-HCR77A0
 - IBM.Coexistence.ICSF.z/OS_V1R13-V2R1-HCR77A1

9. **Review the new mnemonics introduced for the z196 or z114 server.** The new mnemonics might collide with (be identical to) the names of assembler macro instructions you use or provide. In the event of such collisions, the HLASM's default opcode table (UNI) will treat specification of these names as instructions when APAR PK97799 is installed. This will probably cause assembler error messages and possibly cause generation of incorrect object code.

If you write programs in assembler language, you should compare the list provided in *z/Architecture Principles of Operation*, SA22-7832, to the names of assembler macro instructions you use or provide, to identify any such conflicts or collisions that would occur following installation of HLASM APAR PK97799. If a conflict is identified, take one of the following actions:

- Change the name of your macro instruction.
- Specify PARM='...OPTABLE(YOP)...' (or some other earlier opcode table).
- Specify a separate ASMAOPT file containing assembler options, such as in the previous method (this method requires no changes to source code or JCL).
- Add, as the first statement of your source program, *PROCESS OPTABLE(YOP).
- Specify the PROFILE option either in JCL or the ASMAOPT file, and the specified or default member of the SYSLIB data set is copied into the front of the source program.
- If you must use both a new instruction and a macro with the same name in an assembly, you can use the following technique (where XXX is a sample mnemonic):

```
Assume the default OPTABLE(UNI) is in effect
XXX  a,b      new instruction
PUSH ACONTROL save current optable definition
ACONTROL OPTABLE(YOP) switch optable dynamically
XXX  r,s,t    macro invocation
POP  ACONTROL restore previous definition
XXX  c,d      new instruction
```

For more information about HLASM's opcode table, see *HLASM Programmer's Guide*.

Actions you can take after you order a z196 and z114 server

After you order but before you install your zEnterprise server, do the following:

1. **Use the CHPID Mapping Tool.** As you might have done with your z10 EC, z10 BC, z9 EC or z9 BC servers, use the CHPID Mapping Tool to map logical CHPIDs to physical channels (PCHIDs) and create input to HCD/IOCP for your zEnterprise server. The tool is a workstation-based Java application available from the Resource Link® web site (<http://www.ibm.com/servers/resourceLink>). For more information about this tool, refer to the web site.
2. **Define an Ensemble.** If you are running z/OS V1R10 or later, you can define an Ensemble and exploit the IBM zEnterprise Unified Resource Manager. See *System z Ensemble Planning and Configuration Guide* (GC27-2608) for a detailed description of the steps required to define an Ensemble.

Recommended migration steps for a z196 and z114 server

This topic suggests the steps for migrating your same z/OS release level from your current server to a zEnterprise server. The steps are based on the assumption that you want to minimize the amount of change (and therefore risk) and the amount of work required to perform the migration.

Your migration steps follow:

1. If necessary, migrate to an STP-only or Mixed-CTN timing network.
2. Ensure that you have installed the z196, z114, z10 EC (or z10 BC), and z9 EC (or z9 BC) required service, as indicated in the respective PSP buckets. See **Install the necessary z/OS service, as indicated in PSP buckets** in “Actions you can take before you order a z196 and z114 server” on page 64 for information about how to identify, acquire, and install any missing required service.
3. Ensure you have the required service, and any required ICSF web deliverable installed for the cryptographic functions that you have decided to use.
4. Upgrade your hardware to zEnterprise system. If necessary convert to InfiniBand Coupling Links from ICB-4 links.
5. Update configuration setting to exploit zEnterprise functions.

Migration and exploitation considerations for z196 and z114 server functions

This topic provides migration and exploitation considerations for zEnterprise server functions.

The following zEnterprise functions are available on z/OS V1R12 and later releases:

- **InfiniBand Coupling.** Each system can use, or not use, InfiniBand coupling links independently of what other systems are doing, and do so in conjunction with other link types. InfiniBand Coupling connectivity can only be performed with other systems that also support InfiniBand Coupling.
- **HiperDispatch.** The existing HIPERDISPATCH=YES|NO parameter in IEAOPTxx member of parmlib, and on the SET OPT=xx command to control whether HiperDispatch is enabled or disabled for the system, can be changed dynamically.

Beginning with z/OS V1R13 when running on a zEnterprise server, the IEAOPTxx keyword HIPERDISPATCH will default to YES. If HIPERDISPATCH=NO is specified, the specification will be honored as it was on previous z/OS releases. The IBM z/OS Health Checker check SUP_HiperDispatch checks whether the expected HiperDispatch check parameter state (HIPERDISPATCH=YES) or HIPERDISPATCH(NO), where YES is

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the default for the check, matches the actual HiperDispatch state of the system. For more information, see “Accommodate HiperDispatch default of YES” on page 276.

A WLM goal adjustment might be required when using HiperDispatch. Review and update your WLM policies as necessary.

- **HiperDispatch cache and affinity node changes.** This function is enhanced to exploit zEnterprise architecture and now allows three physical CPs from same chip to form affinity node. A z10 uses HiperDispatch book cache support and four physical CPs from same book.

To realize the benefits of HiperDispatch, z/OS has been changed to force HiperDispatch=YES for LPARs with greater than 64 CPUs. On LPARs with greater than 64 CPUs defined on a zEnterprise server with IEAOPT xx specifying HIPERDISPATCH=NO during IPL (or SET OPT= xx after IPL), the system generates a message but continues to run with HIPERDISPATCH=YES. The new message is IRA865I HIPERDISPATCH=YES FORCED DUE TO GREATER THAN 64 LPS DEFINED.

On LPARs in which HIPERDISPATCH=NO is specified with less than 64 CPUs, you can dynamically add more CPUs and continue to run in HIPERDISPATCH=NO. However, you may see the new message ISN012E HIPERDISPATCH MUST BE ENABLED TO CONFIGURE CPU IDS GREATER THAN 3F ONLINE.

Any attempt to configure CPUs greater than 64 CPUs online in HIPERDISPATCH=NO will be rejected with message IEE241I CPU(x) NOT RECONFIGURED ONLINE - REQUIRES HIPERDISPATCH ENABLED.

An LPAR with greater than 64 CPUs that dynamically changed to HIPERDISPATCH=YES cannot go back to HIPERDISPATCH=NO. It will be treated as if it was IPLed with HIPERDISPATCH=YES after HIPERDISPATCH=YES is activated.

To assist with warning when you are getting close to 64 CPUs and running with HIPERDISPATCH=NO, the IBM Health Checker for z/OS check, SUP_HiperDispatchCPUConfig, was added in z/OS V1R12. The check always succeeds for LPAR in HIPERDISPATCH=YES (all CPU configurations supported). When an LPAR is running with HIPERDISPATCH=NO, the check raises an exception when the number of CPUs is close to forcing the LPAR to IPL with HIPERDISPATCH=YES. The CPUSLEFTB4NEEDHD parameter indicates the minimum number of CPUs that can be installed and activated on an LPAR running in HIPERDISPATCH=NO. When CPUSLEFTB4NEEDHD=0, the check always succeeds. The default is 8, with values 0-63 accepted. To assist with warning when you are getting close to 64 CPUs and running with HIPERDISPATCH=NO, use IBM Health Checker for z/OS check, SUP_HiperDispatchCPUConfig. Possible IBM Health Checker for z/OS messages::

- IEAVEH080I CPU configuration supported with HiperDispatch *curstate*
 - IEAVEH081E CPU configuration supported with HiperDispatch disabled. *numcpus* more CPU(s) can be added with HiperDispatch disabled.
- **CFCC Level 17.** If you are moving your coupling facilities and the coupling facility structures will be on higher CFCC levels than they were previously, run the Coupling Facility Structure Sizer (CFSIZER) tool to find out if you have to increase coupling facility structure sizes. zEnterprise servers initially shipped with CFCC Level 17. Prepare to make the necessary changes as indicated by the tool. You can find the CFSIZER tool at <http://www.ibm.com/systems/support/z/cfsizer/>.

Note: The PTFs to support CFCC Level 17 have coexistence (or sysplex preconditioning) PTFs that require installation throughout your sysplex before implementing CFCC Level 17.

- **Third Subchannel Set.** You now have the ability to extend the amount of addressable storage capacity to help facilitate storage growth with the introduction of a third subchannel set, an additional 64K devices, to help complement other functions such as "large" or extended addressing volumes and HyperPAV. This may also help to facilitate consistent device address definitions, simplifying addressing schemes for congruous devices.

The first subchannel set (SS 0) allows definitions of any type of device, such as bases, aliases, secondaries, and those other than disk that do not implement the concept of associated aliases or secondaries. The second and third subchannel sets (SS1 and SS2) can now both be designated for use for disk alias devices (of both primary and secondary devices), or Metro Mirror secondary devices only. The third subchannel set applies ESCON, FICON and zHPF protocols. Definitions for the third subchannel set are similar to those for the second subchannel set and can be made with HCD.

The IODF statement of LOADxx allows users to indicate which devices to use during IPL (that is, devices that are connected to subchannel set 0, 1 or 2). This specification is done on the IODF statement (column 36). For more information, see *z/OS MVS Initialization and Tuning Reference*.

- **IPL from alternate subchannel set.** This function allows you to IPL from subchannel set 1 (SS1) or subchannel set 2 (SS2), in addition to subchannel set 0. Devices used early during IPL processing can now be accessed using subchannel set 1 or subchannel set 2. This is intended to allow users of Metro Mirror (PPRC) secondary devices defined using the same device number and a new device type in an alternate subchannel set to be used for IPL, IODF, and standalone dump volumes when needed. IPL from an alternate subchannel set is supported by z/OS V1R13 and V2R1, as well as z/OS V1R12 with PTFs, and applies to the FICON and zHPF protocols (CHPID type FC).

To IPL from an alternate subchannel set, you need to specify a 5 digit load address on the LPAR image profile on the HMC, and have the appropriate specification on the IODF statement column 36 in LOADxx. This capability is available for z196 as of September 2011 (GA2) and later and for z114. z114 supports only SS0 and SS1, so you cannot IPL from subchannel set 2 (SS2).

Tip: Column 36 of the IODF statement in LOADxx is the subchannel set indicator. This field indicates which subchannel set should be used as the primary volume during IPL. You can now specify an asterisk "*" for this value in the field to indicate that the subchannel set of the IPL volume should be used as the subchannel set for the primary volumes. APAR OA35135 for z/OS V1R11 and V1R12 added this new function to specify a asterisk "*" in column 36 of the IODF statement in LOADxx parmlib member.

- **IBM zEnterprise Unified Resource Manager for enabling management and virtualization of heterogeneous workloads.** The Unified Resource Manager manages the deployment of heterogeneous hardware resources based on individual workload requirements:
 - Performance management
 - Integrated private data network

See *System z Ensemble Planning and Configuration Guide (GC27-2608)* for a detailed description on the steps required.

- **Power save mode.** This function is available only on z196 servers. There is a new SMFPRMxx parmlib option, MAXEVENTINTRECS, that allows governing

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the number of event interval records to be collected when the processor capacity changes. The default is zero. This function is available only on z196 servers; it is not available on z114 servers.

If you are using the CPU Measurement Facility (Hardware Instrumentation Services), there is a new parameter on the `MODIFY hisproc` command. You can use this parameter, `STATECHANGE`, to override the default action to take when a CPU speed change is detected within the HIS component.

- **zHPF performance improvements for FICON Express8S.** FICON Express8S contains a new IBM ASIC which is designed to support the 8 Gbps (gigabytes per second) PCIe interface to the PCIe I/O drawer and increased start I/Os. In addition, a hardware data router has been added in support of the zHPF and FCP protocols for path length reduction and increased throughput. FICON Express8S supports a link data rate of 2, 4, or 8 Gbps autonegotiated. With these changes FICON Express8S, when supporting the zHPF or FCP protocols, has been designed to achieve full duplex line speed (8 Gbps) in each direction. The performance of the FICON protocol remains unchanged from FICON Express8. To use zHPF performance improvements for FICON Express8S, you need to specify the `ZHPF=YES | NO` parameter in the `IECIOSxx` of `PARMLIB` and use FICON Express8S.
- **Additional Crypto exploitation.** The following enhancements have been added to the Common Cryptographic Architecture support, which is used in the Crypto Express3 feature when it is configured as a coprocessor:
 - ANSI X9.8 Pin security
 - Enhanced Common Cryptographic Architecture (CCA), 64bit, CP Assist for Cryptographic Function (CPACF) enhancements
 - Secure Keyed-Hash Message Authentication Code (HMAC)
 - CKDS Constraint Relief
 - PCI Audit, Elliptical Curve Cryptography (ECC) Digital Signature Algorithm
 - CBC Key Wrap
 - PKA RSA OEAP with SHA-256
 - Expanded support for AES algorithm
 - Enhanced ANSI TR-31 Secure Key Exchange
 - PIN block decimalization table protection
 - PKA RSA OAEP with SHA-256 algorithm, additional Elliptic Curve Cryptography (ECC) functions.
- **z/OS Discovery and AutoConfiguration (zDAC) for FICON channels.** With a zEnterprise CPC and z/OS, a new function, z/OS Discovery and AutoConfiguration (zDAC), is designed to automatically perform a number of I/O configuration definition tasks for new and changed disk and tape controllers through FICON channels. Starting with z/OS V2R1 FICON point-to-point paths are also included in the discovery process whether or not they are connected to a switch or director when attached to a FICON channel. When new controllers are added to an I/O configuration, or changes are made to existing controllers, the system is designed to discover them and propose configuration changes based on a policy you define in the Hardware Configuration Definition (HCD) dialog. Your policy can include preferences for availability and bandwidth including parallel access volume (PAV) definitions, control unit numbers, and device number ranges.

zDAC is designed to perform discovery for all systems in a sysplex that support the function. The proposed configuration will incorporate the current contents of the I/O definition file (IODF) with additions for newly installed and changed control units and devices. zDAC is designed to help simplify I/O configuration

on CPC running z/OS and reduce complexity and setup time. zDAC applies to all FICON features supported on zEnterprise servers when configured as CHPID type FC, and is supported by z/OS V1R12 and later.

To use zDAC, you must first establish a policy for the discovery operation. This is done through HCD or HCM. You can limit the scope of the discovery, limit the proposal information, indicate the desired number of paths to discovered logical control units, and indicate the method used for device and control unit numbering. After controllers and devices are discovered, you can select which controllers to be defined and accept or override the proposed values for control units and devices.

- **OSA-Express3 and OSA-Express4S Inbound Workload Queuing (IWQ).** Inbound workload queuing for Enterprise Extender is supported by the OSA-Express4S and OSA-Express3 features when defined as CHPID types OSD or OSX. It is exclusive to the z196 and z114 servers, and is supported by z/OS and by z/VM for guest exploitation. OSA-Express3 introduces inbound workload queuing (IWQ), which creates multiple input queues and allows OSA to differentiate workloads "off the wire" and then assign work to a specific input queue (per device) to z/OS. With each input queue representing a unique type of workload, each having unique service and processing requirements, the IWQ function allows z/OS to preassign the appropriate processing resources for each input queue. This approach allows multiple concurrent z/OS processing threads to then process each unique input queue (workload), avoiding traditional resource contention. In a heavily mixed workload environment, this "off the wire" network traffic separation provided by OSA-Express3 IWQ reduces the conventional z/OS processing required to identify and separate unique workloads, which results in improved overall system performance and scalability. The types of z/OS workloads that are identified and assigned to unique input queues are:
 - z/OS Sysplex Distributor traffic: Network traffic that is associated with a distributed Virtual Internet Protocol Address (VIPA) is assigned a unique input queue allowing the Sysplex Distributor traffic to be immediately distributed to the target host.
 - z/OS bulk data traffic: Network traffic that is dynamically associated with a streaming (bulk data) TCP connection is assigned to a unique input queue allowing the bulk data processing to be assigned the appropriate resources and isolated from critical interactive workloads.

IWQ is supported on zEnterprise CPC and System z10, and is exclusive to OSA-Express3 CHPID types OSD and OSX (exclusive to zEnterprise CPC). There are some Communications Server configuration settings required to enable multiple inbound data queues.

- **Display OSAINFO.** OSA-Express3 introduces the capability for the operating system to directly query and display the current OSA configuration information (similar to OSA/SF). z/OS exploits this new OSA capability by introducing a new TCP/IP operator command, Display OSAINFO. Display OSAINFO allows the operator to monitor and verify the current OSA configuration, which helps to improve the overall management, serviceability, and usability of OSA-Express3. The Display OSAINFO command is exclusive to OSA-Express3 CHPID types OSD, OSM, and OSX (on z196, z114, and z10 servers).
- **XL C/C++ ARCH(9) and TUNE(9) options.** The ARCHITECTURE XL C/C++ compiler option selects the minimum level of machine architecture on which your program can run. Certain features provided by the compiler require a minimum architecture level. ARCH(9) exploits instructions available on zEnterprise servers. For more information, refer to the ARCHITECTURE compiler option in *z/OS XL C/C++ User's Guide*. The TUNE compiler option

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allows you to optimize your application for specific machine architecture. The TUNE level has to be at the ARCH level, at a minimum. If the TUNE level is lower than the specified ARCH level, the compiler forces TUNE to match the ARCH level, or uses the default TUNE level, whichever is greater. For more information about the ARCHITECTURE and TUNE compiler options refer to *z/OS XL C/C++ User's Guide*.

Exploitation restriction. When programs exploit the ARCH(9) or TUNE(9) option, those programs can only run on zEnterprise servers, or an operation exception will occur. This is a consideration for programs that will run on different server levels (z10 and z9 servers) during development, test, and production, as well as during fallback or disaster recovery.

The following zEnterprise functions are only available on z/OS V1R13 and later releases. See *z/OS Introduction and Release Guide* for restrictions, dependencies, and steps to take to use these new hardware functions:

- **OSA-Express4S checksum offload for LPAR-to-LPAR traffic for IPv4 and IPv6 packets (CHPID type OSD).** Checksum offload for LPAR-to-LPAR traffic is included in the OSA-Express4S design. The checksum function has been moved from the PCIe adapter to the OSA-Express4S hardware to help reduce CPU utilization.
- **OSA-Express4S large send for IPv6 packets (CHPID types OSD and OSX).** Large send (also referred to as TCP segmentation offload) is designed to improve performance by offloading outbound TCP segmentation processing from the host to an OSA-Express4S feature by employing a more efficient memory transfer into OSA-Express4. Large send support for IPv6 packets applies to the OSA-Express4S features (CHPID type OSD and OSX), and is exclusive to z196 and z114.
- **Inbound workload queuing for Enterprise Extender.** Inbound workload queuing (IWQ) for the OSA-Express4S features has been enhanced to differentiate and separate inbound Enterprise Extender traffic to a new input queue. The Enterprise Extender separation and processing associated with the Enterprise Extender input queue provides improved scalability and performance for Enterprise Extender.

Note: See *z/OS Communications Server: IP Configuration Guide* for additional information about OSA-Express4S checksum offload for LPAR-to-LPAR traffic for IPv4 and IPv6 packets (CHPID type OSD), OSA-Express4S large send for IPv6 packets (CHPID types OSD and OSX), and Inbound workload queuing for Enterprise Extender.

Accommodate functions for the z196 and z114 servers to be discontinued on future servers

Description: The following changes in hardware support could affect your environment. Make appropriate changes as needed.

- **ISC-3 features (#0217, #0218, #0219).** The IBM zEnterprise zEC12 is planned to be the last high-end System z server to offer support of the InterSystem Channel-3 (ISC-3) for Parallel Sysplex environments at extended distances. ISC-3 will not be supported on future high-end System z servers as carry forward on an upgrade. Previously it was announced that the IBM zEnterprise 196 (z196) and IBM zEnterprise 114 (z114) servers were the last to offer ordering of ISC-3. Enterprises should continue migrating from ISC-3 features (#0217, #0218, #0219) to 12x InfiniBand (#0171 - HCA3-O fanout) or 1x InfiniBand (#0170 - HCA3-O LR fanout) coupling links.
- **Power Sequence Controller (PSC feature #6501).** The last zEnterprise server machines to support PSC (feature #6501) are the z196 (machine type 2817) and

z114 (machine type 2818). PSC features cannot be ordered and cannot be carried forward on an upgrade to the zEC12 server. The optional PSC feature is used to turn on or off specific control units from the central processor complex (CPC).

- **ESCON channels.** The last zEnterprise server to support ESCON channels are the z196 (machine type 2817) and z114 (machine type 2818). In addition, ESCON channels cannot be carried forward on an upgrade to the zEC12 server. This applies to channel path identifier (CHPID) types CNC, CTC, CVC, and CBY and to feature numbers 2323 and 2324. You should be migrating from ESCON to FICON and eliminating ESCON channels from the mainframe wherever possible. Alternate solutions are available for connectivity to ESCON devices. IBM Global Technology Services offers an ESCON to FICON migration solution, Offering ID #6948-97D, to help facilitate migration from ESCON to FICON. This offering can help you to simplify and manage a single physical and operational environment.
- **OSA-Express2 features.** The z196 is the last high-end server, and the z114 is the last mid-range server, to support OSA-Express2 features. OSA-Express2 features are not supported on future servers. You should begin migrating from OSA-Express2 features (#3364, #3365, #3366) to OSA-Express3 1000BaseT and OSA-Express4S features.
- **Dial-up modems.** The z196 is the last high-end server, and the z114 is the last mid-range server, to support dial-up modems for use with the Remote Support Facility (RSF), and the External Time Source (ETS) option of Server Time Protocol (STP). These features are not supported on future servers. The currently available Network Time Protocol (NTP) server option for ETS, as well as Internet time services available using broadband connections, can be used to provide the same degree of accuracy as dial-up time services. You should begin migrating from dial-up modems to broadband for RSF connections.

Note: IBM's statements regarding its plans, directions, and intent are subject to change or withdrawal without notice at IBM's sole discretion. Information regarding potential future products is intended to outline our general product direction and it should not be relied on in making a purchasing decision. The information mentioned regarding potential future products is not a commitment, promise, or legal obligation to deliver any material, code, or functionality. Information about potential future products may not be incorporated into any contract. The development, release, and timing of any future features or functionality described for our products remains at our sole discretion

Element or feature:	Multiple.
When change was introduced:	<ul style="list-style-type: none"> • 12 July 2011 in U.S. Announcement Letter 211-252. • 15 February 2011 in U.S. Announcement Letter 111-012. • 22 July 2010 in U.S. Announcement letter 110-170.
Applies to migration from:	z/OS V2R1, z/OS V1R13, and z/OS V1R12.
Timing:	Before migrating to a z114 or z196 server.
Is the migration action required?	Yes if you are using a zEC12 or zBC12 server because these servers do not support the functions mentioned in Description .
Target system hardware requirements:	See Description .
Target system software requirements:	None.

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Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Take into account the statements in **Description** as you make your plans for the future.

Reference information: None.

Migrate to a System z10 server

Description: The IBM System z10 servers (z10 EC and z10 BC) are follow ons to the IBM System z9 servers (z9 EC [formerly z9-109] and z9 BC) and IBM eServer zSeries servers (z990, z890, z900, and z800). The System z10 servers build on the inherent strengths of the System z platform, deliver new technologies that offer dramatic improvements in price and performance for key new workloads, and enable a new range of hybrid solutions.

The specific System z10 functions exploited by z/OS V2R1, z/OS V1R13, and V1R12 as part of the base z/OS support are:

- Dynamic addition of logical CPs without preplanning
- RMF FICON enhancement
- Greater than 54 CPs (64) for a single LPAR (z10 EC only)
- XL C/C++ ARCH(8) and TUNE(8)
- Large memory (up to 1 TB on z10 EC now, up to 248 GB on z10 BC planned for 30Jun2009)
- HiperDispatch
- CPACF and Configurable Crypto Express2
- Key management for remote loading of ATM and point-of-sale (POS) keys and support for ISO 16609 CBC Mode T-DES MAC requirements
- New z/Architecture instructions
- 65535 MP factors
- OSA-Express3 10 Gigabit Ethernet
- FICON8 enhancement
- OSA-Express3 Gigabit Ethernet
- 1000BASE-T Ethernet
- Protected Key CP Assist for Cryptographic Function
- New Crypto Express3 and Crypto Express3 -1P

The specific System z10 functions exploited by z/OS V2R1, z/OS V1R13, and V1R12 as part of the explicit z/OS support are:

- HiperSockets Multiple Write Facility
- Capacity Provisioning
- Large page support
- OSA-Express3 double port density
- CPU Measurement Facility architecture

- Service aids support for large dumps
- Layer 3 VMAC support (VMAC Support for OSA-Express2 and OSA-Express3 when configured as CHPID type OSD [QDIO])
- CPACF enhanced to support SHA-384 and SHA-512 bit for message digest, ISO Format 3 PIN blocks, secure key AES, support for RSA keys up to 4096 bits in length, dynamically add crypto to a logical partition, Random Number Generator Long, and enhanced TKE auditin
- Support for 13-digit through 19-digit PAN data, ICSF Query service, and enhanced SAF checking
- Coupling facility level 16
- High Performance FICON for System z (zHPF)
- Decimal floating point
- Usage Report Program (IFAURP) support
- Parallel Sysplex InfiniBand (PSIFB) coupling links

Element or feature:	Multiple.
When change was introduced:	The System z10 EC server, which first shipped in February 2008.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Anytime.
Is the migration action required?	Yes, if you want to run z/OS on a System z10 server.
Target system hardware requirements:	A System z10 server.
Target system software requirements:	See the appropriate PSP buckets for required web deliverables and PTFs for specific functions, as described in “Recommended migration steps for a System z10 server” on page 80.
Other system (coexistence or fallback) requirements:	See the appropriate PSP buckets for required PTFs for specific functions, as described in “Recommended migration steps for a System z10 server” on page 80.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow the recommendations and considerations, adhere to the restrictions, and perform the tasks described in the following topics.

General recommendations and considerations for a System z10 server

As you plan your migration to a System z10 server, consider the following:

1. **Relatively few migration actions are new when coming from a System z9 server.** Migration to a System z10 server has, as its basis, a migration to a z9 EC or z9 BC. This means that if you are migrating to a System z10 server from a z9 EC or z9 BC (and have performed the migration actions associated with the z9 EC or z9 BC), you have fewer migration actions than if you were migrating from a server before the z9 EC or z9 BC and have not yet performed the migration actions associated with the z9 EC or z9 BC. There are, in fact, very few new migration actions to perform on z/OS for a System z10 server if

General migration actions: Hardware

you have already migrated to a z9 EC or z9 BC. It is important to note that you can migrate directly to a System z10 server without installing the intermediate (before z9 EC and z9 BC) servers, but you still need to ensure that any migration considerations are satisfied for the servers that you “skipped”.

2. **Support is delivered by service (and FMID web deliverables for ICSF).** The delta (from a z9 EC or z9 BC) support for a System z10 server, excluding cryptographic support, is delivered by service (PTFs). Some cryptographic support for the System z10 (and earlier) servers is provided by a web deliverable (FMID). Depending on the cryptographic support provided and the z/OS release that you are running, you might need to download and install a different ICSF web deliverable.
3. **Larger coupling facility structure sizes might be necessary.** When you change coupling facility control code (CFCC) levels, your coupling facility structure sizes might change. System z10 servers initially shipped with CFCC level 16. If, as part of your migration to a System z10 server, you change CFCC levels (either by placing a coupling facility on the System z10 server or by moving the coupling facility to a z9 EC or z9 BC at a later CFCC level), you might have larger structure sizes than you did previously. If your CFCC levels are identical, structure sizes are not expected to change when you migrate from a previous server to a System z10 server.
4. **Update CFRM policies.** Coupling facilities are identified in the CFRM policy by their physical node descriptor information (for example, machine type, model, serial number, LPAR number). When a coupling facility undergoes a hardware upgrade, one or more of these pieces of information is likely to change, therefore, the definition of the coupling facility in the CFRM policy must change accordingly.
5. **Use the same software level throughout a sysplex.** Having members of a sysplex at the same software level (other than during brief migration periods) is good software management policy.
6. **Migrate hardware and software at different times.** To minimize the amount of change (and therefore risk) that you experience at one time, do not migrate your software release level at the same time that you migrate your hardware.

Restrictions for a System z10 server

Restrictions associated with the System z10 server are:

1. **Functional limitations:** Not all System z10 functions are available in every z/OS release. See “Migrate to a System z10 server” on page 74 for a list of the System z10 functions available in each z/OS release. Some functions have exploitation or migration considerations (described later). Many functions are enabled or disabled, based on the presence or absence of the required hardware and software. If you wish to position to exploit any new System z10 functions, the software and hardware may be installed in either order. That is, there is no requirement to install either software or hardware first to exploit a specific function.
2. **System z10 in a sysplex:**
 - In a Parallel Sysplex you can include the following servers:
 - zEC12 and zBC12 servers
 - zEnterprise servers (z196 or z114)
 - z10 EC and z10 BC servers.
 - The following IBM servers are no longer supported to run z/OS V2R1 and are not supported in a mixed sysplex:
 - IBM eServer zSeries 990 (z990)
 - IBM eServer zSeries 890 (z890)

- IBM eServer zSeries 900 (z900)
- IBM eServer zSeries 800 (z800)

Note that running z/OS V2R1 as a z/VM guest has the same requirements as running natively in an LPAR.

Note: See “Ensure you are running on supported servers and storage controllers” on page 84.

Actions you can take before you order a System z10 server

You can perform the following migration actions before you order or install your System z10 server:

1. **Review the sysplex configuration in which the System z10 server will participate.** In particular, if you have any existing z900 or z800 z/OS images or coupling facilities in the sysplex, move these z/OS images or coupling facilities to later servers (such as z990 or z890 or later). This action is necessitated by the restriction that a System z10 server cannot participate with a z900 or z800 in a sysplex.
2. **Install new links and connectors on earlier servers.** This action is necessitated because the ICB connector on the System z10 server is different than on previous servers.
3. **Review restrictions and coexistence requirements for earlier servers.** Because the z9 EC and z9 BC support is the basis for the System z10 server support, the restrictions and coexistence requirements for the z9 EC and z9 BC also apply to the System z10 server. For instance, large page support is not supported by z/OS when z/OS runs as a guest under z/VM[®] on a System z10 server. Review the restrictions and coexistence requirements that were introduced for the z9 EC, if you have not already done so, and take any necessary actions.
4. **Install the necessary z/OS service, as indicated in PSP buckets.** The appropriate PSP buckets are listed in “Recommended migration steps for a System z10 server” on page 80 and are dependent on the z/OS release you will run on the System z10 server and on the hardware support you already have installed. If you reviewed the PSP buckets a long time ago, there might have been additions since then, so ensure that any newly identified z/OS service has been installed. To assist you in determining whether you have the recommended service installed on your system, which is identified in these PSP buckets, you can use the SMP/E REPORT MISSINGFIX command with a FIXCAT value of “IBM.Device.Server.z10-EC-2097” or “IBM.Device.Server.z10-BC-2098”, the Enhanced PSP Tool (<http://www14.software.ibm.com/webapp/set2/psp/srchBroker>), or ServiceLink’s PSP Service Extraction tool.

If you use REPORT MISSINGFIX, some FIXCAT values you can use for specific System z10 functions are:

- IBM.Device.Server.z10-BC-2098.CapacityProvisioning
- IBM.Device.Server.z10-BC-2098.DecimalFloatingPoint
- IBM.Device.Server.z10-BC-2098.MIDAW
- IBM.Device.Server.z10-BC-2098.ParallelSysplexInfiniBandCoupling
- IBM.Device.Server.z10-BC-2098.ServerTimeProtocol
- IBM.Device.Server.z10-BC-2098.zAAP
- IBM.Device.Server.z10-BC-2098.zHighPerformanceFICON
- IBM.Device.Server.z10-BC-2098.zIIP
- IBM.Device.Server.z10-EC-2097.CapacityProvisioning
- IBM.Device.Server.z10-EC-2097.DecimalFloatingPoint

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- IBM.Device.Server.z10-EC-2097.MIDAW
 - IBM.Device.Server.z10-EC-2097.ParallelSysplexInfiniBandCoupling
 - IBM.Device.Server.z10-EC-2097.ServerTimeProtocol
 - IBM.Device.Server.z10-EC-2097.zAAP
 - IBM.Device.Server.z10-EC-2097.zHighPerformanceFICON
 - IBM.Device.Server.z10-EC-2097.zIIP
5. **Run CFSizer.** If you are moving your coupling facilities and the coupling facility structures will be on later CFCC levels than they were previously, run the Coupling Facility Structure Sizer (CFSizer) tool to find out if you have to increase coupling facility structure sizes. Prepare to make the necessary changes as indicated by the tool. You can find the CFSizer tool at <http://www.ibm.com/systems/support/z/cfsizer/>.
 6. **Plan for the System z10 fixed HSA enhancement.** With System z10 servers, planning requirements are minimized by the availability of a fixed HSA and introduction of the ability to seamlessly include events such as creation of LPARs, inclusion of logical subsystems, changing logical processor definitions in an LPAR, and introduction of cryptography into an LPAR. For more information about this enhancement, see the System z10 Redbooks®.
 7. **Decide on the steps you will take for your migration to a System z10 server.** As a guide, see “Recommended migration steps for a System z10 server” on page 80. Be aware of the following:
 - You should review the cryptographic support you currently have installed versus the support required for the functions you plan to use on the System z10 server. Several cryptographic support web deliverables have been made available for various z/OS releases. Newer cryptographic web deliverables include previous function (when applicable). Note that you can use the newer cryptographic web deliverables on servers before the System z10 server (that is, on System z9 and zSeries servers).

The level of cryptographic support integrated in z/OS is ICSF FMID HCR7770 in z/OS V1R12. ICSF FMID HCR7780 in z/OS V1R13, and ICSF FMID HCR7790 in z/OS V2R1.

PTFs for coexistence: For ICSF FMIDs HCR7770 and later, Coexistence PTFs are required to be installed on older levels of ICSF. To assist in identifying the coexistence service, you can use the following Fix Categories: :

 - IBM.Coexistence.ICSF.z/OS_V1R9-V1R11-HCR7770
 - IBM.Coexistence.ICSF.z/OS_V1R10-V1R12-HCR7780
 - IBM.Coexistence.ICSF.z/OS_V1R11-V1R13-HCR7790
 - IBM.Coexistence.ICSF.z/OS_V1R12-V1R13-HCR77A0
 - IBM.Coexistence.ICSF.z/OS_V1R13-V2R1-HCR77A1
 - You can migrate to z/OS V2R1 before or after you migrate to a System z10 server.
 8. **Upgrade your SCRT level if you want to process System z10 SMF data.** SCRT V14.2.9 (Version 14 Release 2 Modification Level 9) provides support for the System z10 server. If you collect SMF data on a System z10 server and the data will be processed by the SCRT, you must minimally use SCRT V14.2.9 to generate your SCRT reports. If you do not need to process SMF data from a System z10 server, you are not required to download or use SCRT V14.2.9; you may continue to use SCRT V14.1.0 or V14.2.0 until the next version upgrade of the SCRT. SCRT V14.2.9 (or later) is available from the SCRT web site at <http://www.ibm.com/eserver/zseries/swprice/scrt/>.

9. **Review the new mnemonics introduced for the System z10.** In support of the System z10 server, HLASM introduced new mnemonics for the new machine instructions. The new mnemonics might collide with (be identical to) the names of assembler macro instructions you use or provide. In the event of such collisions, the HLASM default opcode table (UNI) will treat specification of these names as instructions when the PTF for APAR PK58463 is installed. This will probably cause assembler error messages and possibly cause generation of incorrect object code.

If you write programs in assembler language, you should compare the list provided in *z/Architecture Principles of Operation*, SA22-7832, to the names of assembler macro instructions you use or provide, to identify any such conflicts or collisions that would occur following installation of the PTF for HLASM APAR PK58463.

To see the differences of supported mnemonics before and after applying the PTF for APAR PK58463, assemble an END statement with the PARM='OPTABLE(UNI,LIST)' option, and compare the SYSPRINT files for the two assemblies.

If a conflict is identified, take one of the following actions:

- Change the name of your macro instruction.
- Specify PARM='...OPTABLE(YOP)...' or some other, earlier opcode table.
- Specify a separate ASMAOPT file containing assembler options as in the previous method. This method requires no changes to source code or JCL.
- Add *PROCESS OPTABLE(YOP) as the first statement of your source program.
- Specify the PROFILE option in either JCL or the ASMAOPT file, and the specified or default member of the SYSLIB data set is copied into the beginning of the source program.
- If you must use both a new instruction and a macro with the same name in an assembly, you can use the following technique, where XXX is a sample mnemonic. (Assume that the default OPTABLE(UNI) is in effect.)

```

XXX  a,b      new instruction
PUSH  ACONTROL save current optable definition
ACONTROL OPTABLE(YOP)  switch optable dynamically
XXX  r,s,t    macro invocation
POP   ACONTROL restore previous definition
XXX  c,d      new instruction

```

For more information about the HLASM opcode table, see *HLASM Programmer's Guide*.

Actions you can take after you order a System z10 server

After you order but before you install your System z10 server, do the following:

1. **Use the CHPID Mapping Tool.** As you might have done with your z9 EC or z9 BC, use the CHPID Mapping Tool to map logical CHPIDs to physical channels (PCHIDs) and create input to HCD/IOCP for your System z10 server. The tool is a workstation-based Java application available from the Resource Link web site (<http://www.ibm.com/servers/resourcelink>). For more information about this tool, refer to the web site.
2. **Plan for the changes in hardware memory granularity on a System z10 server.** The minimum hardware memory granularity for LPAR assignment to central storage elements (initial and reserved) and for z/OS memory reconfiguration is changed on System z10 servers. On a z9 EC, or z9 BC it is 64 MB, on a z10 EC it is 256 MB, and on a z10 BC it is 128 MB. Addressability is also increased to 8 TB on a z10 EC. For more information, see *PR/SM Planning Guide*, GA22-7236.

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If your installation is set up to do central memory reconfiguration with z/OS, you might have to change your RSU setting in parmlib member IEASYSxx. You can specify RSU as a number, a percentage of all storage, or in MB (or GB or TB). *z/OS MVS Initialization and Tuning Reference* states that while number values from 1-9999 are supported, it is recommended that you use the megabyte, gigabyte, or terabyte format. If you currently specify RSU as a number, such as RSU=10 on a System z9 server, this would result in 640 MB assuming a partition with the largest element of 32 GB or less of central storage. However, on a z10 EC with the same amount of central storage, the result would be 2560 MB. If you specify an RSU in MB or GB, there will probably be less of an impact but you need to understand that the values are rounded to a multiple of 256 MB instead of 64 MB or 128 MB.

Note that specifying an RSU value greater than the total amount of real storage available on the system will cause message IAR026I THE RSU VALUE SPECIFIED EXCEEDS THE TOTAL AMOUNT OF REAL STORAGE AVAILABLE ON THIS SYSTEM: *yyyyyyyyM* to be issued by the system during IPL indicating an RSU overspecification condition, and showing the amount of real storage available on the system. This message will be followed by IAR006A INVALID {VRREGN|REAL|RSU} PARM - RESPECIFY OR PRESS ENTER FOR THE DEFAULT prompting for a valid RSU value. Special care should be given to select the right RSU value for the system. A large RSU value can ultimately cause system performance problems.

Recommended migration steps for a System z10 server

This topic suggests the steps for migrating your same z/OS release level from your current server to a System z10 server. The steps are based on the assumption that you want to minimize the amount of change (and therefore risk) and the amount of work required to perform the migration.

If your current z/OS release is V1R12, follow these steps:

1. Install the service in the following PSP buckets:
 - The z10 PSP bucket:
 - For the z10 EC: upgrade 2097DEVICE, subset 2097/ZOS
 - For the z10 BC: upgrade 2098DEVICE, subset 2098/ZOS
 - The z9 EC PSP bucket: upgrade 2094DEVICE, subset 2094/ZOS (if not already on a z9 EC or z9 BC)

If your current z/OS release is V1R13, follow these steps:

1. Install the service in the following PSP buckets:
 - The z10 PSP bucket:
 - For the z10 EC: upgrade 2097DEVICE, subset 2097/ZOS
 - For the z10 BC: upgrade 2098DEVICE, subset 2098/ZOS
 - The z9 EC PSP bucket: upgrade 2094DEVICE, subset 2094/ZOS (if not already on a z9 EC or z9 BC)

If your current z/OS release is V2R1, follow these steps:

1. Install the service in the following PSP buckets:
 - The z10 PSP bucket:
 - For the z10 EC: upgrade 2097DEVICE, subset 2097/ZOS
 - For the z10 BC: upgrade 2098DEVICE, subset 2098/ZOS
 - The z9 EC PSP bucket: upgrade 2094DEVICE, subset 2094/ZOS (if not already on a z9 EC or z9 BC)

Tip for locating the correct service: To simplify finding the appropriate PSP bucket and identifying which PTFs listed in the PSP bucket need to be installed on your system, use the SMP/E REPORT MISSINGFIX command in conjunction with the FIXCAT type of HOLDDATA, as follows:

1. Acquire and RECEIVE the latest HOLDDATA onto your pre-z/OS V2R1 systems. Use your normal service acquisition portals or download the HOLDDATA directly from <http://service.software.ibm.com/holddata/390holddata.html>. Ensure you use the FULL file (last 730 days) to receive the FIXCAT HOLDDATA, as the other files do not contain FIXCAT HOLDDATA.
2. Run the SMP/E REPORT MISSINGFIX command on your pre-z/OS V21R1 systems and specify a Fix Category (FIXCAT) value of "IBM.Device.Server.z10-BC-2098" or "IBM.Device.Server.z10-EC-2097". The report will identify any missing coexistence and fallback PTFs for that system. For complete information about the REPORT MISSINGFIX command, see *SMP/E for z/OS Commands*.
3. Periodically, you might want to acquire the latest HOLDDATA and rerun the REPORT MISSINGFIX command to find out if there are any new coexistence and fallback PTFs.

Migration and exploitation considerations for System z10 functions

1. **C/C++ ARCH(8) and TUNE(8) options:** The ARCHITECTURE option of the XL C/C++ compiler selects the minimum level of machine architecture on which your programs will run. Certain features provided by the compiler require a minimum architecture level. ARCH(8) exploits instructions available on System z10 servers. For more information, see the ARCHITECTURE compiler option in *z/OS XL C/C++ User's Guide*. The TUNE compiler option allows you to optimize your application for a specific machine architecture within the constraints imposed by the ARCHITECTURE option. The TUNE level must not be lower than the setting in the ARCHITECTURE option. For more information, refer to the TUNE compiler option in *z/OS XL C/C++ User's Guide*.

Exploitation restriction: Once programs exploit the ARCH(8) or TUNE(8) option, the programs can only run on System z10 servers; otherwise, an operation exception will occur. This is a consideration for programs that will run on different server levels (System z9 and zSeries) during development, test, and production, as well as during fallback or disaster recovery.

Note: ARCH(7) is the minimum level required to exploit decimal floating point support. The resulting program objects can run on System z9 servers (depending on the MLC installed) as well as on System z10 servers.

2. **HiperDispatch:** A new HIPERDISPATCH=YES|NO parameter in parmlib member IEAOPTxx, and on the SET OPT=xx command, controls whether HiperDispatch is enabled or disabled for the system. The value can be changed dynamically. HiperDispatch defaults to disabled. Thus, by default, your environment is not changed from a HiperDispatch perspective when migrating from a pre-System z10 server to a System z10 server. Once migration has completed, you can exploit the HiperDispatch function of the System z10 server.

Because HiperDispatch improves the performance of a System z10 system, a new health check (SUP_HIPERDISPATCH) was added to verify that HiperDispatch is enabled. The new health check is only added on System z10 systems. WLM goal adjustment might be required when using this function. Review and update your WLM policies as necessary. You might need to turn off and on HiperDispatch while adjusting your WLM goals.

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3. **Capacity Provisioning:** An installed On/Off CoD record is a necessary prerequisite for automated control of temporary capacity through z/OS Capacity Provisioning. Capacity Provisioning allows you to set up rules defining the circumstances under which additional capacity should be provisioned in order to fulfill a specific business need. The rules are based on criteria, such as the maximum additional capacity that may be activated for one or more workloads, and time and workload conditions. The workload condition can identify a specific application by use of WLM service classes. Capacity changes can be suggested or implemented automatically, when authorized by policy. This support provides a fast response to capacity changes and ensures sufficient processing power will be available with the least possible delay even if workloads fluctuate. For more information, see *z/OS MVS Capacity Provisioning User's Guide*.

4. **Large page support:** A change to the z/Architecture on System z10 servers is designed to allow memory to be extended to support large (1 MB) pages. Large pages are used in addition to the existing 4 KB pages. The use of large pages is expected to reduce memory management overhead for exploiting applications. Large page support is primarily of benefit for long-running applications that are memory-access intensive. Large page support is not recommended for general use. Short-lived processes with small working sets are normally not good candidates for large pages.

To use large pages, you need to run z/OS V1R9 (or later) with the appropriate PTFs in a native System z10 LPAR. The support is not enabled if you are running without the software support, are running on a prior generation of server, or are running as a z/OS guest under z/VM. Without the large page support, page frames are allocated at the (current) 4 KB size.

Furthermore, to exploit large page frames, a new LFAREA=xx %|xxxxxxM|xxxxxxG parameter in parmlib member IEASYSxx must be specified. This parameter cannot be changed dynamically.

With the installation of APAR OA32001, the calculation of the max value of the LFAREA is changed. The LFAREA max value is now less than the old max LFAREA value. The maximum amount of real storage that can be used to back large pages is now (80% of the online storage available at IPL) minus 2 GB. Make sure the LFAREA value you specify in the IEASYSxx member is less than the new max value available in the system. You can specify LFAREA as a percentage of all storage, or in MB or GB. Specifying a percentage for the LFAREA parameter is now also calculated as (the percent of the online storage available at IPL) minus 2 GB. Special care should be given to select the right LFAREA value for the system. See *z/OS MVS Initialization and Tuning Reference* and DOC APAR OA34024 for information about valid specification of the LFAREA parameter.

Note:

- a. You must apply the PTF for APAR OA31116 to z/OS V1R11 and z/OS V1R12 to use the command **DISPLAY VIRTSTOR,LFAREA** to find the allocation status of LFAREA.
- b. If you do not want large frame support, do not use LFAREA= to exploit large page frames. Starting with z/OS V2R1, when you specify LFAREA=0M in IEASYSxx parmlib member, the following message is issued: IAR048I LFAREA=0M WAS PROCESSED WHICH RESULTED IN 0 1MB PAGES AND 0 2GB PAGES.

5. **Coupling facility level 16:** Service time for CF duplexing is improved, shared IMS and MQ list notification is improved, and the structure increment size is increased from 512 KB to 1 MB.

6. **Parallel Sysplex InfiniBand (PSIFB) coupling links:** InfiniBand coupling links provide an additional option for your Parallel Sysplex cluster on System z10 and System z9. When used in the data center, InfiniBand coupling links can replace Integrated Cluster Bus-4 (ICB-4) and InterSystem Channel-3 (ISC-3) links.

Note: Be sure to conduct performance analyses when replacing one type of coupling link with another.

Coupling facilities can now be separated by up to 150 meters (492 feet).

InfiniBand coupling links use fiber optic cabling containing 12 pairs (12x) of fiber compared to one pair (1x) of fiber used with ISC-3 fiber optic cabling. InfiniBand coupling links support double data rate (DDR) when a z10 EC is communicating with another z10 EC. InfiniBand coupling links support single data rate (SDR) when a z10 EC is communicating with a z9 EC dedicated CF or z9 BC Model S07 dedicated CF. When the InfiniBand coupling link is z10 EC-to-z10 EC, the link auto-negotiates to 6 Gbps. A z10 EC system auto-negotiates to 3 Gbps when connected to a z9 EC or z9 BC dedicated coupling facility.

Note: The InfiniBand link data rate of 6 Gbps or 3 Gbps does not represent the performance of the link. The actual performance is dependent upon many factors including latency through the adapters, cable lengths, and the type of workload. With InfiniBand coupling links, while the link data rate may be higher than that of ICB, the service times of coupling operations are greater, and the actual throughput may be less than with ICB links.

Refer to the *Coupling Facility Configuration Options* white paper for a more specific explanation of when to continue using the current ICB technology versus migrating to InfiniBand coupling links. The white paper is available at <http://www.ibm.com/systems/z/advantages/pso/whitepaper.html>.

A new infrastructure was created to support an InfiniBand coupling link environment. Host channel adapter optical (HCA-O) fanouts have been introduced for System z10 and System z9 dedicated coupling facilities. The HCA-O fanouts, with two ports per fanout, reside on the front of each processor book. The fiber optic cables are plugged directly into the front of the HCA-O fanouts:

- HCA2-O fanout for System z10 servers
- HCA1-O fanout for z9 EC and z9 BC Model S07 dedicated coupling facilities

There is a new physical definition to associate with a channel path identifier with an adapter identification. Unlike channels installed in an I/O cage, which are identified by a physical channel path identifier (PCHID) number related to their physical location, HCA-O fanouts and ports are identified by an adapter identification (AID) value that is determined by its physical location. The AID must be used to assign a CHPID to the fanout in the hardware configuration definition. The CHPID assignment is done by associating the CHPID to an AID and port. The AID assigned to a fanout can be found in the PCHID report provided for each new server or for upgrades on System z10 and System z9 servers.

There is also a new CHPID type CIB (coupling using InfiniBand). CHPID type CIB is common for System z10 and System z9 servers.

On System z10 and System z9 servers, the design allows up to 16 CHPIDs to be defined across the two ports on each HCA-O fanout. This can reduce the number of coupling links; physical coupling links can be shared by multiple sysplexes. For example, this capability allows for one CHPID to be directed to one coupling facility and a second CHPID to be directed to a separate coupling

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facility on the same target server, using the same port. An increased number of CHPIDs per physical link can help to facilitate consolidation of ISC-3 links onto InfiniBand coupling links.

InfiniBand coupling links can also be used to exchange timekeeping messages for Server Time Protocol (STP).

You can choose the coupling links that best suit your business needs: IC, ICB, IFB, or ISC-3.

Ensure you are running on supported servers and storage controllers

z/OS V2R1 runs on these IBM System z servers:

- IBM zEnterprise EC12 (zEC12)
- IBM zEnterprise BC12 (zBC12)
- IBM zEnterprise 196 (z196)
- IBM zEnterprise 114 (z114)
- IBM System z10 (z10 EC, z10 BC) (**Note:** withdrawn from marketing)
- IBM System z9 (z9 BC, z9 EC) (**Note:** withdrawn from marketing. For the z9 EC and z9 BC, the minimum driver and MCL level required is Driver-67, Bundle #6b, MCL053 in the G40965 (System) stream. Although this level is the minimum, IBM recommends that you install the latest driver and MCL)

In addition, z/OS V2R1 supports these and later IBM storage control units:

- 3990 Model 3 and 3990 Model 6
- 9393
- 2105
- 2107
- 2421
- 2422
- 2423
- 2424

The following IBM servers are no longer supported to run z/OS V2R1:

- IBM eServer zSeries 990 (z990)
- IBM eServer zSeries 890 (z890)
- IBM eServer zSeries 900 (z900)
- IBM eServer zSeries 800 (z800)

Note that running z/OS V2R1 as a z/VM guest has the same requirements as running natively in an LPAR.

Element or feature:	Multiple.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS VR13 and z/OS V1R12.
Timing:	Anytime
Is the migration action required?	Yes, if you use any of the servers or controllers that are no longer supported to run with z/OS V2R1.
Target system hardware requirements:	None.
Target system software requirements:	None.

Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	<ul style="list-style-type: none"> During IPL/NIP processing, if you try to use an unsupported control unit for z/OS V2R1, you receive the following error condition for devices under the control unit . IEA434I (nnnn) ONLINE IS NOT ALLOWED, INVALID CONTROL UNIT MODEL During VARY ONLINE command processing after IPL/NIP, you receive the following error condition for devices under the unsupported control unit: IEA434I DEVICE ONLINE IS NOT ALLOWED, INVALID CONTROL UNIT MODEL If you IPL z/OS V2R1 on a server that it does not support, you might receive wait state 07B-1E (decimal 30). Note: The number of IEA434I messages is limited to 32 during IPL/NIP to avoid exhausting initial ESQA. An IEA444I message will be reported one time during IPL/NIP to indicate that additional IEA434I messages have been suppressed: IEA444I NUMBER OF IEA434I MESSAGES EXCEEDS NIP MAXIMUM
Related IBM Health Checker for z/OS check:	None.

Steps to take:

- Determine whether the servers and control units that you use are supported for z/OS V2R1. If you have a question about support for any devices not listed, contact your IBM representative.
- Install replacement servers and control units. Detach unsupported servers and control units from the system and delete their corresponding definitions from the input/output definition file (IODF).

Reference: For more information, see *Release memorandum - RFA 58183 - 04/15/13 (IBM Guide 27.10)*.

Replace unsupported devices

Description: You should remove and replace devices that were supported by earlier releases but cannot be used with the current release of z/OS because they are no longer supported.

Element or feature:	Multiple.
When change was introduced:	General migration action not tied to a specific release.

General migration actions: Hardware

Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Anytime.
Is the migration action required?	Yes, if you use any of the devices that are no longer supported.
Target system hardware requirements:	Replacement devices as necessary.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take:

1. Determine whether the devices you use are supported. A list of supported I/O devices is in the topic about identifying I/O device requirements in *z/OS Planning for Installation*. If you have a question about support for any devices not listed, contact your IBM representative.
2. Install replacement devices. Move data that is stored on unsupported devices to the supported devices. Detach unsupported devices from the system and delete their corresponding device definitions from the input/output definition file (IODF).

Reference information:

- For a list of I/O devices that are supported, see the topic about identifying I/O device requirements in *z/OS Planning for Installation*.
- For information about deleting device definitions from the IODF, see *z/OS HCD User's Guide*.

Provide for new device installations

Description: The hardware configuration of your processors and I/O devices determines how many devices you can attach to your system. z/OS supports attachment of up to 65,280 devices, each with up to eight access paths.

Element or feature:	Multiple.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Anytime.
Is the migration action required?	Yes, if you are going to use new devices with z/OS V2R1 and later.
Target system hardware requirements:	Dependent upon the new devices used.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.

Related IBM Health Checker for z/OS check:	None.
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Steps to take: The following are general considerations related to I/O device support.

- *Attaching devices through HCD.* You can define, or attach, new devices to your system through the interactive panels of the Hardware Configuration Definition (HCD) base element. HCD has dynamic I/O capabilities, changing hardware definitions without the need for an IPL or hard power-on reset.
Any time you make changes to your I/O configuration, you need to use HCD to modify your system's I/O definition file (IODF). You should also update the input/output configuration data set (IOCDs) when you run HCD to ensure that the configuration information is consistent across the software and microcode.
- *Operating modes.* Most devices attached to z/OS operate in full function mode, that is, all features on the device are compatible with, and usable on, the operating system. Some of these features include:
 - For DASD devices: dynamic path reconnection, extended count-key-data operation, and caching and cache-related facilities
 - For tape devices: cartridge stack loading and data compaction
 Some devices also operate in compatibility mode, which allows you to simulate the function of another device or model. Compatibility mode causes the device to function like a different device of the same type, ignoring some or all of the additional features the device might have. This allows you to migrate between devices with minimal impact on programs that have device dependencies.
- *UCB virtual storage constraint relief.* Each device attached to the system has one or more UCBs associated with it. You have the option to define UCBs either above or below the 16 MB line by specifying the LOCANY parameter on the Hardware Configuration Definition (HCD) panel. The system programmer should review the contents of the link pack area (LPA) list to determine whether to remove or move libraries to gain virtual storage constraint relief.
- *Hardware maintenance.* Some devices require a specific level of hardware maintenance to operate properly on a z/OS system. DFSMS software support for new hardware devices might also require the installation of PTFs.

Reference information:

- For a summary of the most commonly-used I/O devices supported by z/OS that are also directly supported by DFSMS functions, see the topic about identifying I/O devices in *z/OS Planning for Installation*. If you have a question about support for a device that is not listed, contact your IBM representative.
- For more information about HCD, see *z/OS HCD Planning*.
- For information about working with IODFs, see *z/OS HCD User's Guide*.

Update your CFRM policy with coupling facility structure size changes

Description: If you are migrating to a new level of coupling facility control code (CFCC), you have to make appropriate coupling facility structure size updates in the z/OS coupling facility resource management (CFRM) policy.

Element or feature:	Multiple.
When change was introduced:	General migration action not tied to a specific release.

General migration actions: Hardware

Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Anytime.
Is the migration action required?	Yes, if you are migrating to a new CFCC level.
Target system hardware requirements:	See http://www.ibm.com/systems/z/advantages/psocftable.html .
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: If you are migrating to a new CFCC level, do the following:

1. Run the Coupling Facility Structure Sizer (CFSizer) tool. This tool sizes structures, taking into account the amount of space needed for the current CFCC levels. The tool sizes for the most currently available level; you might find that the results are oversized if you use an earlier CFCC level. You can find the tool at <http://www.ibm.com/systems/support/z/cfsizer/>.

Alternatively, you can run an as-is batch utility program called SIZER after you have brought a new CFLEVEL coupling facility into use in your configuration. SIZER examines your currently allocated coupling facility structures and recalculates the size that should be used for them with the new later-CFLEVEL coupling facility. The as-is SIZER utility is available as a zipped package that you can download from <http://www.ibm.com/systems/support/z/cfsizer/altsize.html> .

2. Update the CFRM policy with the size modifications that are needed.
3. Activate the updated CFRM policy so that it becomes the active policy governing structure allocation in the sysplex.

Reference information: For a detailed description of coupling facility code levels and the processors that support those levels, see <http://www.ibm.com/systems/z/advantages/psocftable.html> .

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Chapter 3 describes those actions for anyone who is migrating from z/OS V1R13.

Sysplex migration actions

This topic summarizes actions for you to take if you are migrating systems that are members of a base sysplex or Parallel Sysplex configuration.

Sysplex actions related to hardware upgrades

Title of migration action	Page or topic
"Update your CFRM policy with coupling facility structure size changes" on page 87	"Update your CFRM policy with coupling facility structure size changes" on page 87
"Migrate to an IBM zEnterprise EC12 server or IBM zEnterprise BC12 server" on page 41	"Migrate to an IBM zEnterprise EC12 server or IBM zEnterprise BC12 server" on page 41
"Migrate to an IBM zEnterprise z196 or z114 server" on page 57	"Migrate to an IBM zEnterprise z196 or z114 server" on page 57
"Migrate to a System z10 server" on page 74	"Migrate to a System z10 server" on page 74

Sysplex actions to perform before installing z/OS V2R1

Element or feature	Title of migration action	Page or topic
Multiple	"Install coexistence and fallback PTFs" on page 9	"Install coexistence and fallback PTFs" on page 9
DFSMSdfp	"DFSMSdfp: Back up SMS control data sets" on page 151	"DFSMSdfp: Back up SMS control data sets" on page 151
Distributed File Service	"zFS: Ensure sysplex=filesys is available on all zFS R11 and R12 systems in a shared file system environment" on page 378	"zFS: Ensure sysplex=filesys is available on all zFS R11 and R12 systems in a shared file system environment" on page 378

Sysplex actions to perform before the first IPL of z/OS V2R1

None.

Element or feature	Title of migration action	Page or topic
BCP	"Change value for ARM restart processing" on page 279	"Change value for ARM restart processing" on page 279

Migration actions from z/OS V1R13: Sysplex

Element or feature	Title of migration action	Page or topic
BCP	"Modify automation that references output from D XCF,SYSPLEX console commands" on page 272	"Modify automation that references output from D XCF,SYSPLEX console commands" on page 272
BCP	"Accommodate OPERLOG EMCS console name change" on page 278	"Accommodate OPERLOG EMCS console name change" on page 278
JES3	"Avoid redundant *S main,FLUSH command in response to XCF messages" on page 403	"Avoid redundant *S main,FLUSH command in response to XCF messages" on page 403

Sysplex actions to perform after the first IPL of z/OS V2R1

None.

Element or feature	Title of migration action	Page or topic
SDSF	"Update configuration for sysplex support" on page 426	"Update configuration for sysplex support" on page 426

BCP migration actions

This topic describes migration actions for the base element BCP (Base Control Program).

BCP actions to perform before installing z/OS V2R1

This topic describes BCP migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

Evaluate your stand-alone dump data set allocations and your IPCS processing of them

Description: As your applications grow in size and use ever greater amounts of storage, you should evaluate whether the DASD allocated for your stand-alone dump data continues to be adequate.

In z/OS V1R6, support was introduced for extended-format sequential data sets, a form of data set that is SMS-managed and can occupy more than 64 K tracks per volume. In z/OS V1R7, this support was supplemented with support for large

Migration actions from z/OS V1R13: BCP

format sequential data sets (DSNTYPE=LARGE), a form of data set that is essentially the same as conventional sequential data sets except that more than 64 K tracks may be spanned per volume. If your stand-alone dump data sets are spread over more volumes than you want, both types of support can help you gain better control over the number of volumes used for each stand-alone dump data set.

Element or feature:	BCP.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	No, but recommended because of changes that have been made to stand-alone dump processing (that reorder dump records with the intent of recording more important data early), and especially recommended if you deploy any LPARs with significantly more main storage than previously used.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

- Use multivolume stand-alone dump data sets. Adjust the number of volumes and their separation to achieve tolerable stand-alone dump capture times.
- Use extended-format sequential data sets or large format sequential data sets. Copy their contents to an extended-format, compressed, striped data set using the IPCS COPYDUMP subcommand before analysis. Use the same or a larger striping factor than you used for your stand-alone dump data sets. Dump data sets to which stand-alone dump can write may be neither compressed nor striped, but both attributes are advantageous for the target of the copy operation. Starting with z/OS V1R12, stand-alone dump data sets can be placed in track-managed space as well as cylinder-managed space on Extended Address Volumes (EAV).
- Use a large CISIZE and striping for IPCS dump directories, and use blocking, striping, and compression for the stand-alone dump data set. Very large stand-alone dumps might require that you define your directory with the extended addressing attribute, allowing it to hold more than 4 GB.

Tips: Control interval sizes less than 24K have been shown to be more vulnerable to fragmentation when used as IPCS dump directories, and IPCS performance can be degraded when such fragmentation occurs. In this background, warning message BLS2110I will be issued and you might recreate the DDIR by using the CLIST BLSCDDIR.

BLS2110I CISIZE(cisize) is less than 24K. It may degrade IPCS performance

Reference information: The following are references:

Migration actions from z/OS V1R13: BCP

- For information about dump data set allocation, extended-format sequential data sets, large format sequential data sets, and multivolume dump data sets, see *z/OS MVS Diagnosis: Tools and Service Aids*.
- For stand-alone dump best practices, see *z/OS Problem Management*.

Plan to move from SHARED mode to DISTRIBUTED mode for consoles

Description: The release following z/OS V2R1 is planned to be the last release in which the consoles component will support SHARED mode. IBM recommends that you migrate to DISTRIBUTED mode, which was introduced in z/OS V1R10.

Element or feature:	BCP
When change was introduced:	Planned for the release following z/OS V2R1, as previewed in Statement of direction: IBM z/OS IBM United States Software Announcement 212-086 April 11, 2012.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	No, but recommended if you are using SHARED console mode. When shared mode is removed, you are required to move to DISTRIBUTED mode.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	There are fallback considerations in moving from DISTRIBUTED to SHARED mode. See "Migration and fallback considerations" in <i>z/OS MVS Planning: Operations</i> .
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Move from SHARED mode to DISTRIBUTED mode for your console environment. Note that the default switched from SHARED to DISTRIBUTED mode in z/OS V1R13.

Reference information: See *Statement of direction: IBM z/OS IBM United States Software Announcement 212-086 April 11, 2012*. For distributed mode, see *z/OS MVS Planning: Operations*.

Make accommodations for RACROUTE AUTH check for SLIP command

Description: As of z/OS V2R1, a RACROUTE AUTH check is now performed for a SLIP command that is issued with action of REFAFTER or REFBEFOR. This change might affect your installation, depending on the security product you are using.

Element or feature:	BCP
When change was introduced:	z/OS V2R1
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.

Is the migration action required?	Yes, if you are use a SLIP command with Action of REFAFTER or REFBEFOR and are using a security product that is affected by the additional RACROUTE AUTH check.
Target system hardware requirements:	See Steps to take .
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: If you use the z/OS RACF security product, there is no action to take. If you use another security product, contact your vendor to see if there is any support or changes that you need to make.

Reference information: *z/OS MVS System Commands*

Update Capacity Provisioning Manager parameters to use CIM Client for Java Version 2

Description: z/OS V2R1 is planned to be the last release to include Version 1 of the Standards Based Linux Instrumentation for Manageability (SBLIM) CIM client for Java. Version 1 support for SourceForge open source project was discontinued in 2010. Version 2 of the SBLIM client, which is designed to be a JSR48-compliant implementation, is included in z/OS V1R13 and planned to be included in z/OS V2R1. IBM recommends that users of SBLIM Version 1 convert to Version 2.

Element or feature:	BCP.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	No, but recommended because it is planned to be a requirement in the release after z/OS V2R1.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

1. The Provisioning Manager user CPOSRV needs READ access to CIM Client for Java Version 2 `sblim-cim-client.jar`. This access usually by default should be sufficient. If it is not, you must set the "other" READ access file permissions using the z/OS UNIX command `chmod` (for example, `chmod`

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o+r/usr/lpp/wbem/jcclient/sblim-cim-client2.jar. Note that this command must be issued by a user with the appropriate authorization.

2. If your CIM installation directory is not at the default location, you need to add the location of the CIM Client for Java Version 2 **slim-cim-client2.jar** to the CLASSPATH entry. If you have already specified the location of a previous version of the CIM Client Java, you need to add the location of CIM Client for Java Version 2 before the location of the previous version of CIM Client for Java. the CLASSPATH is specified in the ENV member of the Provisioning Manager runtime environment data set with prefix.PARM. The prefix for the data set name is the high-level qualifier of the Capacity Provisioning Manager parameters data set and the name of the domain managed by the Capacity Provisioning Manager. For example, with default values, the data set name is CPO.DOMAIN1.PARM.

Reference information: For more information, see *z/OS MVS Capacity Provisioning User's Guide*.

Migrate from SNMP to z/OS BCPii for communication to the HMC or SE for z/OS Capacity Provisioning support

Description: As of z/OS V2R1 the Capacity Provisioning Manager no longer supports the System z API for communication with the Support Element (SE) or Hardware Management Console (HMC). The protocol used by System z API is based on IP network connection using SNMP. For z/OS V2R1 it is required to configure the Capacity Provisioning Manager for communication through the z/OS BCP Internal Interface (BCPii) protocol. The SE and HMC support for the System z API remain, and is not affected by this withdrawal of support for Capacity Provisioning. If you are currently using SNMP for the communication, it is required that you now migrate to BCPii. The migration includes enabling the communication through BCPii for the Provisioning Manager user and adding a new key to the Capacity Provisioning Manager parameter file.

Element or feature:	BCP.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you use the Windows-based Capacity Provisioning Control Center (CPCC) function.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

- You can use the tracking facility to help with this migration action. In tracking facility output, look for violations that start with CPO-W:SNMP usage *domain name*, where *domain name* is replaced with the actual name of the affected domain. Exploit the z/OS tracking facility on z/OS V1R13 or z/OS V1R12 by

installing the PTF for APAR OA35284. If you are using the tracking facility and have no instances of affected domains after starting Capacity Provisioning Manager, then this migration action is not applicable to you.

- Set up BCPii as described in *z/OS MVS Programming: Callable Services for High-Level Languages*.
- Define the required security profiles to allow the Capacity Provisioning Manager user to access the hardware information.
- Add the Topology.Protocol=INTERNAL key to the Capacity Provisioning Manager parameter file. Using the default values, the file is the member CPO.DOMAIN1.PARM(PARM).

Reference information: The following are references:

- For information about BCPii setup, see *z/OS MVS Programming: Callable Services for High-Level Languages*.
- For information about required security profile and how to define the new key to the Capacity Provisioning Manager parameters, see *z/OS MVS Capacity Provisioning User's Guide*.
- For information about using the tracking facility, see "Appendix A" *z/OS MVS Planning: Operations*.

Remove the REPORTCOMPLETIONS option from the IEAOPTxx member

Description: As of z/OS V1R13, the support for the REPORTCOMPLETIONS=YES|NO parameter in IEAOPTxx member of parmlib has been removed. This option was introduced with OA34801 (2010/11/24) and removed with OA35428 July 7, 2011. REPORTCOMPLETIONS=YES was intended to provide a system-wide option for installations with a single large production environment, where all regions were exempted from being managed towards response time goals and if you wanted to obtain response time statistics with different granularity through service and report classes. In all other cases the usage of this parameter was not recommended.

The REPORTCOMPLETIONS=YES option has been superseded by the "Manage Region Using Goal Of Both" option on the classification rule that allows to manage CICS Terminal Owning Regions (TORs) in a very granular way.

Element or feature:	BCP
When change was introduced:	z/OS V2R1, and with the PTF for APAR OA35428 on z/OS V1R13
Applies to migration from:	z/OS V1R13 without the PTF for APAR OA34801 applied and z/OS V1R12 with the PTF for APAR OA34801 applied.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	No, but recommended to avoid the information message, if you ever used the REPORTCOMPLETIONS parameter.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.

Migration actions from z/OS V1R13: BCP

Related IBM Health Checker for z/OS check:	None.
--	-------

Steps to take: To clean up the IEAOPTxx parmlib member, remove the REPORTCOMPLETIONS.

You can still set the REPORTCOMPLETIONS option, but it is ignored with the following message:

```
IRA800I OPT MEMBER IEAOPTxx KEYWORD ReportCompletions IGNORED, NO LONGER USED
```

Reference information: For further information, see the documentation descriptions for APARs OA34801 and OA35428.

Move BCPii API calls into your application instead of in BCPii ENF exits

Description: As stated in various IBM publications, non-SRB ENF exits need to avoid time-consuming processing. Coding an HWIEVENT ENF exit to execute BCPii APIs may result in multiple problems, such as delays with BCPii event notification processing when BCPii services are simultaneously being invoked. Starting with z/OS V1R12 and later, BCPii enforces this restriction, and BCPii API calls made from within a BCPii ENF exit are now rejected with return code HWI_UNSUPPORTED_ENVIRONMENT.

Element or feature:	BCP.
When change was introduced:	z/OS V1R13 and z/OS V1R12, both with APAR OA37035.
Applies to migration from:	z/OS V1R13 and z/OS V1R12, both without the PTF for APAR OA37035 applied.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you have coded a BCPii API call from your ENF exit.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	BCPii API calls made from within a BCPii ENF exit are now rejected with return code HWI_UNSUPPORTED_ENVIRONMENT.
Related IBM Health Checker for z/OS check:	None.

Steps to take: If you have coded a BCPii API call from your ENF exit, move the BCPii API call into your application and have the BCPii ENF exit post the application when the event occurs. Your application program may now issue the BCPii API call from the user's thread.

For an example of how to code a BCPii ENF exit, see the sample ENF event exit HWIXMCX1 in SYS1.SAMPLIB.

Reference information: For additional information, see *z/OS MVS Programming: Callable Services for High-Level Languages*.

Remove policies for the PFA_FRAMES_AND_SLOTS_USAGE check

Description: The PFA_FRAMES_AND_SLOTS_USAGE check no longer exists. Remove any policies you have in place for the PFA_FRAMES_AND_SLOTS_USAGE check.

Element or feature:	BCP
When change was introduced:	z/OS V2R1, and on z/OS V1R13 and z/OS V1R12 with APAR OA40065.
Applies to migration from:	z/OS V1R13 and z/OS V1R12 both without OA40065.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you have any policies in place for the PFA_FRAMES_AND_SLOTS_USAGE check.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	Failure to remove some types of customization for the PFA_FRAMES_AND_SLOTS_USAGE check results in error messages.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Remove all IBM Health Checker for z/OS policy and non-policy statements in HZSPRMxx that refer to the PFA_FRAMES_AND_SLOTS_USAGE check.

Reference information: *z/OS Problem Management*

Update code that invokes the IOSSPOF macro in a PSW key of 0-7

Description: The IOSSPOF macro changed to conditionally obtain the returned SPOFAREA in a different subpool depending on the caller's PSW key. This may cause the caller, depending on their current PSW key, to be required to change to a different PSW key if they want to update the storage. In addition, certain PSW key callers can no longer rely on the storage automatically being freed when the task ends. The subpool number continues to be returned in the SPOFAREA_SUBPOOL so that it can be used when the storage is freed.

The specific changes are:

- Key 0-7 callers: The returned SPOFAREA mapped by IOSDSPOF is obtained in subpool 252, which is key 0 storage, non-fetch-protected, and is associated with the jobstep task.
- Key 8-15 callers: The returned SPOFAREA mapped by IOSDSPOF continues to be obtained in subpool 1, which is fetch-protected storage with a key equal to the TCB key and is associated with the issuing task.

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The specific restrictions are:

- Key 0-7 callers cannot rely on the SPOFAREA storage automatically being freed when the task ends. The area must now be explicitly freed and the caller must meet the state, key, and APF-authorization requirements for freeing from subpool 252.
- Key 1-7 callers must change to Key 0 in order to update the returned SPOFAREA storage.
- Key 8-15 callers must be in the PSW key of the TCB in order to access the SPOFAREA storage.

Element or feature:	BCP.
When change was introduced:	z/OS V2R1, z/OS V1R13 and z/OS V1R12 all with APAR OA37035.
Applies to migration from:	z/OS V1R13 and z/OS V1R12 both without APAR OA37035 applied.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you have code that invokes the IOSSPOF macro in a PSW key of 0-7.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: For any program that invokes the IOSSPOF macro in a PSW key of 0-7, ensure the following restrictions are followed:

- Key 0-7 callers: Because the subpool used for the SPOFAREA has changed from being associated with the issuing task to being associated with the jobstep task, be sure to free the storage if your task is not the jobstep task. In addition, make sure your storage-free invocation meets the state, key, and APF-authorization requirements for freeing from subpool 252.
- Key 1-7 callers: If the program attempts to write to the returned SPOFAREA, the program must switch to key 0 to update the area.

Reference information: For additional information, see *z/OS MVS Programming: Authorized Assembler Services Reference EDT-IXG*.

BCP actions to perform before the first IPL of z/OS V2R1

This topic describes BCP migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

Create IPL text

Description: IPL text is bootstrap information required for IPL (such as the location of the nucleus library). You must create IPL text by running ICKDSF against the system residence volume.

Element or feature:	BCP.
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Migration actions from z/OS V1R13: BCP

When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Update and run the IPLTEXT job to write a new copy of the IPL text. If you install z/OS with a ServerPac, an installation dialog job is provided to perform this action. If you install z/OS with a CBPDO, instructions to perform this action are provided in *z/OS Program Directory*.

Tip: With ICKDSF R17 APAR PM42057, a new parameter called REMOVEIPLTXT has been added to the REFORMAT command that allows you to remove IPL text from the volume.

Note: When the IPLTXTEXTIST parameter (which was introduced by ICKDSF R17 APAR PK16403) is specified with the REFORMAT command using the IPLDD parameter, WTOR message ICK21836D is suppressed if IPL text already exists.

Reference information: For a sample IPLTEXT job, see *z/OS Program Directory*. ServerPac provides a similar job for accomplishing this task; see *ServerPac: Installing Your Order*.

Review the list of WTORs in parmlib member AUTOR00

Description: In z/OS V1R12, the DDDEF'd PARMLIB provides an AUTOR00 member. This member should be found in your parmlib concatenation during IPL and will result in auto-reply processing being activated. If the WTORs listed in AUTOR00 are automated by your existing automation product, ensure that the replies in AUTOR00 are appropriate.

Element or feature:	BCP.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.

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System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Examine the WTOR replies in the AUTOR00 parmlib member. If the replies or delay duration are not desirable, you can create a new AUTORxx parmlib member and make corresponding changes. Also compare the replies to what your automation product would reply to these WTORs. Make sure that the AUTOR00 replies are in accordance with the replies from your automation product. IBM does not recommend making updates to AUTOR00, because updates to AUTOR00 might be made by the service stream or in new z/OS releases.

Reference information: For information, see the following:

- For more information about the AUTORxx and IEASYSyy parmlib members, see *z/OS MVS Initialization and Tuning Reference*
- For planning for the contents of AUTOR00, see "Appendix B. AUTOR00 parmlib member" in *z/OS MVS Planning: Operations*.

Reassemble the stand-alone dump program

Description: The stand-alone dump program produces a dump of storage that is occupied by a system that failed or a stand-alone dump program that failed. You must reassemble the stand-alone dump program each release. Once the stand-alone dump program is properly created on a DASD residence volume, it resides in the SYS1.PAGEDUMP.Vvolser data set.

Element or feature:	BCP.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Reassemble the stand-alone dump program. If you install z/OS with a ServerPac, an installation dialog job is provided to perform this action. If you install z/OS with a CBPDO, instructions to perform this action are provided in *z/OS MVS Diagnosis: Tools and Service Aids*.

Reference information: For information, see the following:

- *ServerPac: Installing Your Order*
- *z/OS MVS Diagnosis: Tools and Service Aids*

Move from the console tracking facility to the Generic Tracker

Description: Before z/OS V2R1, the console tracking facility was used to track use of system functions; however, it had some limitations. Starting with z/OS V2R1, the console tracking facility is being replaced with a new enhanced Generic Tracker. As of z/OS V2R1, support for the console tracking facility parmlib member, CNIDTRxx, is no longer provided. The Generic Tracker accepts GTZPRMxx parmlib members, and a tool to convert CNIDTRxx to the Generic Tracker GTZPRMxx is also provided.

Element or feature:	BCP
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you have started or customized the console tracking facility.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	It is assumed that the retired console tracking facility commands are typically issued manually and for diagnostic purposes only, not in any scripts or automation tools. The callable service CNZTRKR, compiled into executable programs, continues to be supported and the internal routing of any data passed to CNZTRKR and the Generic Tracker will be transparent to the existing CNZTRKR caller.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

- Replace the use of any console tracking facility commands. Use COMMNDxx, automation scripts, or manually enter the commands on the console command line with their corresponding Generic Tracker (GTZ) counterparts. You can use the following mapping as a quick reference:
 - Instead of using COMMNDxx to start the console tracking facility, use the new system parameter GTZ (in IEASYSxx) to specify a GTZPRMxx member that specifies the SETGTZ TRACKING=ON command.
 - Instead of the DISPLAY command, consider using utility GTZPRINT or a user-written program with the service GTZQUERY to retrieve, store, and process current tracking data.
 - Instead of SETCON TRACKING={ON | OFF}, use SETGTZ TRACKING={ON | OFF}
 - Instead of SETCON TRACKING=ONWITHABEND, use SETGTZ DEBUG(ACTION=ABEND...)
 - Instead of DISPLAY OPDATA,TRACKING, use DISPLAY GTZ command, the GTZPRINT tool, or the GTZQUERY macro service.

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- Instead of SET CNIDTR=xx, use SET GTZ=xx or system parameter GTZ in IEASYSxx
- Instead of having any SETGTZ commands in COMMNDxx, consider putting them into GTZPRMxx parmlib members. You can use the SET GTZ command or the GTZ system parameter in IEASYSxx to select and execute the content of those GTZPRMxx.
- For any new applications use macro GTZTRACK instead of macro CNZTRKR. Consider converting any existing use of CNZTRKR to GTZTRACK.
- Convert existing CNIDTRxx parmlib members to GTZPRMxx. See the sample GTZCNIDJ for how the GTZCNIDT conversion tool can help you automate this conversion.

Reference information: For information, see the following:

- For details about SETGTZ, SET GTZ, DISPLAY GTZ, see *z/OS MVS System Commands* .
- For details about GTZTRACK and GTZQUERY, see *z/OS MVS Programming: Assembler Services Reference ABE-HSP*.
- For details about GTZPRMxx and IEASYSxx GTZ=, see *z/OS MVS Initialization and Tuning Reference*.

Convert your existing IBM Health Checker for z/OS set-up for automatic start-up

Description: Before z/OS V2R1, IBM Health Checker for z/OS users had to perform a set-up procedure and start IBM Health Checker for z/OS manually. As of z/OS V2R1 the system starts IBM Health Checker for z/OS automatically.

Element or feature:	BCP
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you are currently using the IBM Health Checker for z/OS and wish to continue to use it as you have customized it. This migration action is strongly recommended for those that have not used the IBM Health Checker for z/OS on each system yet.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	If you haven't started IBM Health Checker for z/OS before, you will probably see program exceptions. See the <i>IBM Health Checker for z/OS: User's Guide</i> for how to handle those exceptions.
Related IBM Health Checker for z/OS check:	None.

Steps to take: For first time users of IBM Health Checker for z/OS, follow the steps for Optimizing IBM Health Checker for z/OS in *IBM Health Checker for z/OS: User's Guide*.

For users with existing IBM Health Checker for z/OS set-ups, use the following migration actions to convert systems to the IBM Health Checker for z/OS automatic start-up:

1. Make sure the system knows the name of your hzsproc procedure if you renamed it from the default HZSPROC: The start-up procedure for IBM Health Checker for z/OS is called HZSPROC, by default. If you customized your hzsproc name, you must specify it to the system, using the new HZSPROC system parameter in IEASYSxx.
2. Remove any existing START HZSPROC invocations that start IBM Health Checker for z/OS and rely on the automatic start-up: Because IBM Health Checker for z/OS now starts automatically, you must look for instances of START HZSPROC invocations in your installation. For example, look for START HZSPROC invocations in the COMMNDxx, parmlib member.

After the system brings IBM Health Checker for z/OS up automatically, the system rejects any attempt to bring up a second instance. The system issues one of the two following warning messages:

```
HZS0101I - "...HEALTH CHECKER... IS ALREADY ACTIVE"
```

or if the automatically started IPL-time instance is still initializing:

```
HZS0116I - "...HEALTH CHECKER... START PENDING"
```

3. Change the way you specify the HZSPRMxx parmlib members you want the system to use: Before z/OS V2R1, users typically specified the HZSPRMxx parmlib members for IBM Health Checker for z/OS in the HZSPROC procedure. Now starting with z/OS V2R1, IBM recommends that you do the following to tell the system which members of HZSPRMxx to use:

- a. Specify the HZSPRMxx parmlib members for your installation in the new HZS system parameter of IEASYSxx. This provides the default for the automatic start of IBM Health Checker for z/OS at IPL-time.

- b. In your hzsproc procedure, default to or define HZSPRM='PREV':

```
//HZSPROC PROC HZSPRM='PREV'
//HZSSTEP EXEC PGM=HZSINIT,REGION=0K,TIME=NOLIMIT,
//          PARM='SET PARMLIB=&HZSPRM'
//*HZSPDATA DD DSN=SYS1.&SYSNAME..HZSPDATA,DISP=OLD
//          PEND
//          EXEC HZSPROC
```

- c. HZSPRM='PREV' specifies the following:

- For the initial automatic start, the system will use the HZSPRMxx suffixes listed in the HZS system parameter.
- For manual restarts after the initial automatic start, IBM Health Checker for z/OS initially uses the HZSPRMxx parmlib members that were in effect just before the previous Health Checker instance was stopped. This action will in particular include any parmlib members specified through a MODIFY HZSPROC,ADD,PARMLIB or MODIFY HZSPROC,REPLACE,PARMLIB command, while this first instance was running.

For example, assume HZSPRM=PREV was specified when that first instance was started and system parameter HZS was set to (00,01). Then this first instance would have initially used HZSPRM00 and HZSPRM01.

Now assume a MODIFY HZSPROC,ADD,PARMLIB=(02,03) was specified and then later this first instance is stopped. A manual restart, still with

Migration actions from z/OS V1R13: BCP

HZSPRM=PREV, will initially use HZSPRM00, HZSPMR01, HZSPRM02, and HZSPRM03, as in the previous instance before it was stopped.

If MODIFY HZSPROC,REPLACE,PARMLIB=(02,03) is used instead, the secondary instance initially only uses HZSPRM02 and HZSPRM03.

Specifying HZSPRM='PREV' makes occasional manual restarts (after applying service, for example) easy and consistent.

4. Optionally specify an HZSPDATA data set for persistent data in the HZSPRMxx parmlib member: Before z/OS V2R1, you could only specify the HZSPDATA in the HZSPROC startup procedure. Now you can define your HZSPDATA data set in either the HZSPROC startup procedure or on the HZSPDATA parameter of the HZSPRMxx parmlib member.

Reference information: For information, see the following:

- For system parameters HZS and HZSPROC, see IEASYSxx (system parameter list) in *z/OS MVS Initialization and Tuning Reference*.
- For specifying the HZSPRMxx parmlib members you want the system to use, see "Tell the system which members of HZSPRMxx you want to use" in *IBM Health Checker for z/OS: User's Guide*.
- For details on the HZSPROC procedure, see "The HZSPROC procedure" in *IBM Health Checker for z/OS: User's Guide*.
- For specifying the HZSPDATA data set for persistent data in HZSPRMxx, see "Create HZSPRMxx parmlib members" in *IBM Health Checker for z/OS: User's Guide*.

Consider the new default value for the LOADxx DYNCPADD keyword that indicates how many CPUs z/OS is prepared to dynamically add

Description: Before z/OS V2R1, through PARMLIB member LOADxx you could enable that CPUs be added to the configuration over the life of the IPL if the hardware supported such addition. The default was for all CPUs that could be configured to the LPAR, which was the minimum supported by the z/OS release (for example, 100) and the machine (for example, 80), and which could be asked for explicitly by DYNCPADD ENABLE. In z/OS V2R1, the LOADxx keyword DYNCPADD now supports a 1-4 character decimal value nnnn that indicates how many CPUs z/OS is able to dynamically add over the life of the IPL. The default has changed to 16.

Element or feature:	BCP.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if the LOADxx DYNCPADD value is omitted (defaulted) and the default number of CPUs (16) z/OS will be able to dynamically add over the life of the IPL is not sufficient. Recommended, if you specify DYNCPADD ENABLE, which provides maximum flexibility but also results in maximum storage usage and overhead.
Target system hardware requirements:	All system z hardware (z10 EC/BC and later hardware) that supports dynamic CPU addition.

Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	When specifying the maximum number of CPs that z/OS can dynamically add with LOADxx DYNCPADD <i>nnnn</i> , this LOADxx cannot be shared with pre-V2R1 systems; that is, the <i>nnnn</i> parameter of DYNCPADD is not recognized by pre-V2R1 systems.
Restrictions:	None.
System impacts:	Specifying DYNCPADD <i>nnnn</i> or taking the DYNCPADD 16 default allows z/OS to determine the number of CPUs that z/OS must be prepared to be dynamically added for the life of the IPL. Because z/OS can know the maximum CPU id that can be dynamically added for the life of the IPL at IPL, z/OS can obtain CPU array related storage based on the maximum number of CPUs that can be activated for the life of the IPL.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

1. If the default limit of 16 CPUs that can be dynamically added is not sufficient, then indicate on your LOADxx DYNCPADD the number you desire. The maximum number of CPUs that can be added over the life of the IPL will be capped by the minimum between the highest CPU id hardware and the z/OS release supports.
2. Review the changed messages associated with two digit CP IDs. Update any necessary automation or operator procedures to accommodate the two digits. Before z/OS V2R1, there was only one digit used for CP IDs. The messages that will now contain 2 byte CP ids are the following:
 - BLW007W MULTIPLE ACR ATTEMPTS BY CPU id
 - IEA020W AN FRR STACK POINTER FOR CPU xxxx IS DAMAGED, THE ERROR MASK IS abcdefghijklmnopqrst
 - IEA796E ACR HAS TAKEN CPU x [LOGICALLY] OFFLINE BECAUSE *text*
text inserts that are updated include:
 - CPU *x* CHECKSTOPPED.
 - CPU *x* REACHED ITS *vv* MACHINE-CHECK THRESHOLD.
 - CPU *x*'S TOD CLOCK COULD NOT BE SYNCHRONIZED.
 - CPU *x*'S CLOCK COULD NOT BE SYNCHRONIZED TO THE ETR
 - IEE178I AUTOMATIC RECOVERY IS IN PROGRESS. NO OPERATOR ACTION IS REQUIRED.
 - [PROCESSOR (*y*) DETECTED AN EXCESSIVE DISABLED SPIN LOOP WAITING FOR event FROM PROCESSOR (*x*)]
 - [An event OCCURRED WHEN PROCESSOR (*y*) TRIED TO SIGNAL PROCESSOR (*x*)]
 - IEE331A PROCESSOR (*y*) IS IN AN EXCESSIVE DISABLED SPIN LOOP WAITING FOR *event*. REPLY U OR SPIN TO CONTINUE SPIN, REPLY ABEND TO TERMINATE WORK ON PROCESSOR (*x*) WITH RETRY REPLY

Migration actions from z/OS V1R13: BCP

TERM TO TERMINATE WORK ON PROCESSOR (x) WITHOUT RETRY OR STOP PROCESSOR (x) AND REPLY ACR

- ISN011I CPU nnnn HAS BEEN ADDED

Reference information: For information, see the following:

- *z/OS MVS Initialization and Tuning Reference*
- The appropriate *z/OS MVS System Messages* volume for a description of the messages:
 - *z/OS MVS System Messages, Vol 3 (ASB-BPX)*
 - *z/OS MVS System Messages, Vol 6 (GOS-IEA)*
 - *z/OS MVS System Messages, Vol 7 (IEB-IEE)*

Plan for the increase of the maximum number of supported CPUs to 256

Description: In z/OS V2R1, z/OS CPU infrastructure will support up to a maximum of 256 CPUs (CPU ids 0-255). Earlier releases of z/OS support up to 100 CPUs (CPU ids 0-99). Components or products allocating storage for CPU related arrays or bitmasks might require changes to support the V2R1 CPU infrastructure.

Allocating CPU related arrays or bitmasks on a per CPU basis is done using one of the following:

- Run-time fields in the z/OS CVT (mapped by CVT) and ECVT (mapped by IHAECVT) control blocks representing the maximum CPU id a z/OS image can use for the life of the IPL. Products using run time fields will not require changes to support the V2R1 CPU infrastructure.
- Compile-time or assemble-time constants in the z/OS ECVT control block or within the product itself representing the maximum CPU id the z/OS CPU infrastructure supports. Products using compile-time or assemble-time constants will need to recompile at a minimum and may require code changes to support the V2R1 CPU infrastructure.

All products running on z/OS V2R1 must prepare to support all CPUs supported by the z/OS V2R1 CPU infrastructure (up to 256 CPUs with CPU ids 0-255). Products that support the z/OS V2R1 CPU infrastructure will be able to run on earlier z/OS releases whose CPU infrastructure supports a smaller number of CPUs.

Element or feature:	BCP
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1
Is the migration action required?	Yes, for programs using local constants or the z/OS constants for the number of CPUs the z/OS CPU infrastructure supports at the current or a specific level of z/OS
Target system hardware requirements:	None.
Target system software requirements:	z/OS V2R1.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.

System impacts:	Programs that do not support up to the maximum number of CPUs the z/OS infrastructure supports might not be able to work with all CPUs on the z/OS image. The system impacts are program dependent.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

- Scan your code for all of the constants in the ECVT control block that have a prefix of ECVT_max_* or ECVT_zOSR11_*. These fields are all related to the maximum CPU id the current or a specific z/OS release supports.
- Scan your code for compile-time or assemble-time constants in your product for constants related to the maximum CPU id that the current or a specific z/OS release supports. Also scan your product for constants related to the maximum number of CPUs the current or a specific z/OS release supports.

If you use ECVT constants with a prefix of ECVT_max_* or ECVT_zOSR11_*, the product will require the following changes:

- If the ECVT_zOSR11_highestCPUID or ECVT_max_highestCPUID constants are in use;, consider upgrading your code to use the run-time field CVTMAXMP (for allocating CPU related arrays) or ECVT_Installed_CPU_HWM (for traversing CPU related arrays).
- If ECVT compile-time or assemble-time constants with a prefix of ECVT_max_* are in use, recompile/reassemble all appropriate parts with the new z/OS V2R1 IHAECVT macro.
- If ECVT compile-time or assemble-time constants with a prefix of ECVT_zOSR11_* are in use, consider converting constants with a prefix of ECVT_zOSR11_* to the ECVT_max_* analog. Otherwise change ECVT_zOSR11_* to the new ECVT_zOSV2R1 analog.

If your code has its own local declares for compile-time or assembler-time constants, update your code to use the z/OS run-time fields or the z/OS compile-time or assemble-time constants. Do the following:

1. Allocate CPU bit masks at compile-time or assemble-time using ECVT_max_CPUMaskSizeInBits or ECVT_max_CPUMaskSizeInBytes.
2. Convert to using run-time fields like CVTMAXMP to allocate your local CPU related arrays. If using run-time fields is undesirable, allocate CPU arrays using the compile-time or assemble time constants ECVT_max_* or ECVT_zOSV2R1_* fields

Reference information: *z/OS MVS Data Areas, Vol 2.*

Plan for the new default TRACKDIRLOAD in PROGxx

Description: Before z/OS V2R1 , the system-wide tracking of directed load modules was not enabled. As of z/OS V2R1, you can control the enablement or disablement of this function in PROGxx, with the default being TRACKDIRLOAD (to enable system-wide tracking).

Element or feature:	BCP.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of V2R1.

Migration actions from z/OS V1R13: BCP

Is the migration action required?	No. If you used the old default value of NOTRACKDIRLOAD and you want to retain it, you must explicitly specify NOTRACKDIRLOAD in PROGxx.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None expected. Using TRACKDIRLOAD might cause extra but generally beneficial overall processing.
Related IBM Health Checker for z/OS check:	None.

Steps to take: If you want to use the old default value, specify NOTRACKDIRLOAD in PROGxx. As a result, you will see CSV567I TRACKDIRLOAD IS NOT IN EFFECT.

Reference information: *z/OS MVS Initialization and Tuning Reference*

Update automation that handles messages IEE302I, IEE303I, IEE1302I, IEE1303I, and IOS566I

Description: Starting in z/OS V2R1, the following messages have changed message text:

- Messages IEE302I, IEE303I, IEE1302I, and IEE1303I are changed from including ESCM in the message text to including CONFIG MANAGER in the message text.
- Message IOS566I is changed from including SYSTEM AUTOMATION in the message text to including CONFIG MANAGER in the message text.

Element or feature:	BCP.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you use automation programs or other procedures to handle messages IEE302I, IEE303I, IEE1302I, IEE1303I, and IOS566I.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Modify automated actions for IEE302I, IEE303I, IEE1302I, IEE1303I, and IOS566I so they now work with the updated message text.

Reference information: For details about messages IEE302I, IEE303I, IEE1302I, and IEE1303I, see *z/OS MVS System Messages, Vol 7 (IEB-IEE)*. For details about messages IOS566I, see *z/OS MVS System Messages, Vol 9 (IGF-IWM)*.

Plan for new entries AXRINIT and AXRRXTSS in the program properties table

Description: In z/OS V1R13 and earlier there were no entries in the program properties table for AXRINIT and AXRRXTSS to indicate that these programs needed to run privileged, so you had to manually add PPT entries for AXRINIT and AXRRXTSS into SCHEDxx parmlib members. In z/OS V2R1, these entries are now included in the IBM supplied default program properties table, and you can remove the SCHEDxx PPT specifications for AXRINIT and AXRRXTSS.

Element or feature:	BCP
When change was introduced:	z/OS V2R1
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	No, but recommended to avoid an unintended override of the IBM shipped default PPT.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Remove the PPT specifications of AXRINIT and AXRRXTSS in SCHEDxx parmlib member.

Note: The recommended action described in DOC APAR OA40519 is no longer needed in z/OS V2R1.

Reference information: *z/OS MVS Initialization and Tuning Reference*.

Plan for security changes to EXECIO restricting the REXX exec for allocating an internal reader

Description: In z/OS V1R13 and earlier for a REXX exec that was running under System REXX (TSO=YES), the exec was able to allocate an internal reader and subsequently invoke EXECIO to submit JCL. As of z/OS V2R1, this function is restricted if the security product (RACF or equivalent) indicates that the invoker does not have authority to the entity JCL.

Element or feature:	BCP
When change was introduced:	z/OS V2R1
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if the invoker of the System REXX exec wants to invoke EXECIO to submit JCL.

Migration actions from z/OS V1R13: BCP

Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Permit access to allow the System REXX exec that uses EXECIO to submit JCL for allocating an internal reader. The System REXX exec runs under the security environment as specified by the SECURITY keyword on the AXREXX invocation; the default is the invoker of the AXREXX macro. The invoker of the System REXX exec must have access to the JCL resource in the TSOAUTH resource class.

Reference information: *z/OS Security Server RACF Security Administrator's Guide.*

Accommodate increase in nucleus size

Description: With the introduction of the z/OS V1R13 RSM Enablement Offering Web deliverable, the nucleus will increase in size by approximately 380K above the 16MB line. Because of this increase, the available private storage might affect the way your applications run on your system.

Element or feature:	BCP
When change was introduced:	z/OS V1R13 RSM Enablement Offering Web deliverable.
Applies to migration from:	z/OS V1R13 without the z/OS V1R13 RSM Enablement Offering Web deliverable or from z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if the increase in nucleus size will affect the private storage available to applications on your system above the 16MB line.
Target system hardware requirements:	None. The migration action is relevant on all servers.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	Failure to have sufficient private storage available might result in errors that affect the running of your applications.
Related IBM Health Checker for z/OS check:	VSM_CSA_CHANGE. You can use this health check to identify changes in the size of CSA or private (including the extended areas) since the last IPL.

Steps to take: Review your current available private storage usage above the 16MB line using reports from RMF or an equivalent product. Ensure that an increase of 380K for the nucleus above the 16 MB line will not adversely affect your system. Adjust values accordingly.

Reference information: See “Verify that virtual storage limits are set properly” on page 25

Also see *z/OS MVS Initialization and Tuning Guide* and *z/OS MVS Initialization and Tuning Reference*.

Accommodate increase in ESQA

Description: With the introduction of the z/OS V1R13 RSM Enablement Offering Web deliverable, there is an increased allocation of 24K (6 pages) in ESQA per CPU per LPAR. This increased allocation in ESQA per CPU includes general purpose CPs, zIIPs, and zAAPs regardless of the status (online, offline, configured, stand-by, and so forth) of the hardware. Because of this increase in ESQA, if you change the ESQA size, the available private storage may affect application execution on your system.

Element or feature:	BCP
When change was introduced:	z/OS V1R13 RSM Enablement Offering Web deliverable.
Applies to migration from:	z/OS V1R13 without the z/OS V1R13 RSM Enablement Offering Web deliverable or from z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if the increase in ESQA usage might cause you to run out of ESQA storage.
Target system hardware requirements:	The migration action is relevant on all servers.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	<p>Failure to have sufficient private storage available might result in errors that affect the running of your applications. The following messages might be issued:</p> <pre>IRA103I SQA/ESQA HAS EXPANDED INTO CSA/ECSA BY xxxx PAGES</pre> <pre>IRA104I SQA/ESQA EXPANSION INTO CSA/ECSA HAS BEEN RELIEVED</pre>
Related IBM Health Checker for z/OS check:	VSM_CSA_CHANGE. You can use this health check to identify changes in the size of CSA or private (including the extended areas) since the last IPL.

Steps to take: Review your ESQA specification in IEASYSxx, to ensure that an ESQA increased allocation of 24K per CPU used on the LPAR will not adversely affect your system. If you need to increase your ESQA specification, you should

Migration actions from z/OS V1R13: BCP

also review the effects on your current available private storage usage above the 16 MB line using reports from RMF or an equivalent product. Adjust values accordingly.

Reference information: See “Verify that virtual storage limits are set properly” on page 25

Also see *z/OS MVS Initialization and Tuning Guide* and *z/OS MVS Initialization and Tuning Reference*.

BCP actions to perform after the first IPL of z/OS V2R1

This topic describes BCP migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

Accommodate the SETLOAD xx,IEASYM command to update system symbols without initiating an IPL

Description: Before z/OS V2R1, the downloadable SYMUPDTE routine and the IEASYMUP module in SYS1.SAMPLIB were provided as mechanisms to update system symbols without initiating an IPL. Starting with z/OS V2R1, the SETLOAD xx,IEASYM command is available to perform this task. In z/OS V2R1, the IEASYMUP module in SAMPLIB is updated to return with a RC=X'FFF', not having done the requested function. However, unless this IEASYMUP module is rebound, there is no way to prevent the usage of an old copy, or detect an update because of use of an old copy of the tool.

In z/OS V2R1 you should stop using the downloadable SYMUPDTE routine or the IEASYMUP module from samplib in your earlier release. Note that use of SYMUPDTE or IEASYMUP might produce incorrect results when used in conjunction with the SETLOAD xx,IEASYM command. The SYS1.LINKLIB program IEASYMU2 is instead provided via APAR OA42569 as a replacement for the function provided by IEASYMUP / SYMUPDTE on previous z/OS releases. IEASYMU2 is a supported program in z/OS, and has considerations when used with SETLOAD xx, IEASYM.

Element or feature:	BCP.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	After the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you are currently using the IEASYMUP module provided in SYS1.SAMPLIB or the SYMUPDTE routine to update system symbols.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.

Restrictions:	If you continue to use the SYMUPDTE routine or the IEASYMUP module, or if you use the IEASYMU2 program, system symbols will be updated and the system will continue to function properly until the SETLOAD xx,IEASYM command is used. Once SETLOAD xx,IEASYM has been issued, updates introduced by those other programs will be lost. You may continue to use the IEASYMU2 program again, even after a SETLOAD xx,IEASYM has been issued, but the same considerations will be in effect.
System impacts:	<p>Note:</p> <ul style="list-style-type: none"> • Updates to the system symbol table through the SETLOAD xx,IEASYM command will occur only on the system issuing the command. • When a SETLOAD command is issued and fails, messages issued by IEFPRMLB (logical parmlib service) that contain <i>jobname</i> and <i>stepname</i> will contain the master <i>jobname</i> and <i>stepname</i> of the last step that ran under master because the SETLOAD command runs under master but does not run as its own step. In this case, the error is related to the SETLOAD processing and NOT the step whose name appears in the message.
Related IBM Health Checker for z/OS check:	SUP_SYSTEM_SYMBOL_TABLE_SIZE. This code checks if the size of the static system symbol table has exceeded the threshold. This check is initially run once and is also run when the SETLOAD xx,IEASYM command is successfully processed.

Steps to take: Follow these steps:

- Rebind the IEASYMUP module from the z/OS V2R1 SAMPLIB to disable the code or simply remove it from LINKLIB or your LNKLST library.
- If you have used the downloadable SYMUPDTE routine, remove it from your LINKLIB or your LNKLST library. Begin using SETLOAD xx,IEASYM command instead of these obsolete modules. Or change your JCL to use IEASYMU2 instead of IEASYMUP (and remove any joblib/steplib specification). IEASYMU2 verifies access through the same profile of IEASYMUP.* in the FACILITY class that IEASYMUP did, so there are no security definition changes from using IEASYMUP to IEASYMU2.

Reference information: The "SETLOAD command" in *z/OS MVS Planning: Operations* and "System Symbols" in *z/OS MVS Initialization and Tuning Reference*

Use the z/OSMF Capacity Provisioning task to define z/OS MVS Capacity Provisioning policies rather than the Windows-based Capacity Provisioning Control Center (CPCC)

Description: z/OS V1R13 was the last release to provide the Windows-based Capacity Provisioning Control Center (CPCC) function for use with z/OS MVS Capacity Provisioning. As of z/OS V2R1, IBM provides the z/OSMF based

Migration actions from z/OS V1R13: BCP

Capacity Provisioning task as an alternative means to define Capacity Provisioning policies and to allow you to control your Capacity Provisioning function.

Element or feature:	BCP.
When change was introduced:	z/OS V2R1 with partial support rolled back in the z/OSMF APAR PM74519.
Applies to migration from:	z/OS V1R13 without the z/OSMF APAR PM74519 and z/OS V1R12.
Timing:	After the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you are using Capacity Provisioning.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Use the Capacity Provisioning task in z/OSMF V2R1 as the replacement for the former Capacity Provisioning Control Center. When you have set up z/OSMF, you can import your previous Domain Configurations and Capacity Provisioning Policies into the z/OSMF Capacity Provisioning task using the Import from File or Import from Domain actions.

Reference information: For more information about using the z/OSMF Capacity Provisioning task, see the following publication and the z/OSMF online help: *z/OS MVS Capacity Provisioning User's Guide*.

BookManager BUILD migration actions

This topic describes migration actions for optional feature BookManager BUILD.

BookManager BUILD actions to perform before installing z/OS V2R1

This topic describes BookManager BUILD migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

Plan for the removal of support for the optional feature BookManager BUILD

Description: z/OS V2R1 is the last release that is planned to support the optional feature BookManager BUILD of z/OS. Plan for the removal of support.

Element or feature:	BookManager BUILD
When change was introduced:	Planned for the release following z/OS V2R1, as previewed in Statement of direction: IBM z/OS IBM United States Software Announcement 212-086 April 11, 2012.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.

Migration actions from z/OS V1R13: BookManager BUILD

Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you use the optional feature BookManager BUILD.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Remove any usage of BookManager BUILD for releases of z/OS later than z/OS V2R1

Reference information: None.

BookManager BUILD actions to perform before the first IPL of z/OS V2R1

This topic describes BookManager BUILD migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

None.

BookManager BUILD actions to perform after the first IPL of z/OS V2R1

This topic describes BookManager BUILD migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

None.

CIM migration actions

This topic describes migration actions for the base element Common Information Model (CIM).

CIM actions to perform before installing z/OS V2R1

This topic describes CIM migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

None.

CIM actions to perform before the first IPL of z/OS V2R1

This topic describes CIM migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

None.

CIM actions to perform after the first IPL of z/OS V1R13

This topic describes CIM migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

Update to SBLIM CIM Client for Java Version 2

Description: z/OS V2R1 is planned to be the last release to include Version 1 of the Standards Based Linux Instrumentation for Manageability (SBLIM) CIM client for Java. Version 1 support for the SourceForge open source project was discontinued after 2010. Version 2 of the SBLIM client, which is designed to be a JSR48- compliant implementation, is included in z/OS V1R13 and planned to be included in z/OS V2R1. IBM recommends that users of SBLIM Version 1 convert to Version 2.

If you are using SBLIM Version 1, convert to Version 2 which has been included in z/OS V1R13

Element or feature:	CIM
When change was introduced:	IBM United States Software Announcement 213-013, dated February 5, 2013.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	After the first IPL of z/OS V2R1.
Is the migration action required?	No, but recommended because it is planned to be a requirement in the release after z/OS V2R1.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Identify any non-IBM application that is using the SBLIM CIM Client for Java Version1 (**sblimCIMClient.jar**) and contact the owner of the application to convert it to use SBLIM CIM Client for Java Version 2 (**sblim-cim-client2.jar**).

Reference information: For additional information about Setting up a Capacity Provisioning domain, see *z/OS MVS Capacity Provisioning User's Guide*

Communications Server migration actions

This topic describes migration actions for base element Communications Server.

Communications Server actions to perform before installing z/OS V2R1

This topic describes Communications Server migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

IP Services: Permit intranode management network application to use OSM interfaces

Description: Beginning in z/OS V2R1, access to OSM interface information by using ioctls SIOCGIFNAMEINDEX, SIOCGHOMEIF6, and SIOCGIFCON6 has been restricted to applications with READ authorization to the EZB.OSM.sysname.tcpname resource.

Element or feature:	z/OS Communications Server.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you run an application that requires OSM interface information by using the ioctls.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: An applications that uses ioctls SIOCGIFNAMEINDEX, SIOCGHOMEIF6, or SIOCGIFCONF6 to retrieve OSM interface information requires authorization to the EZB.OSM.sysname.tcpname resource.

- If your security server is RACF, issue the following commands.

```
SETROPTS CLASSACT(SERVAUTH)
SETROPTS RACLIST (SERVAUTH)
RDEFINE SERVAUTH EZB.OSM.sysname.tcprocname
PERMIT EZB.OSM.sysname.tcpname CLASS(SERVAUTH) -
ID(userid) ACCESS(READ)
SETROPTS RACLIST(SERVAUTH) REFRESH
```

- If you use a different security server, perform the equivalent steps.

Reference information: *z/OS Communications Server: IP Configuration Guide*

Configuration assistant: Migrate to the Configuration Assistant for Communications Server in the z/OS Management Facility (z/OSMF)

Description: Starting in z/OS V2R1, IBM Configuration Assistant for z/OS Communications Server is no longer offered as a stand-alone application that runs

Migration actions from z/OS V1R13: Communications Server

on the Windows operating system. IBM Configuration Assistant for z/OS Communications Server is available as a fully supported task in the z/OSMF product. Use the task available in z/OSMF.

Element or feature:	Communications Server.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if a Windows desktop version is being used.
Target system hardware requirements:	None.
Target system software requirements:	z/OSMF V2R1
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: To use the IBM Configuration Assistant for z/OS Communications Server task, you need to take the following steps:

1. Configure z/OSMF.
2. Transfer your existing backing store files into the z/OSMF environment if desired.

Reference information: For information, see the following:

- For information about configuring z/OSMF, see *IBM z/OS Management Facility Configuration Guide*.
- For information about transferring Configuration Assistant backing store files to z/OSMF, see the Updating z/OS for the Configuration Assistant plug-in section in *IBM z/OS Management Facility Configuration Guide*.

IP Services: Ensure FTP is listed in the AUTHCMD and AUTHPGM NAMES section of your IKJTSOxx member of SYS1.PARMLIB

Description: Beginning in z/OS V2R1, the z/OS FTP client supports user exits. The FTP client invokes z/OS Dynamic Exit Services (DES) to determine whether you have installed FTP client user exit EZAFCCMD or EZAFCREP. To invoke DES successfully, the program FTP must be APF authorized. Therefore, you must add FTP to the AUTHCMD and AUTHPGM NAMES section of your IKJTSOxx member of SYS1.PARMLIB. Otherwise, the following error messages EZA1555I are displayed when you start the FTP client:

- CSVDYNEX DEFINE failed for user exit EZAFCCMD, RETURN CODE x'08' REASON CODE x'00000804'
- CSVDYNEX DEFINE failed for user exit EZAFCREP, RETURN CODE x'08' REASON CODE x'00000804'

Element or feature:	Communications Server.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.

Migration actions from z/OS V1R13: Communications Server

Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you invoke the z/OS FTP client.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps: Add FTP in the AUTHCMD and AUTHPGM NAMES section of your IKJTSOxx member of SYS1.PARMLIB.

Note: In z/OS V2R1, SYS1.SAMPLIB(IKJTSO00) member contains the FTP definitions in both AUTHCMD and AUTHPGM NAMES section.

Reference information: For information, see the following:

- FTP client user exits in *z/OS Communications Server: IP Configuration Reference*.
- TSO command authorization in *z/OS Communications Server: IP Configuration Guide*
- For a complete list of all the z/OS Communications Server commands and programs that need to be added to the AUTHCMD NAMES and AUTHPGM NAMES statements in your IKJTSOxx PARMLIB member, see the *z/OS Program Directory*.

IP Services: Understand the change in the support provided by the DVIPSEC parameter on the IPSEC statement in the TCP/IP profile

Description: Before z/OS V2R1, the DVIPSEC parameter on the IPSEC statement in the TCP/IP profile enabled Sysplex-Wide Security Associations (SWSA) for IPv4 on a stack that had IPCONFIG IPSECURITY specified in the TCP/IP profile. Support for SWSA for IPv6 was not provided in these releases.

Beginning with z/OS V2R1, SWSA for IPv6 is supported. The DVIPSEC parameter on the IPSEC statement in the TCP/IP profile enables SWSA for IPv6 on a stack that has IPCONFIG6 IPSECURITY specified in the TCP/IP profile.

Element or feature:	Communications Server.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if the TCP/IP profile for your stack specifies the IPSECURITY parameter on the IPCONFIG6 statement and also specifies the DVIPSEC parameter on the IPSEC statement.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.

Migration actions from z/OS V1R13: Communications Server

Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

- If you have both of the following specified in your TCP/IP profile, be aware that SWSA for IPv6 will be enabled on your stack:
 - The IPSECURITY parameter on the IPCONFIG6 statement
 - The DVIPSEC parameter on the IPSEC statement
- If you have IPv6 TCP traffic that is protected by an IPSec Security Association (SA) with an IPv6 DVIPA endpoint, you can see the following changes:
 - When an IPv6 DVIPA is moved during a planned or unplanned DVIPA takeover, new SAs are automatically reestablished with the same security service characteristics as the SAs that existed on the host that owned the DVIPA.
 - IPv6 TCP traffic that is protected by an IPSec SA with a sysplex-distributed DVIPA endpoint can be distributed to target hosts.
- Ensure that you configure the appropriate IP security policy on the backup and target hosts.

Reference information: See "Sysplex-Wide Security Associations" in *z/OS Communications Server: IP Configuration Guide*.

IP Services: Be aware of IP Fragment attack type of the Intrusion Detection Services (IDS) enhancements to monitor both IPv4 and IPv6 traffic

Beginning in z/OS V2R1, IP Fragment attack type of the Intrusion Detection Services (IDS) is enhanced to monitor both IPv4 and IPv6 traffic for suspicious fragments. It is also enhanced further to check for overlays that change the data in the packet. Be aware that in z/OS V2R1, if you have the IP fragment IDS attack enabled, IPv6 traffic will now be monitored. In earlier releases, only IPv4 traffic was monitored.

Element or feature:	Communications Server.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you are using IDS on a stack and the IP Fragment attack type is enabled.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

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Steps to take: Follow these steps:

If you are using IDS on a stack and the IP Fragment attack type is enabled, be aware of the following information:

- Both IPv4 and IPv6 traffic are monitored for suspicious fragments.
- The IP Fragment attack type checking is enhanced to check for overlays that change the data in the packet, including changes to the length of the packet.

Reference information: For more information about IP fragments, see "Attack of IDS policy definition considerations" in *z/OS Communications Server: IP Configuration Guide*.

IP Services: Relink NMI applications using the 64-bit TMI copy buffer function (EZBTMIC4)

Description: Starting with z/OS V2R1, the interface between the 64-bit TMI copy buffer function (EZBTMIC4) and the TCP/IP stack is changed. Applications that use the real-time TCP/IP network monitoring network management interface (NMI) and statically link to this function must either relink or change to dynamic linking or loading of the function.

Element or feature:	Communications Server.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if your application statically links to the 64-bit TMI copy buffer function (EZBTMIC4). No change is required for applications that use the 32-bit TMI copy buffer function (EZBTMIC1) or that dynamically link or load EZBTMIC4.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: If your application statically links to the 64-bit TMI copy buffer function (EZBTMIC4), relink your application, or change your application to dynamically link to the 64-bit TMI copy buffer function (EZBTMIC4).

Reference information: For information, see the following: See "EZBTMIC1 or EZBTMIC4: Copy TCP/IP Management Interface Data Buffer" in *z/OS Communications Server: IP Programmer's Guide and Reference*

IP Services: Review XL C/C++ applications that use the GetProfile request of the TCP/IP callable network management interface (NMI)

Description: In z/OS V2R1, the definitions of some of the IPv6 address fields returned by the TCP/IP callable NMI GetProfile request, have changed. The

Migration actions from z/OS V1R13: Communications Server

definitions for the following fields are corrected to specify a data type of `in6_addr` instead of a character string in the XL C/C++ header file `ezbnmmph.h`.

- `NMTP_V6CFDynXcfAddr`
- `NMTP_IPA6Addr`

If you have XL C/C++ applications that reference these fields, you need to modify your application before recompiling it with the updated XL C/C++ header file.

Element or feature:	Communications Server.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you plan on recompiling your application with the updated XL C/C++ header file.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

1. Review the references to the changed fields in your application program.
2. If you have XL C/C++ applications that reference these fields, you need to modify your application before recompiling it with the updated XL C/C++ header file.

Reference information: For more information about the `GetProfile` request, see "TCP/IP callable NMI (EZBNMIFR)" in *z/OS Communications Server: IP Configuration Guide*

IP Services: Prepare for the addition of IPv6 support for policy-based routing

Description: As of z/OS V2R1 policy-based routing is enhanced to route IPv6 traffic. In earlier releases a policy-based routing rule that did not specify the source and destination IP addresses only applied to IPv4 packets. Starting in z/OS V2R1, that same policy-based routing rule applies to both IPv4 and IPv6 packets.

Element or feature:	z/OS Communications Server.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you are using policy-based routing on a stack that is being run as a dual-mode stack (IPv4 and IPv6).
Target system hardware requirements:	None.
Target system software requirements:	None.

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Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: If you have a policy-based routing rule that specifies neither source IP addresses nor destination IP addresses, the rule will apply to both IPv4 and IPv6 packets. If you want the rule to continue to apply to only IPv4 packets, modify the rule to specify either a source or destination IP address of 0.0.0.0/0.

Reference information: See the RoutingRule statement in *z/OS Communications Server: IP Configuration Reference*

IP Services: Replace any GATEWAY statements in the TCP/IP profile with equivalent BEGINROUTES statements

Description: Support for the GATEWAY statement in the TCP/IP profile will be eliminated in a future release. The BEGINROUTES/ENDROUTES statement block was introduced in z/OS V1R1 Communications Server and replaces the GATEWAY profile statement for configuration of static routes. The GATEWAY statement has been stabilized since then, and has not been updated to support enhancements such as IPv6 and replaceable static routes. Additionally, the GATEWAY syntax is error prone.

Element or feature:	Communications Server.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	No, but recommended to take advantage of the latest support offered by BEGINROUTES/ENDROUTES.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	ZOSMIGV2R1_CS_GATEWAY can help you determine if you are using any GATEWAY statements in your TCP/IP profile.

Steps to take: Replace any GATEWAY statements in your TCP/IP profile with the equivalent BEGINROUTES/ENDROUTES statement block.

In order to create BEGINROUTES statements from your existing specification, you can use IPCS. Run the TCPIPCS PROFILE report on a dump of the TCP/IP address space and static routes are presented as a BEGINROUTES/ENDROUTES

Migration actions from z/OS V1R13: Communications Server

statement block, even if you coded them by using a GATEWAY statement. However, you will have to execute the commands to know with certainty what changes to make.

Reference information: For information, see the following:

- See "Chapter 2: TCP/IP Profile and Configuration Statements" in *z/OS Communications Server: IP Configuration Reference*
- See "Chapter 6: PCS Subcommands for TCP/IP" in *z/OS Communications Server: IP Diagnosis Guide*

IP Services: Migrate from BIND 9.2.0

Description: z/OS V1R13 was the last release that supported the z/OS BIND 9.2.0 name server function. If you are using this function as a name server, you must find a replacement.

Element or feature:	Communications Server
When change was introduced:	The removal of the BIND 9.2.0 function was first announced in February 2009. z/OS V1R13 was the last release that supported the z/OS BIND 9.2.0 name server function, as stated in the z/OS V1R13 preview announcement on February 11th, 2011.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you are using the BIND 9.2.0 function as a name server.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	ZOSMIGV1R11_CS_DSNBIND9.

Steps to take: Follow these steps:

- If you are using z/OS BIND 9.2.0 as a caching-only name server, use the z/OS resolver DNS caching function to cache DNS responses.
- If you are using z/OS BIND 9.2.0 as a primary or secondary authoritative name server, investigate using BIND on Linux for System z or BIND on an IBM blade in a zBX.
- Update the NSINTERADDR statements in the resolver configuration file.
- If the z/OS BIND 9.2.0 name server is the only name server to be contacted in the NSINTERADDR list of name servers, replace the name server entry with one or more name server IP addresses.
- If more than one name server is in the NSINTERADDR list of name servers, delete the IP address of the z/OS BIND 9.2.0 name server.
- If the automated domain name registration(ADNR) application is being used, ensure the name server is configured to support ADNR. See *z/OS Communications Server: IP Configuration Guide* for configuring automated domain name registration.

Reference information: For details about the resolver, see *z/OS Communications Server: IP Configuration Guide* and *z/OS Communications Server: IP Configuration Reference*.

Communications Server actions to perform before the first IPL of z/OS V2R1

This topic describes Communications Server migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

IP Services: Allow the IKE daemon and the NSS daemon access to the CSFIQF resource of the CSFSERV class if ICSF is to be used with IP security

Description: Starting in z/OS V2R1, the IKE daemon and the NSS daemon perform additional status queries to ICSF. If ICSF is active and the CSFSERV class is active, the userids associated with IKED and NSSD must have READ access to the CSFIQF resource of the CSFSERV class. This access will allow IKED and NSSD to query ICSF.

Element or feature:	Communications Server.
When change was introduced:	z/OS V2R1
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if the IKE daemon or the NSS daemon will be started.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: If the CSFSERV class is active, give READ access to the userids associated with IKED and NSSD to the CSFIQF resource within the CSFSERV class.

Reference information: See "See "Steps for preparing to run IP security" in Appendix E in *z/OS Communications Server: IP Configuration Guide*.

IP Services: Ensure ICSF is active before starting the NSS daemon in FIPS 140 mode

Description: As of z/OS V2R1 FIPS 140 support now requires ICSF services. If the NSS daemon is configured in FIPS 140 mode, the daemon will fail to activate if ICSF is not active. Ensure ICSF is started before starting the NSS daemon if it is configured in FIPS 140 mode.

Element or feature:	Communications Server.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.

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Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if the NSS daemon is configured in FIPS 140 mode.
Target system hardware requirements:	None.
Target system software requirements:	ICSF must be active.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	The NSS daemon will fail to initialize.
Related IBM Health Checker for z/OS check:	None.

Steps to take: If the NSS daemon is configured in FIPS 140 mode, ensure ICSF is active prior to starting the NSS daemon.

Reference information: See “Steps for preparing the z/OS system for IP security” and “Steps for configuring IP security to support FIPS 140 mode” in Chapter 19 “IP Security” in *z/OS Communications Server: IP Configuration Guide* for additional information.

IP Services: Ensure ICSF is active before starting the IKE daemon in FIPS 140 mode

Description: As of z/OS V2R1 FIPS 140 support now requires ICSF services. If the NSS daemon is configured in FIPS 140 mode, the daemon will fail to activate if ICSF is not active. Ensure ICSF is started before starting the IKE daemon if it is configured in FIPS 140 mode.

Element or feature:	Communications Server.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if the IKE daemon is configured in FIPS 140 mode.
Target system hardware requirements:	None.
Target system software requirements:	ICSF must be active.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	The IKE daemon will fail to initialize.
Related IBM Health Checker for z/OS check:	None.

Steps to take: If the IKE daemon is configured in FIPS 140 mode, ensure ICSF is active prior to starting the IKE daemon.

Reference information: See “Steps for preparing the z/OS system for IP security” and “Steps for configuring IP security to support FIPS 140 mode” in Chapter 19 “IP Security” in *z/OS Communications Server: IP Configuration Guide* for additional information.

IP Services: Allow users of AT-TLS access to CSFIQA and CSFRNG resources of the CSFSERV class if ICSF will be used with AT-TLS

Description: Starting in z/OS V2R1, System SSL will attempt to use ICSF services if ICSF is active during AT-TLS group initialization. If ICSF is active and the CSFSERV class is active, the userid associated with TCP/IP stack should have READ access to the CSFIQA and CSFRNG resources of the CSFSERV class. This will allow System SSL to be aware of the hardware available with ICSF and use ICSF to generate random numbers during initialization. Application userids using AT-TLS groups should also be given READ access to the CSFRNG resource of the CSFSERV class.

Element or feature:	Communications Server
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

1. If the CSFSERV class is active, give READ access to the userid associated with the TCP/IP stack and any application userid using the TTLSGroup to the CSFRNG resource within the CSFSERV class.
2. If the CSFSERV class is active, give READ access to the userid associated with the TCP/IP stack to the CSFIQA resource within the CSFSERV class.

Reference information: See "See Chapter 3. Using Cryptographic Features with System SSL" in *z/OS Cryptographic Services System SSL Programming*.

IP Services: Ensure ICSF is active before starting the Policy Agent when AT-TLS groups are configured in FIPS 140 mode

Description: As of z/OS V2R1, FIPS140 support now requires ICSF services. Ensure ICSF is started before starting AT-TLS groups with FIPS140 support enabled. ICSF services will be used for random number generation and for Diffie Hellman support for generating key parameters, key pairs and key exchanges.

Element or feature:	Communications Server
When change was introduced:	z/OS V2R1
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if AT-TLS groups are configured in FIPS 140 mode.
Target system hardware requirements:	None.

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Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	The AT-TLS group will be installed but inactive.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

1. Ensure ICSF is active before starting AT-TLS groups configured to support FIPS140-2
2. If the CSFSERV class is defined, give READ access to the userid associated with the TCPIP stack and any application userid using the TTLSGroup to the CSFRNG resource within the RACF CSFSERV class.
3. If the CSFSERV class is defined and Diffie Hellman is being used, give READ access to the application userid to the CSF1TRC, CSF1DVK, CSF1GKP, CSF1GSK, CSF1GAV, and CSF1TRD resources within the RACF CSFSERV class.

Reference information: See "FIPS 140-2 support" in *z/OS Communications Server: IP Configuration Guide*.

IP Services: Update automation on D TCPIP,tproc,<Telnet>,CONN for the expanded EN TY column in message EZZ6064I

Description: Message EZZ6064I, which is issued in response to a D TCPIP,tproc,<Telnet>,CONN command, is expanded by two bytes to show a four byte cipher value when the connection is secured with AT-TLS. As a result of this change, the previous column header of "EN TY" has been changed to "ENCR TYPE" The cipher value can be up to four bytes in length. Cipher values less than four bytes are padded with blanks.

Element or feature:	Communications Server
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if automating on the D TCPIP,tproc,<Telnet>,CONN command message EZZ6064I.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

Migration actions from z/OS V1R13: Communications Server

- Be aware of the changes in message EZZ6064I.
- Update any automation on D TCPIP,tproc,<Telnet>,CONN message EZZ6064I.

Reference information: See an example of the updated "D TCPIP,tproc,<Telnet>,CONN output" in *z/OS Communications Server: IP System Administrator's Commands*.

IP Services: Update automation to monitor resolver address space initialization completion messages

Description: In releases before z/OS V2R1, the resolver address space initialization failed if errors were detected in the setup file. Beginning with z/OS V2R1, the resolver processes the entire resolver setup file during resolver address space initialization. When the resolver detects syntax errors or when it does not recognize the resolver setup statement, the resolver ignores the setup file statement and the resolver initialization completes successfully with warning messages. Ignoring the setup file statement might result in the resolver using default settings for some resolver setup statements if the statement was specified with errors.

If the resolver issues warning messages during address space initialization, the resolver issues message EZD2038I instead of message EZZ9293I when the initialization completes.

Element or feature:	Communications Server
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you customize the resolver and want to correct any errors that the resolver finds in the resolver setup file.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	The resolver might initialize with the incorrect configuration because of errors in the setup file, which might cause applications issuing resolver API calls to get erroneous results.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

If you customize the resolver and want to detect when the resolver ignores errors in the resolver setup file during address space initialization, do the following:

- Monitor resolver address space initialization for message EZD2038I RESOLVER INITIALIZATION COMPLETED WITH WARNINGS.
- Issue the MODIFY RESOLVER,DISPLAY command after system initialization completed to determine if the following message has been issued in the display output:
EZD2039I WARNINGS ISSUED DURING RESOLVER INITIALIZATION

Migration actions from z/OS V1R13: Communications Server

If the resolver issues the message EZD2038I or EZD2039I, take the following steps:

1. Collect the system console messages that are issued by the resolver during resolver address space initialization.
2. Contact the system programmer. The system programmer needs to use the resolver warning messages to correct the errors in the resolver setup file.
3. When the errors are corrected, the network operator needs to issue a MODIFY RESOLVER,REFRESH,SETUP=setup_file command to correct the resolver configuration.

Reference information: For more information about the resolver, see "Customizing the resolver" in *z/OS Communications Server: IP Configuration Guide*.

IP Services: Update OMPROUTE configuration procedures for OMPROUTE_OPTIONS

Description: Before z/OS V2R1, the OMPROUTE_OPTIONS environment variable was used by OMPROUTE to set various controls for OMPROUTE processing and only the hello_hi option was supported. The hello_hi option optimized the processing of OSPF Hello packets in OMPROUTE to minimize the potential adjacency failures with neighbors.

Beginning with z/OS V2R1, the OMPROUTE_OPTIONS environment variable is ignored and will not be supported in a future release. The optimization function for OSPF Hello packets is always enabled

If the environment variable, OMPROUTE_OPTIONS, is configured then the following message will be issued to the console or hardcopy log:

```
EZZ8172I jobname IGNORING ENVIRONMENT VARIABLE OMPROUTE_OPTIONS WHICH WILL BE  
RETIRED IN A FUTURE RELEASE
```

Element or feature:	Communications Server.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	No, but recommended if the environment variable OMPROUTE_OPTIONS=hello_hi is coded.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: If you want to suppress the warning message that the environment variable OMPROUTE_OPTIONS is to be retired in a future release, remove the environment variable from the OMPROUTE environment variable file.

Reference information: See "Steps for Configuring OMPROUTE" in *z/OS Communications Server: IP Configuration Guide*.

IP Services: Check the values specified for TCP related configuration statements.

Description: As of z/OS V2R1 the default values for TCPCVBUFRSIZE and TCPSENBUFFERSIZE parameters on the TCPCONFIG statement have been increased from 16K to 64K. Increasing the receive or send buffer size does not in itself allocate or consume any additional storage. The receive and send buffer sizes determine the amount of data that can be buffered by TCPIP for the application. The increase in the default values can allow more data to be buffered and consequently, more storage to be used.

The default value for the SOMAXCONN statement has increased from 10 to 1024. The SOMAXCONN value limits what a server application can specify for its listening backlog.

The amount of time a connection remains in FINWAIT2 has been changed to use the value specified on the TCPCONFIG parameter FINWAIT2. Previously, an additional seventy five seconds was added to the time specified on the FINWAIT2 parameter before the connection was dropped.

Element or feature:	z/OS Communications Server.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1..
Is the migration action required?	Yes, for one of the following conditions: <ul style="list-style-type: none"> • If the potential increase in the size of the send and receive buffers is likely to cause a storage shortage • If you used the current defaulted value of SOMAXCONN to limit applications from specifying a listening backlog larger than 10 • If you require the additional seventy-five seconds before the connection is dropped
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: If needed, do the following:

- Change the TCPCVBUFRSIZE and TCPSENBUFFERSIZE values to 16K.
- Change the SOMAXCONN value to 10.
- Increase the FINWAIT2 value by 75 seconds.

Reference information: See an example of the updated "D TCPIP,tnproc,<Telnet>,CONN output" in *z/OS Communications Server: IP Configuration Reference*.

IP Services: Make changes for Netstat enhancements

Description: The Netstat command displays the status of a local host. Each release, the Netstat reports are changed in ways that can affect automation or front-end programs.

Element or feature:	Communications Server
When change was introduced:	z/OS V2R1
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if the changed or removed settings affect either (1) automation that uses the Netstat report output or (2) front-end programs that invoke the Netstat command.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None..

Steps to take: Accommodate Netstat changes in your automation and front-end programs. You can begin planning your changes by reviewing the ways in which the displays are updated each release. For details about how each Netstat report has changed, see *z/OS Summary of Message and Interface Changes*. However, you will have to execute the commands to know with certainty what changes to make.

Reference information: For information, see the following:

- For details about using Netstat, see *z/OS Communications Server: IP System Administrator's Commands*
- For details about Netstat report changes, see *z/OS Summary of Message and Interface Changes*.

IP Services: Update /etc configuration files

Description: Some utilities provided by Communications Server require the use of certain configuration files. You are responsible for providing these files if you expect to use the utilities. IBM provides default configuration files as samples in the `/usr/lpp/tcpip/samples` directory. Before the first use of any of these utilities, you should copy these IBM-provided samples to the `/etc` directory (in most cases). You can further customize these files to include installation-dependent information. An example is setting up the `/etc/osnmpd.data` file by copying the sample file from `/usr/lpp/tcpip/samples/osnmpd.data` to `/etc/osnmpd.data` and then customizing it for the installation.

If you customized any of the configuration files that have changed, then you must incorporate the customization into the new versions of the configuration files.

Element or feature:	Communications Server.
When change was introduced:	Various releases. See Table 10 on page 137.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.

Migration actions from z/OS V1R13: Communications Server

Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you have customized a configuration file (listed in Table 10) that IBM has changed.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: If you added installation-dependent customization to any of the IBM-provided configuration files listed in Table 10, make the same changes in the new versions of the files by copying the IBM-provided samples to the files shown in the table and then customizing the files.

Table 10. Changed Communications Server configuration files

Utility	IBM-provided sample file	Target location	What changed and when
SNMP agent	/usr/lpp/tcpip/samples/osnmpd.data	/etc/osnmpd.data	Every release, the value of the sysName MIB object is updated to the current release.
File Transfer Protocol Daemon (FTPD)	SEZAINST(FTPDATA)	/etc/ftp.data	In z/OS V2R1, a new configuration statement is provided to specify that a type 119 SMF record of subtype 71 is collected for the FTP daemon configuration information when the FTP daemon starts.

Reference information: For information, see the following:

- For more details about configuration files, see *z/OS Communications Server: IP Configuration Guide*.
- For information about modifying the NFS samples, see Chapter 10 in *z/OS Communications Server: IP Configuration Reference*.

Communications Server actions to perform after the first IPL of z/OS V2R1

This topic describes Communications Server migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

None.

Cryptographic Services migration actions

This topic describes migration actions for base element Cryptographic Services. Included are the components Integrated Cryptographic Service Facility (ICSF), Open Cryptographic Services Facility (OCSF), PKI Services, and System Secure Sockets Layer (SSL).

Migration actions from z/OS V1R13: Cryptographic Services

Note: For ICSF FMID HCR77A1 Cryptographic Support for z/OS V1R13 – z/OS V2R1, this level of ICSF is not integrated in z/OS V2R1 and needs to be downloaded and installed even after ordering a z/OS V2R1 ServerPac. The Cryptographic web deliverable is available at the following web site:
https://www14.software.ibm.com/webapp/iwm/web/preLogin.do?lang=en_US&source=cbcthttp://www.ibm.com/systems/z/os/zos/downloads/

Cryptographic Services actions to perform before installing z/OS V2R1

This topic describes Cryptographic Services migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

ICSF: Detect any coprocessor that that will not become active when HCR77A1 is started.

Note: The FMID HCR77A1 ICSF level is not integrated in z/OS V2R1 and needs to be downloaded and installed even after ordering a z/OS V2R1 ServerPac. The Cryptographic web deliverable is available at the followig web site:
<http://www.ibm.com/systems/z/os/zos/downloads/>.

Description: For ICSF FMIDS HCR7780, HCR7790, and HCR77A0, the activation procedure was designed to maximize the number of active coprocessors by selecting the set of master keys that are available on the majority of coprocessors. A DES master key is no longer required in order for a coprocessor to become active. Instead, any one of four master keys – the DES master key, the AES master key, the RSA master key (which in earlier releases was called the asymmetric master key), or the ECC master key – is enough for a coprocessor to become active. However, because the goal is to select the combination of master keys that will maximize the number of active coprocessors, if a certain master key is not set on all the same coprocessors, that master key support will not be available.

Starting with FMID HCR77A1, the activation procedure now uses the master key verification patterns (MKVP) in the header record of the CKDS and PKDS to determine which coprocessors become active. If the MKVP of a master key is in the CKDS or PKDS, that master key must be loaded and the verification pattern of the current master key register must match the MKVP in the CKDS or PKDS. If all of the MKVPs in the CKDS and PKDS match the current master key registers, the coprocessor will become active. Otherwise, the status is master keys incorrect. This applies to all master keys that the coprocessor supports. When there is a MKVP in the CKDS or PKDS and the coprocessor does not support that master key, it is ignored. When a MKVP is not in the CKDS or PKDS, the master key is ignored.

If there are no MKVPs in the CKDS and PKDS, the coprocessor will be active. If the CKDS is initialized without any MKVPs, the CKDS cannot be used on a system that has cryptographic features installed.

Element or feature:	Cryptographic Services
When change was introduced:	Cryptographic Support for z/OS V1R13 - z/OS V2R1 web deliverable (FMID HCR77A1), which installs on z/OS V1R13 or z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.

Migration actions from z/OS V1R13: Cryptographic Services

Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you have installed the Cryptographic Support for z/OS V1R13 – z/OS V2R1 web deliverable (FMID HCR77A1) to accommodate the change in the way master keys are processed to determine which coprocessors become active.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	Use check ICSFMIG77A1_CCA_COPROCESSOR_ACTIVE to determine which coprocessors will not become active when Cryptographic Support for z/OS V1R13 - z/OS V2R1 Web Deliverable (FMID HCR77A1) is started. This check is delivered in APAR OA42011 available for ICSF FMIDs HCR7770, HCR7780, HCR7790 and HCR77A0.

Steps to take: Run the migration check ICSFMIG77A1_CCA_COPROCESSOR_ACTIVE to find any coprocessors that will not become active when you start HCR77A1.

Reference information: See the following information:

- See the chapter on migration in *z/OS Cryptographic Services ICSF System Programmer's Guide*
- For IBM Health Checker, see *IBM Health Checker for z/OS: User's Guide*.

ICSF: Run HCR77A1 on a supported server

Note: The FMID HCR77A1 ICSF level is not integrated in z/OS V2R1 and needs to be downloaded and installed even after ordering a z/OS V2R1 ServerPac. The Cryptographic web deliverable is available at the following web site: <http://www.ibm.com/systems/z/os/zos/downloads/>.

Description Starting with ICSF Cryptography FMID HCR77A1, only z890 or later servers are supported. Also, starting with z/OS V2R1, only z9 or later servers are supported. The migration check is available for HCR7770, HCR7780, HCR7790, and HCR77A0 through APAR OA42011.

Element or feature:	Cryptographic Services
When change was introduced:	Cryptographic Support for z/OS V1R13 – z/OS V2R1 web deliverable (FMID HCR77A1), which installs on z/OS V1R12, z/OS V1R13 or z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.

Migration actions from z/OS V1R13: Cryptographic Services

Is the migration action required?	Yes, if you have installed the Cryptographic Support for z/OS V1R13 – z/OS V2R1 web deliverable (FMID HCR77A1) to determine which servers can support HCR77A1. As of HCR77A1, only z890 or later servers are supported.
Target system hardware requirements:	z890 or later.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	If running on z/OS R13 or z/OS 2.1, and attempt to start HCR77A1 on a z800 or z900, you will receive the following message ICSFM010E ICSF TERMINATING. PROCESSOR IS UNSUPPORTED, and ICSF will not start.
Related IBM Health Checker for z/OS check:	You can use the IBM Health Checker check ICSFMIG77A1_UNSUPPORTED_HW to determine if your current server can support HCR77A1. The migration check is available for HCR7770, HCR7780, HCR7790, and HCR77A0 through APAR OA42011.

Steps to take: Ensure that if you are planning to run HCR77A1, that it will be on a supported server. Run the migration check ICSFMIG77A1_UNSUPPORTED_HW to determine if HCR77A1 can start on your current server.

Reference information: For IBM Health Checker, see *IBM Health Checker for z/OS: User's Guide*.

ICSF: Detect TKDS objects that are too large for the new record format in HCR77A1

Note: The FMID HCR77A1 ICSF level is not integrated in z/OS V2R1 and needs to be downloaded and installed even after ordering a z/OS V2R1 ServerPac. The Cryptographic web deliverable is available at the following web site:
<http://www.ibm.com/systems/z/os/zos/downloads/>.

Description: In ICSF FMID HCR77A1, ICSF is introducing a common key data set record format for CCA key tokens and PKCS #11 tokens and objects. This new record format adds new fields for key utilization and metadata. Because of the size of the new fields, some existing PKCS #11 objects in the TKDS might cause ICSF to fail. If you do not have a Token Data Set (TKDS) with PKDS #11 objects in it, there is no need to run this check.

The problem exists for TKDS object records with large objects. The User datafield in the existing record will cause the TKDS not be to loaded if the object size is greater than 32,520 bytes. The TKDSREC_LEN field in the record has the size of the object. If the User data field is not empty and the size of the object is greater than 32,520 bytes, the TKDS cannot be loaded.

Note that ICSF does not provide any interface to modify the User data field in the TKDS object record. A field can be created using IDCAMS. Check the contents of the User data field and determine if the information in the field is valuable. If you

Migration actions from z/OS V1R13: Cryptographic Services

want to preserve the data, consider how the information can be stored other than in the object record. The field can only be modified by editing the record. For information about the TKDS object record, see *z/OS Cryptographic Services ICSF System Programmer's Guide*. The new IBM Health Checker migration check, CSFMIG77A1_TKDS_OBJECT will detect any TKDS object that is too large to allow the TKDS is read into storage during ICSF initialization starting with ICSF FMID HCR77A1. This migration check is available for HCR7770, HR7780, HCR7790, and HCR77A0 through APAR OA42011

Element or feature:	Cryptographic Services
When change was introduced:	Cryptographic Support for z/OS V1R13 – z/OS V2R1 web deliverable (FMID HCR77A1), which installs on z/OS V1R12, z/OS V1R13 or z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you have installed the Cryptographic Support for z/OS V1R13 – z/OS V2R1 web deliverable (FMID HCR77A1) to handle TKDS with PKDS #11 objects for the new format in HCR77A1.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	Use the new IBM Health Checker migration check CSFMIG77A1_TKDS_OBJECT to detect any TKDS object with a value in the User data field that is too large to preserve in the User data field of the new format record. This migration check is available for HCR7770, HR7780, HCR7790, and HCR77A0 through APAR OA42011.

Steps to take: Run the migration check ICSFMIG77A1_TKDS_OBJECT to detect if TKDS objects are too large for the new record format in HCR77A1.

Note: ICSF does not provide any interface to modify the User data field in the TKDS object record. A flat file can be created using IDCAMS. Check the contents of the User data field and determine if the information in the field is valuable. If you want to preserve the data, consider how the information can be stored other than in the object record. The field can only be modified by editing the record. For information about the TKDS object record, see *z/OS Cryptographic Services ICSF System Programmer's Guide*.

Reference information: See the following information:

- For information about TKDS, see *z/OS Cryptographic Services ICSF System Programmer's Guide*.
- For IBM Health Checker, see *IBM Health Checker for z/OS: User's Guide*.

Cryptographic Services actions to perform before the first IPL of z/OS V2R1

This topic describes Cryptographic Services migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

OCSF: Migrate the directory structure

Description: If you previously configured Open Cryptographic Services Facility (OCSF), you need to verify that the OCSF directories have been migrated to the target system. When your system is up and running, customize OCSF by running the customization script and then the IVP.

Note: If you want to take advantage of the new Software Cryptographic Service Provider 2 (SWCSP2), you should bypass this migration action. When your system is up and running, install OCSF by running the install script and then the IVP.

Element or feature:	Cryptographic Services.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you currently use OCSF or if new products or functions on your new z/OS system require OCSF to be active. However, if you installed your new z/OS system with ServerPac or SystemPac, the OCSF installation script has been run and you do not have to perform this migration action for that system.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Migrate the OCSF /var directory structure to the target system. If you installed z/OS with CBPDO or by cloning an already-installed z/OS system, you can either copy the /var/ocsf directory from your old system or rerun the installation script. If you installed z/OS with ServerPac, the OCSF installation script has been run and you have no migration actions for that target system (although you still have to migrate the directory structure to any cloned systems, as already described).

If you installed z/OS V1R11 with CBPDO or by cloning an already-installed V1R11 system, you can either copy the /var/ocsf directory from your old system or rerun the installation script. If you installed z/OS V1R11 with ServerPac or SystemPac,

Migration actions from z/OS V1R13: Cryptographic Services

the OCSF installation script has been run and you have no migration actions for that target system (although you still have to migrate the directory structure to any cloned systems, as already described).

If you copy `/var/ocsf`, verify that the OCSF `/var` directory structure has been migrated to the target system as described in “Migrate `/etc` and `/var` system control files” on page 18. The OCSF registry (the `/var/ocsf` files) contains the directory path names to the code libraries. If the registry files are copied, the CSSM DLL and the add-ins must be in the same location on the target system as on the prior release. The normal locations are `/usr/lpp/ocsf/lib` for the CSSM and supporting DLLs and `/usr/lpp/ocsf/addins` for the add-in libraries.

If you copied `/var/ocsf`, do the following:

1. Verify that the following four files exist in that directory:
 - `CDSA_Registry.dir` with permissions `(-rw-r--r--)`
 - `CDSA_Registry.pag` with permissions `(-rw-r--r--)`
 - `CDSA_Sections.dir` with permissions `(-rw-r--r--)`
 - `CDSA_Sections.pag` with permissions `(-rw-r--r--)`
2. Verify that the required RACF FACILITY class profiles are defined and set up:
 - `CDS.CSSM` — authorizes the daemon to call OCSF services
 - `CDS.CSSM.CRYPTO` — authorizes the daemon to call a cryptographic service provider (CSP)
 - `CDS.CSSM.DATALIB` — authorizes the daemon to call a data storage library (DL) service provider
3. Ensure that the necessary libraries are program controlled:
 - XL C/C++ runtime libraries
 - Language Environment libraries
 - `SYS1.LINKLIB`
 - `SYS1.SIEALNKE`

If you did not copy `/var/ocsf`, rerun the installation script:

1. Set up the RACF FACILITY class profiles required by OCSF and authorize the appropriate user IDs to those profiles:
 - `CDS.CSSM` — authorizes the daemon to call OCSF services
 - `CDS.CSSM.CRYPTO` — authorizes the daemon to call a cryptographic service provider (CSP)
 - `CDS.CSSM.DATALIB` — authorizes the daemon to call a data storage library (DL) service provider
2. Ensure that the following libraries are defined as program controlled:
 - XL C/C++ runtime libraries
 - Language Environment libraries
 - `SYS1.LINKLIB`
 - `SYS1.SIEALNKE`
3. Run the `ocsf_install_crypto` script from the OMVS shell. This must be run from the target system.
 - a. Verify and update `$LIBPATH`.
 - b. Change directory to the location of the script (`/usr/lpp/ocsf/bin`).
 - c. Run the script.

Migration actions from z/OS V1R13: Cryptographic Services

Whether you reinstalled or migrated, it is strongly recommended that you rerun IVP `ocsf_baseivp` from the OMVS shell. This IVP verifies that OCSF is installed and configured correctly. To run the IVP:

1. Mount `/usr/lpp/ocsf/ivp`.
2. Read the README file and follow the instructions.
3. Run the IVP.

If you were using other IBM or non-IBM services to supplement the functions in OCSF, such as the Open Cryptographic Enhanced Plug-ins (OCEP) component of base element Integrated Security Services, or the PKI Services component of base element Cryptographic Services, you must ensure that these are migrated or reinstalled.

Reference information: *Integrated Security Services Open Cryptographic Enhanced Plug-ins Application Programming.*

System SSL: Ensure ICSF is available when running System SSL in FIPS 140-2 mode

Description: In z/OS V2R1, System SSL, when running in FIPS 140-2 mode, uses ICSF's random number generation and Diffie-Hellman support. Before running System SSL in FIPS 140-2 mode you must ensure that ICSF is running and that all user IDs that start SSL applications in FIPS 140-2 mode, invoke the `gskkyman` utility to manage FIPS 140-2 key database files, or invoke the `GSKSRVR` started task in FIPS mode have access to certain `CSFSERV` classes.

When it is running in non-FIPS mode, System SSL uses its own implementation of Diffie-Hellman and does not require ICSF. In non-FIPS 140-2 mode, however, System SSL attempts to use ICSF's random number generation as it would when running in FIPS 140-2 mode. If ICSF or the required resource is unavailable, System SSL uses its own random number generation capabilities as in earlier releases.

Element or feature:	Cryptographic Services.
When change was introduced:	V2R1
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if your installation runs System SSL in FIPS mode.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None

Steps to take: To run System SSL in FIPS 140-2 mode, you must now make sure that ICSF is running and that all user IDs that start SSL applications in FIPS 140-2 mode, invoke the `GSKSRVR` started task in FIPS 140-2 mode, or invoke the `gskkyman` utility to manage FIPS 140-2 key database files can access the necessary ICSF callable services.

Migration actions from z/OS V1R13: Cryptographic Services

1. Make sure that ICSF is running. Assuming CSF is the name of the ICSF started task, you would enter:
DISPLAY A,CSF*
To display status about all started tasks, you would enter:
DISPLAY A,ALL
In z/OS V1R12 and V1R13, System SSL is providing capability to identify System SSL applications that are running in FIPS 140-2 mode, which are started before ICSF is available. Identification of these applications is done by using the System SSL started task (GSKSRVR) and the z/OS tracking facility. This migration assistance support is delivered in APAR OA40816. See *Brief overview of APAR OA40816* for more information.
2. System SSL applications that are running in FIPS 140-2 mode, the GSKSRVR started task that is running in FIPS 140-2 mode, and the gskkyman utility (if managing FIPS 140-2 key database files) must be able to access ICSF's PKCS #11 pseudo-random function callable service for random number generation. In addition, applications and the gskkyman utility must access the following callable services to use ICSF's Diffie-Hellman capabilities:
 - PKCS #11 Token record create
 - PKCS #11 Derive key
 - PKCS #11 Generate key pair
 - PKCS #11 Generate secret key
 - PKCS #11 Get attribute value
 - PKCS #11 Token record delete

To ensure that RACF user IDs have access to the necessary services:

- a. Determine if the CSFSERV class is active. If active, this class restricts access to the ICSF programming interface. If it is not active, access to the ICSF programming interface (and the necessary callable services) is unrestricted. No configuration is necessary.

To determine which RACF classes are currently active, enter the SETROPTS command with the LIST parameter specified. SETROPTS LIST

- b. If the SETROPTS LIST command shows that the CSFSERV class is active, identify the profile or profiles that cover the following resources:
 - CSFRNG (which represents the PKCS #11 Pseudo-random function callable service)
 - CSF1TRC (which represents the PKCS #11 Token record create callable service)
 - CSF1DVK (which represents the PKCS #11 Derive key callable service)
 - CSF1GKP (which represents the PKCS #11 Generate key pair callable service)
 - CSF1GSK (which represents the PKCS #11 Generate secret key callable service)
 - CSF1GAV (which represents the PKCS #11 Get attribute value callable service)
 - CSF1TRD (which represents the PKCS #11 Token record delete callable service)

Each of these resources can be covered by a discrete profile or, if generic profile checking is activated, a generic profile. You can use the RLIST command to determine if a profile is defined to protect each resource. For example, to determine if a profile is defined to protect the CSFRNG resource, enter the following RLIST command: RLIST CSFSERV CSFRNG.

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When you enter this command, RACF lists information for the discrete profile CSFRNG. If there is no matching discrete profile, RACF lists the generic profile that most closely matches the resource name.

- c. If the RLIST command output reveals that there is a discrete or generic profile that covers the resource, examine the command output to ensure that all RACF user IDs that might start System SSL applications in FIPS 140-2 mode have at least READ access to the resource. If necessary, use the PERMIT command to give the appropriate users or groups access. For example, if a discrete profile CSFRNG exists, the following command would give the user JASMINE access:

```
PERMIT CSFRNG CLASS(CSFSERV) ID(JASMINE) ACCESS(READ)
```

If you do make changes, refresh the in-storage RACF profiles for the CSFSERV class: SETROPTS RACLIST(CSFSERV) REFRESH

Brief Overview of APAR OA40816: the following is a brief overview of the APAR:

In z/OS V1R12 and V1R13, System SSL is providing capability to identify System SSL applications that are running in FIPS 140-2 mode that have been started before ICSF was available. Identification of these applications is done by using the System SSL started task (GSKSRVR) and the z/OS tracking facility. See *z/OS MVS Planning: Operations* for more information about the z/OS tracking facility.

When the System SSL started task is enabled to write to the tracking facility, the started task will get notified of any SSL applications that are running in FIPS 140-2 mode before ICSF was available. The messages in the z/OS tracking facility can be monitored by issuing a **DISPLAY OPDATA,TRACKING** command to see which System SSL applications are running in FIPS 140-2 mode before ICSF being available. The following example shows output from the **DISPLAY OPDATA,TRACKING** command:

```
12.43.50          d o,tr
12.43.50          CNZ1001I 12.43.50 TRACKING DISPLAY 788
STATUS=ON        NUM=4    MAX=1000 MEM=n/a EXCL=0    REJECT=0
---- TRACKING INFORMATION----- -VALUE--  JOBNAME  PROGNAME+OFF-- ASID NUM
GSK01058I No ICSF for FIPS.           00 GSKSRVR  GSKSRVR  D9D6  48  1
GSK01059I SSLAPP1 no ICSF.            00 GSKSRVR  GSKSRVR  DAB0  48  5
GSK01059I SSLAPP2 no ICSF.            00 GSKSRVR  GSKSRVR  DAB0  48  2
GSK01059I SUIMGVD9 no ICSF.           00 GSKSRVR  GSKSRVR  DAB0  48  1
-----
```

From the tracking information above:

1. The GSK01058I message is the generic message that is written to the z/OS tracking facility once for the life of the System SSL started task. This message is issued the first time when either the System SSL started task or a System SSL application is running in FIPS 140-2 mode before ICSF being available.
2. The SSLAPP1 job was started or submitted 5 times
3. The SSLAPP2 job was started or submitted 2 times.
4. The SUIMGVD9 job was started or submitted just 1 time.

For more information about the support in APAR OA40816, see the documentation updates in OA40816.

Reference information: For additional information about System SSL use of ICSF callable services, see *z/OS Cryptographic Services System SSL Programming*.

Migration actions from z/OS V1R13: Cryptographic Services

For additional information on the ICSF installation options file, see *z/OS Cryptographic Services ICSF System Programmer's Guide*.

For additional information about ICSF's CSFSERV resource class and the Installation Option Display panel, see *z/OS Cryptographic Services ICSF Administrator's Guide*.

System SSL: Modify automated scripts running the gskkyman utility to interact with new menus

Description: When you run the **gskkyman** program in interactive mode, a series of menus guide you through various tasks, prompting you for each piece of information required to complete the task. In z/OS V2R1, some of the existing **gskkyman** menus have been refined to make the tasks simpler and more intuitive for the user to perform.

Although users should find the new **gskkyman** menus clearer and more straightforward, installations that have created automated scripts to interact with the **gskkyman** menus will need to modify these scripts to work with the new menus. Similarly, if you have created documentation that describes the **gskkyman** menus, the documentation will need to be updated to describe the new menus.

Element or feature:	Cryptographic Services.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if your installation has automated scripts or documentation for the gskkyman menus.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None

Steps to take: If your installation has automated scripts or documentation based on the earlier **gskkyman** menus, be aware that the certificate creation, certificate request creation, and key parameters creation menus have been altered. You will need to modify any scripts that interact with these menus. Similarly, you will need to modify any documentation that describes these menus. The following topics in *z/OS Cryptographic Services System SSL Programming* describe the tasks that have changed because of the menu restructuring. If necessary, compare these topics against the same topics in the earlier version of the documentation.

- Creating a Self-Signed Server or Client Certificate
- Creating a Certificate Request
- Creating a Signed Certificate and Key
- Creating a Signed ECC Certificate and Key
- Creating a certificate to be used with a fixed Diffie-Hellman key exchange

Migration actions from z/OS V1R13: Cryptographic Services

Reference information: For information on the `gskkyman` program and the menus provided when this program is run in interactive mode, see *z/OS Cryptographic Services System SSL Programming*.

System SSL: Ensure all RACF user IDs that start SSL applications in non-FIPS mode can access the CSFRNG resource of the CSFSERV class

Description: Before z/OS V2.1, System SSL always used its own random number generation support available in software. As of z/OS V2R1, System SSL now exploits ICSF random number generation support if ICSF is available. In order to utilize ICSF when the random number generation service is protected by a RACF resource profile (CSFRNG), the userid under which the application is executing must have at least READ access to the resource profile. If the application is not FIPS enabled the processing is able to fall back to a software implementation and allow the application to continue (as a result, you might receive RACF unauthorized messages). If the application is FIPS enabled, it will fail.

If the user ID that starts the SSL application cannot access the CSFRNG resource of the CSFSERV class, System SSL will not be able to use the PKCS #11 Pseudo-random function callable service, and the informational message ICH408I (which indicates insufficient authorization) may be issued to the console. Although System SSL processing will continue, your application will be using System SSL's random number generation and will not be exploiting the random number generation capability provided by ICSF software or the Crypto Express3 Coprocessor card or the Crypto Express4 Coprocessor card.

Element or feature:	Cryptographic Services.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if the following conditions are true: <ul style="list-style-type: none">• Your installation uses ICSF.• The CSFSERV general resource class is active.• A profile covering the CSFRNG resource of the CSFSERV class is defined and does not grant READ access to all users.
Target system hardware requirements:	ICSF might employ one of multiple techniques to derive the random content. For both FIPS certified random content and for non-FIPS certified random content, the availability of CCA and/or PKCS #11 coprocessors enables ICSF to derive the random content without imposing significant CPU overhead on the system. Either type of coprocessor can be exploited for non-FIPS certified content, but only a PKCS #11 coprocessor can be used to avoid CPU cycles for FIPS certified random content. Installations may wish to plan for CCA and/or PKCS #11 coprocessor availability to avoid potentially excessive CPU cycles being exhausted on random number content generation.
Target system software requirements:	None.

Migration actions from z/OS V1R13: Cryptographic Services

Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	The system issues informational message ICH408I that indicates insufficient authorization might be issued to the console.
Related IBM Health Checker for z/OS check:	None

Steps to take: If your installation uses ICSF, you should ensure that any RACF user ID that will start SSL applications can access the CSFRNG callable service. This includes the SSL started task (GSKSRVR), and the **gskkyman** and **gsktrace** utilities.

1. Determine if the CSFSERV class is active. If active, this class restricts access to the ICSF programming interface. If it is not active, access to the ICSF programming interface (and specifically the CSFRNG callable service) is unrestricted. No configuration is necessary.

To determine which RACF classes are currently active, enter the SETROPTS command with the LIST parameter specified:

```
SETROPTS LIST
```

2. If the SETROPTS LIST command shows that the CSFSERV class is active, identify the profile that covers the CSFRNG resource. This could be a discrete profile named CSFRNG or, if generic profile checking is activated, a generic profile.

To determine if a profile has been defined to protect the CSFRNG resource, enter the following RLIST command:

```
RLIST CSFSERV CSFRNG
```

When you enter this command, RACF lists information for the discrete resource profile CSFRNG. If there is no matching discrete profile, RACF will list the generic profile that most closely matches the resource name.

3. If the RLIST command output revealed that there is a discrete or generic profile defined that covers the CSFRNG resource, examine the command output to ensure that all RACF user IDs that may start System SSL applications have at least READ access to the CSFRNG resource. If necessary, use the PERMIT command to give the appropriate users or groups access. For example, if a discrete profile CSFRNG exists, the following command would give user BAILEY access.

```
PERMIT CSFRNG CLASS(CSFSERV) ID(BAILEY) ACCESS(READ)
```

If you do make any changes, refresh the in-storage RACF profiles for the CSFSERV class:

```
SETROPTS RACLIST(CSFSERV) REFRESH
```

Reference information: For additional information about System SSL use of ICSF callable services, see *z/OS Cryptographic Services System SSL Programming*.

For additional information on the ICSF installation options file, see *z/OS Cryptographic Services ICSF System Programmer's Guide*.

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For additional information about ICSF's CSFSERV resource class and the Installation Option Display panel, see *z/OS Cryptographic Services ICSF Administrator's Guide*.

Cryptographic Services actions to perform after the first IPL of z/OS V2R1

This topic describes Cryptographic Services migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

None.

ICSF: Accommodate the TRACEENTRY option deprecation in the installation options data set

Note: The FMID HCR77A1 ICSF level is not integrated in z/OS V2R1 and needs to be downloaded and installed even after ordering a z/OS V2R1 ServerPac. The Cryptographic web deliverable is available at the following web site: <http://www.ibm.com/systems/z/os/zos/downloads/>.

Starting with ICSF HCR77A1, option TRACEENTRY has been deprecated and ICSF CTRACE support has been enhanced to support configurable ICSF CTRACE options from PARMLIB. A default CTICSF00 PARMLIB member is installed in SYS1.PARMLIB. The CTICSF00 PARMLIB member provides default component trace values for ICSF. By default, ICSF CTRACE support will trace with the KdsIO, CardIO, and SysCall filters using a 2M buffer. Configurable options are commented out within this PARMLIB member to provide examples of how to turn them on.

Element or feature:	Cryptographic Services
When change was introduced:	Cryptographic Support for z/OS V1R13 - z/OS V2R1 web deliverable (FMID HCR77A1), which installs only on z/OS V1R13 or z/OS V2R1.
Applies to migration from:	z/OS V2R1 and z/OS V1R13 without the Cryptographic Support for z/OS V1R13 - z/OS V2R1 web deliverable (FMID HCR77A1). Note that when the Cryptographic Support for z/OS V1R13 - z/OS V2R1 Web deliverable (FMID HCR77A1) is not installed, this migration item is not applicable.
Timing:	After the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you have installed the Cryptographic Support for z/OS V1R13 - z/OS V2R1 web deliverable (FMID HCR77A1) to handle TKDS with PKDS #11 objects for the new format in HCR77A1.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.

Migration actions from z/OS V1R13: Cryptographic Services

System impacts:	If the TRACEENTRY option is specified it will be ignored and will produce message CSFO0212 at startup; processing continues.
Related IBM Health Checker for z/OS check:	None.

Steps to take You can code the new CTRACE option within a BEGIN(HCR77A1) END option pair in a options data set shared between multiple releases of ICSF.

- If you share the installation options data set between HCR77A1 and pre-HCR77A1 systems, you can continue to supply the TRACEENTRY option at the lower level systems as it is ignored, and processing will continue on the HCR77A1 systems.
- If your installation cannot tolerate the CSFO0212 message that is issued at startup, you need to use different installation option data sets. Note that new CTRACE options will be in effect:
 - Review the default CTRACE options to ensure that they are satisfactory for your system.
 - Make any necessary changes. Use the CTICSF00 PARMLIB to create customized ICSF CTRACE Configuration Data Sets in PARMLIB. You can use the new CTRACE option to specify the customized ICSF CTRACE Configuration Data Set in the ICSF Options Data Set.

For example, you can specify CTRACE(CTICSFxx), where xx is any two characters that were used when copying the default CTICSF00 parmlib member.

Component tracing is active when ICSF starts using the trace options defined in the CTICSFxx PARMLIB member, where 00 is the default. If the CTICSF00 PARMLIB member is incorrect or missing, ICSF CTRACE performs tracing using an internal default set of trace options. The operator can specify trace options individually on the TRACE CT command or specify the name of a CTICSFxx PARMLIB member containing the desired trace options. Using a PARMLIB member on the TRACE CT command can help minimize operator intervention and avoid syntax or keystroke errors

Reference information : *z/OS Cryptographic Services ICSF Administrator's Guide*

- For information about TKDS, see *z/OS Cryptographic Services ICSF System Programmer's Guide*.
- For IBM Health Checker, see *IBM Health Checker for z/OS: User's Guide*.

DFSMS migration actions

This topic describes migration actions for base element DFSMSdfp and optional features DFSMSdss, DFSMShsm, DFSMSrmm, and DFSMStvs.

DFSMS actions to perform before installing z/OS V2R1

This topic describes DFSMS migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

DFSMSdfp: Back up SMS control data sets

Description: In a multisystem Storage Management Subsystem (SMS) complex, operating systems share a common set of SMS classes, groups, ACS routines, and a

Migration actions from z/OS V1R13: DFSMS

configuration base, which make up the storage management policy for the complex. This storage management policy is maintained in a source control data set (SCDS). When this policy is activated for SMS, the bound policy is maintained in processor storage and on DASD in an active control data set (ACDS). Systems in the complex communicate SMS information through a common communications data set (COMMDS).

It is recommended that to successfully share SMS control data sets in a multisystem environment where there are mixed levels of DFSMS, you update, translate, validate, and activate SMS policies on the system with the latest level of DFSMS. When an earlier control data set is to be updated or activated, the control data set is formatted by the later-level system. The shared SMS control blocks reflect the new, rather than the previous, lengths and control information.

For fallback, IBM recommends restoring SMS control data sets from backups taken on the fallback release.

Editing a policy on an earlier system could invalidate unused control information and prevent the control data set from being accessed by a later system. A warning message is provided before a policy can be changed on an earlier system. ACS routines may need to be updated and translated so to not reference policy items not known to the earlier system.

Remember, you risk policy activation failures if SCDS changes are not validated using the latest-level system in a sysplex.

Element or feature:	DFSMSdfp.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	No, but recommended to ensure data integrity.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	Install the PTFs in "Install coexistence and fallback PTFs" on page 9 if they are not already installed.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Do the following on your pre-z/OS V2R1 systems:

1. Back up SMS control data sets according to established procedures in the event that fallback is required. The control data set format is VSAM linear.
2. Install all coexistence PTFs in "Install coexistence and fallback PTFs" on page 9.

In addition, if you modified and activated a higher-level policy on a pre-z/OS V2R1 system, do the following to ensure that the ACDS can be accessed on z/OS V2R1 and that the SMS control block reflect the new lengths and control information:

1. On the pre-z/OS V2R1 system, save the active ACDS as an SCDS with the SETSMS SAVESCDS command.
2. On z/OS V2R1, update, translate, validate, and activate the saved SMS policy.

Reference information:

- *z/OS DFSMS Implementing System-Managed Storage*
- *z/OS DFSMSdfp Storage Administration*

DFSMSdfp: Obtain descriptive text in messages for Open/Close/End of Volume ABENDs

Description: z/OS V1R13 DFSMSdfp introduces a new function that displays descriptive text for certain IECxxxx messages for OPEN, CLOSE, end-of-volume determinant ABENDs,. The descriptive text is from the message documentation manuals. You can enable this function by specifying it in the MPFLSTxx PARMLIB member: .MSGOPTION VERBOSE(x), where x is either Y or N, with N as the default. If you were using OCE_ABEND_DESCRIP in DEVSUPxx to obtain this descriptive text before OA37505 was installed, you need to convert to using MPFLSTxx after OA37505 is installed.

Note: Beginning in z/OS V2R1, or after applying the PTF for APAR OA37505 in z/OS V1R13, the VERBOSE message is displayed only in the JOBLOG.

In addition, all OPEN, CLOSE and end-of-volume ABEND messages are issued using a Message Buffer Manager service, whether or not the new VERBOSE message function is enabled. One change this introduces is that the IECxxxx portion of the message always appears as a multi-line WTO message. Automated operation services that parse these messages may be affected.

Element or feature:	DFSMSdfp
When change was introduced:	z/OS V1R13 with PTF for APAR OA37505 applied.
Applies to migration from:	z/OS V1R13 without PTF for APAR OA37505 applied, and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if any of these conditions are true: <ul style="list-style-type: none"> • You have z/OS V1R13 without APAR OA37505 installed, and are using the OCE_ABEND_DESCRIP function in DEVSUPxx for verbose messages. • If you have automation or programs that depend upon the type (single-line WTO as opposed to multi-line WTO) of the IECxxxx message for OPEN, CLOSE, end-of-Volume determinant ABENDs.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.

Migration actions from z/OS V1R13: DFSMS

System impacts:	Remove OCE_ABEND_DESCRIP from DEVSUPxx parmlib member; otherwise you receive the following informational message at IPL time: IEA253I DEVSUP OCE_ABEND_DESCRIP NO LONGER HAS AFFECT. USE MPFLSTXX MEMBER
Related IBM Health Checker for z/OS check:	None.

Steps to take: If you were using DEVSUPxx to obtain the ABEND descriptive text before OA37505 was installed, then you need to convert to using MPFLSTxx to obtain this information after OA37505 is installed. In the MPFLSTxx PARMLIB member, specify .MSGOPTION VERBOSE(Y) to enable display of the descriptive text.

Because OPEN, CLOSE and end-of-volume ABEND messages now include the IECxxxx portion of the message as a multi-line WTO message, any automated operation services that parse these messages might need to be adjusted. Examine such automated operation services and adjust them to handle the new format as needed.

Here is an example of the output message you receive after you install APAR OA37505:

```
JOB00608 00000090 IEC141I 013-18,IGG0191B,IBMUSER9,S01,SYSUT1,5901,ZR1DT1, 651
        651      00000090 SYS1.SAMPLIB(ZZZZZZZ)
```

Reference information: For details about using the VERBOSE option in MPFLSTxx, see *z/OS MVS Initialization and Tuning Reference*.

DFSMSdfp: Remove SMA fields from the SMS storage group construct IGDSGD and from ISMF panels

Description: Before z/OS V1R13, new SMS storage group constructs were created in DFSMS in support of the z/OSMF DASD Management task. Starting with z/OS V1R13 the DASD Management task has been removed from z/OSMF, and these fields (known as SMA attributes) will be removed from the storage group construct (IGDSGD). The fields have been removed from ISMF panels, Naviquest APIs, and DCOLLECT records.

Element or feature:	DFSMSdfp
When change was introduced:	z/OS V1R13 with APAR PM40869 applied. See Software Announcement 211-252 (RFA56143).
Applies to migration from:	z/OS V1R13 and z/OS V1R12, both without APAR PM40869 applied.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you parse the new attributes in DCOLLECT output or view/update them through NAVIQUEST. IBM might redefine these storage group and DCOLLECT fields in a future release.
Target system hardware requirements:	None.
Target system software requirements:	None.

Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

1. Look for the following storage group attributes (known as SMA attributes) as defined by the IGDSGD macro.
 - SGDMANTH
 - SGDMASUG
 - SGDMAMAX
 - SGDMAVSZ
 - SGDMAVTC
 - SGDMARSP
 - SGDMAVNM
2. Identify the following Navquest functions associated with the SMA attributes identified in step 1.:
 - ACBQBAJ2 – clist for Define/Alter/Display pool storage group
 - ACBQBAJG – clist for Pool Storage Group Display ACBJBAJ2 –
 - Sample JCL for Pool storage group define/alter/display
3. Use the IDCDOU mapping macro to map the following DCOLLECT fields and remove the references to those fields:
 - DSGFSMA
 - DSGMANTH
 - DSGMASUG
 - DSGMAMAX
 - DSGMAVSZ
 - DSGMAVTC
 - DSGMARSP
 - DSGMAVNM

Reference information: For information about the SMA attributes, see the following:

- *z/OS DFSMS Using the New Functions*
- *z/OS DFSMSdfp Storage Administration*
- *z/OS DFSMS Access Method Services Commands*

DFSMS actions to perform before the first IPL of z/OS V2R1

This topic describes DFSMS migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

DFSMSdfp: Update SYS1.IMAGELIB

Description: If you use page mode printers such as the IBM 3800 or the IBM 3900 running in line mode (not page mode), you must install library character sets,

Migration actions from z/OS V1R13: DFSMS

graphic character modification modules, and character arrangement tables in SYS1.IMAGELIB. This migration action does not apply if you are using IBM 3900 printers that are driven by PSF.

Element or feature:	DFSMSdfp.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you are not using your old SYS1.IMAGELIB, you are installing with ServerPac or SystemPac, and you are using line mode printers such as the 3800 or 3900.
Target system hardware requirements:	IBM 3800 or 3900 printers.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

1. Run the LCSBLD1 job from the samplib data set to create character sets, graphic character modification modules, and character arrangement tables in SYS1.IMAGELIB.
2. Copy customized or locally-written FCBs and UCS images from your old system's SYS1.IMAGELIB data set to the new system's SYS1.IMAGELIB data set.

Reference information: For information about maintaining SYS1.IMAGELIB, see *z/OS DFSMSdfp Advanced Services*.

DFSMSdfp: Accommodate changes in LISTCAT LEVEL output

Description: To be similar to ISPF, DFSMSdfp has enhanced the LISTCAT LEVEL output for the qualifier level specification as of z/OS V2R1. Prior to z/OS V2R1, the LISTCAT LEVEL command output would only include entries that had additional qualifiers after those specified. Additional qualifiers would include GDG data sets that were defined. Empty GDG base entries would not be included.

: As of z/OS V2R1 and matching ISPF, the command output provides the matches for:

- Te *specified* qualifiers, and any entries that had additional matching qualifier entries, and an alias entry of the specified value, and empty GDG base entries. (GDG data sets are included, as before.)

Element or feature:	DFSMSdfp.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.

Is the migration action required?	Yes, if you have programs that pass a parameter list of exactly three words to IEBCOPY and do not set on the high order bit in the last word.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Although LISTCAT output is not a programming interface, review if this change will affect your system. An example of the output differences is shown below: On pre-z/OS V1R13 systems:

```
LISTCAT LEVEL(A.B.C)
IDC3012I ENTRY A.B.C NOT FOUND
IDC3007I ** VSAM CATALOG RETURN-CODE IS 8
IDC1566I ** A.B.C NOT LISTED
...
IDC0001I FUNCTION COMPLETED, HIGHEST CONDITION CODE WAS 4
```

As of z/OS V2R1, the same command may produce:

```
LISTCAT LEVEL(A.B.C)
NONVSAM ----- A.B.C
          IN-CAT --- CATALOG.UCATA
...
IDC0001I FUNCTION COMPLETED, HIGHEST CONDITION CODE WAS 0
```

Notice that not only the information returned is different, but the return code and condition codes may be different as of z/OS V2R1. Take steps to convert any programs that rely upon LISTCAT output to use the Catalog Search Interface (CSI) instead. CSI is a supported general-use programming interface for the catalog, and will remove any dependency you have on future possible changes that may occur to LISTCAT output. Until such time as you can use the CSI interface, the following suggestions may be of help:

- Change invocations of LISTCAT LEVEL(A.B.C) to LISTCAT ENT(A.B.C.*) to return to the behavior prior to z/OS V2R1.
- Change invocations from PGM=IDCAMS to PGM=IDCNOGFL.

Reference information:

- For the LISTCAT command, see *z/OS DFSMS Access Method Services Commands/z/OS DFSMS Access Method Services Commands*.
- For information on the Catalog Search Interface, see *z/OS DFSMS Managing Catalogs/z/OS DFSMS Managing Catalogs*. Information APAR II14670 also provides a description of this change.
- For information on previous LISTCAT changes, see informational APAR II14250.

DFSMSdfp: Do not use IEBCOPYO

Description: In z/OS V1R13, the IEBCOPY utility was enhanced, and one of the enhancements was that the utility was no longer APF-authorized. For users who needed to fallback from the new IEBCOPY to the previous APF-authorized form,

Migration actions from z/OS V1R13: DFSMS

IEBCOPY was retained in z/OS V1R13 under the name IEBCOPYO. The IEBDSCPYP alias name for IEBCOPY was also revised to apply to IEBCOPYO for z/OS V1R13.

In z/OS V2R1, the IEBCOPYO form of the utility is eliminated and the IEBDSCPYP alias now applies to the standard non-APF-authorized form of IEBCOPY.

Element or feature:	DFSMSdfp.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you used IEBCOPYO directly or through the alias IEBDSCPYP.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take:

- Any programs or jobs that called IEBCOPYO in z/OS V1R13 must be changed to call IEBCOPY in V2R1. It is not expected that you used IEBCOPYO on z/OS V1R13, unless you had a problem with the z/OS V1R13 level of IEBCOPY and had to fall back to the z/OS V1R12 level of IEBCOPY.
- Any programs or jobs that call the IEBDSCPYP alias name in z/OS V2R1 will invoke the non-APF-authorized IEBCOPY. Make any appropriate changes if this affects your programs or jobs.

Reference information: For more information about the IEBCOPY utility, see *z/OS DFSMSdfp Utilities*.

DFSMSdfp: Examine and update program calls to IEBCOPY

Before z/OS V2R1, the IEBCOPY utility assumed that calls from programs (not from JCL) that passed three parameters, had the high order bit set on in the third word of the parameter list. Starting in z/OS V2R1, IEBCOPY requires the high order bit to be on in the third word of a parameter list; if that bit is not on, IEBCOPY causes a failure. This change can affect your programs that call IEBCOPY, requiring you to update them if needed.

Element or feature:	DFSMSdfp.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you have programs that pass a parameter list of exactly three words to IEBCOPY and do not set on the high order bit in the last word.

Migration actions from z/OS V1R13: DFSMS

Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Examine calls from programs (not from JCL) to IEBCOPY, to see whether any pass three parameters without turning on the high order bit in the last word. If you have such programs, revise them to turn on the high order bit of the last word of the parameter list. If you are using the CALL, LINK or ATTACH macro, the simplest way to do this is to add the VL parameter to CALL or VL=1 parameter to LINK or ATTACH.

Reference information: For details about program calls to IEBCOPY, see *z/OS DFSMSdfp Utilities*.

DFSMSdfp: Specify new option to suppress the message IGD17054I

Description: In z/OS V1R13, issuance of the IGD17054I message was controlled by the value specified for the SUPPRESS_DRMSGS parameter, which was new in z/OS V1R13, in the IGDSMSxx parmlib member. Beginning in z/OS V2R1, issuance of the IGD17054I message is controlled by the new SUPPRESS_SMSMSG parameter, also in the IGDSMSxx parmlib member. Issuance of all other DELETE/RENAME messages are controlled as before by the SUPPRESS_DRMSGS parameter.

Element or feature:	DFSMSdfp
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you specify the SUPPRESS_DRMSGS(YES) parameter in IGDSMSxx parmlib member to suppress the IGD17054I message and continue to suppress the message IGD17054I.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: If you specify the SUPPRESS_DRMSGS(YES) parameter in an IGDSMSxx parmlib member to suppress the IGD17054I message, you need additionally to specify the SUPPRESS_SMSMSG(YES,IGD17054I) parameter in your

Migration actions from z/OS V1R13: DFSMS

IGDSMSxx parmlib member. This enables the message suppression from consoles and all logs, including the job log and the hardcopy log. Without this action, you are unable to suppress the message IGD17054I by default regardless of what is specified for SUPPRESS_DRMSG.

Tip: If you currently suppress the message IGD17054I by coding any message processing exit routines or specifying the MPFLSTxx parmlib option in z/OS V1R12, you are now able to make use of the new parameter SUPPRESS_SMSMSG(YES,IGD17054I) alternatively.

Reference information: For more information, see *z/OS MVS Initialization and Tuning Reference*.

DFSMSdss: Build the IPLable stand-alone DFSMSdss image

Description: If you intend to use the Stand-Alone Services provided by DFSMSdss, you must use the DFSMSdss BUILDSA function to create the Stand-Alone Services IPL-capable core image. Starting with z/OS V1R12, DFSMSdss now uses BSAM instead of EXCP to read from and write to DFSMSdss dump data sets during DUMP, COPYDUMP, and RESTORE operations. To migrate to this support, you must rebuild the IPL-able core image for the Stand-Alone Services program.

If this migration action is not performed, users of the DSS standalone restore will not be able to restore backups on tape created with greater than 65520 byte blocks. Message ADRY3530I SEQUENCE ERROR ON RESTORE TAPE is issued and the operation is terminated. Backups created with 65520 byte blocks will restore as before.

Element or feature:	DFSMSdss.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you intend to use the Stand-Alone Services provided by DFSMSdss.
Target system hardware requirements:	Stand-Alone Services supports the IBM 3494 TotalStorage Enterprise Automated Tape Library, the IBM 3495 TotalStorage Enterprise Automated Tape Library, and the IBM 3590 TotalStorage Enterprise Tape Subsystem.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	Stand-Alone Services does not support the creation of the core image on an SMS-managed volume.
System impacts:	<ul style="list-style-type: none">• To ensure that Stand-Alone Services is available when you run from DASD, do not delete the SYS1.ADR.SAIPLD.Vvolser data set or move it to another volume.• If you IPL from DASD and later change the volume serial number, you must rerun the BUILDSA function to create a new core image data set with the new volume serial number in the name.

Related IBM Health Checker for z/OS check:	None.
--	-------

Steps to take: Follow these steps:

1. Prepare for Stand-Alone Services by creating a Stand-Alone Services IPLable core image with the BUILDSEA command. With the BUILDSEA command you can specify the device (card reader, tape drive, or DASD volume) from which Stand-Alone Services will be IPLed. You can also specify the operator console to be used for Stand-Alone Services.
The BUILDSEA function builds the IPLable core image under the current operating system and determines a record size based on whether the IPL is from card, tape, or DASD.
2. Use RACF or another external security system to protect the SYS1.ADR.SAIPLD.Vvolser data set and the Stand-Alone Services modules.
3. If you have not done so already, make a backup copy of your system that can be restored by this function. For information about backing up volumes, see *z/OS DFSMSdfp Storage Administration*.

Note: Message ADRY3530I SEQUENCE ERROR ON RESTORE TAPE might be issued with operation terminated if a user tries to restore a back up that was created with a block size greater than 65520 bytes, using the DSS stand-alone restore program from z/OS V1R11.

Reference information: For more information, see *z/OS DFSMSdfp Storage Administration*.

DFSMSdss: Review changes to the messages that result from a COPY or RESTORE operation with COPYVOLID

Description: With APAR OA36296 on z/OS V1R13, DFSMSdss uses the IEEVARYD service, rather than the VARY command, to vary the target volume offline during a COPY or RESTORE operation with either FULL or TRACKS and the COPYVOLID parameter, when the target volume becomes a duplicate of the source volume. As a result, the hardcopy log no longer contains:

- VARY device-number,OFFLINE DFSMSDSS INTERNAL VARY
- IEF281I device-number NOW OFFLINE.

Instead, the hardcopy log contains message IEF880I, as follows:

```
IEF880I device-number NOW OFFLINE BY ADRSBRTN
```

Programs or procedures that rely on the presence of either the VARY command or the IEF281I message in the hardcopy log or job logs should be updated.

Element or feature:	DFSMSdss
When change was introduced:	z/OS V2R1. z/OS V1R13 with APAR OA36296 applied.
Applies to migration from:	z/OS V1R13 without APAR OA36296 applied, and z/OS V1R12
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you have programs or procedures that rely on the presence of either the VARY command or the IEF281I message.
Target system hardware requirements:	None.

Migration actions from z/OS V1R13: DFSMS

Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Modify your programs or procedures to check for the following message, which in z/OS V2R1 is no longer a command response:

IEF880I device-number NOW OFFLINE BY ADRSBRTN

This message indicates that the device has been varied offline as the result of a DFSMSdss operation with the COPYVOLID parameter.

Reference information: For more information about COPY and RESTORE, see *z/OS DFSMSdftp Storage Administration*

DFSMSHsm: Update applications that depend on LIST command output

Description: The output of the LIST DUMPCLASS command now includes the value of the RECOVERRESET parameter. RECOVERRESET is a new parameter of the DEFINE DUMPCLASS command that specifies whether or not the data-set-changed indicator in the VTOC entry is reset for all data sets that are restored during full volume recover processing.

Element or feature:	DFSMSHsm
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if your application depends on the output of the LIST DUMPCLASS command.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Update applications that depend on the output of the LIST DUMPCLASS command to accommodate the new value for RECOVERRESET.

Reference information: For details about the VTOCCOPIES parameter of the DEFINE DUMPCLASS command, see *z/OS DFSMSHsm Storage Administration*

DFSMSshm: Accommodate default value change for dump VTOC copies

Description: Before z/OS V2R1, the system used a default value of 2 for the VTOCCOPIES parameter of the DFSMSshm DEFINE DUMPCLASS command. Starting with z/OS V2R1, if the VTOCCOPIES parameter is not specified, the system uses a default value of 0 when DFSMSshm dumps copy pool volumes. The default value of 2 will continue to be used when DFSMSshm dumps non-copy pool volumes. If the VTOCCOPIES parameter is never specified, the LIST DUMPCLASS output displays a VTOCCOPIES value of *** to indicate that no value is specified. VTOC copies are not needed in a FRBACKUP/FRRECOV environment.

Element or feature:	DFSMSshm
When change was introduced:	z/OS V2R1
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you want the old default value of VTOCCOPIES(2) in a FRBACKUP/FRRECOV environment.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: If you want to keep the default value of VTOCCOPIES(2) used before z/OS V2R1 in a FRBACKUP/FRRECOV environment, specify VTOCCOPIES(2) on the DEFINE DUMPCLASS command for each dump class used to dump copy pool volumes.

Reference information: For details about the VTOCCOPIES parameter of the DEFINE DUMPCLASS command, see *z/OS DFSMSshm Storage Administration*

DFSMSrmm: Check how you control your RACF tape profile processing

Description: The currently supported releases of DFSMSrmm support the TAPEAUTHDSN parameter in the DEVSUPxx (device support) parmlib member; however, this support has required enhancements in z/OS V2R1 to be properly implemented.

Before z/OS V2R1, for TAPEAUTHDSN=YES, DFSMSrmm performed tape authorization checks in the DATASET class with DSTYPE=T to indicate to RACF that the check was for data sets on tape volumes and that RACF had to perform a check for discrete profiles.

With z/OS V2R1 DFSMSrmm correctly supports option TAPEAUTHDSN according to the documentation in *z/OS MVS Initialization and Tuning Guide* and in *z/OS DFSMSrmm Implementation and Customization Guide*. If TAPEAUTHDSN=YES is set,

Migration actions from z/OS V1R13: DFSMS

DFSMSrmm now performs authorization checking without DSTYPE=T. The RACROUTE is issued in the DATASET class as if for a DASD data set.

If you want to continue using your existing data set profiles (generic or discrete), you need to change your existing TAPEAUTHDSN settings. See **Steps to take**.

Element or feature:	DFSMSrmm
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you have set up the RACF implementation.
Target system hardware requirements:	None
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Check to determine if you use the TAPEAUTHDSN=YES option in your DEVSUPxx parmlib member. If the option is specified, based on the RACF and DFSMSrmm configuration that you use with discrete data set profiles, you must prepare for a change in processing after you IPL V2R1.

If you want to continue using your existing data set profiles (generic or discrete), you need to exchange the current TAPEAUTHDSN settings:

1. Change TAPEAUTHDSN=NO to TAPEAUTHDSN=YES to now make use of generic profiles.
2. Change TAPEAUTHDSN=YES to TAPEAUTHDSN=NO to now make use of discrete profiles.

Reference information: See the following information:

- See "Enhanced security for tape data sets" in *z/OS MVS Initialization and Tuning Guide*
- See "Recommendations for using RACF tape profile processing" in *z/OS DFSMSrmm Implementation and Customization Guide*

DFSMS actions to perform after the first IPL of z/OS V2R1

This topic describes DFSMS migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

DFSMSdfp: Configure clusters and storage groups for SMS volume selection

Description: Before z/OS V2R1, when allocating or extending a multi-volume data set, SMS preferred the candidate volumes in the same storage facility image (SFI) if the storage class accessibility attribute was set to CONTINUOUS or CONTINUOUS PREFERRED. With z/OS V2R1, SMS prefers volumes that are in the same cluster. Similarly, when allocating the target data set for the data set fast

Migration actions from z/OS V1R13: DFSMS

replication function, SMS now prefers volumes that are in the same cluster as the source data set. In both cases, if it is not possible to honor the preference of volumes in the cluster, SMS reverts to preferring volumes in the same SFI. If you wish SMS to select volumes in the same cluster, you should configure your clusters accordingly.

Before z/OS V2R1, when allocating a striped data set, SMS allocated the stripes across separate logical control units (LCUs). With z/OS V2R1, SMS attempts to allocate the stripes across separate extent pools. If this is not possible, SMS continues to allocate the stripes across LCUs. If you wish SMS to separate the stripes across extent pools, you should configure your storage groups accordingly.

Element or feature:	DFSMSdfp.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	After the first IPL of z/OS V2R1.
Is the migration action required?	No, but recommended for optimum efficiency of data set fast replication and for the most uniform performance with striped data sets.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: If you wish SMS to select volumes in the same cluster, configure your clusters accordingly.

For striped data sets, if you wish SMS to separate the stripes across extent pools, configure your storage groups accordingly.

Reference information: For details about SMS volume selection and about striped data sets, see *z/OS DFSMSdfp Storage Administration*.

DFSMSdfp: Run OAM DB2 BIND jobs

Description: When migrating to any new release of z/OS, you must run OAM DB2 BIND jobs if you are using OAM for object support. The BIND jobs update DB2 with new OAM DB2 code.

Element or feature:	DFSMSdfp.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	After the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you use OAM object support.
Target system hardware requirements:	None.

Migration actions from z/OS V1R13: DFSMS

Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Run the BIND jobs appropriate to your installation:

1. Update and execute the samplib job CBRPBIND (OAM DB2 Bind Package Job).
2. Do one of the following:
 - If your installation starts OAM, uses the file system sublevel or optical or tape devices, or uses the OAM storage management component (OSMC), do the following:
 - Update and execute samplib job CBRABIND (OAM DB2 Application Plan Bind for LCS and OSR).
 - Update and execute samplib job CBRHBIND (OAM DB2 Application Plan Bind for OSMC).
 - If your installation does not start OAM, use the file system sublevel or optical or tape devices, or use OSMC, update and execute samplib job CBRIBIND (OAM DB2 Application Plan Bind for OSR only).
3. For more information, see the topic "Migrating, Installing, and Customizing OAM" in *z/OS DFSMS OAM Planning, Installation, and Storage Administration Guide for Object Support*.

Note: If you choose to edit a previous version of an OAM BIND job, you must incorporate any new changes as described in the header of each samplib OAM BIND job.

Reference information: For more information about OAM, see *z/OS DFSMS OAM Planning, Installation, and Storage Administration Guide for Object Support*.

DFSMSdss: Accommodate new default behavior for full-volume and track restore operations

Description: The data-set-changed indicator (DS1DSCHA) in the VTOC indicates whether or not the data set has changed since its last backup. Before z/OS V2R1, during a full-volume restore operation, DFSMSdss unconditionally reset (turned off) the data-set-changed indicator for each data set restored to the target volume. During a tracks restore operation, if any VTOC track was restored, DFSMSdss might reset the data-set-changed indicator for all data sets on the volume. This applies to all VSAM and non-VSAM data sets and all SMS and non-SMS data sets.

With z/OS V2R1, the default behavior for full-volume and tracks restore operations has changed. By default, DFSMSdss now resets the data-set-changed indicator only if the RESET keyword was specified on the DUMP command. Along with this change, a RESET keyword has been added to the RESTORE FULL and RESTORE TRACKS commands, which allows you to specify whether the data-set-changed indicator is to be reset. In addition, you can use the options installation exit routine, ADRUIXIT, to control the resetting of the data-set-changed indicator.

Migration actions from z/OS V1R13: DFSMS

You can use RESET on the RESTORE command for any FULL or TRACKS dump taken with V2R1, or any previous releases. RESET(YES) and RESET(NO) will work as expected. However, RESET(DUMP) will act as RESET(NO) because there is no way to determine if the RESET keyword was specified at DUMP time on a down-level dump. The new RESET(DUMP) functionality is only available in V2R1.

Note that the default behavior for DFSMSdss DUMP is unchanged when DFSMSShsm invokes DFSMSdss to perform a full volume restore. By default, DFSMSShsm will pass RESET(YES) to DFSMSdss. The other parameters might be specified through the DEFINE DUMPCLASS command.

Element or feature:	DFSMSdss.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	After the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you want DFSMSdss to unconditionally reset the data-set-changed indicator during full-volume and tracks restore operations.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	RESET(DUMP) will act as RESET(NO) because there is no way to determine if the RESET keyword has been specified at DUMP time on a down-level dump. The new RESET(DUMP) function is only available in V2R1.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: To obtain the behavior in previous releases to allow DFSMSdss to unconditionally reset the data-set-changed indicator during full-volume and tracks restore operations, use RESET(YES) with the RESTORE FULL and RESTORE TRACKS commands. The other options for the RESET keyword are:

NO DFSMSdss does not alter the DS1DSCHA values. Each DS1DSCHA represents the value the data sets had at the time the dump was taken.

DUMP

DFSMSdss resets the data-set-changed indicator (DS1DSCHA=OFF) only if the RESET keyword was specified on the DUMP command. This is the default.

You can also use the options installation exit routine ADRUIXIT or API programs to override the behavior. The ADRUFO parameter list contains these bits in the UFO8FLGS structure:

UF08RESY

Corresponds to RESET(YES)

UF08RESN

Corresponds to RESET(NO)

Migration actions from z/OS V1R13: DFSMS

UF08RES0

Corresponds to RESET(DUMP).

Note: The default behavior is unchanged when DFSMSHsm invokes DFSMSDss to perform a full volume restore. By default, DFSMSHsm will pass RESET(YES) to DFSMSDss. You can specify the other parameters through the DEFINE DUMPCLASS command.

Reference information: For details about the RESTORE command, see *z/OS DFSMSDss Storage Administration*. For details about the installation exit, see *z/OS DFSMS Installation Exits*.

DFSORT migration actions

This topic describes migration actions for optional feature DFSORT.

DFSORT actions to perform before installing z/OS V2R1

This topic describes DFSORT migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

None.

DFSORT actions to perform before the first IPL of z/OS V2R1

This topic describes DFSORT migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

Update automation for changed DFSORT messages

Description: In z/OS V2R1, the text for some DFSORT messages (ICExxxx) is changed. Text and insert fields have been added, changed, or removed in the messages listed in “Steps to take”. These changes can affect automation programs that examine the text of the messages.

Element or feature:	DFSORT.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you have automation routines that examine the message text of the messages listed in “Steps to take”.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Update your automation to handle the following DFSORT message changes:

-
- The product number has changed from "5694-A01" to "5650-ZOS", and the release level has changed from "V1R12" to "V2R1 ", in message ICE000I.
- The following new messages have been added:
 - ICE290A
 - ICE291I
- Text and insert fields have been changed in the following messages to provide new information:
 - ICE083A
 - ICE118I
 - ICE141A
 - ICE236I
 - ICE285A
 - ICE997I

Reference information: For details about the ICE messages, see *z/OS DFSORT Messages, Codes and Diagnosis Guide*.

Use TUNE=OLD option to prevent balancing resources for concurrent sort applications

Description: Beginning with z/OS V2R1, a new TUNE installation default allows you to specify whether DFSORT should allocate storage in increments with additional disk work space to minimize the risk of failure, or to allocate all storage at initialization so disk work space allocation can be reduced. The IBM-supplied default for the new TUNE installation option is TUNE=STOR which specifies allocation of available central storage as needed in increments sized to balance resource usage for concurrent sorts. If you want DFSORT to allocate available central storage using fixed sized increments, as in previous releases, you can set TUNE=OLD.

TUNE has the following values:

- STOR
- DISK
- DDYN
- OLD

Element or feature:	DFSORT.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if the default value TUNE=STOR is not acceptable.
Target system hardware requirements:	None.
Target system software requirements:	None.

Migration actions from z/OS V1R13: DFSORT

Other system (coexistence or fallback) requirements:	ICEPRMxx member(s) of PARMLIB can be shared between systems running different releases of DFSORT. Any installation options specified in the ICEPRMxx member that are only supported in the newer release of DFSORT will be ignored on the system using the earlier release of DFSORT.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

- Use ICEPRMxx members activated by a START ICEOPT started task command to set the TUNE=OLD option, as appropriate.
- Alternatively, you can set TUNE=OLD with the previous (less preferred) method of using the ICEMAC macro and usermods.

Reference information: See the following information:

- For details about the TUNE installation option, see *z/OS DFSORT Installation and Customization*.

Use EXPOLD=MAX and EXPRES=0 to prevent changed defaults

Description: Beginning with z/OS V2R1, IBM-supplied defaults have been changed to EXPOLD=50% (from EXPOLD=MAX) and to EXPRES=10% (from EXPRES=0). If you want DFSORT to use the old defaults, as in previous releases, you can set EXPOLD=MAX and EXPRES=0.

Element or feature:	DFSORT.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if the new defaults are not acceptable.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

- Use ICEPRMxx members activated by a START ICEOPT started task command to set the EXPOLD=MAX or EXPRES=0 options, as appropriate.
- Alternatively, you can set EXPOLD=MAX or EXPRES=0 with the previous (less preferred) method of using the ICEMAC macro and usermods.

Reference information: See the following information:

- For details about the EXPOLD and EXPRES installation options, see *z/OS DFSORT Installation and Customization*.

DFSORT actions to perform after the first IPL of z/OS V2R1

This topic describes DFSORT migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

None.

Distributed File Service migration actions

This topic describes migration actions for base element Distributed File Service.

Distributed File Service actions to perform before installing z/OS V2R1

This topic describes Distributed File Service migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

Determine whether to accept the new default values for certain zFS IOEFSPRM variables in the zFS IOEFSPRM configuration file

Description: Before z/OS V2R1, certain default values were used for the IOEFSPRM files or IOEPRMxx parmlib member variables `meta_cache_size`, `metaback_cache_size`, `user_cache_size`, or `convert_auditfid`. Starting in z/OS V2R1, new default values are created for them.

In z/OS V2R1, the zFS IOEFSPRM configuration file variable `convert_auditfid` default value was changed to ON so that all files and directories in zFS file systems can be uniquely identified in SMF audit records. The zFS IOEFSPRM configuration file variable `user_cache_size` default value will be changed to a value that is calculated based on the amount of real storage in the system. The zFS IOEFSPRM configuration file variables `meta_cache_size` and `metaback_cache_size` default values will be changed when both values are not specified to also be calculated based on the amount of real storage in the system. These are so that a system that has the capacity for more storage use and has sufficient space in the ZFS address space can have better performing caches.

Element or feature:	z/OS Distributed File Service
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you do not want the new default values to take effect or if you want to change existing values to the new default values.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.

Migration actions from z/OS V1R13: Distributed File Service

System impacts:	If enough real storage exists, zFS can use more storage by default than it would have used in prior releases.
Related IBM Health Checker for z/OS check:	Use check ZOSMIGV2R1_ZFS_VERITY_CACHESIZE introduced in APAR OA42672. This check determines if you are using the default meta_cache_size, metaback_cache_size and user_cache_size and further indicates whether the new defaults would affect you. See <i>IBM Health Checker for z/OS: User's Guide</i> .

Steps to take: Follow these steps:

- Look for these:
 - IOEFSPRM files or IOEPRMxx parmlib members that do not specify both meta_cache_size and metaback_cache_size options.
 - IOEFSPRM files or IOEPRMxx parmlib members that do not specify the user_cache_size option.
 - IOEFSPRM files or IOEPRMxx parmlib members that do not specify convert_auditfid settings.
 - Programs that use **zfsadm format** commands where unique auditfids are not desired.
 - JCL that contains calls to **ioeagfmt** that create aggregates for which unique auditfids are not desired.
 - Programs that use zFS format API where unique auditfids are not desired.
- Take these actions:
 - For meta_cache_size, metaback_cache_size, or user_cache_size, if the old default values are desired, specify these values in your IOEFSPRM files or IOEPRMxx parmlib members.
 - For auditfid, if you want the previous defaults, specify -nonewauditfid on calls to **ioeagfmt** or **zfsadm format** and convert_auditfid=0FF in your IOEFSPRM files or IOEPRMxx parmlib members.

Reference information: None.

Remove usage of zFS clone function

Description: z/OS V1R13 was the last release that zFS supported the cloning file systems function. The zFS clone functions included the **zfsadm clone** and **zfsadm clonesys** commands. Also removed was the ability to mount any zFS file system aggregates that contain a cloned (.bak) file system.

Element or feature:	z/OS Distributed File Service
When change was introduced:	z/OS V1R13 was the last release for the function. The function has been removed in z/OS V2R1. (See IBM United States Software Announcemen 211-007t , dated February 15, 2011.)
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2 R1.
Is the migration action required?	Yes, if you are using or have used the zFS clone function.

Migration actions from z/OS V1R13: Distributed File Service

Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	If any system earlier than z/OS V2R1 mounts a zFS aggregate that contains a .bak (clone) file system in a shared file system environment, any catch-up mounts on a V2R1 system fail and z/OS UNIX function ships from the V2R1 system to the z/OS UNIX owning system.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Determine whether you have any .bak file systems. You can do this by issuing a command like the following:

```
zfsadm lsfs | grep .bak
```

You might see results as in this example:

```
PLEX.JMS.AGG1.bak (Not Mounted) 458 K alloc 458 K quota On-line  
PLEX.JMS.AGG2.bak (Not Mounted) 26 K alloc 26 K quota On-line
```

This example shows that there are two zFS aggregates that contain a .bak file system – PLEX.JMS.AGG1 and PLEX.JMS.AGG2. In this case, unmount the .bak file systems (if they are mounted) and delete each .bak file system from the aggregate with a command similar to the following example:

```
zfsadm delete PLEX.JMS.AGG1.bak
```

(Note that the file system name is case-sensitive.) If the delete fails because the file system was not found, it probably means that the zFS aggregate is not attached. Attach it, delete the .bak file, and detach the aggregate.

You should delete all .bak file systems before you bring zFS into the shared file system environment or before you IPL the V2R1 system. Minimally, you must ensure that no zFS aggregates that contain .bak file systems are mounted.

Reference information: For more information, see *z/OS Distributed File Service zFS Administration*.

zFS: Copy data from zFS multi-file system aggregates to zFS compatibility mode aggregates

Description: z/OS V1R13 was the last release of zFS support for multi-file system aggregates. If you have data stored in zFS multi-file system aggregates, you should copy the data from the zFS multi-file system aggregates into zFS compatibility mode aggregates.

As of z/OS V2R1, only zFS compatibility mode aggregates are supported, only zFS compatibility mode aggregates will be supported.

Element or feature:	z/OS Distributed File Service
When change was introduced:	z/OS V1R13 was the last release for the function. The function has been removed in z/OS V2R1.

Migration actions from z/OS V1R13: Distributed File Service

Applies to migration from:	z/OS V1R13 and V1R12.
Timing:	Before installing V2R1.
Is the migration action required?	Yes, if you have any multi-file system aggregates.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	Use check ZOSMIGV1R11_ZFS_RM_MULTIFS or check ZOSMIGREC_ZFS_RM_MULTIFS to help determine if any multi-file system aggregates are attached on your system.

Steps to take: Use one of the following methods to determine if you are using zFS multi-file system aggregates:

- Use the IBM Health Checker for z/OS check referenced in **Related IBM Health Checker for z/OS check**.
- Scan your zFS IOEFSPRM configuration options file for define_aggr statements.
- Scan your /etc/rc file for any **zfsadm attach** commands.
- Issue the **zfsadm aggrinfo** command to determine if an aggregate is a multi-file system aggregate; in the command response, COMP indicates compatibility mode and MULT indicates multi-file system.

If you are using zFS multi-file system aggregates, copy the data from each of those file systems into its own zFS compatibility mode aggregate.

Reference information: See the following information:

- For more information about zFS commands and administration tasks, see *z/OS Distributed File Service zFS Administration*.
- For more information about IBM health checks, refer to *IBM Health Checker for z/OS: User's Guide*.

Distributed File Service actions to perform before the first IPL of z/OS V2R1

This topic describes Distributed File Service migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

z/FS: Ensure that the zFS kernel is active when using the batch utility ioagfmt

Description: Before z/OS V2R1, the batch utility **ioagfmt** did not require that the zFS kernel be active. Starting in V2R1, **ioagfmt** requires that the zFS kernel be active.

Element or feature:	z/OS Distributed File Services.
When change was introduced:	z/OS V2R1.

Migration actions from z/OS V1R13: Distributed File Service

Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you did not run ioeagfmt after the kernel was initialized. However, it would be unusual not to have zFS active when running ioeagfmt .
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Look for JCL or vendor applications that might be creating or submitting JCL that contain **ioeagfmt** calls that are run when the zFS kernel is not active. Run them when the zFS kernel is active. If you are formatting file systems to be used by another system, you should be setting the **-version** parameter on **ioeagfmt** because the local zFS kernel would not have the information for a remote zFS system. You can also use the IOEFSUTL program to format aggregates. IOEFSUTL does not require the zFS kernel to be active to format a file system if you specify the **-version** parameter. But it will require the zFS kernel to be active if the **-version** parameter is left out.

Reference information: *z/OS Distributed File Service zFS Administration*

Distributed File Service actions to perform after the first IPL of z/OS V2R1

This topic describes Distributed File Service migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

None

HCD migration actions

This topic describes migration actions for the base element Hardware Configuration Definition (HCD).

HCD actions to perform before installing z/OS V2R1

This topic describes HCD migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

Migrate security definitions for HCM users

Description: With z/OS V2R1 Hardware Configuration Definition (HCD) uses the application ID CBDSERVE to verify any user that logs on to the HCD agent, that is, any user that uses Hardware Configuration Manager (HCM) to perform hardware configuration definitions. If you have the APPL class active in your

Migration actions from z/OS V1R13: HCD

external security manager, for example in RACF, and you have a generic profile in that class that covers the new HCD application ID CBDSERVE, you need to permit all HCM users READ access to that profile. Otherwise, the users of HCM are no longer able to log on to HCD.

Element or feature:	HCD
When change was introduced:	z/OS V2R1
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you use HCM to perform hardware configuration definitions, have the APPL security class active in your security product, and have a APPL profile that covers the application ID CBDSERVE.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: You can either give all HCM users READ access to your existing APPL profile that covers the HCD application ID CBDSERVE, or you can define a specific profile for the new HCD application ID and permit all HCM users to that profile. Sample definitions for a new profile and a user HCDUSER for RACF are similar to the following:

```
RDEFINE APPL CBDSERVE UACC(NONE)
PERMIT CBDSERVE CLASS(APPL) ID(HCDUSER) ACCESS(READ)
```

Reference information: See the following information:

- For information about protecting applications and the security definitions in RACF, see *z/OS Security Server RACF Security Administrator's Guide*.
- For information about setting up the HCD agent for use by HCD and HCM users, see *z/OS HCD User's Guide*

HCD actions to perform before the first IPL of z/OS V2R1

This topic describes HCD migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

None.

HCD actions to perform after the first IPL of z/OS V2R1

This topic describes HCD migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

None.

HLASM migration actions

This topic describes migration actions for the base element High Level Assembler (HLASM).

HLASM actions to perform before installing z/OS V2R1

This topic describes HLASM migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

Accommodate new assembler mnemonics for new machine instructions

Description: System z introduces new instructions having mnemonics that might collide with existing macro instruction names. Collisions can be managed by using a different OPTABLE option (described in *HLASM 1.6 Programmer's Guide* or mnemonic tags (described in the *HLASM 1.6 Language Reference*).

Element or feature:	HLASM
When change was introduced:	z/OS V2R1, z/OS V1R13, and z/OS V1R12, all with hardware support HLASM APARs, the latest of which are APARs PM49761 and PM86821.
Applies to migration from:	z/OS V2R1, z/OS V1R13, and z/OS V1R12, all without hardware support HLASM APARs installed. The latest of which are APARs PM49761 and PM86821.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you have a collision with a new instruction mnemonic.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Look for possible conflicts between new mnemonics and existing macro instructions with the same name:

1. Assemble an END statement with the OPTABLE(UNI,LIST) option to cause HLASM to display all mnemonics in the UNI opcode table.
2. If a conflicting name appears, do one of the following:
 - Use either a different OPTABLE option to avoid the new mnemonics or mnemonic tags to distinguish machine instruction use from macro instruction use.
 - Change the macro names.

Reference information: For the OPTABLE option, see *HLASM Programmer's Guide*. For mnemonic tags, see *HLASM Language Reference*.

HLASM actions to perform before the first IPL of z/OS V2R1

This topic describes HLASM migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

None.

HLASM actions to perform after the first IPL of z/OS V2R1

This topic describes HLASM migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

None.

IBM HTTP Server migration actions

This topic describes migration actions for base element IBM HTTP Server.

IBM HTTP Server actions to perform before installing z/OS V2R1

This topic describes IBM HTTP Server migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

Plan for the removal of support for IBM HTTP Server

Description: z/OS V2R1 is planned to be the last release to include the IBM HTTP Server Powered by Domino (IHS powered by Domino).

Element or feature:	IBM HTTP Server
When change was introduced:	Announced April 2013 for z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	No, but is planned to be a requirement in the release after z/OS V2R1.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: IBM recommends that you use the IBM HTTP Server Powered by Apache (IHS powered by Apache), which is available in z/OS Ported Tools as a replacement. IHS powered by Apache supports IPv6, 64-bit execution, and includes

security authentication and authorization capabilities similar to those provided in IHS powered by Domino . Also, a refresh of IBM HTTP Server powered by Apache is planned later in 2013.

Reference information: IBM plans to provide documentation help with customer migration to IBM HTTP Server Powered by Apache.

IBM HTTP Server actions to perform before the first IPL of z/OS V2R1

This topic describes IBM HTTP Server migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

None.

IBM HTTP Server actions to perform after the first IPL of z/OS V1R13

This topic describes IBM HTTP Server migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

None.

Infoprint Server migration actions

This topic describes migration actions for optional feature Infoprint Server.

Infoprint Server actions to perform before installing z/OS V2R1

This topic describes Infoprint Server migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

Discontinue use of the Infoprint Server SNMP subagent

Description: In a z/OS release after V2R1, the Simple Network Management Protocol (SNMP) subagent will no longer be provided with Infoprint Server. Therefore, you should take steps to stop using it now. The SNMP subagent lets network management systems (such as, Ricoh Network Printer Manager for the web) communicate with PSF-controlled printers that do not have internal SNMP agents. However, most newer printers contain internal SNMP agents, so network management systems can communicate directly with these printers.

As an alternative to using a network management system to monitor PSF-controlled printers, you can use Infoprint Central, a web-based print management system. Infoprint Central can display the status of all your PSF-controlled printers. In addition, Infoprint Central lets you stop and start the printers, change printer work-selection criteria, turn TCP/IP-connected printers online and offline, and so on, so network management systems can communicate directly with these printers.

Element or feature:	z/OS Infoprint Server.
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Migration actions from z/OS V1R13: Infoprint Server

When change was introduced:	Planned removal was announced on 23 July 2013.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	No, but is planned to be a requirement in the release after z/OS V2R1 if you use the SNMP subagent. You are using the SNMP subagent if the start-daemons={snmpd} attribute is specified in the Infoprint Server configuration file. The configuration file's default location is /etc/Printsrv/aopd.conf . However, you might have specified a different location in environment variable AOPCONF in the aopstart EXEC.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

1. If you use a network management system to monitor PSF-controlled printers, do one of these:
 - Configure the network management system to communicate with the printers directly.
 - Use Infoprint Central to manage the printers. To use Infoprint Central, you must customize PSF to use the Infoprint Server Printer Inventory.
2. Stop the SNMP subagent daemon:
 - a. Edit the Infoprint Server configuration file (aopd.conf) to remove value **snmp** from the **start-daemons** attribute. The next time you start Infoprint Server, the SNMP subagent daemon will not start. (In the future z/OS release, value **snmp** will be ignored.)
 - b. If Infoprint Server is running, stop the SNMP subagent daemon (**aopsnmpd**). For example, enter this MVS START command to run the AOPSTOP procedure to stop daemon **aopsnmpd**:

```
START AOPSTOP,OPTIONS='-d snmpd'
```

Reference information: For information about:

- How to edit the Infoprint Server configuration file (aopd.conf) and how to customize Infoprint Central, see *z/OS Infoprint Server Customization*.
- How to use Infoprint Central and how to stop Infoprint Server daemons, see *z/OS Infoprint Server Operation and Administration*.
- How to customize PSF to use the Printer Inventory, see *PSF for z/OS: Customization*.

Migrate from IP PrintWay basic mode to extended mode

Description: Since z/OS V1R5, the IP PrintWay™ component of Infoprint Server can operate in a mode called *IP PrintWay extended mode*. IP PrintWay extended mode uses the SYSOUT Application Programming Interface (SAPI) to obtain output data sets from the JES spool. IP PrintWay extended mode provides better performance, improved usability, and additional functions. For information about the enhancements and limitations in extended mode, see *z/OS Infoprint Server Customization*

IP PrintWay basic mode is the name used for the original IP PrintWay mode of operation. You can continue to run IP PrintWay basic mode in z/OS V2R1. In future releases, IBM will make enhancements only to IP PrintWay.

You can run IP PrintWay basic mode and IP PrintWay extended mode at the same time only if you make sure that IP PrintWay basic mode and IP PrintWay extended mode select different print jobs from the JES spool to print. Otherwise, unpredictable results can occur.

Element or feature:	Infoprint Server.
When change was introduced:	Basic mode was stabilized in z/OS V1R5. Extended mode was introduced in z/OS V1R5.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	No, but recommended because it will become a requirement in a future release.
Target system hardware requirements:	None.

Migration actions from z/OS V1R13: Infoprint Server

Target system software requirements:	<ul style="list-style-type: none"> • If you use Infoprint Central to work with IP PrintWay extended mode print jobs and printers, you need: <ul style="list-style-type: none"> – An operating IBM HTTP Server base element of z/OS – The XML Toolkit for z/OS V1.10 (5655-J51) – One of these Java products: <ul style="list-style-type: none"> - IBM 31-bit SDK for z/OS, Java Technology Edition, V7 (5655-W43) – - IBM 64-bit SDK for z/OS, Java Technology Edition, V7 (5655-W44) – - IBM 31-bit SDK for z/OS, Java Technology Edition, V6.0.1 (5655-R31) – - IBM 64-bit SDK for z/OS, Java Technology Edition, V6.0.1 (5655-R32) – - IBM 31-bit SDK for z/OS, Java Technology Edition, V6 (5655-R31) – - IBM 64-bit SDK for z/OS, Java Technology Edition, V6 (5655-R32) – Microsoft Internet Explorer 6.0 or later • In addition to IBM 31-bit SDK for z/OS, Java Technology Edition, V6 (5655-R31), one of the following will also work: <ul style="list-style-type: none"> – IBM 64-bit SDK for z/OS, Java Technology Edition, V6 (5655-R32) – IBM 31-bit SDK for z/OS, Java 2 Technology Edition, V5 (5655-N98) – IBM 64-bit SDK for z/OS, Java 2 Technology Edition, V5 (5655-N99) • To use IP PrintWay extended mode to print to VTAM-controlled printers, Infoprint Coaxial Printer Support for z/OS (5655-N62) is required.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	Use check INFOPRINT_PRINTWAY_MODE, available with APAR OA26583, to determine if you are currently using IP PrintWay basic mode.

Steps to take: See "Migrating from IP PrintWay basic mode to extended mode" in *z/OS Infoprint Server Customization*.

Reference information: See the following information:

- *z/OS Infoprint Server Customization* describes the features and limitations of IP PrintWay extended mode and how to customize IP PrintWay extended mode. It also describes how to customize the common message log and Infoprint Central.

Migration actions from z/OS V1R13: Infoprint Server

- *z/OS Infoprint Server Operation and Administration* describes how to log in to Infoprint Central and how to view messages in the common message log. It also describes how to modify printer definitions for IP PrintWay extended mode.
- *z/OS Infoprint Server User's Guide* describes considerations for submitting print jobs when you use IP PrintWay extended mode.
- *z/OS Infoprint Server Messages and Diagnosis* describes how to trace IP PrintWay extended mode.
- The Infoprint Central online help system describes how to use Infoprint Central.

Infoprint Server actions to perform before the first IPL of z/OS V2R1

This topic describes Infoprint Server migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

Remount the Printer Inventory and copy files that were customized

Description: When you migrate to the latest z/OS system, you must bring forward the customized data from your previous system.

Element or feature:	Infoprint Server.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

- *Printer Inventory:*
 - Remount the /var/Printsrv directory from the z/OS V1R13 system on the z/OS V2R1 system. The /var/Printsrv directory contains the Printer Inventory as well as other Infoprint Server files. The default directory is /var/Printsrv. However, you might have changed the directory name in the base-directory attribute in the aopd.conf configuration file.

Note:

1. After you start Infoprint Server on the z/OS system, you should use the Infoprint Server **pidu** command to export the Printer Inventory on the z/OS V2R1 system so that you have a backup of the Printer Inventory.
2. If /var/Printsrv is not mounted at a separate mount point, use the Infoprint Server **pidu** command to export the Printer Inventory on the

Migration actions from z/OS V1R13: Infoprint Server

original system and restore it on the z/OS V2R1 system. Do not use other copy commands to copy the Printer Inventory. (Mounting /var/Printsrv at a separate mount point can result in better management of disk space and easier migration.)

- Configure the Infoprint Server environment variables (for example, AOPCONF, PATH, LIBPATH, NLSPATH, MANPATH) in /etc/profile.
- *Configuration file*: If you modified the Infoprint Server configuration file, copy the file to the z/OS V2R1 system. Its default location is /etc/Printsrv/aopd.conf. However, you might have specified a different location in environment variable AOPCONF.
- *aopstart EXEC*: If you modified the **aopstart** EXEC, copy it to the z/OS V2R1 system.
- *IP PrintWay*: If you currently use the IP PrintWay component of Infoprint Server, copy to the z/OS V2R1 system any IP PrintWay exit routines and data stream filters you have written. It is a good practice to recompile the exits and filters on z/OS V2R1.
- *NetSpool*: If you currently use the NetSpool component of Infoprint Server, copy to the z/OS V2R1 system any NetSpool exit routines you have written. It is a good practice to recompile the exits and filters on z/OS V2R1.
- *Print Interface*: If you currently use the Print Interface component of Infoprint Server, take these actions:
 - If you have written any data stream filters, copy them to the z/OS V2R1 system. You do not need to recompile them.
 - If you run the SAP R/3 application server on the z/OS system, copy the SAP callback daemon configuration file to the z/OS V2R1 system. Its default location is /etc/Printsrv/aopsapd.conf. However, you might have specified a different location in environment variable AOPSAPD_CONF.
- *Infoprint Central*: If you currently use Infoprint Central, copy the z/OS HTTP Server configuration and environment variables files to the z/OS V2R1 system. The default locations of these files are /etc/httpd.conf and /etc/httpd.envvars.

Reference information: See the following information: *z/OS Infoprint Server Customization* .

Infoprint Server actions to perform after the first IPL of z/OS V2R1

This topic describes Infoprint Server migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

Run aopsetup

Description: When migrating to z/OS V2R1 Infoprint Server, you must run the **aopsetup** shell script to establish the correct file permissions for Infoprint Server directories and files.

Element or feature:	Infoprint Server.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	After the first IPL of z/OS V2R1.
Is the migration action required?	Yes.

Migration actions from z/OS V1R13: Infoprint Server

Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Run the **aopsetup** shell script from an rlogin shell, from an OMVS session, or with the BPXBATCH command. Specify the names of the RACF groups that you defined for Infoprint Server operators and administrators as arguments to **aopsetup**. For example, if you defined group AOPOPER for operators and group AOPADMIN for administrators, enter:

```
/usr/lpp/Printsrv/bin/aopsetup AOPOPER AOPADMIN
```

Rule: You must run **aopsetup** from a user ID with a UID of 0. You can use the **su** command to switch to an effective UID of 0 if you have READ access to the BPX.SUPERUSER profile in the RACF FACILITY class.

Tip: You can run **aopsetup** from the driving system (instead of the target system) if all of these are true:

- You have the target system's /var/Printsrv directory accessible.
- You reference the target system's /usr/lpp/Printsrv directory mounted under a /service directory as described in the comments at the beginning of the **aopsetup** shell script.
- The RACF database groups for operators and administrators are the same on the driving and target system.

Reference information: For details about unning **aopsetup**, see *z/OS Infoprint Server Customization*.

JES2 migration actions

This topic describes migration actions for base element JES2.

JES2 actions to perform before installing z/OS V2R1

This topic describes JES2 migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

Change JESJOBS profiles

Description: In z/OS V2R1, the new Job Modify SSI 85 defines additional resource names to the JESJOBS class. If any existing JESJOBS entity name matches one of the new resource names, it could result in unintended user authorization to modify job attributes. If necessary, update your JESJOBS profiles to avoid granting unintended user authority to modify jobs.

Element or feature:	z/OS JES2.
When change was introduced:	z/OS V2R1.

Migration actions from z/OS V1R13: JES2

Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if JESJOBS profiles could grant unintended authority to modify the job.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

1. Search for JESJOBS profile names which match any of the new JESJOBS resource names:
 - SUBMIT.localnodeid.jobname.userid
 - HOLD.nodename.userid.jobname
 - RELEASE.nodename.userid.jobname
 - PURGE.nodename.userid.jobname
 - CANCEL.nodename.userid.jobname
 - START.nodename.userid.jobname
 - RESTART.nodename.userid.jobname
 - SPIN.nodename.userid.jobname
 - MODIFY.nodename.userid.jobname
 - REROUTE.nodename.userid.jobname

For more information, see *z/OS JES2 Initialization and Tuning Guide*.
2. Ensure that your existing JESJOBS profiles grant the intended authority, given the new use of JESJOBS by the Job Modify SSI 85.
3. If any JESJOBS profile inadvertently allows user authority to Job Modify SSI 85 actions, update the profile or create a new profile, if necessary.

Reference information: See the following information:

- *z/OS JES2 Initialization and Tuning Guide*
- *z/OS Security Server RACF Security Administrator's Guide*
- *z/OS Planning for Multilevel Security and the Common Criteria*

Activate z11 mode

Description: To take advantage of the full-function level of z/OS V1R11 JES2, you must be in z11 mode. Activating z11 mode upgrades the JES2 checkpoint and enables JES2 functional that is introduced in z/OS V1R11, including JOE data area extensions supported by BERTs. z/OS V2R1 is planned to be the last release for which JES2 will support the z2 level for checkpoint data sets. For more information on the JES2 functionality introduced in z/OS V1R11, see **Reference information**.

Element or feature:	JES2.
----------------------------	-------

When change was introduced:	Planned for the release following z/OS V2R1. See IBM United States Software Announcement 212-086, dated April 11, 2012
Applies to migration from:	z/OS V1R13 and z/OS V1R12
Timing:	Before installing z/OS V2R1.
Is the migration action required?	No, but recommended because it will be a requirement in the release following z/OS V2R1. (IBM United States Software Announcement 212-086, dated April 11, 2012).
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	You are able to fall back to z2 mode, if necessary.
System impacts:	None.
Related IBM Health Checker for z/OS check:	Use check JES2_Z11_Upgrade_CK_JES2 to determine if your system is ready to upgrade the JES2 checkpoint to z11 mode. For more information, see <i>IBM Health Checker for z/OS: User's Guide</i> .

Steps to take: Follow these steps:

- After migrating to z/OS V1R11 JES2, or later, on all systems in your MAS, determine your z11 checkpoint activation readiness:
 1. Use the **\$D ACTIVATE** command. This command indicates if activation to z11 mode will succeed.
 2. Review your current utilization of BERT data to determine if there are sufficient BERTS, as detailed in “Check BERT utilization” on page 188.
 3. If you issue the **\$ACTIVATE,LEVEL=z11** command, activation of LARGEDS support is required.
 4. An additional *nmn* 4K records for CKPT1 is required for z11 mode.
- Run the **JES2 \$ACTIVATE** command to verify non-configuration changes that must be accommodated before going to z11, and to activate z11 mode following the considerations for this command found in *z/OS JES2 Commands*.

Note: The SPOOLDEF LARGEDS=FAIL (default value) in JES2PARM parmlib member is not supported in z11 mode. In z11 mode, on a COLD start, JES2 defaults to LARGEDS=ALLOWED. However, you cannot issue the **\$ACTIVATE,LEVEL=z11** command in the environment of SPOOLDEF LARGEDS=FAIL.

By default, JES2 restarts in the same mode (z2 or z11) as other members of the MAS (if any are active) or the mode the last active JES2 member was in when it came down. To restart JES2 in z2 mode, specify UNACT on PARM=. On a cold start JES2 starts in z11 mode unless overridden by OPTSDEF COLD_START_MODE or UNACT parameter.

Reference information: See the following information:

Migration actions from z/OS V1R13: JES2

- For a list of the enhancements introduced in z/OS V1R11 for z11 mode, see *z/OS Introduction and Release Guide*.
- For \$ACTIVATE, \$D ACTIVATE, \$D CKPTSPACE and \$JD HISTORY command details, see *z/OS JES2 Commands*.

Check BERT utilization: Before issuing the \$ACTIVATE,LEVEL=z11 command, review the current utilization of BERT data to determine whether there are sufficient BERTs. Additional BERTs are needed for each SYSOUT data set that has transaction data associated with it. These SYSOUT data sets can be seen using SDSF by setting APPC ON and examining SYSOUT data sets on the H and O panels; SYSOUT data sets with transaction data have nontraditional JES2 job IDs. Consider increasing the number of BERTs to correspond to two times the maximum number of transaction SYSOUT data sets on the system. BERT utilization should be monitored after the \$ACTIVATE to z11 mode to ensure there are sufficient BERTs for the jobs and SYSOUT in the MAS. There are several ways to determine your current BERT usage.

- The \$D CKPTSPACE,BERTUSE command displays a table of the types of control blocks in BERTs and how many BERTs are used by each control block type. The example shows the output of the command:

\$HASP852	CKPTSPACE	CURRENT BERT TYPE	UTILIZATION COUNT	CB COUNT
\$HASP852		INTERNAL	11	1,
\$HASP852		JQE	211	108,
\$HASP852		CAT	114	38,
\$HASP852		WSCQ	1	1,
\$HASP852		DJBQ	0	0,
\$HASP852		JOE	0	0,
\$HASP852		FREE	763	0

In the example, there are 108 JQEs that have a total of 211 BERTs associated with them. This example is for a system in z2 mode and does not have any BERTs associated with JOEs.

- The \$D ACTIVATE command displays the number of BERTs that are needed for activation to z11 mode. This is the number of BERTs that will be associated with JOEs after the \$ACTIVATE. The example shows the output of the \$D ACTIVATE command:

```
$HASP895 $DACTIVATE
$HASP895 JES2 CHECKPOINT MODE IS CURRENTLY Z2
$HASP895 THE CURRENT CHECKPOINT:
$HASP895 -- CONTAINS 1100 BERTS AND BERT UTILIZATION IS 30
$HASP895 PERCENT.
$HASP895 -- CONTAINS 158 4K RECORDS.
$HASP895 z11 CHECKPOINT MODE ACTIVATION WILL:
$HASP895 -- EXPAND CHECKPOINT SIZE TO 165 4K RECORDS.
$HASP895 -- REQUIRE 22 ADDITIONAL BERTS AND UTILIZATION
$HASP895 WOULD REACH 32 PERCENT.
$HASP895 z11 ACTIVATION WILL SUCCEED IF ISSUED FROM THIS MEMBER.
```

In the example, there are 22 additional BERTs that will be used after the \$ACTIVATE to z11 mode, for transaction data associated with JOEs.

Note: When the SPOOLDEF LARGEDS=FAIL (default value) is in effect in your JES2PARM parmlib member, the following message will be issued by the \$ACTIVATE command:

```
$HASP895 z11 ACTIVATION WILL FAIL IF ISSUED FROM THIS MEMBER.
$HASP895 THE FOLLOWING ISSUES PREVENT ACTIVATION:
$HASP895 -- LARGEDS SUPPORT MUST BE ACTIVATED.
```

- A general history of BERT usage can be obtained by using the \$JD HISTORY(BERT) command or by using the SDSF RM panel. This displays the usage of BERTs after the system was IPLed. The example below shows the output of the \$JD HISTORY(BERT) command:

```
$HASP9130 D HISTORY
$HASP9131 JES2 BERT      USAGE HISTORY
DATE      TIME          LIMIT  USAGE      LOW      HIGH  AVERAGE
-----
2009.086 16:00:00      1100    337      337     337   337
2009.086 15:50:09      1100    337      125     337   192
```

JES2 actions to perform before the first IPL of z/OS V2R1

This topic describes JES2 migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

Remove BRODCAST= from the OUTDEF initialization statement

Description: In z/OS V2R1, JES2 ignores any specifications of the BRODCAST= parameter. TSO notify messages are sent to the user, or are issued locally if the user is not logged on. You can no longer use BRODCAST= to specify where TSO notify messages are sent.

Element or feature:	z/OS JES2.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	No, but recommended to keep your initialization deck clean of outdated and obsolete specifications.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

1. Check the OUTDEF statement in the JES2 initialization deck for BRODCAST= specifications.
2. Remove BRODCAST= specifications from the OUTDEF statement.

Reference information: See the following information:

- *z/OS JES2 Messages*
- *z/OS JES2 Initialization and Tuning Reference*
- *z/OS JES2 Diagnosis*.

Remove JCLERR= from the JOBDEF initialization statement

Description: Before z/OS V2R1, for JCL job card errors that were detected during the input phase that the converter also detected, you could either have JES2 fail the

Migration actions from z/OS V1R13: JES2

job during input phase (JCLERR=YES) and the job never was sent to conversion, or you could have JES2 ignore the errors (JCLERR=NO) and send the job to the conversion phase where the converter could detect them. Starting with z/OS V2R1, input phase still detects errors, but jobs are always queued to the conversion phase and the input errors are added to those found by conversion and reported in the same way. The message id associated with the message indicates where the error occurred.

In z/OS V2R1, JES2 ignores any specifications of the JCLERR= parameter. If an error on the JOB card is encountered during the INPUT phase, the job is sent to the converter for INPUT phase error message processing. You can no longer use JCLERR=YES to specify for the job to be failed under these conditions.

Element or feature:	z/OS JES2.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	No, but recommended to keep your initialization deck clean of outdated and obsolete specifications.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

1. Check the JOBDEF statement in the JES2 initialization deck for JCLERR= specifications.
2. Remove any JCLERR= specifications from the JOBDEF statement.

Note: With JES2 APAR OA41881, the output message \$HASP835 from \$DJOBDEF command no longer displayd the JCLERR=YES or JCLERR=NO value.

Reference information: See the following information:

- *z/OS JES2 Messages*
- *z/OS JES2 Initialization and Tuning Reference*
- *z/OS JES2 Diagnosis.*
- *z/OS JES2 Commands..*

JES2 actions to perform after the first IPL of z/OS V2R1

This topic describes JES2 migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

None.

JES3 migration actions

This topic describes migration actions for optional feature JES3.

JES3 actions to perform before installing z/OS V2R1

This topic describes JES3 migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

None.

JES3 actions to perform before the first IPL of z/OS V2R1

This topic describes JES3 migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

Change JES3 release level format

Description: In z/OS V2R1 SSI 54, SSI 82 and SSI 83 report the JES3 release level using the JES2 format z/OS 2.1. In previous versions of z/OS, JES3 reported the release level using the format z 1.13.0. The SSI fields which are affected by the format change are:

- SSI 54: SSVIVERS field from macro IEFSSVI
- SSI 82: JPXVERSN field from macro IAZJPLEX
- SSI 83: JPSYVERN field from macro IAZJPLXI.

Element or feature:	z/OS JES3.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if code is dependent on the JES3 release level returned by SSI 54, SSI 82 or SSI 83.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

1. Search for fields SSVIVERS, JPXVERSN and JPSYVERN in invocations of SSI 54, SSI 82 and SSI 83.
2. For any code that requires the z/OS 2.1 JES3 release level, change the expected format to 'z/OS 2.1' (z/OS #.#).

Reference information: *z/OS MVS Using the Subsystem Interface.*

Remove DUMP=JES and DUMP=MVS from the OPTIONS initialization statement

Description: For enhanced problem determination and availability in z/OS V2R1, JES3 has dropped support for the DUMP=JES and DUMP=MVS parameter specifications on the OPTIONS initialization statement. In z/OS V2R1, DUMP=PRDMP is the default value and the only supported DUMP parameter specification.

Element or feature:	z/OS JES3.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	<p>No, but recommended to avoid warning messages. Any references to unsupported values are ignored, DUMP=PRDMP is used, a message is issued and initialization continues.</p> <p>For example, if DUMP=JES or DUMP=MVS is specified, the system issues one of the following messages, and JES3 initialization continues:</p> <p>IAT3255 WARNING: JES IS INVALID FOR KEYWORD DUMP, DEFAULT PRDUMP IS BEING USED</p> <p>IAT3255 WARNING: MVS IS INVALID FOR KEYWORD DUMP, DEFAULT PRDUMP IS BEING USED</p>
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

1. Check the OPTIONS statement in the JES3 initialization deck for DUMP=JES and DUMP=MVS specifications.
2. Remove DUMP=JES and DUMP=MVS specifications from the OPTIONS statement, or change the values to DUMP=PRDMP.

Reference information: See the following information:

- *z/OS JES3 Initialization and Tuning Reference*
- *z/OS JES3 Messages*
- *z/OS JES3 Commands*
- *z/OS JES3 Diagnosis Reference*

Remove SDI from the OPTIONS initialization statement

Description: In z/OS V2R1, JES3 has removed the option to turn off Spool Data Integrity (SDI) functionality. If JES3 encounters the SDI keyword, command processing stops and a message is issued.

If SDI is specified in the inish deck, the system issues the following message, and JES3 initialization continues: IAT3256 SDI KEYWORD IGNORED, NO LONGER SUPPORTED. If SDI is used on a command (*F Q,SDI=), the system issues the following message, and the command is aborted: IAT8050 SDI IS AN INVALID FIELD.

Element or feature:	z/OS JES3.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	No, but recommended to avoid warning messages and command errors.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

1. Remove the SDI keyword from the OPTIONS statement in the JES3 initialization deck.
2. Remove or update any automated instances of the *F Q and *I Q commands that specify the SDI parameter.

Reference information: See the following information:

- *z/OS JES3 Initialization and Tuning Reference*
- *z/OS JES3 Messages*
- *z/OS JES3 Commands*
- *z/OS JES3 Diagnosis Reference*

JES3 actions to perform after the first IPL of z/OS V2R1

This topic describes JES3 migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

None.

Language Environment migration actions

This topic describes migration actions for base element Language Environment.

Language Environment actions to perform before installing z/OS V2R1

This topic describes Language Environment migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

Convert to CEEPRMxx to set system-level default runtime options

Description: In the IBM z/OS V1R12 Software Announcement 210-235 dated 22 July 2010, IBM announced plans to remove the capability to change the default Language Environment runtime options settings using SMP/E installable USERMODs. As of z/OS V2R1 if you are still using assembler modules to specify your installation-wide default runtime options (CEEDOPT, CEECOPT, or CELQDOPT), you must convert to using the CEEPRMxx parmlib member to set your system-level default Language Environment runtime options. z/OS V1R13 was the last release to support the SMP/E USERMOD to customize the LE Run-time options.

Element or feature:	Language Environment.
When change was introduced:	z/OS V2R1. (Previewed in IBM z/OS V1R12 Software Announcement 210-235, 22 July 2010.)
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you still use SMP/E USERMOD to customize the Language Environment runtime options.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	Use CEE_USING_LE_PARMLIB to check that default Language Environment runtime options are set within a CEEPRMxx parmlib member.

Steps to take: Follow these steps:

- If you are no longer using the Language Environment runtime option assembler usermods, you do not have to take further action.
- If you are using the Language Environment runtime option assembler usermods, you must convert to CEEPRMxx parmlib member.

Reference information: For details about specifying the CEEPRMxx parmlib member, see *z/OS Language Environment Customization*.

Language Environment actions to perform before the first IPL of z/OS V2R1

This topic describes Language Environment migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

Update the CSD based on the newest CEECCSD

Description: Each release, Language Environment adds or deletes load modules in the CICS system definition (CSD) file. Thus, you should update the file each

Migration actions from z/OS V1R13: Language Environment

release using the program definitions found in members CEECCSD and CEECCSDX found in the SCEESAMP data set. The CSD samples provided by Language Environment (CEECCSD and CEECCSDX) at the latest release can be used for systems at earlier releases that can co-exist with this level of z/OS.

Element or feature:	Language Environment.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you use CICS.
Target system hardware requirements:	None.
Target system software requirements:	CICS.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Update the CSD file using the program definitions in member CEECCSD (and member CEECCSDX if using CICS TS V3 or later) found in the hlq.SCEESAMP data set.

Note: The group containing the Language Environment runtime routines must be in the group list used during CICS startup.

Reference information: See *z/OS Language Environment Runtime Application Migration Guide*

Update Language Environment load modules in the LPA

Description: Each release you must update the Language Environment load modules that you make accessible through the link pack area (LPA). In addition, each release you should review your list of Language Environment load modules in the LPA to determine if it's still suitable.

Element or feature:	Language Environment.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you need to make modules accessible through the link pack area (LPA).
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.

Migration actions from z/OS V1R13: Language Environment

Related IBM Health Checker for z/OS check:	None.
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Steps to take: Review Language Environment load modules in the LPA.

To move load modules into the LPA, use the following sample members in the CEE.SCEESAMP data set:

- *AFHWMLP2*: This is a sample of all Language Environment Fortran component modules eligible for the LPA.
- *CEEWLPA*: This is a sample of a PROGxx member of SYS1.PARMLIB that includes all Language Environment CEE-prefixed runtime modules eligible for the LPA (that is, all Language Environment base modules) except the callable services stubs.
- *CELQWLPA*: This is a sample for AMODE 64 runtime support.
- *EDCWLPA*: This is a sample of a PROGxx member of SYS1.PARMLIB that includes all Language Environment EDC-prefixed and CEH-prefixed runtime modules eligible for the LPA (that is, all XL C/C++ component modules) except locales and code page converters.
- *IBMALLP2* (or *IBMPLPA1* for Enterprise PL/I for z/OS): This is a sample of all Language Environment PL/I component modules eligible for the LPA.
- *IGZWMLP4*: This is a sample of all Language Environment COBOL component modules eligible for the LPA.

To see which modules are eligible for the LPA, refer to *z/OS Language Environment Customization*. The modules listed there can be put in the LPA or extended LPA (ELPA) depending on their RMODE value:

- If the RMODE is ANY, the module can reside in the LPA or in the ELPA (above or below the 16 MB line).
- If the RMODE is 24, the module can reside only in the LPA (below the 16 MB line).

If you are considering placing the modules listed in *z/OS Language Environment Customization* in the LPA or the ELPA, then IBM recommends that you place the SCEELPA data set in the LPA list (LPALSTxx). SCEELPA contains Language Environment load modules that are reentrant, that reside above the 16 MB line, and that are heavily used by z/OS.

In *z/OS Language Environment Customization* you will also see tables of modules eligible for the LPA and the ELPA above and beyond what is found in the SCEELPA data set. You will need to use the dynamic LPA or MLPA approach to move these modules into the LPA or ELPA. You do not need to include recommended modules if they contain functions your installation does not use. Language Environment modules not listed in these tables can be moved into the LPA or ELPA at your discretion.

Reference information: See the table “Language Environment sample IEALPAnn or PROGxx members in hlq.SCEESAMP” for the list of sample members and their changed content in *z/OS Language Environment Customization*. The table contains a list of eligible load modules for:

- Language Environment base modules
- Language Environment XL C/C++ component modules
- Language Environment COBOL component modules

- Language Environment Fortran component modules
- Language Environment PL/1 component modules

Determine if the region-level runtime option JCL requires changes

Description: Because of the changes introduced in “Accommodate removal of samples provided for system-level runtime usermods” on page 198, new region-level assembler samples are provided in the SCEESAMP data set. These samples are called CEERDOPT, CEERCOPT and CELQRDOP. Each sample contains the IBM-supplied default values for runtime options. The instructions in the CEEWROPT and CEEWQROP sample JCL parts for creating region-level runtime options load modules have been updated to refer to the new assembler samples.

Element or feature:	Language Environment.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	No, but recommended if you need to create a new region-level runtime options module.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: No action is needed for existing CEEROPT modules or for JCL job which already contain a copy of the old assembler samples. If you need to create a new region-level runtime options module, use the updated JCL and sample assembler parts.

Reference information: For more information about creating region-level runtime option load modules, see *z/OS Language Environment Customization*.

Update programs that read the Language Environment options report

Description: The Language Environment options reports, which may be obtained by specifying RPTOPTS(ON), with the CLER CICS transaction, with a CEEDUMP or using VERBX LEDATA in an IPCS readable Cdump, will no longer show "Installation Default" as the last where Cset field. If the runtime option defaults shipped with Language Environment have not been changed, the last where set field will show "IBM-supplied Cdefault". Also, the last where set value of "Installation non-overrideable" is no longer used.

Element or feature:	Language Environment.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.

Migration actions from z/OS V1R13: Language Environment

Is the migration action required?	Yes, if you have an application that reads the output of an options report
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: If you have programs that attempt to read the output from these reports, your programs should be updated accordingly. Similarly, if you were outputting an options report you should use "IBM-supplied default" for a where set value that formerly matched "Installation default".

Reference information: See the following information:

- *z/OS Language Environment Debugging Guide*
- *z/OS Language Environment Customization*
- *z/OS Language Environment Programming Guide for 64-bit Virtual Addressing Mode*

Accommodate removal of samples provided for system-level runtime usermods

Description:In z/OS V1R12, Language Environment issued a statement of direction indicating that the preferred method of setting default system-level runtime options is using the CEEPRMxx support. The statement of direction further indicated that the ability to change installation-level runtime options with SMP/E installable usermods would be removed in a future release. Starting in z/OS V2R1, that ability is removed. See "Convert to CEEPRMxx to set system-level default runtime options" on page 194.

The CEEWDOPT, CEEWCOPT, and CEEWQDOP sample JCL jobs that were used to install Language Environment runtime option usermods are no longer included in the SCEESAMP dataset. The corresponding CEEDOPT, CEECOPT, and CELQDOPT assembler source code samples, which contained the IBM-supplied runtime option, are also no longer included in the SCEESAMP dataset. Additionally, the CEEXOPT macro has been updated to issue an MNOTE if the generation of a CEEDOPT or CELQDOPT CSECT is requested.

Element or feature:	Language Environment.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you still use the assembler language usermods to modify installation-wide runtime options.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.

Migration actions from z/OS V1R13: Language Environment

Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: If you used the CEEWDOPT, CEEWCOPT, and CEEWQDOP sample JCL jobs described in the **Description** in releases earlier than z/OS V2R1, you can no longer do so. You must now migrate to using the CEEPRMxx support. See “Convert to CEEPRMxx to set system-level default runtime options” on page 194.

Reference information: For more information about setting system-level default runtime options, see *z/OS Language Environment Customization*.

Language Environment actions to perform after the first IPL of z/OS V2R1

This topic describes Language Environment migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

None.

Library Server migration actions

This topic describes migration actions for base element Library Server.

Library Server actions to perform before installing z/OS V2R1

This topic describes Library Server migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

None.

Library Server actions to perform before the first IPL of z/OS V2R1

This topic describes Library Server migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

Copy Library Server configuration files

Description: The Library Server configuration files (bookmgr.80, booksrv.80) contain information about your environment and preferences. The information in bookmgr.80 includes the names of bookshelf lists for bookshelves in z/OS data sets and the names of the file system directories that Library Server reads and writes during execution. The information in booksrv.80 includes the file system directory names of book collections, shelves, and bookcases, as well as product option settings configured via the Library Server Administration Page. There are default values but normally you would customize them. In order to bring the customized values over to your new system, you have to copy them. (Note that port number suffix .80, used in bookmgr.80 and booksrv.80, is an example. Your port number suffix might be different.)

Migration actions from z/OS V1R13: Library Server

Element or feature:	Library Server.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you intend to preserve your Library Server configuration.
Target system hardware requirements:	None.
Target system software requirements:	z/OSMF V2R1, if you want to use the z/OSMF InfoCenter.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Copy your current (customized) configuration files, usually `bookmgr.80` and `booksrv.80`, to your new system and add any configuration parameters that are new since the z/OS release from which you are migrating. Otherwise Library Server will run with default values, not the values you're used to. A suggested (but not required) place for these configuration files is `/etc/booksrv`. Library Server will also search `/etc` and the original `cgi-bin` for them. If you place the files in any other directory, use the `EPHConfigPath` environment variable to tell Library Server where to find them.

Reference information: For a complete description of each parameter of the Library Server configuration files, see *z/OS Program Directory*.

Copy Library Server notes files

Description: Users can make comments in book topics by creating notes that are appended to the end of each topic. If you do not copy these notes to the new system, they will be lost.

Element or feature:	Library Server.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you intend to preserve notes from release to release.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Copy all the files from your existing notes directory to the new one. The default directory for saving book notes is `/usr/lpp/booksrv/public/bookmgr/notes`. You can override this default by specifying a directory on the `NOTEDIR` parameter of the `bookmgr.80` configuration file.

Reference information: For a complete description of each parameter of the Library Server configuration files, see *z/OS Program Directory*.

Library Server actions to perform after the first IPL of z/OS V2R1

This topic describes Library Server migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

Reconfigure Library Server InfoCenters

Description: Starting with z/OS V2R1, the Library Server element requires the `Location` value (`ICPATH=`) value of InfoCenters to be configured differently than it was in the past. Thus, for any existing InfoCenter configurations migrated from the previous version, you must delete, reconfigure and re-process the reconfigured InfoCenters as described in **Steps to take**.

Element or feature:	Library Server
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	After the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you intend to preserve configured InfoCenters from the previous version
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take:

1. Migrate your current customized `booksrv.80` as described in **Description**.
2. Configure and start your HTTP server as required for Library Server as described in the *z/OS Program Directory*.
3. Using the Library Server Administrative Interface, delete any existing InfoCenter configuration entries.
4. Using the Library Server Administrative Interface, reconfigure (that is, "create new") each deleted InfoCenter, using for its `Location` field the fully qualified "root plugin" directory name, or jar file name, of the InfoCenter. (Note that the "root plugin" is a child of the InfoCenter parent directory and is typically distinguishable as the plugin that contains the "plugin_customization.ini" file for the InfoCenter.)

Migration actions from z/OS V1R13: Library Server

5. Using the Library Server Administrative Interface for managing InfoCenters, for each reconfigured InfoCenter, use "Prepare InfoCenter Plugins" to prepare its plugins for subsequent creation of the InfoCenter search index.
6. Using the Library Server Administrative Interface for managing InfoCenters, for each reconfigured InfoCenter, use "Receive InfoCenter Plugins" to copy/catalog all the prepared InfoCenter plugin objects (for example, TOC files and plugin card files) into the Library.
7. Using the Library Server Administrative Interface for managing InfoCenters, for each reconfigured InfoCenter, use "Create InfoCenter Search Index" to create the search index which enables searching across all the plugins for the InfoCenter.

Reference information: For a complete description of each parameter of the Library Server configuration files, see the *z/OS Program Directory*.

RMF migration actions

This topic describes migration actions for optional feature Resource Measurement Facility™ (RMF).

RMF actions to perform before installing z/OS V2R1

This topic describes RMF migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

None.

RMF actions to perform before the first IPL of z/OS V2R1

This topic describes RMF migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

Control the invocation of data reduction exit routines

Description: As of z/OS V2R1, if you are running unauthorized applications that invoke the RMF Monitor II Sysplex Data Gathering service (ERB2XDGS) or the RMF Monitor III Sysplex Data Retrieval service (ERB3XDRS), you must take certain actions to allow the applications to make use of data reduction exit routines

Element or feature:	RMF.
When change was introduced:	z/OS V2R1. This function is rolled back to z/OS V1R13, z/OS V1R12, and z/OS V1R11 with APAR OA38022 for RMF Monitor II service and APAR OA37965 for RMF Monitor III.
Applies to migration from:	z/OS V1R13 and z/OS V1R12, both without the PTFs for APARs OA38022 and OA37965 applied.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you have unauthorized applications that invoke ERB2XDGS (RMF Monitor II Sysplex Data Gathering service) or ERB3XDRS (RMF Monitor III Sysplex Data Retrieval service).

Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.

Steps to take: To allow your applications to make use of data reduction exit routines specified with the ERB2XDGS or ERB3XDRS services, take the following actions:

- If the application has been designed to run authorized, you must adapt the application or program so that it runs in supervisor state, system state, or be APF authorized.
- You can approve the exit by adding RACF resource ERBSDS.MON2EXIT.<exit_name> or ERBSDS.MON3EXIT.<exit_name> to the RACLISTed class FACILITY and by granting read access to the profile for the user ID that invokes the Sysplex Data Server API.
- If you are running an unauthorized application that invokes RMF Monitor II Sysplex Data Gathering service ERB2XDGS/ERB2XD64 or Monitor III Sysplex Data Retrieval service ERB3XDRS/ERB3XD64, you must take one of the following actions to allow the application to make use of data reduction exits.
 1. If the application is properly designed and secure to run authorized, you must adapt the application or program so that it runs in supervisor state, system state, or APF authorized.
 2. You can approve the exit by adding RACF resource ERBSDS.MON2EXIT <exit_name> or ERBSDS.MON3EXIT<exit_name>.RACLISTed class FACILITY and by granting read access to the profile for the user id invoking the Sysplex Data Server API.

Reference information: For details about the RMF sysplex data services see *z/OS RMF Programmer's Guide*

Check your GPMSERVE and GPM4CIM options for TCP/IP address regular expressions

Description: Starting with z/OS V2R1, RMF GPMSERVE honors IPv6 address syntax when parsing the option settings from a parmlib member. The same applies to GPM4CIM parsing options from a configuration file.

Element or feature:	RMF
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you use GPMSERVE or GPM4CIM with IPv6 address regular expressions.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.

Migration actions from z/OS V1R13: RMF

System impacts:	None.
Related IBM Health Checker for z/OS check:	None

Steps to take: If you use GPMSSERVE or GPM4CIM in an IPv6 or dual mode IPv6/IPv4 network environment, check one or more of your options parmlib members for options containing regular expressions representing IP addresses (for example, the options HTTP_ALLOW or HTTP_NOAUTH). Make sure that the regular expressions adhere strictly to the format of the IP addresses in your network. Examples include the following:

Table 11. Examples of IP matches

IP address expression	Match	Examples of full IP address match
'6.*'	Matches any IP address starting with '6.'	6.19.107.32' or '6.34.88.103'
::ffff:6.*'	Matches any (mapped) IP address starting with '::ffff:6.'	::ffff:6.19.107.32' or '::ffff:6.9.50.7'
'*6.*'	Matches any IP address containing a substring '6.'	::ffff:6.9.50.7' or '6.19.107.32'

Reference information: For further information see *z/OS RMF User's Guide*.

Define the RACF definitions to enable the GPMSSERVE Started Task for Authorization Code zero (AC=0)

Description: Starting with z/OS V2R1, the RMF GPMSSERVE Started Task runs as a module linked with Authorization Code zero (AC=0).

Element or feature:	RMF
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

1. Define READ Access to the BPX.SERVER Facility for the GPMSSERVE userid:
PERMIT BPX.SERVER CLASS(FACILITY) ID(GPMSSERVE) ACCESS(READ)
2. Ensure that all programs loaded by GPMSSERVE are defined to PROGRAM CONTROL:

```
RDEFINE PROGRAM GPM* ADDMEM('SYS1.SERBLINK'//NOPADCHK) UACC(READ)
RDEFINE PROGRAM ERB* ADDMEM('SYS1.SERBLINK'//NOPADCHK) UACC(READ)
RDEFINE PROGRAM CEEBINIT ADDMEM('CEE.SCEERUN'//NOPADCHK) UACC(READ)
RDEFINE PROGRAM IEEMB878 ADDMEM('SYS1.LINKLIB'//NOPADCHK) UACC(READ)
RDEFINE PROGRAM CELHV003 ADDMEM('SYS1.SCEERUN2'//NOPADCHK) UACC(READ)
RDEFINE PROGRAM C128 ADDMEM('SYS1.SCEERUN2'//NOPADCHK) UACC(READ)
RDEFINE PROGRAM CELHDCPP ADDMEM('SYS1.SCEERUN2'//NOPADCHK) UACC(READ)
SETROPTS WHEN(PROGRAM) REFRESH
```

This action is only needed when GPMSEVERE is not already defined to PROGRAM CONTROL. In previous RMF Releases this was recommended but not required since the GPMSEVERE module was linked with Authorization Code one (AC=1).

3. Define READ access to the BPX.STOR.SWAP FACILITY class for the GPMSEVERE userid.

```
PERMIT BPX.STOR.SWAP CLASS(FACILITY) ID(GPMSEVERE) ACCESS(READ)
```

Reference Information: For further information see *z/OS RMF User's Guide*

RMF actions to perform after the first IPL of z/OS V2R1

This topic describes RMF migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

Use an RMF Monitor III reporter version equal to or later than your RMF Monitor III gatherer version

Description: To avoid problems when reporting Monitor III data, use an RMF reporter version that is equal to or later than the latest RMF gatherer version used to collect the data to be reported. For example, it is safe to use an RMF reporter version from z/OS V1R13 for data collected with an RMF gatherer from z/OS V1R12, but not vice versa.

Mixed (and therefore problematic) levels of collected data can occur in the following scenarios:

- *Single system:* You install and test a new release, then fall back to an earlier one; your data sets might contain data collected with different versions of the RMF gatherer.
- *Sysplex:* You migrate to a new release on one system in a sysplex but try to use an earlier reporter version from another system to report on the migrated system's data.

Element or feature:	RMF.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	After the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you had planned to use an earlier-level RMF reporter on data that was collected with a later-level RMF gatherer.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	See "Steps to take".

Migration actions from z/OS V1R13: RMF

Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Always use an RMF Monitor III reporter version that is equal to or later than the gatherer version used to collect the data from which you want to produce a report.

Note: Monitor III notifies users by issuing information message ERB948I when a reporter session is started on a system in a sysplex that is not running with the highest RMF level available in the sysplex. The message helps users to avoid reporting problems.

Reference information: For more information about Monitor III commands, see *z/OS RMF User's Guide*.

Monitor the zFS file system activity

Description: The Monitor III data gatherer options that control the data collection for measuring zFS file system activity are ZFS and NOZFS. Before z/OS V2R1, this data was gathered by default with the RMF Monitor III parmlib option ZFS as set in ERBRMF04. Starting with z/OS V2R1, the default is NOZFS, and RMF does not automatically gather any data about zFS file system activity.

Element or feature:	RMF.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	After the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you want to collect data about zFS file system activity.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.

Steps to take: Determine if you want to monitor zFS file system activity. When starting a Monitor III session in this case, you can permanently specify the ZFS option in the parmlib member for your Monitor III data gatherer sessions. Or you can use the following RMF MODIFY command during a running session:

```
MODIFY RMF,MODIFY III,ZFS
```

Reference information: For details about zFS file system data gathering see *z/OS RMF User's Guide*.

Determine need of SMF data collection for Postprocessor PCIE Activity report based on SMF 74.9 record.

Description: Starting with z/OS V2R1, RMF provides a new Postprocessor PCIE Activity report based on SMF 74.9 record. If you do not need this report, you should turn off data collection for SMF record 74 subtype 9.

Migration actions from z/OS V1R13: RMF

Element or feature:	RMF.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	After the first IPL of z/OS V2R1.
Is the migration action required?	No, but recommended if you do not want to collect SMF data for the Postprocessor PCIE Activity report.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Determine if you want to use the new Postprocessor PCIE Activity report. SMF data required for this report is gathered by default. If you do not want to use this report, you should suppress the SMF data collection for the new record type 74 subtype 9. You achieve this by specifying NOTYPE for this SMF record type in the SMF parmlib member SMFPRMxx.

Another method to suppress the data gathering of record 74.9 for the Postprocessor PCIE Activity report is to use the SUBSYS parameter in the SMFPRMxx parmlib member for the STC subsystem (started tasks, where RMF is one of them). To exclude data gathering for SMF record 74.9, specify **SUBSYS(STC,NOTYPE(74(9)), ...)**.

The SUBSYS specification overrides the SYS specification. So for example, if you have defined **SYS(TYPE(...,74,...))** in your SMFPRMxx parmlib member, you can use **SUBSYS(STC, NOTYPE(74(9)))** to make exceptions to your SYS specification and just exclude gathering of SMF record 74.9 for started tasks like RMF.

Reference information: For details about specifying SMF data collection, see *z/OS MVS Initialization and Tuning Reference*.

SDSF migration actions

This topic describes migration actions for optional feature SDSF.

SDSF actions to perform before installing z/OS V2R1

This topic describes SDSF migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

None.

SDSF actions to perform before the first IPL of z/OS V2R1

This topic describes SDSF migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

Review and reassemble user exit routines

Description: If you have written user exit routines, review them to ensure they are still appropriate for the current environment, and make changes as necessary. All user exit routines must be reassembled with the z/OS V2R1 level of the SDSF macro library.

Element or feature:	SDSF.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if user exit routines are in use.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Review user exit routines to ensure they are appropriate for z/OS V2R1. Make changes as necessary. Regardless of whether you have made changes, reassemble the user exit routines with the z/OS V2R1 level of the SDSF macro library.

Tip: A PROPLIST statement, along with PROPERTY statements, both in the ISFPRMxx parmlib member, defines customized values for certain SDSF properties. It provides an alternative to writing user exit routines to customize those properties. A user exit routine that customizes the same property as a PROPERTY statement overrides the value on the PROPERTY statement.

Reference information: See *z/OS SDSF Operation and Customization*.

Use dynamic statements for ISFPARMS to avoid reassembly

Description: ISFPARMS in SDSF is used for specifying global options, the format of panels, and security for SDSF functions. SDSF provides two alternatives for ISFPARMS:

- Assembler macros that you define, assemble, and then link into the SDSF load library. This is the original format for defining ISFPARMS and it continues to be supported for compatibility.
- Dynamic statements, which are in parmlib member ISFPRMxx. Dynamic statements are the recommended format. They are easier to code and are more dynamic than the assembler macros; they can be updated without reassembling or link-editing. The statements are processed by an SDSF server, which is controlled by MVS™ operator commands.

Migration actions from z/OS V1R13: SDSF

Element or feature:	SDSF.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	No, but recommended to avoid the migration action of reassembling your customized ISFPARMS for each z/OS release. (If you do not use dynamic statements for ISFPARMS, reassembly of your customized ISFPARMS is required on each release.)
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.

Migration actions from z/OS V1R13: SDSF

Related IBM Health Checker for z/OS check:

Use check SDSF_ISFPARMS_IN_USE to verify that SDSF dynamic statements in ISFPRMxx are being used rather than the assembler macros. If the check determines that the assembler macro ISFPARMS is in use instead, and that it has been modified, the check generates an exception. If the assembler macro ISFPARMS is in use but it has not been modified, so that all defaults are in effect, the check does not generate an exception.

SDSF registers this check with the IBM Health Checker for z/OS infrastructure when the SDSF server address space is initialized. However, one of the items this check verifies is that the SDSF server itself is in use, so you have to manually add this check (particularly if you do not use the SDSF server) so that the IBM Health Checker for z/OS infrastructure will invoke the check. To add the check, put the following statement in your PROGxx parmlib member: `EXIT ADD EXITNAME(HZSADDCK) MODNAME(ISFHCADC)`.

SDSF health checks are distributed in ISF.SISFLOAD for installations running SDSF in the LNKLST. The checks are also distributed in ISF.SISFLINK for installations that do not run SDSF in the LNKLST. For those installations, ISF.SISFLINK must be added to the LNKLST.

Note: To avoid a possible ABEND 290 with reason code 02014007 issued by HZSADDCK:

- Make sure that you specify the proper check routine name. The check routine module must be in an APF-authorized library. The system must be able to locate the check routine within the joblib, the steplib of the IBM Health Checker for z/OS address space, the LPA, or the LNKLST.
 - Make sure that you specify the proper message table name. The message table module must be in an APF-authorized library. The system must be able to locate the message table within the joblib, the steplib of the IBM Health Checker for z/OS address space, the LPA, or the LNKLST.
-

Steps to take: If you are already using dynamic statements for ISFPARMSxx, there is no migration action to perform.

If you are using assembler macros for ISFPARMS, do one of the following:

- Convert your existing ISFPARMS to dynamic statements by using a conversion utility that you invoke with the ISFACP command.

- Reassemble your customized ISFPARMS for use with z/OS V2R1. Reassembly must be done whenever you change your z/OS release. Before reassembling ISFPARMS, you might want to update it for new function. The assembler ISFPARMS cannot be shared with any other release of SDSF. Only use ISFPARMS for the release on which it is assembled.

Note: If you have an SMP/E usermod that specifies modifications to assembler macro ISFPARMS, change the usermod to indicate that module ISFPARMS is now owned by the z/OS V2R1 SDSF JES2 feature FMID (JJE779S) and not the base z/OS V2R1 SDSF FMID (HQX7790). The correct SMP/E syntax is ++VER(Z038) FMID(JJE779S), instead of ++VER(Z038) FMID(HQX7790).

Reference information: See the following information:

- For details about invoking the conversion utility with the ISFACP command, see *z/OS SDSF Operation and Customization*.
- For information about ISFPARMS and the ISFPRMxx parmlib member, see "ISFPARMS format alternatives" in *z/OS SDSF Operation and Customization*.

SDSF actions to perform after the first IPL of z/OS V2R1

This topic describes SDSF migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

Control how SDSF handles extended consoles

Description: As of z/OS V2R1, the behavior for obtaining an extended console (used for issuing system commands) has changed. Before z/OS V2R1, when SDSF attempted to obtain an extended console and the default extended console name was already in use, SDSF shared that console. For example, if you used ISPF split screen and accessed SDSF in multiple logical screens, SDSF shared the console activated in the first logical screen with subsequent logical screens. As a result, the user log in the first logical screen contained system messages for all of the logical screens.

With V2R1, when SDSF attempts to activate an extended console and the default console name is in use, SDSF activates a new console with a different name. The new name is derived by appending a single-character suffix to the default name. SDSF tries up to 32 different characters to create a unique console name.

If you want SDSF to share the extended console, rather than obtaining a new console with a name derived by modifying the default console name, you can disable console name modification. You can also define which characters should be used for the suffix that modifies the default console name.

Element or feature:	SDSF.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	After the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you want SDSF to share the extended console, as in previous releases.
Target system hardware requirements:	None.
Target system software requirements:	None.

Migration actions from z/OS V1R13: SDSF

Other system (coexistence or fallback) requirements:	The new custom properties will be ignored in the down-level systems when the toleration APAR PM78102 is applied. Message ISF862I is issued for each non-supported property: KEYWORD <i>keyword</i> VALUE <i>value</i> IGNORED, NOT SUPPORTED IN THIS RELEASE.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: To disable console name modification, so that, as in previous releases, SDSF shares the extended console when the default name is already in use, you can use:

- The SET CONMOD (OFF) command
- The custom property Console.EMCS.NoConMod in ISFPARMS with VALUE(TRUE)
- In a REXX exec, the ISFCONMOD special variable
- In a Java program, ISFRequestSettings.

Note: When the SDSF Server is started with the PROPERTY NAME(Console.EMCS.NoConMod),VALUE(TRUE) statement in the ISFPRMxx parmlib member, the SET CONMOD ON command will fail with message OPTION LOCALLY DISABLED.

To specify which characters can be used as a suffix to modify the default extended console name, use custom property Console.EMCS.ConModChars in ISFPRMxx parmlib member. By default, the characters are \$#@12345.

Reference information: For details about setting custom properties in ISFPARMS, see the discussion of the PROPLIST nad PROPERTY statements in *z/OS SDSF Operation and Customization*.

Security Server migration actions

This topic describes migration actions for optional feature Security Server.

Security Server actions to perform before installing z/OS V2R1

This topic describes Security Server migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

None.

Security Server actions to perform before the first IPL of z/OS V2R1

This topic describes Security Server migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

Check for duplicate class names

Description: When new classes are shipped with RACF, you should verify that any installation-defined class names that have been added to the class descriptor table (CDT) do not conflict with the new classes. For a list of new classes shipped with RACF, see *z/OS Summary of Message and Interface Changes*.

Element or feature:	Security Server.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you have user-defined classes.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Verify that any installation-defined class names that have been added to the class descriptor table (CDT) do not conflict with the new classes.

- If you have duplicate class names, RACF issues the following message and enters failsoft mode:

```
ICH564A RACF DETECTED AN ERROR IN THE INSTALLATION CLASS DESCRIPTOR TABLE,
ENTRY class_name, ERROR CODE 7
```
- If a conflict in class names occurs, resolve it as follows:
 1. Delete the profiles in the installation-defined class with the conflicting name.
 2. Delete the CDT entry for the class.
 3. Add a CDT entry with a different name.
 4. Redefine the profiles.

Reference information: See *z/OS Security Server RACF System Programmer's Guide*.

Determine whether you define CHOWN.UNRESTRICTED in the UNIXPRIV class.

Description:

As of z/OS V2R1 z/OS UNIX imposes a new restriction on certain sensitive types of executable files, namely, that the files be owned by UID(0). Generally, this is acceptable because the ability to change a file's owner is restricted to privileged users (those with UID 0 or with READ access to SUPERUSER.FILESYS.CHOWN in

Migration actions from z/OS V1R13: Security Server

the UNIXPRIV class). However, the POSIX standard allows a user to change ownership of any file to another user or group.

RACF supports the POSIX standard with the CHOWN.UNRESTRICTED profile in the UNIXPRIV class. If the profile exists, the alternate POSIX implementation applies, and any user can transfer ownership of files to other users or groups.

This change requires at least UPDATE access to CHOWN.UNRESTRICTED in order to give a file that you own to UID(0). To give your file to a user with a UID other than 0, or to a group to which you are not connected, requires READ access.

Currently, CHOWN.UNRESTRICTED most likely has a universal access (UACC) of NONE. Some documented examples of creating this profile specify UACC(NONE) explicitly. Others do not, but the default UACC is NONE.

Although highly unusual, a client might have defined the profile with any UACC and might permit any number of users and groups with any access level. Thus, the most likely result of this change is a complete reversal of the recommended behavior of the profile, in that nobody will have the authority to change the owner of their files. On an individual basis, clients can permit specific users or groups to this profile in order to grant the original capability. Alternatively, they can simply change its UACC to READ, but IBM does NOT recommend this action

Element or feature:	Security Server.
When change was introduced:	z/OS V1R13 and z/OS V1R12, both with APAR OA41364.
Applies to migration from:	z/OS V1R13 and z/OS V1R12, both without APAR OA41364. applied.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	No, but recommended for system security.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

- Check that the profile for CHOWN.UNRESTRICTED in the UNIXPRIV class is defined as discrete by using the following command:
RLIST UNIXPRIV CHOWN.UNRESTRICTED ALL
- If this profile does not exist, there is nothing more that you need to do.
- If the profile does exist, the recommendation is to delete it by issuing the following command:
RDELETE UNIXRIV CHOWN.UNRESTRICTED SETROPTS RACLIST(UNIXPRIV) REFRESH

If you have users with a genuine need to change file owners, they can request that a privileged user do this for them. If you trust a user enough to preserve their ability to perform this action, you can permit such a user, or group of users to

CHOWN.UNRESTRICTED in order to restore the ability they previously had. Before doing so, verify that the profile does not currently allow any inadvertent access by making sure the UACC value is NONE, and that there are no entries on the access list. To do that issue the following commands:

```
PERMIT CHOWN.UNRESTRICTED CLASS(UNIXPRIV) RESET
RALTER UNIXRIV CHOWN.UNRESTRICTED UACC(NONE)
SETROPTS RACLIST(UNIXPRIV) REFRESH
```

You can now permit users and groups as appropriate for your installation. Note that CHOWN.UNRESTRICTED must currently exist as a discrete profile. With the change from a switch profile to an authorization profile, the requirement for it to be discrete will continue to be enforced, so that inadvertent access is not granted through an existing generic profile.

Reference information: See the following information:

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

Security Server actions to perform after the first IPL of z/OS V2R1

This topic describes Security Server migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

Update database templates

Description: To ensure that the RACF utilities function properly, use the IRRMIN00 utility to update the test and production RACF databases with the database templates for the current release level.

Element or feature:	Security Server.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	After the first IPL of z/OS V2R1.
Is the migration action required?	Yes.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: To install the database template updates, run the IRRMIN00 utility with PARM=UPDATE.

Note: If IRRMIN00 produces a return code of 4 and message IRR8025 PARM=UPDATE specified, but template update not required, you do not necessarily have a problem. Check that your JCL points to the new level of IRRMIN00. If it does,

Migration actions from z/OS V1R13: Security Server

ignore the return code and warning message. A PTF might have already brought your templates up to the current level for the new release. If your JCL accidentally points to an old copy of IRRMIN00, correct the JCL and run IRRMIN00 again.

Reference information: See the following information:

- *z/OS Program Directory*
- *ServerPac: Installing Your Order*
- *z/OS Security Server RACF System Programmer's Guide*

Normalize user names specified as X.500 distinguished names in distributed identity filters

Go to “Normalize user names specified as X.500 distinguished names in distributed identity filters” on page 429.

TSO/E migration actions

This topic describes migration actions for the base element Time Sharing Option/Extensions (TSO/E).

TSO/E actions to perform before installing z/OS V2R1

This topic describes TSO/E migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

Consider what can happen when you read from a DD concatenation containing an empty data set with EXECIO under REXX for TSO/E

Description: When EXECIO is used to read a DD consisting of a concatenation of 2 or more data sets, that concatenation might contain empty sequential data sets (as of V2R1) as long as any empty data sets are SMS managed.

- Before V2R1, REXX EXECIO would fail with RC=4 if EXECIO was used with DISKR or DISKRU to read a DD consisting of a concatenation of 2 or more data sets where one of the data sets was an empty (i.e. null) sequential data set.
- Starting with V2R1, REXX EXECIO can successfully read (using DISKR or DISKRU) a DD even if one or more of the data sets within that DD concatenation is an empty data set, as long as all empty data set within the concatenation are SMS managed empty data sets. If the DD concatenation contains a non-SMS managed empty data set, EXECIO will still fail the read request with RC=4 and messages IRX0670E and IRX0566E.

Element or feature:	TSO/E
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you depend upon the behavior that occurred before z/OS V2R1.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.

System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: This item is intended to alert users of EXECIO to a behavioral change that may occur due to a relaxing the restriction on null data sets within a concatenation being read by EXECIO DISKR or DISKRU. If your exec tests the EXECIO return code and handles RC=4, you will likely have no action that needs to be taken. The RC=4 that was previously returned when EXECIO detected a null data set within the DD concatenation being read by EXECIO is still a possible return code, if the concatenation contains a null data set which is not SMS managed. Yet, if the EXECIO read against a DD containing a null data set completes successfully (i.e. RC=0 or 2), you would typically have no exceptional action to take, since the read operation will have worked as if the empty data set were not even present.

On the other hand, if you have an exec that expects EXECIO to fail whenever it reads a concatenation containing a null data set, and you exec depends on this EXECIO read failure, you should now look for RC=0 or RC=2 to allow for the possibility of success.

For example, if you use EXECIO RC=4 and the associated message IRX0566E to determine whether a DD concatenation contains a null data set, this will no longer work if the null data set is an SMS managed sequential data set. The read would work (RC=0). You could still determine if a data set is empty by allocating that data set alone to a DD and reading it with EXECIO. RC=2 (or RC=0, if execio * were used) and zero records read would indicate that the data set was empty.

Note: Note that EXECIO against a single null data set that is not part of a multi data set concatenation has always worked successfully, regardless of whether or not the empty data set is SMS managed.

Reference information: For details about EXECIO see, *z/OS TSO/E REXX Reference*. For details about messages IRX0670E and IRX0566E, see *z/OS TSO/E Messages*.

TSO/E actions to perform before the first IPL of z/OS V2R1

This topic describes TSO/E migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

None.

TSO/E actions to perform after the first IPL of z/OS V2R1

This topic describes TSO/E migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

None.

XL C/C++ migration actions

This topic describes migration actions for optional feature C/C++ without Debug Tool with XL C/C++.

XL C/C++ actions to perform before installing z/OS V2R1

This topic describes XL C/C++ migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

Review the XL C/C++ Migration Guide for the Application Programmer

Description: Be sure to review the publication *z/OS XL C/C++ Compiler and Runtime Migration Guide for the Application Programmer* for any z/OS C/C++ migration actions. It is written for application programmers, whereas this publication (*z/OS Migration*) is written for system programmers. In some customer locations, job scope can overlap such that system programmers might find information in the XL C/C++ publication that is relevant to their responsibilities. For example, migration information related to the c89 utility in the XL C/C++ publication could be of interest.

Element or feature:	XL C/C++
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing V2R1.
Is the migration action required?	No, but recommended if you use XL C/C++.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Look through *z/OS XL C/C++ Compiler and Runtime Migration Guide for the Application Programmer* for migration information that is relevant to your installation.

Reference information: *z/OS XL C/C++ Compiler and Runtime Migration Guide for the Application Programmer*

XL C/C++ actions to perform before the first IPL of z/OS V2R1

This topic describes XL C/C++ migration actions that you can perform only before you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

None.

XL C/C++ actions to perform after the first IPL of z/OS V2R1

This topic describes XL C/C++ migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

None.

z/OS Font Collection migration actions

This topic describes migration actions for the base z/OS Font Collection. z/OS Font Collection is a new z/OS base element for z/OS V2R1.

z/OS Font Collection actions to perform before installing z/OS V2R1

This topic describes z/OS Font Collection actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

None.

z/OS Font Collection actions to perform before the first IPL of z/OS V2R1

This topic describes z/OS Font Collection migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

Stop using old fonts and start using the fonts from the z/OS Font Collection

Description: z/OS V2R1 contains a new base element: z/OS Font Collection. The z/OS Font Collection provides fonts that were previously marketed and serviced for z/OS, including both single-byte and double-byte fonts.

The z/OS Font Collection includes:

- AFP Font Collection for S/390 (5648-B33), includes Japanese, Korean, Traditional Chinese, and Simplified Chinese
- IBM Infoprint Fonts for z/OS (5648-E76), includes Japanese, Korean, Traditional Chinese, and Simplified Chinese
- Compatibility fonts, which are also a feature of Print Services Facility (PSF) for z/OS (5655-M32)
- WorldType fonts from IBM Infoprint Fonts for Multiplatforms, Version 1 Release 1 (5648-E77).
- Selected object fonts (not source), Pi and Special (5771-ABC), Math and Science (5771-ADT), Data1 Fonts (5771-ADA), APL R1.2 Bounded Box (5771-ADB), Son Serif Headline (5771-ADW), Senoran Serif (5771-ABA), Son San Serif (5771-ABB), Son San Serif Headline (5771-ADX), Son San Serif Cond (5771-AFL), Son Serif Expanded R1 (5771-AFN)

Element or feature:	z/OS Font Collection
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1
Is the migration action required?	Yes, if you use standalone program products for fonts with your z/OS system.
Target system hardware requirements:	None.

Migration actions from z/OS V1R13: z/OS Font Collection

Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: The z/OS Font Collection, for migration and compatibility with previously available font program products, will continue to use existing font libraries, and will have some new libraries. IBM recommends you use the latest level of the fonts available for z/OS, and therefore, those that are found in the z/OS Font Collection. For that reason, do not continue to use the standalone font program product data sets with z/OS releases after z/OS V1R13. No application or program changes are anticipated.

Do not expect to order separately available font program products with z/OS V2R1, or to install them into the z/OS V2R1 SMP/E zones. The z/OS Font Collection provides SMP/E statements to supercede, delete, or version the earlier standalone program product levels of the fonts.

Reference information: For details about the z/OS Font Collection, see *z/OS Font Collection*. For installation planning information, see *z/OS Planning for Installation*.

z/OS Font Collection actions to perform after the first IPL of z/OS V2R1

This topic describes z/OS Font Collection migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

None.

z/OS UNIX migration actions

This topic describes migration actions for base element z/OS UNIX System Services (z/OS UNIX).

z/OS UNIX actions to perform before installing z/OS V2R1

This topic describes z/OS UNIX migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

Remove ICLI component from z/OS

Description: IBM has removed the Integrated Call Level Interface (ICLI) in z/OS V2R1. ICLI is used by those who have requested and obtained the ICLI API documentation and the C language header file. IBM believes that users of this interface have changed from using ICLI to standard IBM DB2 Connect for database connectivity and do not need it for z/OS V2R1. ICLI has not been enhanced since z/OS V1R6.

Element or feature:	z/OS UNIX.
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Migration actions from z/OS V1R13: z/OS UNIX

When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you use ICLI.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: The PTF UA67900 for APAR OA41143 provides the ability to track the usage of ICLI on your systems. On pre-z/OS V2R1 systems, the operator command DISPLAY OPDATA,TRACKING shows the following tracking information for the ICLI servers 3.1I, 4.0B, 4.5B and 4.6D when these servers have been started on your system after you have activated the tracking facility through the SETCON TRACKING=ON command:

```
ICLI server for SAP 3.1I .... FOME31IS ...
ICLI server for SAP 4.0B .... FOME40BS ...
ICLI server for SAP 4.5B .... FOME45BS ...
ICLI server for SAP 4.6D .... FOME46DS ...
```

You can display the tracking information to determine if your system is using an ICLI server, and whether you will be affected by its planned removal in z/OS V2R1.

Reference information: *z/OS Planning for Installation.*

Ensure that your applications do not use removed z/OS UNIX APIs

Description: Before z/OS V2R1, certain z/OS UNIX application programming interfaces (APIs) were available. Starting in z/OS V2R1, they are no longer available.

Element or feature:	z/OS UNIX.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if your installation has C/C++ or Assembler language applications that explicitly invoke z/OS UNIX application programming interfaces.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.

Migration actions from z/OS V1R13: z/OS UNIX

System impacts:	This change does not affect the z/OS system itself but might cause applications or products other than z/OS to give erroneous results or behave unexpectedly.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Check three interfaces to see if the removed services are being used.

1. Scan the source code for use of the following z/OS UNIX application programming interfaces:
 - The `_osenv()` syscall
 - For Assembler language programs, search for BPX1OSE and BPX4OSE.
 - For C or C++ code, search for calls to the `_osenv()` service.
 - The `pthread_quiesce_and_get_np()` syscall
 - For Assembler language programs, search for BPX1PQG and BPX4PQG.
 - For C or C++ code, search for calls to the `pthread_quiesce_and_get_np()` service.
 - The `QUICK_FREEZE_EXIT_REG` option of `oe_env_np()`
 - For Assembler language programs, search for BPX1ENV and BPX4ENV.
 - There is no C/C++ interface that allows direct use of the `QUICK_FREEZE_EXIT_REG` option. If you find use of the BPX1ENV or BPX4ENV service, check whether the `QUICK_FREEZE_EXIT_REG` option is specified. If you do use this option, verify that you have code that invokes the `pthread_quiesce_and_get_np()` service (in XL C/C++) or calls BPX1PQG or BPX4PQG. If you do not have code that calls the `pthread_quiesce_and_get_np()` service, then you do not need to invoke the BPX1ENV or BPX4ENV service with the `QUICK_FREEZE_EXIT_REG` option. Remove that call from your application.
2. If your applications use any of these interfaces, update the applications to either eliminate the calls or handle the new return code and reason code that the removed interfaces will return.

Reference information: See the following information:

- *z/OS UNIX System Services Programming: Assembler Callable Services Reference*
- *z/OS XL C/C++ Runtime Library Reference*

Use the BPX.UNIQUE.USER profile instead of BPX.DEFAULT.USER

Description: Before z/OS V1R11, if the BPX.DEFAULT.USER profile in the FACILITY class was defined, users who accessed z/OS UNIX services who did not have an OMVS user or group segment were assigned the default OMVS segments for the length of the user session. All users of the default OMVS segments shared the same UID and GID. As of z/OS V1R11, if BPX.UNIQUE.USER has been defined, users who access z/OS UNIX services who do not have an OMVS user or group segment are automatically assigned an OMVS segment with a unique UID and GID. The new OMVS segments are added to the user and group profiles in the RACF database. As of z/OS V2R1 BPX.DEFAULT.USER has been removed.

Element or feature:	z/OS UNIX.
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Migration actions from z/OS V1R13: z/OS UNIX

When change was introduced:	z/OS V2R1. See IBM United States Software Announcement 211-007, dated February 15, 2011.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you use BPX.DEFAULT.USER profile in the FACILITY class.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	You need AIM Stage 3 to use the BPX.UNIQUE.USER profile. You can run the IRRIRA00 utility to determine the current AIM Stage in your RACF database and increase the level to AIM Stage 3.
System impacts:	None.
Related IBM Health Checker for z/OS check:	Use check ZOSMIGV2R1_DEFAULT_UNIX_ID introduced in APAR OA37164. This check determines if you are relying on assigning default z/OS UNIX identities for users without OMVS segments.

Steps to take: Follow the steps in *z/OS UNIX System Services Planning* to set up the BPX.UNIQUE.USER profile. If BPX.DEFAULT.USER has not been deleted, BPX.UNIQUE.USER takes precedence when default OMVS segments are used.

To remove the BPX.DEFAULT.USER profile, use the following RACF commands:

```
RDELETE FACILITY BPX.DEFAULT.USER  
SETROPTS RACLIST(FACILITY) REFRESH
```

RACF APAR OA42554 provides assistance with the conversion to BPX.UNIQUE.USER on z/OS V1R13 and z/OS V1R12. With this APAR you can model the user's home directory path by specifying &racuid in the model user's OMVS segment. Then, when the user's OMVS segment is automatically created, RACF will substitute the correct user ID. For more information on this capability, see the information in APAR OA42554.

Reference information:

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

Accommodate the new Shell and Utilities version of the zlsnf utility

Description: Before z/OS V2R1, the **zlsnf** utility was obtained from the Tools and Toys section of the z/OS UNIX website. Starting in z/OS V2R1, Shell and Utilities support of the **zlsnf** utility has been added. The supported version differs from the Tools and Toys version in a number of ways. For example, the new **zlsnf** version includes support for displaying file lock holders and waiters when the byte range lock manager is used.:

Migration actions from z/OS V1R13: z/OS UNIX

Element or feature:	z/OS UNIX.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you currently use the Tools and Toys version of the z1sof utility.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Look for current use of the Tools and Toys version of **z1sof**. If there is no current use of the Tools and Toys version of **z1sof**, then no actions or changes are required.

If there is current usage of the Tools and Toys version of **z1sof**, determine if the command is in `/bin`, or in another directory. Also, determine if you want to preserve the Tools and Toys version in addition to the officially shipped version. Note that **z1sof** can also reside in data sets where rexx execs can be run.

1. If you want to preserve the Tools and Toys version, ensure that you save it into a directory that z/OS V2R1 will not install into. z/OS V2R1 provides **z1sof** in the `/bin` directory.
2. If you do not want to preserve the Tools and Toys version and it is in `/bin`, then the installation of z/OS V2R1 automatically replaces the Tools and Toys version with the new officially supported version. If the Tools and Toys version is not in `/bin`, remove it from its current location.

Reference information: For details about the **z1sof** command, see *z/OS UNIX System Services Command Reference*

Migrate from HFS file systems to zFS file systems

Description: Before z/OS V1R7, the HFS file system was the primary hierarchical file system. As of z/OS V1R7, you can use any combination of HFS and zFS file systems. Because zFS has higher performance characteristics than HFS and is the strategic file system, you should migrate your HFS file systems to zFS.

The HFS and zFS file system types in mount statements and command operands are now generic file system types that can mean either HFS or zFS. Based on the data set type, the system will determine which is appropriate. But note that you must still specify a type (HFS or zFS and it cannot be defaulted), and if the type you specify is not correct for the file system being mounted, any associated parameter string setting in the mount statement or command is ignored, even though the system sets the type correctly and processes the mount.

Element or feature:	z/OS UNIX.
When change was introduced:	z/OS Distributed File Service became the strategic file system in z/OS V1R7.

Migration actions from z/OS V1R13: z/OS UNIX

Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	No, but recommended because the action is planned to become a requirement in a future release. zFS is the strategic file system for z/OS UNIX and continues to be enhanced to provide superior performance, reliability, and data integrity. z/OS V2R1 will support HFS file systems.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	<ul style="list-style-type: none"> • Understand the zFS recommendations and limits. For more information, see "Minimum and maximum file sizes" in <i>z/OS Distributed File Service zFS Administration</i> • The DDNAME() keyword of the BPXPRMxx ROOT and MOUNT statements is not supported by zFS. Use the FILESYSTEM(<i>name</i>) keyword instead.
System impacts:	None.
Related IBM Health Checker for z/OS check:	Use check USS_HFS_DETECTED to verify all file systems mounted. This check issues exception message BPXH068E if any HFS file systems are found.

Steps to take: Follow these steps:

1. Before beginning the migration, do the following:

- Establish backout procedures.
- Decide on naming conventions.
- Decide on unavailability.
- Understand any cloning or deployment changes required by zFS systems being linear data sets. Considerations would include any copy utility invocations, BPXPRMxx specifications for symbolics, and placement of zFS file systems on system volumes.

2. Perform the conversion from an HFS to zFS file system.

Tip: Use the BPXWH2Z tool to perform the conversion. It is an ISPF-based tool that migrates HFS file systems to zFS file systems. Using its panel interface, you can alter the space allocation, placement, SMS classes, and data set names. A HELP panel is provided. With this tool, you can:

- Migrate HFS file systems (both mounted and unmounted) to zFS file systems. If the HFS being migrated is mounted, the tool automatically unmounts it and then mounts the new zFS file system on its current mount point.
- Define zFS aggregates by default to be approximately the same size as the HFS. The new allocation size can also be increased or decreased. In z/OS V1R13, ZFS could require up to four times (4X) the space that HFS did;

Migration actions from z/OS V1R13: z/OS UNIX

therefore, for z/OS V2R1 be sure to allocate more space. See zFS:
Accommodate new DASD space requirements.

- Have the migration run in TSO/E foreground or UNIX background.

You can use the JCL sample ISPBTC in SYS1.SAMPLIB to invoke BPXWH2Z as an ISPF batch job. Before you run the job, read the **Notes** section. When you run BPXWH2Z on your z/OS system, make sure it uses that same z/OS level of the pax command. You can manually migrate from an HFS to zFS file system without using the tool. However, you would need to allocate and format the target zFS file systems.

You can use the JCL sample ISPBTC in SYS1.SAMPLIB to invoke BPXWH2Z as an ISPF batch job. Before you run the job, read the notes section. When you run BPXWH2Z on your z/OS V1R13 system, it uses the z/OS V1R13 level of the pax command. This level was enhanced in z/OS V1R7 for sparse file support and other characteristics that are of concern when migrating from an HFS to zFS file system. You can manually migrate from an HFS to zFS file system without using the tool. However, you would need to allocate and format the target zFS file systems.

Requirement: The BPXWH2Z tool requires the zFS address space to be operational. Therefore, before attempting to migrate existing HFS to zFS file systems using BPXWH2Z, make sure that the zFS address space has been successfully configured and initialized.

Tip: You can dynamically migrate the HFS sysplex root in a shared file system configuration to zFS while the root is in use, without disrupting workloads. Although the shared file system configuration is required, the sysplex can be a single system. For the steps involved in migrating the sysplex root file system from HFS to zFS, see **Migrating the sysplex root file system from HFS to zFS after IPLing z/OS V1R12**.

3. Change policies and scripts, and so forth, to reflect the change from the HFS file system to zFS file system. Use the RMF Monitor III option to report on zFS activity. Refer to migration action "Monitor the zFS file system activity" for information on gathering zFS activity in RMF Monitor III.

Tip: Use the RMF Monitor III option to report on zFS activity.

Note: Beginning in z/OS V2R1, the default of RMF Monitor III option was changed to NOZFS. So, you need to explicitly specify ZFS option.

4. The DDNAME(name) keyword of the BPXPRMxx ROOT and MOUNT statements is not supported by zFS. If you use them, change these statements to use the FILESYSTEM(name) keyword instead.

Migrating the sysplex root file system from HFS to zFS after IPLing z/OS V1R12:

Before you begin the migration:

- Ensure that the following requirements have been met:
 - All systems in the sysplex are at the V1R12 level.
 - The current sysplex root file system PFS, and the new sysplex root file system PFS, are up in all the systems in shared file system configuration.
- Be aware of the following restrictions:
 - The current sysplex root file system must be mounted as a read-only file system.

- The systems that do not meet the requirements for this migration action cannot join the sysplex during the sysplex root file system migration processing, but they can join the sysplex after the sysplex root migration has completed.
- The current sysplex root and the new sysplex root must be either HFS or zFS in any combination. If the new sysplex root is zFS, then it must be HFS-compatible.
- The sysplex root or any directories on it cannot have been exported by the DFS or SMB server.
- Note the following:
 - Remote NFS mounts of the sysplex root or any directories on it are considered active use of the current sysplex root file system.
 - During the migration, the new zFS sysplex root file system must not be HSM-migrated, mounted, or in use.
 - Mount parameters are preserved during the migration or replacement of the sysplex root file system of the same file system type (PFS). They are dropped if the file system type is different.
 - Directories, data, files, and links are not copied from one file system to another.

Perform the migration as follows:

1. Ensure that a file system has been mounted read-only as the current sysplex root file system. When the root is mounted read-only, there are no function-shipping clients as long as physical paths to the DASD are available to each system. To verify that there are no function-shipping clients, issue:
`D OMVS,F,NAME=root_file_system_name`

You should see CLIENT=N on each system.

2. Allocate and set up the new zFS sysplex root file system:
 - a. Create a new zFS file system to be used as the new sysplex root file system. *z/OS Distributed File Service zFS Administration* discusses creating and managing zFS file systems.

Rules:

- The UID, GID and the permission bits of the root directory in the new sysplex root file system must be same as the root directory in the current sysplex root file system.
 - If the SECLABEL class is active and the MLFSOBJ option is active, the security label for the new zFS file system must match the assumed security label of the current sysplex root file system.
- b. On the new sysplex root file system, set up the active mount points and the symbolic links. The mount points and symbolic links must be the same as the ones on the current sysplex root file system. You can set them up either (1) manually or (2) by using the **pax** shell command to populate the new sysplex root file system using the existing sysplex root as a source. To do it manually, create a mount point in the existing sysplex root (for example, /newroot) and mount the new sysplex root file system in the MODE(RDWR) on that mount point. After mounting the new sysplex root file system, manually issue MKDIRs and ln -s to create the mount point directories and symbolic links similar to the existing sysplex root file system. Note that the new sysplex root file system must contain all active mount points and symbolic links exactly as on the existing sysplex root file system.

Migration actions from z/OS V1R13: z/OS UNIX

- c. Use the **pax** shell command to populate the new file system, using the existing sysplex root as a source.

Example:

```
cd /  
pax -wr -pe -XCM ./ /newroot
```

For more information about using **pax** to copy data from an HFS file system to a zFS file system, see *z/OS Distributed File Service zFS Administration*.

- d. Unmount the new zFS file system.
3. On any system in the shared file system configuration, issue:

```
F OMVS,NEWROOT=new.root.file.system.name,COND=<Yes|No>
```

YES Proceed conditionally. The system checks for active usage in the current sysplex root file system and reports the active usage in a BPXF245I message. If file activity is found, the command fails with EBUSY return code and JrActivityFound reason code. If file activity is not found, the command continues processing to replace the sysplex root. YES is the default.

NO Proceed unconditionally. The system checks for active usage in the current sysplex root file system and reports the active usage in a BPXF245I message. Replacement of the sysplex root file system will continue.

The migration of the sysplex root file system will begin. During the migration, active connections to files and directories in the current sysplex root file system are broken.

After the migration completes:

- The root CWD('/') is updated on all systems in the sysplex to point to the new sysplex root file system.
 - New opens go to the new sysplex root file system. The current sysplex root for the root directory is replaced for all processes in all systems. The current directory for root directory is replaced for any processes using it
 - Old connections in the previous sysplex root file system might get EIO errors.
4. Update the TYPE parameter and name of the sysplex root file system in the BPXPRMxx member of SYS1.PARMLIB. Because the DDNAME() keyword of the BPXPRMxx ROOT and CMOUNT statements is not supported by zFS, change these statements to use the FILESYSTEM(name) keyword instead.

Reference information: v

- For more information about the HFS and zFS file systems, see *z/OS UNIX System Services Command Reference*.
- To read about setting up zFS, see *z/OS Distributed File Service zFS Administration*.
- For information about the **pax** command, see *z/OS UNIX System Services Command Reference*.

z/OS UNIX actions to perform before the first IPL of z/OS V2R1

This topic describes z/OS UNIX migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

Update applications that use SMF type 92 subtype 11 close records

Description: Before z/OS V2R1, SMF type 92, subtype 11 close records were written when sockets or character special records were closed. Sockets and character special files have very high close rates and do not provide useful information in determining how often files and directories are used. Starting in z/OS V2R1, they are written as subtype 16 close records instead. The sockets and character special file close records will no longer appear in type 92 subtype 11 records. Instead, you need to include type 92 subtype 16 records in the SMFPRMxx parmlib member to collect them.

Element or feature:	z/OS UNIX.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL z/OS V2R1.
Is the migration action required?	Yes, if you want continue to get close records for sockets and character special files.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

1. Determine whether you have applications that use SMF type 92 subtype 11 close records. For those applications, SMF92TYP is set to SMF92#CLOSE (11) for subtype 11. SMF92CTY is set to FT_SOCKET (7) for sockets and FT_CHARSPEC (2) for character special files.
2. Change the application to look at subtype 16 records. SMF92TYP will be set to SMF92#CLSSOCCHARSPEC (16).

Reference information: See the following information:

- *z/OS UNIX System Services Planning*

Determine if any sticky bit files or external links in your z/OS UNIX file system are involved with link-edited MVS programs with AC=1 (Part 1 before the first IPL of V2R1)

Description: Starting in z/OS V2R1, the invocation requirements for MVS load library programs invoked through the z/OS UNIX spawn, exec and attach_exec services have changed. These changes apply to the invocation of MVS programs link-edited AC=1 found in an APF-authorized library and for MVS load library programs that are to run as a z/OS UNIX set-user-id or set-group-id program. The following list describes the changes:

- If the z/OS UNIX *pathname* that is supplied to spawn, exec or attach_exec represents an external link that resolves to an MVS program found in an APF-authorized library and link-edited with the AC=1 attribute, the external link must have an owning UID of 0 and not be found in a file system that is mounted as NOSECURITY to allow this type of invocation.

Migration actions from z/OS V1R13: z/OS UNIX

- If the z/OS UNIX *pathname* that is supplied to spawn, exec, or attach_exec represents a regular file with the sticky bit attribute that resolves to an MVS program found in an APF-authorized library and link-edited with the AC=1 attribute, the sticky bit file must have an owning UID of 0 or have the APF extended attribute turned on to allow this type of invocation. Additionally, the sticky bit file must not be found in a file system that is mounted as NOSECURITY to allow this type of invocation.
- If the z/OS UNIX *pathname* that supplied to spawn, exec or attach_exec represents a symbolic link to a regular file with the sticky bit attribute and the sticky bit file has the set-user-id attribute, the symbolic link must have an owning UID of 0 or an owning UID equal to that of the sticky bit file. If the sticky bit file has the set-group-id attribute, the symbolic link must have an owning UID of 0 or an owning GID equal to that of the sticky bit file. Additionally, the symbolic link must not be found in a file system that is mounted as NOSECURITY to allow this type of invocation.

Element or feature:	z/OS UNIX.
When change was introduced:	z/OS V1R13 and z/OS V1R12, both with APAR OA41101.
Applies to migration from:	z/OS V1R13 and z/OS V1R12 both without APAR OA41101 applied.
Timing:	Before the first IPL of V2R1. (For steps to take after the first IPL of z/OS V2R1, see “Determine if any sticky bit files or external links in your z/OS UNIX file system are involved in the invocation of MVS programs that are link-edited with the AC=1 attribute (Part 2 after IPL of z/OS V2R1)” on page 233.)
Is the migration action required?	No, but recommended even though most, if not all, IBM and vendor products install their executable files into the z/OS UNIX file system with an owning UID of 0, so few, if any, executable files on a customer system should have a problem.
Target system hardware requirements:	None.
Target system software requirements:	See Steps to take .
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take before the first IPL: If you are migrating a z/OS system from z/OS V1R12 or z/OS V1R13 with APAR OA41101 installed, then no migration actions need to be taken. In this case, it is assumed that you have taken all required actions related to this APAR. Also see the documentation APAR OA41490.

If you are migrating from a z/OS system that does not have OA41101 installed and use the following IBM products, then you should ensure that you have the latest service levels and have followed the most recent install documentation for these IBM products:

Migration actions from z/OS V1R13: z/OS UNIX

- IBM z/OS Problem Determination Tools File Manager Software V10 (see Doc APAR PM81080)
- IBM z/OS Problem Determination Tools File Manager Software V11.1.0 with upgrade subset HADLB10 (ensure that PTF UK91613 is installed)
- IBM z/OS Problem Determination Tools Common Component Software V1.6.0 with upgrade subset HVWR160 (ensure that PTF UK91612 is installed)
- IBM InfoSphere Data Replication (see Doc APAR PM81306)
- IBM Security zSecure Suite (See Technote 1625364)
- IBM Tivoli Security Information and Event Manager (see Technote 1626384)

You may have to change the installation of some z/OS UNIX files and links provided by these products.

Otherwise, if you follow the standard install process for z/OS UNIX software, then you should not need to make any further changes related to APAR OA41101.

Exceptions to this would be:

- If you installed z/OS UNIX sticky bit files, symbolic links or external links for any of your own software without using SMP/E
- If you installed any IBM or other vendor provided z/OS UNIX sticky bit files, symbolic links or external links outside the normal SMP/E install process
- If you installed z/OS UNIX software using SMP/E from a user that is not running with UID 0 and is not permitted to BPX.SUPERUSER

If any of these exceptions exist on your system, then you might have to change the installation of these files and links. To identify all the sticky bit files, symbolic links and external links that need to change, you need to IPL with z/OS V2R1 installed. If any of these files or links are executed, you will then start seeing EC6-xxxxC04A abends along with message BPXP028I in the system log, which identifies the files or links that must be changed. You can then use the documentation for message BPXP028I to correct the files or links that are installed improperly. For more information about message BPXP028I, see *z/OS MVS System Messages, Vol 3 (ASB-BPX)*.

For steps to take after the first IPL, see “Determine if any sticky bit files or external links in your z/OS UNIX file system are involved in the invocation of MVS programs that are link-edited with the AC=1 attribute (Part 2 after IPL of z/OS V2R1)” on page 233.

Reference information: *z/OS UNIX System Services Command Reference*.

Determine whether any of your installed products include z/OS UNIX set-user-ID or set-group-ID privileged programs that invoke other z/OS UNIX executable programs

Description: Starting in z/OS V2R1, the requirements for the execution or loading of z/OS UNIX executable programs through the z/OS UNIX spawn, exec, loadhfs, loadhfs extended and attach_exec services and the REXX external subroutine and function processing have changed. These changes apply only to the usage of these interfaces by z/OS UNIX set-user-ID or set-group-ID privileged programs. A set-user-ID or set-group-ID privileged program is installed in the z/OS UNIX file system with either the set-user-ID or set-group-ID bit turned on.

The affected interfaces, when invoked from a z/OS UNIX set-user-ID or set-group-ID privileged program, now require that a target z/OS UNIX program file have a file owning UID of 0 or a file owning UID that is equal to that of the

Migration actions from z/OS V1R13: z/OS UNIX

set-user-ID program, or have the program control extended attribute turned ON. Additionally, the target z/OS UNIX program file cannot be located in a NoSecurity file system. If any part of the z/OS UNIX path name that resolves to the target z/OS UNIX program file is a symbolic link, the symbolic link also must meet the same requirements.

Element or feature:	z/OS UNIX.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL and after the first IPL.
Is the migration action required?	No, but recommended even though most, if not all, IBM and vendor products install their z/OS UNIX executable files and associated links into the z/OS UNIX file system with an owning UID of 0.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Before you begin, note that the standard IBM product installation process (SMP/E) installs all product-related files and links with an owning UID of 0 with the possible exception of set-user-id program files.

z/OS UNIX actions to take before the first IPL of z/OS V2R1

- If you are migrating a z/OS system from z/OS V1R12 or z/OS V1R13 with APAR OA42093 installed, then no migration actions need to be taken. In this case, it is assumed that you have taken all required actions related to this APAR.
- If you are migrating from a z/OS system that does not have OA42093 installed and use the following IBM products, then you should ensure that you have the latest service levels and have followed the most recent install documentation for these IBM products:
 1. IBM Infoprint Transforms to AFP for z/OS (Insure APAR OA42691 is installed)

Otherwise, if you follow the standard install process for z/OS UNIX software, then you should not need to make any further changes related to APAR OA42093. Exceptions to this would be:

- If you installed z/OS UNIX executable files and associated symbolic links without using SMP/E.
- If you installed any IBM or other vendor provided z/OS UNIX executable files and associated symbolic links outside the normal SMP/E install process.
- If you installed z/OS UNIX software using SMP/E from a user that is not running with UID 0 and is not permitted to BPX.SUPERUSER.

If any of these exceptions exist on your system, then you might have to change the installation of these files and links. To identify all z/OS executable files and associated symbolic links that need to change, you need to IPL with z/OS V2R1

installed. If any of these files or links are executed, you will then start seeing EC6-xxxxE04B abends along with message BPXP029I in the system log, which identifies the files or links that must be changed. You can then use the documentation for message BPXP029I to correct the files or links that are installed improperly. For more information about message BPXP029I, see *z/OS MVS System Messages, Vol 3 (ASB-BPX)*.

z/OS UNIX actions to perform after the first IPL of z/OS V2R1

If you see EC6-xxxxE04B abends occurring, look for message BPXP029I in the system log to determine the details of the z/OS UNIX files or links involved with the errors and how to correct the problem. This abend is indicative of an attempt to execute, call or load an improperly installed z/OS UNIX executable program file. For more information about message BPXP029I, see *z/OS MVS System Messages, Vol 3 (ASB-BPX)*.

Reference information: See the following information:

- *z/OS UNIX System Services Programming: Assembler Callable Services Reference*
- *z/OS Using REXX and z/OS UNIX System Services*
- *z/OS MVS System Commands*
- *z/OS MVS System Messages, Vol 3 (ASB-BPX)*

z/OS UNIX actions to perform after the first IPL of z/OS V2R1

This topic describes z/OS UNIX migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

Determine if any sticky bit files or external links in your z/OS UNIX file system are involved in the invocation of MVS programs that are link-edited with the AC=1 attribute (Part 2 after IPL of z/OS V2R1)

Description: Starting in z/OS V2R1, the invocation requirements for MVS load library programs invoked through the z/OS UNIX spawn, exec and attach_exec services have changed. These changes apply to the invocation of MVS programs link-edited AC=1 found in an APF-authorized library and for MVS load library programs that are to run as a z/OS UNIX set-user-id or set-group-id program. The following list describes the changes:

- If the z/OS UNIX *pathname* that is supplied to spawn, exec or attach_exec represents an external link that resolves to an MVS program found in an APF-authorized library and link-edited with the AC=1 attribute, the external link must have an owning UID of 0 and not be found in a file system that is mounted as NOSECURITY to allow this type of invocation.
- If the z/OS UNIX *pathname* that is supplied to spawn, exec, or attach_exec represents a regular file with the sticky bit attribute that resolves to an MVS program found in an APF-authorized library and link-edited with the AC=1 attribute, the sticky bit file must have an owning UID of 0 or have the APF extended attribute turned on to allow this type of invocation. Additionally, the sticky bit file must not be found in a file system that is mounted as NOSECURITY to allow this type of invocation.
- If the z/OS UNIX *pathname* that supplied to spawn, exec or attach_exec represents a symbolic link to a regular file with the sticky bit attribute and the sticky bit file has the set-user-id attribute, the symbolic link must have an owning UID of 0 or an owning UID equal to that of the sticky bit file. If the sticky bit file has the set-group-id attribute, the symbolic link must have an owning UID of 0 or an owning GID equal to that of the sticky bit file.

Migration actions from z/OS V1R13: z/OS UNIX

Additionally, the symbolic link must not be found in a file system that is mounted as NOSECURITY to allow this type of invocation.

Element or feature:	z/OS UNIX.
When change was introduced:	z/OS V1R13 and z/OS V1R12, both with APAR OA41101.
Applies to migration from:	z/OS V1R13 and z/OS V1R12, both without APAR OA41101 applied.
Timing:	After the first IPL of z/OS V2R1. (For steps to take before the first IPL, see “Determine if any sticky bit files or external links in your z/OS UNIX file system are involved with link-edited MVS programs with AC=1 (Part 1 before the first IPL of V2R1)” on page 229).
Is the migration action required?	No, but recommended even though most, if not all, IBM and vendor products install their executable files into the z/OS UNIX file system with an owning UID of 0, so few, if any, executable files on a customer system should have a problem.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take after the first IPL: If you see EC6-xxxxC04A abends occurring, look for message BXP028I in the system log to determine the details of the z/OS UNIX files or links and MVS programs involved with the errors and how to correct the problem. This abend is indicative of an attempt to execute an improperly installed z/OS UNIX sticky bit file, symbolic link or external link that resolves to a MVS program. For more information about message BXP028I, see *z/OS MVS System Messages, Vol 3 (ASB-BPX)*.

For **Steps to take before the first IPL**, see “Determine if any sticky bit files or external links in your z/OS UNIX file system are involved with link-edited MVS programs with AC=1 (Part 1 before the first IPL of V2R1)” on page 229.

Reference information: *z/OS UNIX System Services Command Reference*.

Determine whether any of your installed products include z/OS UNIX set-user-ID or set-group-ID privileged programs that invoke other z/OS UNIX executable programs

Description: Starting in z/OS V2R1, the requirements for the execution or loading of z/OS UNIX executable programs via the z/OS UNIX spawn, exec, loadhfs, loadhfs extended and attach_exec services and the REXX external subroutine and function processing have changed. These changes apply only to the usage of these interfaces by z/OS UNIX set-user-ID or set-group-ID privileged programs. A set-user-ID or set-group-ID privileged program is installed in the z/OS UNIX file system with either the set-user-ID or set-group-ID bit turned on.

The affected interfaces, when invoked from a z/OS UNIX set-user-ID or set-group-ID privileged program, now require that a target z/OS UNIX program file have a file owning UID of 0 or a file owning UID that is equal to that of the set-user-ID program, or have the program control extended attribute turned ON. Additionally, the target z/OS UNIX program file cannot be located in a NoSecurity file system. If any part of the z/OS UNIX path name that resolves to the target z/OS UNIX program file is a symbolic link, the symbolic link also must meet the same requirements.

For complete migration actions including action before and after the first IPL, see “Determine if any sticky bit files or external links in your z/OS UNIX file system are involved in the invocation of MVS programs that are link-edited with the AC=1 attribute (Part 2 after IPL of z/OS V2R1)” on page 233 and “Determine if any sticky bit files or external links in your z/OS UNIX file system are involved in the invocation of MVS programs that are link-edited with the AC=1 attribute (Part 2 after IPL of z/OS V2R1)” on page 233.

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Migration actions from z/OS V1R12: General

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Chapter 4 describes those actions for anyone who is migrating from z/OS V1R12.

Sysplex migration actions

This topic summarizes actions for you to take if you are migrating systems that are members of a base sysplex or Parallel Sysplex configuration.

Sysplex actions related to hardware upgrades

Title of migration action	Page or topic
“Update your CFRM policy with coupling facility structure size changes” on page 87	“Update your CFRM policy with coupling facility structure size changes” on page 87
“Migrate to an IBM zEnterprise EC12 server or IBM zEnterprise BC12 server” on page 41	“Migrate to an IBM zEnterprise EC12 server or IBM zEnterprise BC12 server” on page 41
“Migrate to an IBM zEnterprise z196 or z114 server” on page 57	“Migrate to an IBM zEnterprise z196 or z114 server” on page 57
“Migrate to a System z10 server” on page 74	“Migrate to a System z10 server” on page 74

Sysplex actions to perform before installing z/OS V2R1

Element or feature	Title of migration action	Page or topic
Multiple	“Install coexistence and fallback PTFs” on page 9	“Install coexistence and fallback PTFs” on page 9
DFSMSdftp	“DFSMSdftp: Back up SMS control data sets” on page 341	“DFSMSdftp: Back up SMS control data sets” on page 341
Distributed File Service	“zFS: Ensure sysplex=filesys is available on all zFS R11 and R12 systems in a shared file system environment” on page 378	“zFS: Ensure sysplex=filesys is available on all zFS R11 and R12 systems in a shared file system environment” on page 378

Sysplex actions to perform before the first IPL of z/OS V2R1

None.

Element or feature	Title of migration action	Page or topic
BCP	"Change value for ARM restart processing" on page 279	"Change value for ARM restart processing" on page 279
BCP	"Modify automation that references output from D XCF,SYSPLEX console commands" on page 272	"Modify automation that references output from D XCF,SYSPLEX console commands" on page 272
BCP	"Accommodate OPERLOG EMCS console name change" on page 278	"Accommodate OPERLOG EMCS console name change" on page 278
JES3	"Avoid redundant *S main,FLUSH command in response to XCF messages" on page 403	"Avoid redundant *S main,FLUSH command in response to XCF messages" on page 403

Sysplex actions to perform after the first IPL of z/OS V2R1

None.

Element or feature	Title of migration action	Page or topic
BCP	"Migrate to GRS-managed FICON CTCs" on page 283	"Migrate to GRS-managed FICON CTCs" on page 283
SDSF	"Update configuration for sysplex support" on page 426	"Update configuration for sysplex support" on page 426

BCP migration actions

This topic describes migration actions for the base element BCP (Base Control Program).

BCP actions to perform before installing z/OS V2R1

This topic describes BCP migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

Evaluate your stand-alone dump data set allocations and your IPCS processing of them

Description: As your applications grow in size and use ever greater amounts of storage, you should evaluate whether the DASD allocated for your stand-alone dump data continues to be adequate.

In z/OS V1R6, support was introduced for extended-format sequential data sets, a form of data set that is SMS-managed and can occupy more than 64 K tracks per volume. In z/OS V1R7, this support was supplemented with support for large format sequential data sets (DSNTYPE=LARGE), a form of data set that is essentially the same as conventional sequential data sets except that more than 64 K tracks may be spanned per volume. If your stand-alone dump data sets are spread over more volumes than you want, both types of support can help you gain better control over the number of volumes used for each stand-alone dump data set.

Element or feature:	BCP.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	No, but recommended because of changes that have been made to stand-alone dump processing (that reorder dump records with the intent of recording more important data early), and especially recommended if you deploy any LPARs with significantly more main storage than previously used.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

- Use multivolume stand-alone dump data sets. Adjust the number of volumes and their separation to achieve tolerable stand-alone dump capture times.
- Use extended-format sequential data sets or large format sequential data sets. Copy their contents to an extended-format, compressed, striped data set using the IPCS COPYDUMP subcommand before analysis. Use the same or a larger striping factor than you used for your stand-alone dump data sets. Dump data sets to which stand-alone dump can write may be neither compressed nor striped, but both attributes are advantageous for the target of the copy

operation. Starting with z/OS V1R12, stand-alone dump data sets can be placed in track-managed space as well as cylinder-managed space on Extended Address Volumes (EAV).

- Use a large CISIZE and striping for IPCS dump directories, and use blocking, striping, and compression for the stand-alone dump data set. Very large stand-alone dumps might require that you define your directory with the extended addressing attribute, allowing it to hold more than 4 GB.

Tips: Control interval sizes less than 24K have been shown to be more vulnerable to fragmentation when used as IPCS dump directories, and IPCS performance can be degraded when such fragmentation occurs. In this background, warning message BLS21110I will be issued and you might recreate the DDIR by using the CLIST BLSCDDIR.

BLS21110I CISIZE(cisize) is less than 24K. It may degrade IPCS performance

Reference information: The following are references:

- For information about dump data set allocation, extended-format sequential data sets, large format sequential data sets, and multivolume dump data sets, see *z/OS MVS Diagnosis: Tools and Service Aids*.
- For stand-alone dump best practices, see *z/OS Problem Management*.

Plan to move from SHARED mode to DISTRIBUTED mode for consoles

Description: The release following z/OS V2R1 is planned to be the last release in which the consoles component will support SHARED mode. IBM recommends that you migrate to DISTRIBUTED mode, which was introduced in z/OS V1R10.

Element or feature:	BCP
When change was introduced:	Planned for the release following z/OS V2R1, as previewed in Statement of direction: IBM z/OS IBM United States Software Announcement 212-086 April 11, 2012.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	No, but recommended if you are using SHARED console mode. When shared mode is removed, you are required to move to DISTRIBUTED mode.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	There are fallback considerations in moving from DISTRIBUTED to SHARED mode. See "Migration and fallback considerations" in <i>z/OS MVS Planning: Operations</i> .
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Move from SHARED mode to DISTRIBUTED mode for your console environment. Note that the default switched from SHARED to DISTRIBUTED mode in z/OS V1R13.

Migration actions from z/OS V1R12: BCP

Reference information: See *Statement of direction: IBM z/OS IBM United States Software Announcement 212-086 April 11, 2012*. For distributed mode, see *z/OS MVS Planning: Operations*.

Make accommodations for RACROUTE AUTH check for SLIP command

Description: As of z/OS V2R1, a RACROUTE AUTH check is now performed for a SLIP command that is issued with action of REFAFTER or REFBEFOR. This change might affect your installation, depending on the security product you are using.

Element or feature:	BCP
When change was introduced:	z/OS V2R1
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you are use a SLIP command with Action of REFAFTER or REFBEFOR and are using a security product that is affected by the additional RACROUTE AUTH check.
Target system hardware requirements:	See Steps to take .
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: If you use the z/OS RACF security product, there is no action to take. If you use another security product, contact your vendor to see if there is any support or changes that you need to make.

Reference information: *z/OS MVS System Commands*

Update Capacity Provisioning Manager parameters to use CIM Client for Java Version 2

Description: z/OS V2R1 is planned to be the last release to include Version 1 of the Standards Based Linux Instrumentation for Manageability (SBLIM) CIM client for Java. Version 1 support for SourceForge open source project was discontinued in 2010. Version 2 of the SBLIM client, which is designed to be a JSR48-compliant implementation, is included in z/OS V1R13 and planned to be included in z/OS V2R1. IBM recommends that users of SBLIM Version 1 convert to Version 2.

Element or feature:	BCP.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	No, but recommended because it is planned to be a requirement in the release after z/OS V2R1.
Target system hardware requirements:	None.

Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

1. The Provisioning Manager user CPOSRV needs READ access to CIM Client for Java Version 2 **sblim-cim-client.jar**. This access usually by default should be sufficient. If it is not, you must set the "other" READ access file permissions using the z/OS UNIX command **chmod** (for example, `chmod o+r/usr/lpp/wbem/jclient/sblim-cim-client2.jar`. Note that this command must be issued by a user with the appropriate authorization.
2. If your CIM installation directory is not at the default location, you need to add the location of the CIM Client for Java Version 2 **slim-cim-client2.jar** to the CLASSPATH entry., If you have already specified the location of a previous version of the CIM Client Java, you need to add the location of CIM Client for Java Version 2 before the location of the previous version of CIM Client for Java. the CLASSPATH is specified in the ENV member of the Provisioning Manager runtime environment data set with prefix.PARM. The prefix for the data set name is the high-level qualifier of the Capacity Provisioning Manager parameters data set and the name of the domain managed by the Capacity Provisioning Manager. For example, with default values, the data set name is CPO.DOMAIN1.PARM.

Reference information: For more information, see *z/OS MVS Capacity Provisioning User's Guide*.

Migrate from SNMP to z/OS BCPii for communication to the HMC or SE for z/OS Capacity Provisioning support

Description: As of z/OS V2R1 the Capacity Provisioning Manager no longer supports the System z API for communication with the Support Element (SE) or Hardware Management Console (HMC). The protocol used by System z API is based on IP network connection using SNMP. For z/OS V2R1 it is required to configure the Capacity Provisioning Manager for communication through the z/OS BCP Internal Interface (BCPii) protocol. The SE and HMC support for the System z API remain, and is not affected by this withdrawal of support for Capacity Provisioning. If you are currently using SNMP for the communication, it is required that you now migrate to BCPii. The migration includes enabling the communication through BCPii for the Provisioning Manager user and adding a new key to the Capacity Provisioning Manager parameter file.

Element or feature:	BCP.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you use the Windows-based Capacity Provisioning Control Center (CPCC) function.
Target system hardware requirements:	None.

Migration actions from z/OS V1R12: BCP

Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

- You can use the tracking facility to help with this migration action. In tracking facility output, look for violations that start with CPO-W:SNMP usage *domain name*, where *domain name* is replaced with the actual name of the affected domain. Exploit the z/OS tracking facility on z/OS V1R13 or z/OS V1R12 by installing the PTF for APAR OA35284. If you are using the tracking facility and have no instances of affected domains after starting Capacity Provisioning Manager, then this migration action is not applicable to you.
- Set up BCPii as described in *z/OS MVS Programming: Callable Services for High-Level Languages*.
- Define the required security profiles to allow the Capacity Provisioning Manager user to access the hardware information.
- Add the Topology.Protocol=INTERNAL key to the Capacity Provisioning Manager parameter file. Using the default values, the file is the member CPO.DOMAIN1.PARM(PARM).

Reference information: The following are references:

- For information about BCPii setup, see *z/OS MVS Programming: Callable Services for High-Level Languages*.
- For information about required security profile and how to define the new key to the Capacity Provisioning Manager parameters, see *z/OS MVS Capacity Provisioning User's Guide*.
- For information about using the tracking facility, see "Appendix A" *z/OS MVS Planning: Operations*.

Remove the REPORTCOMPLETIONS option from the IEAOPTxx member

Description: As of z/OS V1R13, the support for the REPORTCOMPLETIONS=YES|NO parameter in IEAOPTxx member of parmlib has been removed. This option was introduced with OA34801 (2010/11/24) and removed with OA35428 July 7, 2011. REPORTCOMPLETIONS=YES was intended to provide a system-wide option for installations with a single large production environment, where all regions were exempted from being managed towards response time goals and if you wanted to obtain response time statistics with different granularity through service and report classes. In all other cases the usage of this parameter was not recommended.

The REPORTCOMPLETIONS=YES option has been superseded by the "Manage Region Using Goal Of Both" option on the classification rule that allows to manage CICS Terminal Owning Regions (TORs) in a very granular way.

Element or feature:	BCP
When change was introduced:	z/OS V2R1, and with the PTF for APAR OA35428 on z/OS V1R13

Migration actions from z/OS V1R12: BCP

Applies to migration from:	z/OS V1R13 without the PTF for APAR OA34801 applied and z/OS V1R12 with the PTF for APAR OA34801 applied.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	No, but recommended to avoid the information message, if you ever used the REPORTCOMPLETIONS parameter.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: To clean up the IEAOPTxx parmlib member, remove the REPORTCOMPLETIONS.

You can still set the REPORTCOMPLETIONS option, but it is ignored with the following message:

```
IRA800I OPT MEMBER IEAOPTxx KEYWORD ReportCompletions IGNORED, NO LONGER USED
```

Reference information: For further information, see the documentation descriptions for APARs OA34801 and OA35428.

Move BCPii API calls into your application instead of in BCPii ENF exits

Description: As stated in various IBM publications, non-SRB ENF exits need to avoid time-consuming processing. Coding an HWIEVENT ENF exit to execute BCPii APIs may result in multiple problems, such as delays with BCPii event notification processing when BCPii services are simultaneously being invoked. Starting with z/OS V1R12 and later, BCPii enforces this restriction, and BCPii API calls made from within a BCPii ENF exit are now rejected with return code HWI_UNSUPPORTED_ENVIRONMENT.

Element or feature:	BCP.
When change was introduced:	z/OS V1R13 and z/OS V1R12, both with APAR OA37035.
Applies to migration from:	z/OS V1R13 and z/OS V1R12, both without the PTF for APAR OA37035 applied.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you have coded a BCPii API call from your ENF exit.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.

Migration actions from z/OS V1R12: BCP

System impacts:	BCPii API calls made from within a BCPii ENF exit are now rejected with return code HWI_UNSUPPORTED_ENVIRONMENT.
Related IBM Health Checker for z/OS check:	None.

Steps to take: If you have coded a BCPii API call from your ENF exit, move the BCPii API call into your application and have the BCPii ENF exit post the application when the event occurs. Your application program may now issue the BCPii API call from the user's thread.

For an example of how to code a BCPii ENF exit, see the sample ENF event exit HWIXMCX1 in SYS1.SAMPLIB.

Reference information: For additional information, see *z/OS MVS Programming: Callable Services for High-Level Languages*.

Update code that invokes the IOSSPOF macro in a PSW key of 0-7

Description: The IOSSPOF macro changed to conditionally obtain the returned SPOFAREA in a different subpool depending on the caller's PSW key. This may cause the caller, depending on their current PSW key, to be required to change to a different PSW key if they want to update the storage. In addition, certain PSW key callers can no longer rely on the storage automatically being freed when the task ends. The subpool number continues to be returned in the SPOFAREA_SUBPOOL so that it can be used when the storage is freed.

The specific changes are:

- Key 0-7 callers: The returned SPOFAREA mapped by IOSDSPOF is obtained in subpool 252, which is key 0 storage, non-fetch-protected, and is associated with the jobstep task.
- Key 8-15 callers: The returned SPOFAREA mapped by IOSDSPOF continues to be obtained in subpool 1, which is fetch-protected storage with a key equal to the TCB key and is associated with the issuing task.

The specific restrictions are:

- Key 0-7 callers cannot rely on the SPOFAREA storage automatically being freed when the task ends. The area must now be explicitly freed and the caller must meet the state, key, and APF-authorization requirements for freeing from subpool 252.
- Key 1-7 callers must change to Key 0 in order to update the returned SPOFAREA storage.
- Key 8-15 callers must be in the PSW key of the TCB in order to access the SPOFAREA storage.

Element or feature:	BCP.
When change was introduced:	z/OS V2R1, z/OS V1R13 and z/OS V1R12 all with APAR OA37035.
Applies to migration from:	z/OS V1R13 and z/OS V1R12 both without APAR OA37035 applied.
Timing:	Before installing z/OS V2R1.

Migration actions from z/OS V1R12: BCP

Is the migration action required?	Yes, if you have code that invokes the IOSSPOF macro in a PSW key of 0-7.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: For any program that invokes the IOSSPOF macro in a PSW key of 0-7, ensure the following restrictions are followed:

- Key 0-7 callers: Because the subpool used for the SPOFAREA has changed from being associated with the issuing task to being associated with the jobstep task, be sure to free the storage if your task is not the jobstep task. In addition, make sure your storage-free invocation meets the state, key, and APF-authorization requirements for freeing from subpool 252.
- Key 1-7 callers: If the program attempts to write to the returned SPOFAREA, the program must switch to key 0 to update the area.

Reference information: For additional information, see *z/OS MVS Programming: Authorized Assembler Services Reference EDT-IXG*.

Remove policies for the PFA_FRAMES_AND_SLOTS_USAGE check

Description: The PFA_FRAMES_AND_SLOTS_USAGE check no longer exists. Remove any policies you have in place for the PFA_FRAMES_AND_SLOTS_USAGE check.

Element or feature:	BCP
When change was introduced:	z/OS V2R1, and on z/OS V1R13 and z/OS V1R12 with APAR OA40065.
Applies to migration from:	z/OS V1R13 and z/OS V1R12 both without OA40065.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you have any policies in place for the PFA_FRAMES_AND_SLOTS_USAGE check.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	Failure to remove some types of customization for the PFA_FRAMES_AND_SLOTS_USAGE check results in error messages.
Related IBM Health Checker for z/OS check:	None.

Migration actions from z/OS V1R12: BCP

Steps to take: Remove all IBM Health Checker for z/OS policy and non-policy statements in HZSPRMxx that refer to the PFA_FRAMES_AND_SLOTS_USAGE check.

Reference information: *z/OS Problem Management*

Consider exploiting WARNUND for new IEASYSxx statements

Description: Starting in z/OS V1R13 (and rolled back to z/OS V1R12 and z/OS V1R11 in OA35929), you can specify the WARNUND statement in IEASYSxx. When used, this statement indicates that warning messages IEA660I and IEA321I are to be issued when undefined statements are encountered, rather than prompting for a correct statement. Usage of WARNUND can be particularly useful when specifying new parmlib options in IEASYSxx (such as the new IXGCNF and CATALOG system parameters which are introduced in z/OS V1R13), and allowing these new IEASYSxx specifications to be shared with pre-z/OS V2R1 systems.

Element or feature:	BCP.
When change was introduced:	z/OS V1R13, and rolled back to z/OS V1R12 and z/OS V1R11 with APAR OA35929.
Applies to migration from:	z/OS V1R12 without the PTF for APAR OA35929 applied.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	No, but recommended to assist in sharing IEASYSxx members between z/OS V2R1, and pre-z/OS V1R13 systems, when new enhancements in z/OS V2R1 are to be exploited.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	Ensure the PTF for APAR OA35929 is installed on all pre-z/OS V1R13 systems so that the WARNUND statement can be identified and processed correctly.
Restrictions:	Certain restrictions are identified when using WARNUND in IEASYSxx. See reference information.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

1. Install the PTF for APAR OA35929 on all pre-z/OS V1R13 systems. z/OS V1R13 has the support incorporated.
2. As you add new statements in IEASYSxx for functional exploitation and you wish to share those modified IEASYSxx members with pre-z/OS V2R1 systems, add **WARNUND** to the beginning of IEASYS00 in those pre-z/OS V2R1 systems as that will cover updates in all IEASYSxx members as that will cover updates in all IEASYSxx members. If you wish to only have WARNUND cover certain updates, place WARNUND just before those updates to limit the scope of its control.

Reference information: For information, see the following:

- *z/OS MVS System Messages, Vol 6 (GOS-IEA)*.
- *z/OS MVS Initialization and Tuning Reference*.
- Documentation in the PTFs for APAR OA35929.

Define DASD storage for Predictive Failure Analysis

Description: Before z/OS V1R13, Predictive Failure Analysis (PFA) did not document the requirement for additional DASD storage to accommodate check output. Starting with z/OS V1R13, *z/OS Problem Management* contains DASD requirements to ensure PFA has enough space to update and create files in the z/OS UNIX file system to store check output. In addition, because zFS no longer stores data in 1K fragments, zFS for z/OS V1R13 might need more DASD storage to store the same amount of data than was required in previous releases. For additional information about zFS requirements, see “zFS: Accommodate new DASD space requirements” on page 373.

Element or feature:	BCP.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	Before installing V2R1.
Is the migration action required?	Yes, if you use PFA.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Define additional DASD storage for PFA. The total space for the PFA file system for each LPAR depends on the release of z/OS you are running.

z/OS V1R12 (HBB7770)

200 cylinders primary; 50 cylinders secondary on a 3390 device.

z/OS V1R13 (HBB7780)

300 cylinders primary; 50 cylinders secondary on a 3390 device.

Reference information: For additional information and storage requirements for earlier z/OS releases, see "Steps for installing PFA" in *z/OS Problem Management*.

Verify that at least one blank follows all major keyword statements in CONSOLExx

Description: Before z/OS V1R13, you could specify INIT, DEFAULT, HARDCOPY and CONSOLE keyword statements without using a blank delimiter. This can cause a problem if other keywords are misplaced or misspelled. For example, if INTIDS(Y) is misspelled as INITIDS(Y), the parser considers this an INIT statement. This could result in a console not being defined correctly, or even having a system with no consoles after initialization except the system console.

Starting with z/OS V1R13, if you do not have a blank character after the four major keywords (INIT, DEFAULT, HARDCOPY, and CONSOLE), you will receive a

Migration actions from z/OS V1R12: BCP

syntax error during CONSOL xx parmlib processing indicated by message IEA195I or message IEA196I as shown in the example:

- IEA196I CONSOLM1 03E0: NAME REQUIRED FOR CONSOLE.
- IEA196I CONSOLM1 INIT: DUPLICATE SPECIFICATION IGNORED.
- IEA196I CONSOLM1 03E0: UNRECOGNIZED KEYWORD INITDS(Y) IGNORED.
- IEA196I CONSOLM1 03E0: UNRECOGNIZED KEYWORD INITDS(Y) IGNORED.
- IEA195I CONSOLM1 LINE1: UNRECOGNIZED STATEMENT TYPE IGNORED.
- IEA195I CONSOLM1 LINE1: UNRECOGNIZED STATEMENT TYPE IGNORED.

Also, if you do not have a blank after the major keywords INIT, DEFAULT, and HARDCOPY, the default values will be used. In the case of the major keyword, CONSOLE, you will be left with only the system console if all of your CONSOLE statements do not end with a blank characters.

Element or feature:	BCP.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	Before installing V2R1.
Is the migration action required?	Yes, if you do not have at least one blank after any of the four major keywords INIT, DEFAULT, HARDCOPY, and CONSOLE.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

1. Examine your CONSOL xx parmlib member to verify that you have at least one blank after all of your major keyword statements.
2. If, you do not have a blank, update your CONSOL xx parmlib member by entering one or more blanks between the major keyword statements and their associated keywords.

Reference information: For more information about the CONSOL xx parmlib member, see *z/OS MVS Initialization and Tuning Reference*.

Examine source for dynamic allocation callers that set the S99DSABA and S99ACUCB flags

Description: TIOTs and XTIOts contain entries for each DD statement allocated by either batch (JCL) or dynamic allocation. The TIOT is a below-the-line control block that contains contiguous DD entries, which allows for a sequential search. Because of limits on its size and structure, a TIOT can only accommodate a specific number of DD statements (for example, 3273 single unit DD statements for a TIOT size of 32k.)

To overcome this restriction, device allocation introduced XTIOts or extended TIOTs above the 16M line, but the support was limited to authorized dynamic allocation callers only because the authorized flag S99TIOEX had to be set in order to build XTIOts. Later, this restriction was relaxed when unauthorized dynamic

Migration actions from z/OS V1R12: BCP

allocation callers could request XTIOs by setting S99ACUCB; however, the ability to get an above-the-line data set association block (DSAB) that contains a pointer to the TIOs/ XTIOs was limited to requests by authorized callers only, because the S99DSABA flag (which can be set by authorized or unauthorized callers) is honored only if the authorized S99TIOEX flag also has been set.

In z/OS V1R12, the Basic Access Method (BAM) added support for XTIOs. Because it makes sense to allow unauthorized callers to get DSABs above the line, in z/OS V1R13, device allocation added support to build DSABs above the line when the S99DSABA bit flag is set and either S99ACUCB or S99TIOEX is also set. Thus, unauthorized users can fully utilize the virtual storage constraint relief (VSCR) capabilities provided by allocation and get the benefits of both the above-the-line DSABs and XTIOs.

If any unauthorized dynamic allocation caller indicates through S99DSABA that above-the-line DSABs are supported but encounters a programming error in the user code when referencing above-the-line DSABs, action is required. Before z/OS V1R13, if the dynamic allocation callers set the S99DSABA and S99ACUCB flags, allocation built below-the-line DSABs, scanned the below-the-line DSAB queue, and found them below the line. For z/OS V1R13, if dynamic allocation callers request above-the-line DSABs through S99DSABA and S99ACUCB, allocation builds above-the-line DSABs, scans the above-the-line DSAB queue, and finds them above the line. If the dynamic allocation callers have an existing programming error when they attempt to reference above-the-line DSABs, they will continue to encounter errors. If these dynamic allocation callers need to use below-the-line DSABs, they should not set the S99DSABA.

Element or feature:	BCP.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	Before installing V2R1.
Is the migration action required?	Yes, if you have unauthorized dynamic allocation callers that set the S99DSABA and S99ACUCB flags.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: For mission critical code, examine source for use of S99DSABA. If found, verify that field DSQDSABA is not used and that 4 byte (31 bit) pointers are used if the DSAB is accessed by the program itself.

Reference information: For details about S99DSABA and S99ACUCB, see z/OS *MVS Programming: Authorized Assembler Services Guide*.

Upgrade Java support for Capacity Provisioning

Description: Starting with z/OS V1R13, the Provisioning Manager component of Capacity Provisioning requires Java 2 V6.0. If the references in the ENV member of the Provisioning Manager parameters dataset specify the location of an earlier version of Java, you must update the LIBPATH environment variable.

Element or feature:	BCP.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	Before installing V2R1.
Is the migration action required?	Yes, if you use Capacity Provisioning.
Target system hardware requirements:	None.
Target system software requirements:	IBM 31-bit SDK for z/OS, Java 2 Technology Edition, V6 (5655-R31).
Other system (coexistence or fallback) requirements:	None
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

- Install IBM 31-bit SDK for z/OS, Java 2 Technology Edition, V6 (5655-R31).
- Change the LIBPATH variable in the ENV member of your Provisioning Manager PARM data set to point to the installation directories of your Java V6 installation. LIBPATH statement may look like:

```
LIBPATH=/usr/lib:/usr/lpp/java/J6.0/bin:usr/lpp/java/J6.0/bin/classic:
        /usr/lpp/cpo/lib
```

Reference information: For information about how to adapt the Provisioning Manager parameters, see *z/OS MVS Capacity Provisioning User's Guide*

Discontinue use of PGSER to protect and unprotect the READONLY nucleus

Description: Starting in z/OS V1R12, most of the READONLY nucleus is backed by 1 MB pages. This makes protecting or unprotecting the READONLY nucleus with the PGSER macro difficult because the macro can only handle virtual storage pages backed by 4 KB pages. Therefore, the PGSER macro is changed, with APAR OA33782, to no longer support requests to protect and unprotect the READONLY nucleus if it is backed by 1 MB pages.

Element or feature:	BCP.
When change was introduced:	z/OS V1R12 by APAR OA33782.
Applies to migration from:	z/OS V1R12 without APAR OA33782.
Timing:	Before installing V2R1.
Is the migration action required?	Yes, if you use the PGSER macro to protect or unprotect the READONLY nucleus.
Target system hardware requirements:	None.
Target system software requirements:	None.

Migration actions from z/OS V1R12: BCP

Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	Failure to discontinue use of PGSER to protect and unprotect READONLY nucleus that is backed by 1 MB pages will result in the ABEND18A reason codes indicated in "Steps to take".
Related IBM Health Checker for z/OS check:	None.

Steps to take: Do not use PGSER to protect or unprotect the READONLY nucleus when it is backed by 1 MB pages. Users requiring the modification of READONLY nucleus should use the DATOFF macro.

Failure to discontinue use of PGSER to protect and unprotect READONLY nucleus that is backed 1 MB pages will result in the following ABEND18A reason codes:

- FF070411– The caller issued a PGSER macro with the PROTECT parameter for virtual storage in the READONLY nucleus that is backed by 1 MB pages. This storage area cannot be specified with the PROTECT keyword.
- FF080411 – The caller issued a PGSER macro with the UNPROTECT parameter for virtual storage in the READONLY nucleus that is backed by 1 MB pages. This storage area cannot be specified with the UNPROTECT keyword.

Reference information: For detailed information about PGSER, see For detailed information about PGSER, see *z/OS MVS Programming: Authorized Assembler Services Reference LLA-SDU*.

BCP actions to perform before the first IPL of z/OS V2R1

This topic describes BCP migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

Create IPL text

Description: IPL text is bootstrap information required for IPL (such as the location of the nucleus library). You must create IPL text by running ICKDSF against the system residence volume.

Element or feature:	BCP.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.

Migration actions from z/OS V1R12: BCP

Related IBM Health Checker for z/OS check:	None.
---	-------

Steps to take: Update and run the IPLTEXT job to write a new copy of the IPL text. If you install z/OS with a ServerPac, an installation dialog job is provided to perform this action. If you install z/OS with a CBPDO, instructions to perform this action are provided in *z/OS Program Directory*.

Tip: With ICKDSF R17 APAR PM42057, a new parameter called REMOVEIPLTXT has been added to the REFORMAT command that allows you to remove IPL text from the volume.

Note: When the IPLTXTEXTIST parameter (which was introduced by ICKDSF R17 APAR PK16403) is specified with the REFORMAT command using the IPLDD parameter, WTOR message ICK21836D is suppressed if IPL text already exists.

Reference information: For a sample IPLTEXT job, see *z/OS Program Directory*. ServerPac provides a similar job for accomplishing this task; see *ServerPac: Installing Your Order*.

Review the list of WTORS in parmlib member AUTOR00

Description: In z/OS V1R12, the DDDEF'd PARMLIB provides an AUTOR00 member. This member should be found in your parmlib concatenation during IPL and will result in auto-reply processing being activated. If the WTORS listed in AUTOR00 are automated by your existing automation product, ensure that the replies in AUTOR00 are appropriate.

Element or feature:	BCP.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Examine the WTOR replies in the AUTOR00 parmlib member. If the replies or delay duration are not desirable, you can create a new AUTORxx parmlib member and make corresponding changes. Also compare the replies to what your automation product would reply to these WTORS. Make sure that the AUTOR00 replies are in accordance with the replies from your automation product. IBM does not recommend making updates to AUTOR00, because updates to AUTOR00 might be made by the service stream or in new z/OS releases.

Reference information: For information, see the following:

- For more information about the AUTORxx and IEASYSyy parmlib members, see *z/OS MVS Initialization and Tuning Reference*
- For planning for the contents of AUTOR00, see "Appendix B. AUTOR00 parmlib member" in *z/OS MVS Planning: Operations*.

Reassemble the stand-alone dump program

Description: The stand-alone dump program produces a dump of storage that is occupied by a system that failed or a stand-alone dump program that failed. You must reassemble the stand-alone dump program each release. Once the stand-alone dump program is properly created on a DASD residence volume, it resides in the SYS1.PAGEDUMP.Vvolser data set.

Element or feature:	BCP.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Reassemble the stand-alone dump program. If you install z/OS with a ServerPac, an installation dialog job is provided to perform this action. If you install z/OS with a CBPDO, instructions to perform this action are provided in *z/OS MVS Diagnosis: Tools and Service Aids*.

Reference information: For information, see the following:

- *ServerPac: Installing Your Order*
- *z/OS MVS Diagnosis: Tools and Service Aids*

Move from the console tracking facility to the Generic Tracker

Description: Before z/OS V2R1, the console tracking facility was used to track use of system functions; however, it had some limitations. Starting with z/OS V2R1, the console tracking facility is being replaced with a new enhanced Generic Tracker. As of z/OS V2R1, support for the console tracking facility parmlib member, CNIDTRxx, is no longer provided. The Generic Tracker accepts GTZPRMxx parmlib members, and a tool to convert CNIDTRxx to the Generic Tracker GTZPRMxx is also provided.

Element or feature:	BCP
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.

Migration actions from z/OS V1R12: BCP

Is the migration action required?	Yes, if you have started or customized the console tracking facility.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	It is assumed that the retired console tracking facility commands are typically issued manually and for diagnostic purposes only, not in any scripts or automation tools. The callable service CNZTRKR, compiled into executable programs, continues to be supported and the internal routing of any data passed to CNZTRKR and the Generic Tracker will be transparent to the existing CNZTRKR caller.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

- Replace the use of any console tracking facility commands. Use COMMNDxx, automation scripts, or manually enter the commands on the console command line with their corresponding Generic Tracker (GTZ) counterparts. You can use the following mapping as a quick reference:
 - Instead of using COMMNDxx to start the console tracking facility, use the new system parameter GTZ (in IEASYSxx) to specify a GTZPRMxx member that specifies the SETGTZ TRACKING=ON command.
 - Instead of the DISPLAY command, consider using utility GTZPRINT or a user-written program with the service GTZQUERY to retrieve, store, and process current tracking data.
 - Instead of SETCON TRACKING={ON | OFF}, use SETGTZ TRACKING={ON | OFF}
 - Instead of SETCON TRACKING=ONWITHABEND, use SETGTZ DEBUG(ACTION=ABEND...)
 - Instead of DISPLAY OPDATA,TRACKING, use DISPLAY GTZ command, the GTZPRINT tool, or the GTZQUERY macro service.
 - Instead of SET CNIDTR=xx, use SET GTZ=xx or system parameter GTZ in IEASYSxx
- Instead of having any SETGTZ commands in COMMNDxx, consider putting them into GTZPRMxx parmlib members. You can use the SET GTZ command or the GTZ system parameter in IEASYSxx to select and execute the content of those GTZPRMxx.
- For any new applications use macro GTZTRACK instead of macro CNZTRKR. Consider converting any existing use of CNZTRKR to GTZTRACK.
- Convert existing CNIDTRxx parmlib members to GTZPRMxx. See the sample GTZCNIDJ for how the GTZCNIDT conversion tool can help you automate this conversion.

Reference information: For information, see the following:

- For details about SETGTZ, SET GTZ, DISPLAY GTZ, see *z/OS MVS System Commands* .
- For details about GTZTRACK and GTZQUERY, see *z/OS MVS Programming: Assembler Services Reference ABE-HSP*.
- For details about GTZPRMxx and IEASYSxx GTZ=, see *z/OS MVS Initialization and Tuning Reference*.

Convert your existing IBM Health Checker for z/OS set-up for automatic start-up

Description: Before z/OS V2R1, IBM Health Checker for z/OS users had to perform a set-up procedure and start IBM Health Checker for z/OS manually. As of z/OS V2R1 the system starts IBM Health Checker for z/OS automatically.

Element or feature:	BCP
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you are currently using the IBM Health Checker for z/OS and wish to continue to use it as you have customized it. This migration action is strongly recommended for those that have not used the IBM Health Checker for z/OS on each system yet.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	If you haven't started IBM Health Checker for z/OS before, you will probably see program exceptions. See the <i>IBM Health Checker for z/OS: User's Guide</i> for how to handle those exceptions.
Related IBM Health Checker for z/OS check:	None.

Steps to take: For first time users of IBM Health Checker for z/OS, follow the steps for Optimizing IBM Health Checker for z/OS in *IBM Health Checker for z/OS: User's Guide*.

For users with existing IBM Health Checker for z/OS set-ups, use the following migration actions to convert systems to the IBM Health Checker for z/OS automatic start-up:

1. Make sure the system knows the name of your hzsproc procedure if you renamed it from the default HZSPROC: The start-up procedure for IBM Health Checker for z/OS is called HZSPROC, by default. If you customized your hzsproc name, you must specify it to the system, using the new HZSPROC system parameter in IEASYSxx.
2. Remove any existing START HZSPROC invocations that start IBM Health Checker for z/OS and rely on the automatic start-up: Because IBM Health Checker for z/OS now starts automatically, you must look for instances of

Migration actions from z/OS V1R12: BCP

START HZSPROC invocations in your installation. For example, look for START HZSPROC invocations in the COMMNDxx, parmlib member.

After the system brings IBM Health Checker for z/OS up automatically, the system rejects any attempt to bring up a second instance. The system issues one of the two following warning messages:

```
HZS0101I - "...HEALTH CHECKER... IS ALREADY ACTIVE"
```

or if the automatically started IPL-time instance is still initializing:

```
HZS0116I - "...HEALTH CHECKER... START PENDING"
```

3. Change the way you specify the HZSPRMxx parmlib members you want the system to use: Before z/OS V2R1, users typically specified the HZSPRMxx parmlib members for IBM Health Checker for z/OS in the HZSPROC procedure. Now starting with z/OS V2R1, IBM recommends that you do the following to tell the system which members of HZSPRMxx to use:
 - a. Specify the HZSPRMxx parmlib members for your installation in the new HZS system parameter of IEASYSxx. This provides the default for the automatic start of IBM Health Checker for z/OS at IPL-time.
 - b. In your hzsproc procedure, default to or define HZSPRM='PREV':

```
//HZSPROC PROC HZSPRM='PREV'  
//HZSSTEP EXEC PGM=HZSINIT,REGION=0K,TIME=NOLIMIT,  
// PARM='SET PARMLIB=&HZSPRM'  
//*HZSPDATA DD DSN=SYS1.&SYSNAME..HZSPDATA,DISP=OLD  
// PEND  
// EXEC HZSPROC
```
 - c. HZSPRM='PREV' specifies the following:
 - For the initial automatic start, the system will use the HZSPRMxx suffixes listed in the HZS system parameter.
 - For manual restarts after the initial automatic start, IBM Health Checker for z/OS initially uses the HZSPRMxx parmlib members that were in effect just before the previous Health Checker instance was stopped. This action will in particular include any parmlib members specified through a MODIFY HZSPROC,ADD,PARMLIB or MODIFY HZSPROC,REPLACE,PARMLIB command, while this first instance was running.

For example, assume HZSPRM=PREV was specified when that first instance was started and system parameter HZS was set to (00,01). Then this first instance would have initially used HZSPRM00 and HZSPRM01. Now assume a MODIFY HZSPROC,ADD,PARMLIB=(02,03) was specified and then later this first instance is stopped. A manual restart, still with HZSPRM=PREV, will initially use HZSPRM00, HZSPMR01, HZSPRM02, and HZSPRM03, as in the previous instance before it was stopped. If MODIFY HZSPROC,REPLACE,PARMLIB=(02,03) is used instead, the secondary instance initially only uses HZSPRM02 and HZSPRM03.

Specifying HZSPRM='PREV' makes occasional manual restarts (after applying service, for example) easy and consistent.
4. Optionally specify an HZSPDATA data set for persistent data in the HZSPRMxx parmlib member: Before z/OS V2R1, you could only specify the HZSPDATA in the HZSPROC startup procedure. Now you can define your HZSPDATA data set in either the HZSPROC startup procedure or on the HZSPDATA parameter of the HZSPRMxx parmlib member.

Reference information: For information, see the following:

- For system parameters HZS and HZSPROC, see IEASYSxx (system parameter list) in *z/OS MVS Initialization and Tuning Reference*.
- For specifying the HZSPRMxx parmlib members you want the system to use, see "Tell the system which members of HZSPRMxx you want to use" in *IBM Health Checker for z/OS: User's Guide*.
- For details on the HZSPROC procedure, see "The HZSPROC procedure" in *IBM Health Checker for z/OS: User's Guide*.
- For specifying the HZSPDATA data set for persistent data in HZSPRMxx, see "Create HZSPRMxx parmlib members" in *IBM Health Checker for z/OS: User's Guide*.

Consider the new default value for the LOADxx DYNCPADD keyword that indicates how many CPUs z/OS is prepared to dynamically add

Description: Before z/OS V2R1, through PARMLIB member LOADxx you could enable that CPUs be added to the configuration over the life of the IPL if the hardware supported such addition. The default was for all CPUs that could be configured to the LPAR, which was the minimum supported by the z/OS release (for example, 100) and the machine (for example, 80), and which could be asked for explicitly by DYNCPADD ENABLE. In z/OS V2R1, the LOADxx keyword DYNCPADD now supports a 1-4 character decimal value nnnn that indicates how many CPUs z/OS is able to dynamically add over the life of the IPL. The default has changed to 16.

Element or feature:	BCP.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if the LOADxx DYNCPADD value is omitted (defaulted) and the default number of CPUs (16) z/OS will be able to dynamically add over the life of the IPL is not sufficient. Recommended, if you specify DYNCPADD ENABLE, which provides maximum flexibility but also results in maximum storage usage and overhead.
Target system hardware requirements:	All system z hardware (z10 EC/BC and later hardware) that supports dynamic CPU addition.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	When specifying the maximum number of CPs that z/OS can dynamically add with LOADxx DYNCPADD nnnn, this LOADxx cannot be shared with pre-V2R1 systems; that is, the nnnn parameter of DYNCPADD is not recognized by pre-V2R1 systems.
Restrictions:	None.

Migration actions from z/OS V1R12: BCP

System impacts:	Specifying DYNCPADD nnnn or taking the DYNCPADD 16 default allows z/OS to determine the number of CPUs that z/OS must be prepared to be dynamically added for the life of the IPL. Because z/OS can know the maximum CPU id that can be dynamically added for the life of the IPL at IPL, z/OS can obtain CPU array related storage based on the maximum number of CPUs that can be activated for the life of the IPL.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

1. If the default limit of 16 CPUs that can be dynamically added is not sufficient, then indicate on your LOADxx DYNCPADD the number you desire. The maximum number of CPUs that can be added over the life of the IPL will be capped by the minimum between the highest CPU id hardware and the z/OS release supports.
2. Review the changed messages associated with two digit CP IDs. Update any necessary automation or operator procedures to accommodate the two digits. Before z/OS V2R1, there was only one digit used for CP IDs. The messages that will now contain 2 byte CP ids are the following:
 - BLW007W MULTIPLE ACR ATTEMPTS BY CPU id
 - IEA020W AN FRR STACK POINTER FOR CPU xxxx IS DAMAGED, THE ERROR MASK IS abcdefghijklmnopqrst
 - IEA796E ACR HAS TAKEN CPU x [LOGICALLY] OFFLINE BECAUSE *text text* inserts that are updated include:
 - CPU *x* CHECKSTOPPED.
 - CPU *x* REACHED ITS *vv* MACHINE-CHECK THRESHOLD.
 - CPU *x*'S TOD CLOCK COULD NOT BE SYNCHRONIZED.
 - CPU *x*'S CLOCK COULD NOT BE SYNCHRONIZED TO THE ETR
 - IEE178I AUTOMATIC RECOVERY IS IN PROGRESS. NO OPERATOR ACTION IS REQUIRED.
 - [PROCESSOR (*y*) DETECTED AN EXCESSIVE DISABLED SPIN LOOP WAITING FOR event FROM PROCESSOR (*x*)]
 - [An event OCCURRED WHEN PROCESSOR (*y*) TRIED TO SIGNAL PROCESSOR (*x*)]
 - IEE331A PROCESSOR (*y*) IS IN AN EXCESSIVE DISABLED SPIN LOOP WAITING FOR *event*. REPLY U OR SPIN TO CONTINUE SPIN, REPLY ABEND TO TERMINATE WORK ON PROCESSOR (*x*) WITH RETRY REPLY TERM TO TERMINATE WORK ON PROCESSOR (*x*) WITHOUT RETRY OR STOP PROCESSOR (*x*) AND REPLY ACR
 - ISN011I CPU nnnn HAS BEEN ADDED

Reference information: For information, see the following:

- *z/OS MVS Initialization and Tuning Reference*
- The appropriate *z/OS MVS System Messages* volume for a description of the messages:
 - *z/OS MVS System Messages, Vol 3 (ASB-BPX)*

- z/OS MVS System Messages, Vol 6 (GOS-IEA)
- z/OS MVS System Messages, Vol 7 (IEB-IEE)

Plan for the increase of the maximum number of supported CPUs to 256

Description: In z/OS V2R1, z/OS CPU infrastructure will support up to a maximum of 256 CPUs (CPU ids 0-255). Earlier releases of z/OS support up to 100 CPUs (CPU ids 0-99). Components or products allocating storage for CPU related arrays or bitmasks might require changes to support the V2R1 CPU infrastructure.

Allocating CPU related arrays or bitmasks on a per CPU basis is done using one of the following:

- Run-time fields in the z/OS CVT (mapped by CVT) and ECVT (mapped by IHAECVT) control blocks representing the maximum CPU id a z/OS image can use for the life of the IPL. Products using run time fields will not require changes to support the V2R1 CPU infrastructure.
- Compile-time or assemble-time constants in the z/OS ECVT control block or within the product itself representing the maximum CPU id the z/OS CPU infrastructure supports. Products using compile-time or assemble-time constants will need to recompile at a minimum and may require code changes to support the V2R1 CPU infrastructure.

All products running on z/OS V2R1 must prepare to support all CPUs supported by the z/OS V2R1 CPU infrastructure (up to 256 CPUs with CPU ids 0-255). Products that support the z/OS V2R1 CPU infrastructure will be able to run on earlier z/OS releases whose CPU infrastructure supports a smaller number of CPUs.

Element or feature:	BCP
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1
Is the migration action required?	Yes, for programs using local constants or the z/OS constants for the number of CPUs the z/OS CPU infrastructure supports at the current or a specific level of z/OS
Target system hardware requirements:	None.
Target system software requirements:	z/OS V2R1.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	Programs that do not support up to the maximum number of CPUs the z/OS infrastructure supports might not be able to work with all CPUs on the z/OS image. The system impacts are program dependent.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

Migration actions from z/OS V1R12: BCP

- Scan your code for all of the constants in the ECVT control block that have a prefix of ECVT_max_* or ECVT_zOSR11_*. These fields are all related to the maximum CPU id the current or a specific z/OS release supports.
- Scan your code for compile-time or assemble-time constants in your product for constants related to the maximum CPU id that the current or a specific z/OS release supports. Also scan your product for constants related to the maximum number of CPUs the current or a specific z/OS release supports.

If you use ECVT constants with a prefix of ECVT_max_* or ECVT_zOSR11_*, the product will require the following changes:

- If the ECVT_zOSR11_highestCPUID or ECVT_max_highestCPUID constants are in use, consider upgrading your code to use the run-time field CVTMAXMP (for allocating CPU related arrays) or ECVT_Installed_CPU_HWM (for traversing CPU related arrays).
- If ECVT compile-time or assemble-time constants with a prefix of ECVT_max_* are in use, recompile/reassemble all appropriate parts with the new z/OS V2R1 IHAECVT macro.
- If ECVT compile-time or assemble-time constants with a prefix of ECVT_zOSR11_* are in use, consider converting constants with a prefix of ECVT_zOSR11_* to the ECVT_max_* analog. Otherwise change ECVT_zOSR11_* to the new ECVT_zOSV2R1 analog.

If your code has its own local declares for compile-time or assembler-time constants, update your code to use the z/OS run-time fields or the z/OS compile-time or assemble-time constants. Do the following:

1. Allocate CPU bit masks at compile-time or assemble-time using ECVT_max_CPUMaskSizeInBits or ECVT_max_CPUMaskSizeInBytes.
2. Convert to using run-time fields like CVTMAXMP to allocate your local CPU related arrays. If using run-time fields is undesirable, allocate CPU arrays using the compile-time or assemble time constants ECVT_max_* or ECVT_zOSV2R1_* fields

Reference information: *z/OS MVS Data Areas, Vol 2.*

Plan for the new default TRACKDIRLOAD in PROGxx

Description: Before z/OS V2R1, the system-wide tracking of directed load modules was not enabled. As of z/OS V2R1, you can control the enablement or disablement of this function in PROGxx, with the default being TRACKDIRLOAD (to enable system-wide tracking).

Element or feature:	BCP.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of V2R1.
Is the migration action required?	No. If you used the old default value of NOTRACKDIRLOAD and you want to retain it, you must explicitly specify NOTRACKDIRLOAD in PROGxx.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.

System impacts:	None expected. Using TRACKDIRLOAD might cause extra but generally beneficial overall processing.
Related IBM Health Checker for z/OS check:	None.

Steps to take: If you want to use the old default value, specify NOTRACKDIRLOAD in PROGxx. As a result, you will see CSV567I TRACKDIRLOAD IS NOT IN EFFECT.

Reference information: *z/OS MVS Initialization and Tuning Reference*

Update automation that handles messages IEE302I, IEE303I, IEE1302I, IEE1303I, and IOS566I

Description: Starting in z/OS V2R1, the following messages have changed message text:

- Messages IEE302I, IEE303I, IEE1302I, and IEE1303I are changed from including ESCM in the message text to including CONFIG MANAGER in the message text.
- Message IOS566I is changed from including SYSTEM AUTOMATION in the message text to including CONFIG MANAGER in the message text.

Element or feature:	BCP.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you use automation programs or other procedures to handle messages IEE302I, IEE303I, IEE1302I, IEE1303I, and IOS566I.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Modify automated actions for IEE302I, IEE303I, IEE1302I, IEE1303I, and IOS566I so they now work with the updated message text.

Reference information: For details about messages IEE302I, IEE303I, IEE1302I, and IEE1303I, see *z/OS MVS System Messages, Vol 7 (IEB-IEE)*. For details about messages IOS566I, see *z/OS MVS System Messages, Vol 9 (IGF-IWM)*.

Plan for new entries AXRINIT and AXRRXTSS in the program properties table

Description: In z/OS V1R13 and earlier there were no entries in the program properties table for AXRINIT and AXRRXTSS to indicate that these programs needed to run privileged, so you had to manually add PPT entries for AXRINIT and AXRRXTSS into SCHEDxx parmlib members. In z/OS V2R1, these entries are

Migration actions from z/OS V1R12: BCP

now included in the IBM supplied default program properties table, and you can remove the SCHEDxx PPT specifications for AXRINIT and AXRRXTSS.

Element or feature:	BCP
When change was introduced:	z/OS V2R1
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	No, but recommended to avoid an unintended override of the IBM shipped default PPT.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Remove the PPT specifications of AXRINIT and AXRRXTSS in SCHEDxx parmlib member.

Note: The recommended action described in DOC APAR OA40519 is no longer needed in z/OS V2R1.

Reference information: *z/OS MVS Initialization and Tuning Reference.*

Plan for security changes to EXECIO restricting the REXX exec for allocating an internal reader

Description: In z/OS V1R13 and earlier for a REXX exec that was running under System REXX (TSO=YES), the exec was able to allocate an internal reader and subsequently invoke EXECIO to submit JCL. As of z/OS V2R1, this function is restricted if the security product (RACF or equivalent) indicates that the invoker does not have authority to the entity JCL .

Element or feature:	BCP
When change was introduced:	z/OS V2R1
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if the invoker of the System REXX exec wants to invoke EXECIO to submit JCL.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

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Steps to take: Permit access to allow the System REXX exec that uses EXECIO to submit JCL for allocating an internal reader. The System REXX exec runs under the security environment as specified by the SECURITY keyword on the AXREXX invocation; the default is the invoker of the AXREXX macro. The invoker of the System REXX exec must have access to the JCL resource in the TSOAUTH resource class.

Reference information: *z/OS Security Server RACF Security Administrator's Guide.*

Accommodate increase in nucleus size

Description: With the introduction of the z/OS V1R13 RSM Enablement Offering Web deliverable, the nucleus will increase in size by approximately 380K above the 16MB line. Because of this increase, the available private storage might affect the way your applications run on your system.

Element or feature:	BCP
When change was introduced:	z/OS V1R13 RSM Enablement Offering Web deliverable.
Applies to migration from:	z/OS V1R13 without the z/OS V1R13 RSM Enablement Offering Web deliverable or from z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if the increase in nucleus size will affect the private storage available to applications on your system above the 16MB line.
Target system hardware requirements:	None. The migration action is relevant on all servers.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	Failure to have sufficient private storage available might result in errors that affect the running of your applications.
Related IBM Health Checker for z/OS check:	VSM_CSA_CHANGE. You can use this health check to identify changes in the size of CSA or private (including the extended areas) since the last IPL.

Steps to take: Review your current available private storage usage above the 16MB line using reports from RMF or an equivalent product. Ensure that an increase of 380K for the nucleus above the 16 MB line will not adversely affect your system. Adjust values accordingly.

Reference information: See “Verify that virtual storage limits are set properly” on page 25

Also see *z/OS MVS Initialization and Tuning Guide* and *z/OS MVS Initialization and Tuning Reference*.

Accommodate increase in ESQA

Description: With the introduction of the z/OS V1R13 RSM Enablement Offering Web deliverable, there is an increased allocation of 24K (6 pages) in ESQA per CPU

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per LPAR. This increased allocation in ESQA per CPU includes general purpose CPs, zIIPs, and zAAPs regardless of the status (online, offline, configured, stand-by, and so forth) of the hardware. Because of this increase in ESQA, if you change the ESQA size, the available private storage may affect application execution on your system.

Element or feature:	BCP
When change was introduced:	z/OS V1R13 RSM Enablement Offering Web deliverable.
Applies to migration from:	z/OS V1R13 without the z/OS V1R13 RSM Enablement Offering Web deliverable or from z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if the increase in ESQA usage might cause you to run out of ESQA storage.
Target system hardware requirements:	The migration action is relevant on all servers.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	Failure to have sufficient private storage available might result in errors that affect the running of your applications. The following messages might be issued: IRA103I SQA/ESQA HAS EXPANDED INTO CSA/ECSA BY xxxx PAGES IRA104I SQA/ESQA EXPANSION INTO CSA/ECSA HAS BEEN RELIEVED
Related IBM Health Checker for z/OS check:	VSM_CSA_CHANGE. You can use this health check to identify changes in the size of CSA or private (including the extended areas) since the last IPL.

Steps to take: Review your ESQA specification in IEASYSxx, to ensure that an ESQA increased allocation of 24K per CPU used on the LPAR will not adversely affect your system. If you need to increase your ESQA specification, you should also review the effects on your current available private storage usage above the 16 MB line using reports from RMF or an equivalent product. Adjust values accordingly.

Reference information: See “Verify that virtual storage limits are set properly” on page 25

Also see *z/OS MVS Initialization and Tuning Guide* and *z/OS MVS Initialization and Tuning Reference*.

Handle changes to length of field EEPLEVENTSPECIFICINFO in control block IXLYEEPL

Description: In z/OS V1R13 the length of the field EEPLEVENTSPECIFICINFO in the XES Event Exit Parameter List (IXLYEEPL) is being increased by 8 bytes to include additional information for users to take advantage of the new function

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provided by greater-than-32 connectors. This additional information is mapped by EEPLSTRSTATECHANGEINFO. The following fields have been added to the EEPLSTRSTATECHANGEINFO mapping:

- EEPLSSCSTRFACILITYUSERLIMIT
- EEPLSSCSTRLOCKNUMUSERS

A program can determine if these fields are valid; therefore, you can use the longer length for EEPLEVENTSPECIFICINFO if the flag EEPLSSCUSERLIMITINFOVALID is set. This change was rolled back to earlier releases in the service stream through APAR OA34061.

Element or feature:	BCP
When change was introduced:	z/OS V1R13, and z/OS V2R1 with APAR OA34061.
Applies to migration from:	z/OS V1R12 without APAR OA34061 applied.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if any of your programs have relied on the length field of EEPLEVENTSPECIFICINFO in IXLYEEPL.
Target system hardware requirements:	CFLEVEL 17 support for greater-than-32 connectors for list/lock structures.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Consider any program that makes use of the length field EEPLEVENTSPECIFICINFO in IXLYEEPL. If you rely on the length of field EEPLEVENTSPECIFICINFO, for example if its length is used to define local data areas in a module and if the length that the compiler uses will be the updated larger length, all modules using the length of the field need to be recompiled.

Reference information: *z/OS JES2 Data Areas Volume 1*

Start Runtime Diagnostics at system initialization

Description: Before z/OS V1R13, Runtime Diagnostics ran as a as a started task under the master subsystem and had to be started each time you wanted an analysis. It was started, did its analysis, then ended. Beginning with z/OS V1R13, you can start Runtime Diagnostics to run as an address space under the master subsystem. After you start the Runtime Diagnostics address space (HZR), it remains running until stopped using the STOP command. Use the MODIFY HZR,ANALYZE command to generate a Runtime Diagnostics analysis and report.

Element or feature:	BCP.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.

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Is the migration action required?	No, but recommended to use Runtime Diagnostics.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	If you continue to use the SYMUPDTE routine or the IEASYMUP module, or if you use the IEASYMU2 program, system symbols will be updated and the system will continue to function properly until the SETLOAD xx,IEASYM command is used. Once SETLOAD xx,IEASYM has been issued, updates introduced by those other programs will be lost. You may continue to use the IEASYMU2 program again, even after a SETLOAD xx,IEASYM has been issued, but the same considerations will be in effect.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: To start the Runtime Diagnostics address space (HZR) on z/OS V2R1:

1. Ensure the hzrproc (HZR) points to PGM=HZRINIT, not PGM=HZRIMAIN as in z/OS V1R12. The hzrproc (HZR) ships in the SYS1.PROCLIB data set.
2. If you want to start Runtime Diagnostics address space (HZR) during system initialization, specify COM='S HZR,SUB=MSTR' in the COMMNDxx parmlib member. Otherwise, the HZR address space must be started manually: S HZR,SUB=MSTR
3. After the Runtime Diagnostics address space (HZR) is started, use the MODIFY HZR,ANALYZE command to generate Runtime Diagnostics' reports.

Reference information: For complete details about using Runtime Diagnostics, see the topic "Runtime Diagnostics overview" in *z/OS Problem Management*.

Modify automation that references output from D XCF,SYSPLEX console commands

Description: Before z/OS V1R13, when the following D XCF console commands were issued, the resulting messages contained output information from the command depending on the options specified:

- **D XCF**

```
IXC334I  hh.mm.ss  DISPLAY XCF SYSPLEX sysplex-name: sysname sysname  
                sysname sysname
```

- **D XCF,SYSPLEX**

```
IXC334I  hh.mm.ss  DISPLAY XCF SYSPLEX sysplex-name: sysname sysname  
                sysname sysname
```

- **D XCF SYSPLEX,ALL | system name**

```
IXC335I  hh.mm.ss  DISPLAY XCF text
```

Starting with z/OS V1R13, the output message for a D XCF,SYSPLEX command is changed to IXC336I, which provides more basic information about a system. In

addition, a new output message, IXC337I, is issued for a **D XCF,SYSPLEX** command when a system name or ALL is specified. Detailed sysplex and system information was added and reformatted in the new message. These changes can affect your message automation programs.

- **D XCF**

```
IXC334I  hh.mm.ss DISPLAY XCF SYSPLEX sysplex-name: sysname sysname
        sysname sysname
```

- **D XCF,SYSPLEX**

```
IXC336I hh.mm.ss DISPLAY XCF text
SYSTEM TYPE SERIAL LPAR STATUS TIME SYSTEM STATUS
sysname type serial lpar m/dd/yyyy status
```

```
SYSTEM STATUS DETECTION PARTITIONING PROTOCOL CONNECTION EXCEPTIONS: local_limit
SYSTEM DIAG INFO: cpiservice faileddatetime retcode
SYSTEM ABEND CODE: abendcode ABEND REASON CODE: abendrsncode
TIME OF FAILURE: abenddatetime
```

- **D XCF,SYSPLEX,ALL | system name**

```
IXC337I hh.mm.ss DISPLAY XCF
SYSPLEX sysplex-name MODE: plex_mode
SYSTEM system-name STATUS: system-status
                                system-status
```

```
TIMING: system-timing
STATUS TIME: activetime
JOIN TIME: activetime
SYSTEM NUMBER: system-number
```

Element or feature:	BCP.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you use automation programs or other procedures to handle message IXC335I.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Modify automation that references output from **D XCF,SYSPLEX**, **D XCF,SYSPLEX,ALL**, and **D XCF,SYSPLEX,systemname** commands. Message IXC337I replaces IXC335I. IXC335I is no longer issued.

After the APAR OA39334 for z/OS V1R13, the format of the timing data in message IXC337I has been changed to be consistent with other display output (that is, message IEA282I) and/or timing specification. For example, the ETR portion of the CTN identifier for the displayed system now appears in decimal format (consistent with the format used for the D ETR command output in message IEA282I, and with the format used to define it on the HMC). In addition, the STP portion of the CTN identifier is now always included in message IXC337I when running in a mixed CTN.

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The new information of SYSPLEX INITIALIZATION TIME: time, which means the date and time that the sysplex was initialized, is included in specific command response messages after applying the following APARs:

- For z/OS V1R12: APAR OA35342 for message IXC334I and IXC335I.
- For z/OS V1R13: APAR OA41210 for message IXC334I, and APAR OA35342 for message IXC336I and IXC337I.

Reference information: For details about the message output for IXC334I, IXC336I, and IXC337I, see *z/OS MVS System Messages, Vol 10 (IXC-IZP)*.

Update LLA for automation

Description: Before z/OS V1R13, if you started library lookaside (LLA) using a CSVLLAxx parmlib member, and then stopped and restarted LLA without using a parmlib member, LLA honored the "no parmlib member" state and managed only the data sets in the LNKLST concatenation. Beginning with z/OS V1R13, the same scenario results in using the CSVLLAxx parmlib member with which LLA previously started. To get back to the "no parmlib member" state, you must specify LLA=NONE when starting LLA.

Note: If F LLA,UPDATE=xx command is done in between, the update is not honored by the restarted LLA, which is started without specifying LLA=xx.

Element or feature:	BCP.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you have automation or operator procedures that restart LLA and you want LLA to restart with no parmlib member even when you previously started LLA with a parmlib member.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: If you have automation in place to restart LLA and you want automation to restart without a parmlib member even when you had started LLA with a parmlib member, you must change it to use the LLA=NONE parameter.

Reference information: See the topic "CSVLLAxx (library lookaside (LLA) list)" in *z/OS MVS Initialization and Tuning Reference*

Remove references to the MTFTPS utility

Description: Before z/OS V1R13, you might have used the problem documentation upload utility (PDUU), packaged as MTFTPS, to send large volumes of problem documentation, such as stand-alone dumps, to IBM support. Beginning with z/OS

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V1R13, the z/OS problem documentation upload utility (PDUU) is a standard part of the base operating system with entry point name AMAPDUPL.

Element or feature:	BCP.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	No, but recommended if you previously used the stand-alone version of PDUU (MTFTPS).
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: To avoid possible conflicts, remove the stand-alone version of the PDUU utility and begin using the supported version:

1. Remove any prior version of MTFTPS from your system. The PDUU utility name is AMAPDUPL (in SYS1.MIGLIB), although MTFTPS is shipped as an alias entry point to AMAPDUPL
2. Begin using the PDUU as the primary utility for sending large volumes of product documentation to IBM Support.

Reference information: For complete details, including JCL statements and examples, see the topic "The z/OS Problem Documentation Upload Utility" in *z/OS MVS Diagnosis: Tools and Service Aids*.

Adjust CON= system parameter to accommodate default change

Description: Before z/OS V1R13, the default console operating mode was SHARED. Beginning with z/OS V1R13, the default console operating mode has changed from SHARED mode to DISTRIBUTED mode. The release of z/OS following z/OS V2R1 is planned to be the last release in which the consoles component will support SHARED mode. IBM recommends that you migrate to DISTRIBUTED mode, which was introduced in z/OS V1.10.

Element or feature:	BCP.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if there is no specification on the CON= system parameter and SHARED mode is required.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.

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Restrictions:	None.
System impacts:	Impacts could be experienced falling back to shared, but only after taking advantage of some of the functionality offered in distributed. For more information, see "Operation modes of console support" in <i>z/OS MVS Planning: Operations</i> .
Related IBM Health Checker for z/OS check:	Use check ZOSMIGV1R13_CNZ_CONS_OPER_MODE, available with APAR OA32930, to determine if your installation has explicitly identified your console service operating mode.

Steps to take: Examine the system parameters used to IPL the system or sysplex. The initial mode is specified on the CON= system parameter. Use the **D OPDATA,MODE** to find the current mode, which is displayed in message CNZ9006I.

- If DISTRIBUTED is specified, no action is required.
- If SHARED is specified, an action is not currently required, but DISTRIBUTED mode will become a required action in the future.
- If there is no specification on the CON= system parameter, DISTRIBUTED mode is now the default.
- If there is no specification on the CON= system parameter and SHARED mode is required, you have to explicitly request the SHARED mode on the CON= system parameter. This allows the system or systems to continue functioning in the same manner as they do today. In the MULTISYSTEM sysplex environment, use the SETCON MODE=SHARED command to request SHARED mode.

Tip: When you activate the OPERCMDS class, you must have the CONTROL access authority to the profile MVS.SETCON.MODE when issuing the SETCON MODE command.

Reference information: For more information, see:

- DOC APAR OA34738.
- *z/OS MVS Initialization and Tuning Reference*.
- *z/OS MVS Planning: Operations*.

Accommodate HiperDispatch default of YES

Description: Beginning with z/OS V1R13 when running on a z196, z114, or later server, the IEAOPTxx keyword HIPERDISPATCH will default to YES. If HIPERDISPATCH=NO is specified, the specification will be honored as it was on previous z/OS releases.

Element or feature:	BCP.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	Before the first IPL of OS V1R13.
Is the migration action required?	No, but it is recommended. You should be aware of changes in how system resources are being managed.
Target system hardware requirements:	IBM zEnterprise z196, z114, or later server.
Target system software requirements:	None.

Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	<p>Use IBM z/OS Health Checker check SUP_HiperDispatch to determine whether the expected HiperDispatch check parameter state, HIPERDISPATCH YES NO, matches the actual HiperDispatch state of the system.</p> <p>Beginning with z196 and z114 machines on z/OS V1R13, anyone making the SUP_HiperDispatch health check succeed by specifying a parameter of HIPERDISPATCH(NO) for a z/OS image running in HIPERDISPATCH=NO will need to specify the machine type(s) where HiperDispatch(NO) is acceptable using the MachTypes parameter; for example, MachTypes(2817).</p> <p>If the HiperDispatch(NO) parameter is provided to the SUP_HiperDispatch health check, the machine is a z196 or a z114, and the current machine type does not appear in the MachTypes list, the check will expect a HiperDispatch state of HIPERDISPATCH(YES).</p>

Steps to take: Follow these steps:

Examine the IEAOPTxx member(s) used for each image that will be IPLed on an IBM zEnterprise server. Then find the HIPERDISPATCH keyword and take one of the following actions. (You can issue the RMF Monitor-II OPT command to get the current IEAOPTxx parmlib setting.)

- For HiperDispatch=YES, no action is required.
- When the HiperDispatch keyword is omitted, note that the image will take the default of HiperDispatch=YES and IPL with HiperDispatch enabled. Decide if you wish to accept that HiperDispatch will be enabled by default by reviewing the subsequent steps, and the "HiperDispatch=YES considerations" section.
- For HiperDispatch=NO, investigate why that image was running in HiperDispatch=NO and choose one of the following:
 - Define a plan to migrate that image to HiperDispatch=YES. See the "HiperDispatch=YES considerations" section for further information.
 - Continue to run the image with HiperDispatch=NO (IBM does not recommend this option for LPARs where the LPAR weight guarantees a share of two or more physical processors without a compelling reason for running HiperDispatch=NO).

To get the SUP_HiperDispatch health check to succeed, add the machine type to the MachTypes parameter and verify that the HIPERDISPATCH parameter is NO.

HiperDispatch=YES considerations: Consider the following:

Migration actions from z/OS V1R12: BCP

- Before enabling HiperDispatch review the WLM policy and make appropriate changes as needed that are described in the "WLM Policy Considerations" in the "Planning Considerations For HiperDispatch Mode" white paper at <http://www-03.ibm.com/support/techdocs/atmastr.nsf/WebIndex/WP101229>.
- Verify that the LPAR profiles of the partitions in which the system may be IPLed allow for "Global Performance Data Control". See the *Processor Resource/Systems Manager Planning Guide* for a description of this capability. If this capability is not allowed, WLM will be unable to understand capacity that is used by other LPARs and will use all logical processors. Using all logical processors will result in suboptimal use of cache, reducing the capacity of the partition when more logical processors are defined compared to the share of the partition. This can also result in the "short CP" effect where a logical processor may have a unit of work dispatched while removed from a physical processor for significant intervals. This can lead to response time problems.

Reference information: See the following information:

- "Planning Considerations for HiperDispatch Mode" white paper at IBM Techdocs <http://www-03.ibm.com/support/techdocs/atmastr.nsf/WebIndex/WP101229>.
- *Processor Resource/Systems Manager Planning Guide*
- *z/OS MVS Initialization and Tuning Reference*
- *z/OS MVS Planning: Workload Management*
- *IBM Health Checker for z/OS: User's Guide*

Accommodate OPERLOG EMCS console name change

Description: The OPERLOG EMCS console name is generated as *OPLOGxx where 'xx' is the system slot number. The slot numbers (QUASNUM) are assigned by XCF in sequence as systems join the plex. You can externally define the number but you cannot predetermine the order in which systems are iple into the sysplex. Empty slots left by systems leaving the sysplex become available to new systems joining the sysplex so a slot number might not remain assigned to a specific system for the life of the sysplex.

Note: In the environment with a MONOPLEX GRS RING complex defined, the OPERLOG EMCS console name is fixed as *OPLOG01.

After the APAR OA31913 with z/OS V1R12, V1R11, V1R10, and V1R9, the OPERLOG EMCS console name *OPLOGyy is now be generated using the two character System Clone value (&SYSCONE), the default of which is obtained from the System Name (&SYSNAME) (for example, if the system name is SYSTEM1 (system name= SYSTEM1), the system clone value is M1 (system clone = M1). This naming convention is similar to the SYSLOG EMCS console (*SYSLGxx).

Element or feature:	BCP.
When change was introduced:	z/OS V1R13 (z/OS V1R12, z/OS V1R11, z/OS V1R10, and z/OS V1R9 by APAR OA31913).
Applies to migration from:	z/OS V1R12 without the PTF for APAR OA31913 applied.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you depend on the OPERLOG EMCS console name.
Target system hardware requirements:	None.
Target system software requirements:	None.

Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: The change of OPERLOG EMCS console name spans all configurations (MULTISYSTEM, XCFLOCAL, MONOPLEX, in GRS RING or STAR mode). If you depend on the name of OPERLOG EMCS console in your own procedure, it must be adjusted to reflect this change. For example, the following will display the OPERLOG EMCS console name:

```
D C,KEY=OPERLOG (message IEE892I)
D EMCS (message IEE129I)
D EMCS,CN=*OPLOG* (message IEE129I)
```

Note: With z/OS V1R12, this change was already in effect.

Reference information: For more information about the OPERLOG EMCS console, see *z/OS MVS Planning: Operations*.

Change value for ARM restart processing

Description: Before performing cross-system restart, automatic restart management (ARM) waits for member cleanup for the terminated system to complete. ARM proceeds with cross-system restart if cleanup takes longer than a certain amount of time. Before z/OS V1R13, this time was two minutes. Support for a new parameter, CLEANUP_TIMEOUT, is available with the PTFs for APAR OA35357 applied to z/OS V1R13 and z/OS V1R12. The default for this new parameter is five minutes. That is, ARM will wait five minutes for member cleanup for a terminated system to complete before performing cross-system restart for an element.

Starting with z/OS V1R13, the CLEANUP_TIMEOUT parameter can be used to indicate that ARM is to wait additional time for member cleanup for a terminated system to complete. To get the two minute timeout behavior that existed before the default change, CLEANUP_TIMEOUT(120) must be added to the ARM policy. If you do not specify CLEANUP_TIMEOUT(120), the system issues the following message to the system log to record when CLEANUP_TIMEOUT has an effect on cross-system restart processing:

```
IXC815I MEMBER CLEANUP FOR SYSTEM sysname1 NUMBER sysnum1 INCOMPLETE
```

Element or feature:	BCP.
When change was introduced:	z/OS V1R13, and rolled back to z/OS V1R12, z/OS V1R11, and z/OS V1R10 by APAR OA35357.
Applies to migration from:	z/OS V1R12 without the PTFs for OA35357 applied.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if a five-minute timeout for member cleanup is not acceptable.
Target system hardware requirements:	None.
Target system software requirements:	None.

Migration actions from z/OS V1R12: BCP

Other system (coexistence or fallback) requirements:	The new five minute default, or any use of the CLEANUP_TIMEOUT parameter other than CLEANUP_TIMEOUT(120), is not fully effective until all systems in the sysplex have support for the CLEANUP_TIMEOUT parameter. APAR OA35357 provides support for the CLEANUP_TIMEOUT parameter.
Restrictions:	None
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: If you prefer to use the two minute value for ARM restart processing, do the following:

1. Use the z/OS V1R13 version of IXCMIAPU to define an ARM policy with CLEANUP_TIMEOUT(120).
2. Use the SETXCF START command to start the new or updated policy.

Reference information: For details, see the topic "Automatic restart management parameters for administrative data utility" in the chapter "Administrative data utility" in *z/OS MVS Setting Up a Sysplex*.

Issue commands from the system console regardless of problem determination mode

Description: Before z/OS V1R12, the system console could not issue any commands (except **REPLY** and **VARY CN(*),ACTIVATE**) unless it was placed in problem determination (PD) mode through the **VARY CN(*),ACTIVATE** command. Starting with z/OS V1R12, processing changed so that commands could always be entered at the system console regardless of problem determination mode. With APAR OA34731, commands can only be entered at the system console if the **CONSOLxx** keyword **ALLOWCMD(Y)** is specified on the system console definition.

Element or feature:	BCP.
When change was introduced:	z/OS V1R12 with APAR OA34731 and z/OS V1R13.
Applies to migration from:	z/OS V1R12 without the PTF for OA34731 installed.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if it applies to migration from z/OS V1R12 without the PTF for OA34731, and you want to override the default of ALLOWCMD(N) introduced in OA34731 (and integrated into higher releases) to allow the system console issue the commands regardless of problem determination mode.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	The parmlib statement ALLOWCMD in CONSOLxx is not tolerated on systems that do not have the PTF for APAR OA34731 installed.

Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	Use CHECK(CNZ_SYSCONS_ALLOWCMD) to compare the ALLOWCMD setting for the system console with the setting specified on the check.

Steps to take: Add **ALLOWCMD(Y)** to the system console definition in the **CONSOLxx** member of PARMLIB if you wish to allow commands to be issued from the system console regardless of problem determination mode.

Reference information: For information, see the following:

- For CONSOLExx, see *z/OS MVS Initialization and Tuning Reference*.
- PTF HOLD information for APAR OA34731.

BCP actions to perform after the first IPL of z/OS V2R1

This topic describes BCP migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

Accommodate the SETLOAD xx,IEASYM command to update system symbols without initiating an IPL

Description: Before z/OS V2R1, the downloadable SYMUPDTE routine and the IEASYMUP module in SYS1.SAMPLIB were provided as mechanisms to update system symbols without initiating an IPL. Starting with z/OS V2R1, the SETLOAD xx,IEASYM command is available to perform this task. In z/OS V2R1, the IEASYMUP module in SAMPLIB is updated to return with a RC=X'FFF', not having done the requested function. However, unless this IEASYMUP module is rebound, there is no way to prevent the usage of an old copy, or detect an update because of use of an old copy of the tool.

In z/OS V2R1 you should stop using the downloadable SYMUPDTE routine or the IEASYMUP module from samplib in your earlier release. Note that use of SYMUPDTE or IEASYMUP might produce incorrect results when used in conjunction with the SETLOAD xx,IEASYM command. The SYS1.LINKLIB program IEASYMU2 is instead provided via APAR OA42569 as a replacement for the function provided by IEASYMUP / SYMUPDTE on previous z/OS releases. IEASYMU2 is a supported program in z/OS, and has considerations when used with SETLOAD xx, IEASYM.

Element or feature:	BCP.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	After the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you are currently using the IEASYMUP module provided in SYS1.SAMPLIB or the SYMUPDTE routine to update system symbols.
Target system hardware requirements:	None.
Target system software requirements:	None.

Migration actions from z/OS V1R12: BCP

Other system (coexistence or fallback) requirements:	None.
Restrictions:	If you continue to use the SYMUPDTE routine or the IEASYMUP module, or if you use the IEASYMU2 program, system symbols will be updated and the system will continue to function properly until the SETLOAD xx,IEASYM command is used. Once SETLOAD xx,IEASYM has been issued, updates introduced by those other programs will be lost. You may continue to use the IEASYMU2 program again, even after a SETLOAD xx,IEASYM has been issued, but the same considerations will be in effect.
System impacts:	Note: <ul style="list-style-type: none">• Updates to the system symbol table through the SETLOAD xx,IEASYM command will occur only on the system issuing the command.• When a SETLOAD command is issued and fails, messages issued by IEFPRMLB (logical parmlib service) that contain <i>jobname</i> and <i>stepname</i> will contain the master <i>jobname</i> and <i>stepname</i> of the last step that ran under master because the SETLOAD command runs under master but does not run as its own step. In this case, the error is related to the SETLOAD processing and NOT the step whose name appears in the message.
Related IBM Health Checker for z/OS check:	SUP_SYSTEM_SYMBOL_TABLE_SIZE. This code checks if the size of the static system symbol table has exceeded the threshold. This check is initially run once and is also run when the SETLOAD xx,IEASYM command is successfully processed.

Steps to take: Follow these steps:

- Rebind the IEASYMUP module from the z/OS V2R1 SAMPLIB to disable the code or simply remove it from LINKLIB or your LNKLST library.
- If you have used the downloadable SYMUPDTE routine, remove it from your LINKLIB or your LNKLST library. Begin using SETLOAD xx,IEASYM command instead of these obsolete modules. Or change your JCL to use IEASYMU2 instead of IEASYMUP (and remove any joblib/steplib specification). IEASYMU2 verifies access through the same profile of IEASYMUP.* in the FACILITY class that IEASYMUP did, so there are no security definition changes from using IEASYMUP to IEASYMU2.

Reference information: The "SETLOAD command" in *z/OS MVS Planning: Operations* and "System Symbols" in *z/OS MVS Initialization and Tuning Reference*

Use the z/OSMF Capacity Provisioning task to define z/OS MVS Capacity Provisioning policies rather than the Windows-based Capacity Provisioning Control Center (CPCC)

Description: z/OS V1R13 was the last release to provide the Windows-based Capacity Provisioning Control Center (CPCC) function for use with z/OS MVS

Migration actions from z/OS V1R12: BCP

Capacity Provisioning. As of z/OS V2R1, IBM provides the z/OSMF based Capacity Provisioning task as an alternative means to define Capacity Provisioning policies and to allow you to control your Capacity Provisioning function.

Element or feature:	BCP.
When change was introduced:	z/OS V2R1 with partial support rolled back in the z/OSMF APAR PM74519.
Applies to migration from:	z/OS V1R13 without the z/OSMF APAR PM74519 and z/OS V1R12.
Timing:	After the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you are using Capacity Provisioning.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Use the Capacity Provisioning task in z/OSMF V2R1 as the replacement for the former Capacity Provisioning Control Center. When you have set up z/OSMF, you can import your previous Domain Configurations and Capacity Provisioning Policies into the z/OSMF Capacity Provisioning task using the Import from File or Import from Domain actions.

Reference information: For more information about using the z/OSMF Capacity Provisioning task, see the following publication and the z/OSMF online help: *z/OS MVS Capacity Provisioning User's Guide*.

Migrate to GRS-managed FICON CTCs

Description: Before OA38230, GRS could only manage CTCs running in basic mode. Starting with APAR OA38230 (on z/OS V1R11, z/OS V1R12, and z/OS V1R13, and incorporated into z/OS V2R1), GRS can additionally manage FICON CTCs (FCTC), which run in extended mode.

Migrate GRS-managed basic-mode CTCs to GRS-managed FICON CTCs in order to run in extended mode. Note that GRS star continues to be the recommended configuration for global ENQ/DEQ processing because of its better performance and overall reliability, availability, and serviceability (RAS). If the installation requires a GRS ring, IBM suggests that the GRS complex equals the sysplex, as it provides a more robust transport layer for its communications.

Element or feature:	BCP.
When change was introduced:	z/OS V1R13, z/OS V1R12 and z/OS V1R11 with APAR OA38230.
Applies to migration from:	z/OS V1R12 without APAR OA38230.
Timing:	After the first IPL of z/OS V2R1.

Migration actions from z/OS V1R12: BCP

Is the migration action required?	<p>Yes, if you meet the conditions mentioned in this description and you are running on a zEC12 server or higher. See the hardware release memorandum RFA z196 for further information. http://www-01.ibm.com/common/ssi/rep_ca/0/897/ENUS110-170/ENUS110-170.PDF</p> <p>This migration action only applies to installations where GRS directly manages CTCs as specified in GRSCNFxx. There are two applicable configurations:</p> <ul style="list-style-type: none">• A GRS Ring where the GRS complex is greater than the sysplex, or• A GRS ring that does not utilize sysplex communications at all. <p>If you are running GRS Star, or using embedded XCF communications links rather than GRS-managed CRCs, this migration action is not applicable to you.</p>
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	Until each system that communicates with another system is configured to use FCTCs, GRS will be unable to use that FCTC.
Related IBM Health Checker for z/OS check:	IBM Health Checker for z/OS check GRS_MODE can help you determine if you are running GRS Star or ring. If this check indicates that you are running GRS Star (the recommendation), then this migration action is not applicable to you. If this check indicates that you are running GRS ring, then this migration action may be applicable as described in the section Is the migration action required?

Steps to take: There are two separate methods to migrate to the updated GRSCNFxx members with the additional FICON CTC, depending on the needs of the installation.

Initial preparation:

Regardless of the migration method chosen, there is some initial preparation:

- Apply the program temporary fixes (PTFs) for OA38230 to all the systems before an IPL of any system.
- Make sure all FICON CTC adapters, in addition to the existing ESCON basic channel-to-channel (BCTC) adapters, have the proper configuration and connection to each z/OS system in the GRS complex.
- Determine the FICON CTC adapter device numbers from the hardware configuration.

- Add the corresponding FICON CTC device numbers to the end of the existing list for GRSCNFxx members used across the complex, as shown in the example.

GRS-managed CTC devices are solely for the use of GRS and cannot be added to the system dynamically. The CTC devices must be defined in GRSCNFxx at IPL time. Also recall that the order of the CTC devices listed in GRSCNFxx is significant for any given remote system. The CTC device listed last is the first CTC device considered for primary usage. Provided GRS' initialization of that CTC device is successful, the next-to-last CTC device gets set up as an alternate, the next as an additional alternate, and so forth. If your installation is testing the GRS FICON CTC support on hardware that supports ESCON, IBM recommends adding, rather than replacing, the FICON CTC device numbers below the existing CTC device numbers, as shown in the example.

Example:

A GRSCNFxx CTC example.

```

/*****/
/* IN THIS EXAMPLE, */
/* DEVICE NUMBERS BETWEEN 0500 AND 05FF ARE BCTCS */
/*          8100 AND 81FF ARE FCTCS */
/*****/
GRSDEF
MATCHSYS(*)
CTC(5C0) /* prospective 3rd alternate - BCTC */
CTC(5DF) /* " 2nd alternate - BCTC */
CTC(8100) /* " alternate - FCTC */
CTC(811F) /* " primary - FCTC */

```

There are two separate ways to migrate to the updated GRSCNFxx members with the additional FICON CTC devices, depending on the needs of the installation.

Migration method that uses rolling IPL:

Migrating to FICON CTC communication means a planned outage because at least one system remains active in the current GRS ring throughout the migration. The advantage of performing a rolling IPL is that it allows for better availability.

Use the following procedure to minimize the chance of a ring disruption in the migration of GRS-managed CTC communication:

1. **Follow your normal procedures for bringing down the system and preparing to IPL.** Don't forget to enter the Z EOD command to write buffered system management facilities (SMF) records, and system log and LOGREC data, and wait for message IEE3341: HALT EOD SUCCESSFUL.
2. **Quiesce the systems from the ring.** On any system, enter the VARY GRS(X),QUIESCE command. Wait for message ISG013I; SYSTEM X QUIESCED GLOBAL RESOURCE SERIALIZATION. The VARY GRS(X),QUIESCE command is important because it prevents a ring disruption from removing the QUIESCED system. You can only use VARY GRS(X),QUIESCE when there is at least one XCF=local or monoplex system in the complex using CTC communication.
3. **Stop the system.** Now it is safe to stop system X. Do so by initiating a system reset on the hardware management console (HMC). For Parallel Sysplex, the sysplex failure management (SFM) policy and the status update missing intervals (specified on the INTERVAL keyword in COUPLExx) start counting down as soon as you use the system reset.

Migration actions from z/OS V1R12: BCP

4. **Purge the system from the ring.** After system X stops, it is an XCF=local system or a monoplex. On any system, issue VARY GRS(X),PURGE. If system X is a member of a sysplex, issue VARY XCF,X,OFFLINE and respond to the prompts as usual. In either case, wait for message ISG013I: SYSTEM X PURGED FROM GRS COMPLEX, which means system X is removed from the ring.
5. **IPL with a new GRSCNFxx.** IPL system X. When the system is ready, issue D GRS to verify the system (and the other systems). It should show up as "ACTIVE" in the existing GRS ring. If the JOIN process on the existing ring fails, make sure GRSCNFxx is correct and the purge of the previous instance from the ring was successful. Try this step again.
6. **Check the CTC devices.** Verify that the D GRS output lists the new CTC device numbers as IN-USE, ALTERNATE or conditionally QUIESCE. If the CTC device is IN-USE or ALTERNATE, the TARGET SYSNAME field must be accurate. If a CTC status is QUIESCE, it is online, but the other side of the CTC device is not communicating. If the system on the other side of the CTC device has not been re-IPLed to pick up the new CTC definitions, then QUIESCE status is expected. Scenario II in Figure 1 on page 287 shows that GRS will not attempt to use a new CTC device until the system at the other side of the link is re-IPLed to pick up its corresponding CTC device. If all of the systems are running with the new CTC device, it is unusual that the CTC device remains QUIESCE. If there are one or more QUIESCE CTC devices, look for a CTC problem on the system at the other end of the link. If the CTC device is unexpectedly DISABLED, look for the corresponding ISG046E message from the SYSLOG. There is probably a parmlib member or device configuration issue. After you address the issue, try to VARY the device online.
7. **Repeat steps 1 through 6** for each system in the GRS ring.

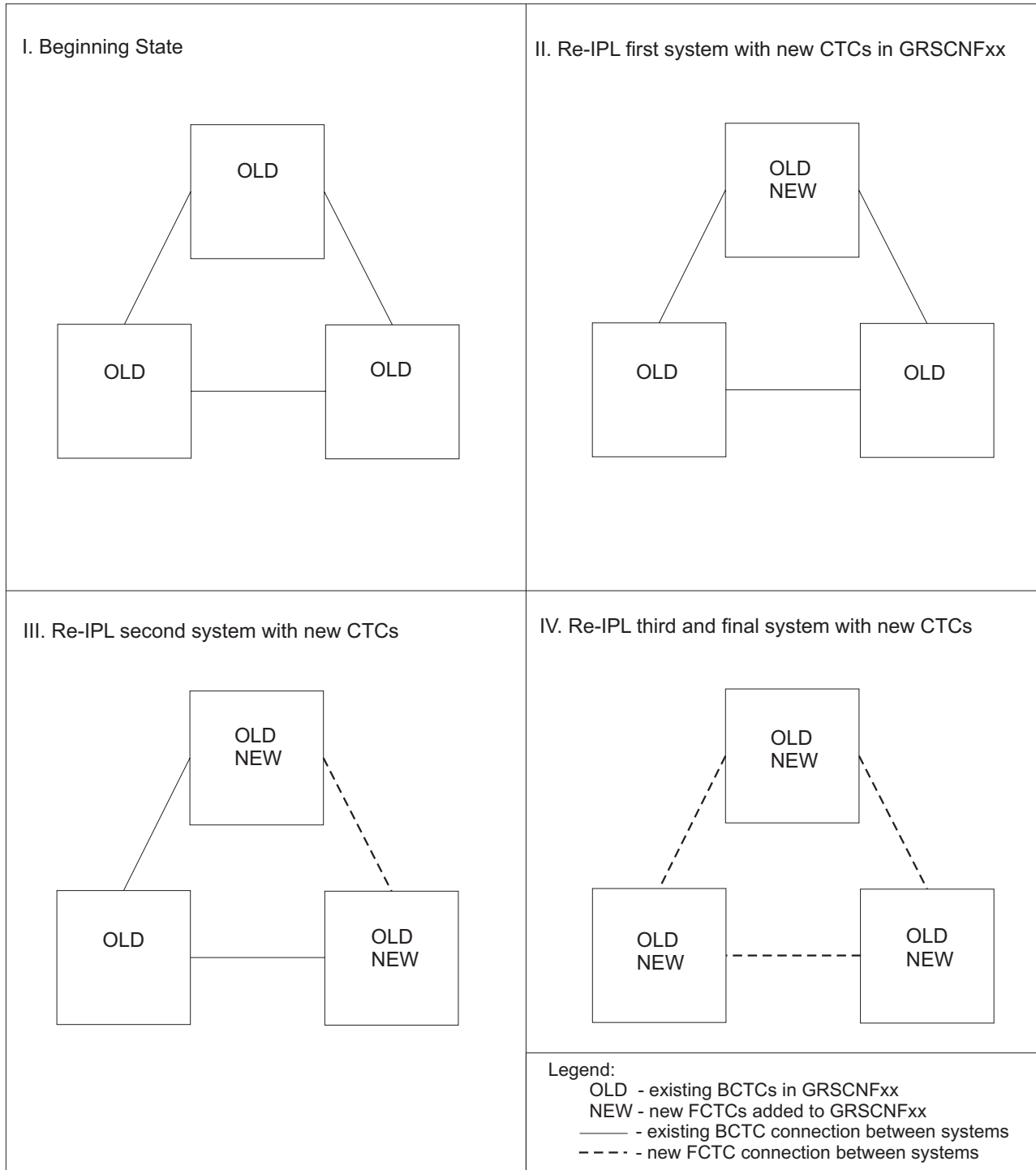


Figure 1. Example of a rolling IPL on a three-system GRS ring

Figure 1 illustrates how the rolling IPL eventually starts using the new FICON CTC (FCTC) devices. After the first system is restarted with the original CTC and FCTC devices (scenario II in Figure 1), GRS continues to use the original CTC device and JOIN the existing GRS ring. However, as the second and third system are restarted (scenario's III and IV in Figure 1), GRS uses the FCTC rather than the BCTC because on IPLing system, GRS always tries to initialize the CTC devices in last-to-first order as they appear in GRSCNFxx.

Migration actions from z/OS V1R12: BCP

Migration method that uses complex-wide IPL:

A GRS complex-wide IPL depends on the installation's policies and procedures regarding planned outages of that scale. The preparation is the same with regard to applied PTF, FICON setup, and GRSCNFxx settings. The orderly shutdown can use the same initial steps to avoid ring disruptions.

In the case of a mixed complex, it is important for the last system to be an XCF=local or monoplex system. Whenever a mixed GRS complex transitions into a pure sysplex, VARY GRS(X) is no longer allowed. It is also recommended that you IPL that system alone with GRS=START to establish the ring of one with all of its CTC devices QUIESCE before starting the remaining systems. See 288.

TRYJOIN Warning:

Do not use GRS=TRYJOIN if any systems in the GRS complex use GRS-managed CTC communication. When the GRS complex equals the sysplex, the TryJoin option is planned to resolve correctly. In a mixed up ring or a ring where GRS manages all of its CTC communication directly, a single system should specify GRS=START and the remainder GRS=JOIN. Otherwise, there exists a race condition for the initializing systems to form a split ring where data integrity is compromised. This is still true with FICON CTC support.

Reference information: See these information sources.

- For more information about GRS, see *z/OS MVS Planning: Global Resource Serialization*.
- For more information on CTC definitions, see:
 - *z/OS HCD User's Guide*
 - *z/OS HCD Planning*

Examine use of the CMDS ABEND command

Description: Before z/OS V1R13, the CMDS ABEND command ended an executing command if the command was hung. In z/OS V1R12, the command processors were allowed to specify the new non-abendable attribute to set themselves non-abendable. When the new attribute was specified for a target command, the CMDS ABEND command rejected with the following message: CNZ6002I COMMAND *command* WITH ID *id* NOT ABENDABLE. The CMDS ABEND attempted to terminate the hung command.. Starting in z/OS V1R13, the new parameter FORCE is added to the CMDS command so that a CMDS FORCE specification overrides the non-abendable attribute and the command will be terminated as it is today. Separating the ABEND and FORCE requests allow different RACF profiles to be defined so that installations can allow CMDS ABEND, but not CMDS FORCE. FORCE is intended to be used where the only alternative is to re-IPL the system.

Element or feature:	BCP.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	After the first IPL of z/OS V2R1.
Is the migration action required?	No, but recommended if you use the CMDS ABEND command or have automation that does.
Target system hardware requirements:	None.

Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Automation that uses the CMDS ABEND command is affected because the termination of a running command can be rejected. For some commands, this rejection is important because it can prevent a system or sysplex outage. If you use the CMDS ABEND command or have automation that does, certain commands will no longer be terminated by the CMDS ABEND command.

- If you must terminate a command, continue to use the CMDS ABEND command. If the command is in a state making it non-abendable, use the CMDS FORCE command after understanding the following recommendations associated with the FORCE parameter:
 - After issuing CMDS FORCE, you might have to re-IPL the system or, depending on the command being terminated, a sysplex-wide IPL may be required.
 - You should ensure that the target command is hung and not just requiring additional time to complete.

Reference information:

- For details about the CMDS command, see *z/OS MVS System Commands*.
- See message CNZ6002I in *z/OS MVS System Messages, Vol 4 (CBD-DMO)*.

Add to the maximum number of open files under z/OS UNIX Systems Services for PFA

Description: Starting in z/OS V1R13, Predictive Failure Analysis (PFA) has two additional checks, PFA_JES_SPOOL_USAGE and PFA_ENQUEUE_REQUEST_RATE. These additional checks add to the number of open files for the PFA started task id.

Element or feature:	BCP.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	After the first IPL of z/OS V1R13 and before the start of PFA.
Is the migration action required?	Yes, if you use PFA and MAXFILEPROC is less than 5000.

Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.

Migration actions from z/OS V1R12: BCP

Related IBM Health Checker for z/OS check:	None.
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Steps to take: PFA requires the maximum number of open files under z/OS UNIX System Services to be 5000 or greater. You can increase the value in one of two ways. The first option is preferable:

1. Update the FILEPROCMAX field in the OMVS segment of the PFA started task id, for example:
TSO ALU pfauser OMVS(FILEPROCMAX(5000))
2. Update the BPXPRMxx MAXFILEPROC value in the parmlib member BPXPRMxx.

Reference information: For more information about the MAXFILEPROC value, see *z/OS MVS Initialization and Tuning Reference*.

For information about FILEPROCMAX, see *z/OS MVS Diagnosis: Tools and Service Aids*

Set AUTHQLVL parameter in GRSCNFxx parmlib member to recognize new GRS qnames

Description: Beginning with z/OS V1R13, global resource serialization (GRS) provides an additional list of qnames that are conditionally authorized: ARCDNS, ARCBTAPE, ARCGPA, ARCBACV, and ARCMIGV. You can set the new AUTHQLVL parameter in the GRSCNFxx parmlib member to indicate whether the system is to recognize the second list of authorized qnames in addition to the original list. The value is either 1 (default) or 2.

The AUTHQLVL setting of 1 (default) denotes that the existing IBM default list for authorized qnames (that is, the list in effect for systems at z/OS V1R12 and earlier) is in effect for the system in the global resource serialization (GRS) complex. The AUTHQLVL setting of 2 denotes the addition of the five new qnames (ARCDNS, ARCBTAPE, ARCGPA, ARCBACV, ARCMIGV) to the authorized qname list and provides a higher level of protection; however, it can cause some products to fail. An unauthorized program issuing ENQ or DEQ requests for any of these qnames when AUTHQLVL of 2 is in effect will get ABEND338 or ABEND330, respectively. ISGENQ requests with COND=NO will get similar ABENDs and ISGENQ requests with COND=YES will get return code 8, reason code xxxx081E, ISGENQRsn_NotAuthorizedForQName.

Element or feature:	BCP
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	After the first IPL of z/OS V2R1.
Is the migration action required?	Yes, to protect authorized programs utilizing these qnames from denial-of-service attacks.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.

Related IBM Health Checker for z/OS check:	Use check GRS_AUTHQLVL_SETTING to help determine your installation's need for authorized qname protection.
---	--

Steps to take: Follow these steps:

1. Products that are designed to interact with resources that have these qnames need to run authorized. In order to help determine if your installation has any of these products running on your system, there is a new AUTHQ2 filter on the EQDQ Monitor. Before the new AUTHQLVL is increased to 2, this filter shows ENQ requests that are made with any of these new qnames from an unauthorized program.
2. The AUTHQLVL setting in GRSCNFxx refers to a specific system. A rolling IPL is required to ensure consistency across the GRS complex. The increased AUTHQLVL value can be tested on one system but only for ENQ requests initiated on that system. The AUTHQLVL=2 migration process is not complete until all systems across the GRS complex are at 2.
3. If ABEND338 or ABEND330 occurs from the change because one of the required products is missed, the **SETGRS** command supports a fallback to 1 on any given system by issuing **SETGRS AUTHQLVL=1**; however, you cannot dynamically increase the AUTHQLVL. Another IPL is required. As with other SETGRS keywords that require UPDATE access to an OPERCMDS profile matching an MVS.SETGRS.xxx profile name, downgrading the AUTHQLVL to 1 through the SETGRS command in an OPERCMDS environment requires update access to a profile of the form MVS.SETGRS.AUTHQLVL

Reference information: For details about authorized qnames, see *z/OS MVS Planning: Global Resource Serialization*.

BookManager BUILD migration actions

This topic describes migration actions for optional feature BookManager BUILD.

BookManager BUILD actions to perform before installing z/OS V2R1

This topic describes BookManager BUILD migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

Plan for the removal of support for the optional feature BookManager BUILD

Description: z/OS V2R1 is the last release that is planned to support the optional feature BookManager BUILD of z/OS. Plan for the removal of support.

Element or feature:	BookManager BUILD
When change was introduced:	Planned for the release following z/OS V2R1, as previewed in Statement of direction: IBM z/OS IBM United States Software Announcement 212-086 April 11, 2012.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.

Migration actions from z/OS V1R12: BookManager BUILD

Is the migration action required?	Yes, if you use the optional feature BookManager BUILD.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Remove any usage of BookManager BUILD for releases of z/OS later than z/OS V2R1

Reference information: None.

BookManager BUILD actions to perform before the first IPL of z/OS V2R1

This topic describes BookManager BUILD migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

None.

BookManager BUILD actions to perform after the first IPL of z/OS V2R1

This topic describes BookManager BUILD migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

None.

CIM migration actions

This topic describes migration actions for the base element Common Information Model (CIM).

CIM actions to perform before installing z/OS V2R1

This topic describes CIM migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

None.

CIM actions to perform before the first IPL of z/OS V2R1

This topic describes CIM migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

None.

CIM actions to perform after the first IPL of z/OS V1R13

This topic describes CIM migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

Update to SBLIM CIM Client for Java Version 2

Description: z/OS V2R1 is planned to be the last release to include Version 1 of the Standards Based Linux Instrumentation for Manageability (SBLIM) CIM client for Java. Version 1 support for the SourceForge open source project was discontinued after 2010. Version 2 of the SBLIM client, which is designed to be a JSR48- compliant implementation, is included in z/OS V1R13 and planned to be included in z/OS V2R1. IBM recommends that users of SBLIM Version 1 convert to Version 2.

If you are using SBLIM Version 1, convert to Version 2 which has been included in z/OS V1R13

Element or feature:	CIM
When change was introduced:	IBM United States Software Announcement 213-013, dated February 5, 2013.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	After the first IPL of z/OS V2R1.
Is the migration action required?	No, but recommended because it is planned to be a requirement in the release after z/OS V2R1.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Identify any non-IBM application that is using the SBLIM CIM Client for Java Version1 (**sblimCIMClient.jar**) and contact the owner of the application to convert it to use SBLIM CIM Client for Java Version 2 (**sblim-cim-client2.jar**).

Reference information: For additional information about Setting up a Capacity Provisioning domain, see *z/OS MVS Capacity Provisioning User's Guide*

Communications Server migration actions

This topic describes migration actions for base element Communications Server.

Communications Server actions to perform before installing z/OS V2R1

This topic describes Communications Server migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

IP Services: Permit intranode management network application to use OSM interfaces

Description: Beginning in z/OS V2R1, access to OSM interface information by using ioctls SIOCGIFNAMEINDEX, SIOCGHOMEIF6, and SIOCGIFCON6 has been restricted to applications with READ authorization to the EZB.OSM.*sysname.tcpname* resource.

Element or feature:	z/OS Communications Server.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you run an application that requires OSM interface information by using the ioctls.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: An applications that uses ioctls SIOCGIFNAMEINDEX, SIOCGHOMEIF6, or SIOCGIFCONF6 to retrieve OSM interface information requires authorization to the EZB.OSM.*sysname.tcpname* resource.

- If your security server is RACF, issue the following commands.


```

SETROPTS CLASSACT(SERVAUTH)
SETROPTS RACLIST (SERVAUTH)
RDEFINE SERVAUTH EZB.OSM.sysname.tcpprocname
PERMIT EZB.OSM.sysname.tcpname CLASS(SERVAUTH) -
ID(userid) ACCESS(READ)
SETROPTS RACLIST(SERVAUTH) REFRESH
            
```
- If you use a different security server, perform the equivalent steps.

Reference information: *z/OS Communications Server: IP Configuration Guide*

Configuration assistant: Migrate to the Configuration Assistant for Communications Server in the z/OS Management Facility (z/OSMF)

Description: Starting in z/OS V2R1, IBM Configuration Assistant for z/OS Communications Server is no longer offered as a stand-alone application that runs on the Windows operating system. IBM Configuration Assistant for z/OS Communications Server is available as a fully supported task in the z/OSMF product. Use the task available in z/OSMF.

Migration actions from z/OS V1R12: Communications Server

Element or feature:	Communications Server.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if a Windows desktop version is being used.
Target system hardware requirements:	None.
Target system software requirements:	z/OSMF V2R1
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: To use the IBM Configuration Assistant for z/OS Communications Server task, you need to take the following steps:

1. Configure z/OSMF.
2. Transfer your existing backing store files into the z/OSMF environment if desired.

Reference information: For information, see the following:

- For information about configuring z/OSMF, see *IBM z/OS Management Facility Configuration Guide*.
- For information about transferring Configuration Assistant backing store files to z/OSMF, see the Updating z/OS for the Configuration Assistant plug-in section in *IBM z/OS Management Facility Configuration Guide*.

IP Services: Ensure FTP is listed in the AUTHCMD and AUTHPGM NAMES section of your IKJTSOxx member of SYS1.PARMLIB

Description: Beginning in z/OS V2R1, the z/OS FTP client supports user exits. The FTP client invokes z/OS Dynamic Exit Services (DES) to determine whether you have installed FTP client user exit EZAFCCMD or EZAFCREP. To invoke DES successfully, the program FTP must be APF authorized. Therefore, you must add FTP to the AUTHCMD and AUTHPGM NAMES section of your IKJTSOxx member of SYS1.PARMLIB. Otherwise, the following error messages EZA1555I are displayed when you start the FTP client:

- CSVDYNEX DEFINE failed for user exit EZAFCCMD, RETURN CODE x'08' REASON CODE x'00000804'
- CSVDYNEX DEFINE failed for user exit EZAFCREP, RETURN CODE x'08' REASON CODE x'00000804'

Element or feature:	Communications Server.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you invoke the z/OS FTP client.

Migration actions from z/OS V1R12: Communications Server

Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps: Add FTP in the AUTHCMD and AUTHPGM NAMES section of your IKJTSOxx member of SYS1.PARMLIB.

Note: In z/OS V2R1, SYS1.SAMPLIB(IKJTSO00) member contains the FTP definitions in both AUTHCMD and AUTHPGM NAMES section.

Reference information: For information, see the following:

- FTP client user exits in *z/OS Communications Server: IP Configuration Reference*.
- TSO command authorization in *z/OS Communications Server: IP Configuration Guide*
- For a complete list of all the z/OS Communications Server commands and programs that need to be added to the AUTHCMD NAMES and AUTHPGM NAMES statements in your IKJTSOxx PARMLIB member, see the *z/OS Program Directory*.

IP Services: Understand the change in the support provided by the DVIPSEC parameter on the IPSEC statement in the TCP/IP profile

Description: Before z/OS V2R1, the DVIPSEC parameter on the IPSEC statement in the TCP/IP profile enabled Sysplex-Wide Security Associations (SWSA) for IPv4 on a stack that had IPCONFIG IPSECURITY specified in the TCP/IP profile. Support for SWSA for IPv6 was not provided in these releases.

Beginning with z/OS V2R1, SWSA for IPv6 is supported. The DVIPSEC parameter on the IPSEC statement in the TCP/IP profile enables SWSA for IPv6 on a stack that has IPCONFIG6 IPSECURITY specified in the TCP/IP profile.

Element or feature:	Communications Server.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if the TCP/IP profile for your stack specifies the IPSECURITY parameter on the IPCONFIG6 statement and also specifies the DVIPSEC parameter on the IPSEC statement.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.

Migration actions from z/OS V1R12: Communications Server

Related IBM Health Checker for z/OS check:	None.
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Steps to take: Follow these steps:

- If you have both of the following specified in your TCP/IP profile, be aware that SWSA for IPv6 will be enabled on your stack:
 - The IPSECURITY parameter on the IPCONFIG6 statement
 - The DVIPSEC parameter on the IPSEC statement
- If you have IPv6 TCP traffic that is protected by an IPSec Security Association (SA) with an IPv6 DVIPA endpoint, you can see the following changes:
 - When an IPv6 DVIPA is moved during a planned or unplanned DVIPA takeover, new SAs are automatically reestablished with the same security service characteristics as the SAs that existed on the host that owned the DVIPA.
 - IPv6 TCP traffic that is protected by an IPSec SA with a sysplex-distributed DVIPA endpoint can be distributed to target hosts.
- Ensure that you configure the appropriate IP security policy on the backup and target hosts.

Reference information: See "Sysplex-Wide Security Associations" in *z/OS Communications Server: IP Configuration Guide*.

IP Services: Be aware of IP Fragment attack type of the Intrusion Detection Services (IDS) enhancements to monitor both IPv4 and IPv6 traffic

Beginning in z/OS V2R1, IP Fragment attack type of the Intrusion Detection Services (IDS) is enhanced to monitor both IPv4 and IPv6 traffic for suspicious fragments. It is also enhanced further to check for overlays that change the data in the packet. Be aware that in z/OS V2R1, if you have the IP fragment IDS attack enabled, IPv6 traffic will now be monitored. In earlier releases, only IPv4 traffic was monitored.

Element or feature:	Communications Server.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you are using IDS on a stack and the IP Fragment attack type is enabled.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

Migration actions from z/OS V1R12: Communications Server

If you are using IDS on a stack and the IP Fragment attack type is enabled, be aware of the following information:

- Both IPv4 and IPv6 traffic are monitored for suspicious fragments.
- The IP Fragment attack type checking is enhanced to check for overlays that change the data in the packet, including changes to the length of the packet.

Reference information: For more information about IP fragments, see "Attack of IDS policy definition considerations" in *z/OS Communications Server: IP Configuration Guide*.

IP Services: Relink NMI applications using the 64-bit TMI copy buffer function (EZBTMIC4)

Description: Starting with z/OS V2R1, the interface between the 64-bit TMI copy buffer function (EZBTMIC4) and the TCP/IP stack is changed. Applications that use the real-time TCP/IP network monitoring network management interface (NMI) and statically link to this function must either relink or change to dynamic linking or loading of the function.

Element or feature:	Communications Server.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if your application statically links to the 64-bit TMI copy buffer function (EZBTMIC4). No change is required for applications that use the 32-bit TMI copy buffer function (EZBTMIC1) or that dynamically link or load EZBTMIC4.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: If your application statically links to the 64-bit TMI copy buffer function (EZBTMIC4), relink your application, or change your application to dynamically link to the 64-bit TMI copy buffer function (EZBTMIC4).

Reference information: For information, see the following: See "EZBTMIC1 or EZBTMIC4: Copy TCP/IP Management Interface Data Buffer" in *z/OS Communications Server: IP Programmer's Guide and Reference*

IP Services: Review XL C/C++ applications that use the GetProfile request of the TCP/IP callable network management interface (NMI)

Description: In z/OS V2R1, the definitions of some of the IPv6 address fields returned by the TCP/IP callable NMI GetProfile request, have changed. The definitions for the following fields are corrected to specify a data type of `in6_addr` instead of a character string in the XL C/C++ header file `ezbnmmpc.h`.

Migration actions from z/OS V1R12: Communications Server

- NMTP_V6CFDynXcfAddr
- NMTP_IPA6Addr

If you have XL C/C++ applications that reference these fields, you need to modify your application before recompiling it with the updated XL C/C++ header file.

Element or feature:	Communications Server.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you plan on recompiling your application with the updated XL C/C++ header file.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

1. Review the references to the changed fields in your application program.
2. If you have XL C/C++ applications that reference these fields, you need to modify your application before recompiling it with the updated XL C/C++ header file.

Reference information: For more information about the GetProfile request, see "TCP/IP callable NMI (EZBNMIFR)" in *z/OS Communications Server: IP Configuration Guide*

IP Services: Prepare for the addition of IPv6 support for policy-based routing

Description: As of z/OS V2R1 policy-based routing is enhanced to route IPv6 traffic. In earlier releases a policy-based routing rule that did not specify the source and destination IP addresses only applied to IPv4 packets. Starting in z/OS V2R1, that same policy-based routing rule applies to both IPv4 and IPv6 packets.

Element or feature:	z/OS Communications Server.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you are using policy-based routing on a stack that is being run as a dual-mode stack (IPv4 and IPv6).
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.

Migration actions from z/OS V1R12: Communications Server

Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: If you have a policy-based routing rule that specifies neither source IP addresses nor destination IP addresses, the rule will apply to both IPv4 and IPv6 packets. If you want the rule to continue to apply to only IPv4 packets, modify the rule to specify either a source or destination IP address of 0.0.0.0/0.

Reference information: See the RoutingRule statement in *z/OS Communications Server: IP Configuration Reference*

IP Services: Replace any GATEWAY statements in the TCP/IP profile with equivalent BEGINROUTES statements

Description: Support for the GATEWAY statement in the TCP/IP profile will be eliminated in a future release. The BEGINROUTES/ENDROUTES statement block was introduced in z/OS V1R1 Communications Server and replaces the GATEWAY profile statement for configuration of static routes. The GATEWAY statement has been stabilized since then, and has not been updated to support enhancements such as IPv6 and replaceable static routes. Additionally, the GATEWAY syntax is error prone.

Element or feature:	Communications Server.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	No, but recommended to take advantage of the latest support offered by BEGINROUTES/ENDROUTES.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	ZOSMIGV2R1_CS_GATEWAY can help you determine if you are using any GATEWAY statements in your TCP/IP profile.

Steps to take: Replace any GATEWAY statements in your TCP/IP profile with the equivalent BEGINROUTES/ENDROUTES statement block.

In order to create BEGINROUTES statements from your existing specification, you can use IPCS. Run the TCPIPCS PROFILE report on a dump of the TCP/IP address space and static routes are presented as a BEGINROUTES/ENDROUTES statement block, even if you coded them by using a GATEWAY statement. However, you will have to execute the commands to know with certainty what changes to make.

Reference information: For information, see the following:

Migration actions from z/OS V1R12: Communications Server

- See "Chapter 2: TCP/IP Profile and Configuration Statements" in *z/OS Communications Server: IP Configuration Reference*
- See "Chapter 6: PCS Subcommands for TCP/IP" in *z/OS Communications Server: IP Diagnosis Guide*

IP Services: Migrate from BIND 9.2.0

Description: z/OS V1R13 was the last release that supported the z/OS BIND 9.2.0 name server function. If you are using this function as a name server, you must find a replacement.

Element or feature:	Communications Server
When change was introduced:	The removal of the BIND 9.2.0 function was first announced in February 2009. z/OS V1R13 was the last release that supported the z/OS BIND 9.2.0 name server function, as stated in the z/OS V1R13 preview announcement on February 11th, 2011.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you are using the BIND 9.2.0 function as a name server.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	ZOSMIGV1R11_CS_DSNBIND9.

Steps to take: Follow these steps:

- If you are using z/OS BIND 9.2.0 as a caching-only name server, use the z/OS resolver DNS caching function to cache DNS responses.
- If you are using z/OS BIND 9.2.0 as a primary or secondary authoritative name server, investigate using BIND on Linux for System z or BIND on an IBM blade in a zBX.
- Update the NSINTERADDR statements in the resolver configuration file.
- If the z/OS BIND 9.2.0 name server is the only name server to be contacted in the NSINTERADDR list of name servers, replace the name server entry with one or more name server IP addresses.
- If more than one name server is in the NSINTERADDR list of name servers, delete the IP address of the z/OS BIND 9.2.0 name server.
- If the automated domain name registration(ADNR) application is being used, ensure the name server is configured to support ADNR. See *z/OS Communications Server: IP Configuration Guide* for configuring automated domain name registration.

Reference information: For details about the resolver, see *z/OS Communications Server: IP Configuration Guide* and *z/OS Communications Server: IP Configuration Reference*.

IP Services: Plan for the change of greater than 8 characters for the FTP password

Description: Before z/OS V1R13 an FTP password greater than 8 characters was truncated to 8 characters. Starting with V1R13, the z/OS FTP server supports password phrases. This support passes the provided password to the installation security product without any truncation.

The lack of the truncation might cause the FTP server SAF call to fail. By applying the PTF for APAR PM62213 in z/OS V1R13, FTP has been modified to support a new server FTP.DATA statement called PASSPHRASE. It indicates whether the FTP server supports logging into FTP with password phrases. The parameters are:

- TRUE: The FTP server allows an FTP client to log into FTP with a password phrase. This is the default.
- FALSE: The FTP server does not allow an FTP client to log into FTP with a password phrase.

To expect the same behavior as in earlier releases to z/OS V1R13, you need to specify FALSE explicitly.

Element or feature:	Communications Server.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you are not using passphrases and wish the existing behavior (before z/OS V1R13) to remain.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	

Steps to take: Decide if you need Communications Server to continue the truncation of passwords for FTP or not. If you would like no truncation and intend to use passphrases for FTP, then the default is acceptable for you. If you wish to override the default value and have the z/OS FTP server truncate passwords longer than 8 characters, then override the default for PASSPHRASE in FTP.DATA.

Reference information: For information, see the following: See *z/OS Communications Server: IP Configuration Reference*.

IP Services: Accommodate new format of FTP daemon console messages that no longer are prefixed with '+'

Description: Before V1R13, FTP daemon console messages were prefixed with a '+' status indicator. Beginning in V1R13, these messages are no longer prefixed with the '+' status indicator.

Element or feature:	Communications Server
When change was introduced:	z/OS V1R13.

Migration actions from z/OS V1R12: Communications Server

Applies to migration from:	z/OS V1R12.
Timing:	Before installing V2R1.
Is the migration action required?	Yes, if you have message automation that expects to see the '+' character.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Adjust your message automation to examine only the message ID and text of console messages, and not to examine the status character. The following FTP daemon console messages are affected:

- EZYFT59I
- EZYFT70I
- EZYFT72I
- EZYFT80I
- EZYFT81I
- EZYFT82I
- EZYFT83I
- EZYFT84I
- EZYFT86I
- EZYFT89I
- EZYFT90I
- EZY2702I
- EZY2706E
- EZY2707E
- EZY2714I

Tip: The system might insert a character, like "+" or "*" preceding the message identifier. This character is not a part of the message identifier. Do not add it to the msgid specification in the MPFLSTxx parmlib member.

Reference information: For messages sent to the MCS/SMCS consoles, see *z/OS MVS System Messages, Vol 3 (ASB-BPX)*.

IP Services: Define a user ID for the system resolver with an associated OMVS segment

Description: Starting with z/OS V1R13, the system resolver uses z/OS UNIX services in the resolver address space. Use of z/OS UNIX services requires the resolver to have an OMVS segment associated with its user ID. If you do not define a user ID for the resolver with an associated OMVS segment, the resolver initialization will fail and the TCP/IP stack initialization will not be able to complete with message

EZZ9315E TCP/IP WAITING FOR RESOLVER TO INITIALIZE.

Migration actions from z/OS V1R12: Communications Server

Element or feature:	Communications Server.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	Before installing V2R1.
Is the migration action required?	Yes, if you do not have a user ID defined for the system resolver that has an associated OMVS segment, which provides access to z/OS UNIX services.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	<p>If you do not define a user ID for the system resolver that includes an OMVS segment, the resolver initialization will fail and the initialization of all TCP/IP stacks will be delayed. The following messages might be issued to describe the initialization failure scenario:</p> <pre>IEF695I START RESOLVER WITH JOBNAME RESOLVER IS ASSIGNED TO USER RESOLVER IEF403I RESOLVER - STARTED - TIME=13.40.06 ICH408I JOB(RESOLVER) STEP(RESOLVER) CL(PROCESS) OMVS SEGMENT NOT DEFINED EZZ9301E RESOLVER ENDED ABNORMALLY IEF450I RESOLVER RESOLVER - ABEND=SEC6 U0000 REASON=0F01C008 TIME=13.40.07 IEF404I RESOLVER - ENDED - TIME=13.40.07</pre>
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

1. If you already have a user ID for the system resolver started procedure, and you explicitly defined an OMVS segment for the ID, or an OMVS segment was created automatically through the RACF automated assignment of unique UNIX identities support, no action is required.
2. If you already have a resolver user ID but it does not have an OMVS segment, you must define an OMVS segment for the resolver user ID.
3. If you do not have a resolver user ID, you must create one that includes an OMVS segment.

The following information is an excerpt of the SEZAINST(EZARACF) sample job that you can use to define a user ID with an OMVS segment and assign it to the system resolver started procedure. You might need to modify the sample values that are specified in the commands for your environment. For example, the UID, Default Group, and Resolver user ID values are sample values.

```
//*===== RESOLVER =====
//*=====
//*=====
//*
//* Create the userid and its OMVS Segment for the daemon and
//* add it to the STARTED Class which is activated in this job.
```


Migration actions from z/OS V1R12: Communications Server

```
/**
/** If you chose not to use the RACF STARTED Class,
/** the entry should be placed in the started procedures table ICHRIN03.
/**
//RESOLVER EXEC PGM=IKJEFT01
//SYSTSPRT DD SYSOUT=*
//SYSTSIN DD *
SETROPTS CLASSACT(STARTED)
SETROPTS RACLIST(STARTED)
SETROPTS GENERIC(STARTED)
ADDUSER RESOLVER DFLTGRP(OMVSGRP) OMVS(UID(42) HOME('/')) -
NOPASSWORD
RDEFINE STARTED RESOLVER.* STDATA(USER(RESOLVER))
SETROPTS RACLIST(STARTED) REFRESH
SETROPTS GENERIC(STARTED) REFRESH
/**
```

Reference information: For information about defining and assigning a user ID for started procedures, see "Using Started Procedures" in *z/OS Security Server RACF Security Administrator's Guide*.

For information about defining an OMVS segment, see "RACF and z/OS Unix" in *z/OS Security Server RACF Security Administrator's Guide*.

For general information about the system resolver, see "Steps for defining the resolver address space" in *z/OS Communications Server: IP Configuration Guide*.

IP Services: Ensure storage availability for ancillary input queue for Enterprise Extender traffic

Description: In z/OS V1R13, the processing of IPAQENET and IPAQENET6 INTERFACE statements is enhanced. Coding the WORKLOADQ parameter on these INTERFACE statements now enables the QDIO inbound workload queuing function for Enterprise Extender (EE) traffic. An additional ancillary input queue (AIQ) is established for inbound traffic for EE if HPR=RTP is specified as a VTAM start option. Each AIQ increases storage utilization by an amount equal to 36K of fixed ECSA, plus potentially the READSTORAGE value (64K multiplied by the number of SBALs) of fixed CSM 4K data space storage. If you have configured QDIO inbound workload queuing, you must ensure that there is sufficient fixed ECSA and 4K CSM dataspace storage for the AIQ for EE traffic.

Element or feature:	Communications Server.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	Before installing V2R1.
Is the migration action required?	No, but recommended if you have the WORKLOADQ parameter specified on the INTERFACE statement and you have concerns about using additional storage.
Target system hardware requirements:	This migration action is required only if you are using OSA-Express3, or later, features on an IBM zEnterprise z196.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.

Migration actions from z/OS V1R12: Communications Server

System impacts:	Each AIQ increases storage utilization by an amount equal to 36K of fixed ECSA plus potentially the READSTORAGE value (64K multiplied by the number of SBALs) of fixed CSM 4K data space storage.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

1. Verify if you are using EE; you are using EE if HPR=RTP is defined as a VTAM start option and if an EE XCA Major Node is defined and active. If you are using EE, continue with steps 2-5. If you have HPR=RTP defined as a VTAM start option but do not have an EE XCA Major Node defined and active, continue with steps 2, 3 and 5. Otherwise there is no increase in storage usage and no further action is required.
2. Count the total number of OSA-Express3, and later, interfaces that are coded with the WORKLOADQ parameter on the IPAQENET and IPAQENET6 INTERFACE statements. Make a note of the number.
3. Verify that sufficient ECSA is available. To do this, multiply the total number of OSA-Express3, and later, interfaces that have inbound workload queueing enabled (you determined this number in step 2) by 36K. The resulting number indicates how much new ECSA is required. Use the DISPLAY CSM command to verify that sufficient ECSA is available to enable this function.
4. Verify that sufficient real storage is available. 64-bit real storage is used for the dataspace read buffers. Multiply the total number of OSA-Express3, and later, interfaces that have inbound workload queueing enabled (determined in step 2) by 64K and by 126 (8064K). The maximum number of read buffers per queue is 126. The resulting number is approximately the amount of additional 64-bit real storage that is required for the data space read buffers for all the new EE input queues.
5. If sufficient storage is not available, either increase the available storage or consider defining some of the OSA-Express3, and later, INTERFACE statements with the NOWORKLOADQ parameter.

Reference information: Performance improvements for Enterprise Extender traffic in *z/OS Communications Server: New Function Summary*.

IP Services: Permit IKE daemon running in FIPS mode to use additional ICSF services

Description: In z/OS V1R13, the Internet Key Exchange (IKE) daemon is enhanced to take advantage of new services that are provided by Integrated Cryptographic Service Facility (ICSF) when the IKE daemon is running in Federal Information Processing Standards (FIPS) mode. The new ICSF services are provided in updates to ICSF PKCS number 11 functions CSFPDVK and CSFPDMK. ICSF now provides the following information to the IKE daemon, each with a single call to ICSF:

- The derivation of the original seed key.
- The phase 1 key set.
- The phase 2 key set.

Element or feature:	Communications Server.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.

Migration actions from z/OS V1R12: Communications Server

Timing:	Before installing V2R1.
Is the migration action required?	Yes, if you currently run the IKE daemon in FIPS mode and if you control the access to ICSF resources in the CSFSERV class.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

- The IKE daemon now requires READ access to the CSF1DVK and CSF1DMK resources in CSFSERV when the IKE daemon is configured to run in FIPS mode.
- If your security server is RACF, issue the following commands in the order shown. If you use a different security server, determine and perform the equivalent steps.
 1. PERMIT CSF1DVK CLASS(CSFSERV) ID(IKED) ACCESS(READ)
 2. PERMIT CSF1DMK CLASS(CSFSERV) ID(IKED) ACCESS(READ)
 3. SETROPTS RACLIST(CSFSERV) REFRESH

Reference information: For details, see the steps for setting up profiles in the CSFSERV resource class in *z/OS Communications Server: IP Configuration Guide*.

IP Services: Understand and prepare for expanded Intrusion Detection Services

Description: Beginning in z/OS V1R13, Intrusion Detection Services (IDS) is enhanced to monitor IPv6 traffic. This includes scan detection and reporting, attack detection, attack reporting, attack prevention, and traffic regulation. Additional attack detection, reporting, and prevention are also provided for IPv4 traffic.

Element or feature:	Communications Server.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you are using IDS on a stack that is being run as a dual-mode stack (IPv4 and IPv6).
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Migration actions from z/OS V1R12: Communications Server

Steps to take: Follow these steps:

1. If any of the following IDS attack types are enabled, be aware that both IPv4 and IPv6 traffic will be monitored for attacks of these types:
 - Malformed attack type
 - UDP perpetual echo attack type
 - Flood attack type
 - ICMP redirect attack type
2. If you use the **trmdstat** command to get a consolidated view of IDS log records, be aware that the default report, provided when the **trmdstat** command is issued with no report option, will be the IDS Summary report. The IDS Summary report provides a summary of all IDS information.
3. If you have a TCP scan rule that applies to all local IP addresses (such as when the LocalHostAddr All is specified explicitly or by default in the policy), then TCP scan events will be detected for both IPv4 and IPv6 packets. If you want the TCP scan rule to continue to only detect scan events for IPv4 packets, modify the rule to specify a local IP address of 0.0.0.0/0.
4. If you have a UDP scan rule that applies to all local IP addresses (such as when the LocalHostAddr All is specified explicitly or by default in the policy), then UDP scan events will be detected for both IPv4 and IPv6 packets. If you want the UDP scan rule to continue to only detect scan events for IPv4 packets, modify the rule to specify a local IP address of 0.0.0.0/0.
5. If you have a TCP traffic regulation (TR) rule that applies to all local IP addresses (such as when the LocalHostAddr All is specified explicitly or by default in the policy), then limits will be enforced for both IPv4 and IPv6 connection requests. If you want the TCP TR rule to continue to only enforce limits for IPv4 connection requests, modify the rule to specify a local IP address of 0.0.0.0/0.
6. If you have a UDP TR rule that applies to all local IP addresses (such as when the LocalHostAddr All is specified explicitly or by default in the policy), then limits will be enforced for both IPv4 and IPv6 packets. If you want the UDP TR rule to continue to only enforce limits for IPv4 packets, modify the rule to specify a local IP address of 0.0.0.0/0.
7. If you use LDAP to configure IDS policy and you are using the default value for attribute `ibm-idsLocalHostIPAddress` with a TCP scan, UDP scan, TCP TR, or UDP TR rule, events will be detected and limits will be enforced for both IPv4 and IPv6 traffic. If you want these rules to continue to apply to only IPv4 traffic, modify the attribute to specify `ibm-idsLocalHostIPAddress:3-0.0.0.0-0`.

Reference information: For details, see the following:

- "Intrusion Detection Services" in *z/OS Communications Server: IP Configuration Guide*
- IBM Configuration Assistant for z/OS Communications Server online help; see the What's New in V1R13 help information for IDS configuration
- "DS policies defined in IDS configuration files" in *z/OS Communications Server: IP Configuration Reference*.

IP Services: Ensure that the FTP user exit routine FTCHKPWD tolerates an additional parameter

Description: Starting in z/OS V1R13, the z/OS FTP server is enhanced to allow logging into FTP with a password phrase. An additional parameter describing the password or password phrase that is used to log into the z/OS FTP server is now passed to the FTCHKPWD user exit. If you have installed an FTCHKPWD exit

Migration actions from z/OS V1R12: Communications Server

routine, and your exit routine meets one or both criteria listed in **Is the migration action required?** below, then you must take action.

Element or feature:	Communications Server.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	Before installing V2R1.
Is the migration action required?	Yes, if your installation uses the FTCHKPWD user exit routine, and if one of the following conditions is true: <ul style="list-style-type: none">• Your exit routine cannot tolerate an additional parameter passed to the exit routine.• Your exit routine inspects or processes the password parameter in any way.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

- Inspect your FTCHKPWD user exit routine. Modify as needed to support the additional parameter.

Reference information: For details, see the following:

- The FTCHKPWD user exit in *z/OS Communications Server: IP Configuration Guide*.
- *z/OS Communications Server: IP Configuration Reference*.

IP Services: Understand change in VIPARANGE security verification processing

Description: Prior to z/OS V1R13, the System Authorization Facility (SAF) resource profile associated with the VIPARANGE statement (EZB.BINDDVIPARANGE.*sysname.tcpname*) was ignored in the following scenario when an application issues a bind:

- The port specified on the bind matches a PORT statement, and
- the IP address of the application's bind is within a VIPARANGE subnet, or the application's bind is an unspecified address and the IP address on the BIND parameter of the PORT statement is within a VIPARANGE subnet.

In this scenario, the PORT statement (including its optional SAF parameter) was used to control access to both the port and to creating the dynamic VIPA (DVIPA).

Beginning in V1R13, the VIPARANGE resource profile is not ignored in this scenario; creation of the IP address is controlled by both the SAF resource profile associated with the VIPARANGE statement and by the PORT statement:

- For a VIPARANGE statement, you can control the creation of the IP address by defining the following SAF resource profiles in the SERVAUTH class:

Migration actions from z/OS V1R12: Communications Server

- EZB.BINDDVIPARANGE.*sysname.tcpname*
- EZB.BINDDVIPARANGE.*sysname.tcpname.resname*, if the new SAF parameter is included on the VIPARANGE statement
- The PORT statement controls whether an application can bind to a given port.

Element or feature:	Communications Server.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	Before installing V2R1.
Is the migration action required?	Yes, if you have defined the EZB.BINDDVIPARANGE. <i>sysname.tcpname</i> resource profile, but you have not given READ access to this resource to all applications that create DVIPAs by binding to addresses that are within a VIPARANGE subnet.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Be aware that the EZB.BINDDVIPARANGE.*sysname.tcpname* resource profile is always checked if defined; ensure all applications that create DVIPAs by binding to addresses within a VIPARANGE subnet have READ access to this resource.

Reference information: For details, see the following:

- Enhanced security for binding to DVIPAs in *z/OS Communications Server: New Function Summary*
- Defining a security profile for SIOCSVIPA, SIOCSVIPA6, and MODDVIPA in *z/OS Communications Server: IP Configuration Guide*
- Defining a security profile for binding to DVIPAs in the VIPARANGE statement in *z/OS Communications Server: IP Configuration Guide*
- VIPARANGE statement in *z/OS Communications Server: IP Configuration Reference*

IP Services: Remove references to DSPNAME for TCP/IP dataspace from DUMP and SLIP commands

Description: Starting with z/OS V1R13, the TCP/IP CTRACE is relocated to HVCOMMON and the TCP/IP dataspace is eliminated.

Tip: Use the **DISPLAY TCPIP,procname,STOR** command to display TCP/IP storage usage information. It displays the current and maximum storage usage for the TCP/IP stack and any TCP/IP storage limits. The maximum storage usage is the highest amount of storage TCP/IP has used since it started. It also contains the information of TRACE HVCOMMON storage usage.

Element or feature:	z/OS Communications Server.
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Migration actions from z/OS V1R12: Communications Server

When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you have references to DSPNAME for TCP/IP dataspace from DUMP and SLIP commands.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

- Accommodate the change in z/OS V1R13, to the value of the SIZE parameter of the TRACE start option and the MODIFY TRACE command, which specifies the number of megabytes of HVCOMMON (for example, SIZE=4M).
- Specify a larger buffer size for the CTRACE component SYSTCPIP. Code the TRACE CT command and specify a value up to 1024 megabytes (1024M) for the SYS1.PARMLIB member CTIEZBxx, or use the command:
`TRACE CT, nnnM,COMP=SYSTCPIP,SUB=(procedure_jobname)`
- In any automation programs, accommodate the numerous messages that are no longer issued and are retired.
- If you have automation that parses for or specifies the character string TCPIPDS1, which before z/OS V1R13 was the name of the data space containing the TCP/IP CTRACE data space, you might want to modify that automation because the data space will no longer be created. This is highly recommended if you have SLIP traps that dump the TCP/IP CTRACE data space.
Consider the following:
 - Failure to remove the DSPNAME for non-existent data spaces can result in an error message but should not stop the running process
 - Check for dump commands that use DSPNAME=('TCPIP'.TCPIPDS1) or ('TCPIP'.*) and remove the DSPNAME parameter.
 - Because FFST dumps do not include data spaces, they are not affected.

Reference information: None.

IP Services: Move references to SEGMENTATIONOFFLOAD and NOSEGMENTATIONOFFLOAD parameters from GLOBALCONFIG to IPCONFIG and IPCONFIG6 statement for segmentation offload support

Description: Starting in z/OS V1R13, the SEGMENTATIONOFFLOAD and NOSEGMENTATIONOFFLOAD parameters on the GLOBALCONFIG statement are deprecated. If no actions are taken to move these parameters to the IPCONFIG and IPCONFIG6 statements, an informational message EZZ0758I is issued to the console to indicate that the parameters will be retired in a future release.

Element or feature:	z/OS Communications Server.
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Migration actions from z/OS V1R12: Communications Server

When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you have SEGMENTATIONOFFLOAD and NOSEGMENTATIONOFFLOAD parameters on the GLOBALCONFIG statement.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Remove any instance of the SEGMENTATIONOFFLOAD and NOSEGMENTATIONOFFLOAD parameters on the GLOBALCONFIG statement.

Reference information: For more information, see *z/OS Summary of Message and Interface Changes*.

SNA Services: Ensure IVTCSM ASSIGN_BUFFER requests do not exceed 500 images for a single CSM buffer

Description: Beginning with z/OS V1R13, Communications Storage Manager (CSM) will reject the ASSIGN_BUFFER request after 500 image buffers of a single CSM buffer are requested, and CSM will return a new reason code of 26. The new reason code 26 states: "Assign buffer request failed because CSM reached the limit of the maximum number of image buffers of the single CSM buffer."

Element or feature:	Communications Server.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	Before installing V2R1.
Is the migration action required?	No, but recommended. Your application probably does not request more than 500 images of a CSM buffer; however, you should examine IVTCSM ASSIGN_BUFFER calls to ensure that this is the case.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Migration actions from z/OS V1R12: Communications Server

Steps to take: To prevent application failures due to excessive ASSIGN_BUFFER requests:

- Identify any authorized applications that use CSM services and verify that the number of image buffers requested by IVTCSM ASSIGN_BUFFER for a single CSM buffer can never be more than 500.
- If necessary, change the application so the total number of IVTCSM ASSIGN_BUFFER image buffer requests is 500 or less.

Reference information: None.

SNA Services: Remove references to DSPNAME for VTAM dataspace from DUMP and SLIP commands

Description: Starting with z/OS V1R13, the VTAM dataspace is relocated from ECSA to HVCOMMON and the VTAM data space is eliminated.

Element or feature:	z/OS Communications Server.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you have references to DSPNAME for VTAM dataspace from DUMP and SLIP commands.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

- Accommodate the change in z/OS V1R13, to the value of the SIZE parameter of the TRACE start option and the MODIFY TRACE command, which specifies the number of megabytes of HVCOMMON (for example, SIZE=4M).
- Remove any instance of the DSPSIZE parameter because it is not valid.
- In any automation programs, accommodate the numerous messages that are no longer issued and are retired.

Reference information: None.

Communications Server actions to perform before the first IPL of z/OS V2R1

This topic describes Communications Server migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

IP Services: Allow the IKE daemon and the NSS daemon access to the CSFIQF resource of the CSFSERV class if ICSF is to be used with IP security

Description: Starting in z/OS V2R1, the IKE daemon and the NSS daemon perform additional status queries to ICSF. If ICSF is active and the CSFSERV class is active, the userids associated with IKED and NSSD must have READ access to the CSFIQF resource of the CSFSERV class. This access will allow IKED and NSSD to query ICSF.

Element or feature:	Communications Server.
When change was introduced:	z/OS V2R1
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if the IKE daemon or the NSS daemon will be started.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: If the CSFSERV class is active, give READ access to the userids associated with IKED and NSSD to the CSFIQF resource within the CSFSERV class.

Reference information: See "See "Steps for preparing to run IP security" in Appendix E in *z/OS Communications Server: IP Configuration Guide*.

IP Services: Ensure ICSF is active before starting the NSS daemon in FIPS 140 mode

Description: As of z/OS V2R1 FIPS 140 support now requires ICSF services. If the NSS daemon is configured in FIPS 140 mode, the daemon will fail to activate if ICSF is not active. Ensure ICSF is started before starting the NSS daemon if it is configured in FIPS 140 mode.

Element or feature:	Communications Server.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if the NSS daemon is configured in FIPS 140 mode.
Target system hardware requirements:	None.
Target system software requirements:	ICSF must be active.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	The NSS daemon will fail to initialize.

Migration actions from z/OS V1R12: Communications Server

Related IBM Health Checker for z/OS check:	None.
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Steps to take: If the NSS daemon is configured in FIPS 140 mode, ensure ICSF is active prior to starting the NSS daemon.

Reference information: See “Steps for preparing the z/OS system for IP security” and “Steps for configuring IP security to support FIPS 140 mode” in Chapter 19 “IP Security” in *z/OS Communications Server: IP Configuration Guide* for additional information.

IP Services: Ensure ICSF is active before starting the IKE daemon in FIPS 140 mode

Description: As of z/OS V2R1 FIPS 140 support now requires ICSF services. If the NSS daemon is configured in FIPS 140 mode, the daemon will fail to activate if ICSF is not active. Ensure ICSF is started before starting the IKE daemon if it is configured in FIPS 140 mode.

Element or feature:	Communications Server.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if the IKE daemon is configured in FIPS 140 mode.
Target system hardware requirements:	None.
Target system software requirements:	ICSF must be active.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	The IKE daemon will fail to initialize.
Related IBM Health Checker for z/OS check:	None.

Steps to take: If the IKE daemon is configured in FIPS 140 mode, ensure ICSF is active prior to starting the IKE daemon.

Reference information: See “Steps for preparing the z/OS system for IP security” and “Steps for configuring IP security to support FIPS 140 mode” in Chapter 19 “IP Security” in *z/OS Communications Server: IP Configuration Guide* for additional information.

IP Services: Allow users of AT-TLS access to CSFIQA and CSFRNG resources of the CSFSERV class if ICSF will be used with AT-TLS

Description: Starting in z/OS V2R1, System SSL will attempt to use ICSF services if ICSF is active during AT-TLS group initialization. If ICSF is active and the CSFSERV class is active, the userid associated with TCP/IP stack should have READ access to the CSFIQA and CSFRNG resources of the CSFSERV class. This will allow System SSL to be aware of the hardware available with ICSF and use

Migration actions from z/OS V1R12: Communications Server

ICSF to generate random numbers during initialization. Application userids using AT-TLS groups should also be given READ access to the CSFRNG resource of the CSFSERV class.

Element or feature:	Communications Server
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

1. If the CSFSERV class is active, give READ access to the userid associated with the TCP/IP stack and any application userid using the TTLSGroup to the CSFRNG resource within the CSFSERV class.
2. If the CSFSERV class is active, give READ access to the userid associated with the TCP/IP stack to the CSFIQA resource within the CSFSERV class.

Reference information: See “See Chapter 3. Using Cryptographic Features with System SSL” in *z/OS Cryptographic Services System SSL Programming*.

IP Services: Ensure ICSF is active before starting the Policy Agent when AT-TLS groups are configured in FIPS 140 mode

Description: As of z/OS V2R1, FIPS140 support now requires ICSF services. Ensure ICSF is started before starting AT-TLS groups with FIPS140 support enabled. ICSF services will be used for random number generation and for Diffie Hellman support for generating key parameters, key pairs and key exchanges.

Element or feature:	Communications Server
When change was introduced:	z/OS V2R1
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if AT-TLS groups are configured in FIPS 140 mode.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	The AT-TLS group will be installed but inactive.

Related IBM Health Checker for z/OS check:	None.
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Steps to take: Follow these steps:

1. Ensure ICSF is active before starting AT-TLS groups configured to support FIPS140-2
2. If the CSFSERV class is defined, give READ access to the userid associated with the TCPIP stack and any application userid using the TTLSGroup to the CSFRNG resource within the RACF CSFSERV class.
3. If the CSFSERV class is defined and Diffie Hellman is being used, give READ access to the application userid to the CSF1TRC, CSF1DVK, CSF1GKP, CSF1GSK, CSF1GAV, and CSF1TRD resources within the RACF CSFSERV class.

Reference information: See "FIPS 140-2 support" in *z/OS Communications Server: IP Configuration Guide*.

IP Services: Update automation on D TCPIP,tproc,<Telnet>,CONN for the expanded EN TY column in message EZZ6064I

Description: Message EZZ6064I, which is issued in response to a D TCPIP,tproc,<Telnet>,CONN command, is expanded by two bytes to show a four byte cipher value when the connection is secured with AT-TLS. As a result of this change, the previous column header of "EN TY" has been changed to "ENCR TYPE" The cipher value can be up to four bytes in length. Cipher values less than four bytes are padded with blanks.

Element or feature:	Communications Server
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if automating on the D TCPIP,tproc,<Telnet>,CONN command message EZZ6064I.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

- Be aware of the changes in message EZZ6064I.
- Update any automation on D TCPIP,tproc,<Telnet>,CONN message EZZ6064I.

Reference information: See an example of the updated "D TCPIP,tproc,<Telnet>,CONN output" in *z/OS Communications Server: IP System Administrator's Commands*.

IP Services: Update automation to monitor resolver address space initialization completion messages

Description: In releases before z/OS V2R1, the resolver address space initialization failed if errors were detected in the setup file. Beginning with z/OS V2R1, the resolver processes the entire resolver setup file during resolver address space initialization. When the resolver detects syntax errors or when it does not recognize the resolver setup statement, the resolver ignores the setup file statement and the resolver initialization completes successfully with warning messages. Ignoring the setup file statement might result in the resolver using default settings for some resolver setup statements if the statement was specified with errors.

If the resolver issues warning messages during address space initialization, the resolver issues message EZD2038I instead of message EZZ9293I when the initialization completes.

Element or feature:	Communications Server
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you customize the resolver and want to correct any errors that the resolver finds in the resolver setup file.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	The resolver might initialize with the incorrect configuration because of errors in the setup file, which might cause applications issuing resolver API calls to get erroneous results.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

If you customize the resolver and want to detect when the resolver ignores errors in the resolver setup file during address space initialization, do the following:

- Monitor resolver address space initialization for message EZD2038I RESOLVER INITIALIZATION COMPLETED WITH WARNINGS.
- Issue the MODIFY RESOLVER,DISPLAY command after system initialization completed to determine if the following message has been issued in the display output:

```
EZD2039I WARNINGS ISSUED DURING RESOLVER INITIALIZATION
```

If the resolver issues the message EZD2038I or EZD2039I, take the following steps:

1. Collect the system console messages that are issued by the resolver during resolver address space initialization.
2. Contact the system programmer. The system programmer needs to use the resolver warning messages to correct the errors in the resolver setup file.

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3. When the errors are corrected, the network operator needs to issue a MODIFY RESOLVER,REFRESH,SETUP=setup_file command to correct the resolver configuration.

Reference information: For more information about the resolver, see "Customizing the resolver" in *z/OS Communications Server: IP Configuration Guide*.

IP Services: Update OMPROUTE configuration procedures for OMPROUTE_OPTIONS

Description: Before z/OS V2R1, the OMPROUTE_OPTIONS environment variable was used by OMPROUTE to set various controls for OMPROUTE processing and only the hello_hi option was supported. The hello_hi option optimized the processing of OSPF Hello packets in OMPROUTE to minimize the potential adjacency failures with neighbors.

Beginning with z/OS V2R1, the OMPROUTE_OPTIONS environment variable is ignored and will not be supported in a future release. The optimization function for OSPF Hello packets is always enabled

If the environment variable, OMPROUTE_OPTIONS, is configured then the following message will be issued to the console or hardcopy log:

```
EZZ8172I jobname IGNORING ENVIRONMENT VARIABLE OMPROUTE_OPTIONS WHICH WILL BE  
RETIRED IN A FUTURE RELEASE
```

Element or feature:	Communications Server.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	No, but recommended if the environment variable OMPROUTE_OPTIONS=hello_hi is coded.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: If you want to suppress the warning message that the environment variable OMPROUTE_OPTIONS is to be retired in a future release, remove the environment variable from the OMPROUTE environment variable file.

Reference information: See "Steps for Configuring OMPROUTE" in *z/OS Communications Server: IP Configuration Guide*.

IP Services: Check the values specified for TCP related configuration statements.

Description: As of z/OS V2R1 the default values for TCPCVBUFRSIZE and TCPSENDBUFRSIZE parameters on the TCPCONFIG statement have been increased from 16K to 64K. Increasing the receive or send buffer size does not in

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itself allocate or consume any additional storage. The receive and send buffer sizes determine the amount of data that can be buffered by TCPIP for the application. The increase in the default values can allow more data to be buffered and consequently, more storage to be used.

The default value for the SOMAXCONN statement has increased from 10 to 1024. The SOMAXCONN value limits what a server application can specify for its listening backlog.

The amount of time a connection remains in FINWAIT2 has been changed to use the value specified on the TCPCONFIG parameter FINWAIT2. Previously, an additional seventy five seconds was added to the time specified on the FINWAIT2 parameter before the connection was dropped.

Element or feature:	z/OS Communications Server.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1..
Is the migration action required?	Yes, for one of the following conditions: <ul style="list-style-type: none">• If the potential increase in the size of the send and receive buffers is likely to cause a storage shortage• If you used the current defaulted value of SOMAXCONN to limit applications from specifying a listening backlog larger than 10• If you require the additional seventy-five seconds before the connection is dropped
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: If needed, do the following:

- Change the TCPRCVBUFRSIZE and TCPSENDBUFRSIZE values to 16K.
- Change the SOMAXCONN value to 10.
- Increase the FINWAIT2 value by 75 seconds.

Reference information: See an example of the updated "D TCPIP,tproc,<Telnet>,CONN output" in *z/OS Communications Server: IP Configuration Reference*.

IP Services: Make changes for Netstat enhancements

Description: The Netstat command displays the status of a local host. Each release, the Netstat reports are changed in ways that can affect automation or front-end programs.

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Element or feature:	Communications Server
When change was introduced:	z/OS V2R1
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if the changed or removed settings affect either (1) automation that uses the Netstat report output or (2) front-end programs that invoke the Netstat command.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None..

Steps to take: Accommodate Netstat changes in your automation and front-end programs. You can begin planning your changes by reviewing the ways in which the displays are updated each release. For details about how each Netstat report has changed, see *z/OS Summary of Message and Interface Changes*. However, you will have to execute the commands to know with certainty what changes to make.

Reference information: For information, see the following:

- For details about using Netstat, see *z/OS Communications Server: IP System Administrator's Commands*
- For details about Netstat report changes, see *z/OS Summary of Message and Interface Changes*.

IP Services: Update /etc configuration files

Description: Some utilities provided by Communications Server require the use of certain configuration files. You are responsible for providing these files if you expect to use the utilities. IBM provides default configuration files as samples in the `/usr/lpp/tcpip/samples` directory. Before the first use of any of these utilities, you should copy these IBM-provided samples to the `/etc` directory (in most cases). You can further customize these files to include installation-dependent information. An example is setting up the `/etc/osnmpd.data` file by copying the sample file from `/usr/lpp/tcpip/samples/osnmpd.data` to `/etc/osnmpd.data` and then customizing it for the installation.

If you customized any of the configuration files that have changed, then you must incorporate the customization into the new versions of the configuration files.

Element or feature:	Communications Server.
When change was introduced:	Various releases. See Table 10 on page 137.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you have customized a configuration file (listed in Table 10 on page 137) that IBM has changed.

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Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: If you added installation-dependent customization to any of the IBM-provided configuration files listed in Table 10 on page 137, make the same changes in the new versions of the files by copying the IBM-provided samples to the files shown in the table and then customizing the files.

Table 12. Changed Communications Server configuration files

Utility	IBM-provided sample file	Target location	What changed and when
SNMP agent	/usr/lpp/tcpip/samples/osnmpd.data	/etc/osnmpd.data	Every release, the value of the sysName MIB object is updated to the current release.
File Transfer Protocol Daemon (FTPD)	SEZAINST(FTPDATA)	/etc/ftp.data	In z/OS V2R1, a new configuration statement is provided to specify that a type 119 SMF record of subtype 71 is collected for the FTP daemon configuration information when the FTP daemon starts.

Reference information: For information, see the following:

- For more details about configuration files, see *z/OS Communications Server: IP Configuration Guide*.
- For information about modifying the NFS samples, see Chapter 10 in *z/OS Communications Server: IP Configuration Reference*.

IP Services: Review VIPARANGE definitions

Description: Prior to z/OS V1R13, for any dynamic VIPA (DVIPA) creation request, the first matching VIPARANGE statement is used when creating a DVIPA. Beginning in z/OS V1R13, the most specific VIPARANGE statement match is used when creating a DVIPA.

Element or feature:	Communications Server.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	No, but recommended to ensure DVIPAs are created as intended.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.

Migration actions from z/OS V1R12: Communications Server

Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

1. Be aware of the change in VIPARANGE processing.
2. Update VIPARANGE definitions as needed.

Reference information: For details, see the following:

- "VIPARANGE statement" in *z/OS Communications Server: IP Configuration Reference*.

SNA Services: Adjust to the relocation of the VTAM internal trace table

Description: Starting with z/OS V1R13, the VTAM internal trace (VIT) table is relocated from ECSA to HVCOMMON and the VIT data space is eliminated. As a result, be aware of the following changes starting in z/OS V1R13:

Tip: By applying the PTF of APAR OA41908 (z/OS V1R13) and APAR OA42180 (z/OS V2R1), the output from DISPLAY BFRUSE command was enhanced to include the current HVCOMM storage usage, maximum storage usage counters and constant of 2048 megabytes for the HVCOMM storage limit for the VTAM Internal trace (VIT) table.

Element or feature:	Communications Server.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if one or more of the following conditions are true: <ul style="list-style-type: none"> • If automation of the MODIFY TRACE command exists and the command specifies SIZE in pages or DSPSIZE, and the failure of that command is unacceptable. • If automated applications that parse retired messages not finding any of the newly retired messages is unacceptable.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.

Migration actions from z/OS V1R12: Communications Server

Restrictions:	<ul style="list-style-type: none">• Valid SIZE values are 4M-2048M inclusive.• If you specify a SIZE value that is larger than the default value, z/OS will perform paging on portions of the VIT table. Before you specify a large SIZE value, ensure that you have sufficient real or auxiliary storage to contain the entire VIT. Failure to ensure sufficient storage might result in an auxiliary storage shortage. If an SVC dump is taken that includes common storage, the size of the dump data set also increases. You must also take the increase in the size of the dump data set into consideration.
System impacts:	Moving the VIT to HVCOMMON can make up to 999 pages of ECSA available to other applications or subsystems.
Related IBM Health Checker for z/OS check:	None. The VIT associated health checks have been removed. See "Update your check customization for modified IBM Health Checker for z/OS checks" on page 27 for more information.

Steps to take: Follow these steps:

- Migrate your VTAM start lists:

Although the VTAM internal trace (VIT) table size is now specified in megabytes and the DSPSIZE parameter is no longer valid, you are not forced to update your VTAM start lists before using z/OS V1R13. If you use a nonzero DSPSIZE value in your start list, your tracing capacity will be diminished unless you perform these migration tasks. You should convert your SIZE value to megabytes and delete your DSPSIZE specification.
- Migrate your automated MODIFY TRACE commands:

Unlike the VTAM start lists, the migration of any automation of the MODIFY TRACE command that specifies the value of the SIZE parameter in pages or the DSPSIZE parameter is required before using z/OS V1R13 if the failure of that command is unacceptable. If you fail to perform this migration effort, the automated command will be rejected, the size of the table will remain unchanged, and any other modifications specified on the command (for example, opt=all) will be ignored.
- Migrate your TRACE option or MODIFY TRACE command when they specify the SIZE parameter, the DSPSIZE parameter, or both parameters:
 1. If DSPSIZE=0 is specified, delete the specification. If the SIZE parameter is also specified or you want a table size larger than 4 megabytes, proceed to steps 2, 3, and 4.
 2. If DSPSIZE is not specified, specify the SIZE value as the number of megabytes you want in your trace table (4 megabytes minimum, for example, SIZE=4M). Regardless of the size of the VIT, only a few megabytes are backed by 64-bit real storage. This range of fixed pages is dynamically shifted as VIT records are written. The migration task is complete for this start list or automated command.
 3. If the DSPSIZE parameter is specified and the SIZE parameter is not, change DSPSIZE to SIZE and change the value to the number of megabytes you want in your trace table (4 megabytes minimum). If you want to retain the

Migration actions from z/OS V1R12: Communications Server

equivalent of what was specified for DSPSIZE, specify the SIZE value as the DSPSIZE value and append '0M'. For example, DSPSIZE=1 is equivalent to SIZE=10M. The migration task is complete for this start list or automated command.

4. If the DSPSIZE and SIZE parameters are both specified, delete the DSPSIZE specification and change the value of the SIZE parameter to the number of megabytes you want in your trace table (4 megabytes minimum). If you want to retain the equivalent of what was specified for the DSPSIZE parameter, change the value of the SIZE parameter to the DSPSIZE value and append '0M'. For example, DSPSIZE=3 is equivalent to SIZE=30M.

- Migrate applications that parse retired messages:

If you have automation that parses the output from the MODIFY TRACE, DISPLAY TRACE, or DISPLAY STATS command, you might need to update them because the VIT size is now reported in megabytes. Also, you will no longer see DSPSIZE reported as the VIT data space has been removed.

In addition, numerous messages are retired because they no longer apply. As a result, perform the following steps:

- If you run automation that parses the output of the MODIFY or DISPLAY TRACE command, change the automation to process megabytes instead of pages.

Previous message: IST315I VTAM INTERNAL TRACE ACTIVE - MODE = INT,
SIZE = *size* PAGES

Updated message: IST315I VTAM INTERNAL TRACE ACTIVE - MODE = INT,
SIZE = *size* MB

- If you run automation that parses the output of the DISPLAY STATS command, change the automation to process megabytes instead of pages.

Previous message: IST1227I 2 999 = VIT TABLE SIZE

Updated message: IST1227I 2 4 = VIT TABLE SIZE

Also, you will no longer see the following message because the VIT data space has been removed:

IST1227I 163 0 = VIT DATA SPACE TABLE SIZE

- If you run automation that parses any of the following messages, delete the automation because the messages are either retired or no longer used for the VIT.

IST318I VTAM INTERNAL TRACE ACTIVATION FAILED -- UNABLE TO FIX STORAGE
IST495I *type* HAS BEEN SET TO *value*

IST1659I DATA SPACE *dspname* DSPSIZE = *dspsize* *actsize*

IST1741I DATA SPACE SDUMPX FAILED WITH RETURN CODE *code* REASON *reason*

ISTH003I The VTAM Internal Trace (VIT) table size is at the maximum value, which provides optimal trace information for problem determination

ISTH004E VTAM Internal Trace (VIT) table size of *vit_size* is too small

ISTH007I VTAM Internal Trace (VIT) dataspace size is at the maximum value, which provides optimal trace information for problem determination

ISTH008E VTAM Internal Trace (VIT) dataspace size of *dspsize* is too small

IVT5602I DATA SPACE SDUMPX FAILED WITH RETURN CODE *code* REASON *reason*

- Other automation:

Migration actions from z/OS V1R12: Communications Server

If you have automation that parses for or specifies the character string `ISTITDS1`, which prior to z/OS V1R13 was the name of the data space containing the VIT data space, you might want to modify that automation because the data space will no longer be created. This is highly recommended if you have SLIP traps that dump the VIT data space.

Note:

- Failure to remove the `DSPNAME` for non-existent data spaces can result in an error message but should not preclude the running process
- Check for dump commands that use `DSPNAME=('VTAM'.ISTITDS1)` and remove the `DSPNAME` parameter. Note that VTAM uses additional data spaces, so you should not remove any `DSPNAME` parameter that specifies a wildcard data space name.
- Because FFST dumps do not include data spaces, they are not affected.

Reference information: For information, see the following:

- See `TRACE` for `MODULE`, `STATE` (with `OPTION`), or VTAM internal trace in *z/OS Communications Server: SNA Resource Definition Reference* for additional information about specifying the size of the VTAM internal trace (VIT) table using the VTAM `TRACE` start option.
- See `MODIFY TRACE` command in *z/OS Communications Server: SNA Operation* for additional information about specifying the size of the VTAM internal trace (VIT) table using the `MODIFY TRACE` command.

Communications Server actions to perform after the first IPL of z/OS V2R1

This topic describes Communications Server migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

None.

Cryptographic Services migration actions

This topic describes migration actions for base element Cryptographic Services. Included are the components Integrated Cryptographic Service Facility (ICSF), Open Cryptographic Services Facility (OCSF), PKI Services, and System Secure Sockets Layer (SSL).

Cryptographic Services actions to perform before installing z/OS V2R1

This topic describes Cryptographic Services migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

ICSF: Detect any coprocessor that that will not become active when HCR77A1 is started.

Note: The FMID HCR77A1 ICSF level is not integrated in z/OS V2R1 and needs to be downloaded and installed even after ordering a z/OS V2R1 ServerPac. The Cryptographic web deliverable is available at the following web site:
<http://www.ibm.com/systems/z/os/zos/downloads/>.

Migration actions from z/OS V1R12: Cryptographic Services

Description: For ICSF FMIDS HCR7780, HCR7790, and HCR77A0, the activation procedure was designed to maximize the number of active coprocessors by selecting the set of master keys that are available on the majority of coprocessors. A DES master key is no longer required in order for a coprocessor to become active. Instead, any one of four master keys – the DES master key, the AES master key, the RSA master key (which in earlier releases was called the asymmetric master key), or the ECC master key – is enough for a coprocessor to become active. However, because the goal is to select the combination of master keys that will maximize the number of active coprocessors, if a certain master key is not set on all the same coprocessors, that master key support will not be available.

Starting with FMID HCR77A1, the activation procedure now uses the master key verification patterns (MKVP) in the header record of the CKDS and PKDS to determine which coprocessors become active. If the MKVP of a master key is in the CKDS or PKDS, that master key must be loaded and the verification pattern of the current master key register must match the MKVP in the CKDS or PKDS. If all of the MKVPs in the CKDS and PKDS match the current master key registers, the coprocessor will become active. Otherwise, the status is master keys incorrect. This applies to all master keys that the coprocessor supports. When there is a MKVP in the CKDS or PKDS and the coprocessor does not support that master key, it is ignored. When a MKVP is not in the CKDS or PKDS, the master key is ignored.

If there are no MKVPs in the CKDS and PKDS, the coprocessor will be active. If the CKDS is initialized without any MKVPs, the CKDS cannot be used on a system that has cryptographic features installed.

Element or feature:	Cryptographic Services
When change was introduced:	Cryptographic Support for z/OS V1R13 - z/OS V2R1 web deliverable (FMID HCR77A1), which installs on z/OS V1R13 or z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you have installed the Cryptographic Support for z/OS V1R13 – z/OS V2R1 web deliverable (FMID HCR77A1) to accommodate the change in the way master keys are processed to determine which coprocessors become active.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	Use check ICSFMIG77A1_CCA_COPROCESSOR_ACTIVE to determine which coprocessors will not become active when Cryptographic Support for z/OS V1R13 - z/OS V2R1 Web Deliverable (FMID HCR77A1) is started. This check is delivered in APAR OA42011 available for ICSF FMIDs HCR7770, HCR7780, HCR7790 and HCR77A0.

Migration actions from z/OS V1R12: Cryptographic Services

Steps to take: Run the migration check ICSFMIG77A1_CCA_COPROCESSOR_ACTIVE to find any coprocessors that will not become active when you start HCR77A1.

Reference information: See the following information:

- See the chapter on migration in *z/OS Cryptographic Services ICSF System Programmer's Guide*
- For IBM Health Checker, see *IBM Health Checker for z/OS: User's Guide*.

ICSF: Run HCR77A1 on a supported server

Note: The FMID HCR77A1 ICSF level is not integrated in z/OS V2R1 and needs to be downloaded and installed even after ordering a z/OS V2R1 ServerPac. The Cryptographic web deliverable is available at the following web site: <http://www.ibm.com/systems/z/os/zos/downloads/>.

Description Starting with ICSF Cryptography FMID HCR77A1, only z890 or later servers are supported. Also, starting with z/OS V2R1, only z9 or later servers are supported. The migration check is available for HCR7770, HCR7780, HCR7790, and HCR77A0 through APAR OA42011.

Element or feature:	Cryptographic Services
When change was introduced:	Cryptographic Support for z/OS V1R13 – z/OS V2R1 web deliverable (FMID HCR77A1), which installs on z/OS V1R12, z/OS V1R13 or z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you have installed the Cryptographic Support for z/OS V1R13 – z/OS V2R1 web deliverable (FMID HCR77A1) to determine which servers can support HCR77A1. As of HCR77A1, only z890 or later servers are supported.
Target system hardware requirements:	z890 or later.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	If running on z/OS R13 or z/OS 2.1, and attempt to start HCR77A1 on a z800 or z900, you will receive the following message ICSFM010E ICSF TERMINATING. PROCESSOR IS UNSUPPORTED, and ICSF will not start.
Related IBM Health Checker for z/OS check:	You can use the IBM Health Checker check ICSFMIG77A1_UNSUPPORTED_HW to determine if your current server can support HCR77A1. The migration check is available for HCR7770, HCR7780, HCR7790, and HCR77A0 through APAR OA42011.

Migration actions from z/OS V1R12: Cryptographic Services

Steps to take: Ensure that if you are planning to run HCR77A1, that it will be on a supported server. Run the migration check ICSFMIG77A1_UNSUPPORTED_HW to determine if HCR77A1 can start on your current server.

Reference information: For IBM Health Checker, see *IBM Health Checker for z/OS: User's Guide*.

ICSF: Detect TKDS objects that are too large for the new record format in HCR77A1

Note: The FMID HCR77A1 ICSF level is not integrated in z/OS V2R1 and needs to be downloaded and installed even after ordering a z/OS V2R1 ServerPac. The Cryptographic web deliverable is available at the following web site: <http://www.ibm.com/systems/z/os/zos/downloads/>.

Description: In ICSF FMID HCR77A1, ICSF is introducing a common key data set record format for CCA key tokens and PKCS #11 tokens and objects. This new record format adds new fields for key utilization and metadata. Because of the size of the new fields, some existing PKCS #11 objects in the TKDS might cause ICSF to fail. If you do not have a Token Data Set (TKDS) with PKDS #11 objects in it, there is no need to run this check.

The problem exists for TKDS object records with large objects. The User datafield in the existing record will cause the TKDS not be to loaded if the object size is greater than 32,520 bytes. The TKDSREC_LEN field in the record has the size of the object. If the User data field is not empty and the size of the object is greater than 32,520 bytes, the TKDS cannot be loaded.

Note that ICSF does not provide any interface to modify the User data field in the TKDS object record. A field can be created using IDCAMS. Check the contents of the User data field and determine if the information in the field is valuable. If you want to preserve the data, consider how the information can be stored other than in the object record. The field can only be modified by editing the record. For information about the TKDS object record, see *z/OS Cryptographic Services ICSF System Programmer's Guide*. The new IBM Health Checker migration check, CSFMIG77A1_TKDS_OBJECT will detect any TKDS object that is too large to allow the TKDS is read into storage during ICSF initialization starting with ICSF FMID HCR77A1. This migration check is available for HCR7770, HR7780, HCR7790, and HCR77A0 through APAR OA42011

Element or feature:	Cryptographic Services
When change was introduced:	Cryptographic Support for z/OS V1R13 – z/OS V2R1 web deliverable (FMID HCR77A1), which installs on z/OS V1R12, z/OS V1R13 or z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you have installed the Cryptographic Support for z/OS V1R13 – z/OS V2R1 web deliverable (FMID HCR77A1) to handle TKDS with PKDS #11 objects for the new format in HCR77A1.
Target system hardware requirements:	None.
Target system software requirements:	None.

Migration actions from z/OS V1R12: Cryptographic Services

Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	Use the new IBM Health Checker migration check CSFMIG77A1_TKDS_OBJECT to detect any TKDS object with a value in the User data field that is too large to preserve in the User data field of the new format record. This migration check is available for HCR7770, HR7780, HCR7790, and HCR77A0 through APAR OA42011.

Steps to take: Run the migration check ICSFMIG77A1_TKDS_OBJECT to detect if TKDS objects are too large for the new record format in HCR77A1.

Note: ICSF does not provide any interface to modify the User data field in the TKDS object record. A flat file can be created using IDCAMS. Check the contents of the User data field and determine if the information in the field is valuable. If you want to preserve the data, consider how the information can be stored other than in the object record. The field can only be modified by editing the record. For information about the TKDS object record, see *z/OS Cryptographic Services ICSF System Programmer's Guide*.

Reference information: See the following information:

- For information about TKDS, see *z/OS Cryptographic Services ICSF System Programmer's Guide*.
- For IBM Health Checker, see *IBM Health Checker for z/OS: User's Guide*.

Cryptographic Services actions to perform before the first IPL of z/OS V2R1

This topic describes Cryptographic Services migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

ICSF: Ensure the CSFPUTIL utility is not used to initialize a PKDS

Description: ICSF provides a utility program, CSFPUTIL, that performs certain functions that can also be performed using the administrator's panels. In releases of ICSF prior to FMID HCR7780 (available as web deliverable *Cryptographic Support for z/OS V1R10-V1R12*), you could use the CSFPUTIL utility program to initialize a PKDS, reencipher a PKDS, and refresh the in-storage copy of the PKDS. You can still use the CSFPUTIL utility to reencipher or refresh a PKDS. However, starting with FMID HCR7780 (*Cryptographic Support for z/OS V1R10-V1R12*, now integrated into z/OS V1R13), the CSFPUTIL utility program no longer supports the function to initialize a PKDS. Instead, the ICSF panels must be used to initialize a PKDS.

Element or feature:	Cryptographic Services.
When change was introduced:	ICSF FMID HCR7780, which was initially made available in web deliverable <i>Cryptographic Support for z/OS V1R10-R12</i> and is integrated into z/OS V1R13.

Migration actions from z/OS V1R12: Cryptographic Services

Applies to migration from:	z/OS V1R12 without ICSF FMID HCR7780 installed.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you have jobs that use the CSFPUTIL utility program to initialize a PKDS.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	Because of this change, jobs that call the CSFPUTIL utility with the INITPKDS option will no longer initialize a PKDS, and return code 4 (which indicates that supplied parameters are incorrect) will be returned.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Make sure no jobs call CSFPUTIL with the INITPKDS option. Use the administrator panels to initialize the PKDS instead.

Reference information: For more information in initializing the PKDS and on the CSFPUTIL utility, refer to *z/OS Cryptographic Services ICSF Administrator's Guide*.

OCSF: Migrate the directory structure

Description: If you previously configured Open Cryptographic Services Facility (OCSF), you need to verify that the OCSF directories have been migrated to the target system. When your system is up and running, customize OCSF by running the customization script and then the IVP.

Note: If you want to take advantage of the new Software Cryptographic Service Provider 2 (SWCSP2), you should bypass this migration action. When your system is up and running, install OCSF by running the install script and then the IVP.

Element or feature:	Cryptographic Services.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you currently use OCSF or if new products or functions on your new z/OS system require OCSF to be active. However, if you installed your new z/OS system with ServerPac or SystemPac, the OCSF installation script has been run and you do not have to perform this migration action for that system.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.

Migration actions from z/OS V1R12: Cryptographic Services

Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Migrate the OCSF /var directory structure to the target system. If you installed z/OS with CBPDO or by cloning an already-installed z/OS system, you can either copy the /var/ocsf directory from your old system or rerun the installation script. If you installed z/OS with ServerPac, the OCSF installation script has been run and you have no migration actions for that target system (although you still have to migrate the directory structure to any cloned systems, as already described).

If you installed z/OS V1R11 with CBPDO or by cloning an already-installed V1R11 system, you can either copy the /var/ocsf directory from your old system or rerun the installation script. If you installed z/OS V1R11 with ServerPac or SystemPac, the OCSF installation script has been run and you have no migration actions for that target system (although you still have to migrate the directory structure to any cloned systems, as already described).

If you copy /var/ocsf, verify that the OCSF /var directory structure has been migrated to the target system as described in “Migrate /etc and /var system control files” on page 18. The OCSF registry (the /var/ocsf files) contains the directory path names to the code libraries. If the registry files are copied, the CSSM DLL and the add-ins must be in the same location on the target system as on the prior release. The normal locations are /usr/lpp/ocsf/lib for the CSSM and supporting DLLs and /usr/lpp/ocsf/addins for the add-in libraries.

If you copied /var/ocsf, do the following:

1. Verify that the following four files exist in that directory:
 - CDSA_Registry.dir with permissions (-rw-r--r--)
 - CDSA_Registry.pag with permissions (-rw-r--r--)
 - CDSA_Sections.dir with permissions (-rw-r--r--)
 - CDSA_Sections.pag with permissions (-rw-r--r--)
2. Verify that the required RACF FACILITY class profiles are defined and set up:
 - CDS.CSSM — authorizes the daemon to call OCSF services
 - CDS.CSSM.CRYPTO — authorizes the daemon to call a cryptographic service provider (CSP)
 - CDS.CSSM.DATALIB — authorizes the daemon to call a data storage library (DL) service provider
3. Ensure that the necessary libraries are program controlled:
 - XL C/C++ runtime libraries
 - Language Environment libraries
 - SYS1.LINKLIB
 - SYS1.SIEALNKE

If you did not copy /var/ocsf, rerun the installation script:

1. Set up the RACF FACILITY class profiles required by OCSF and authorize the appropriate user IDs to those profiles:
 - CDS.CSSM — authorizes the daemon to call OCSF services

Migration actions from z/OS V1R12: Cryptographic Services

- CDS.CSSM.CRYPTO — authorizes the daemon to call a cryptographic service provider (CSP)
 - CDS.CSSM.DATALIB — authorizes the daemon to call a data storage library (DL) service provider
2. Ensure that the following libraries are defined as program controlled:
 - XL C/C++ runtime libraries
 - Language Environment libraries
 - SYS1.LINKLIB
 - SYS1.SIEALNKE
 3. Run the **ocsf_install_crypto** script from the OMVS shell. This must be run from the target system.
 - a. Verify and update \$LIBPATH.
 - b. Change directory to the location of the script (/usr/lpp/ocsf/bin).
 - c. Run the script.

Whether you reinstalled or migrated, it is strongly recommended that you rerun IVP **ocsf_baseivp** from the OMVS shell. This IVP verifies that OCSF is installed and configured correctly. To run the IVP:

1. Mount /usr/lpp/ocsf/ivp.
2. Read the README file and follow the instructions.
3. Run the IVP.

If you were using other IBM or non-IBM services to supplement the functions in OCSF, such as the Open Cryptographic Enhanced Plug-ins (OCEP) component of base element Integrated Security Services, or the PKI Services component of base element Cryptographic Services, you must ensure that these are migrated or reinstalled.

Reference information: *Integrated Security Services Open Cryptographic Enhanced Plug-ins Application Programming.*

System SSL: Ensure ICSF is available when running System SSL in FIPS 140-2 mode

Description: In z/OS V2R1, System SSL, when running in FIPS 140-2 mode, uses ICSF's random number generation and Diffie-Hellman support. Before running System SSL in FIPS 140-2 mode you must ensure that ICSF is running and that all user IDs that start SSL applications in FIPS 140-2 mode, invoke the gskkyman utility to manage FIPS 140-2 key database files, or invoke the GSKSRVR started task in FIPS mode have access to certain CSFSERV classes.

When it is running in non-FIPS mode, System SSL uses its own implementation of Diffie-Hellman and does not require ICSF. In non-FIPS 140-2 mode, however, System SSL attempts to use ICSF's random number generation as it would when running in FIPS 140-2 mode. If ICSF or the required resource is unavailable, System SSL uses its own random number generation capabilities as in earlier releases.

Element or feature:	Cryptographic Services.
When change was introduced:	V2R1
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.

Migration actions from z/OS V1R12: Cryptographic Services

Is the migration action required?	Yes, if your installation runs System SSL in FIPS mode.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None

Steps to take: To run System SSL in FIPS 140-2 mode, you must now make sure that ICSF is running and that all user IDs that start SSL applications in FIPS 140-2 mode, invoke the GSKSRVR started task in FIPS 140-2 mode, or invoke the gskkyman utility to manage FIPS 140-2 key database files can access the necessary ICSF callable services.

1. Make sure that ICSF is running. Assuming CSF is the name of the ICSF started task, you would enter:

```
DISPLAY A,CSF*
```

To display status about all started tasks, you would enter:

```
DISPLAY A,ALL
```

In z/OS V1R12 and V1R13, System SSL is providing capability to identify System SSL applications that are running in FIPS 140-2 mode, which are started before ICSF is available. Identification of these applications is done by using the System SSL started task (GSKSRVR) and the z/OS tracking facility. This migration assistance support is delivered in APAR OA40816. See *Brief overview of APAR OA40816* for more information.

2. System SSL applications that are running in FIPS 140-2 mode, the GSKSRVR started task that is running in FIPS 140-2 mode, and the gskkyman utility (if managing FIPS 140-2 key database files) must be able to access ICSF's PKCS #11 pseudo-random function callable service for random number generation. In addition, applications and the gskkyman utility must access the following callable services to use ICSF's Diffie-Hellman capabilities:
 - PKCS #11 Token record create
 - PKCS #11 Derive key
 - PKCS #11 Generate key pair
 - PKCS #11 Generate secret key
 - PKCS #11 Get attribute value
 - PKCS #11 Token record delete

To ensure that RACF user IDs have access to the necessary services:

- a. Determine if the CSFSERV class is active. If active, this class restricts access to the ICSF programming interface. If it is not active, access to the ICSF programming interface (and the necessary callable services) is unrestricted. No configuration is necessary.

To determine which RACF classes are currently active, enter the SETROPTS command with the LIST parameter specified. SETROPTS LIST

- b. If the SETROPTS LIST command shows that the CSFSERV class is active, identify the profile or profiles that cover the following resources:

Migration actions from z/OS V1R12: Cryptographic Services

- CSFRNG (which represents the PKCS #11 Pseudo-random function callable service)
- CSF1TRC (which represents the PKCS #11 Token record create callable service)
- CSF1DVK (which represents the PKCS #11 Derive key callable service)
- CSF1GKP (which represents the PKCS #11 Generate key pair callable service)
- CSF1GSK (which represents the PKCS #11 Generate secret key callable service)
- CSF1GAV (which represents the PKCS #11 Get attribute value callable service)
- CSF1TRD (which represents the PKCS #11 Token record delete callable service)

Each of these resources can be covered by a discrete profile or, if generic profile checking is activated, a generic profile. You can use the RLIST command to determine if a profile is defined to protect each resource. For example, to determine if a profile is defined to protect the CSFRNG resource, enter the following RLIST command: RLIST CSFSERV CSFRNG. When you enter this command, RACF lists information for the discrete profile CSFRNG. If there is no matching discrete profile, RACF lists the generic profile that most closely matches the resource name.

- c. If the RLIST command output reveals that there is a discrete or generic profile that covers the resource, examine the command output to ensure that all RACF user IDs that might start System SSL applications in FIPS 140-2 mode have at least READ access to the resource. If necessary, use the PERMIT command to give the appropriate users or groups access. For example, if a discrete profile CSFRNG exists, the following command would give the user JASMINE access:

```
PERMIT CSFRNG CLASS(CSFSERV) ID(JASMINE) ACCESS(READ)
```

If you do make changes, refresh the in-storage RACF profiles for the CSFSERV class: SETROPTS RACLIST(CSFSERV) REFRESH

Brief Overview of APAR OA40816: the following is a brief overview of the APAR:

In z/OS V1R12 and V1R13, System SSL is providing capability to identify System SSL applications that are running in FIPS 140-2 mode that have been started before ICSF was available. Identification of these applications is done by using the System SSL started task (GSKSRVR) and the z/OS tracking facility. See *z/OS MVS Planning: Operations* for more information about the z/OS tracking facility.

When the System SSL started task is enabled to write to the tracking facility, the started task will get notified of any SSL applications that are running in FIPS 140-2 mode before ICSF was available. The messages in the z/OS tracking facility can be monitored by issuing a **DISPLAY OPDATA,TRACKING** command to see which System SSL applications are running in FIPS 140-2 mode before ICSF being available. The following example shows output from the **DISPLAY OPDATA,TRACKING** command:

```
12.43.50          d o,tr
12.43.50          CNZ1001I 12.43.50 TRACKING DISPLAY 788
STATUS=ON        NUM=4    MAX=1000 MEM=n/a EXCL=0    REJECT=0
---- TRACKING INFORMATION----- -VALUE-- JOBNAME  PROGRAM+OFF-- ASID NUM
GSK01058I No ICSF for FIPS.        00 GSKSRVR  GSKSRVR  D9D6  48  1
GSK01059I SSLAPP1 no ICSF.        00 GSKSRVR  GSKSRVR  DAB0  48  5
```

Migration actions from z/OS V1R12: Cryptographic Services

```
GSK01059I SSLAPP2 no ICSF.      00 GSKSRVR  GSKSRVR  DAB0  48  2
GSK01059I SUIMGVD9 no ICSF.    00 GSKSRVR  GSKSRVR  DAB0  48  1
-----
```

From the tracking information above:

1. The GSK01058I message is the generic message that is written to the z/OS tracking facility once for the life of the System SSL started task. This message is issued the first time when either the System SSL started task or a System SSL application is running in FIPS 140-2 mode before ICSF being available.
2. The SSLAPP1 job was started or submitted 5 times
3. The SSLAPP2 job was started or submitted 2 times.
4. The SUIMGVD9 job was started or submitted just 1 time.

For more information about the support in APAR OA40816, see the documentation updates in OA40816.

Reference information: For additional information about System SSL use of ICSF callable services, see *z/OS Cryptographic Services System SSL Programming*.

For additional information on the ICSF installation options file, see *z/OS Cryptographic Services ICSF System Programmer's Guide*.

For additional information about ICSF's CSFSERV resource class and the Installation Option Display panel, see *z/OS Cryptographic Services ICSF Administrator's Guide*.

System SSL: Modify automated scripts running the gskkyman utility to interact with new menus

Description: When you run the **gskkyman** program in interactive mode, a series of menus guide you through various tasks, prompting you for each piece of information required to complete the task. In z/OS V2R1, some of the existing **gskkyman** menus have been refined to make the tasks simpler and more intuitive for the user to perform.

Although users should find the new **gskkyman** menus clearer and more straightforward, installations that have created automated scripts to interact with the **gskkyman** menus will need to modify these scripts to work with the new menus. Similarly, if you have created documentation that describes the **gskkyman** menus, the documentation will need to be updated to describe the new menus.

Element or feature:	Cryptographic Services.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if your installation has automated scripts or documentation for the gskkyman menus.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.

Related IBM Health Checker for z/OS check:	None
--	------

Steps to take: If your installation has automated scripts or documentation based on the earlier **gskkyman** menus, be aware that the certificate creation, certificate request creation, and key parameters creation menus have been altered. You will need to modify any scripts that interact with these menus. Similarly, you will need to modify any documentation that describes these menus. The following topics in *z/OS Cryptographic Services System SSL Programming* describe the tasks that have changed because of the menu restructuring. If necessary, compare these topics against the same topics in the earlier version of the documentation.

- Creating a Self-Signed Server or Client Certificate
- Creating a Certificate Request
- Creating a Signed Certificate and Key
- Creating a Signed ECC Certificate and Key
- Creating a certificate to be used with a fixed Diffie-Hellman key exchange

Reference information: For information on the **gskkyman** program and the menus provided when this program is run in interactive mode, see *z/OS Cryptographic Services System SSL Programming*.

System SSL: Ensure all RACF user IDs that start SSL applications in non-FIPS mode can access the CSFRNG resource of the CSFSERV class

Description: Before z/OS V2.1, System SSL always used its own random number generation support available in software. As of z/OS V2R1, System SSL now exploits ICSF random number generation support if ICSF is available. In order to utilize ICSF when the random number generation service is protected by a RACF resource profile (CSFRNG), the userid under which the application is executing must have at least READ access to the resource profile. If the application is not FIPS enabled the processing is able to fall back to a software implementation and allow the application to continue (as a result, you might receive RACF unauthorized messages). If the application is FIPS enabled, it will fail.

If the user ID that starts the SSL application cannot access the CSFRNG resource of the CSFSERV class, System SSL will not be able to use the PKCS #11 Pseudo-random function callable service, and the informational message ICH408I (which indicates insufficient authorization) may be issued to the console. Although System SSL processing will continue, your application will be using System SSL's random number generation and will not be exploiting the random number generation capability provided by ICSF software or the Crypto Express3 Coprocessor card or the Crypto Express4 Coprocessor card.

Element or feature:	Cryptographic Services.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.

Migration actions from z/OS V1R12: Cryptographic Services

Is the migration action required?	Yes, if the following conditions are true: <ul style="list-style-type: none"> • Your installation uses ICSF. • The CSFSERV general resource class is active. • A profile covering the CSFRNG resource of the CSFSERV class is defined and does not grant READ access to all users.
Target system hardware requirements:	ICSF might employ one of multiple techniques to derive the random content. For both FIPS certified random content and for non-FIPS certified random content, the availability of CCA and/or PKCS #11 coprocessors enables ICSF to derive the random content without imposing significant CPU overhead on the system. Either type of coprocessor can be exploited for non-FIPS certified content, but only a PKCS #11 coprocessor can be used to avoid CPU cycles for FIPS certified random content. Installations may wish to plan for CCA and/or PKCS #11 coprocessor availability to avoid potentially excessive CPU cycles being exhausted on random number content generation.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	The system issues informational message ICH408I that indicates insufficient authorization might be issued to the console.
Related IBM Health Checker for z/OS check:	None

Steps to take: If your installation uses ICSF, you should ensure that any RACF user ID that will start SSL applications can access the CSFRNG callable service. This includes the SSL started task (GSKSRVR), and the **gskkyman** and **gsktrace** utilities.

1. Determine if the CSFSERV class is active. If active, this class restricts access to the ICSF programming interface. If it is not active, access to the ICSF programming interface (and specifically the CSFRNG callable service) is unrestricted. No configuration is necessary.

To determine which RACF classes are currently active, enter the SETROPTS command with the LIST parameter specified:

```
SETROPTS LIST
```

2. If the SETROPTS LIST command shows that the CSFSERV class is active, identify the profile that covers the CSFRNG resource. This could be a discrete profile named CSFRNG or, if generic profile checking is activated, a generic profile.

To determine if a profile has been defined to protect the CSFRNG resource, enter the following RLIST command:

```
RLIST CSFSERV CSFRNG
```

Migration actions from z/OS V1R12: Cryptographic Services

When you enter this command, RACF lists information for the discrete resource profile CSFRNG. If there is no matching discrete profile, RACF will list the generic profile that most closely matches the resource name.

3. If the RLIST command output revealed that there is a discrete or generic profile defined that covers the CSFRNG resource, examine the command output to ensure that all RACF user IDs that may start System SSL applications have at least READ access to the CSFRNG resource. If necessary, use the PERMIT command to give the appropriate users or groups access. For example, if a discrete profile CSFRNG exists, the following command would give user BAILEY access.

```
PERMIT CSFRNG CLASS(CSFSEV) ID(BAILEY) ACCESS(READ)
```

If you do make any changes, refresh the in-storage RACF profiles for the CSFSEV class:

```
SETROPTS RACLIST(CSFSEV) REFRESH
```

Reference information: For additional information about System SSL use of ICSF callable services, see *z/OS Cryptographic Services System SSL Programming*.

For additional information on the ICSF installation options file, see *z/OS Cryptographic Services ICSF System Programmer's Guide*.

For additional information about ICSF's CSFSEV resource class and the Installation Option Display panel, see *z/OS Cryptographic Services ICSF Administrator's Guide*.

Cryptographic Services actions to perform after the first IPL of z/OS V2R1

This topic describes Cryptographic Services migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

ICSF: Accommodate the TRACEENTRY option deprecation in the installation options data set

Note: The FMID HCR77A1 ICSF level is not integrated in z/OS V2R1 and needs to be downloaded and installed even after ordering a z/OS V2R1 ServerPac. The Cryptographic web deliverable is available at the following web site: <http://www.ibm.com/systems/z/os/zos/downloads/>.

Starting with ICSF HCR77A1, option TRACEENTRY has been deprecated and ICSF CTRACE support has been enhanced to support configurable ICSF CTRACE options from PARMLIB. A default CTICSF00 PARMLIB member is installed in SYS1.PARMLIB. The CTICSF00 PARMLIB member provides default component trace values for ICSF. By default, ICSF CTRACE support will trace with the KdsIO, CardIO, and SysCall filters using a 2M buffer. Configurable options are commented out within this PARMLIB member to provide examples of how to turn them on.

Element or feature:	Cryptographic Services
When change was introduced:	Cryptographic Support for z/OS V1R13 - z/OS V2R1 web deliverable (FMID HCR77A1), which installs only on z/OS V1R13 or z/OS V2R1.

Migration actions from z/OS V1R12: Cryptographic Services

Applies to migration from:	z/OS V2R1 and z/OS V1R13 without the Cryptographic Support for z/OS V1R13 - z/OS V2R1 web deliverable (FMID HCR77A1). Note that when the Cryptographic Support for z/OS V1R13 - z/OS V2R1 Web deliverable (FMID HCR77A1) is not installed, this migration item is not applicable.
Timing:	After the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you have installed the Cryptographic Support for z/OS V1R13 - z/OS V2R1 web deliverable (FMID HCR77A1) to handle TKDS with PKDS #11 objects for the new format in HCR77A1.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	If the TRACEENTRY option is specified it will be ignored and will produce message CSFO0212 at startup; processing continues.
Related IBM Health Checker for z/OS check:	None.

Steps to take You can code the new CTRACE option within a BEGIN(HCR77A1) END option pair in a options data set shared between multiple releases of ICSF.

- If you share the installation options data set between HCR77A1 and pre-HCR77A1 systems, you can continue to supply the TRACEENTRY option at the lower level systems as it is ignored, and processing will continue on the HCR77A1 systems.
- If your installation cannot tolerate the CSFO0212 message that is issued at startup, you need to use different installation option data sets. Note that new CTRACE options will be in effect:
 - Review the default CTRACE options to ensure that they are satisfactory for your system.
 - Make any necessary changes. Use the CTICSF00 PARMLIB to create customized ICSF CTRACE Configuration Data Sets in PARMLIB. You can use the new CTRACE option to specify the customized ICSF CTRACE Configuration Data Set in the ICSF Options Data Set.

For example, you can specify CTRACE(CTICSFxx), where xx is any two characters that were used when copying the default CTICSF00 parmlib member.

Component tracing is active when ICSF starts using the trace options defined in the CTICSFxx PARMLIB member, where 00 is the default. If the CTICSF00 PARMLIB member is incorrect or missing, ICSF CTRACE performs tracing using an internal default set of trace options. The operator can specify trace options individually on the TRACE CT command or specify the name of a CTICSFxx PARMLIB member containing the desired trace options. Using a PARMLIB member on the TRACE CT command can help minimize operator intervention and avoid syntax or keystroke errors

Reference information : *z/OS Cryptographic Services ICSF Administrator's Guide*

- For information about TKDS, see *z/OS Cryptographic Services ICSF System Programmer's Guide*.
- For IBM Health Checker, see *IBM Health Checker for z/OS: User's Guide*.

DFSMS migration actions

This topic describes migration actions for base element DFSMSdfp and optional features DFSMSdss, DFSMSshm, DFSMSrmm, and DFSMStvs.

DFSMS actions to perform before installing z/OS V2R1

This topic describes DFSMS migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

DFSMSdfp: Back up SMS control data sets

Description: In a multisystem Storage Management Subsystem (SMS) complex, operating systems share a common set of SMS classes, groups, ACS routines, and a configuration base, which make up the storage management policy for the complex. This storage management policy is maintained in a source control data set (SCDS). When this policy is activated for SMS, the bound policy is maintained in processor storage and on DASD in an active control data set (ACDS). Systems in the complex communicate SMS information through a common communications data set (COMMDS).

It is recommended that to successfully share SMS control data sets in a multisystem environment where there are mixed levels of DFSMS, you update, translate, validate, and activate SMS policies on the system with the latest level of DFSMS. When an earlier control data set is to be updated or activated, the control data set is formatted by the later-level system. The shared SMS control blocks reflect the new, rather than the previous, lengths and control information.

For fallback, IBM recommends restoring SMS control data sets from backups taken on the fallback release.

Editing a policy on an earlier system could invalidate unused control information and prevent the control data set from being accessed by a later system. A warning message is provided before a policy can be changed on an earlier system. ACS routines may need to be updated and translated so to not reference policy items not known to the earlier system.

Remember, you risk policy activation failures if SCDS changes are not validated using the latest-level system in a sysplex.

Element or feature:	DFSMSdfp.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	No, but recommended to ensure data integrity.
Target system hardware requirements:	None.

Migration actions from z/OS V1R12: DFSMS

Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	Install the PTFs in “Install coexistence and fallback PTFs” on page 9 if they are not already installed.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Do the following on your pre-z/OS V2R1 systems:

1. Back up SMS control data sets according to established procedures in the event that fallback is required. The control data set format is VSAM linear.
2. Install all coexistence PTFs in “Install coexistence and fallback PTFs” on page 9.

In addition, if you modified and activated a higher-level policy on a pre-z/OS V2R1 system, do the following to ensure that the ACDS can be accessed on z/OS V2R1:

1. On the pre-z/OS V2R1 system, save the active ACDS as an SCDS with the SETSMS SAVESCDs command.
2. On z/OS V2R1, update, translate, validate, and activate the saved SMS policy.

Reference information: See the following information:

- *z/OS DFSMS Implementing System-Managed Storage*
- *z/OS DFSMSdfp Storage Administration*

DFSMSdfp: Obtain descriptive text in messages for Open/Close/End of Volume ABENDs

Description: z/OS V1R13 DFSMSdfp introduces a new function that displays descriptive text for certain IECxxxx messages for OPEN, CLOSE, end-of-volume determinant ABENDs,. The descriptive text is from the message documentation manuals. You can enable this function by specifying it in the MPFLSTxx PARMLIB member: .MSGOPTION VERBOSE(x), where x is either Y or N, with N as the default. If you were using OCE_ABEND_DESCRIPT in DEVSUPxx to obtain this descriptive text before OA37505 was installed, you need to convert to using MPFLSTxx after OA37505 is installed.

Note: Beginning in z/OS V2R1, or after applying the PTF for APAR OA37505 in z/OS V1R13, the VERBOSE message is displayed only in the JOBLOG.

In addition, all OPEN, CLOSE and end-of-volume ABEND messages are issued using a Message Buffer Manager service, whether or not the new VERBOSE message function is enabled. One change this introduces is that the IECxxxx portion of the message always appears as a multi-line WTO message. Automated operation services that parse these messages may be affected.

Element or feature:	DFSMSdfp
When change was introduced:	z/OS V1R13 with PTF for APAR OA37505 applied.
Applies to migration from:	z/OS V1R13 without PTF for APAR OA37505 applied, and z/OS V1R12.
Timing:	Before installing z/OS V2R1.

Is the migration action required?	Yes, if any of these conditions are true: <ul style="list-style-type: none"> You have z/OS V1R13 without APAR OA37505 installed, and are using the OCE_ABEND_DESCRIP function in DEVSUPxx for verbose messages. If you have automation or programs that depend upon the type (single-line WTO as opposed to multi-line WTO) of the IECxxx message for OPEN, CLOSE, end-of-Volume determinant ABENDs.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	Remove OCE_ABEND_DESCRIP from DEVSUPxx parmlib member; otherwise you receive the following informational message at IPL time: IEA253I DEVSUP OCE_ABEND_DESCRIP NO LONGER HAS AFFECT. USE MPFLSTXX MEMBER
Related IBM Health Checker for z/OS check:	None.

Steps to take: If you were using DEVSUPxx to obtain the ABEND descriptive text before OA37505 was installed, then you need to convert to using MPFLSTxx to obtain this information after OA37505 is installed. In the MPFLSTxx PARMLIB member, specify .MSGOPTION VERBOSE(Y) to enable display of the descriptive text.

Because OPEN, CLOSE and end-of-volume ABEND messages now include the IECxxx portion of the message as a multi-line WTO message, any automated operation services that parse these messages might need to be adjusted. Examine such automated operation services and adjust them to handle the new format as needed.

Here is an example of the output message you receive after you install APAR OA37505:

```
JOB00608 00000090 IEC141I 013-18,IGG0191B,IBMUSER9,S01,SYSUT1,5901,ZR1DT1, 651
        651      00000090 SYS1.SAMPLIB(ZZZZZZZZ)
```

Reference information: For details about using the VERBOSE option in MPFLSTxx, see *z/OS MVS Initialization and Tuning Reference*.

DFSMSdfp: Remove SMA fields from the SMS storage group construct IGDSGD and from ISMF panels

Description: Before z/OS V1R13, new SMS storage group constructs were created in DFSMS in support of the z/OSMF DASD Management task. Starting with z/OS V1R13 the DASD Management task has been removed from z/OSMF, and these fields (known as SMA attributes) will be removed from the storage group construct (IGDSGD). The fields have been removed from ISMF panels, Navquest APIs, and DCOLLECT records.

Migration actions from z/OS V1R12: DFSMS

Element or feature:	DFSMSdfp
When change was introduced:	z/OS V1R13 with APAR PM40869 applied. See Software Announcement 211-252 (RFA56143).
Applies to migration from:	z/OS V1R13 and z/OS V1R12, both without APAR PM40869 applied.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you parse the new attributes in DCOLLECT output or view/update them through NAVIQUEST. IBM might redefine these storage group and DCOLLECT fields in a future release.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

1. Look for the following storage group attributes (known as SMA attributes) as defined by the IGDSGD macro.
 - SGDMANTH
 - SGDMASUG
 - SGDMAMAX
 - SGDMAVSZ
 - SGDMAVTC
 - SGDMARSP
 - SGDMAVNM
2. Identify the following Naviquest functions associated with the SMA attributes identified in step 1.:
 - ACBQBAJ2 – clist for Define/Alter/Display pool storage group
 - ACBQBAJG – clist for Pool Storage Group Display ACBQBAJ2 –
 - Sample JCL for Pool storage group define/alter/display
3. Use the IDCDOUT mapping macro to map the following DCOLLECT fields and remove the references to those fields:
 - DSGFSMA
 - DSGMANTH
 - DSGMASUG
 - DSGMAMAX
 - DSGMAVSZ
 - DSGMAVTC
 - DSGMARSP
 - DSGMAVNM

Reference information: For information about the SMA attributes, see the following:

- *z/OS DFSMS Using the New Functions*
- *z/OS DFSMSdfp Storage Administration*
- *z/OS DFSMS Access Method Services Commands*

DFSMSdfp: Accommodate deletion of NOIMBED and NOREPLICAT LISTCAT command attributes

Description: Before z/OS V1R13, output from the IDCAMS LISTCAT command displayed the NOIMBED and NOREPLICAT attributes. Starting with z/OS V1R13, these attributes are no longer included in the LISTCAT command output. This might affect programs that parse LISTCAT results.

In 2001, support for creating data sets with IMBED or REPLICATE attributes on the AMS DEFINE command was removed. Starting with z/OS V1R13, the LISTCAT output no longer displays the default NOIMBED and NOREPLICAT attributes. This information is no longer needed. This might affect programs that parse LISTCAT results.

Note that for any cluster defined prior to 2001 with IMBED or REPLICATE attributes, those attributes are displayed in IDCAMS LISTCAT command output.

Before this z/OS V1R13 change, when you issued a LISTCAT for a data set, at the end, you would see attribute characteristics. They would look something like this example:

```

ATTRIBUTES
KEYLEN-----15      AVGLRECL-----80
RKP-----0         MAXLRECL-----80
STRIPE-COUNT-----1

SHROPTNS(4,3)  RECOVERY  UNIQUE      NOERASE  INDEXED  NOWRITECHK  NOIMBED  NOREPLICAT
UNORDERED     NOREUSE   NONSPANNED EXTENDED EXT-ADDR
    
```

Starting with z/OS VR13, when you issue a LISTCAT for a data set, the result will look something like this example:

```

ATTRIBUTES
KEYLEN-----15      AVGLRECL-----80
RKP-----0         MAXLRECL-----80
STRIPE-COUNT-----1

SHROPTNS(4,3)  RECOVERY  UNIQUE      NOERASE  INDEXED  NOWRITECHK  UNORDERED  NOREUSE
NONSPANNED     EXTENDED  EXT-ADDR
    
```

Element or feature:	DFSMSdfp.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	No, but recommended if you use programs that parse LISTCAT results.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.

Migration actions from z/OS V1R12: DFSMS

Related IBM Health Checker for z/OS check:	None.
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Steps to take: It is recommended that you convert the programs that parse LISTCAT results to use Catalog Search Interface (CSI).

Reference information: See information about CSI in *z/OS DFSMS Managing Catalogs*.

DFSMSdfp: Define IGGCATxx parmlib member

Description: Starting with z/OS V1R13, if you do not use an IGGCATxx parmlib member for catalog parameters, you might receive system message IEA301I IGGCAT00 NOT FOUND IN PARMLIB. If you are using a single parmlib data set like SYS1.PARMLIB, message IEA301I is displayed with the following text: IGGCAT00 NOT FOUND IN SYS1.PARMLIB.

Element or feature:	DFSMSdfp
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	No, but recommended to avoid message IEA301I referencing missing parmlib member IGGCATxx.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Do one of the following to define parmlib member IGGCATxx to your system before IPLing V1R13 to prevent system message IEA301I referencing missing parmlib member IGGCATxx:

- Create member IGGCAT00 in SYS1.PARMLIB or concatenation. Because IGGCAT00 is the default, you do not have to specify 00 on the CATALOG= parameter in parmlib member IEASYSxx.
- Create IGGCATxx member(s) in SYS1.PARMLIB or concatenation. Specify one or more members on the CATALOG= parameter of IEASYSxx so that the system will search for and parse the specified members.

If you wish to take the default values set up for IGGCATxx, you do not have to specify any parameters in the IGGCATxx member(s). The system will find the member or members, and use the default parameter values if none are specified in IGGCATxx.

Reference information: For details about the IGGCATxx parmlib member, see *z/OS MVS Initialization and Tuning Reference*.

DFSMS actions to perform before the first IPL of z/OS V2R1

This topic describes DFSMS migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

DFSMSdfp: Update SYS1.IMAGELIB

Description: If you use page mode printers such as the IBM 3800 or the IBM 3900 running in line mode (not page mode), you must install library character sets, graphic character modification modules, and character arrangement tables in SYS1.IMAGELIB. This migration action does not apply if you are using IBM 3900 printers that are driven by PSF.

Element or feature:	DFSMSdfp.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you are not using your old SYS1.IMAGELIB, you are installing with ServerPac or SystemPac, and you are using line mode printers such as the 3800 or 3900.
Target system hardware requirements:	IBM 3800 or 3900 printers.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

1. Run the LCSBLD1 job from the samplib data set to create character sets, graphic character modification modules, and character arrangement tables in SYS1.IMAGELIB.
2. Copy customized or locally-written FCBs and UCS images from your old system's SYS1.IMAGELIB data set to the new system's SYS1.IMAGELIB data set.

Reference information: For information about maintaining SYS1.IMAGELIB, see *z/OS DFSMSdfp Advanced Services*.

DFSMSdfp: Accommodate changes in LISTCAT LEVEL output

Description: To be similar to ISPF, DFSMSdfp has enhanced the LISTCAT LEVEL output for the qualifier level specification as of z/OS V2R1. Prior to z/OS V2R1, the LISTCAT LEVEL command output would only include entries that had additional qualifiers after those specified. Additional qualifiers would include GDG data sets that were defined. Empty GDG base entries would not be included.

: As of z/OS V2R1 and matching ISPF, the command output provides the matches for:

Migration actions from z/OS V1R12: DFSMS

- Te *specified* qualifiers, and any entries that had additional matching qualifier entries, and an alias entry of the specified value, and empty GDG base entries. (GDG data sets are included, as before.)

Element or feature:	DFSMSdfp.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you have programs that pass a parameter list of exactly three words to IEBCOPY and do not set on the high order bit in the last word.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Although LISTCAT output is not a programming interface, review if this change will affect your system. An example of the output differences is shown below: On pre-z/OS V1R13 systems:

```
LISTCAT LEVEL(A.B.C)
IDC3012I ENTRY A.B.C NOT FOUND
IDC3007I ** VSAM CATALOG RETURN-CODE IS 8
IDC1566I ** A.B.C NOT LISTED
...
IDC0001I FUNCTION COMPLETED, HIGHEST CONDITION CODE WAS 4
```

As of z/OS V2R1, the same command may produce:

```
LISTCAT LEVEL(A.B.C)
NONVSAM ----- A.B.C
          IN-CAT --- CATALOG.UCATA
...
IDC0001I FUNCTION COMPLETED, HIGHEST CONDITION CODE WAS 0
```

Notice that not only the information returned is different, but the return code and condition codes may be different as of z/OS V2R1. Take steps to convert any programs that rely upon LISTCAT output to use the Catalog Search Interface (CSI) instead. CSI is a supported general-use programming interface for the catalog, and will remove any dependency you have on future possible changes that may occur to LISTCAT output. Until such time as you can use the CSI interface, the following suggestions may be of help:

- Change invocations of LISTCAT LEVEL(A.B.C) to LISTCAT ENT(A.B.C.*) to return to the behavior prior to z/OS V2R1.
- Change invocations from PGM=IDCAMS to PGM=IDCNOGFL.

Reference information:

- For the LISTCAT command, see *z/OS DFSMS Access Method Services Commands/z/OS DFSMS Access Method Services Commands*.

- For information on the Catalog Search Interface, see *z/OS DFSMS Managing Catalogs/z/OS DFSMS Managing Catalogs*. Information APAR II14670 also provides a description of this change.
- For information on previous LISTCAT changes, see informational APAR II14250.

DFSMSdfp: Examine and update program calls to IEBCOPY

Before z/OS V2R1, the IEBCOPY utility assumed that calls from programs (not from JCL) that passed three parameters, had the high order bit set on in the third word of the parameter list. Starting in z/OS V2R1, IEBCOPY requires the high order bit to be on in the third word of a parameter list; if that bit is not on, IEBCOPY causes a failure. This change can affect your programs that call IEBCOPY, requiring you to update them if needed.

Element or feature:	DFSMSdfp.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you have programs that pass a parameter list of exactly three words to IEBCOPY and do not set on the high order bit in the last word.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Examine calls from programs (not from JCL) to IEBCOPY, to see whether any pass three parameters without turning on the high order bit in the last word. If you have such programs, revise them to turn on the high order bit of the last word of the parameter list. If you are using the CALL, LINK or ATTACH macro, the simplest way to do this is to add the VL parameter to CALL or VL=1 parameter to LINK or ATTACH.

Reference information: For details about program calls to IEBCOPY, see *z/OS DFSMSdfp Utilities*.

DFSMSdfp: Update operator procedures and system automation for new DADSM pre- and post-processing dynamic exits

Description: Before z/OS V1R13, exits for the DADSM pre- and post-processing functions were loaded by DFSMSdfp, as installation exits during initialization, as modules IGGPRE00 and IGGPOST0. Starting with z/OS V1R13, z/OS dynamic exits services is used to define a pre-processing dynamic exit, IGGPRE00_EXIT, and a post-processing dynamic exit, IGGPOST0_EXIT, and associate IGGPRE00 and IGGPOST0 modules as exit routines to these respective dynamic exits. All DADSM functions (create, extend, scratch, partial release, and rename) share these common dynamic exits and will be called where the previous installation exits of IGGPRE00 and IGGPOST0 were called using the same existing interfaces. This change requires changes to DFSMSdfp operating procedures and system automation (if any).

Migration actions from z/OS V1R12: DFSMS

Element or feature:	DFSMSdfp.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if DADSM installation exits IGGPRE00 or IGGPOST0 are in use.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

- If you use the IGGPRE00 or the IGGPOST0 installation exits, you do not need to change them in any way; just install them as you always have. DFSMSdfp will automatically exploit the dynamic exit services and use your IGGPRE00 or IGGPOST0 installation exit as exit routines to the new IGGPRE00_EXIT and IGGPOST0_EXIT dynamic exits. You do not need to change the load module names for IGGPRE00 or IGGPOST0, however, you may change the names if desired. If you do change the names, update the PROGxx parmlib member or issue the **SETPROG** command to get the modules loaded because DFSMSdfp will not load them as exit routines to the dynamic exits.
- You can now have multiple exit routines associated with each of the IGGPRE00_EXIT and IGGPOST0_EXIT dynamic exits for the DADSM pre- and post-processing exits. Other programs can use the CSVDYNEX macro to associate their exit routines to these dynamic exits and can add and delete exit routines from any dynamic exit routine as required. They also can be added and deleted with the PROGxx member of parmlib and with the SETPROG ADD operator command. All exit routines will be called when the DADSM pre- and post-dynamic exits are called from each DADSM function. The execution of one exit routine may then change the behavior of a subsequent one. The order in which the exit routines are called by the system could be in any order.
- The IGGPRE00 and IGGPOST0 module addresses in the CVAF table (CVFDPR31, CVFDPOR31) will continue to be set. Therefore, other programs that continue to use this interface will be unaffected. Since dynamic exit services would not be used in this case, no other exit routine associated with the dynamic exits will be called. These programs should be changed to use dynamic exit services, CSVDYNEX.

Reference information: To read more about the use of dynamic exit services and these new dynamic exits, see:

- *z/OS MVS Programming: Authorized Assembler Services Guide* for information about the CSVDYNEX macro.
- *z/OS MVS Initialization and Tuning Reference* for information about the PROGxx parmlib member.
- *z/OS MVS System Commands* for information about the **D PROG**, **SETPROG EXIT**, and **SET PROG=xx** commands.

- *z/OS DFSMS Installation Exits*, "DFSMS Data Management Installation/Dynamic Exits" chapter.

DFSMSdss: Build the IPLable stand-alone DFSMSdss image

Description: If you intend to use the Stand-Alone Services provided by DFSMSdss, you must use the DFSMSdss BUILDSA function to create the Stand-Alone Services IPL-capable core image. Starting with z/OS V1R12, DFSMSdss now uses BSAM instead of EXCP to read from and write to DFSMSdss dump data sets during DUMP, COPYDUMP, and RESTORE operations. To migrate to this support, you must rebuild the IPL-able core image for the Stand-Alone Services program.

If this migration action is not performed, users of the DSS standalone restore will not be able to restore backups on tape created with greater than 65520 byte blocks. Message ADRY3530I SEQUENCE ERROR ON RESTORE TAPE is issued and the operation is terminated. Backups created with 65520 byte blocks will restore as before.

Element or feature:	DFSMSdss.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you intend to use the Stand-Alone Services provided by DFSMSdss.
Target system hardware requirements:	Stand-Alone Services supports the IBM 3494 TotalStorage Enterprise Automated Tape Library, the IBM 3495 TotalStorage Enterprise Automated Tape Library, and the IBM 3590 TotalStorage Enterprise Tape Subsystem.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	Stand-Alone Services does not support the creation of the core image on an SMS-managed volume.
System impacts:	<ul style="list-style-type: none"> • To ensure that Stand-Alone Services is available when you run from DASD, do not delete the SYS1.ADR.SAIPLD.Vvolser data set or move it to another volume. • If you IPL from DASD and later change the volume serial number, you must rerun the BUILDSA function to create a new core image data set with the new volume serial number in the name.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

1. Prepare for Stand-Alone Services by creating a Stand-Alone Services IPLable core image with the BUILDSA command. With the BUILDSA command you can specify the device (card reader, tape drive, or DASD volume) from which Stand-Alone Services will be IPLed. You can also specify the operator console to be used for Stand-Alone Services.

Migration actions from z/OS V1R12: DFSMS

The BUILDSEA function builds the IPLable core image under the current operating system and determines a record size based on whether the IPL is from card, tape, or DASD.

2. Use RACF or another external security system to protect the SYS1.ADR.SAIPLD.Vvolser data set and the Stand-Alone Services modules.
3. If you have not done so already, make a backup copy of your system that can be restored by this function. For information about backing up volumes, see *z/OS DFSMSdfp Storage Administration*.

Note: Message ADRY3530I SEQUENCE ERROR ON RESTORE TAPE might be issued with operation terminated if a user tries to restore a back up that was created with a block size greater than 65520 bytes, using the DSS stand-alone restore program from z/OS V1R11.

Reference information: For more information, see *z/OS DFSMSdfp Storage Administration*.

DFSMSdss: Review changes to the messages that result from a COPY or RESTORE operation with COPYVOLID

Description: With APAR OA36296 on z/OS V1R13, DFSMSdss uses the IEEVARYD service, rather than the VARY command, to vary the target volume offline during a COPY or RESTORE operation with either FULL or TRACKS and the COPYVOLID parameter, when the target volume becomes a duplicate of the source volume. As a result, the hardcopy log no longer contains:

- VARY device-number,OFFLINE DFSMSDSS INTERNAL VARY
- IEF281I device-number NOW OFFLINE.

Instead, the hardcopy log contains message IEF880I, as follows:

IEF880I device-number NOW OFFLINE BY ADRSBRTN

Programs or procedures that rely on the presence of either the VARY command or the IEF281I message in the hardcopy log or job logs should be updated.

Element or feature:	DFSMSdss
When change was introduced:	z/OS V2R1. z/OS V1R13 with APAR OA36296 applied.
Applies to migration from:	z/OS V1R13 without APAR OA36296 applied, and z/OS V1R12
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you have programs or procedures that rely on the presence of either the VARY command or the IEF281I message.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Modify your programs or procedures to check for the following message, which in z/OS V2R1 is no longer a command response:

```
IEF880I device-number NOW OFFLINE BY ADRSBRTN
```

This message indicates that the device has been varied offline as the result of a DFSMSdss operation with the COPYVOLID parameter.

Reference information: For more information about COPY and RESTORE, see *z/OS DFSMSdss Storage Administration*

DFSMSdss: Accommodate Catalog Search Interface default change

Description: In z/OS V1R11, DFSMSdss logical data set COPY, DUMP, and RELEASE operation used the Catalog Search Interface (CSI) by default to find cataloged data sets based on the generic filter criteria on the INCLUDE keyword when no input volumes are specified. Before z/OS V1R11, you could make use of CSI functionality on z/OS V1R10, z/OS V1R9, and z/OS V1R8 systems by installing the PTF for APAR OA25644 and patching the offset X'54' into the ADRPATCH module to X'11'.

In z/OS V1R13 (and with the PTF for APAR OA32120 installed on z/OS V1R12), DFSMSdss no longer uses the CSI for Catalog filtering during logical data set processing as the default; DFSMSdss uses generic catalog locates in this scenario.

Element or feature:	DFSMSdss.
When change was introduced:	z/OS V1R12 with APAR OA32120 applied.
Applies to migration from:	z/OS V1R12 without the PTF for APAR OA32120 applied.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you want to use CSI during Catalog filtering for logical data set processing.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

- To use the CSI during Catalog filtering for the DFSMSdss logical data set COPY, DUMP, and RELEASE operation, the DFSMSdss patch byte at offset X'54' must be set to X'11' to enable the functionality.
- If the DFSMSdss patch byte at offset X'54' is set to any value other than X'00' and X'11' to use generic catalog locates instead of CSI (as done in earlier releases), you do not need to set it because this previous method of finding cataloged data sets is now in effect by default.

Note: If you are intentionally using the CSI default by setting the DFSMSdss PATCH byte at offset X'54' to X'11', then you don't need to take any action to expect the functionality be effective. However, if you left the DFSMSdss PATCH

Migration actions from z/OS V1R12: DFSMS

byte at offset X'54' as X'00' and want to continue using the CSI during Logical Data Set processing, you need to set that Patch byte to X'11'.

Reference information: For more information about the DFSMSdss patch byte, see

- INFO APAR II14616.
- *z/OS DFSMSdss Storage Administration*.

DFSMSHsm: Update applications that depend on LIST command output

Description: The output of the LIST DUMPCLASS command now includes the value of the RECOVERRESET parameter. RECOVERRESET is a new parameter of the DEFINE DUMPCLASS command that specifies whether or not the data-set-changed indicator in the VTOC entry is reset for all data sets that are restored during full volume recover processing.

Element or feature:	DFSMSHsm
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if your application depends on the output of the LIST DUMPCLASS command.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Update applications that depend on the output of the LIST DUMPCLASS command to accommodate the new value for RECOVERRESET.

Reference information: For details about the VTOCCOPIES parameter of the DEFINE DUMPCLASS command, see *z/OS DFSMSHsm Storage Administration*

DFSMSHsm: Accommodate default value change for dump VTOC copies

Description: Before z/OS V2R1, the system used a default value of 2 for the VTOCCOPIES parameter of the DFSMSHsm DEFINE DUMPCLASS command. Starting with z/OS V2R1, if the VTOCCOPIES parameter is not specified, the system uses a default value of 0 when DFSMSHsm dumps copy pool volumes. The default value of 2 will continue to be used when DFSMSHsm dumps non-copy pool volumes. If the VTOCCOPIES parameter is never specified, the LIST DUMPCLASS output displays a VTOCCOPIES value of *** to indicate that no value is specified. VTOC copies are not needed in a FRBACKUP/FRRECOV environment.

Element or feature:	DFSMSHsm
When change was introduced:	z/OS V2R1
Applies to migration from:	z/OS V1R13 and z/OS V1R12.

Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you want the old default value of VTOCCOPIES(2) in a FRBACKUP/FRRECOV environment.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: If you want to keep the default value of VTOCCOPIES(2) used before z/OS V2R1 in a FRBACKUP/FRRECOV environment, specify VTOCCOPIES(2) on the DEFINE DUMPCLASS command for each dump class used to dump copy pool volumes.

Reference information: For details about the VTOCCOPIES parameter of the DEFINE DUMPCLASS command, see *z/OS DFSMSShsm Storage Administration*

DFSMSHsm: Accommodate the changed default of PDA trace during DFSMSHsm startup

Description: Before z/OS V1R13, PDA trace was disabled (PDA=NO) during DFSMSHsm startup unless PDA=YES was *manually* added to the DFSMSHsm startup procedure. Starting with z/OS V1R13, PDA trace is enabled (PDA=YES) by default during DFSMSHsm startup. After DFSMSHsm is started, the SETSYS PDA setting controls PDA tracing.

Element or feature:	DFSMSHsm.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you do not want the new default.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: To enable PDA trace during DFSMSHsm startup, no action is required. To disable PDA trace during DFSMSHsm startup, specify PDA=NO in the DFSMSHsm startup procedure before starting DFSMSHsm.

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Note: When you do not allocate the ARCPDOX and ARCPDOY data sets in the DFSMSHsm start procedure, you receive the following message during initialization unless PDA=NO is explicitly specified.

```
ARC0036E I/O [INHIBITED | DISABLED] FOR DFSMSHSM PROBLEM DETERMINATION  
OUTPUT DATA SET, REAS=reason-code
```

Even in this situation, HSM continues to initialize and operate.

Reference information: For more information about enabling or disabling PDA trace during DFSMSHsm startup, see *z/OS DFSMSHsm Implementation and Customization Guide*.

DFSMSHsm: Accommodate the changed SETSYS FASTREPLICATION command DATASETRECOVERY parameter default

Description: Before z/OS V1R13, the **SETSYS FASTREPLICATION** command **DATASETRECOVERY** parameter default was **PREFERRED** and fast replication data set recovery was performed whenever possible. The standard copy method was used when fast replication could not be. Starting with z/OS V1R13, the **SETSYS FASTREPLICATION** command **DATASETRECOVERY** parameter default is changed to **NONE** and the standard copy method is used to perform data set recovery. Fast replication is not used by default.

Element or feature:	DFSMSHsm.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you want to use fast replication for data set recovery and you do not currently specify a fast replication data set recovery preference in the ARCCMDxx parmlib member of SYS1.PARMLIB.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

1. Determine which fast replication data set recovery preference you want to use.
2. Add a fast replication data set recovery preference to the ARCCMDxx parmlib member of SYS1.PARMLIB.
 - If a fast replication data set recovery preference is specified and matches the preference you want to use, no action is required.
 - If no fast replication data set recovery preference is specified, add **SETSYS FASTREPLICATION (DATASETRECOVERY (PREFERRED))** to continue using the same preference as before z/OS V1R13.

Alternatively, if your preference is to require fast replication data set recovery, you can specify **SETSYS FASTREPLICATION (DATASETRECOVERY (REQUIRED))**.

Note:

1. If you previously specified **SETSYS FASTREPLICATION (DATASETRECOVERY (NONE))** in the ARCCMDxx parmlib member of SYS1.PARMLIB, you can optionally remove it and use the default.
2. The **FRRECOV** command ALLOWPPRCP options PRESERVEMIRRORREQUIRED, PRESERVEMIRRORPREFERRED, PRESERVEMIRRORNO, and YES cannot be used if fast replication data set recovery is not allowed, that is, if the z/OS V1R13 **SETSYS FASTREPLICATION** command DATASETRECOVERY parameter default is used or if **SETSYS FASTREPLICATION (DATASETRECOVERY (NONE))** setting is in effect.

Reference information: For more information about fast replication, the **FRRECOV** command, and the **SETSYS** command, see *z/OS DFSMSShsm Storage Administration*

DFSMSHsm: Replace user-defined patch with new SETSYS FASTREPLICATION command to enable ARC1809I messages

Description: Before z/OS V1R13, a patch was required to enable (and subsequently disable) ARC1809I messages during fast replication volume pairing. Starting with z/OS V1R13, the VOLUMEPAIRMESSAGES parameter is added to the existing **SETSYS FASTREPLICATION** command to control the issuance of the ARC1809I messages. Remove the patch and replace it with the new parameter.

Element or feature:	DFSMSHsm.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if the ARCCMDxx parmlib member of SYS1.PARMLIB contains: PATCH .FRGCB.+9 BITS(.1.....)
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	The SETSYS FASTREPLICATION (VOLUMEPAIRMESSAGES(YES)) statement in ARCCMDxx is not supported on pre-z/OS V1R13 system
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

1. Remove PATCH .FRGCB.+9 BITS(.1.....) from the ARCCMDxx parmlib member of SYS1.PARMLIB.
2. Add **SETSYS FASTREPLICATION(VOLUMEPAIRMESSAGES(YES))** to the ARCCMDxx parmlib member of SYS1.PARMLIB.

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Reference information: For more information about using the SETSYS FASTREPLICATION command and VOLUMEPAIRMESSAGES parameter to disable unwanted ARC1809I messages, see *z/OS DFSMSShsm Storage Administration*

DFSMSHsm: Review messages changed from I (informational) to E (eventual action) type

Description: Before z/OS V1R13, messages ARC0036, ARC0503, and ARC0704 were *informational* messages (ending in the letter "I"). Starting with z/OS V1R13, messages ARC0036, ARC0503, and ARC0704 are reclassified as *eventual action* messages (ending in the letter "E"). The meaning of the messages is unchanged. The type is changed only.

Each of these messages indicate a significant error has occurred and are more easily identifiable as eventual action messages.

- Message ARC0036E indicates that an I/O error occurred when writing to the PDA output data set.
- Message ARC0503E indicates a dynamic allocation error.
- Message ARC0704E indicates a VTOC copy data set processing error during volume backup, dump, or recovery.

These changes can affect applications that depend on message ARC0036I, ARC0503I, or ARC0704I and applications triggered by message type.

Element or feature:	DFSMSHsm.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if your applications depend on message ARC0036I, ARC0503I, or ARC0704I or if your applications are triggered by message type.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Update applications that:

- depend on ARC0036I to work with ARC0036E.
- depend on ARC0503I to work with ARC0503E.
- depend on ARC0704I to work with ARC0704E.
- are triggered by message type.

Reference information: For more information about DFSMSHsm messages, see *z/OS DFSMSShsm Storage Administration*

DFSMSHsm: Remove patch that prevents SMS MVT chain rebuild

Description: Before z/OS V1R13, the flag at MCVT+C8 X'80' was used to prevent the SMS MVT chain rebuild at the beginning of primary space management and at

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the beginning of interval migration, based on the current SMS storage group definitions. If the SMS storage groups had not been changed and no new SMS volumes had been added since the last time primary space management or interval migration was run, you could prevent the SMS MVT chain from being needlessly rebuilt or refreshed by entering the following PATCH command:

```
PATCH .MCVT.+C8 BITS(1.....)
```

Starting with z/OS V1R13, this flag is maintained automatically by DFSMSHsm. DFSMSHsm checks for the occurrence of an ENF 15 event at the beginning of primary space management, at the beginning of interval migration, and at the beginning of on-demand migration. When an ENF 15 event is reported, DFSMSHsm performs an SMS MVT chain rebuild or refresh. After a successful SMS MVT chain rebuild, DFSMSHsm does not rebuild or refresh the MVT chain until the next SMS configuration change (that is, the next ENF 15 event).

Starting with z/OS V1R13, DFSMSHsm does not take into account the **PATCH .MCVT.+C8 BITS(1.....)** command. Nevertheless, it is recommended to remove this patch command from the ARCCMDxx parmlib member of SYS1.PARMLIB to avoid any misunderstanding.

Element or feature:	DFSMSHsm.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	No, but recommended because starting from z/OS V1R13, the patch command no longer performs a useful function other than what is already handled automatically by DFSMSHsm. Additionally, it been discovered in the past that leaving unnecessary useless patches in DFSMSHsm's startup procedures can cause confusion and potential problems.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	Remove this patch when all systems are at z/OS V2R1 if a common DFSMSHsm's startup procedure is shared with downlevel systems.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Remove **PATCH .MCVT.+C8 BITS(1.....)** from the ARCCMDxx parmlib member of SYS1.PARMLIB.

Reference information: None.

DFSMSHsm: Stop using the HOLD command to quiesce activity prior to control data set backup

Description: Before z/OS V1R13, you might have manually or programmatically held DFSMSHsm activity using the **HOLD** command prior to starting a control

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data set (CDS) backup. Starting with z/OS V1R13, the ARCCAT resource is released by all functions running on z/OS V1R13 DFSMSShsm hosts, and the functions are quiesced when CDS backup starts. Manually or programmatically holding DFSMSShsm activity is no longer necessary.

Element or feature:	DFSMSShsm.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	No, but recommended because DFSMSShsm will automatically release the ARCCAT resource when a CDS backup is starts.
Target system hardware requirements:	Cross coupling facility (XCF) services are required to communicate the start of a CDS backup to all DFSMSShsm hosts. XCF services must be available and configured properly.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	The following are restrictions of taking this migration action. <ul style="list-style-type: none"> • In a record-level sharing (RLS) CDS environment, all DFSMSShsm hosts in the HSMplex must be z/OS V1R13 or later hosts. • In a non-RLS CDS environment, this migration action can be taken on z/OS V1R13 DFSMSShsm hosts without changing hosts running on prior releases of z/OS. • Some DFSMSShsm environment configuration do not require XCF services. Specifically, a non-RLS CDS non-multiple address space DFSMSShsm (MASH) configuration typically does not require XCF services. However, XCF services are required and must be available and configured in all DFSMSShsm RLS CDS and MASH configurations.
System impacts:	If you continue to issue a HOLD command to quiesce DFSMSShsm activity before a CDS backup and a corresponding RELEASE command to resume activity after CDS backup is complete, the only impact is that you will not see the performance benefit intended by this enhancement.
Related IBM Health Checker for z/OS check:	None.

Steps to take: On all z/OS V1R13 DFSMSShsm hosts:

1. Remove the procedures, processes, or programs that issue the **HOLD** command to quiesce DFSMSShsm activity prior to starting CDS backup.

- Remove the corresponding procedures, processes, or programs that issue the **RELEASE** command to resume DFSMSHsm activity after CDS backup completes.

Reference information: For an overview of the CDS backup enhancement that relieves ARCCAT resource contention, see *z/OS DFSMS Using the New Functions*

DFSMSrmm: Check how you control your RACF tape profile processing

Description: The currently supported releases of DFSMSrmm support the TAPEAUTHDSN parameter in the DEVSUPxx (device support) parmlib member; however, this support has required enhancements in z/OS V2R1 to be properly implemented.

Before z/OS V2R1, for TAPEAUTHDSN=YES, DFSMSrmm performed tape authorization checks in the DATASET class with DSTYPE=T to indicate to RACF that the check was for data sets on tape volumes and that RACF had to perform a check for discrete profiles.

With z/OS V2R1 DFSMSrmm correctly supports option TAPEAUTHDSN according to the documentation in *z/OS MVS Initialization and Tuning Guide* and in *z/OS DFSMSrmm Implementation and Customization Guide*. If TAPEAUTHDSN=YES is set, DFSMSrmm now performs authorization checking without DSTYPE=T. The RACROUTE is issued in the DATASET class as if for a DASD data set.

If you want to continue using your existing data set profiles (generic or discrete), you need to change your existing TAPEAUTHDSN settings. See **Steps to take**.

Element or feature:	DFSMSrmm
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you have set up the RACF implementation.
Target system hardware requirements:	None
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Check to determine if you use the TAPEAUTHDSN=YES option in your DEVSUPxx parmlib member. If the option is specified, based on the RACF and DFSMSrmm configuration that you use with discrete data set profiles, you must prepare for a change in processing after you IPL V2R1.

If you want to continue using your existing data set profiles (generic or discrete), you need to exchange the current TAPEAUTHDSN settings:

- Change TAPEAUTHDSN=NO to TAPEAUTHDSN=YES to now make use of generic profiles.

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2. Change TAPEAUTHDSN=YES to TAPEAUTHDSN=NO to now make use of discrete profiles.

Reference information: See the following information:

- See "Enhanced security for tape data sets" in *z/OS MVS Initialization and Tuning Guide*
- See "Recommendations for using RACF tape profile processing" in *z/OS DFSMSrmm Implementation and Customization Guide*

DFSMS actions to perform after the first IPL of z/OS V2R1

This topic describes DFSMS migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

DFSMSdfp: Configure clusters and storage groups for SMS volume selection

Description: Before z/OS V2R1, when allocating or extending a multi-volume data set, SMS preferred the candidate volumes in the same storage facility image (SFI) if the storage class accessibility attribute was set to CONTINUOUS or CONTINUOUS PREFERRED. With z/OS V2R1, SMS prefers volumes that are in the same cluster. Similarly, when allocating the target data set for the data set fast replication function, SMS now prefers volumes that are in the same cluster as the source data set. In both cases, if it is not possible to honor the preference of volumes in the cluster, SMS reverts to preferring volumes in the same SFI. If you wish SMS to select volumes in the same cluster, you should configure your clusters accordingly.

Before z/OS V2R1, when allocating a striped data set, SMS allocated the stripes across separate logical control units (LCUs). With z/OS V2R1, SMS attempts to allocate the stripes across separate extent pools. If this is not possible, SMS continues to allocate the stripes across LCUs. If you wish SMS to separate the stripes across extent pools, you should configure your storage groups accordingly.

Element or feature:	DFSMSdfp.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	After the first IPL of z/OS V2R1.
Is the migration action required?	No, but recommended for optimum efficiency of data set fast replication and for the most uniform performance with striped data sets.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: If you wish SMS to select volumes in the same cluster, configure your clusters accordingly.

For striped data sets, if you wish SMS to separate the stripes across extent pools, configure your storage groups accordingly.

Reference information: For details about SMS volume selection and about striped data sets, see *z/OS DFSMSdfp Storage Administration*.

DFSMSdfp: Accommodate 64-bit and AR mode rules enforcement in DFSMS macros

Description: Before z/OS V1R13, many DFSMS macros that did not support 64-bit or AR mode did not react to being invoked in 64-bit or AR mode, and generated code that might have been invalid in 64-bit or AR mode. Starting with z/OS V1R13, these macros are changed to issue an assembly-time message and suppress expansion if they are invoked in 64-bit or AR mode. If you have code, including exits, that invokes DFSMS macros, you should review your code and modify it as appropriate to accommodate the new enforcement of 64-bit and AR mode rules.

Element or feature:	DFSMSdfp.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	After the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you have code, including exits, that invokes DFSMS macros.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Modify your source code so that no DFSMS macros are invoked after the SYSSTATE macro specifies 64-bit or AR mode. (The one exception is the TRKADDR macro, which supports 64-bit mode.) When you assemble your code, if a return code of 8 or greater is returned by the High Level Assembler, check for assembler messages that indicate that a macro has been invoked after AMODE 64 or AR mode was specified on the SYSSTATE macro.

Change the source code as appropriate:

- If the macro invocation will be executing in a supported environment (31-bit or 24-bit and not AR mode), then precede that invocation with SYSSTATE AMODE64=NO,ASCENV=P.
- If your tests show that the macro expansion does work when invoked in 64-bit or AR mode, then you can consider coding SYSSTATE with AMODE64=NO and ASCENV=P even though it does not match the execution environment. This type of macro invocation is not supported by IBM unless the documentation for that macro says otherwise.

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Reference information: For details about DFSMS macros, refer to *z/OS DFSMS Macro Instructions for Data Sets* and *z/OS DFSMSdfp Advanced Services*.

DFSMSdfp: Run OAM configuration database migration job

Description: When migrating to z/OS V1R13, you must run the OAM configuration database migration job (CBRSMR1D). CBRSMR1D creates the File System Delete Table in the OAM Configuration Database. If you use OAM object support, you must run CBRSMR1D even if you do not plan to use OAM file system support.

Element or feature:	DFSMSdfp.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	After the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you use OAM object support.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

1. If you use OAM object support, you must run CBRSMR1D even if you do not plan to use OAM file system support. Update and run the OAM configuration database migration job (CBRSMR1D) provided in SAMPLIB.
2. Run OAM DB2 BIND and GRANT jobs. To determine which BIND and GRANT jobs you need to run, see *z/OS DFSMS OAM Planning, Installation, and Storage Administration Guide for Object Support*.

Reference information: For more information, see the topic "Migrating, Installing, and Customizing OAM" in *z/OS DFSMS OAM Planning, Installation, and Storage Administration Guide for Object Support*.

DFSMSdfp: Run OAM DB2 BIND jobs

Description: When migrating to any new release of z/OS, you must run OAM DB2 BIND jobs if you are using OAM for object support. The BIND jobs update DB2 with new OAM DB2 code.

Element or feature:	DFSMSdfp.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	After the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you use OAM object support.
Target system hardware requirements:	None.
Target system software requirements:	None.

Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Run the BIND jobs appropriate to your installation:

1. Update and execute the samplib job CBRPBIND (OAM DB2 Bind Package Job).
2. Do one of the following:
 - If your installation starts OAM, uses the file system sublevel or optical or tape devices, or uses the OAM storage management component (OSMC), do the following:
 - Update and execute samplib job CBRABIND (OAM DB2 Application Plan Bind for LCS and OSR).
 - Update and execute samplib job CBRHBIND (OAM DB2 Application Plan Bind for OSMC).
 - If your installation does not start OAM, use the file system sublevel or optical or tape devices, or use OSMC, update and execute samplib job CBRIBIND (OAM DB2 Application Plan Bind for OSR only).
3. For more information, see the topic "Migrating, Installing, and Customizing OAM" in *z/OS DFSMS OAM Planning, Installation, and Storage Administration Guide for Object Support*.

Note: If you choose to edit a previous version of an OAM BIND job, you must incorporate any new changes as described in the header of each samplib OAM BIND job.

Reference information: For more information about OAM, see *z/OS DFSMS OAM Planning, Installation, and Storage Administration Guide for Object Support*.

DFSMSdss: Accommodate new default behavior for full-volume and track restore operations

Description: The data-set-changed indicator (DS1DSCHA) in the VTOC indicates whether or not the data set has changed since its last backup. Before z/OS V2R1, during a full-volume restore operation, DFSMSdss unconditionally reset (turned off) the data-set-changed indicator for each data set restored to the target volume. During a tracks restore operation, if any VTOC track was restored, DFSMSdss might reset the data-set-changed indicator for all data sets on the volume. This applies to all VSAM and non-VSAM data sets and all SMS and non-SMS data sets.

With z/OS V2R1, the default behavior for full-volume and tracks restore operations has changed. By default, DFSMSdss now resets the data-set-changed indicator only if the RESET keyword was specified on the DUMP command. Along with this change, a RESET keyword has been added to the RESTORE FULL and RESTORE TRACKS commands, which allows you to specify whether the data-set-changed indicator is to be reset. In addition, you can use the options installation exit routine, ADRUIXIT, to control the resetting of the data-set-changed indicator.

You can use RESET on the RESTORE command for any FULL or TRACKS dump taken with V2R1, or any previous releases. RESET(YES) and RESET(NO) will work

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as expected. However, RESET(DUMP) will act as RESET(NO) because there is no way to determine if the RESET keyword was specified at DUMP time on a down-level dump. The new RESET(DUMP) functionality is only available in V2R1.

Note that the default behavior for DFSMSdss DUMP is unchanged when DFSMSShsm invokes DFSMSdss to perform a full volume restore. By default, DFSMSShsm will pass RESET(YES) to DFSMSdss. The other parameters might be specified through the DEFINE DUMPCLASS command.

Element or feature:	DFSMSdss.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	After the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you want DFSMSdss to unconditionally reset the data-set-changed indicator during full-volume and tracks restore operations.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	RESET(DUMP) will act as RESET(NO) because there is no way to determine if the RESET keyword has been specified at DUMP time on a down-level dump. The new RESET(DUMP) function is only available in V2R1.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: To obtain the behavior in previous releases to allow DFSMSdss to unconditionally reset the data-set-changed indicator during full-volume and tracks restore operations, use RESET(YES) with the RESTORE FULL and RESTORE TRACKS commands. The other options for the RESET keyword are:

NO DFSMSdss does not alter the DS1DSCHA values. Each DS1DSCHA represents the value the data sets had at the time the dump was taken.

DUMP

DFSMSdss resets the data-set-changed indicator (DS1DSCHA=OFF) only if the RESET keyword was specified on the DUMP command. This is the default.

You can also use the options installation exit routine ADRUIXIT or API programs to override the behavior. The ADRUFO parameter list contains these bits in the UFO8FLGS structure:

UF08RESY

Corresponds to RESET(YES)

UF08RESN

Corresponds to RESET(NO)

UF08RESD

Corresponds to RESET(DUMP).

Note: The default behavior is unchanged when DFSMSHsm invokes DFSMSdss to perform a full volume restore. By default, DFSMSHsm will pass RESET(YES) to DFSMSdss. You can specify the other parameters through the DEFINE DUMPCLASS command.

Reference information: For details about the RESTORE command, see *z/OS DFSMSdss Storage Administration*. For details about the installation exit, see *z/OS DFSMS Installation Exits*.

DFSORT migration actions

This topic describes migration actions for optional feature DFSORT.

DFSORT actions to perform before installing z/OS V2R1

This topic describes DFSORT migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

None.

DFSORT actions to perform before the first IPL of z/OS V2R1

This topic describes DFSORT migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

Update automation for changed DFSORT messages

Description: In z/OS V2R1, the text for some DFSORT messages (ICExxxx) is changed. Text and insert fields have been added, changed, or removed in the messages listed in “Steps to take”. These changes can affect automation programs that examine the text of the messages.

Element or feature:	DFSORT.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you have automation routines that examine the message text of the messages listed in “Steps to take”.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Update your automation to handle the following DFSORT message changes:

Migration actions from z/OS V1R12: DFSORT

-
- The product number has changed from “5694-A01” to “5650-ZOS”, and the release level has changed from "V1R12" to "V2R1 ", in message ICE000I.
- The following new messages have been added:
 - ICE290A
 - ICE291I
- Text and insert fields have been changed in the following messages to provide new information:
 - ICE083A
 - ICE118I
 - ICE141A
 - ICE236I
 - ICE285A
 - ICE997I

Reference information: For details about the ICE messages, see *z/OS DFSORT Messages, Codes and Diagnosis Guide*.

Use TUNE=OLD option to prevent balancing resources for concurrent sort applications

Description: Beginning with z/OS V2R1, a new TUNE installation default allows you to specify whether DFSORT should allocate storage in increments with additional disk work space to minimize the risk of failure, or to allocate all storage at initialization so disk work space allocation can be reduced. The IBM-supplied default for the new TUNE installation option is TUNE=STOR which specifies allocation of available central storage as needed in increments sized to balance resource usage for concurrent sorts. If you want DFSORT to allocate available central storage using fixed sized increments, as in previous releases, you can set TUNE=OLD.

TUNE has the following values:

- STOR
- DISK
- DDYN
- OLD

Element or feature:	DFSORT.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if the default value TUNE=STOR is not acceptable.
Target system hardware requirements:	None.
Target system software requirements:	None.

Other system (coexistence or fallback) requirements:	ICEPRMxx member(s) of PARMLIB can be shared between systems running different releases of DFSORT. Any installation options specified in the ICEPRMxx member that are only supported in the newer release of DFSORT will be ignored on the system using the earlier release of DFSORT.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

- Use ICEPRMxx members activated by a START ICEOPT started task command to set the TUNE=OLD option, as appropriate.
- Alternatively, you can set TUNE=OLD with the previous (less preferred) method of using the ICEMAC macro and usermods.

Reference information: See the following information:

- For details about the TUNE installation option, see *z/OS DFSORT Installation and Customization*.

Use EXPOLD=MAX and EXPRES=0 to prevent changed defaults

Description: Beginning with z/OS V2R1, IBM-supplied defaults have been changed to EXPOLD=50% (from EXPOLD=MAX) and to EXPRES=10% (from EXPRES=0). If you want DFSORT to use the old defaults, as in previous releases, you can set EXPOLD=MAX and EXPRES=0.

Element or feature:	DFSORT.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if the new defaults are not acceptable.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

- Use ICEPRMxx members activated by a START ICEOPT started task command to set the EXPOLD=MAX or EXPRES=0 options, as appropriate.
- Alternatively, you can set EXPOLD=MAX or EXPRES=0 with the previous (less preferred) method of using the ICEMAC macro and usermods.

Reference information: See the following information:

Migration actions from z/OS V1R12: DFSORT

- For details about the EXPOLD and EXPRES installation options, see *z/OS DFSORT Installation and Customization*.

DFSORT actions to perform after the first IPL of z/OS V2R1

This topic describes DFSORT migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

None.

Distributed File Service migration actions

This topic describes migration actions for base element Distributed File Service.

Distributed File Service actions to perform before installing z/OS V2R1

This topic describes Distributed File Service migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

Determine whether to accept the new default values for certain zFS IOEFSPRM configuration file

Description: Before z/OS V2R1, certain default values were used for the IOEFSPRM files or IOEPRMxx parmlib member variables `meta_cache_size`, `metaback_cache_size`, `user_cache_size`, or `convert_auditfid`. Starting in z/OS V2R1, new default values are created for them.

In z/OS V2R1, the zFS IOEFSPRM configuration file variable `convert_auditfid` default value was changed to ON so that all files and directories in zFS file systems can be uniquely identified in SMF audit records. The zFS IOEFSPRM configuration file variable `user_cache_size` default value will be changed to a value that is calculated based on the amount of real storage in the system. The zFS IOEFSPRM configuration file variables `meta_cache_size` and `metaback_cache_size` default values will be changed when both values are not specified to also be calculated based on the amount of real storage in the system. These are so that a system that has the capacity for more storage use and has sufficient space in the zFS address space can have better performing caches.

Element or feature:	z/OS Distributed File Service
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you do not want the new default values to take effect or if you want to change existing values to the new default values.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.

Migration actions from z/OS V1R12: Distributed File Service

System impacts:	If enough real storage exists, zFS can use more storage by default than it would have used in prior releases.
Related IBM Health Checker for z/OS check:	Use check ZOSMIGV2R1_ZFS_VERITY_CACHESIZE introduced in APAR OA42672. This check determines if you are using the default meta_cache_size, metaback_cache_size and user_cache_size and further indicates whether the new defaults would affect you. See <i>IBM Health Checker for z/OS: User's Guide</i> .

Steps to take: Follow these steps:

- Look for these:
 - IOEFSPRM files or IOEPRMxx parmlib members that do not specify both meta_cache_size and metaback_cache_size options.
 - IOEFSPRM files or IOEPRMxx parmlib members that do not specify the user_cache_size option.
 - IOEFSPRM files or IOEPRMxx parmlib members that do not specify convert_auditfid settings.
 - Programs that use **zfsadm format** commands where unique auditfids are not desired.
 - JCL that contains calls to **ioeagfmt** that create aggregates for which unique auditfids are not desired.
 - Programs that use zFS format API where unique auditfids are not desired.
- Take these actions:
 - For meta_cache_size, metaback_cache_size, or user_cache_size, if the old default values are desired, specify these values in your IOEFSPRM files or IOEPRMxx parmlib members.
 - For auditfid, if you want the previous defaults, specify -nonewauditfid on calls to **ioeagfmt** or **zfsadm format** and convert_auditfid=OFF in your IOEFSPRM files or IOEPRMxx parmlib members.

Reference information: None.

Remove usage of zFS clone function

Description: z/OS V1R13 was the last release that zFS supported the cloning file systems function. The zFS clone functions included the **zfsadm clone** and **zfsadm clonesys** commands. Also removed was the ability to mount any zFS file system aggregates that contain a cloned (**.bak**) file system.

Element or feature:	z/OS Distributed File Service
When change was introduced:	With IBM United States Software Announcement 211-007 , dated February 15, 2011.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you are using or have used the zFS clone function.
Target system hardware requirements:	None.
Target system software requirements:	None.

Migration actions from z/OS V1R12: Distributed File Service

Other system (coexistence or fallback) requirements:	If any system earlier than z/OS V2R1 mounts a zFS aggregate that contains a .bak (clone) file system in a shared file system environment, any catch-up mounts on a V2R1 system fail and z/OS UNIX function ships from the V2R1 system to the z/OS UNIX owning system.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Determine whether you have any .bak file systems. You can do this by issuing a command like the following:

```
zfsadm lsfs | grep .bak
```

You might see results as in this example:

```
PLEX.JMS.AGG1.bak (Not Mounted) 458 K alloc 458 K quota On-line
PLEX.JMS.AGG2.bak (Not Mounted) 26 K alloc 26 K quota On-line
```

This example shows that there are two zFS aggregates that contain a .bak file system – PLEX.JMS.AGG1 and PLEX.JMS.AGG2. In this case, unmount the .bak file systems (if they are mounted) and delete each .bak file system from the aggregate with a command similar to the following example:

```
zfsadm delete PLEX.JMS.AGG1.bak
```

(Note that the file system name is case-sensitive.) If the delete fails because the file system was not found, it probably means that the zFS aggregate is not attached. Attach it, delete the .bak file, and detach the aggregate.

You should delete all .bak file systems before you bring zFS into the shared file system environment or before you IPL the V2R1 system. Minimally, you must ensure that no zFS aggregates that contain .bak file systems are mounted.

Reference information: For more information, see *z/OS Distributed File Service zFS Administration*.

zFS: Copy data from zFS multi-file system aggregates to zFS compatibility mode aggregates

Description: z/OS V1R13 was the last release of zFS support for multi-file system aggregates. If you have data stored in zFS multi-file system aggregates, you should copy the data from the zFS multi-file system aggregates into zFS compatibility mode aggregates.

As of z/OS V2R1, only zFS compatibility mode aggregates are supported, only zFS compatibility mode aggregates will be supported.

Element or feature:	z/OS Distributed File Service
When change was introduced:	z/OS V1R13 was the last release for the function. The function has been removed in z/OS V2R1.
Applies to migration from:	z/OS V1R13 and V1R12.
Timing:	Before installing V2R1.

Migration actions from z/OS V1R12: Distributed File Service

Is the migration action required?	Yes, if you have any multi-file system aggregates.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	Use check ZOSMIGV1R11_ZFS_RM_MULTIFS or check ZOSMIGREC_ZFS_RM_MULTIFS to help determine if any multi-file system aggregates are attached on your system.

Steps to take: Use one of the following methods to determine if you are using zFS multi-file system aggregates:

- Use the IBM Health Checker for z/OS check referenced in **Related IBM Health Checker for z/OS check**.
- Scan your zFS IOEFSPRM configuration options file for `define_aggr` statements.
- Scan your `/etc/rc` file for any **zfsadm attach** commands.
- Issue the **zfsadm agrinfo** command to determine if an aggregate is a multi-file system aggregate; in the command response, `COMP` indicates compatibility mode and `MULT` indicates multi-file system.

If you are using zFS multi-file system aggregates, copy the data from each of those file systems into its own zFS compatibility mode aggregate.

Reference information: See the following information:

- For more information about zFS commands and administration tasks, see *z/OS Distributed File Service zFS Administration*.
- For more information about IBM health checks, refer to *IBM Health Checker for z/OS: User's Guide*.

zFS: Accommodate new DASD space requirements

Description: zFS always reads and writes data in 8K blocks. However, starting in z/OS V1R13, zFS stores data either inline or in 8K blocks. (Inline data is a file that is smaller than 53 bytes and is stored in the file's metadata.) Unlike in previous releases, z/OS V1R13 zFS no longer stores data in 1K fragments. z/OS V1R13 zFS can read data stored in fragments; however, when the data is updated, it is moved into 8K blocks. Previously, zFS could store data in 1K fragments (contained in an 8K block). This meant that multiple small files could be stored in a single 8K block.

Because data is no longer stored in fragments, zFS might need more DASD storage than was required in previous releases to store the same amount of data. More storage may also be needed if z/OS V1R13 zFS is in a mixed-release sysplex and becomes the zFS owning system of a file system.

Because data is no longer stored in fragments, zFS R13 might need more DASD storage than was required in previous releases to store the same amount of data. More storage may also be needed if zFS R13 is in a mixed-release sysplex and becomes the zFS owning system of a file system.

Migration actions from z/OS V1R12: Distributed File Service

- **Scenario 1:** If every file in the file system is 1K or less, z/OS V1R13 R13 could require up to four times the DASD storage as was needed in previous releases.
- **Scenario 2:** Because HFS uses 4K blocks to store data and zFS uses 8K blocks, if every file in the file system were 4K or less, z/OS V1R13 zFS could require up to twice as much DASD space to store these files than HFS did.
- **Scenario 3:** If the file system contains 1000 files that are 1K in size, z/OS V1R13 zFS could take a maximum of 10 cylinders more than zFS in previous releases.

Typically, however, any increase in the DASD storage used by zFS will be negligible. For example, the z/OS V1R13 version root file system copied using z/OS V1R13 zFS takes approximately 2% more space than the same file system copied using z/OS V1R12 zFS. Note that z/OS V1R13 zFS packs multiple ACLs and symbolic links into an 8K block which previous releases did not do. To minimize the chance of application failure due to running out of DASD storage in newly mounted file systems, the default value for the IOEFSPRM option `aggrgrow` is changed from **Off** to **On**.

Element or feature:	z/OS Distributed File Service.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	Before installing V2R1.
Is the migration action required?	Yes, if you will be using z/OS V2R1 zFS to create new zFS file systems or update data in existing file systems, where the file system contains many small files. This action is also required if you have not specified the zFS <code>aggrgrow</code> option in your IOEFSPRM configuration options file, and want to use the old default of Off .
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	z/OS V2R1 can use more DASD storage for data than previous releases required. The amount of DASD storage depends on file sizes and on ACL and symbolic link usage. In general, the more small files in the file system, the more likely it is that a file system created or updated with z/OS V2R1 will require more DASD storage than previous releases.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Perform the following steps, as appropriate for your installation.

For all zFS file systems

1. If you have not specified the zFS `aggrgrow` option in your IOEFSPRM configuration options file, recognize that the default is changing in z/OS V1R13 from `aggrgrow=off` to `aggrgrow=on`. This means that by default, a zFS read-write mounted file system that is mounted on z/OS V2R1 will attempt to

Migration actions from z/OS V1R12: Distributed File Service

dynamically extend when it runs out of space if a secondary allocation size is specified and there is space on the volume(s).

2. If you do not want that default change and you want it to act as in prior releases, specify `aggrgrow=off` in your IOEFSPRM configuration options file so that it takes effect on the next IPL. You can dynamically change the `aggrgrow` option to off with the `zfsadm config -aggrgrow off` command. You can see your current value for `aggrgrow` with the `zfsadm configquery -aggrgrow` command.

For new zFS file systems

1. Increase the estimated size of a new zFS file system, if you know that many files in the file system will be small.
2. Mount zFS read-write file systems and allow them to dynamically extend; if more DASD space is needed, applications will not fail because the file systems are out of storage.

To do so, mount the file systems with the `AGGRGROW` mount option or use the default `aggrgrow=on` IOEFSPRM configuration option. The data set must have a non-zero secondary allocation size and there must be space on the volume to allow dynamic extension.

For existing zFS file systems

1. Use the scan for small files utility (`zfsspace`) to determine if an existing file system needs more DASD storage. For a mounted zFS file system, the utility shows the number of small files (1K or less), if a secondary allocation is specified, and if `aggrgrow=on` is specified. You can determine how many files you have in a file system that are less than or equal to 1K in size by using the following shell command:

```
find <mountpoint> -size -3 -type f -xdev | wc -l
```

The `zfsspace` utility can be downloaded from <ftp://public.dhe.ibm.com/s390/zos/tools/zfsspace/zfsspace.txt>.

2. If a file system has a secondary allocation size and is mounted with the `AGGRGROW` mount option, allow it to dynamically extend to minimize the potential failure due to lack of storage. If there are insufficient candidate volumes, also consider adding volumes by using the `IDCAMS ALTER` command with the `ADDVOLUMES` option. Generally, after adding volumes, a `remount samemode` is required to have them take effect.
3. If a file system is not enabled to dynamically extend, consider explicitly growing the file system using the z/OS UNIX `zfsadm grow` command. This is especially important if the file system contains many small files that will be updated.
4. If you expect a file system to grow larger than 4GB (about 5825 3390 cylinders) and it is not SMS-managed with extended addressability, you will need to copy it to an SMS-managed zFS data set with a data class that includes extended addressability. To do so, use the `pax` command. If a zFS aggregate is to be larger than 4GB, it must be SMS-managed with a data class that includes extended addressability. Beginning in z/OS V2R1, you can have non-SMS managed VSAM Linear Data Sets that are larger than 4GB, with the Extended Addressability attribute.

Reference information: Refer to the following documentation for more information about the migration steps.

- For information about zFS administration tasks and how zFS stores files, see *z/OS Distributed File Service zFS Administration*.

Migration actions from z/OS V1R12: Distributed File Service

- For information about VSAM extended addressability and SMS-managed data sets, see *z/OS DFSMS Implementing System-Managed Storage*.
- For information about the **pax** command, see *z/OS UNIX System Services Command Reference*.

zFS: Copy cloned file systems to a compatibility mode aggregate

Description: z/OS V1R13 is planned to be the last release that zFS will support cloning file systems. In anticipation of this removal of support, you should discontinue using zFS clone functions, such as the **zfsadm clone** and **zfsadm clonesys** commands. You should also discontinue mounting any zFS file system aggregates that contain a cloned (.bak) file system.

When support for cloning file systems is withdrawn, only zFS compatibility mode aggregates will be supported.

Element or feature:	z/OS Distributed File Service.
When change was introduced:	z/OS V1R13 (previewed in z/OS V1R13 Software Announcement 211-007, dated 15 February 2011).
Applies to migration from:	z/OS V1R12.
Timing:	Before installing V2R1.
Is the migration action required?	Yes, if your installation uses cloned file systems.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

1. Determine if cloned file systems (.bak) have been created or are in the process of being created on your system.
 - Issue the **modify zfs,query** command and review the contents of the FILE report. The Flg field in the report will indicate the status of the file system aggregate.
2. If your system contains cloned file systems, copy that data to a compatibility mode aggregate.

Reference information: For more information about zFS commands and performing administration tasks, see *z/OS Distributed File Service zFS Administration*

DCE/DFS: Disable DFS Client initialization

Description: The DFS client (DFSCM) is a physical file system that is started during z/OS UNIX initialization based on a FILESYSTYPE statement in the BPXPRMxx parmlib member. Starting with z/OS V1R13, the DFS client function is removed.

Element or feature:	z/OS Distributed File Service.
----------------------------	--------------------------------

Migration actions from z/OS V1R12: Distributed File Service

When change was introduced:	z/OS V1R13 (previewed in z/OS V1R12 Software Announcement 210-235, dated July 22, 2010).
Applies to migration from:	z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	Use ZOSMIGREC_SMB_RPC available by APAR OA30117.

Steps to take: For parmlib updates, the following members should be the only IOEx programs listed in the AUTHPGM section of the IKJTSOxx parmlib member:

- IOEDFSXP
- IOEAGSLV
- IOEAGFMT
- IOEZADM

All other IOEx programs need to be removed.

Note: The entry for program IOEDFSXP was introduced in SYS1.SAMPLIB(IKJTSO00) member by APAR OA37218 in z/OS V1R13.

If your installation uses the DFS client, you must remove the following statement from the BPXPRMxx parmlib member to prevent the client from initializing:

```
FILESYSTYPE TYPE(DFSC)
ENTRYPOINT(IOECMINI)
  PARM('ENVAR("_EUV_HOME=/opt/dfslocal/home/dfscm") /
>DD:IOEDFSD 2>&1')
ASNAME(DFSCM)
```

If this migration action is not performed before the first IPL of z/OS V2R1, you will receive the following error message:

```
IOEP12402E:
As of z/OS Version 1 Release 13, the DFS client function has been removed.
```

z/OS UNIX will successfully initialize, but you will need to follow the guidance in the message to remove the entry and restart z/OS UNIX.

If you have not already done so, you should use the z/OS UNIX **pax** command to migrate any data in DCE DFS or Episode file systems to other file systems. The recommended general procedure is as follows:

1. Set up a zFS file system to receive the data.
2. Copy your DCE DFS or Episode file system data to the zFS file system, using the z/OS UNIX **pax** command.
3. Set up a z/OS NFS server to allow data access from a remote z/OS UNIX system.

Migration actions from z/OS V1R12: Distributed File Service

Reference information: Refer to the following documentation for more information about these migration steps.

- For details about message IOEP12402E, see *z/OS Distributed File Service Messages and Codes*.
- For information about setting up a zFS file system, see *z/OS Distributed File Service zFS Administration*.
- For information about the **pax** command, see *z/OS UNIX System Services Command Reference*.
- For information about NFS, see *z/OS Network File System Guide and Reference* .
- For information about SMB, see *z/OS Distributed File Service zFS Administration* .

zFS: Ensure sysplex=filesys is available on all zFS R11 and R12 systems in a shared file system environment

Description: Beginning with z/OS V1R13, zFS only runs in sysplex=filesys mode. This requires that all sysplex members in the shared file system environment must run sysplex=filesys, including any z/OS V1R11 and z/OS V1R12 systems.

Element or feature:	z/OS Distributed File Service.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	Before installing V2R1.
Is the migration action required?	Yes, if you have a shared file system environment with more than one system in that environment.
Target system hardware requirements:	None.
Target system software requirements:	None.

Migration actions from z/OS V1R12: Distributed File Service

Other system (coexistence or fallback) requirements:	<p>Install the PTF for APAR OA32925 on z/OS V1R11.</p> <p>If a problem occurs when zFS is running <code>sysplex=filesys</code> on a z/OS V1R12 system, you can perform the following steps:</p> <ul style="list-style-type: none">• Remove the <code>sysplex</code> specification from each system or specify <code>sysplex=off</code> on each system (this is equivalent to the default).• Perform a rolling IPL or restart zFS on each system. <p>This procedure cannot be done after zFS on the z/OS V1R13 system has joined the <code>sysplex</code>. If you try to start zFS on another z/OS V1R13 system after you have changed zFS to <code>sysplex=off</code> on the z/OS V1R12 system, zFS on z/OS V1R13 will not start. This happens because zFS on z/OS V1R13 requires all other systems be zFS <code>sysplex=filesys</code>.</p> <p>Also, if you try to bring in zFS z/OS V1R13 when <code>sysplex=filesys</code> is not active on all systems, you will receive message IOEZ00721I Sysplex member <i>sysname</i> is not running <code>sysplex=filesys</code>. zFS on this initializing member will terminate., where <i>sysname</i> is the <code>sysplex</code> member that is not running <code>sysplex=filesys</code>.</p>
Restrictions:	None.
System impacts:	Specifying zFS <code>sysplex=filesys</code> in a shared file system environment causes zFS to run <code>sysplex-aware</code> on a file system basis. This is the preferred mode for zFS in a shared file system environment.
Related IBM Health Checker for z/OS check:	Use check ZOSMIGV1R13_ZFS_FILESYS(available with APAR OA35465 on z/OS V1R12).

Steps to take: Perform the following steps to ensure that `sysplex=filesys` is available on all zFS z/OS V1R12 systems in a shared file system environment.

1. If you are currently running zFS `sysplex=off`, specify `sysplex=filesys` and make it active on all systems through a rolling IPL.

If you are running `sysplex=on`, specify `sysplex=filesys` and `sysplex_filesys_sharemode=rwshare` and make it active on all systems through a rolling IPL. The health check ZOSMIGV1R13_ZFS_FILESYS verifies that all z/OS V1R12 systems in the shared file system environment have specified `sysplex=filesys` before z/OS V1R13 is introduced.

To determine if you are running zFS `sysplex=filesys`, issue the `MODIFY ZFS,QUERY,LEVEL` operator command. In a shared file system environment, the last line of the response indicates if zFS is running `sysplex=filesys`. In the following example, zFS is running `sysplex=filesys`.

Migration actions from z/OS V1R12: Distributed File Service

```
f zfs,query,level
IOEZ00639I zFS kernel: z/OS zSeries File System
Version 01.11.00 Service Level 0A33895 - HZFS3B0.
Created on Mon Aug 23 14:02:18 EDT 2010.
sysplex(filesys,norwshare) interface(3)
IOEZ00025I zFS kernel: MODIFY command - QUERY,LEVEL completed successfully
```

If you do not perform these steps on z/OS V1R12 systems, you will receive error messages when you try to bring up zFS on a z/OS V1R13 system. In the examples, DCEIMGVM, DCEIMGVN and DCEIMGVQ are three sysplex members in a shared file system environment.

Example 1: DCEIMGVM (running z/OS V1R13) tries to enter the sysplex environment.

DCEIMGVN and DCEIMGVQ are running z/OS V1R11 but the coexistence APAR has not been installed on either system.

Results: DCEIMGVM (z/OS V1R13) issues:

```
IOEZ00675E zFS will terminate... system DCEIMGVN does not support the following
feature(s) used by this system (DCEIMGVM):
enhanced connect
IOEZ00675E zFS will terminate... system DCEIMGVQ does not support the following
feature(s) used by this system (DCEIMGVM):
enhanced connect
IOEZ00057I zFS kernel program IOEFSKN is ending
```

Example 2: DCEIMGVN (running z/OS V1R11 without coexistence APAR) tries to enter the sysplex environment.

DCEIMGVM and DCEIMGVQ are running z/OS V1R13.

Results: DCEIMGVN (z/OS V1R11) issues the following messages:

```
IOEZ00677E zFS will terminate... system DCEIMGVM uses feature(s) not supported
by the initializing system (DCEIMGVN).
IOEZ00677E zFS will terminate... system DCEIMGVQ uses feature(s) not supported
by the initializing system (DCEIMGVN).
IOEZ00057I zFS kernel program IOEFSCM is ending
```

DCEIMGVM (z/OS V1R13) issues:

```
IOEZ00676E DCEIMGVN will terminate... it does not support the following
feature(s) used by this system(DCEIMGVM):
enhanced connect
```

DCEIMGVQ (z/OS V1R13) issues:

```
IOEZ00676E DCEIMGVN will terminate... it does not support the following
feature(s) used by this system(DCEIMGVQ):
enhanced connect
```

Example 3: DCEIMGVM (running z/OS V1R13) tries to enter the sysplex environment.

Results: DCEIMGVM (z/OS V1R13) issues:

```
IOEZ00721I Sysplex member DCEIMGVN is not running sysplex=filesys.
zFS on this initializing member will terminate.
IOEZ00721I Sysplex member DCEIMGVQ is not running sysplex=filesys.
zFS on this initializing member will terminate.
IOEZ00057I zFS kernel program IOEFSKN is ending.
```

Migration actions from z/OS V1R12: Distributed File Service

DCEIMGVN and DCEIMGVQ (running z/OS V1R11 with the coexistence APAR installed) are not running sysplex=filesys.

Example 4: DCEIMGVN (running z/OS V1R11 without sysplex=filesys and with the coexistence APAR installed) tries to enter the sysplex environment. DCEIMGVM and DCEIMGVQ are running z/OS V1R13.

DCEIMGVN (z/OS V1R11 without sysplex=filesys) issues:

```
IOEZ00677E zFS will terminate... system DCEIMGVM uses feature(s)
           not supported by the initializing system (DCEIMGVN).
IOEZ00677E zFS will terminate... system DCEIMGVQ uses feature(s)
           not supported by the initializing system (DCEIMGVN).
IOEZ00057I zFS kernel program IOEFSCM is ending
```

DCEIMGVM (z/OS V1R13) issues:

```
IOEZ00720I Initializing system DCEIMGVN will not be allowed
           to join the sysplex.
           It is not running sysplex=filesys.
```

DCEIMGVQ (z/OS V1R13) issues:

```
IOEZ00720I Initializing system DCEIMGVN will not be allowed
           to join the sysplex.
           It is not running sysplex=filesys.
```

Reference information: Refer to the following documentation for more information about these migration steps.

- For details about messages, see *z/OS Distributed File Service Messages and Codes*.
- For more information about running zFS in a shared file system environment, see *z/OS Distributed File Service zFS Administration*.
- For more information about IBM health checks, refer to *IBM Health Checker for z/OS: User's Guide*.

Distributed File Service actions to perform before the first IPL of z/OS V2R1

This topic describes Distributed File Service migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

z/FS: Ensure that the zFS kernel is active when using the batch utility ioagfmt

Description: Before z/OS V2R1, the batch utility **ioagfmt** did not require that the zFS kernel be active. Starting in V2R1, **ioagfmt** requires that the zFS kernel be active.

Element or feature:	z/OS Distributed File Services.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you did not run ioagfmt after the kernel was initialized. However, it would be unusual not to have zFS active when running ioagfmt .
Target system hardware requirements:	None.

Migration actions from z/OS V1R12: Distributed File Service

Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Look for JCL or vendor applications that might be creating or submitting JCL that contain **ioeagfmt** calls that are run when the zFS kernel is not active. Run them when the zFS kernel is active. If you are formatting file systems to be used by another system, you should be setting the `-version` parameter on **ioeagfmt** because the local zFS kernel would not have the information for a remote zFS system. You can also use the IOEFSUTL program to format aggregates. IOEFSUTL does not require the zFS kernel to be active to format a file system if you specify the `-version` parameter. But it will require the zFS kernel to be active if the `-version` parameter is left out.

Reference information: *z/OS Distributed File Service zFS Administration*

Distributed File Service actions to perform after the first IPL of z/OS V2R1

This topic describes Distributed File Service migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

None.

HCD migration actions

This topic describes migration actions for the base element Hardware Configuration Definition (HCD).

HCD actions to perform before installing z/OS V2R1

This topic describes HCD migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

Migrate security definitions for HCM users

Description: With z/OS V2R1 Hardware Configuration Definition (HCD) uses the application ID CBDSERVE to verify any user that logs on to the HCD agent, that is, any user that uses Hardware Configuration Manager (HCM) to perform hardware configuration definitions. If you have the APPL class active in your external security manager, for example in RACF, and you have a generic profile in that class that covers the new HCD application ID CBDSERVE, you need to permit all HCM users READ access to that profile. Otherwise, the users of HCM are no longer able to log on to HCD.

Element or feature:	HCD
When change was introduced:	z/OS V2R1

Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you use HCM to perform hardware configuration definitions, have the APPL security class active in your security product, and have a APPL profile that covers the application ID CBDSERVE.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: You can either give all HCM users READ access to your existing APPL profile that covers the HCD application ID CBDSERVE, or you can define a specific profile for the new HCD application ID and permit all HCM users to that profile. Sample definitions for a new profile and a user HCDUSER for RACF are similar to the following:

```
RDEFINE APPL CBDSERVE UACC(NONE)
PERMIT CBDSERVE CLASS(APPL) ID(HCDUSER) ACCESS(READ)
```

Reference information: See the following information:

- For information about protecting applications and the security definitions in RACF, see *z/OS Security Server RACF Security Administrator's Guide*.
- For information about setting up the HCD agent for use by HCD and HCM users, see *z/OS HCD User's Guide*

HCD actions to perform before the first IPL of z/OS V2R1

This topic describes HCD migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

None.

HCD actions to perform after the first IPL of z/OS V2R1

This topic describes HCD migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

None.

HLASM migration actions

This topic describes migration actions for the base element High Level Assembler (HLASM).

HLASM actions to perform before installing z/OS V2R1

This topic describes HLASM migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

Accommodate new assembler mnemonics for new machine instructions

Description: System z introduces new instructions having mnemonics that might collide with existing macro instruction names. Collisions can be managed by using a different OPTABLE option (described in *HLASM 1.6 Programmer's Guide* or mnemonic tags (described in the *HLASM 1.6 Language Reference*).

Element or feature:	HLASM
When change was introduced:	z/OS V2R1, z/OS V1R13, and z/OS V1R12, all with hardware support HLASM APARs, the latest of which are APARs PM49761 and PM86821.
Applies to migration from:	z/OS V2R1, z/OS V1R13, and z/OS V1R12, all without hardware support HLASM APARs installed. The latest of which are APARs PM49761 and PM86821.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you have a collision with a new instruction mnemonic.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Look for possible conflicts between new mnemonics and existing macro instructions with the same name:

1. Assemble an END statement with the OPTABLE(UNI,LIST) option to cause HLASM to display all mnemonics in the UNI opcode table.
2. If a conflicting name appears, do one of the following:
 - Use either a different OPTABLE option to avoid the new mnemonics or mnemonic tags to distinguish machine instruction use from macro instruction use.
 - Change the macro names.

Reference information: For the OPTABLE option, see *HLASM Programmer's Guide*. For mnemonic tags, see *HLASM Language Reference*.

HLASM actions to perform before the first IPL of z/OS V2R1

This topic describes HLASM migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

None.

HLASM actions to perform after the first IPL of z/OS V2R1

This topic describes HLASM migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

None.

IBM HTTP Server migration actions

This topic describes migration actions for base element IBM HTTP Server.

IBM HTTP Server actions to perform before installing z/OS V2R1

This topic describes IBM HTTP Server migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

Plan for the removal of support for IBM HTTP Server

Description: z/OS V2R1 is planned to be the last release to include the IBM HTTP Server Powered by Domino (IHS powered by Domino).

Element or feature:	IBM HTTP Server
When change was introduced:	Announced April 2013 for z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	No, but is planned to be a requirement in the release after z/OS V2R1.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: IBM recommends that you use the IBM HTTP Server Powered by Apache (IHS powered by Apache), which is available in z/OS Ported Tools as a replacement. IHS powered by Apache supports IPv6, 64-bit execution, and includes

Migration actions from z/OS V1R13: IBM HTTP Server

security authentication and authorization capabilities similar to those provided in IHS powered by Domino . Also, a refresh of IBM HTTP Server powered by Apache is planned later in 2013.

Reference information: IBM plans to provide documentation help with customer migration to IBM HTTP Server Powered by Apache.

IBM HTTP Server actions to perform before the first IPL of z/OS V2R1

This topic describes IBM HTTP Server migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

None.

IBM HTTP Server actions to perform after the first IPL of z/OS V1R13

This topic describes IBM HTTP Server migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

None.

Infoprint Server migration actions

This topic describes migration actions for optional feature Infoprint Server.

Infoprint Server actions to perform before installing z/OS V2R1

This topic describes Infoprint Server migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

Discontinue use of the Infoprint Server SNMP subagent

Description: In a z/OS release after V2R1, the Simple Network Management Protocol (SNMP) subagent will no longer be provided with Infoprint Server. Therefore, you should take steps to stop using it now. The SNMP subagent lets network management systems (such as, Ricoh Network Printer Manager for the web) communicate with PSF-controlled printers that do not have internal SNMP agents. However, most newer printers contain internal SNMP agents, so network management systems can communicate directly with these printers.

As an alternative to using a network management system to monitor PSF-controlled printers, you can use Infoprint Central, a web-based print management system. Infoprint Central can display the status of all your PSF-controlled printers. In addition, Infoprint Central lets you stop and start the printers, change printer work-selection criteria, turn TCP/IP-connected printers online and offline, and so on, so network management systems can communicate directly with these printers.

Element or feature:	z/OS Infoprint Server.
----------------------------	------------------------

Migration actions from z/OS V1R12: Infoprint Server

When change was introduced:	Planned removal was announced on 23 July 2013.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	No, but is planned to be a requirement in the release after z/OS V2R1 if you use the SNMP subagent. You are using the SNMP subagent if the start-daemons={snmpd} attribute is specified in the Infoprint Server configuration file. The configuration file's default location is /etc/Printsrv/aopd.conf . However, you might have specified a different location in environment variable AOPCONF in the aopstart EXEC.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

1. If you use a network management system to monitor PSF-controlled printers, do one of these:
 - Configure the network management system to communicate with the printers directly.
 - Use Infoprint Central to manage the printers. To use Infoprint Central, you must customize PSF to use the Infoprint Server Printer Inventory.
2. Stop the SNMP subagent daemon:
 - a. Edit the Infoprint Server configuration file (aopd.conf) to remove value `snmp` from the **start-daemons** attribute. The next time you start Infoprint Server, the SNMP subagent daemon will not start. (In the future z/OS release, value `snmp` will be ignored.)
 - b. If Infoprint Server is running, stop the SNMP subagent daemon (**aopsnmpd**). For example, enter this MVS START command to run the AOPSTOP procedure to stop daemon **aopsnmpd**:

```
START AOPSTOP,OPTIONS='-d snmpd'
```

Reference information: For information about:

- How to edit the Infoprint Server configuration file (aopd.conf) and how to customize Infoprint Central, see *z/OS Infoprint Server Customization*.
- How to use Infoprint Central and how to stop Infoprint Server daemons, see *z/OS Infoprint Server Operation and Administration*.
- How to customize PSF to use the Printer Inventory, see *PSF for z/OS: Customization*.

Migration actions from z/OS V1R12: Infoprint Server

Migrate from IP PrintWay basic mode to extended mode

Description: Since z/OS V1R5, the IP PrintWay component of Infoprint Server can operate in a mode called *IP PrintWay extended mode*. IP PrintWay extended mode uses the SYSOUT Application Programming Interface (SAPI) to obtain output data sets from the JES spool. IP PrintWay extended mode provides better performance, improved usability, and additional functions. For information about the enhancements and limitations in extended mode, see *z/OS Infoprint Server Customization*

IP PrintWay basic mode is the name used for the original IP PrintWay mode of operation. You can continue to run IP PrintWay basic mode in z/OS V2R1. In future releases, IBM will make enhancements only to IP PrintWay.

You can run IP PrintWay basic mode and IP PrintWay extended mode at the same time only if you make sure that IP PrintWay basic mode and IP PrintWay extended mode select different print jobs from the JES spool to print. Otherwise, unpredictable results can occur.

Element or feature:	Infoprint Server.
When change was introduced:	Basic mode was stabilized in z/OS V1R5. Extended mode was introduced in z/OS V1R5.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	No, but recommended because it will become a requirement in a future release.
Target system hardware requirements:	None.

Migration actions from z/OS V1R12: Infoprint Server

Target system software requirements:	<ul style="list-style-type: none"> • If you use Infoprint Central to work with IP PrintWay extended mode print jobs and printers, you need: <ul style="list-style-type: none"> – An operating IBM HTTP Server base element of z/OS – The XML Toolkit for z/OS V1.10 (5655-J51) – One of these Java products: <ul style="list-style-type: none"> - IBM 31-bit SDK for z/OS, Java Technology Edition, V7 (5655-W43) – - IBM 64-bit SDK for z/OS, Java Technology Edition, V7 (5655-W44) – - IBM 31-bit SDK for z/OS, Java Technology Edition, V6.0.1 (5655-R31) – - IBM 64-bit SDK for z/OS, Java Technology Edition, V6.0.1 (5655-R32) – - IBM 31-bit SDK for z/OS, Java Technology Edition, V6 (5655-R31) – - IBM 64-bit SDK for z/OS, Java Technology Edition, V6 (5655-R32) – Microsoft Internet Explorer 6.0 or later • In addition to IBM 31-bit SDK for z/OS, Java Technology Edition, V6 (5655-R31), one of the following will also work: <ul style="list-style-type: none"> – IBM 64-bit SDK for z/OS, Java Technology Edition, V6 (5655-R32) – IBM 31-bit SDK for z/OS, Java 2 Technology Edition, V5 (5655-N98) – IBM 64-bit SDK for z/OS, Java 2 Technology Edition, V5 (5655-N99) • To use IP PrintWay extended mode to print to VTAM-controlled printers, Infoprint Coaxial Printer Support for z/OS (5655-N62) is required.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	Use check INFOPRINT_PRINTWAY_MODE, available with APAR OA26583, to determine if you are currently using IP PrintWay basic mode.

Steps to take: See "Migrating from IP PrintWay basic mode to extended mode" in *z/OS Infoprint Server Customization*.

Reference information: See the following information:

- *z/OS Infoprint Server Customization* describes the features and limitations of IP PrintWay extended mode and how to customize IP PrintWay extended mode. It also describes how to customize the common message log and Infoprint Central.

Migration actions from z/OS V1R12: Infoprint Server

- *z/OS Infoprint Server Operation and Administration* describes how to log in to Infoprint Central and how to view messages in the common message log. It also describes how to modify printer definitions for IP PrintWay extended mode.
- *z/OS Infoprint Server User's Guide* describes considerations for submitting print jobs when you use IP PrintWay extended mode.
- *z/OS Infoprint Server Messages and Diagnosis* describes how to trace IP PrintWay extended mode.
- The Infoprint Central online help system describes how to use Infoprint Central.

Infoprint Server actions to perform before the first IPL of z/OS V2R1

This topic describes Infoprint Server migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

Remount the Printer Inventory and copy files that were customized

Description: When you migrate to the latest z/OS system, you must bring forward the customized data from your previous system.

Element or feature:	Infoprint Server.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

- *Printer Inventory:*
 - Remount the /var/Printsrv directory from the z/OS V1R13 system on the z/OS V2R1 system. The /var/Printsrv directory contains the Printer Inventory as well as other Infoprint Server files. The default directory is /var/Printsrv. However, you might have changed the directory name in the base-directory attribute in the aopd.conf configuration file.

Note:

1. After you start Infoprint Server on the z/OS system, you should use the Infoprint Server **pidu** command to export the Printer Inventory on the z/OS V2R1 system so that you have a backup of the Printer Inventory.
2. If /var/Printsrv is not mounted at a separate mount point, use the Infoprint Server **pidu** command to export the Printer Inventory on the

Migration actions from z/OS V1R12: Infoprint Server

original system and restore it on the z/OS V2R1 system. Do not use other copy commands to copy the Printer Inventory. (Mounting /var/Printsrv at a separate mount point can result in better management of disk space and easier migration.)

- Configure the Infoprint Server environment variables (for example, AOPCONF, PATH, LIBPATH, NLSPATH, MANPATH) in /etc/profile.
- *Configuration file*: If you modified the Infoprint Server configuration file, copy the file to the z/OS V2R1 system. Its default location is /etc/Printsrv/aopd.conf. However, you might have specified a different location in environment variable AOPCONF.
- *aopstart EXEC*: If you modified the **aopstart** EXEC, copy it to the z/OS V2R1 system.
- *IP PrintWay*: If you currently use the IP PrintWay component of Infoprint Server, copy to the z/OS V2R1 system any IP PrintWay exit routines and data stream filters you have written. It is a good practice to recompile the exits and filters on z/OS V2R1.
- *NetSpool*: If you currently use the NetSpool component of Infoprint Server, copy to the z/OS V2R1 system any NetSpool exit routines you have written. It is a good practice to recompile the exits and filters on z/OS V2R1.
- *Print Interface*: If you currently use the Print Interface component of Infoprint Server, take these actions:
 - If you have written any data stream filters, copy them to the z/OS V2R1 system. You do not need to recompile them.
 - If you run the SAP R/3 application server on the z/OS system, copy the SAP callback daemon configuration file to the z/OS V2R1 system. Its default location is /etc/Printsrv/aopsapd.conf. However, you might have specified a different location in environment variable AOPSAPD_CONF.
- *Infoprint Central*: If you currently use Infoprint Central, copy the z/OS HTTP Server configuration and environment variables files to the z/OS V2R1 system. The default locations of these files are /etc/httpd.conf and /etc/httpd.envvars.

Reference information: See the following information: *z/OS Infoprint Server Customization* .

Update or remove the region size in the AOPSTART startup procedure

Description: Starting with z/OS V1R13, the Infoprint Server startup procedure AOPSTART specifies a region size of 512 megabytes. Before z/OS V1R13, AOPSTART did not specify a region size, so the default region size defined for your installation was used.

Because the default region size might not be sufficient to use all the functions that Infoprint Server provides, it is a good practice to specify a region size on the startup procedure. However, if you want to continue to use the default region size or a region size other than 512 megabytes, edit the AOPSTART procedure to remove the region specification. If you have customized the AOPSTART procedure, you can continue to use the customized version.

Element or feature:	Infoprint Server.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.

Migration actions from z/OS V1R12: Infoprint Server

Is the migration action required?	Yes, if you use the AOPSTART procedure that IBM provides and want to continue to use the default region size used in releases prior to z/OS V1R13.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

1. Modify the EXEC statement in the AOPSTART procedure to remove or alter the REGION parameter:

```
//AOPSTART EXEC PGM=AOPBATCH,PARM='//usr/lpp/Printsrv/bin/aopstart',  
//          REGION=512M,  
//          TIME=NOLIMIT
```

2. Save the AOPSTART procedure.

Tips:

- The AOPSTART procedure is distributed in SYS1.IBM.PROCLIB. However, during installation it might have been copied to another data set in the started task PROCLIB concatenation.
- Specify a region size of at least 256 MB if you start the Infoprint Server Transform Manager to run data stream transforms. (This tip also applies to releases before z/OS V1R13.)
- Specify a region size of at least 200 MB if you start the Infoprint Server IPP Server to receive print requests from IPP-enabled clients. (This tip also applies to releases before z/OS V1R13.)
- User exits, such as IEFUSI, can modify the region size of an address space. Do not alter the region size of address spaces in the OMVS subsystem category.

Reference information: See the following information:

- For information about the AOPSTART procedure, see *z/OS Infoprint Server Customization*.
- For more information about the IEFUSI exit, see *z/OS MVS Installation Exits*.

Infoprint Server actions to perform after the first IPL of z/OS V2R1

This topic describes Infoprint Server migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

Run aopsetup

Description: When migrating to z/OS V2R1 Infoprint Server, you must run the **aopsetup** shell script to establish the correct file permissions for Infoprint Server directories and files.

Element or feature:	Infoprint Server.
---------------------	-------------------

Migration actions from z/OS V1R12: Infoprint Server

When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	After the first IPL of z/OS V2R1.
Is the migration action required?	Yes.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Run the **aopsetup** shell script from an rlogin shell, from an OMVS session, or with the BPXBATCH command. Specify the names of the RACF groups that you defined for Infoprint Server operators and administrators as arguments to **aopsetup**. For example, if you defined group AOPOPER for operators and group AOPADMIN for administrators, enter:

```
/usr/lpp/Printsrv/bin/aopsetup AOPOPER AOPADMIN
```

Rule: You must run **aopsetup** from a user ID with a UID of 0. You can use the **su** command to switch to an effective UID of 0 if you have READ access to the BPX.SUPERUSER profile in the RACF FACILITY class.

Tip: You can run **aopsetup** from the driving system (instead of the target system) if all of these are true:

- You have the target system's /var/Printsrv directory accessible.
- You reference the target system's /usr/lpp/Printsrv directory mounted under a /service directory as described in the comments at the beginning of the **aopsetup** shell script.
- The RACF database groups for operators and administrators are the same on the driving and target system.

Reference information: For details about unning **aopsetup**, see *z/OS Infoprint Server Customization*.

ISPF migration actions

This topic describes migration actions for base element ISPF.

ISPF actions to perform before installing z/OS V2R1

This topic describes ISPF migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

None.

ISPF actions to perform before the first IPL of z/OS V2R1

This topic describes ISPF migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

None.

ISPF actions to perform after the first IPL of z/OS V2R1

This topic describes ISPF migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

Review changes to ISPF panels for new allocation of non-SMS-managed sequential data set

Description: Before z/OS V1R13, the allocation option of the Data Set Utility (OPT3.2) in Interactive System Productivity Facility (ISPF) opened and closed new non-SMS-managed sequential data sets to write end-of-file (EOF) markers. Beginning in z/OS V1R13, this action is no longer performed for new allocations through OPT3.2 and the new AL line command of the Data Set List Utility (OPT3.4). As a result, the referenced date is not set and is displayed with a value of *****None***** on the ISPF Data Set Information panel and in the Referred column of the ISPF Data Set list panel. This behavior is now consistent whether the data set is SMS-managed or not.

Element or feature:	ISPF.
When change was introduced:	z/OS V1R13
Applies to migration from:	z/OS V1R12
Timing:	After the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if users expect to have the reference date set when allocating a new non-SMS managed sequential data set using ISPF option 3.2 or the AL line command of ISPF option 3.4.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Notify users that the referred date for a non-SMS-managed sequential data set is not set when the data set is allocated using the ISPF Data Set Utility (option 3.2) or the ISPF Data Set List Utility (option 3.4) AL line command.

Reference information: For a description of ISPF panel changes, see *z/OS ISPF User's Guide Vol II*.

JES2 migration actions

This topic describes migration actions for base element JES2.

JES2 actions to perform before installing z/OS V2R1

This topic describes JES2 migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

Change JESJOBS profiles

Description: In z/OS V2R1, the new Job Modify SSI 85 defines additional resource names to the JESJOBS class. If any existing JESJOBS entity name matches one of the new resource names, it could result in unintended user authorization to modify job attributes. If necessary, update your JESJOBS profiles to avoid granting unintended user authority to modify jobs.

Element or feature:	z/OS JES2.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if JESJOBS profiles could grant unintended authority to modify the job.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

1. Search for JESJOBS profile names which match any of the new JESJOBS resource names:
 - SUBMIT.localnodeid.jobname.userid
 - HOLD.nodename.userid.jobname
 - RELEASE.nodename.userid.jobname
 - PURGE.nodename.userid.jobname
 - CANCEL.nodename.userid.jobname
 - START.nodename.userid.jobname
 - RESTART.nodename.userid.jobname
 - SPIN.nodename.userid.jobname
 - MODIFY.nodename.userid.jobname
 - REROUTE.nodename.userid.jobname

For more information, see *z/OS JES2 Initialization and Tuning Guide*.

2. Ensure that your existing JESJOBS profiles grant the intended authority, given the new use of JESJOBS by the Job Modify SSI 85.
3. If any JESJOBS profile inadvertently allows user authority to Job Modify SSI 85 actions, update the profile or create a new profile, if necessary.

Reference information: See the following information:

Migration actions from z/OS V1R12: JES2

- *z/OS JES2 Initialization and Tuning Guide*
- *z/OS Security Server RACF Security Administrator's Guide*
- *z/OS Planning for Multilevel Security and the Common Criteria*

Activate z11 mode

Description: To take advantage of the full-function level of z/OS V1R11 JES2, you must be in z11 mode. Activating z11 mode upgrades the JES2 checkpoint and enables JES2 functional that is introduced in z/OS V1R11, including JOE data area extensions supported by BERTs. z/OS V2R1 is planned to be the last release for which JES2 will support the z2 level for checkpoint data sets. For more information on the JES2 functionality introduced in z/OS V1R11, see **Reference information**.

Element or feature:	JES2.
When change was introduced:	Planned for the release following z/OS V2R1. See IBM United States Software Announcement 212-086, dated April 11, 2012
Applies to migration from:	z/OS V1R13 and z/OS V1R12
Timing:	Before installing z/OS V2R1.
Is the migration action required?	No, but recommended because it will be a requirement in the release following z/OS V2R1. (IBM United States Software Announcement 212-086, dated April 11, 2012).
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	You are able to fall back to z2 mode, if necessary.
System impacts:	None.
Related IBM Health Checker for z/OS check:	Use check JES2_Z11_Upgrade_CK_JES2 to determine if your system is ready to upgrade the JES2 checkpoint to z11 mode. For more information, see <i>IBM Health Checker for z/OS: User's Guide</i> .

Steps to take: Follow these steps:

- After migrating to z/OS V1R11 JES2, or later, on all systems in your MAS, determine your z11 checkpoint activation readiness:
 1. Use the **\$D ACTIVATE** command. This command indicates if activation to z11 mode will succeed.
 2. Review your current utilization of BERT data to determine if there are sufficient BERTS, as detailed in "Check BERT utilization" on page 188.
 3. If you issue the **\$ACTIVATE,LEVEL=z11** command, activation of LARGEDS support is required.
 4. An additional *nnn* 4K records for CKPT1 is required for z11 mode.
- Run the **JES2 \$ACTIVATE** command to verify non-configuration changes that must be accommodated before going to z11, and to activate z11 mode following the considerations for this command found in *z/OS JES2 Commands*.

Note: The SPOOLDEF LARGEDS=FAIL (default value) in JES2PARM parmlib member is not supported in z11 mode. In z11 mode, on a COLD start, JES2 defaults to LARGEDS=ALLOWED. However, you cannot issue the \$ACTIVATE,LEVEL=z11 command in the environment of SPOOLDEF LARGEDS=FAIL.

By default, JES2 restarts in the same mode (z2 or z11) as other members of the MAS (if any are active) or the mode the last active JES2 member was in when it came down. To restart JES2 in z2 mode, specify UNACT on PARM=. On a cold start JES2 starts in z11 mode unless overridden by OPTSDEF COLD_START_MODE or UNACT parameter.

Reference information: See the following information:

- For a list of the enhancements introduced in z/OS V1R11 for z11 mode, see *z/OS Introduction and Release Guide*.
- For \$ACTIVATE, \$D ACTIVATE, \$D CKPTSPACE and \$JD HISTORY command details, see *z/OS JES2 Commands*.

Check BERT utilization: Before issuing the \$ACTIVATE,LEVEL=z11 command, review the current utilization of BERT data to determine whether there are sufficient BERTs. Additional BERTs are needed for each SYSOUT data set that has transaction data associated with it. These SYSOUT data sets can be seen using SDSF by setting APPC ON and examining SYSOUT data sets on the H and O panels; SYSOUT data sets with transaction data have nontraditional JES2 job IDs. Consider increasing the number of BERTs to correspond to two times the maximum number of transaction SYSOUT data sets on the system. BERT utilization should be monitored after the \$ACTIVATE to z11 mode to ensure there are sufficient BERTs for the jobs and SYSOUT in the MAS. There are several ways to determine your current BERT usage.

- The \$D CKPTSPACE,BERTUSE command displays a table of the types of control blocks in BERTs and how many BERTs are used by each control block type. The example shows the output of the command:

```

$HASP852 CKPTSPACE CURRENT BERT UTILIZATION
$HASP852 TYPE COUNT CB COUNT
$HASP852 -----
$HASP852 INTERNAL 11 1,
$HASP852 JOE 211 108,
$HASP852 CAT 114 38,
$HASP852 WSCQ 1 1,
$HASP852 DJBQ 0 0,
$HASP852 JOE 0 0,
$HASP852 FREE 763 0

```

In the example, there are 108 JOEs that have a total of 211 BERTs associated with them. This example is for a system in z2 mode and does not have any BERTs associated with JOEs.

- The \$D ACTIVATE command displays the number of BERTs that are needed for activation to z11 mode. This is the number of BERTs that will be associated with JOEs after the \$ACTIVATE. The example shows the output of the \$D ACTIVATE command:

```

$HASP895 $DACTIVATE
$HASP895 JES2 CHECKPOINT MODE IS CURRENTLY Z2
$HASP895 THE CURRENT CHECKPOINT:
$HASP895 -- CONTAINS 1100 BERTS AND BERT UTILIZATION IS 30
$HASP895 PERCENT.
$HASP895 -- CONTAINS 158 4K RECORDS.
$HASP895 z11 CHECKPOINT MODE ACTIVATION WILL:

```

Migration actions from z/OS V1R12: JES2

```
$HASP895 -- EXPAND CHECKPOINT SIZE TO 165 4K RECORDS.  
$HASP895 -- REQUIRE 22 ADDITIONAL BERTS AND UTILIZATION  
$HASP895 WOULD REACH 32 PERCENT.  
$HASP895 z11 ACTIVATION WILL SUCCEED IF ISSUED FROM THIS MEMBER.
```

In the example, there are 22 additional BERTs that will be used after the \$ACTIVATE to z11 mode, for transaction data associated with JOEs.

Note: When the SPOOLDEF LARGEDS=FAIL (default value) is in effect in your JES2PARM parmlib member, the following message will be issued by the \$ACTIVATE command:

```
$HASP895 z11 ACTIVATION WILL FAIL IF ISSUED FROM THIS MEMBER.  
$HASP895 THE FOLLOWING ISSUES PREVENT ACTIVATION:  
$HASP895 -- LARGEDS SUPPORT MUST BE ACTIVATED.
```

- A general history of BERT usage can be obtained by using the \$JD HISTORY(BERT) command or by using the SDSF RM panel. This displays the usage of BERTs after the system was IPLed. The example below shows the output of the \$JD HISTORY(BERT) command:

```
$HASP9130 D HISTORY  
$HASP9131 JES2 BERT USAGE HISTORY  
DATE TIME LIMIT USAGE LOW HIGH AVERAGE  
-----  
2009.086 16:00:00 1100 337 337 337 337  
2009.086 15:50:09 1100 337 125 337 192
```

JES2 actions to perform before the first IPL of z/OS V2R1

This topic describes JES2 migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

Remove BROADCAST= from the OUTDEF initialization statement

Description: In z/OS V2R1, JES2 ignores any specifications of the BROADCAST= parameter. TSO notify messages are sent to the user, or are issued locally if the user is not logged on. You can no longer use BROADCAST= to specify where TSO notify messages are sent.

Element or feature:	z/OS JES2.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	No, but recommended to keep your initialization deck clean of outdated and obsolete specifications.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

1. Check the OUTDEF statement in the JES2 initialization deck for BROADCAST= specifications.
2. Remove BROADCAST= specifications from the OUTDEF statement.

Reference information: See the following information:

- *z/OS JES2 Messages*
- *z/OS JES2 Initialization and Tuning Reference*
- *z/OS JES2 Diagnosis*.

Remove JCLERR= from the JOBDEF initialization statement

Description: Before z/OS V2R1, for JCL job card errors that were detected during the input phase that the converter also detected, you could either have JES2 fail the job during input phase (JCLERR=YES) and the job never was sent to conversion, or you could have JES2 ignore the errors (JCLERR=NO) and send the job to the conversion phase where the converter could detect them. Starting with z/OS V2R1, input phase still detects errors, but jobs are always queued to the conversion phase and the input errors are added to those found by conversion and reported in the same way. The message id associated with the message indicates where the error occurred.

In z/OS V2R1, JES2 ignores any specifications of the JCLERR= parameter. If an error on the JOB card is encountered during the INPUT phase, the job is sent to the converter for INPUT phase error message processing. You can no longer use JCLERR=YES to specify for the job to be failed under these conditions.

Element or feature:	z/OS JES2.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	No, but recommended to keep your initialization deck clean of outdated and obsolete specifications.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

1. Check the JOBDEF statement in the JES2 initialization deck for JCLERR= specifications.
2. Remove any JCLERR= specifications from the JOBDEF statement.

Note: With JES2 APAR OA41881, the output message \$HASP835 from \$DJOBDEF command no longer displayd the JCLERR=YES or JCLERR=NO value.

Reference information: See the following information:

- *z/OS JES2 Messages*

Migration actions from z/OS V1R12: JES2

- *z/OS JES2 Initialization and Tuning Reference*
- *z/OS JES2 Diagnosis.*
- *z/OS JES2 Commands..*

JES2 actions to perform after the first IPL of z/OS V2R1

This topic describes JES2 migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

None.

JES3 migration actions

This topic describes migration actions for optional feature JES3.

JES3 actions to perform before installing z/OS V2R1

This topic describes JES3 migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

None.

JES3 actions to perform before the first IPL of z/OS V2R1

This topic describes JES3 migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

Change JES3 release level format

Description: In z/OS V2R1 SSI 54, SSI 82 and SSI 83 report the JES3 release level using the JES2 format z/OS 2.1. In previous versions of z/OS, JES3 reported the release level using the format z 1.13.0. The SSI fields which are affected by the format change are:

- SSI 54: SSVIVERS field from macro IEFSSVI
- SSI 82: JPXVERSN field from macro IAZJPLEX
- SSI 83: JPSYVERN field from macro IAZJPLXI.

Element or feature:	z/OS JES3.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if code is dependent on the JES3 release level returned by SSI 54, SSI 82 or SSI 83.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.

Related IBM Health Checker for z/OS check:	None.
--	-------

Steps to take: Follow these steps:

1. Search for fields SSVIVERS, JPXVERSN and JPSYVERN in invocations of SSI 54, SSI 82 and SSI 83.
2. For any code that requires the z/OS 2.1 JES3 release level, change the expected format to 'z/OS 2.1' (z/OS #.#).

Reference information: *z/OS MVS Using the Subsystem Interface.*

Remove DUMP=JES and DUMP=MVS from the OPTIONS initialization statement

Description: For enhanced problem determination and availability in z/OS V2R1, JES3 has dropped support for the DUMP=JES and DUMP=MVS parameter specifications on the OPTIONS initialization statement. In z/OS V2R1, DUMP=PRDMP is the default value and the only supported DUMP parameter specification.

Element or feature:	z/OS JES3.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	<p>No, but recommended to avoid warning messages. Any references to unsupported values are ignored, DUMP=PRDMP is used, a message is issued and initialization continues.</p> <p>For example, if DUMP=JES or DUMP=MVS is specified, the system issues one of the following messages, and JES3 initialization continues:</p> <p>IAT3255 WARNING: JES IS INVALID FOR KEYWORD DUMP, DEFAULT PRDUMP IS BEING USED</p> <p>IAT3255 WARNING: MVS IS INVALID FOR KEYWORD DUMP, DEFAULT PRDUMP IS BEING USED</p>
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

1. Check the OPTIONS statement in the JES3 initialization deck for DUMP=JES and DUMP=MVS specifications.
2. Remove DUMP=JES and DUMP=MVS specifications from the OPTIONS statement, or change the values to DUMP=PRDMP.

Migration actions from z/OS V1R12: JES3

Reference information: See the following information:

- *z/OS JES3 Initialization and Tuning Reference*
- *z/OS JES3 Messages*
- *z/OS JES3 Commands*
- *z/OS JES3 Diagnosis Reference*

Remove SDI from the OPTIONS initialization statement

Description: In z/OS V2R1, JES3 has removed the option to turn off Spool Data Integrity (SDI) functionality. If JES3 encounters the SDI keyword, command processing stops and a message is issued.

If SDI is specified in the inish deck, the system issues the following message, and JES3 initialization continues: IAT3256 SDI KEYWORD IGNORED, NO LONGER SUPPORTED. If SDI is used on a command (*F Q,SDI=), the system issues the following message, and the command is aborted: IAT8050 SDI IS AN INVALID FIELD.

Element or feature:	z/OS JES3.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	No, but recommended to avoid warning messages and command errors.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

1. Remove the SDI keyword from the OPTIONS statement in the JES3 initialization deck.
2. Remove or update any automated instances of the *F Q and *I Q commands that specify the SDI parameter.

Reference information: See the following information:

- *z/OS JES3 Initialization and Tuning Reference*
- *z/OS JES3 Messages*
- *z/OS JES3 Commands*
- *z/OS JES3 Diagnosis Reference*

Modify code that depends on the format of suppressed split messages in the DLOG

Description: The JES3 DLOG facility was introduced for tracking all message activity in a sysplex. It uses an MCS extended console to receive the messages and reformats them in the JES3 format. When these messages are longer than can be formatted into a single line, they are split into two lines. Before z/OS V1R13 JES3, longer messages having a receive ID were formatted differently if they were

suppressed by the message processing facility (MPF). Beginning with z/OS V1R13 JES3, all suppressed messages with a receive ID are split in the same manner.

The following DLOG excerpt shows how a suppressed message (XXX100I) was split prior to z/OS V1R13 JES3:

```

10250 1143599 SY1 R= XXX33913 ICH70001I IBMUSER LAST ACCESS AT 11:39:46 ON MONDAY, NOVEMBER 1, 2010
10250 1144001 SY1 R= XXX33913 IEF403I XXX33913 - STARTED - TIME=11.44.00
MLG 10250 1144004 &SY1 R= XXX33913 +XXX100I 9012345678901234567890123456
MLG 10250 1144004 &SY1 R= XXX33913789012345678901234567890123456789012345678901234567890123456
10250 1144004 SY1 R= XXX33913 IEF404I XXX33913 - ENDED - TIME=11.44.00

```

The following DLOG excerpt shows how a suppressed message (XXX100I) is split beginning with z/OS V1R13 JES3:

```

10305 1000486 SY1 R= XXX33913 ICH70001I IBMUSER LAST ACCESS AT 09:57:46 ON MONDAY, NOVEMBER 1, 2010
10305 1000488 SY1 R= XXX33913 IEF403I XXX33913 - STARTED - TIME=10.00.48
MLG 10305 1000494 &SY1 R= XXX33913 +XXX100I 9012345678901234567890123456
MLG 10305 1000494 &SY1 R= XXX33913 789012345678901234567890123456789012345678901234567890123456
10305 1000494 SY1 R= XXX33913 IEF404I XXX33913 - ENDED - TIME=10.00.49

```

Element or feature:	JES3.
When change was introduced:	z/OS V1R13
Applies to migration from:	z/OS V1R12
Timing:	Before first IPL of z/OS V2R1.
Is the migration action required?	Yes, if your installation has a code dependency on the format of messages in the JES3 DLOG.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Ensure that any dependency on DLOG message formats are examined and corrected.

Reference information: For more information, see the "Message Format" chapter in *z/OS JES3 Messages*.

Avoid redundant *S main,FLUSH command in response to XCF messages

Description: Prior to z/OS V1R13, a DOWN response to message IXC102A issued for a JES3 local processor required operations to enter the *S main,FLUSH command. Without the *S main,FLUSH command, jobs on the local were held up until the local processor was reconnected.

Starting in z/OS V1R13, JES3 flushes the active jobs on the local processor automatically as soon as the operator responds to message IXC102A. This automatic flush eliminates the step of issuing the command and reduces the time gap between the local processor being removed from the sysplex and job recovery actions.

Migration actions from z/OS V1R12: JES3

In z/OS V1R13 JES3 and later releases, if you run the ***S main,FLUSH** command in response to the XCF messages, the command will have no effect because the affected jobs will have already been flushed by the new automatic processing.

Element or feature:	JES3.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	No, but recommended to avoid redundant *S main,FLUSH commands.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: If you want to avoid redundant ***S main,FLUSH** commands, remove the ***S main,FLUSH** command from all automated procedures or operating procedures.

Reference information: *z/OS JES3 Messages.*

Update automation that handles message IAT3100

Description: In the text of message IAT3100, a space has been added between the "z" and the release identifier. In z/OS V1R12, the text for message IAT3100 appeared as in the following example:

```
IAT3100 JES3 z1.12.0  SYSTEM  HOTSTART ON 2011.304 AS SY1
```

Starting with z/OS V1R13, the text appears as in the following example:

```
IAT3100 JES3 z 1.13.0  SYSTEM  HOTSTART ON 2011.304 AS SY1
```

If your message automation for JES3 depends on the message text instead of the message number, your JES3 automation routines might be affected.

Element or feature:	JES3.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you have automation routines that examine the message text instead of the message number.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.

System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Change your automation routines to account for the additional space.

Reference information: For more information, see *z/OS JES3 Messages*.

Modify code that uses DATLOREC and DATINPTR (IATYDAT) as a programming interface

Description: When a job's JCL contains in-stream data sets, the in-stream data is stored in multi-record files apart from the JESJCLIN file. These files are located by SYSIN pointer records that are written into a job's JESJCLIN file by input service. Prior to z/OS V1R12 (without APAR OA34642), SYSIN pointer records were included in the JESJCLIN file's record count which is saved in DATLOREC (IATYDAT). In z/OS V1R12, z/OS V1R11, and z/OS V1R10 (with APAR OA33040), the SYSIN pointer records were not included in the record count for JESJCLIN files. With APAR OA34642 applied, a new flag, DATCTLRD (IATYDAT), will be on for any record, including SYSIN pointer records, that are not included in a file's record count.

Element or feature:	JES3.
When change was introduced:	z/OS V1R12 JES3, z/OS V1R11 JES3, and z/OS V1R10 JES3 with the PTF for APAR OA34642 applied.
Applies to migration from:	z/OS V1R12 JES3 without the PTF for APAR OA34642 applied.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you use DATLOREC and DATINPTR (IATYDAT) as a programming interface.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Before applying the PTF for APAR OA34642, examine and modify any code that uses DATLOREC and DATINPTR (IATYDAT) as a programming interface. Note that IATYDAT is an internal JES3 control block that resides on spool and that this change affects only JESJCLIN data sets.

Reference information: For more information, see *z/OS JES3 Initialization and Tuning Reference*.

JES3 actions to perform after the first IPL of z/OS V2R1

This topic describes JES3 migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

None.

Language Environment migration actions

This topic describes migration actions for base element Language Environment.

Language Environment actions to perform before installing z/OS V2R1

This topic describes Language Environment migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

Convert to CEEPRMxx to set system-level default runtime options

Description: In the IBM z/OS V1R12 Software Announcement 210-235 dated 22 July 2010, IBM announced plans to remove the capability to change the default Language Environment runtime options settings using SMP/E installable USERMODs. As of z/OS V2R1 if you are still using assembler modules to specify your installation-wide default runtime options (CEEDOPT, CEECOPT, or CELQDOPT), you must convert to using the CEEPRMxx parmlib member to set your system-level default Language Environment runtime options. z/OS V1R13 was the last release to support the SMP/E USERMOD to customize the LE Run-time options.

Element or feature:	Language Environment.
When change was introduced:	z/OS V2R1. (Previewed in IBM z/OS V1R12 Software Announcement 210-235, 22 July 2010.)
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you still use SMP/E USERMOD to customize the Language Environment runtime options.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	Use CEE_USING_LE_PARMLIB to check that default Language Environment runtime options are set within a CEEPRMxx parmlib member.

Steps to take: Follow these steps:

Migration actions from z/OS V1R12: Language Environment

- If you are no longer using the Language Environment runtime option assembler usermods, you do not have to take further action.
- If you are using the Language Environment runtime option assembler usermods, you must convert to CEEPRMxx parmlib member.

Reference information: For details about specifying the CEEPRMxx parmlib member, see *z/OS Language Environment Customization*.

Language Environment actions to perform before the first IPL of z/OS V2R1

This topic describes Language Environment migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

Update the CSD based on the newest CEECCSD

Description: Each release, Language Environment adds or deletes load modules in the CICS system definition (CSD) file. Thus, you should update the file each release using the program definitions found in members CEECCSD and CEECCSDX found in the SCEESAMP data set. The CSD samples provided by Language Environment (CEECCSD and CEECCSDX) at the latest release can be used for systems at earlier releases that can co-exist with this level of z/OS.

Element or feature:	Language Environment.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you use CICS.
Target system hardware requirements:	None.
Target system software requirements:	CICS.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Update the CSD file using the program definitions in member CEECCSD (and member CEECCSDX if using CICS TS V3 or later) found in the hlq.SCEESAMP data set.

Note: The group containing the Language Environment runtime routines must be in the group list used during CICS startup.

Reference information: See *z/OS Language Environment Runtime Application Migration Guide*

Update Language Environment load modules in the LPA

Description: Each release you must update the Language Environment load modules that you make accessible through the link pack area (LPA). In addition,

Migration actions from z/OS V1R12: Language Environment

each release you should review your list of Language Environment load modules in the LPA to determine if it's still suitable.

Element or feature:	Language Environment.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you need to make modules accessible through the link pack area (LPA).
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Review Language Environment load modules in the LPA.

To move load modules into the LPA, use the following sample members in the CEE.SCEESAMP data set:

- *AFHWMLP2*: This is a sample of all Language Environment Fortran component modules eligible for the LPA.
- *CEEWLPA*: This is a sample of a PROGxx member of SYS1.PARMLIB that includes all Language Environment CEE-prefixed runtime modules eligible for the LPA (that is, all Language Environment base modules) except the callable services stubs.
- *CELQWLPA*: This is a sample for AMODE 64 runtime support.
- *EDCWLPA*: This is a sample of a PROGxx member of SYS1.PARMLIB that includes all Language Environment EDC-prefixed and CEH-prefixed runtime modules eligible for the LPA (that is, all XL C/C++ component modules) except locales and code page converters.
- *IBMALLP2* (or *IBMPLPA1* for Enterprise PL/I for z/OS): This is a sample of all Language Environment PL/I component modules eligible for the LPA.
- *IGZWMLP4*: This is a sample of all Language Environment COBOL component modules eligible for the LPA.

To see which modules are eligible for the LPA, refer to *z/OS Language Environment Customization*. The modules listed there can be put in the LPA or extended LPA (ELPA) depending on their RMODE value:

- If the RMODE is ANY, the module can reside in the LPA or in the ELPA (above or below the 16 MB line).
- If the RMODE is 24, the module can reside only in the LPA (below the 16 MB line).

If you are considering placing the modules listed in *z/OS Language Environment Customization* in the LPA or the ELPA, then IBM recommends that you place the

Migration actions from z/OS V1R12: Language Environment

SCEELPA data set in the LPA list (LPALSTxx). SCEELPA contains Language Environment load modules that are reentrant, that reside above the 16 MB line, and that are heavily used by z/OS.

In *z/OS Language Environment Customization* you will also see tables of modules eligible for the LPA and the ELPA above and beyond what is found in the SCEELPA data set. You will need to use the dynamic LPA or MLPA approach to move these modules into the LPA or ELPA. You do not need to include recommended modules if they contain functions your installation does not use. Language Environment modules not listed in these tables can be moved into the LPA or ELPA at your discretion.

Reference information: See the table “Language Environment sample IEALPAnn or PROGxx members in *hlq.SCEESAMP*” for the list of sample members and their changed content in *z/OS Language Environment Customization*. The table contains a list of eligible load modules for:

- Language Environment base modules
- Language Environment XL C/C++ component modules
- Language Environment COBOL component modules
- Language Environment Fortran component modules
- Language Environment PL/1 component modules

Determine if the region-level runtime option JCL requires changes

Description: Because of the changes introduced in “Accommodate removal of samples provided for system-level runtime usermods” on page 198, new region-level assembler samples are provided in the SCEESAMP data set. These samples are called CEERDOPT, CEERCOPT and CELQRDOP. Each sample contains the IBM-supplied default values for runtime options. The instructions in the CEEWROPT and CEEWQROP sample JCL parts for creating region-level runtime options load modules have been updated to refer to the new assembler samples.

Element or feature:	Language Environment.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	No, but recommended if you need to create a new region-level runtime options module.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Migration actions from z/OS V1R12: Language Environment

Steps to take: No action is needed for existing CEEROPT modules or for JCL job which already contain a copy of the old assembler samples. If you need to create a new region-level runtime options module, use the updated JCL and sample assembler parts.

Reference information: For more information about creating region-level runtime option load modules, see *z/OS Language Environment Customization*.

Update programs that read the Language Environment options report

Description: The Language Environment options reports, which may be obtained by specifying RPTOPTS(ON), with the CLER CICS transaction, with a CEEDUMP or using VERBX LEDATA in an IPCS readable Cdump, will no longer show "Installation Default" as the last where Cset field. If the runtime option defaults shipped with Language Environment have not been changed, the last where set field will show "IBM-supplied Cdefault". Also, the last where set value of "Installation non-overrideable" is no longer used.

Element or feature:	Language Environment.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you have an application that reads the output of an options report
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: If you have programs that attempt to read the output from these reports, your programs should be updated accordingly. Similarly, if you were outputting an options report you should use "IBM-supplied default" for a where set value that formerly matched "Installation default".

Reference information: See the following information:

- *z/OS Language Environment Debugging Guide*
- *z/OS Language Environment Customization*
- *z/OS Language Environment Programming Guide for 64-bit Virtual Addressing Mode*

Accommodate removal of samples provided for system-level runtime usermods

Description: In z/OS V1R12, Language Environment issued a statement of direction indicating that the preferred method of setting default system-level runtime options is using the CEEPRMxx support. The statement of direction further indicated that the ability to change installation-level runtime options with SMP/E installable usermods would be removed in a future release. Starting in z/OS V2R1, that ability is removed. See "Convert to CEEPRMxx to set system-level default runtime options" on page 194.

Migration actions from z/OS V1R12: Language Environment

The CEEWDOPT, CEEWCOPT, and CEEWQDOP sample JCL jobs that were used to install Language Environment runtime option usermods are no longer included in the SCEESAMP dataset. The corresponding CEEDOPT, CEECOPT, and CELQDOPT assembler source code samples, which contained the IBM-supplied runtime option, are also no longer included in the SCEESAMP dataset. Additionally, the CEEXOPT macro has been updated to issue an MNOTE if the generation of a CEEDOPT or CELQDOPT CSECT is requested.

Element or feature:	Language Environment.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you still use the assembler language usermods to modify installation-wide runtime options.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: If you used the CEEWDOPT, CEEWCOPT, and CEEWQDOP sample JCL jobs described in the **Description** in releases earlier than z/OS V2R1, you can no longer do so. You must now migrate to using the CEEPRMxx support. See “Convert to CEEPRMxx to set system-level default runtime options” on page 194.

Reference information: For more information about setting system-level default runtime options, see *z/OS Language Environment Customization*.

Language Environment actions to perform after the first IPL of z/OS V2R1

This topic describes Language Environment migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

None.

Library Server migration actions

This topic describes migration actions for base element Library Server.

Library Server actions to perform before installing z/OS V2R1

This topic describes Library Server migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

None.

Library Server actions to perform before the first IPL of z/OS V2R1

This topic describes Library Server migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

Copy Library Server configuration files

Description: The Library Server configuration files (`bookmgr.80`, `booksrv.80`) contain information about your environment and preferences. The information in `bookmgr.80` includes the names of bookshelf lists for bookshelves in z/OS data sets and the names of the file system directories that Library Server reads and writes during execution. The information in `booksrv.80` includes the file system directory names of book collections, shelves, and bookcases, as well as product option settings configured via the Library Server Administration Page. There are default values but normally you would customize them. In order to bring the customized values over to your new system, you have to copy them. (Note that port number suffix `.80`, used in `bookmgr.80` and `booksrv.80`, is an example. Your port number suffix might be different.)

Element or feature:	Library Server.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you intend to preserve your Library Server configuration.
Target system hardware requirements:	None.
Target system software requirements:	z/OSMF V2R1, if you want to use the z/OSMF InfoCenter.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Copy your current (customized) configuration files, usually `bookmgr.80` and `booksrv.80`, to your new system and add any configuration parameters that are new since the z/OS release from which you are migrating. Otherwise Library Server will run with default values, not the values you're used to. A suggested (but not required) place for these configuration files is `/etc/booksrv`. Library Server will also search `/etc` and the original `cgi-bin` for them. If you place the files in any other directory, use the `EPHConfigPath` environment variable to tell Library Server where to find them.

Reference information: For a complete description of each parameter of the Library Server configuration files, see *z/OS Program Directory*.

Copy Library Server notes files

Description: Users can make comments in book topics by creating notes that are appended to the end of each topic. If you do not copy these notes to the new system, they will be lost.

Element or feature:	Library Server.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you intend to preserve notes from release to release.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Copy all the files from your existing notes directory to the new one. The default directory for saving book notes is `/usr/lpp/booksrv/public/bookmgr/notes`. You can override this default by specifying a directory on the `NOTEDIR` parameter of the `bookmgr.80` configuration file.

Reference information: For a complete description of each parameter of the Library Server configuration files, see *z/OS Program Directory*.

Library Server actions to perform after the first IPL of z/OS V2R1

This topic describes Library Server migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

Reconfigure Library Server InfoCenters

Description: Starting with z/OS V2R1, the Library Server element requires the Location value (`ICPATH=`) value of InfoCenters to be configured differently than it was in the past. Thus, for any existing InfoCenter configurations migrated from the previous version, you must delete, reconfigure and re-process the reconfigured InfoCenters as described in **Steps to take**.

Element or feature:	Library Server
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	After the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you intend to preserve configured InfoCenters from the previous version
Target system hardware requirements:	None.

Migration actions from z/OS V1R12: Library Server

Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take:

1. Migrate your current customized booksrv.80 as described in **Description**.
2. Configure and start you HTTP server as required for Library Server as described in the *z/OS Program Directory*.
3. Using the Library Server Administrative Interface, delete any existing InfoCenter configuration entries.
4. Using the Library Server Administrative Interface, reconfigure (that is,"create new") each deleted InfoCenter, using for its *Location*field the fully qualified "root plugin" directory name, or jar file name, of the InfoCenter. (Note that the "root plugin" is a child of the InfoCenter parent directory and is typically distinguishable as the plugin that contains the "plugin_customization.ini" file for the InfoCenter.)
5. Using the Library Server Administrative Interface for managing InfoCenters, for each reconfigured InfoCenter, use "Prepare InfoCenter Plugins" to prepare its plugins for subsequent creation of the InfoCenter search index.
6. Using the Library Server Administrative Interface for managing InfoCenters, for each reconfigured InfoCenter, use "Receive InfoCenter Plugins" to copy/catalog all the prepared InfoCenter plugin objects (for example, TOC files and plugin card files) into the Library.
7. Using the Library Server Administrative Interface for managing InfoCenters, for each reconfigured InfoCenter, use "Create InfoCenter Search Index" to create the search index which enables searching across all the plugins for the InfoCenter.

Reference information: For a complete description of each parameter of the Library Server configuration files, see the *z/OS Program Directory*.

RMF migration actions

This topic describes migration actions for optional feature Resource Measurement Facility (RMF).

RMF actions to perform before installing z/OS V2R1

This topic describes RMF migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

None.

RMF actions to perform before the first IPL of z/OS V2R1

This topic describes RMF migration actions that you can perform after you have installed z/OS V1R13 but before the first time you IPL. These actions might require the z/OS V1R13 level of code to be installed but do not require it to be active.

Control the invocation of data reduction exit routines

Description: As of z/OS V2R1, if you are running unauthorized applications that invoke the RMF Monitor II Sysplex Data Gathering service (ERB2XDGS) or the RMF Monitor III Sysplex Data Retrieval service (ERB3XDRS), you must take certain actions to allow the applications to make use of data reduction exit routines

Element or feature:	RMF.
When change was introduced:	z/OS V2R1. This function is rolled back to z/OS V1R13, z/OS V1R12, and z/OS V1R11 with APAR OA38022 for RMF Monitor II service and APAR OA37965 for RMF Monitor III.
Applies to migration from:	z/OS V1R13 and z/OS V1R12, both without the PTFs for APARs OA38022 and OA37965 applied.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you have unauthorized applications that invoke ERB2XDGS (RMF Monitor II Sysplex Data Gathering service) or ERB3XDRS (RMF Monitor III Sysplex Data Retrieval service).
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.

Steps to take: To allow your applications to make use of data reduction exit routines specified with the ERB2XDGS or ERB3XDRS services, take the following actions:

- If the application has been designed to run authorized, you must adapt the application or program so that it runs in supervisor state, system state, or be APF authorized.
- You can approve the exit by adding RACF resource ERBSDS.MON2EXIT.<exit_name> or ERBSDS.MON3EXIT.<exit_name> to the RACLISTed class FACILITY and by granting read access to the profile for the user ID that invokes the Sysplex Data Server API.
- If you are running an unauthorized application that invokes RMF Monitor II Sysplex Data Gathering service ERB2XDGS/ERB2XD64 or Monitor III Sysplex Data Retrieval service ERB3XDRS/ERB3XD64, you must take one of the following actions to allow the application to make use of data reduction exits.
 1. If the application is properly designed and secure to run authorized, you must adapt the application or program so that it runs in supervisor state, system state, or APF authorized.

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2. You can approve the exit by adding RACF resource ERBSDS.MON2EXIT <exit_name> or ERBSDS.MON3EXIT<exit_name>.RACLISTed class FACILITY and by granting read access to the profile for the user id invoking the Sysplex Data Server API.

Reference information: For details about the RMF sysplex data services see *z/OS RMF Programmer's Guide*

Check your GPMSERVE and GPM4CIM options for TCP/IP address regular expressions

Description: Starting with z/OS V2R1, RMF GPMSERVE honors IPv6 address syntax when parsing the option settings from a parmlib member. The same applies to GPM4CIM parsing options from a configuration file.

Element or feature:	RMF
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you use GPMSERVE or GPM4CIM with IPv6 address regular expressions.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None

Steps to take: If you use GPMSERVE or GPM4CIM in an IPv6 or dual mode IPv6/IPv4 network environment, check one or more of your options parmlib members for options containing regular expressions representing IP addresses (for example, the options HTTP_ALLOW or HTTP_NOAUTH). Make sure that the regular expressions adhere strictly to the format of the IP addresses in your network. Examples include the following:

Table 13. Examples of IP matches

IP address expression	Match	Examples of full IP address match
'6.*'	Matches any IP address starting with '6.'	6.19.107.32' or '6.34.88.103'
::ffff:6.*'	Matches any (mapped) IP address starting with '::ffff:6.'	::ffff:6.19.107.32' or '::ffff:6.9.50.7'
6.'	Matches any IP address containing a substring '6.'	::ffff:6.9.50.7' or '6.19.107.32'

Reference information: For further information see *z/OS RMF User's Guide*.

Define the RACF definitions to enable the GPMSERVE Started Task for Authorization Code zero (AC=0)

Description: Starting with z/OS V2R1, the RMF GPMSERVE Started Task runs as a module linked with Authorization Code zero (AC=0).

Element or feature:	RMF
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

1. Define READ Access to the BPX.SERVER Facility for the GPMSERVE userid:

```
PERMIT BPX.SERVER CLASS(FACILITY) ID(GPMSERVE) ACCESS(READ)
```

2. Ensure that all programs loaded by GPMSERVE are defined to PROGRAM CONTROL:

```
RDEFINE PROGRAM GPM* ADDMEM('SYS1.SERBLINK'//NOPADCHK) UACC(READ)
RDEFINE PROGRAM ERB* ADDMEM('SYS1.SERBLINK'//NOPADCHK) UACC(READ)
RDEFINE PROGRAM CEEBINIT ADDMEM('CEE.SCEERUN'//NOPADCHK) UACC(READ)
RDEFINE PROGRAM IEEMB878 ADDMEM('SYS1.LINKLIB'//NOPADCHK) UACC(READ)
RDEFINE PROGRAM CELHV003 ADDMEM('SYS1.SCEERUN2'//NOPADCHK) UACC(READ)
RDEFINE PROGRAM C128 ADDMEM('SYS1.SCEERUN2'//NOPADCHK) UACC(READ)
RDEFINE PROGRAM CELHDCPP ADDMEM('SYS1.SCEERUN2'//NOPADCHK) UACC(READ)
SETROPTS WHEN(PROGRAM) REFRESH
```

This action is only needed when GPMSERVE is not already defined to PROGRAM CONTROL. In previous RMF Releases this was recommended but not required since the GPMSERVE module was linked with Authorization Code one (AC=1).

3. Define READ access to the BPX.STOR.SWAP FACILITY class for the GPMSERVE userid.

```
PERMIT BPX.STOR.SWAP CLASS(FACILITY) ID(GPMSERVE) ACCESS(READ)
```

Reference Information: For further information see *z/OS RMF User's Guide*

Check your automation for Monitor III messages ERB812I and ERB813I

Description: Starting with z/OS V1R13, RMF Monitor III messages ERB812I and ERB813I are issued as single line WTO messages. Before z/OS V1R13, for those messages, there could have been multiple WTOs if the message length was longer than 69 characters. If you use an automation product that processes these messages, check the algorithm, and, if required, adapt it to the new message output.

Migration actions from z/OS V1R12: RMF

Element or feature:	RMF.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you use automation products for RMF messages ERB812I and ERB813I.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: If you use an automation product that processes RMF Monitor III messages ERB812I and ERB813I, check the algorithm because the output format of these messages changes in z/OS V1R13 RMF.

Below are examples of the old output format and the new output format for these messages. Check the code of your automation product to determine if you need to adapt it to the new message output format.

Old output format: Here is the old format:

```
ERB812I III: MONITOR III DATA RECORDING INTO DATA SET 'RMF.MONITOR3.D
ERB812I III:   ATASET3.SYSE' STOPPED
ERB813I III: ACTIVE MONITOR III DATA SET IS NOW 'RMF.MONITOR3.DATASET
ERB813I III:   4.SYSE'
```

New output format: Here is the new format:

```
ERB812I III: MONITOR III DATA RECORDING INTO DATA SET 'RMF.MONITOR3.DATASET3.SYSE' STOPPED
ERB813I III: ACTIVE MONITOR III DATA SET IS NOW 'RMF.MONITOR3.DATASET4.SYSE'
```

Reference information: For further information see *z/OS RMF Messages and Codes*.

RMF actions to perform after the first IPL of z/OS V2R1

This topic describes RMF migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

Use an RMF Monitor III reporter version equal to or later than your RMF Monitor III gatherer version

Description: To avoid problems when reporting Monitor III data, use an RMF reporter version that is equal to or later than the latest RMF gatherer version used to collect the data to be reported. For example, it is safe to use an RMF reporter version from z/OS V1R13 for data collected with an RMF gatherer from z/OS V1R12, but not vice versa.

Mixed (and therefore problematic) levels of collected data can occur in the following scenarios:

Migration actions from z/OS V1R12: RMF

- *Single system:* You install and test a new release, then fall back to an earlier one; your data sets might contain data collected with different versions of the RMF gatherer.
- *Sysplex:* You migrate to a new release on one system in a sysplex but try to use an earlier reporter version from another system to report on the migrated system's data.

Element or feature:	RMF.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	After the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you had planned to use an earlier-level RMF reporter on data that was collected with a later-level RMF gatherer.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	See "Steps to take".
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Always use an RMF Monitor III reporter version that is equal to or later than the gatherer version used to collect the data from which you want to produce a report.

Note: Monitor III notifies users by issuing information message ERB948I when a reporter session is started on a system in a sysplex that is not running with the highest RMF level available in the sysplex. The message helps users to avoid reporting problems.

Reference information: For more information about Monitor III commands, see *z/OS RMF User's Guide*.

Monitor the zFS file system activity

Description: The Monitor III data gatherer options that control the data collection for measuring zFS file system activity are ZFS and NOZFS. Before z/OS V2R1, this data was gathered by default with the RMF Monitor III parmlib option ZFS as set in ERBRMF04. Starting with z/OS V2R1, the default is NOZFS, and RMF does not automatically gather any data about zFS file system activity.

Element or feature:	RMF.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	After the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you want to collect data about zFS file system activity.
Target system hardware requirements:	None.

Migration actions from z/OS V1R12: RMF

Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.

Steps to take: Determine if you want to monitor zFS file system activity. When starting a Monitor III session in this case, you can permanently specify the ZFS option in the parmlib member for your Monitor III data gatherer sessions. Or you can use the following RMF MODIFY command during a running session:

```
MODIFY RMF,MODIFY III,ZFS
```

Reference information: For details about zFS file system data gathering see For further information see *z/OS RMF User's Guide*.

Determine need of SMF data collection for Postprocessor PCIE Activity report based on SMF 74.9 record.

Description: Starting with z/OS V2R1, RMF provides a new Postprocessor PCIE Activity report based on SMF 74.9 record. If you do not need this report, you should turn off data collection for SMF record 74 subtype 9.

Element or feature:	RMF.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	After the first IPL of z/OS V2R1.
Is the migration action required?	No, but recommended if you do not want to collect SMF data for the Postprocessor PCIE Activity report.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Determine if you want to use the new Postprocessor PCIE Activity report. SMF data required for this report is gathered by default. If you do not want to use this report, you should suppress the SMF data collection for the new record type 74 subtype 9. You achieve this by specifying NOTYPE for this SMF record type in the SMF parmlib member SMFPRMxx.

Another method to suppress the data gathering of record 74.9 for the Postprocessor PCIE Activity report is to use the SUBSYS parameter in the SMFPRMxx parmlib member for the STC subsystem (started tasks, where RMF is one of them). To exclude data gathering for SMF record 74.9, specify **SUBSYS(STC,NOTYPE(74(9)), ...)**.

The SUBSYS specification overrides the SYS specification. So for example, if you have defined **SYS(TYPE(...,74,...))** in your SMFPRMxx parmlib member, you can use **SUBSYS(STC, NOTYPE(74(9)))** to make exceptions to your SYS specification and just exclude gathering of SMF record 74.9 for started tasks like RMF.

Reference information: For details about specifying SMF data collection, see *z/OS MVS Initialization and Tuning Reference*.

Determine need of SMF data collection for Postprocessor Serialization Delay report

Description: Starting with z/OS V1R13, RMF provides a new Postprocessor Serialization Delay report. If you do not need this report, you should turn off data collection for SMF record 72 subtype 5.

Element or feature:	RMF.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	After the first IPL of z/OS V2R1.
Is the migration action required?	No, but recommended if you do not want to collect SMF data for the Postprocessor Serialization Delay report.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Determine if you want to use the new Postprocessor Serialization Delay report. SMF data required for this report is gathered by default. If you do not want to use this report, you should suppress the SMF data collection for the new record type 72 subtype 5. You achieve this by specifying NOTYPE for this SMF record type in the SMF parmlib member SMFPRMxx.

Another method to suppress the data gathering of record 72.5 for the Serialization Delay report is to use the SUBSYS parameter in the SMFPRMxx parmlib member for the STC subsystem (started tasks, where RMF is one of them). To exclude data gathering for SMF record 72.5, specify **SUBSYS(STC,NOTYPE(72(5)), ...)**.

The SUBSYS specification overrides the SYS specification. So for example, if you have defined **SYS(TYPE(...,72,...))** in your SMFPRMxx parmlib member, you can use **SUBSYS(STC, NOTYPE(72(5)))** to make exceptions to your SYS specification and just exclude gathering of SMF record 74.9 for started tasks like RMF.

Reference information: For details about specifying SMF data collection, see *z/OS MVS Initialization and Tuning Reference*.

SDSF migration actions

This topic describes migration actions for optional feature SDSF.

SDSF actions to perform before installing z/OS V2R1

This topic describes SDSF migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

None.

SDSF actions to perform before the first IPL of z/OS V2R1

This topic describes SDSF migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

Review and reassemble user exit routines

Description: If you have written user exit routines, review them to ensure they are still appropriate for the current environment, and make changes as necessary. All user exit routines must be reassembled with the z/OS V2R1 level of the SDSF macro library.

Element or feature:	SDSF.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if user exit routines are in use.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Review user exit routines to ensure they are appropriate for z/OS V2R1. Make changes as necessary. Regardless of whether you have made changes, reassemble the user exit routines with the z/OS V2R1 level of the SDSF macro library.

Tip: A PROPLIST statement, along with PROPERTY statements, both in the ISFPRMxx parmlib member, defines customized values for certain SDSF properties. It provides an alternative to writing user exit routines to customize those properties. A user exit routine that customizes the same property as a PROPERTY statement overrides the value on the PROPERTY statement.

Reference information: See *z/OS SDSF Operation and Customization*.

Use dynamic statements for ISFPARMS to avoid reassembly

Description: ISFPARMS in SDSF is used for specifying global options, the format of panels, and security for SDSF functions. SDSF provides two alternatives for ISFPARMS:

Migration actions from z/OS V1R12: SDSF

- Assembler macros that you define, assemble, and then link into the SDSF load library. This is the original format for defining ISFPARMS and it continues to be supported for compatibility.
- Dynamic statements, which are in parmlib member ISFPRMxx. Dynamic statements are the recommended format. They are easier to code and are more dynamic than the assembler macros; they can be updated without reassembling or link-editing. The statements are processed by an SDSF server, which is controlled by MVS operator commands.

Element or feature:	SDSF.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	No, but recommended to avoid the migration action of reassembling your customized ISFPARMS for each z/OS release. (If you do not use dynamic statements for ISFPARMS, reassembly of your customized ISFPARMS is required on each release.)
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.

Migration actions from z/OS V1R12: SDSF

Related IBM Health Checker for z/OS check:

Use check SDSF_ISFPARMS_IN_USE to verify that SDSF dynamic statements in ISFPRMxx are being used rather than the assembler macros. If the check determines that the assembler macro ISFPARMS is in use instead, and that it has been modified, the check generates an exception. If the assembler macro ISFPARMS is in use but it has not been modified, so that all defaults are in effect, the check does not generate an exception.

SDSF registers this check with the IBM Health Checker for z/OS infrastructure when the SDSF server address space is initialized. However, one of the items this check verifies is that the SDSF server itself is in use, so you have to manually add this check (particularly if you do not use the SDSF server) so that the IBM Health Checker for z/OS infrastructure will invoke the check. To add the check, put the following statement in your PROGxx parmlib member: `EXIT ADD EXITNAME(HZSADDCK) MODNAME(ISFHCADC)`.

SDSF health checks are distributed in ISF.SISFLOAD for installations running SDSF in the LNKLST. The checks are also distributed in ISF.SISFLINK for installations that do not run SDSF in the LNKLST. For those installations, ISF.SISFLINK must be added to the LNKLST.

Note: To avoid a possible ABEND 290 with reason code 02014007 issued by HZSADDCK:

- Make sure that you specify the proper check routine name. The check routine module must be in an APF-authorized library. The system must be able to locate the check routine within the joblib, the steplib of the IBM Health Checker for z/OS address space, the LPA, or the LNKLST.
 - Make sure that you specify the proper message table name. The message table module must be in an APF-authorized library. The system must be able to locate the message table within the joblib, the steplib of the IBM Health Checker for z/OS address space, the LPA, or the LNKLST.
-

Steps to take: If you are already using dynamic statements for ISFPARMSxx, there is no migration action to perform.

If you are using assembler macros for ISFPARMS, do one of the following:

- Convert your existing ISFPARMS to dynamic statements by using a conversion utility that you invoke with the ISFACP command.

- Reassemble your customized ISFPARMS for use with z/OS V2R1. Reassembly must be done whenever you change your z/OS release. Before reassembling ISFPARMS, you might want to update it for new function. The assembler ISFPARMS cannot be shared with any other release of SDSF. Only use ISFPARMS for the release on which it is assembled.

Note: If you have an SMP/E usermod that specifies modifications to assembler macro ISFPARMS, change the usermod to indicate that module ISFPARMS is now owned by the z/OS V2R1 SDSF JES2 feature FMID (JJE779S) and not the base z/OS V2R1 SDSF FMID (HQX7790). The correct SMP/E syntax is ++VER(Z038) FMID(JJE779S), instead of ++VER(Z038) FMID(HQX7790).

Reference information: See the following information:

- For details about invoking the conversion utility with the ISFACP command, see *z/OS SDSF Operation and Customization*.
- For information about ISFPARMS and the ISFPRMxx parmlib member, see "ISFPARMS format alternatives" in *z/OS SDSF Operation and Customization*.

SDSF actions to perform after the first IPL of z/OS V2R1

This topic describes SDSF migration actions that you can perform only after you have IPLed z/OS V1R13. You need a running z/OS V1R13 system to perform these actions.

Control how SDSF handles extended consoles

Description: As of z/OS V2R1, the behavior for obtaining an extended console (used for issuing system commands) has changed. Before z/OS V2R1, when SDSF attempted to obtain an extended console and the default extended console name was already in use, SDSF shared that console. For example, if you used ISPF split screen and accessed SDSF in multiple logical screens, SDSF shared the console activated in the first logical screen with subsequent logical screens. As a result, the user log in the first logical screen contained system messages for all of the logical screens.

With V2R1, when SDSF attempts to activate an extended console and the default console name is in use, SDSF activates a new console with a different name. The new name is derived by appending a single-character suffix to the default name. SDSF tries up to 32 different characters to create a unique console name.

If you want SDSF to share the extended console, rather than obtaining a new console with a name derived by modifying the default console name, you can disable console name modification. You can also define which characters should be used for the suffix that modifies the default console name.

Element or feature:	SDSF.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	After the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you want SDSF to share the extended console, as in previous releases.
Target system hardware requirements:	None.
Target system software requirements:	None.

Migration actions from z/OS V1R12: SDSF

Other system (coexistence or fallback) requirements:	The new custom properties will be ignored in the down-level systems when the toleration APAR PM78102 is applied. Message ISF862I is issued for each non-supported property: KEYWORD <i>keyword</i> VALUE <i>value</i> IGNORED, NOT SUPPORTED IN THIS RELEASE.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: To disable console name modification, so that, as in previous releases, SDSF shares the extended console when the default name is already in use, you can use:

- The SET CONMOD (OFF) command
- The custom property Console.EMCS.NoConMod in ISFPARMS with VALUE(TRUE)
- In a REXX exec, the ISFCONMOD special variable
- In a Java program, ISFRequestSettings.

Note: When the SDSF Server is started with the PROPERTY NAME(Console.EMCS.NoConMod),VALUE(TRUE) statement in the ISFPRMxx parmlib member, the SET CONMOD ON command will fail with message OPTION LOCALLY DISABLED.

To specify which characters can be used as a suffix to modify the default extended console name, use custom property Console.EMCS.ConModChars in ISFPRMxx parmlib member. By default, the characters are \$#@12345.

Reference information: For details about setting custom properties in ISFPARMS, see the discussion of the PROPLIST nad PROPERTY statements in *z/OS SDSF Operation and Customization*.

Update configuration for sysplex support

Description: When SDSF originally introduced support for sysplex-wide device and resource panels in a JES2 environment, that support required WebSphere® MQ, SDSF servers and a server group defined in ISFPARMS. In recent releases, SDSF enhancements have reduced the requirement for WebSphere MQ and the server group. Beginning with z/OS V1R13, SDSF completely eliminates the need for WebSphere MQ and the server group when all systems are at the z/OS V1R13 level or higher.

The following panels are made sysplex-wide by default: LI (lines), NO (nodes), PUN (punches), RDR (readers) and SO (spool offloaders).

The following panels now use cross system coupling facility (XCF) support to provide sysplex-wide data: CK (checks), ENC (enclaves), PS (processes) and RM (JES2 resources). Using XCF for the sysplex-wide data is preferable because XCF is always present and no configuration is required.

Migration actions from z/OS V1R12: SDSF

If you have configured SDSF's sysplex support in previous releases, you may now have obsolete WebSphere MQ configuration and server group definitions in ISFPARMS.

For the CK, ENC, PS and RM panels, you may need to perform some configuration to ensure that all of the systems are included in sysplex-wide panels.

Element or feature:	SDSF.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	After the first IPL of z/OS V2R1.
Is the migration action required?	Yes.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: If all of the systems in the sysplex are at the z/OS V1R13 level:

- Consider removing obsolete definitions:
 - Server group statements (SERVERGROUP, SERVER and COMM) in ISFPARMS.
 - WebSphere MQ configuration and related SAF profiles, including queues that you defined for SDSF and SAF profiles that protect the queues used by SDSF.
- Ensure that the names of the SDSF servers are the same on all systems. By default, SDSF uses the SDSF server name for the XCF application server name to obtain sysplex-wide data for the CK, ENC, PS and RM panels. If the names of the servers are not the same on all systems, you must specify the suffix of an XCF server name with the CONNECT statement in ISFPARMS.

If the sysplex includes systems at the z/OS V1R13 or z/OS V2R1 level, and others at an earlier level, and you want to include the earlier level systems on the CK, ENC, PS or RM panels, you must set the communications mode to Z12. This causes SDSF to obtain sysplex-wide data as in previous releases, using WebSphere MQ and the server group. To set the communications mode:

- Users can issue this command: SET CMODE Z12.
- System programmers can use this custom property in ISFPARMS: Comm.Release.Mode. You set a custom property with the PROPLIST and PROPERTY statements in ISFPRMxx parmlib member.

Reference information: See the following information:

- For more information about the **SET CMODE** command, refer to the online help. For more information about ISFPRMxx, WebSphere MQ configuration and security and the requirements for sysplex-wide panels when the sysplex has mixed levels of z/OS and JES2, refer to *z/OS SDSF Operation and Customization*.
- For information about ISFPARMS and the ISFPRMxx parmlib member, see "ISFPARMS format alternatives" in *z/OS SDSF Operation and Customization*.

Migration actions from z/OS V1R12: SDSF

Review colors on the OPERLOG panel

Description: Starting with z/OS V1R13, messages are displayed on the OPERLOG panel with the color that was assigned to them when they were issued. Users can customize colors or disable the use of color with the SET SCREEN command.

Element or feature:	SDSF.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	After the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you want to disable color on the OPERLOG panel.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: To disable color on the OPERLOG panel, use the SET SCREEN command.

Reference information: For more information on the SET SCREEN command, refer to the online help.

Set the format of device names on the Punch and Reader panels

Description: Starting with z/OS V1R13, SDSF shows device names on the Punch (PUN) and Reader (RDR) panels in a longer format, with dots between subtypes. This could affect batch programs or REXX execs that process the device names. The system programmer can use a custom property to retain the shorter format that was used in previous releases.

Element or feature:	SDSF.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	After the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you want device names on the PUN and RDR panels to be displayed in the shorter format, as in previous releases.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: In ISFPRMxx, set custom property Panel.PUN.DevNameAlwaysShort and Panel.RDR.DevNameAlwaysShort to TRUE, to use the short form of devices names on the PUN and RDR panels.

Reference information: For details about setting the custom property in ISFPRMxx, see the discussion of the PROPLIST and PROPERTY statements, in *z/OS SDSF Operation and Customization*.

Security Server migration actions

This topic describes migration actions for optional feature Security Server.

Security Server actions to perform before installing z/OS V2R1

This topic describes Security Server migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

Normalize user names specified as X.500 distinguished names in distributed identity filters

Description: RACF provides distributed identity filters in support of z/OS identity propagation. Before z/OS V1R13, RACF removed leading and trailing blank characters before storing the user name value of a distributed identity filter when you specified the user name as an X.500 distinguished name (DN). Starting in z/OS V1R13, RACF normalizes the user name before storing it in the RACF database. The normalization process includes removing leading and trailing blank and null characters from each relative distinguished name (RDN) of the DN.

Element or feature:	Security Server.
When change was introduced:	z/OS V1R13, and rolled back to z/OS V1R12 by APAR OA34259.
Applies to migration from:	z/OS V1R12 without APAR OA34259 applied..
Timing:	<ul style="list-style-type: none"> • Before installing V2R1 for determining if your installation has already defined any distributed identity filters. Go to “Security Server actions to perform before installing z/OS V2R1” in this migration action. • Before the first IPL of z/OS V1R13 for customizing and executing the sample REXX exec IRR34258. Go to “Security Server actions to perform before the first IPL of z/OS V2R1” on page 430 in this migration action. • After the first IPL of z/OS V1R13 for redefining a filter for an X.500 user identity. Go to “Security Server actions to perform after the first IPL of z/OS V2R1” on page 432 in this migration action.
Is the migration action required?	Yes, if your installation specified an X.500 DN as the user name of a distributed identity filter on a z/OS V2R1 system without the normalization function provided with APARs OA34259 and OA34258.
Target system hardware requirements:	None.

Migration actions from z/OS V1R12: Security Server

Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	If your installation specified an X.500 DN as the user name of a distributed identity filter on a z/OS V1R12 system without the normalization function provided with APAR OA34259, the filter might not function properly in z/OS V2R1.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Reference information: See the following information:

- Documentation in the PTFs for APAR OA34259.
- For information about how to use a distributed identity filter to map distributed identities to a RACF user ID, see "Distributed identity filters" in *z/OS Security Server RACF Security Administrator's Guide*.
- For details about the normalization rules, see the USERDIDFILTER operand of the RACMAP command in *z/OS Security Server RACF Command Language Reference*.

Security Server actions to perform before the first IPL of z/OS V2R1

This topic describes Security Server migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

Check for duplicate class names

Description: When new classes are shipped with RACF, you should verify that any installation-defined class names that have been added to the class descriptor table (CDT) do not conflict with the new classes. For a list of new classes shipped with RACF, see *z/OS Summary of Message and Interface Changes*.

Element or feature:	Security Server.
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if you have user-defined classes.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Verify that any installation-defined class names that have been added to the class descriptor table (CDT) do not conflict with the new classes.

- If you have duplicate class names, RACF issues the following message and enters failsoft mode:

```
ICH564A RACF DETECTED AN ERROR IN THE INSTALLATION CLASS DESCRIPTOR TABLE,
ENTRY class_name, ERROR CODE 7
```

- If a conflict in class names occurs, resolve it as follows:
 1. Delete the profiles in the installation-defined class with the conflicting name.
 2. Delete the CDT entry for the class.
 3. Add a CDT entry with a different name.
 4. Redefine the profiles.

Reference information: See *z/OS Security Server RACF System Programmer's Guide*.

Determine whether you define CHOWN.UNRESTRICTED in the UNIXPRIV class.

Description:

As of z/OS V2R1 z/OS UNIX imposes a new restriction on certain sensitive types of executable files, namely, that the files be owned by UID(0). Generally, this is acceptable because the ability to change a file's owner is restricted to privileged users (those with UID 0 or with READ access to SUPERUSER.FILESYS.CHOWN in the UNIXPRIV class). However, the POSIX standard allows a user to change ownership of any file to another user or group.

RACF supports the POSIX standard with the CHOWN.UNRESTRICTED profile in the UNIXPRIV class. If the profile exists, the alternate POSIX implementation applies, and any user can transfer ownership of files to other users or groups.

This change requires at least UPDATE access to CHOWN.UNRESTRICTED in order to give a file that you own to UID(0). To give your file to a user with a UID other than 0, or to a group to which you are not connected, requires READ access.

Currently, CHOWN.UNRESTRICTED most likely has a universal access (UACC) of NONE. Some documented examples of creating this profile specify UACC(NONE) explicitly. Others do not, but the default UACC is NONE.

Although highly unusual, a client might have defined the profile with any UACC and might permit any number of users and groups with any access level. Thus, the most likely result of this change is a complete reversal of the recommended behavior of the profile, in that nobody will have the authority to change the owner of their files. On an individual basis, clients can permit specific users or groups to this profile in order to grant the original capability. Alternatively, they can simply change its UACC to READ, but IBM does NOT recommend this action

Element or feature:	Security Server.
When change was introduced:	z/OS V1R13 and z/OS V1R12, both with APAR OA41364.
Applies to migration from:	z/OS V1R13 and z/OS V1R12, both without APAR OA41364. applied.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	No, but recommended for system security.
Target system hardware requirements:	None.
Target system software requirements:	None.

Migration actions from z/OS V1R12: Security Server

Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

- Check that the profile for CHOWN.UNRESTRICTED in the UNIXPRIV class is defined as discrete by using the following command:

```
RLIST UNIXPRIV CHOWN.UNRESTRICTED ALL
```

- If this profile does not exist, there is nothing more that you need to do.
- If the profile does exist, the recommendation is to delete it by issuing the following command:

```
RDELETE UNIXRIV CHOWN.UNRESTRICTED SETROPTS RACLIST(UNIXPRIV) REFRESH
```

If you have users with a genuine need to change file owners, they can request that a privileged user do this for them. If you trust a user enough to preserve their ability to perform this action, you can permit such a user, or group of users to CHOWN.UNRESTRICTED in order to restore the ability they previously had. Before doing so, verify that the profile does not currently allow any inadvertent access by making sure the UACC value is NONE, and that there are no entries on the access list. To do that issue the following commands:

```
PERMIT CHOWN.UNRESTRICTED CLASS(UNIXPRIV) RESET  
RALTER UNIXRIV CHOWN.UNRESTRICTED UACC(NONE)  
SETROPTS RACLIST(UNIXPRIV) REFRESH
```

You can now permit users and groups as appropriate for your installation. Note that CHOWN.UNRESTRICTED must currently exist as a discrete profile. With the change from a switch profile to an authorization profile, the requirement for it to be discrete will continue to be enforced, so that inadvertent access is not granted through an existing generic profile.

Reference information: See the following information:

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

Security Server actions to perform after the first IPL of z/OS V2R1

This topic describes Security Server migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

Update database templates

Description: To ensure that the RACF utilities function properly, use the IRRMIN00 utility to update the test and production RACF databases with the database templates for the current release level.

Element or feature:	Security Server.
---------------------	------------------

Migration actions from z/OS V1R12: Security Server

When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	After the first IPL of z/OS V2R1.
Is the migration action required?	Yes.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: To install the database template updates, run the IRRMIN00 utility with PARM=UPDATE.

Note: If IRRMIN00 produces a return code of 4 and message IRR8025 PARM=UPDATE specified, but template update not required, you do not necessarily have a problem. Check that your JCL points to the new level of IRRMIN00. If it does, ignore the return code and warning message. A PTF might have already brought your templates up to the current level for the new release. If your JCL accidentally points to an old copy of IRRMIN00, correct the JCL and run IRRMIN00 again.

Reference information: See the following information:

- *z/OS Program Directory*
- *ServerPac: Installing Your Order*
- *z/OS Security Server RACF System Programmer's Guide*

Normalize user names specified as X.500 distinguished names in distributed identity filters

Go to "Normalize user names specified as X.500 distinguished names in distributed identity filters" on page 429.

TSO/E migration actions

This topic describes migration actions for the base element Time Sharing Option/Extensions (TSO/E).

TSO/E actions to perform before installing z/OS V2R1

This topic describes TSO/E migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

Consider what can happen when you read from a DD concatenation containing an empty data set with EXECIO under REXX for TSO/E

Description: When EXECIO is used to read a DD consisting of a concatenation of 2 or more data sets, that concatenation might contain empty sequential data sets (as of V2R1) as long as any empty data sets are SMS managed.

Migration actions from z/OS V1R12: TSO/E

- Before V2R1, REXX EXECIO would fail with RC=4 if EXECIO was used with DISKR or DISKRU to read a DD consisting of a concatenation of 2 or more data sets where one of the data sets was an empty (i.e. null) sequential data set.
- Starting with V2R1, REXX EXECIO can successfully read (using DISKR or DISKRU) a DD even if one or more of the data sets within that DD concatenation is an empty data set, as long as all empty data set within the concatenation are SMS managed empty data sets. If the DD concatenation contains a non-SMS managed empty data set, EXECIO will still fail the read request with RC=4 and messages IRX0670E and IRX0566E.

Element or feature:	TSO/E
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you depend upon the behavior that occurred before z/OS V2R1.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: This item is intended to alert users of EXECIO to a behavioral change that may occur due to a relaxing the restriction on null data sets within a concatenation being read by EXECIO DISKR or DISKRU. If your exec tests the EXECIO return code and handles RC=4, you will likely have no action that needs to be taken. The RC=4 that was previously returned when EXECIO detected a null data set within the DD concatenation being read by EXECIO is still a possible return code, if the concatenation contains a null data set which is not SMS managed. Yet, if the EXECIO read against a DD containing a null data set completes successfully (i.e. RC=0 or 2), you would typically have no exceptional action to take, since the read operation will have worked as if the empty data set were not even present.

On the other hand, if you have an exec that expects EXECIO to fail whenever it reads a concatenation containing a null data set, and you exec depends on this EXECIO read failure, you should now look for RC=0 or RC=2 to allow for the possibility of success.

For example, if you use EXECIO RC=4 and the associated message IRX0566E to determine whether a DD concatenation contains a null data set, this will no longer work if the null data set is an SMS managed sequential data set. The read would work (RC=0). You could still determine if a data set is empty by allocating that data set alone to a DD and reading it with EXECIO. RC=2 (or RC=0, if execio * were used) and zero records read would indicate that the data set was empty.

Note: Note that EXECIO against a single null data set that is not part of a multi data set concatenation has always worked successfully, regardless of whether or not the empty data set is SMS managed.

Reference information: For details about EXECIO see, *z/OS TSO/E REXX Reference*. For details about messages IRX0670E and IRX0566E, see *z/OS TSO/E Messages*.

TSO/E actions to perform before the first IPL of z/OS V2R1

This topic describes TSO/E migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

None.

TSO/E actions to perform after the first IPL of z/OS V2R1

This topic describes TSO/E migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

None.

XL C/C++ migration actions

This topic describes migration actions for optional feature C/C++ without Debug Tool with XL C/C++.

XL C/C++ actions to perform before installing z/OS V2R1

This topic describes XL C/C++ migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

Review the XL C/C++ Migration Guide for the Application Programmer

Description: Be sure to review the publication *z/OS XL C/C++ Compiler and Runtime Migration Guide for the Application Programmer* for any z/OS C/C++ migration actions. It is written for application programmers, whereas this publication (*z/OS Migration*) is written for system programmers. In some customer locations, job scope can overlap such that system programmers might find information in the XL C/C++ publication that is relevant to their responsibilities. For example, migration information related to the c89 utility in the XL C/C++ publication could be of interest.

Element or feature:	XL C/C++
When change was introduced:	General migration action not tied to a specific release.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing V2R1.
Is the migration action required?	No, but recommended if you use XL C/C++.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.

Migration actions from z/OS V1R12: XL C/C++

Related IBM Health Checker for z/OS check:	None.
--	-------

Steps to take: Look through *z/OS XL C/C++ Compiler and Runtime Migration Guide for the Application Programmer* for migration information that is relevant to your installation.

Reference information: *z/OS XL C/C++ Compiler and Runtime Migration Guide for the Application Programmer*

XL C/C++ actions to perform before the first IPL of z/OS V2R1

This topic describes XL C/C++ migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

None.

XL C/C++ actions to perform after the first IPL of z/OS V2R1

This topic describes XL C/C++ migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

None.

z/OS Font Collection migration actions

This topic describes migration actions for the base z/OS Font Collection. z/OS Font Collection is a new z/OS base element for z/OS V2R1.

z/OS Font Collection actions to perform before installing z/OS V2R1

This topic describes z/OS Font Collection actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

None.

z/OS Font Collection actions to perform before the first IPL of z/OS V2R1

This topic describes z/OS Font Collection migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

Stop using old fonts and start using the fonts from the z/OS Font Collection

Description: z/OS V2R1 contains a new base element: z/OS Font Collection. The z/OS Font Collection provides fonts that were previously marketed and serviced for z/OS, including both single-byte and double-byte fonts.

Migration actions from z/OS V1R12: z/OS Font Collection

The z/OS Font Collection includes:

- AFP Font Collection for S/390 (5648-B33), includes Japanese, Korean, Traditional Chinese, and Simplified Chinese
- IBM Infoprint Fonts for z/OS (5648-E76), includes Japanese, Korean, Traditional Chinese, and Simplified Chinese
- Compatibility fonts, which are also a feature of Print Services Facility (PSF) for z/OS (5655-M32)
- WorldType fonts from IBM Infoprint Fonts for Multiplatforms, Version 1 Release 1 (5648-E77).
- Selected object fonts (not source), Pi and Special (5771-ABC), Math and Science (5771-ADT), Data1 Fonts (5771-ADA), APL R1.2 Bounded Box (5771-ADB), Son Serif Headline (5771-ADW), Senoran Serif (5771-ABA), Son San Serif (5771-ABB), Son San Serif Headline (5771-ADX), Son San Serif Cond (5771-AFL), Son Serif Expanded R1 (5771-AFN)

Element or feature:	z/OS Font Collection
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1
Is the migration action required?	Yes, if you use standalone program products for fonts with your z/OS system.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: The z/OS Font Collection, for migration and compatibility with previously available font program products, will continue to use existing font libraries, and will have some new libraries. IBM recommends you use the latest level of the fonts available for z/OS, and therefore, those that are found in the z/OS Font Collection. For that reason, do not continue to use the standalone font program product data sets with z/OS releases after z/OS V1R13. No application or program changes are anticipated.

Do not expect to order separately available font program products with z/OS V2R1, or to install them into the z/OS V2R1 SMP/E zones. The z/OS Font Collection provides SMP/E statements to supercede, delete, or version the earlier standalone program product levels of the fonts.

Reference information: For details about the z/OS Font Collection, see *z/OS Font Collection*. For installation planning information, see *z/OS Planning for Installation*.

z/OS Font Collection actions to perform after the first IPL of z/OS V2R1

This topic describes z/OS Font Collection migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

None.

z/OS UNIX migration actions

This topic describes migration actions for base element z/OS UNIX System Services (z/OS UNIX).

z/OS UNIX actions to perform before installing z/OS V2R1

This topic describes z/OS UNIX migration actions that you can perform on your current (old) system. You do not need the z/OS V2R1 level of code to make these changes, and the changes do not require the z/OS V2R1 level of code to run once they are made.

Remove ICLI component from z/OS

Description: IBM has removed the Integrated Call Level Interface (ICLI) in z/OS V2R1. ICLI is used by those who have requested and obtained the ICLI API documentation and the C language header file. IBM believes that users of this interface have changed from using ICLI to standard IBM DB2 Connect for database connectivity and do not need it for z/OS V2R1. ICLI has not been enhanced since z/OS V1R6.

Element or feature:	z/OS UNIX.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you use ICLI.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: The PTF UA67900 for APAR OA41143 provides the ability to track the usage of ICLI on your systems. On pre-z/OS V2R1 systems, the operator command `DISPLAY OPDATA,TRACKING` shows the following tracking information for the ICLI servers 3.1I, 4.0B, 4.5B and 4.6D when these servers have been started on your system after you have activated the tracking facility through the `SETCON TRACKING=ON` command:

```
ICLI server for SAP 3.1I .... FOME31IS ...
ICLI server for SAP 4.0B .... FOME40BS ...
ICLI server for SAP 4.5B .... FOME45BS ...
ICLI server for SAP 4.6D .... FOME46DS ...
```

You can display the tracking information to determine if your system is using an ICLI server, and whether you will be affected by its planned removal in z/OS V2R1.

Reference information: *z/OS Planning for Installation.*

Ensure that your applications do not use removed z/OS UNIX APIs

Description: Before z/OS V2R1, certain z/OS UNIX application programming interfaces (APIs) were available. Starting in z/OS V2R1, they are no longer available.

Element or feature:	z/OS UNIX.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if your installation has C/C++ or Assembler language applications that explicitly invoke z/OS UNIX application programming interfaces.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	This change does not affect the z/OS system itself but might cause applications or products other than z/OS to give erroneous results or behave unexpectedly.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Check three interfaces to see if the removed services are being used.

1. Scan the source code for use of the following z/OS UNIX application programming interfaces:
 - The `_osenv()` syscall
 - For Assembler language programs, search for BPX1OSE and BPX4OSE.
 - For C or C++ code, search for calls to the `_osenv()` service.
 - The `pthread_quiesce_and_get_np()` syscall
 - For Assembler language programs, search for BPX1PQG and BPX4PQG.
 - For C or C++ code, search for calls to the `pthread_quiesce_and_get_np()` service.
 - The `QUICK_FREEZE_EXIT_REG` option of `oe_env_np()`
 - For Assembler language programs, search for BPX1ENV and BPX4ENV.
 - There is no C/C++ interface that allows direct use of the `QUICK_FREEZE_EXIT_REG` option. If you find use of the BPX1ENV or BPX4ENV service, check whether the `QUICK_FREEZE_EXIT_REG` option is specified. If you do use this option, verify that you have code that invokes the `pthread_quiesce_and_get_np()` service (in XL C/C++) or calls BPX1PQG or BPX4PQG. If you do not have code that calls the

Migration actions from z/OS V1R12: z/OS UNIX

pthread_quiesce_and_get_np() service, then you do not need to invoke the BPX1ENV or BPX4ENV service with the QUICK_FREEZE_EXIT_REG option. Remove that call from your application.

2. If your applications use any of these interfaces, update the applications to either eliminate the calls or handle the new return code and reason code that the removed interfaces will return.

Reference information: See the following information:

- *z/OS UNIX System Services Programming: Assembler Callable Services Reference*
- *z/OS XL C/C++ Runtime Library Reference*

Use the BPX.UNIQUE.USER profile instead of BPX.DEFAULT.USER

Description: Before z/OS V1R11, if the BPX.DEFAULT.USER profile in the FACILITY class was defined, users who accessed z/OS UNIX services who did not have an OMVS user or group segment were assigned the default OMVS segments for the length of the user session. All users of the default OMVS segments shared the same UID and GID. As of z/OS V1R11, if BPX.UNIQUE.USER has been defined, users who access z/OS UNIX services who do not have an OMVS user or group segment are automatically assigned an OMVS segment with a unique UID and GID. The new OMVS segments are added to the user and group profiles in the RACF database. As of z/OS V2R1 BPX.DEFAULT.USER has been removed.

Element or feature:	z/OS UNIX.
When change was introduced:	z/OS V2R1. See IBM United States Software Announcement 211-007, dated February 15, 2011.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you use BPX.DEFAULT.USER profile in the FACILITY class.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	You need AIM Stage 3 to use the BPX.UNIQUE.USER profile. You can run the IRRIRA00 utility to determine the current AIM Stage in your RACF database and increase the level to AIM Stage 3.
System impacts:	None.
Related IBM Health Checker for z/OS check:	Use check ZOSMIGV2R1_DEFAULT_UNIX_ID introduced in APAR OA37164. This check determines if you are relying on assigning default z/OS UNIX identities for users without OMVS segments.

Steps to take: Follow the steps in *z/OS UNIX System Services Planning* to set up the BPX.UNIQUE.USER profile. If BPX.DEFAULT.USER has not been deleted, BPX.UNIQUE.USER takes precedence when default OMVS segments are used.

To remove the BPX.DEFAULT.USER profile, use the following RACF commands:

```
RDELETE FACILITY BPX.DEFAULT.USER
SETROPTS RACLIST(FACILITY) REFRESH
```

RACF APAR OA42554 provides assistance with the conversion to BPX.UNIQUE.USER on z/OS V1R13 and z/OS V1R12. With this APAR you can model the user's home directory path by specifying &racuid in the model user's OMVS segment. Then, when the user's OMVS segment is automatically created, RACF will substitute the correct user ID. For more information on this capability, see the information in APAR OA42554.

Reference information:

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

Accommodate the new Shell and Utilities version of the zlsf utility

Description: Before z/OS V2R1, the **zlsf** utility was obtained from the Tools and Toys section of the z/OS UNIX website. Starting in z/OS V2R1, Shell and Utilities support of the **zlsf** utility has been added. The supported version differs from the Tools and Toys version in a number of ways. For example, the new **zlsf** version includes support for displaying file lock holders and waiters when the byte range lock manager is used.:

Element or feature:	z/OS UNIX.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you currently use the Tools and Toys version of the zlsf utility.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Look for current use of the Tools and Toys version of **zlsf**. If there is no current use of the Tools and Toys version of **zlsf**, then no actions or changes are required.

If there is current usage of the Tools and Toys version of **zlsf**, determine if the command is in `/bin`, or in another directory. Also, determine if you want to preserve the Tools and Toys version in addition to the officially shipped version. Note that **zlsf** can also reside in data sets where rexx execs can be run.

1. If you want to preserve the Tools and Toys version, ensure that you save it into a directory that z/OS V2R1 will not install into. z/OS V2R1 provides **zlsf** in the `/bin` directory.

Migration actions from z/OS V1R12: z/OS UNIX

2. If you do not want to preserve the Tools and Toys version and it is in /bin, then the installation of z/OS V2R1 automatically replaces the Tools and Toys version with the new officially supported version. If the Tools and Toys version is not in /bin, remove it from its current location.

Reference information: For details about the **z1sof** command, see *z/OS UNIX System Services Command Reference*

Migrate from HFS file systems to zFS file systems

Description: Before z/OS V1R7, the HFS file system was the primary hierarchical file system. As of z/OS V1R7, you can use any combination of HFS and zFS file systems. Because zFS has higher performance characteristics than HFS and is the strategic file system, you should migrate your HFS file systems to zFS.

The HFS and zFS file system types in mount statements and command operands are now generic file system types that can mean either HFS or zFS. Based on the data set type, the system will determine which is appropriate. But note that you must still specify a type (HFS or zFS and it cannot be defaulted), and if the type you specify is not correct for the file system being mounted, any associated parameter string setting in the mount statement or command is ignored, even though the system sets the type correctly and processes the mount.

Element or feature:	z/OS UNIX.
When change was introduced:	z/OS Distributed File Service became the strategic file system in z/OS V1R7.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	No, but recommended because the action is planned to become a requirement in a future release. zFS is the strategic file system for z/OS UNIX and continues to be enhanced to provide superior performance, reliability, and data integrity. z/OS V2R1 will support HFS file systems.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	<ul style="list-style-type: none">• Understand the zFS recommendations and limits. For more information, see "Minimum and maximum file sizes" in <i>z/OS Distributed File Service zFS Administration</i>• The DDNAME() keyword of the BPXPRMxx ROOT and MOUNT statements is not supported by zFS. Use the FILESYSTEM(<i>name</i>) keyword instead.
System impacts:	None.
Related IBM Health Checker for z/OS check:	Use check USS_HFS_DETECTED to verify all file systems mounted. This check issues exception message BPXH068E if any HFS file systems are found.

Steps to take: Follow these steps:

1. Before beginning the migration, do the following:

- Establish backout procedures.
- Decide on naming conventions.
- Decide on unavailability.
- Understand any cloning or deployment changes required by zFS systems being linear data sets. Considerations would include any copy utility invocations, BPXPRMxx specifications for symbolics, and placement of zFS file systems on system volumes.

2. Perform the conversion from an HFS to zFS file system.

Tip: Use the BPXWH2Z tool to perform the conversion. It is an ISPF-based tool that migrates HFS file systems to zFS file systems. Using its panel interface, you can alter the space allocation, placement, SMS classes, and data set names. A HELP panel is provided. With this tool, you can:

- Migrate HFS file systems (both mounted and unmounted) to zFS file systems. If the HFS being migrated is mounted, the tool automatically unmounts it and then mounts the new zFS file system on its current mount point.
- Define zFS aggregates by default to be approximately the same size as the HFS. The new allocation size can also be increased or decreased. In z/OS V1R13, ZFS could require up to four times (4X) the space that HFS did; therefore, for z/OS V2R1 be sure to allocate more space. See zFS: Accommodate new DASD space requirements.
- Have the migration run in TSO/E foreground or UNIX background.

You can use the JCL sample ISPBATCH in SYS1.SAMPLIB to invoke BPXWH2Z as an ISPF batch job. Before you run the job, read the **Notes** section. When you run BPXWH2Z on your z/OS system, make sure it uses that same z/OS level of the pax command. You can manually migrate from an HFS to zFS file system without using the tool. However, you would need to allocate and format the target zFS file systems.

You can use the JCL sample ISPBATCH in SYS1.SAMPLIB to invoke BPXWH2Z as an ISPF batch job. Before you run the job, read the notes section. When you run BPXWH2Z on your z/OS V1R13 system, it uses the z/OS V1R13 level of the pax command. This level was enhanced in z/OS V1R7 for sparse file support and other characteristics that are of concern when migrating from an HFS to zFS file system. You can manually migrate from an HFS to zFS file system without using the tool. However, you would need to allocate and format the target zFS file systems.

Requirement: The BPXWH2Z tool requires the zFS address space to be operational. Therefore, before attempting to migrate existing HFS to zFS file systems using BPXWH2Z, make sure that the zFS address space has been successfully configured and initialized.

Tip: You can dynamically migrate the HFS sysplex root in a shared file system configuration to zFS while the root is in use, without disrupting workloads. Although the shared file system configuration is required, the sysplex can be a single system. For the steps involved in migrating the sysplex root file system from HFS to zFS, see **Migrating the sysplex root file system from HFS to zFS after IPLing z/OS V1R12**.

3. Change policies and scripts, and so forth, to reflect the change from the HFS file system to zFS file system. Use the RMF Monitor III option to report on zFS activity. Refer to migration action "Monitor the zFS file system activity" for information on gathering zFS activity in RMF Monitor III.

Migration actions from z/OS V1R12: z/OS UNIX

Tip: Use the RMF Monitor III option to report on zFS activity.

Note: Beginning in z/OS V2R1, the default of RMF Monitor III option was changed to NOZFS. So, you need to explicitly specify ZFS option.

4. The DDNAME(name) keyword of the BPXPRMxx ROOT and MOUNT statements is not supported by zFS. If you use them, change these statements to use the FILESYSTEM(name) keyword instead.

Migrating the sysplex root file system from HFS to zFS after IPLing z/OS V1R12:

Before you begin the migration:

- Ensure that the following requirements have been met:
 - All systems in the sysplex are at the V1R12 level.
 - The current sysplex root file system PFS, and the new sysplex root file system PFS, are up in all the systems in shared file system configuration.
- Be aware of the following restrictions:
 - The current sysplex root file system must be mounted as a read-only file system.
 - The systems that do not meet the requirements for this migration action cannot join the sysplex during the sysplex root file system migration processing, but they can join the sysplex after the sysplex root migration has completed.
 - The current sysplex root and the new sysplex root must be either HFS or zFS in any combination. If the new sysplex root is zFS, then it must be HFS-compatible.
 - The sysplex root or any directories on it cannot have been exported by the DFS or SMB server.
- Note the following:
 - Remote NFS mounts of the sysplex root or any directories on it are considered active use of the current sysplex root file system.
 - During the migration, the new zFS sysplex root file system must not be HSM-migrated, mounted, or in use.
 - Mount parameters are preserved during the migration or replacement of the sysplex root file system of the same file system type (PFS). They are dropped if the file system type is different.
 - Directories, data, files, and links are not copied from one file system to another.

Perform the migration as follows:

1. Ensure that a file system has been mounted read-only as the current sysplex root file system. When the root is mounted read-only, there are no function-shipping clients as long as physical paths to the DASD are available to each system. To verify that there are no function-shipping clients, issue:

```
D OMVS,F,NAME=root_file_system_name
```

You should see CLIENT=N on each system.
2. Allocate and set up the new zFS sysplex root file system:
 - a. Create a new zFS file system to be used as the new sysplex root file system. *z/OS Distributed File Service zFS Administration* discusses creating and managing zFS file systems.

Rules:

- The UID, GID and the permission bits of the root directory in the new sysplex root file system must be same as the root directory in the current sysplex root file system.
 - If the SECLABEL class is active and the MLFSOBJ option is active, the security label for the new zFS file system must match the assumed security label of the current sysplex root file system.
- b. On the new sysplex root file system, set up the active mount points and the symbolic links. The mount points and symbolic links must be the same as the ones on the current sysplex root file system. You can set them up either (1) manually or (2) by using the **pax** shell command to populate the new sysplex root file system using the existing sysplex root as a source. To do it manually, create a mount point in the existing sysplex root (for example, /newroot) and mount the new sysplex root file system in the MODE(RDWR) on that mount point. After mounting the new sysplex root file system, manually issue MKDIRs and ln -s to create the mount point directories and symbolic links similar to the existing sysplex root file system. Note that the new sysplex root file system must contain all active mount points and symbolic links exactly as on the existing sysplex root file system.
 - c. Use the **pax** shell command to populate the new file system, using the existing sysplex root as a source.

Example:

```
cd /
pax -wr -pe -XCM ./ /newroot
```

For more information about using **pax** to copy data from an HFS file system to a zFS file system, see *z/OS Distributed File Service zFS Administration*.

- d. Unmount the new zFS file system.
3. On any system in the shared file system configuration, issue:

```
F OMVS,NEWROOT=new.root.file.system.name,COND=<Yes|No>
```

YES Proceed conditionally. The system checks for active usage in the current sysplex root file system and reports the active usage in a BPXF245I message. If file activity is found, the command fails with EBUSY return code and JrActivityFound reason code. If file activity is not found, the command continues processing to replace the sysplex root. YES is the default.

NO Proceed unconditionally. The system checks for active usage in the current sysplex root file system and reports the active usage in a BPXF245I message. Replacement of the sysplex root file system will continue.

The migration of the sysplex root file system will begin. During the migration, active connections to files and directories in the current sysplex root file system are broken.

After the migration completes:

- The root CWD('/') is updated on all systems in the sysplex to point to the new sysplex root file system.
- New opens go to the new sysplex root file system. The current sysplex root for the root directory is replaced for all processes in all systems. The current directory for root directory is replaced for any processes using it

Migration actions from z/OS V1R12: z/OS UNIX

- Old connections in the previous sysplex root file system might get EIO errors.
4. Update the TYPE parameter and name of the sysplex root file system in the BPXPRMxx member of SYS1.PARMLIB. Because the DDNAME() keyword of the BPXPRMxx ROOT and CMOUNT statements is not supported by zFS, change these statements to use the FILESYSTEM(name) keyword instead.

Reference information: v

- For more information about the HFS and zFS file systems, see *z/OS UNIX System Services Command Reference*.
- To read about setting up zFS, see *z/OS Distributed File Service zFS Administration*.
- For information about the pax command, see *z/OS UNIX System Services Command Reference*.

Update invocations of /usr/sbin/mount commands

Description: Before z/OS V1R13, when using the `/usr/sbin/mount` command with the `-o fsoptions` option, that option was ignored for zFS file systems if the `-t` option was not used to specify the file system type. Starting with z/OS V1R13, the `-o fsoptions` option is not ignored in that situation, which might cause the mount to (1) fail or (2) proceed but with possible unintended results.

Element or feature:	z/OS UNIX.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, because invocations of <code>/usr/sbin/mount</code> might fail , or if the mount does not fail, the results might be unpredictable.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: If you have invocations of the `/usr/sbin/mount` command that do not use the `-t` option to specify the file system type but specifies zFS-specific options using the `-o fsoptions` option, take the following actions:

1. If you want to keep the `-o fsoptions` option, determine the type of the file system and specify it, using the `-t` option.
2. If the file system is zFS, verify that the options string that was specified in `-o fsoptions` is valid.

Reference information: See the following information:

- See the mount command in *z/OS UNIX System Services Command Reference*.
- See the section on mounting considerations for zFS in *z/OS UNIX System Services Planning*.

Update invocations of `/usr/sbin/unmount` commands

Description: Before z/OS V1R13, if a path name was specified when using the `/usr/sbin/unmount` command to unmount a file system, the path name could be (1) any file or directory in the file system or (2) the mount point of the file system. Starting in z/OS V1R13, when the `/usr/sbin/unmount` command is issued, only the mount point can be specified for the path name.

Unmounting based on using any file or directory in a file system can sometimes cause the wrong file system from being unmounted. There can be instances, for example, where the file system has already been unmounted and a subsequent unmount on the same path name would result in accidentally unmounting the wrong file system.

Element or feature:	z/OS UNIX.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, because invocations of <code>/usr/sbin/unmount</code> might fail if the path name is not the name of the mount point.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	If the path name is not the name of the mount point, the following message is displayed: FOMF0512I Path is not a mountpoint: <i>path-name</i> .
Related IBM Health Checker for z/OS check:	None.

Steps to take: If you have invocations of the `/usr/sbin/unmount` command that do not specify a mount point on the *name...* parameter, follow these steps:

1. Look for instances where the specified path names in `/usr/sbin/unmount` invocations are files or directories.
2. Select one of the following actions:
 - Use the `-m` option in `/usr/sbin/unmount` command if you have confirmed that something other than mount point needs to be specified. Note the file system that contains the file or the directory will be unmounted.
 - Change the invocation so that only mount points are specified for the path name.

Reference information: See the `unmount` command in *z/OS UNIX System Services Command Reference* for further information.

Discontinue use of z/OS UNIX System Services Connection Scaling

Description: Starting with z/OS V1R13, support of z/OS UNIX System Services Connection Scaling, specifically the Connection Manager and Process Manager components, is discontinued. FMID HCMG110, JCMG1J0, HPMG110, and JPMG1J0 are removed from z/OS V1R13.

Element or feature:	z/OS UNIX.
When change was introduced:	z/OS V1R13 (previewed in z/OS V1R12 Software Announcement 210-235, dated July 22, 2010).
Applies to migration from:	z/OS V1R12.
Timing:	Before installing z/OS V2R1.
Is the migration action required?	Yes, if you use z/OS UNIX System Services Connection Scaling.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Discontinue use of z/OS UNIX System Services Connection Scaling. z/OS UNIX System Services Connection Scaling consists of these FMIDs: HCMG110 (Connection Manager), JCMG1J0 (Connection Manager Japanese), HPMG110 (Process Manager), and JPMG1J0 (Process Manager Japanese).

Reference information: None

z/OS UNIX actions to perform before the first IPL of z/OS V2R1

This topic describes z/OS UNIX migration actions that you can perform after you have installed z/OS V2R1 but before the first time you IPL. These actions might require the z/OS V2R1 level of code to be installed but do not require it to be active.

Update applications that use SMF type 92 subtype 11 close records

Description: Before z/OS V2R1, SMF type 92, subtype 11 close records were written when sockets or character special records were closed. Sockets and character special files have very high close rates and do not provide useful information in determining how often files and directories are used. Starting in z/OS V2R1, they are written as subtype 16 close records instead. The sockets and character special file close records will no longer appear in type 92 subtype 11 records. Instead, you need to include type 92 subtype 16 records in the SMFPRMxx parmlib member to collect them.

Element or feature:	z/OS UNIX.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.

Timing:	Before the first IPL z/OS V2R1.
Is the migration action required?	Yes, if you want continue to get close records for sockets and character special files.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Follow these steps:

1. Determine whether you have applications that use SMF type 92 subtype 11 close records. For those applications, SMF92TYP is set to SMF92#CLOSE (11) for subtype 11. SMF92CTY is set to FT_SOCKET (7) for sockets and FT_CHARSPEC (2) for character special files.
2. Change the application to look at subtype 16 records. SMF92TYP will be set to SMF92#CLSSOCCHARSPEC (16).

Reference information: See the following information:

- *z/OS UNIX System Services Planning*

Determine if any sticky bit files or external links in your z/OS UNIX file system are involved with link-edited MVS programs with AC=1 (Part 1 before the first IPL of V2R1)

Description: Starting in z/OS V2R1, the invocation requirements for MVS load library programs invoked through the z/OS UNIX spawn, exec and attach_exec services have changed. These changes apply to the invocation of MVS programs link-edited AC=1 found in an APF-authorized library and for MVS load library programs that are to run as a z/OS UNIX set-user-id or set-group-id program. The following list describes the changes:

- If the z/OS UNIX *pathname* that is supplied to spawn, exec or attach_exec represents an external link that resolves to an MVS program found in an APF-authorized library and link-edited with the AC=1 attribute, the external link must have an owning UID of 0 and not be found in a file system that is mounted as NOSECURITY to allow this type of invocation.
- If the z/OS UNIX *pathname* that is supplied to spawn, exec, or attach_exec represents a regular file with the sticky bit attribute that resolves to an MVS program found in an APF-authorized library and link-edited with the AC=1 attribute, the sticky bit file must have an owning UID of 0 or have the APF extended attribute turned on to allow this type of invocation. Additionally, the sticky bit file must not be found in a file system that is mounted as NOSECURITY to allow this type of invocation.
- If the z/OS UNIX *pathname* that supplied to spawn, exec or attach_exec represents a symbolic link to a regular file with the sticky bit attribute and the sticky bit file has the set-user-id attribute, the symbolic link must have an owning UID of 0 or an owning UID equal to that of the sticky bit file. If the sticky bit file has the set-group-id attribute, the symbolic link must have an owning UID of 0 or an owning GID equal to that of the sticky bit file.

Migration actions from z/OS V1R12: z/OS UNIX

Additionally, the symbolic link must not be found in a file system that is mounted as NOSECURITY to allow this type of invocation.

Element or feature:	z/OS UNIX.
When change was introduced:	z/OS V1R13 and z/OS V1R12, both with APAR OA41101.
Applies to migration from:	z/OS V1R13 and z/OS V1R12 both without APAR OA41101 applied.
Timing:	Before the first IPL of V2R1. (For steps to take after the first IPL of z/OS V2R1, see "Determine if any sticky bit files or external links in your z/OS UNIX file system are involved in the invocation of MVS programs that are link-edited with the AC=1 attribute (Part 2 after IPL of z/OS V2R1)" on page 233.)
Is the migration action required?	No, but recommended even though most, if not all, IBM and vendor products install their executable files into the z/OS UNIX file system with an owning UID of 0, so few, if any, executable files on a customer system should have a problem.
Target system hardware requirements:	None.
Target system software requirements:	See Steps to take .
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take before the first IPL: If you are migrating a z/OS system from z/OS V1R12 or z/OS V1R13 with APAR OA41101 installed, then no migration actions need to be taken. In this case, it is assumed that you have taken all required actions related to this APAR. Also see the documentation APAR OA41490.

If you are migrating from a z/OS system that does not have OA41101 installed and use the following IBM products, then you should ensure that you have the latest service levels and have followed the most recent install documentation for these IBM products:

- IBM z/OS Problem Determination Tools File Manager Software V10 (see Doc APAR PM81080)
- IBM z/OS Problem Determination Tools File Manager Software V11.1.0 with upgrade subset HADLB10 (ensure that PTF UK91613 is installed)
- IBM z/OS Problem Determination Tools Common Component Software V1.6.0 with upgrade subset HVWR160 (ensure that PTF UK91612 is installed)
- IBM InfoSphere Data Replication (see Doc APAR PM81306)
- IBM Security zSecure Suite (See Technote 1625364)
- IBM Tivoli Security Information and Event Manager (see Technote 1626384)

You may have to change the installation of some z/OS UNIX files and links provided by these products.

Otherwise, if you follow the standard install process for z/OS UNIX software, then you should not need to make any further changes related to APAR OA41101. Exceptions to this would be:

- If you installed z/OS UNIX sticky bit files, symbolic links or external links for any of your own software without using SMP/E
- If you installed any IBM or other vendor provided z/OS UNIX sticky bit files, symbolic links or external links outside the normal SMP/E install process
- If you installed z/OS UNIX software using SMP/E from a user that is not running with UID 0 and is not permitted to BPX.SUPERUSER

If any of these exceptions exist on your system, then you might have to change the installation of these files and links. To identify all the sticky bit files, symbolic links and external links that need to change, you need to IPL with z/OS V2R1 installed. If any of these files or links are executed, you will then start seeing EC6-xxxxC04A abends along with message BPXP028I in the system log, which identifies the files or links that must be changed. You can then use the documentation for message BPXP028I to correct the files or links that are installed improperly. For more information about message BPXP028I, see *z/OS MVS System Messages, Vol 3 (ASB-BPX)*.

For steps to take after the first IPL, see “Determine if any sticky bit files or external links in your z/OS UNIX file system are involved in the invocation of MVS programs that are link-edited with the AC=1 attribute (Part 2 after IPL of z/OS V2R1)” on page 233.

Reference information: *z/OS UNIX System Services Command Reference*.

Determine whether any of your installed products include z/OS UNIX set-user-ID or set-group-ID privileged programs that invoke other z/OS UNIX executable programs

Description: Starting in z/OS V2R1, the requirements for the execution or loading of z/OS UNIX executable programs through the z/OS UNIX spawn, exec, loadhfs, loadhfs extended and attach_exec services and the REXX external subroutine and function processing have changed. These changes apply only to the usage of these interfaces by z/OS UNIX set-user-ID or set-group-ID privileged programs. A set-user-ID or set-group-ID privileged program is installed in the z/OS UNIX file system with either the set-user-ID or set-group-ID bit turned on.

The affected interfaces, when invoked from a z/OS UNIX set-user-ID or set-group-ID privileged program, now require that a target z/OS UNIX program file have a file owning UID of 0 or a file owning UID that is equal to that of the set-user-ID program, or have the program control extended attribute turned ON. Additionally, the target z/OS UNIX program file cannot be located in a NoSecurity file system. If any part of the z/OS UNIX path name that resolves to the target z/OS UNIX program file is a symbolic link, the symbolic link also must meet the same requirements.

Element or feature:	z/OS UNIX.
When change was introduced:	z/OS V2R1.
Applies to migration from:	z/OS V1R13 and z/OS V1R12.
Timing:	Before the first IPL and after the first IPL.

Migration actions from z/OS V1R12: z/OS UNIX

Is the migration action required?	No, but recommended even though most, if not all, IBM and vendor products install their z/OS UNIX executable files and associated links into the z/OS UNIX file system with an owning UID of 0.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: Before you begin, note that the standard IBM product installation process (SMP/E) installs all product-related files and links with an owning UID of 0 with the possible exception of set-user-id program files.

z/OS UNIX actions to take before the first IPL of z/OS V2R1

- If you are migrating a z/OS system from z/OS V1R12 or z/OS V1R13 with APAR OA42093 installed, then no migration actions need to be taken. In this case, it is assumed that you have taken all required actions related to this APAR.
- If you are migrating from a z/OS system that does not have OA42093 installed and use the following IBM products, then you should ensure that you have the latest service levels and have followed the most recent install documentation for these IBM products:
 1. IBM Infoprint Transforms to AFP for z/OS (Insure APAR OA42691 is installed)

Otherwise, if you follow the standard install process for z/OS UNIX software, then you should not need to make any further changes related to APAR OA42093. Exceptions to this would be:

- If you installed z/OS UNIX executable files and associated symbolic links without using SMP/E.
- If you installed any IBM or other vendor provided z/OS UNIX executable files and associated symbolic links outside the normal SMP/E install process.
- If you installed z/OS UNIX software using SMP/E from a user that is not running with UID 0 and is not permitted to BPX.SUPERUSER.

If any of these exceptions exist on your system, then you might have to change the installation of these files and links. To identify all z/OS executable files and associated symbolic links that need to change, you need to IPL with z/OS V2R1 installed. If any of these files or links are executed, you will then start seeing EC6-xxxxE04B abends along with message BPXP029I in the system log, which identifies the files or links that must be changed. You can then use the documentation for message BPXP029I to correct the files or links that are installed improperly. For more information about message BPXP029I, see *z/OS MVS System Messages, Vol 3 (ASB-BPX)*.

z/OS UNIX actions to perform after the first IPL of z/OS V2R1

If you see EC6-xxxxE04B abends occurring, look for message BPXP029I in the system log to determine the details of the z/OS UNIX files or links involved with

the errors and how to correct the problem. This abend is indicative of an attempt to execute, call or load an improperly installed z/OS UNIX executable program file. For more information about message BPXP029I, see *z/OS MVS System Messages, Vol 3 (ASB-BPX)*.

Reference information: See the following information:

- *z/OS UNIX System Services Programming: Assembler Callable Services Reference*
- *z/OS Using REXX and z/OS UNIX System Services*
- *z/OS MVS System Commands*
- *z/OS MVS System Messages, Vol 3 (ASB-BPX)*

Update invocations of MOUNT statements in the BPXPRMxx parmlib member

Description: Before z/OS V1R13, if the MOUNT statement in the BPXPRMxx member of SYS1.PARMLIB was first processed by a system other than the specified target owner, the MOUNT processing was function-shipped to the target owner. Starting with z/OS V1R13, if the MOUNT statement specifies a SYSNAME() keyword, the mount request is ignored during file system initialization and F BPXOINIT,FILESYS=REINIT processing if the SYSNAME() value specifies a different target owner system. The file system is then automatically mounted locally after the MOUNT statement is processed on the target system. The MOUNT statements in BPXPRMxx continues to be processed as part of SET OMVS and SETOMVS command processed without any changes; that is, the MOUNT processing continues to be function-shipped to the specified SYSNAME() target owner system.

Element or feature:	z/OS UNIX.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, because required file systems might not be mounted.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: If you have a BPXPRMxx parmlib member that contains MOUNT statements with a SYSNAME() keyword specifying a specific target name, select one of the following actions:

1. Verify that the BPXPRMxx member is also specified as a z/OS UNIX parmlib member for the specified target systems.
2. Move the MOUNT statements from that BPXPRMxx member to a BPXPRMxx member that is used by the target owner system.

Note that specifying SYSNAME(&SYSNAME) always resolves to the system name of the local system; the MOUNT statement is processed as a result.

Migration actions from z/OS V1R12: z/OS UNIX

Reference information: See "Customizing BPXPRMxx for a shared file system" in *z/OS UNIX System Services Planning* for a description of the SYSNAME() keyword for the BPXPRMxx MOUNT statement.

Accommodate changes to support read-only z/OS root for the z/OS UNIX System Services cron, mail, and uucp utilities

Description: Before z/OS V1R13, for each new release, certain post-installation activities had to be done for the z/OS UNIX System Services **cron**, **mail**, and **uucp** utilities in order for the root file system to be mounted read-only. Starting in z/OS V1R13, the /usr/lib/cron, /usr/mail, and /usr/spool directories are provided as symbolic links. Note that this migration action does not affect other mail utilities such as **tmail**, **mailx**, and Communications Server **sendmail**.

Element or feature:	z/OS UNIX.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	Before the first IPL of z/OS V2R1.
Is the migration action required?	Yes, if either of the following is true: <ul style="list-style-type: none">• You have performed the post-installation activities to make uucp, cron, or mail supported for a read-only z/OS root. You do not necessarily have to be running with the z/OS root as read only but only have the post-installation customization as described in <i>z/OS UNIX System Services Planning</i>.• You have used uucp, cron, or mail facilities and have not performed the post-installation customization as described in <i>z/OS UNIX System Services Planning</i>.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.

System impacts:

- Because the new z/OS V1R13 symbolic links are directed to a system-specific file system, other file systems are not affected by this change. When shared in read-only mode, the z/OS root will contain the /var symbolic links.
- If you use any of the utilities (**uucp**, **cron**, or **mail**), then review any files that these utilities produce, such as logs. Now that the symbolic links, by default, point to the /var location, ensure that you have room for these utility-produced files in /var. This might mean: (1) creating a separate file system for files (such as /var/spool, as recommended in *z/OS UNIX System Services Planning*), (2) moving existing separate file systems you already have to be mounted under /var (from/etc, for instance), or (3) enlarging your /var file system if you don't have separately mounted file systems for these utilities.

Related IBM Health Checker for z/OS check:

Use check ZOSMIGV1R13_RO_SYMLINKS, available with APAR OA35605 and APAR OA35636.

Steps to take: Follow these steps:

Note: While this migration action should be performed before the first IPL of z/OS V1R13, the changes to use /var for this support can be done at any time. Although previous documentation had shown the use of /etc n examples, after further consideration, we now recommend using /var for these utilities.

1. If you currently use /etc or another directory for post-installation customization for these utilities, decide if you want to continue to use those directories or move to the /var structure that is provided with z/OS V1R13. Moving to the /var structure is recommended because:
 - You can minimize any subsequent post-installation customization, since the symbolic links to /var will be provided for you by IBM. Continued use of non-/var directories may mean post-installation work every time to remove the delivered structure and replace it with your own.
 - Continued use of /etc (or another directory), requires you to manage and maintain the symbolic links required from /var to that directory, which is “double symlinking.” This “double symlinking” might be confusing for those that maintain the system.
2. If you use /var for your post-installation customization, then ensure that the /var file system to be mounted at the z/OS V1R13 level of /var (or subdirectories shown below) contains the following directories or files for the utilities you are using. These will now be referenced by symbolic links in the z/OS V1R13 root file system when cron, mail, and uucp are used:
 - /var/mail
 - /var/spool
 - /var/spool/cron
 - /var/spool/locks
 - /var/spool/cron/atjobs
 - /var/spool/cron/crontabs
 - /var/spool/uucp

Migration actions from z/OS V1R12: z/OS UNIX

- /var/spool/uucppublic
- /var/spool/uucp/.Xqtdir
- /var/spool/uucp/.Sequence
- /var/spool/uucp/.Status
- /var/cron
- /var/uucp/Systems
- /var/uucp/Devices
- /var/uucp/Dialers
- /var/uucp/Dialcodes
- /var/uucp/Permissions
- /var/uucp/config

Note that the /var file system provided by ServerPac will contain these directories but not the files, because the files are provided when the utilities are configured and used. If you use to use the ServerPac /var and add your files to that /var file system, that is acceptable, as documented in “Migrate /etc and /var system control files” on page 18. This action is similar to how you would merge an /var file system provided by Server Pac with an existing file system.

If you have any user files under /usr/spool, /usr/lib/cron, or /usr/mail in the root file system (that is, they have not been symlinked under /var or another directory to support the read-only root), then those files must be moved to /var/spool, /var/cron, or /var/mail (or another directory besides the /var that you choose).

Reference information: See the following information:*z/OS UNIX System Services Planning*.

z/OS UNIX actions to perform after the first IPL of z/OS V2R1

This topic describes z/OS UNIX migration actions that you can perform only after you have IPLed z/OS V2R1. You need a running z/OS V2R1 system to perform these actions.

Determine if any sticky bit files or external links in your z/OS UNIX file system are involved in the invocation of MVS programs that are link-edited with the AC=1 attribute (Part 2 after IPL of z/OS V2R1)

Description: Starting in z/OS V2R1, the invocation requirements for MVS load library programs invoked through the z/OS UNIX spawn, exec and attach_exec services have changed. These changes apply to the invocation of MVS programs link-edited AC=1 found in an APF-authorized library and for MVS load library programs that are to run as a z/OS UNIX set-user-id or set-group-id program. The following list describes the changes:

- If the z/OS UNIX *pathname* that is supplied to spawn, exec or attach_exec represents an external link that resolves to an MVS program found in an APF-authorized library and link-edited with the AC=1 attribute, the external link must have an owning UID of 0 and not be found in a file system that is mounted as NOSECURITY to allow this type of invocation.
- If the z/OS UNIX *pathname* that is supplied to spawn, exec, or attach_exec represents a regular file with the sticky bit attribute that resolves to an MVS program found in an APF-authorized library and link-edited with the AC=1 attribute, the sticky bit file must have an owning UID of 0 or have the APF extended attribute turned on to allow this type of invocation. Additionally, the sticky bit file must not be found in a file system that is mounted as NOSECURITY to allow this type of invocation.

Migration actions from z/OS V1R12: z/OS UNIX

- If the z/OS UNIX *pathname* that supplied to `spawn`, `exec` or `attach_exec` represents a symbolic link to a regular file with the sticky bit attribute and the sticky bit file has the set-user-id attribute, the symbolic link must have an owning UID of 0 or an owning UID equal to that of the sticky bit file. If the sticky bit file has the set-group-id attribute, the symbolic link must have an owning UID of 0 or an owning GID equal to that of the sticky bit file. Additionally, the symbolic link must not be found in a file system that is mounted as NOSECURITY to allow this type of invocation.

Element or feature:	z/OS UNIX.
When change was introduced:	z/OS V1R13 and z/OS V1R12, both with APAR OA41101.
Applies to migration from:	z/OS V1R13 and z/OS V1R12, both without APAR OA41101 applied.
Timing:	After the first IPL of z/OS V2R1. (For steps to take before the first IPL, see “Determine if any sticky bit files or external links in your z/OS UNIX file system are involved with link-edited MVS programs with AC=1 (Part 1 before the first IPL of V2R1)” on page 229).
Is the migration action required?	No, but recommended even though most, if not all, IBM and vendor products install their executable files into the z/OS UNIX file system with an owning UID of 0, so few, if any, executable files on a customer system should have a problem.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take after the first IPL: If you see EC6-xxxxC04A abends occurring, look for message BPXP028I in the system log to determine the details of the z/OS UNIX files or links and MVS programs involved with the errors and how to correct the problem. This abend is indicative of an attempt to execute an improperly installed z/OS UNIX sticky bit file, symbolic link or external link that resolves to a MVS program. For more information about message BPXP028I, see *z/OS MVS System Messages, Vol 3 (ASB-BPX)*.

For **Steps to take before the first IPL**, see “Determine if any sticky bit files or external links in your z/OS UNIX file system are involved with link-edited MVS programs with AC=1 (Part 1 before the first IPL of V2R1)” on page 229.

Reference information: *z/OS UNIX System Services Command Reference*.

Determine whether any of your installed products include z/OS UNIX set-user-ID or set-group-ID privileged programs that invoke other z/OS UNIX executable programs

Description: Starting in z/OS V2R1, the requirements for the execution or loading of z/OS UNIX executable programs via the z/OS UNIX spawn, exec, loadhfs, loadhfs extended and attach_exec services and the REXX external subroutine and function processing have changed. These changes apply only to the usage of these interfaces by z/OS UNIX set-user-ID or set-group-ID privileged programs. A set-user-ID or set-group-ID privileged program is installed in the z/OS UNIX file system with either the set-user-ID or set-group-ID bit turned on.

The affected interfaces, when invoked from a z/OS UNIX set-user-ID or set-group-ID privileged program, now require that a target z/OS UNIX program file have a file owning UID of 0 or a file owning UID that is equal to that of the set-user-ID program, or have the program control extended attribute turned ON. Additionally, the target z/OS UNIX program file cannot be located in a NoSecurity file system. If any part of the z/OS UNIX path name that resolves to the target z/OS UNIX program file is a symbolic link, the symbolic link also must meet the same requirements.

For complete migration actions including action before and after the first IPL, see “Determine if any sticky bit files or external links in your z/OS UNIX file system are involved in the invocation of MVS programs that are link-edited with the AC=1 attribute (Part 2 after IPL of z/OS V2R1)” on page 233 and “Determine if any sticky bit files or external links in your z/OS UNIX file system are involved in the invocation of MVS programs that are link-edited with the AC=1 attribute (Part 2 after IPL of z/OS V2R1)” on page 233.

Discontinue use of invalid REXX variables in z/OS UNIX syscalls

Description: Before z/OS V1R13, issuing z/OS UNIX syscalls with invalid REXX variables might not generate an error message. Starting in z/OS V1R13, error messages are issued.

Element or feature:	z/OS UNIX.
When change was introduced:	z/OS V1R13.
Applies to migration from:	z/OS V1R12.
Timing:	After the first IPL of z/OS V2R1.
Is the migration action required?	Yes. Using invalid REXX variables could cause problems that might not be noticed.
Target system hardware requirements:	None.
Target system software requirements:	None.
Other system (coexistence or fallback) requirements:	None.
Restrictions:	None.
System impacts:	None.
Related IBM Health Checker for z/OS check:	None.

Steps to take: If you have REXX programs with multiple syscalls that use the (*rex-*variable**) format of passing variables and do not check RETVAL and or ERRNO upon return, follow these steps.

1. Run these programs.

2. Fix parsing errors as they occur, replacing invalid REXX variables with valid ones. The error number will identify the invalid REXX variable. Note that REXX variable names cannot start with a digit or include arithmetic operators. For example, x*y is an invalid REXX variable.
 - If the program produces a REXX parsing error, the error will be:
IRX0041I Error running line xx:
This is a TSO REXX error message.
 - If the program produces a z/OS UNIX syscall parsing error, the error code will be -21,-22,..., as described under the section "Returned from the SYSCALL environment" in the USS REXX documentation.

Reference information: See *z/OS Using REXX and z/OS UNIX System Services* for information about the error message.

Appendix. Accessibility

Accessible publications for this product are offered through the z/OS Information Center, which is available at www.ibm.com/systems/z/os/zos/bkserv/.

If you experience difficulty with the accessibility of any z/OS information, please send a detailed message to mhvrcfs@us.ibm.com or to the following mailing address:

IBM Corporation
Attention: MHVRCFS Reader Comments
Department H6MA, Building 707
2455 South Road
Poughkeepsie, NY 12601-5400
USA

Accessibility features

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 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. Consult the assistive technology documentation for specific information when using such products to access z/OS interfaces.

Keyboard navigation of the user interface

Users can access z/OS 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 Vol I* 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.

Dotted decimal syntax diagrams

Syntax diagrams are provided in dotted decimal format for users accessing the z/OS Information Center using a screen reader. In dotted decimal format, each syntax element is written on a separate line. If two or more syntax elements are always present together (or always absent together), they can appear on the same line, because they can be considered as a single compound syntax element.

Each line starts with a dotted decimal number; for example, 3 or 3.1 or 3.1.1. To hear these numbers correctly, make sure that your screen reader is set to read out punctuation. All the syntax elements that have the same dotted decimal number (for example, all the syntax elements that have the number 3.1) are mutually

exclusive alternatives. If you hear the lines 3.1 USERID and 3.1 SYSTEMID, you know that your syntax can include either USERID or SYSTEMID, but not both.

The dotted decimal numbering level denotes the level of nesting. For example, if a syntax element with dotted decimal number 3 is followed by a series of syntax elements with dotted decimal number 3.1, all the syntax elements numbered 3.1 are subordinate to the syntax element numbered 3.

Certain words and symbols are used next to the dotted decimal numbers to add information about the syntax elements. Occasionally, these words and symbols might occur at the beginning of the element itself. For ease of identification, if the word or symbol is a part of the syntax element, it is preceded by the backslash (\) character. The * symbol can be used next to a dotted decimal number to indicate that the syntax element repeats. For example, syntax element *FILE with dotted decimal number 3 is given the format 3 * FILE. Format 3* FILE indicates that syntax element FILE repeats. Format 3* * FILE indicates that syntax element * FILE repeats.

Characters such as commas, which are used to separate a string of syntax elements, are shown in the syntax just before the items they separate. These characters can appear on the same line as each item, or on a separate line with the same dotted decimal number as the relevant items. The line can also show another symbol giving information about the syntax elements. For example, the lines 5.1*, 5.1 LASTRUN, and 5.1 DELETE mean that if you use more than one of the LASTRUN and DELETE syntax elements, the elements must be separated by a comma. If no separator is given, assume that you use a blank to separate each syntax element.

If a syntax element is preceded by the % symbol, this indicates a reference that is defined elsewhere. The string following the % symbol is the name of a syntax fragment rather than a literal. For example, the line 2.1 %OP1 means that you should refer to separate syntax fragment OP1.

The following words and symbols are used next to the dotted decimal numbers:

- ? means an optional syntax element. A dotted decimal number followed by the ? symbol indicates that all the syntax elements with a corresponding dotted decimal number, and any subordinate syntax elements, are optional. If there is only one syntax element with a dotted decimal number, the ? symbol is displayed on the same line as the syntax element, (for example 5? NOTIFY). If there is more than one syntax element with a dotted decimal number, the ? symbol is displayed on a line by itself, followed by the syntax elements that are optional. For example, if you hear the lines 5 ?, 5 NOTIFY, and 5 UPDATE, you know that syntax elements NOTIFY and UPDATE are optional; that is, you can choose one or none of them. The ? symbol is equivalent to a bypass line in a railroad diagram.
- ! means a default syntax element. A dotted decimal number followed by the ! symbol and a syntax element indicates that the syntax element is the default option for all syntax elements that share the same dotted decimal number. Only one of the syntax elements that share the same dotted decimal number can specify a ! symbol. For example, if you hear the lines 2? FILE, 2.1! (KEEP), and 2.1 (DELETE), you know that (KEEP) is the default option for the FILE keyword. In this example, if you include the FILE keyword but do not specify an option, default option KEEP will be applied. A default option also applies to the next higher dotted decimal number. In this example, if the FILE keyword is omitted, default FILE(KEEP) is used. However, if you hear the lines 2? FILE, 2.1, 2.1.1!

(KEEP), and 2.1.1 (DELETE), the default option KEEP only applies to the next higher dotted decimal number, 2.1 (which does not have an associated keyword), and does not apply to 2? FILE. Nothing is used if the keyword FILE is omitted.

- * means a syntax element that can be repeated 0 or more times. A dotted decimal number followed by the * symbol indicates that this syntax element can be used zero or more times; that is, it is optional and can be repeated. For example, if you hear the line 5.1* data area, you know that you can include one data area, more than one data area, or no data area. If you hear the lines 3*, 3 HOST, and 3 STATE, you know that you can include HOST, STATE, both together, or nothing.

Note:

1. If a dotted decimal number has an asterisk (*) next to it and there is only one item with that dotted decimal number, you can repeat that same item more than once.
 2. If a dotted decimal number has an asterisk next to it and several items have that dotted decimal number, you can use more than one item from the list, but you cannot use the items more than once each. In the previous example, you could write HOST STATE, but you could not write HOST HOST.
 3. The * symbol is equivalent to a loop-back line in a railroad syntax diagram.
- + means a syntax element that must be included one or more times. A dotted decimal number followed by the + symbol indicates that this syntax element must be included one or more times; that is, it must be included at least once and can be repeated. For example, if you hear the line 6.1+ data area, you must include at least one data area. If you hear the lines 2+, 2 HOST, and 2 STATE, you know that you must include HOST, STATE, or both. Similar to the * symbol, the + symbol can only repeat a particular item if it is the only item with that dotted decimal number. The + symbol, like the * symbol, is equivalent to a loop-back line in a railroad syntax diagram.

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The minimum supported hardware for z/OS releases identified in z/OS announcements can subsequently change when service for particular servers or devices is withdrawn. Likewise, the levels of other software products supported on a particular release of z/OS are subject to the service support lifecycle of those products. Therefore, z/OS and its product publications (for example, panels, samples, messages, and product documentation) can include references to hardware and software that is no longer supported.

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