Migration

Version 1 Release 13

“When behaviors aren't the same anymore, Migration actions are called for.”
This is a major revision to GA22-7499-20 as updated September 2012.

This edition applies to version 1 release 13 of IBM z/OS (product number 5694-A01) and to all subsequent releases and modifications until otherwise indicated in new editions.

This edition replaces GA22-7499-20.

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About this document

This document describes how to migrate to z/OS® Version 1 Release 13 (V1R13) from the following releases:

- z/OS V1R12
- z/OS V1R11

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 V1R13.

How this document is organized

The first four chapters of this document are general in scope, that is, not devoted to a specific z/OS base element or optional feature. Chapter 1 is an introduction, Chapter 2 describes migration actions for everyone (that is, system-level actions), Chapter 3 describes hardware migration actions, and Chapter 4 summarizes sysplex migration actions.

The remaining chapters are devoted to the specific elements and features that have migration actions, with one element or feature per chapter. These chapters are in alphabetic order — from BCP (Chapter 5) to z/OS UNIX (Chapter 23). Within each chapter, the following standard organization is used:

- Migration actions to perform before installing z/OS V1R13
- Migration actions to perform before the first IPL of z/OS V1R13
- Migration actions to perform after the first IPL of z/OS V1R13

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, “Introduction,” on page 1. You can then proceed sequentially through the subsequent chapters or in whatever order you prefer based on element or feature interest. The chapters are in alphabetic order by name of element or feature, once you pass the chapter on migration actions for everyone, the chapter on hardware migration actions, and the chapter on sysplex migration actions. Another way to proceed is to concentrate first on preinstall migration actions within each chapter, then pre-IPL migration actions, and then post-IPL migration actions. These actions are clearly identified by major headings within each 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 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 V1R13.** 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 V1R13 level of code to make these changes, and the changes do not require the z/OS V1R13 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 V1R13.

• **Actions to perform before the first IPL of z/OS V1R13.** These are migration actions that you perform after you have installed z/OS V1R13 but before the first time you IPL. These actions require the z/OS V1R13 level of code to be installed but do not require it to be active. That is, you need the z/OS V1R13 programs, utilities, and samples in order to perform the migration actions, but the z/OS V1R13 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 V1R13 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 V1R13 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 V1R13.** These are 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. 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 V1R13 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 above 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.

**Related information**

See [z/OS Introduction and Release Guide](http://www.ibm.com/eserver/zseries/zos/bkserv/) for an introduction to z/OS and an overview of the new functions in each release of z/OS.

See [z/OS Planning for Installation](http://www.ibm.com/eserver/zseries/zos/bkserv/) for a summary of installation changes in each release of z/OS, driving system hardware and software requirements, target system hardware and software requirements, the coexistence-migration-fallback policy, required releases of IBM middleware products, and considerations for planning future installations.

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Summary of changes

This topic summarizes the changes made to this document.

Changes made in z/OS Version 1 Release 13 as updated September 2012

This document contains information previously presented in GA22-7499-20, which supports z/OS Version 1 Release 13.

New information:

Information is provided for the new server IBM zEnterprise zEC12. See “Migrate to an IBM zEnterprise zEC12 server” on page 47.

The following migration actions are new:

- Prepare for z/OS V1R13 RSM Enablement Offering Web deliverable. See that topic in “Migration and exploitation considerations for zEC12 server functions” on page 58.
- BCP
  - Migration action “Accommodate increase in nucleus size for the z/OS V1R13 RSM Enablement Offering Web deliverable” on page 122 is new.
  - Migration action “Accommodate increase in ESQA with the z/OS V1R13 RSM Enablement Offering Web deliverable” on page 123 is new.
  - Migration action “Migrate to GRS-managed FICON CTCs” on page 148 is new.
- Communications Server
  - Migration action “IP and SNA Services: Remove TCPIPDS1 and ISTITDS1 specification from dump commands” on page 181 is new.
- DFSMS
  - Migration action “DFSMScs: Review changes to the messages that result from a COPY or RESTORE operation with COPYVOLID” on page 220 is new.
- ISPF
  - Migration action “Review changes to ISPF panels for new allocation of non-SMS-managed sequential data set” on page 273 is new.
- TSO/E
  - Migration action “Specify the SMSINFO keyword on LISTDSI to retrieve detailed PDSE information” on page 321 is new.

Changed information:

- “Elements and features that do not have migration actions” on page 5 has been updated.
- For changes to z/OS messages and interfaces, including parmlib members, for this release, see z/OS Summary of Message and Interface Changes

This document contains terminology, maintenance, and editorial changes. Technical changes or additions to the text and illustrations are indicated by a vertical line to the left of the change.
Changes made in z/OS Version 1 Release 13 as updated April 2012

This document contains information previously presented in z/OS MVS Migration, GA22-7499-19, which supports z/OS Version 1 Release 13.

New information:

- The following migration actions are new:
  - BCP
    - “Adjust LOGRECSUMMARY statement value in CEAPRMxx member” on page 146.
    - “Add to the maximum number of open files under z/OS UNIX Systems Services for PFA” on page 161.
  - Communications Server
    - “IP Services: Accommodate new format of FTP daemon console messages that no longer are prefixed with ‘+’” on page 163.
  - SSL
    - “System SSL: Ensure all RACF user IDs that start SSL applications can access the CSFIQA resource of the CSFSERV class” on page 202.
  - JES3
    - “Update automation that handles message IAT3100” on page 284.

Changed information:

- “Stop using Computing Environment (DCE) and DCE Security Server” on page 10 has been updated.
- “Set up an IPCS environment” on page 16 has been updated.
- “Migrate to an IBM zEnterprise z196 or z114 server” on page 61 has been updated.
- “Consider exploiting WARNUND for new IEASYSysx statements” on page 113 has been updated.
- “Issue commands from the system console regardless of problem determination mode” on page 133 has been updated.
- “Set AUTHQVL parameter in GRSCNFxx parmlib member to recognize new GRS qnames” on page 152 has been updated.
- “DFSMSdss: Modify applications to handle larger I/O buffers” on page 227 has been updated.
- “DFSMSdfp: Run OAM configuration database migration job” on page 239 has been updated.
- “DCE/DFS: Disable DFS Client initialization” on page 258 has been updated.
- “Modify code that depends on the format of suppressed split messages in the DLOG” on page 281 has been updated.
- “Convert to CEEPRMxx to set system-level default runtime options” on page 287 has been updated.

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Changes made in z/OS Version 1 Release 13

This document contains information previously presented in z/OS MVS Migration, GA22-7499-18, which supports z/OS Version 1 Release 12.

New information:

- The following migration actions are new:
  - Migration actions for everyone
    - “Stop using Computing Environment (DCE) and DCE Security Server” on page 10.
  - BCP
    - “Consider exploiting WARNUND for new IEASYSxx statements” on page 113.
    - “Define DASD storage for Predictive Failure Analysis” on page 114.
    - “Migrate from SNMP to z/OS BCPii for communication to the HMC or SE” on page 115.
    - “Verify that at least one blank follows all major keyword statements in CONSOLExxx” on page 116.
    - “Upgrade Java support for Capacity Provisioning” on page 117.
  - “Discontinue use of PGSER to protect and unprotect the READONLY nucleus” on page 117.
  - “Remove references to the MTFTPS utility” on page 124.
  - “Change value for ARM restart processing” on page 124.
  - “Modify automation that references output from D XCF;SYSPLEX console commands” on page 126.
  - “Update LLA for automation” on page 127.
  - “Accommodate OPERLOG EMCS console name change” on page 128.
  - “Adjust CON= system parameter to accommodate default change” on page 128.
  - “Accommodate HiperDispatch default of YES on IBM zEnterprise zEC12 and IBM zEnterprise (z196 and z114)” on page 130.
  - “Start Runtime Diagnostics at system initialization” on page 131.
  - “Issue commands from the system console regardless of problem determination mode” on page 133.
  - “Update Capacity Provisioning Manager parameters to use CIM client for Java Version 2” on page 147.
  - “Set AUTHQLVL parameter in GRSCNFxx parmlib member to recognize new GRS qnames” on page 152.
  - “Examine use of the CMDS ABEND command” on page 153.
  - “Ensure Runtime Diagnostics is installed before invoking Predictive Failure Analysis” on page 154.
  - Communications Server
    - “IP Services: Define a user ID for the system resolver with an associated OMVS segment” on page 164.
    - “IP Services: Understand and prepare for expanded Intrusion Detection Services” on page 169.
    - “IP Services: Ensure that the FTP user exit routine FTCHKPWD tolerates an additional parameter” on page 170.
- “IP Services: Understand change in VIPARANGE security verification processing” on page 171.
- “SNA Services: Ensure IVTCSM ASSIGN_BUFFER requests do not exceed 500 images for a single CSM buffer” on page 179.
- “IP Services: Review VIPARANGE definitions” on page 182.
- “SNA Services: Adjust to the relocation of the VTAM internal trace table” on page 188.

- Cryptographic Services
  - “ICSF: Ensure the CSFPUTIL utility is not used to initialize a PKDS” on page 196.
  - “System SSL: Ensure PKCS #11 tokens contain complete certificate chains” on page 200.
  - “ICSF: Ensure the expected master key support is available” on page 204.

- DFSMS
  - “DFSMShsm: Accommodate deletion of NOIMBED and NOREPLICAT LISTCAT command attributes” on page 211.
  - “DFSMShsm: Update operator procedures and system automation for new DADSM pre- and post-processing dynamic exits” on page 221.
  - “DFSMShsm: Update procedures that use IEBDSCPY alias name to access IEBCOPY” on page 222.
  - “DFSMShsm: Accommodate the changed default of PDA trace during DFSMShsm startup” on page 228.
  - “DFSMShsm: Accommodate the changed SETSYS FASTREPLICATION command DATASETRECOVERY parameter default” on page 229.
  - “DFSMShsm: Replace user-defined patch with new SETSYS FASTREPLICATION command to enable ARC1809I messages” on page 230.
  - “DFSMShsm: Review messages changed from I (informational) to E (eventual action) type” on page 231.
  - “DFSMShsm: Remove patch that prevents SMS MVT chain rebuild” on page 232.
  - “DFSMShsm: Update operator procedure in the Multicluster CDS environment” on page 233.
  - “DFSMShsm: Accommodate 64-bit and AR mode rules enforcement in DFSMS macros” on page 238.
  - “DFSMShsm: Run OAM configuration database migration job” on page 239.
  - “DFSMShsm: Accommodate Catalog Search Interface default change” on page 241.
  - “DFSMShsm: Stop using the HOLD command to quiesce activity prior to control data set backup” on page 242.

- Distributed File Service
  - “zFS: Accommodate new DASD space requirements” on page 249.
  - “zFS: Copy cloned file systems to a compatibility mode aggregate” on page 251.
  - “zFS: Copy data from zFS multi-file system aggregates to zFS compatibility mode aggregates” on page 252.
  - “zFS: Ensure sysplex=filesys is available on all zFS R11 and R12 systems in a shared file system environment” on page 253.
  - “zFS: Verify virtual storage usage” on page 256.
  - “DCE/DFS: Disable DFS Client initialization” on page 258.
– Infoprint Server
  - “Update or remove the region size in the AOPSTART startup procedure” on page 266.

– JES3
  - “Avoid redundant *S main,FLUSH command in response to XCF messages” on page 282.

– Language Environment
  - “Convert to CEEPRMxx to set system-level default runtime options” on page 287.

– RMF
  - “Check your automation for Monitor III messages ERB812I and ERB813I” on page 295.
  - “Determine need of SMF data collection for Postprocessor Serialization Delay report” on page 297.

– SDSF
  - “Update configuration for sysplex support” on page 302.
  - “Review colors on the OPERLOG panel” on page 303.
  - “Set the format of device names on the Punch and Reader panels” on page 304.

– Security Server
  - “Normalize user names specified as X.500 distinguished names in distributed identity filters” on page 309.

– z/OS UNIX
  - “Update invocations of /usr/sbin/mount commands” on page 325.
  - “Update invocations of /usr/sbin/unmount commands” on page 326.
  - “Review programs that invoke the BPX1EXM/BPX4EXM callable service” on page 327.
  - “Update invocations of MOUNT statements in the BPXPRMxx parmlib member” on page 334.
  - “Accommodate changes to support read-only z/OS root for the z/OS UNIX System Services cron, mail, and uucp utilities” on page 335.
  - “Discontinue use of invalid REXX variables in z/OS UNIX syscalls” on page 338.

Changed information:
• z/OS Management Facility (z/OSMF) migration actions are located in "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” on page 5 has been updated.
• Changes "Migration and exploitation considerations for zEC12 server functions” on page 58.
• “Update your check customization for modified IBM Health Checker for z/OS checks” on page 29 has been updated to reflect new, changed, and deleted IBM for Health Checker for z/OS checks.
• Table 3 on page 31 has been updated.
• Table 4 on page 45 has been updated.
• “Accommodate functions for the z196 and z114 servers to be discontinued on future servers” on page 76 has been updated to include information about the new IBM zEnterprise 114 (z114) server.

• The z/OS V1R12 migration action, "Migrate to an IBM zEnterprise 196 (z196) server," has been undated to include information about the new IBM zEnterprise 114 (z114 server) and is now titled, "Migrate to an IBM zEnterprise z196 or z114 server" on page 61.

• "IP Services: Migrate from DNS BIND 9.2.0" and replaced with "IP Services: Migrate from BIND 9.2.0" on page 168.

• “Determine the impact of added and changed runtime options” on page 285 has been updated.

• Also, see additional changes indicated by the change bar | in the margin.

Deleted information:

• Approximately 80 migration actions have been deleted because they applied to migrations from z/OS V1R10, and that release is not supported for migration to z/OS V1R13.

• z/OS Management Facility (z/OSMF) migration actions can be found in "Migrating from an earlier release of z/OSMF" in IBM z/OS Management Facility Configuration Guide.

This document contains terminology, maintenance, and editorial changes. Technical changes or additions to the text and illustrations are indicated by a vertical line to the left of the change.
Chapter 1. Introduction

Upgrading to a new release of z/OS is usually a two-stage process:

- **Stage 1: Migration.** 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.

- **Stage 2: Exploitation.** During this stage you do whatever customizing and programming are necessary to take advantage of (exploit) the enhancements available in the new release.

This document describes what you must do to migrate from either of the two releases that are supported for direct migration to z/OS V1R13:

- z/OS V1R12
- z/OS V1R11

If you want to migrate to z/OS V1R13 from any other release, contact your IBM representative to find out if there are alternatives available.

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:


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 V1R13. 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 V1R13. (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 V1R13.

   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 V1R13 system. (See “Install coexistence and fallback PTFs” on page 8.) This service needs to be installed on all systems that will coexist with z/OS V1R13 and all systems that will be migrated to z/OS V1R13 (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 V1R13. 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 V1R13**. (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 V1R13 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 V1R13**. (Again, not all of the actions are required. Some depend on your environment, configuration, and workload, and are identified accordingly.)

   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 V1R13 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 V1R12 or z/OS V1R11 exploit the functions introduced in z/OS V1R13.

11. Deploy this exploitation on other systems (again within a sysplex, data center, and eventually enterprise).

### 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.

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 **ZOSMIGVvRrr_component_program_name** (or, for ICSF, **ICSFMIGnnnn_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, refer to "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.

As stated previously, 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 shown below.

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 prior to 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 V1R11 to z/OS V1R13 you need to activate the migration checks for changes that occurred in both z/OS V1R12 and z/OS V1R13. If you are migrating from z/OS V1R12 to z/OS V1R13, you only need to activate the migration checks for changes that occurred in z/OS V1R13. 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*,ZOSMIGV1R12)

   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 ZOSMIGVvvvrrr). Use a wildcard filter that includes the intended migration checks.

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 prior to 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*,ICSFMIG*)`
- `F HZSPROC,DEACTIVATE,CHECK=(IBM*,ZOSMIGV1R12)`

After you have migrated to the new z/OS 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](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 V1R11 to z/OS V1R13, you need to activate the migration checks for changes that occurred in both z/OS V1R12 and z/OS V1R13. If you are migrating from z/OS V1R12 to z/OS V1R13, you only need to activate the migration checks for changes that occurred in z/OS V1R13. 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*,ICSFMIG*)`
   - `F HZSPROC,ACTIVATE,CHECK=(IBM*,ZOSMIGV1R12)`

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*,ICSFMIG*)`
   - `F HZSPROC,DEACTIVATE,CHECK=(IBM*,ZOSMIGV1R12)`

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.
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](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.

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/](http://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](http://www.ibm.com/systems/z/os/zos/zosmf/).

Elements and features that do not have migration actions

The following z/OS V1R13 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® BUILD
- BookManager READ
- CIM
- Communications Server Security Level 3
- EREP
- ESCON® Director Support
- FFST
- GDDM
- GDDM-PGF
- GDDM-REXX
- HCD
- HCM
- HLASM
- HLASM Toolkit
- IBM HTTP Server
- ICKDSF
- Integrated Security Services
- Metal C Runtime Library
- MICR/OCR
- NFS
- Run-Time Library Extensions
- TIOC
- z/OS IBM TDS
- z/OS Security Level 3
- 3270 PC File Transfer Program
Chapter 2. Migration actions for everyone

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Use z/SoftCap to identify the effect of capacity changes ........................................... 8
Stop using Computing Environment (DCE) and DCE Security Server ......................... 9
Add or change volumes to keep your z/OS root file system in a single data set ............... 10
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Upgrade Windows 2000, 98, 95, and NT clients .................................................. 15
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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 V1R13

This topic describes general migration actions that you can perform on your current (old) system. You do not need the z/OS V1R13 level of code to make these changes, and the changes do not require the z/OS V1R13 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).

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>Multiple.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>General migration action not tied to a specific release.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before installing z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
</tbody>
</table>
Steps to take:

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 V1R13 and its servers. The z/OS V1R13 upgrade is ZOSV1R13; the server upgrades are shown in Table 1.
   - 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. Note that 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.

<table>
<thead>
<tr>
<th>Server</th>
<th>Upgrade</th>
<th>FIXCAT value</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM zEnterprise zEC12</td>
<td>2827DEVICE</td>
<td>IBM.Device.Server.zEC12-2827</td>
</tr>
<tr>
<td>z196</td>
<td>2817DEVICE</td>
<td>IBM.Device.Server.z196-2817</td>
</tr>
<tr>
<td>z114</td>
<td>2818DEVICE</td>
<td>IBM.Device.Server.z114-2818</td>
</tr>
<tr>
<td>z10 EC</td>
<td>2097DEVICE</td>
<td>IBM.Device.Server.z10-EC-2097</td>
</tr>
<tr>
<td>z10 BC</td>
<td>2098DEVICE</td>
<td>IBM.Device.Server.z10-BC-2098</td>
</tr>
<tr>
<td>z9 EC</td>
<td>2094DEVICE</td>
<td>IBM.Device.Server.z9-EC-2094</td>
</tr>
<tr>
<td>z9 BC</td>
<td>2096DEVICE</td>
<td>IBM.Device.Server.z9-BC-2096</td>
</tr>
<tr>
<td>z990</td>
<td>2084DEVICE</td>
<td>IBM.Device.Server.z990-2084</td>
</tr>
<tr>
<td>z890</td>
<td>2086DEVICE</td>
<td>IBM.Device.Server.z890-2086</td>
</tr>
<tr>
<td>z900</td>
<td>2064DEVICE</td>
<td>IBM.Device.Server.z900-2064</td>
</tr>
<tr>
<td>z800</td>
<td>2066DEVICE</td>
<td>IBM.Device.Server.z800-2066</td>
</tr>
</tbody>
</table>


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.)

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

Install coexistence and fallback PTFs

Description: Coexistence and fallback PTFs installed on pre-z/OS V1R13 systems allow those systems to coexist with z/OS V1R13 systems during your migration, and allow backout from z/OS V1R13 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 V1R13 using rolling IPLs (one system at a
time), allowing for continuous application availability.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>Multiple.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>General migration action not tied to a specific release.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before installing z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>Install the appropriate PTFs.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>None.</td>
</tr>
</tbody>
</table>

**Steps to take:** Before introducing z/OS V1R13 into your environment, install coexistence and fallback PTFs on all pre-z/OS V1R13 systems with which your z/OS V1R13 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 V1R13 systems. Use your normal service acquisition portals or download the HOLDDATA directly from [http://service.software.ibm.com/holdata/390holddata.html](http://service.software.ibm.com/holdata/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 V1R13 systems and specify a Fix Category (FIXCAT) value of “IBM.Coexistence.z/OS.V1R13”. The report will identify any missing coexistence and fallback PTFs for that system. For complete information about the REPORT MISSINGFIX command, see [SMP/E Commands](http://www.ibm.com/servers/eserver/zseries/zos/bkserv/smpย์e.html).

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](http://www.ibm.com/servers/eserver/zseries/zos/bkserv/zosplanningforinstallation.html).

**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.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>Multiple.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>General migration action not tied to a specific release.</td>
</tr>
</tbody>
</table>
**Applies to migration from:** z/OS V1R12 and z/OS V1R11.

**Timing:** Before installing z/OS V1R13.

**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:
- 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:
- 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:**
- Download zSoftCap from one of the following web sites:
- Run zSoftCap to determine your expected increase in CPU utilization (if any) and to identify your storage requirements, such as how much storage is needed to IPL.

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

**Stop using Computing Environment (DCE) and DCE Security Server**

**Description:** Starting with z/OS V1R13, the Distributed Computing Environment (DCE) and DCE Security Server elements of z/OS will no longer be shipped. Any product or application with direct or indirect dependency on either of these DCE elements of z/OS needs to be migrated to another solution.

- DCE includes the following interfaces that other products or applications depend on:
  - DCE RPC (DCE Remote Procedure Call)
  - CDS (DCE Cell Directory Service)
- DTS (DCE Distributed Time Service)
- DCE Threads Service
- IDL (Interface Definition Language – part of RPC, but widely used)

Other products known to depend on DCE interfaces include the following:
- The DCE Security Server
- DFS (Distributed File Service)
- DCE Application Support Server (no longer supported; used IDL and RPC Runtime to interface with back ends like CICS®, IMS™, OTMA, etc.)

<table>
<thead>
<tr>
<th>Element or feature</th>
<th>Multiple.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced</td>
<td>z/OS V1R13 (previewed in z/OS V1R12 Software Announcement 210-235, dated July 22, 2010).</td>
</tr>
<tr>
<td>Applies to migration from</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing</td>
<td>Before installing z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes.</td>
</tr>
<tr>
<td>Target system hardware requirements</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check</td>
<td>ZOSMIGREC_SMB_RPC available in APAR OA30117.</td>
</tr>
</tbody>
</table>

Steps to take:
- Look for:
  - DCEKERN started task is necessary for your product or application to work, or
  - DCE API function calls are made by your product or application, including calls to the RPC Runtime.
- Then migrate:
  - All dependencies on any DCE technology to an equivalent offering from another product (IBM WebSphere® Application Server, the IBM Network Authentication Service, or the IBM Directory Server). For more information, see the Redbooks® DCE Replacement Strategies at [http://www.redbooks.ibm.com/redbooks/pdfs/sg246935.pdf](http://www.redbooks.ibm.com/redbooks/pdfs/sg246935.pdf).

Deleting DCE-related userids: The DCE-related userids are safe to delete, if you are not using DCE on a lower level z/OS system that shares the same security (RACF) database, or on some other system in the RRSF network if the automatic command direction for those ids is active for the USER class. This condition applies to any STARTED profile. Note that Distributed File Service Server Message Block (SMB) or another product might be using the DCE segment defined in the security (RACF) database so you should not remove that segment, unless you are sure it is not being used by any service or product.
Considerations for a RACF userid that was associated with the DCEKERN address space: In previous releases of z/OS, you needed to ensure that the following conditions were in effect for the z/OS user ID under which DCE was to be started:

- A DCE segment did not exist for that user in the RACF profile.
- The AUTOLOGIN variable in the DCE segment was set to NO.

This was necessary whether the server was started by batch job or by a procedure. Configuring the user ID differently could have produced unpredictable results when the server was started.

In this release, you can eliminate the RACF userid associated with DCEKERN if the userid is not used for any other purpose. Also, check to determine if the userid had any DCE daemons running in an address space other than that of the main DCEKERN (for example, the DCE Security Server address space if it was run in a separate job). You can most likely eliminate the user under which the DCE Security Server runs as long as it is not used for any other purpose.

Considerations for a RACF userid that was associated with the DCECONF utility: You can also eliminate the userid that executed the DCECONF (configuration) utility as long as that userid is not used for any other purpose. (The administrator of the DCECONF utility was probably given a superuser ID. In z/OS UNIX system Services, the superuser or root has a user identifier (UID) of zero (0). A user can be given superuser privileges by specifying zero in the UID parameter of the ADDUSER or ALTUSER commands. Before this release, the DCECONF administrator required update authority to the DCEKERN.START.REQUEST Security Facility. This facility was created during the installation of z/OS DCE and determined if a TSO user had the necessary permissions to start or stop the z/OS DCE daemons in the DCEKERN address space. For information, see z/OS Program Directory.)

Considerations for RACF users that were created by DCE interoperability: DCE also provided a mechanism to allow for single signon/interoperability to map a DCE user (principal) with a RACF user and create a DCE segment for the RACF user. This interoperability information was defined in the DCE segment in RACF so you can look for any RACF users with a DCE segment. Check those DCE segments to see if they might have another function other than that for DCE. If not, you can delete those RACF users.


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. As of z/OS V1R10, the size of the z/OS root file system, whether HFS or zFS, was approximately 3100 cylinders on a 3390 Direct Access Storage Device. This is close to 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.

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

### Applies to migration from:
z/OS V1R12 and z/OS V1R11.

### Timing:
Before installing z/OS V1R13.

### 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. This capability is available in z/OS V1R11 with PTF UA49363 (APAR OA28684) installed.

### 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.

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.

Beginning with z/OS V1R11 ServerPac, the default device type is changed to 3390-9 instead of 3390-3 in the Modify System Layout panels.

### 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.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>Multiple.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>General migration action not tied to a specific release.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before installing z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>No, but recommended to ensure that you have an adequate number of XCF groups and members formatted in your sysplex couple data sets.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>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.</td>
</tr>
</tbody>
</table>

**Steps to take:**

1. Issue the DISPLAY XCF,COPULLE 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:**
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.

**Stop using Managed System Infrastructure for Setup (msys for Setup) element**

**Description:** Starting in z/OS V1R12, support is withdrawn for Managed System Infrastructure for Setup (msys for Setup). In the future, IBM intends to continue to deliver improvements to help with z/OS setup and configuration.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>Multiple.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R12 (previewed in Announcement Letter Number AP05-1215 dated July 27, 2005).</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before installing z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you use msys for Setup.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>None.</td>
</tr>
</tbody>
</table>

**Steps to take:** Discontinue using msys for Setup for function enablement, setup, or configuration of z/OS.

**Reference information:** For software supported with z/OS, see the software requirements topic in z/OS Planning for Installation.

**Upgrade Windows 2000, 98, 95, and NT clients**

**Description:** z/OS does not support service for client operating systems whose service is withdrawn by the operating system manufacturer. As a result, IBM no longer supports service for clients running Windows 2000, Windows 98, Windows 95, or Windows NT Workstation 4.xx.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>Multiple.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>13 August 2002 in the z/OS V1R4 availability announcement.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before installing z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>No, but recommended because z/OS does not support service for client operating systems whose service is withdrawn by the operating system manufacturer.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
</tbody>
</table>
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.


Reference information: For client software supported with z/OS, see the software requirements topic in z/OS Planning for Installation.

Migration actions for everyone before the first IPL of z/OS V1R13

This topic describes general 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.

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.

Note:

Element or feature: Multiple.

When change was introduced: General migration action not tied to a specific release.

Applies to migration from: z/OS V1R12 and z/OS V1R11.

Timing: Before the first IPL of z/OS V1R13.

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:
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 an z/OS MVS system.

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.

When using unique aliases, remember that you may have to update the security definition for the unique high-level qualifier used in the catalog.

Restrictions: None.

System impacts: None.

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: z/OS V1R13 GTF data cannot be properly formatted on a pre-z/OS V1R13 system. If you attempt to format z/OS V1R13 GTF data with IPCS on a pre-z/OS V1R13 system, the fields will be unusable. Also note that pre-z/OS V1R13 GTF data cannot be properly formatted on a z/OS V1R13 system. You must use z/OS V1R13 IPCS for z/OS V1R13 GTF data and pre-z/OS V1R13 IPCS for pre-z/OS V1R13 GTF data. You cannot merge pre-z/OS V1R13 GTF data with z/OS V1R13 GTF data and expect to format it on any z/OS release. 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

<table>
<thead>
<tr>
<th>DD name</th>
<th>Data set name</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>IATTABL</td>
<td>SYS1.SIATTBL0, if applicable</td>
<td>This is a JES3 data set. If you use JES3, ensure that this data set corresponds to the level of JES3 that you are running with z/OS V1R13.</td>
</tr>
</tbody>
</table>
Table 2. IPCS data set requirements for a logon procedure or DD name allocation (continued)

<table>
<thead>
<tr>
<th>DD name</th>
<th>Data set name</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPCSPARM</td>
<td>SYS1.PARMLIB</td>
<td>This is the data set that contains all the shipped z/OS V1R13 parmlib IPCS members. If the copies of BLSCECT and all the other IPCS members are not at z/OS V1R13 level, then IPCS might fail when you attempt to use it.</td>
</tr>
<tr>
<td></td>
<td>SYS1.SHASPARM, if applicable</td>
<td>This is a JES2 data set. If you use JES2, ensure that this data set corresponds to the level of JES2 that you are running with z/OS V1R13.</td>
</tr>
<tr>
<td></td>
<td>SYS1.SIATPARM, if applicable</td>
<td>This is a JES3 data set. If you use JES3, ensure that this data set corresponds to the level of JES3 that you are running with z/OS V1R13.</td>
</tr>
<tr>
<td>ISPMLIB</td>
<td>SYS1.SBLSMSG0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SYS1.SIATMSG0, if applicable</td>
<td>This is a JES3 data set. If you use JES3, ensure that this data set corresponds to the level of JES3 that you are running with z/OS V1R13.</td>
</tr>
</tbody>
</table>
## Table 2. IPCS data set requirements for a logon procedure or DD name allocation (continued)

<table>
<thead>
<tr>
<th>DD name</th>
<th>Data set name</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISPPLIB</td>
<td>SYS1.SBLSPNL0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SYS1.SHASPNL0, if applicable</td>
<td>This is a JES2 data set. If you use JES2, ensure that this data set corresponds to the level of JES2 that you are running with z/OS V1R13.</td>
</tr>
<tr>
<td></td>
<td>SYS1.SIATPNL0, if applicable</td>
<td>This is a JES3 data set. If you use JES3, ensure that this data set corresponds to the level of JES3 that you are running with z/OS V1R13.</td>
</tr>
<tr>
<td>ISPSLIB</td>
<td>SYS1.SBLSKE10</td>
<td></td>
</tr>
<tr>
<td>ISPTLIB</td>
<td>SYS1.SBLSTBL0</td>
<td></td>
</tr>
<tr>
<td>STEPLIB</td>
<td>SYS1.MIGLIB</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SYS1.SIEAMIGE</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>SYS1.SHASMIG, if applicable</td>
<td>This is a JES2 data set. If you use JES2, ensure that this data set corresponds to the level of JES2 that you are running with z/OS V1R13</td>
</tr>
<tr>
<td></td>
<td>SYS1.SIATMIG, if applicable</td>
<td>This is a JES3 data set. If you use JES3, ensure that this data set corresponds to the level of JES3 that you are running with z/OS V1R13</td>
</tr>
<tr>
<td>SYSEXEC</td>
<td>SYS1.SIATCLI0, if applicable</td>
<td>This is a JES3 data set. If you use JES3, ensure that this data set corresponds to the level of JES3 that you are running with z/OS V1R13</td>
</tr>
<tr>
<td>SYSPROC</td>
<td>SYS1.SBLSCLI0</td>
<td></td>
</tr>
</tbody>
</table>

### Reference 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 V1R13 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 V1R12 and z/OS V1R11.
- **Timing:** Before the first IPL of z/OS V1R13.
- **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:**
- For parmlib, add the data set pointed to by the z/OS V1R13 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). See “Provide the migrate or new parameter when running the PFA install script” on page 138.
- CIM.
- Communications Server (IP Services component). See "IP Services: Update /etc configuration files" on page 186.
- 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 265.
- Library Server. See "Library Server actions to perform before the first IPL of z/OS V1R13" on page 293.
- z/OS UNIX.

The following elements and features use /var:
- Cryptographic Services (OCSF component). See "OCSF: Migrate the directory structure" on page 198.
- 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 265.

During installation, subdirectories of /etc and /var are created. If you install z/OS using ServerPac or SystemPac®, some files are loaded into /etc and /var because of the customization performed in ServerPac and SystemPac. 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 V1R13 /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 V1R13 requirements.

<table>
<thead>
<tr>
<th>Element or feature</th>
<th>Multiple.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced</td>
<td>General migration action not tied to a specific release.</td>
</tr>
<tr>
<td>Applies to migration from</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>None.</td>
</tr>
</tbody>
</table>
Steps to take: Copy files from your old system to the z/OS V1R13 /etc and /var subdirectories, and then modify the files as necessary to reflect z/OS V1R13 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 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:

```sh
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:

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

  ```sh
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.

<table>
<thead>
<tr>
<th>Element or feature</th>
<th>Multiple.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced</td>
<td>General migration action not tied to a specific release.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you use automation programs or other procedures to handle messages.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>None.</td>
</tr>
</tbody>
</table>

**Steps to take:** Review the lists of changed and deleted messages at [Summary of message changes 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:

- “Update automation that handles messages IEF374I and IEF376I” on page 134
- “Modify automation that references output from D XCF,SYSPLEX console commands” on page 126
- “Update automation for changed DFSORT messages” on page 245
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.
- Updates to default modules to set site defaults differently than the IBM-supplied defaults, such as for the following element and features:
  - C/C++ without Debug Tool.
  - 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. Also consider using the CEEPRMxx parmlib member, introduced in z/OS V1R7, to eliminate the assembler language runtime option modules. As of the next release of z/OS there is no longer any support for the SMP/E USERMOD for customizing the LE Run-time options.
  - SDSF (ISFPARMS customization). See Use dynamic statements for ISFPARMS to avoid reassembly on page 300 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.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>Multiple.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>General migration action not tied to a specific release.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you made any user modifications.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
</tbody>
</table>
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:
- 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.

Reconnect non-IBM products

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

<table>
<thead>
<tr>
<th>Element or feature</th>
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</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced</td>
<td>General migration action not tied to a specific release.</td>
</tr>
<tr>
<td>Applies to migration from</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you use any ISV products and need to reconnect them after performing a ServerPac or SystemPac installation.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
</tbody>
</table>
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 or SystemPac.

Reference 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.

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 V1R12 and z/OS V1R11.
Timing: Before the first IPL of z/OS V1R13.
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 coexistence 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.

Reference information: Subsystem program directories.
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.

<table>
<thead>
<tr>
<th>Element or feature</th>
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</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced</td>
<td>General migration action not tied to a specific release.</td>
</tr>
<tr>
<td>Applies to migration from</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>None.</td>
</tr>
</tbody>
</table>

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 44.
- 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 V1R12 and z/OS V1R11.

Timing: Before the first IPL of z/OS V1R13.

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 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 prior to 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. (Prior to 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.
Reference 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 a 64-bit Environment - V1 at [http://www.ibm.com/support/techdocs](http://www.ibm.com/support/techdocs) (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](http://www.ibm.com/support/mount/tex).  
- For more information about the HONORIEFUSIREGION keyword, see [z/OS MVS Initialization and Tuning Reference](http://www.ibm.com/support/mount/tex).

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.

<table>
<thead>
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<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>None.</td>
</tr>
</tbody>
</table>

**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](http://www.ibm.com/support/mount/tex) and Washington Systems Center flash 10165 at [http://www.ibm.com/support/techdocs](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 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

The checks that were changed by IBM in z/OS V1R12 are:

- USS_PARMLIB
- ZOSMIGREC_ROOT_FS_SIZE (introduced by APAR OA28684 for z/OS V1R9, V1R10 and V1R11)

<table>
<thead>
<tr>
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<tr>
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<td>Applies to migration from</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>No, but recommended to ensure that your checks continue to work as you intend them to work.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>See Steps to take: below.</td>
</tr>
</tbody>
</table>

### Steps to take:
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 HZSPRM:xx 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.

<table>
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</tr>
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<td>When change was introduced</td>
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</tr>
<tr>
<td>Timing</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
</tbody>
</table>
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 Table 3 as a guide, remove data sets and paths that do not exist in the current release. 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 table, the data sets are identified as distribution library (DLIB) data sets or target library data sets.

Notes:
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.

Table 3. Data sets and paths deleted from z/OS V1R13 and z/OS V1R12 (in alphabetic order by DDDEF name)

<table>
<thead>
<tr>
<th>DDDEF</th>
<th>Data set name or path (high-level qualifiers are defaults)</th>
<th>DLIB or target</th>
<th>From element or feature</th>
<th>When deleted</th>
<th>Why deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACIMHFS</td>
<td>CIM.ACIMHFS</td>
<td>DLIB</td>
<td>msys for Setup</td>
<td>z/OS V1R12</td>
<td>msys for Setup removed from z/OS</td>
</tr>
<tr>
<td>ACIMMOD1</td>
<td>CIM.ACIMMOD1</td>
<td>DLIB</td>
<td>msys for Setup</td>
<td>z/OS V1R12</td>
<td>msys for Setup removed from z/OS</td>
</tr>
<tr>
<td>ACIMPLUG</td>
<td>CIM.ACIMPLUG</td>
<td>DLIB</td>
<td>msys for Setup</td>
<td>z/OS V1R12</td>
<td>msys for Setup removed from z/OS</td>
</tr>
<tr>
<td>ABPAHFS</td>
<td>BPA.ABPAHFS</td>
<td>DLIB</td>
<td>z/OS UNIX System Services</td>
<td>z/OS V1R13</td>
<td>z/OS UNIX System Services Connection Manager removed from z/OS</td>
</tr>
<tr>
<td>ACMXDBRM</td>
<td>CMX.ACMXDBRM</td>
<td>DLIB</td>
<td>z/OS UNIX System Services</td>
<td>z/OS V1R13</td>
<td>z/OS UNIX System Services Connection Manager removed from z/OS</td>
</tr>
</tbody>
</table>
Table 3. Data sets and paths deleted from z/OS V1R13 and z/OS V1R12 (in alphabetic order by DDDEF name) (continued)

<table>
<thead>
<tr>
<th>DDDEF</th>
<th>Data set name or path (high-level qualifiers are defaults)</th>
<th>DLIB or target</th>
<th>From element or feature</th>
<th>When deleted</th>
<th>Why deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACMXHFS</td>
<td>CMX.ACMXHFS</td>
<td>DLIB</td>
<td>z/OS UNIX System Services</td>
<td>z/OS V1R13</td>
<td>z/OS UNIX System Services Connection Manager removed from z/OS</td>
</tr>
<tr>
<td>ACUNIMG</td>
<td>SYS1.ACUNIMG</td>
<td>DLIB</td>
<td>BCP</td>
<td>z/OS V1R12</td>
<td>Unicode Services will no longer ship the pre-built image SYS1.ACUNIMG</td>
</tr>
<tr>
<td>AEUVACF</td>
<td>EUV.AEUVACF</td>
<td>DLIB</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see “Stop using Computing Environment (DCE) and DCE Security Server” on page 10.</td>
</tr>
<tr>
<td>AEUVDBRM</td>
<td>EUV.AEUVDBRM</td>
<td>DLIB</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see “Stop using Computing Environment (DCE) and DCE Security Server” on page 10.</td>
</tr>
<tr>
<td>AEUVEXEC</td>
<td>EUV.AEUVEXEC</td>
<td>DLIB</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see “Stop using Computing Environment (DCE) and DCE Security Server” on page 10.</td>
</tr>
<tr>
<td>AEUVEXP</td>
<td>EUV.AEUVEXP</td>
<td>DLIB</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see “Stop using Computing Environment (DCE) and DCE Security Server” on page 10.</td>
</tr>
</tbody>
</table>
Table 3. Data sets and paths deleted from z/OS V1R13 and z/OS V1R12 (in alphabetic order by DDDEF name) (continued)

<table>
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<tr>
<th>DDDEF</th>
<th>Data set name or path (high-level qualifiers are defaults)</th>
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<th>When deleted</th>
<th>Why deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>AEUVHDR</td>
<td>EUV.AEUVHDR</td>
<td>DLIB</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see “Stop using Computing Environment (DCE) and DCE Security Server” on page 10.</td>
</tr>
<tr>
<td>AEUVHDRK</td>
<td>EUV.AEUVHDRK</td>
<td>DLIB</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see “Stop using Computing Environment (DCE) and DCE Security Server” on page 10.</td>
</tr>
<tr>
<td>AEUVHDCP</td>
<td>EUV.AEUVHDCP</td>
<td>DLIB</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see “Stop using Computing Environment (DCE) and DCE Security Server” on page 10.</td>
</tr>
<tr>
<td>AEUVHETC</td>
<td>EUV.AEUVHETC</td>
<td>DLIB</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see “Stop using Computing Environment (DCE) and DCE Security Server” on page 10.</td>
</tr>
<tr>
<td>AEUVHINC</td>
<td>EUV.AEUVHINC</td>
<td>DLIB</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see “Stop using Computing Environment (DCE) and DCE Security Server” on page 10.</td>
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Table 3. Data sets and paths deleted from z/OS V1R13 and z/OS V1R12 (in alphabetic order by DDDEF name) (continued)

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<th>DDDEF</th>
<th>Data set name or path (high-level qualifiers are defaults)</th>
<th>DLIB or target</th>
<th>From element or feature</th>
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<th>Why deleted</th>
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<tbody>
<tr>
<td>AEUVHJPN</td>
<td>EUV.AEUVHJPN</td>
<td>DLIB</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see &quot;Stop using Computing Environment (DCE) and DCE Security Server&quot; on page 10.</td>
</tr>
<tr>
<td>AEUVHLBR</td>
<td>EUV.AEUVHLBR</td>
<td>DLIB</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see &quot;Stop using Computing Environment (DCE) and DCE Security Server&quot; on page 10.</td>
</tr>
<tr>
<td>AEUVHTCL</td>
<td>EUV.AEUVHTCL</td>
<td>DLIB</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see &quot;Stop using Computing Environment (DCE) and DCE Security Server&quot; on page 10.</td>
</tr>
<tr>
<td>AEUVHXMP</td>
<td>EUV.AEUVHXMP</td>
<td>DLIB</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see &quot;Stop using Computing Environment (DCE) and DCE Security Server&quot; on page 10.</td>
</tr>
<tr>
<td>AEUVIDL</td>
<td>EUV.AEUVIDL</td>
<td>DLIB</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see &quot;Stop using Computing Environment (DCE) and DCE Security Server&quot; on page 10.</td>
</tr>
</tbody>
</table>
Table 3. Data sets and paths **deleted** from z/OS V1R13 and z/OS V1R12 (in alphabetic order by DDDEF name) (continued)

<table>
<thead>
<tr>
<th>DDDEF</th>
<th>Data set name or path (high-level qualifiers are defaults)</th>
<th>DLIB or target</th>
<th>From element or feature</th>
<th>When deleted</th>
<th>Why deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>AEUVLIB</td>
<td>EUV.AEUVLIB</td>
<td>DLIB</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see “Stop using Computing Environment (DCE) and DCE Security Server” on page 10.</td>
</tr>
<tr>
<td>AEUVLIBK</td>
<td>EUV.AEUVLIBK</td>
<td>DLIB</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see “Stop using Computing Environment (DCE) and DCE Security Server” on page 10.</td>
</tr>
<tr>
<td>AEUVLIBS</td>
<td>EUV.AEUVLIBS</td>
<td>DLIB</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see “Stop using Computing Environment (DCE) and DCE Security Server” on page 10.</td>
</tr>
<tr>
<td>AEUVLINK</td>
<td>EUV.AEUVLINK</td>
<td>DLIB</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see “Stop using Computing Environment (DCE) and DCE Security Server” on page 10.</td>
</tr>
<tr>
<td>AEUVMMSG</td>
<td>EUV.AEUVMMSG</td>
<td>DLIB</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see “Stop using Computing Environment (DCE) and DCE Security Server” on page 10.</td>
</tr>
</tbody>
</table>
Table 3. Data sets and paths deleted from z/OS V1R13 and z/OS V1R12 (in alphabetic order by DDDEF name) (continued)

<table>
<thead>
<tr>
<th>DDDEF</th>
<th>Data set name or path (high-level qualifiers are defaults)</th>
<th>DLIB or target</th>
<th>From element or feature</th>
<th>When deleted</th>
<th>Why deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>AEUVMSGJ</td>
<td>EUV.AEUVMSGJ</td>
<td>DLIB</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see &quot;Stop using Computing Environment (DCE) and DCE Security Server&quot; on page 10.</td>
</tr>
<tr>
<td>AEUVPNL</td>
<td>EUV.AEUVPNL</td>
<td>DLIB</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see &quot;Stop using Computing Environment (DCE) and DCE Security Server&quot; on page 10.</td>
</tr>
<tr>
<td>AEUVPNLIJ</td>
<td>EUV.AEUVPNLIJ</td>
<td>DLIB</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see &quot;Stop using Computing Environment (DCE) and DCE Security Server&quot; on page 10.</td>
</tr>
<tr>
<td>AEUVPRC</td>
<td>EUV.AEUVPRC</td>
<td>DLIB</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see &quot;Stop using Computing Environment (DCE) and DCE Security Server&quot; on page 10.</td>
</tr>
<tr>
<td>AIOELMOD</td>
<td>IOE.AIIOELMOD</td>
<td>DLIB</td>
<td>DFS</td>
<td>z/OS V1R13</td>
<td>No load modules are installed in these libraries as of z/OS V1R13.</td>
</tr>
<tr>
<td>AIOEMSGE</td>
<td>IOE.AIIOEMSGE</td>
<td>DLIB</td>
<td>DFS</td>
<td>z/OS V1R13</td>
<td>English message library is no longer provided as of z/OS V1R13.</td>
</tr>
<tr>
<td>AIOEMSGJ</td>
<td>IOE.AIIOEMSGJ</td>
<td>DLIB</td>
<td>DFS</td>
<td>z/OS V1R13</td>
<td>Japanese message library is no longer provided in z/OS V1R13.</td>
</tr>
<tr>
<td>AIOEPNLE</td>
<td>IOE.AIIOEPNLE</td>
<td>DLIB</td>
<td>DFS</td>
<td>z/OS V1R13</td>
<td>English panel library is no longer provided in z/OS V1R13.</td>
</tr>
</tbody>
</table>
Table 3. Data sets and paths deleted from z/OS V1R13 and z/OS V1R12 (in alphabetic order by DDDEF name) (continued)

<table>
<thead>
<tr>
<th>DDDEF</th>
<th>Data set name or path (high-level qualifiers are defaults)</th>
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<th>When deleted</th>
<th>Why deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIOEPNLJ</td>
<td>IOE.AIOEPNLJ</td>
<td>DLIB</td>
<td>DFS</td>
<td>z/OS V1R13</td>
<td>Japanese panel library is not provided in z/OS V1R13.</td>
</tr>
<tr>
<td>SBPABIN</td>
<td>/usr/lpp/bpa/bin/IBM/</td>
<td>Target</td>
<td>z/OS UNIX System Services</td>
<td>z/OS V1R13</td>
<td>z/OS UNIX System Services Connection Manager removed from z/OS.</td>
</tr>
<tr>
<td>SBPAINC</td>
<td>/usr/lpp/bpa/include/IBM/</td>
<td>Target</td>
<td>z/OS UNIX System Services</td>
<td>z/OS V1R13</td>
<td>z/OS UNIX System Services Connection Manager removed from z/OS.</td>
</tr>
<tr>
<td>SBPALIB</td>
<td>/usr/lpp/bpa/lib/IBM/</td>
<td>Target</td>
<td>z/OS UNIX System Services</td>
<td>z/OS V1R13</td>
<td>z/OS UNIX System Services Connection Manager removed from z/OS.</td>
</tr>
<tr>
<td>SBPAMSC</td>
<td>/usr/lpp/bpa/nls/msg/C/IBM/</td>
<td>Target</td>
<td>z/OS UNIX System Services</td>
<td>z/OS V1R13</td>
<td>z/OS UNIX System Services Connection Manager removed from z/OS.</td>
</tr>
<tr>
<td>SBPAMJPN</td>
<td>/usr/lpp/bpa/nls/msg/Ja_JP/IBM/</td>
<td>Target</td>
<td>z/OS UNIX System Services</td>
<td>z/OS V1R13</td>
<td>z/OS UNIX System Services Connection Manager removed from z/OS.</td>
</tr>
<tr>
<td>SBPASAMP</td>
<td>/usr/lpp/bpa/samples/IBM/</td>
<td>Target</td>
<td>z/OS UNIX System Services</td>
<td>z/OS V1R13</td>
<td>z/OS UNIX System Services Connection Manager removed from z/OS.</td>
</tr>
<tr>
<td>SCEEUMAP</td>
<td>CEE.SCEEUMAP</td>
<td>Target</td>
<td>Language Environment</td>
<td>z/OS V1R12</td>
<td>The SCEEUMAP data set will no longer be shipped.</td>
</tr>
<tr>
<td>SCIMLIB</td>
<td>/usr/lpp/cim/lib/IBM/</td>
<td>Target</td>
<td>msys for Setup</td>
<td>z/OS V1R12</td>
<td>msys for Setup removed from z/OS</td>
</tr>
<tr>
<td>SCIMBIN</td>
<td>/usr/lpp/cim/bin/IBM/</td>
<td>Target</td>
<td>msys for Setup</td>
<td>z/OS V1R12</td>
<td>msys for Setup removed from z/OS</td>
</tr>
<tr>
<td>SCIMPWS</td>
<td>/usr/lpp/cim/IBM/</td>
<td>Target</td>
<td>msys for Setup</td>
<td>z/OS V1R12</td>
<td>msys for Setup removed from z/OS</td>
</tr>
<tr>
<td>SCIMPLUG</td>
<td>/usr/lpp/cim/plugin/IBM/</td>
<td>Target</td>
<td>msys for Setup</td>
<td>z/OS V1R12</td>
<td>msys for Setup removed from z/OS</td>
</tr>
<tr>
<td>SCIMXML</td>
<td>CIM.SCIMXML</td>
<td>Target</td>
<td>msys for Setup</td>
<td>z/OS V1R12</td>
<td>msys for Setup removed from z/OS</td>
</tr>
<tr>
<td>SCMXBIN</td>
<td>/usr/lpp/cmx/bin/IBM/</td>
<td>Target</td>
<td>z/OS UNIX System Services</td>
<td>z/OS V1R13</td>
<td>z/OS UNIX System Services Connection Manager removed from z/OS.</td>
</tr>
<tr>
<td>SCMXDBRM</td>
<td>CMX.SCMXDBRM</td>
<td>Target</td>
<td>z/OS UNIX System Services</td>
<td>z/OS V1R13</td>
<td>z/OS UNIX System Services Connection Manager removed from z/OS.</td>
</tr>
</tbody>
</table>
Table 3. Data sets and paths deleted from z/OS V1R13 and z/OS V1R12 (in alphabetic order by DDDEF name) (continued)

<table>
<thead>
<tr>
<th>DDDEF</th>
<th>Data set name or path (high-level qualifiers are defaults)</th>
<th>DLIB or target</th>
<th>From element or feature</th>
<th>When deleted</th>
<th>Why deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCMXINC</td>
<td>/usr/lpp/cmx/include/IBM/</td>
<td>Target</td>
<td>z/OS UNIX System Services</td>
<td>z/OS V1R13</td>
<td>z/OS UNIX System Services Connection Manager removed from z/OS.</td>
</tr>
<tr>
<td>SCMXLIB</td>
<td>/usr/lpp/cmx/lib/IBM/</td>
<td>Target</td>
<td>z/OS UNIX System Services</td>
<td>z/OS V1R13</td>
<td>z/OS UNIX System Services Connection Manager removed from z/OS.</td>
</tr>
<tr>
<td>SCXMJPN</td>
<td>/usr/lpp/cmx/nls/msg/Ja_JP/IBM/</td>
<td>Target</td>
<td>z/OS UNIX System Services</td>
<td>z/OS V1R13</td>
<td>z/OS UNIX System Services Connection Manager removed from z/OS.</td>
</tr>
<tr>
<td>SCXMSC</td>
<td>/usr/lpp/cmx/nls/msg/C/IBM/</td>
<td>Target</td>
<td>z/OS UNIX System Services</td>
<td>z/OS V1R13</td>
<td>z/OS UNIX System Services Connection Manager removed from z/OS.</td>
</tr>
<tr>
<td>SCXSAMP</td>
<td>/usr/lpp/cmx/samples/IBM/</td>
<td>Target</td>
<td>z/OS UNIX System Services</td>
<td>z/OS V1R13</td>
<td>z/OS UNIX System Services Connection Manager removed from z/OS.</td>
</tr>
<tr>
<td>SCUNIMG</td>
<td>SYS1.SCUNIMG</td>
<td>Target</td>
<td>BCP</td>
<td>z/OS V1R12</td>
<td>Unicode Services will no longer ship the pre-built image SYS1.SCUNIMG. See “Remove reference to Unicode Services pre-built image CUNIDHC2” on page 140 for more information.</td>
</tr>
<tr>
<td>SEUVACF</td>
<td>EUV.SEUVACF</td>
<td>Target</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see “Stop using Computing Environment (DCE) and DCE Security Server” on page 10.</td>
</tr>
<tr>
<td>SEUVDBRM</td>
<td>EUV.SEUVDBRM</td>
<td>Target</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see “Stop using Computing Environment (DCE) and DCE Security Server” on page 10.</td>
</tr>
<tr>
<td>DDDEF</td>
<td>Data set name or path (high-level qualifiers are defaults)</td>
<td>DLIB or target</td>
<td>From element or feature</td>
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</tr>
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<td>----------------------------------------------------------</td>
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</tr>
<tr>
<td>SEUVEXEC</td>
<td>EUV:SEUVEXEC</td>
<td>Target</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see &quot;Stop using Computing Environment (DCE) and DCE Security Server&quot; on page 10.</td>
</tr>
<tr>
<td>SEUVEXP</td>
<td>EUV:SEUVEXP</td>
<td>Target</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see &quot;Stop using Computing Environment (DCE) and DCE Security Server&quot; on page 10.</td>
</tr>
<tr>
<td>SEUVHBIN</td>
<td>/usr/lpp/dce/bin/IBM/</td>
<td>Target</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see &quot;Stop using Computing Environment (DCE) and DCE Security Server&quot; on page 10.</td>
</tr>
<tr>
<td>SEUVHDCP</td>
<td>/usr/lpp/dce/dcecp/IBM/</td>
<td>Target</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see &quot;Stop using Computing Environment (DCE) and DCE Security Server&quot; on page 10.</td>
</tr>
<tr>
<td>SEUVHDR</td>
<td>EUV:SEUVHDR</td>
<td>Target</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see &quot;Stop using Computing Environment (DCE) and DCE Security Server&quot; on page 10.</td>
</tr>
</tbody>
</table>
### Table 3. Data sets and paths deleted from z/OS V1R13 and z/OS V1R12 (in alphabetic order by DDDEF name) (continued)

<table>
<thead>
<tr>
<th>DDDEF</th>
<th>Data set name or path (high-level qualifiers are defaults)</th>
<th>DLIB or target</th>
<th>From element or feature</th>
<th>When deleted</th>
<th>Why deleted</th>
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</thead>
<tbody>
<tr>
<td>SEUVHDRK</td>
<td>EUV.SEUVHDRK</td>
<td>Target</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see &quot;Stop using Computing Environment (DCE) and DCE Security Server&quot; on page 10.</td>
</tr>
<tr>
<td>SEUVHETC</td>
<td>/usr/lpp/dce/etc/IBM/</td>
<td>Target</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see &quot;Stop using Computing Environment (DCE) and DCE Security Server&quot; on page 10.</td>
</tr>
<tr>
<td>SEUVHINC</td>
<td>/usr/lpp/dce/share/include/IBM/</td>
<td>Target</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see &quot;Stop using Computing Environment (DCE) and DCE Security Server&quot; on page 10.</td>
</tr>
<tr>
<td>SEUVHJPN</td>
<td>/usr/lpp/dce/lib/nls/msg/Ja_JP/IBM/</td>
<td>Target</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see &quot;Stop using Computing Environment (DCE) and DCE Security Server&quot; on page 10.</td>
</tr>
<tr>
<td>SEUVHLBR</td>
<td>/usr/lpp/dce/lib/IBM/</td>
<td>Target</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see &quot;Stop using Computing Environment (DCE) and DCE Security Server&quot; on page 10.</td>
</tr>
</tbody>
</table>
Table 3. Data sets and paths **deleted** from z/OS V1R13 and z/OS V1R12 (in alphabetic order by DDDEF name) (continued)

<table>
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<tr>
<th>DDDEF</th>
<th>Data set name or path (high-level qualifiers are defaults)</th>
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<th>When deleted</th>
<th>Why deleted</th>
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</thead>
<tbody>
<tr>
<td>SEUVHTCL</td>
<td>/usr/lpp/dce/tcl/IBM/</td>
<td>Target</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see “Stop using Computing Environment (DCE) and DCE Security Server” on page 10.</td>
</tr>
<tr>
<td>SEUVHXMP</td>
<td>/usr/lpp/dce/examples/IBM/</td>
<td>Target</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see “Stop using Computing Environment (DCE) and DCE Security Server” on page 10.</td>
</tr>
<tr>
<td>SEUVLIB</td>
<td>EUV:SEUVLIB</td>
<td>Target</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see “Stop using Computing Environment (DCE) and DCE Security Server” on page 10.</td>
</tr>
<tr>
<td>SEUVLIBK</td>
<td>EUV:SEUVLIBK</td>
<td>Target</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see “Stop using Computing Environment (DCE) and DCE Security Server” on page 10.</td>
</tr>
<tr>
<td>SEUVLIBS</td>
<td>EUV:SEUVLIBS</td>
<td>Target</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see “Stop using Computing Environment (DCE) and DCE Security Server” on page 10.</td>
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<tr>
<td>DDDEF</td>
<td>Data set name or path (high-level qualifiers are defaults)</td>
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<td>-------------</td>
</tr>
<tr>
<td>SEUVIDL</td>
<td>EUV.SEUVIDL</td>
<td>Target</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see &quot;Stop using Computing Environment (DCE) and DCE Security Server&quot; on page 10.</td>
</tr>
<tr>
<td>SEUVLINK</td>
<td>EUV.SEUVLINK</td>
<td>Target</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see &quot;Stop using Computing Environment (DCE) and DCE Security Server&quot; on page 10.</td>
</tr>
<tr>
<td>SEUVLPA</td>
<td>EUV.SEUVLPA</td>
<td>Target</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see &quot;Stop using Computing Environment (DCE) and DCE Security Server&quot; on page 10.</td>
</tr>
<tr>
<td>SEUVMSG</td>
<td>EUV.SEUVMSG</td>
<td>Target</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see &quot;Stop using Computing Environment (DCE) and DCE Security Server&quot; on page 10.</td>
</tr>
<tr>
<td>SEUVMSGJ</td>
<td>EUV.SEUVMSGJ</td>
<td>Target</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see &quot;Stop using Computing Environment (DCE) and DCE Security Server&quot; on page 10.</td>
</tr>
<tr>
<td>Code</td>
<td>Description</td>
<td>Type</td>
<td>Environment</td>
<td>Version</td>
<td>Notes</td>
</tr>
<tr>
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<td>---------------------------</td>
<td>--------</td>
<td>-------------</td>
<td>---------</td>
<td>-------</td>
</tr>
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<td>SEUVPNL</td>
<td>EUV.SEUVPNL</td>
<td>Target</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see “Stop using Computing Environment (DCE) and DCE Security Server” on page 10.</td>
</tr>
<tr>
<td>SEUVPNLJ</td>
<td>EUV.SEUVPNLJ</td>
<td>Target</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see “Stop using Computing Environment (DCE) and DCE Security Server” on page 10.</td>
</tr>
<tr>
<td>SEUVPRC</td>
<td>EUV.SEUVPRC</td>
<td>Target</td>
<td>DCE</td>
<td>z/OS V1R13</td>
<td>DCE removed from z/OS. For considerations about safely removing DCE userids, see “Stop using Computing Environment (DCE) and DCE Security Server” on page 10.</td>
</tr>
<tr>
<td>SFOMUCMP</td>
<td>/usr/lib/nls/locale/ucmap/IBM/</td>
<td>Target</td>
<td>Language Environment</td>
<td>z/OS V1R12</td>
<td>HFS directory will no longer be shipped.</td>
</tr>
<tr>
<td>SFOMUCNV</td>
<td>/usr/lib/nls/locale/ucnvtable/IBM/</td>
<td>Target</td>
<td>Language Environment</td>
<td>z/OS V1R12</td>
<td>HFS directory will no longer be shipped.</td>
</tr>
<tr>
<td>SIOELMOD</td>
<td>IOE.SIOELMOD</td>
<td>Target</td>
<td>DFS</td>
<td>z/OS V1R13</td>
<td>No load modules are installed in these libraries as of z/OS V1R13.</td>
</tr>
<tr>
<td>SIOEMSGE</td>
<td>IOE.SIOEMSGE</td>
<td>Target</td>
<td>DFS</td>
<td>z/OS V1R13</td>
<td>English message library is no longer provided as of z/OS V1R13.</td>
</tr>
<tr>
<td>SIOEMSGJ</td>
<td>IOE.SIOEMSGJ</td>
<td>Target</td>
<td>DFS</td>
<td>z/OS V1R13</td>
<td>Japanese message library is no longer provided in z/OS V1R13.</td>
</tr>
<tr>
<td>SIOEPNLE</td>
<td>IOE.SIOEPNLE</td>
<td>Target</td>
<td>DFS</td>
<td>z/OS V1R13</td>
<td>English panel library is no longer provided in z/OS V1R13.</td>
</tr>
<tr>
<td>SIOEPNLJ</td>
<td>IOE.SIOEPNLJ</td>
<td>Target</td>
<td>DFS</td>
<td>z/OS V1R13</td>
<td>Japanese panel library is not provided in z/OS V1R13.</td>
</tr>
</tbody>
</table>
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 V1R12 and z/OS V1R11.

Timing: Before the first IPL of z/OS V1R13.

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 Table 4 on page 45 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 4. Data sets added to z/OS V1R13 and z/OS V1R12 (in alphabetic order by DDDEF name)

<table>
<thead>
<tr>
<th>DDDEF</th>
<th>Data set name (high-level qualifiers are defaults) or path</th>
<th>DLIB or target</th>
<th>To element or feature</th>
<th>When added</th>
<th>Why added</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERBHFS</td>
<td>/usr/lpp/gpm/IBM</td>
<td>Target</td>
<td>RMF</td>
<td>z/OS V1R13.</td>
<td>New RMF file system path for RMF XP.</td>
</tr>
</tbody>
</table>

Reference information: None.

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.

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))

For more information, refer to z/OS RMF User’s Guide.

• 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 131 for more information.

There was one new address space in z/OS V1R12. ARcnRSTy is the address space identifier for full-volume recovery from dump, where n is the DFSMShsm host ID and y is the instance of the DFSMSdss started task (a number from 1 to 4). Data set recovery from dump will still use ARcnREST. See “DFSMShsm: Configure your security system to permit started procedures using new address space identifier” on page 234 for more information.

Element or feature:  
- BCP for HZR.  
- RMF for GPM4CIM.
**When change was introduced:**
- z/OS V1R13 for GPM4CIM and HZR.
- z/OS V1R12 for ARCnRSTy.

**Applies to migration from:**
- z/OS V1R12 and z/OS V1R11

**Timing:**
Before the first IPL of z/OS V1R13.

**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.

**Notes:**
1. A modest overspecification of MAXUSER should not hurt system performance.
2. The number of total address spaces is the sum of M/S, TS USERS, SYSAS, and INITs.
3. If you change your MAXUSER value, you must re-IPL to make the change effective.

**Reference information:**
For more information about the MAXUSER parameter, including its interaction with the RSVSTRT and RSVNONR parameters and factors that contribute to the number of active address spaces, see "statements and parameters for IEASYSxx" in [z/OS MVS Initialization and Tuning Reference](https://www.ibm.com/docs/en/zos?topic=ieasyssxx).

---

**Migration actions for everyone after the first IPL of z/OS V1R13**

None.
Chapter 3. Hardware migration actions

Migrate to an IBM zEnterprise zEC12 server

Description: An IBM zEnterprise zEC12 can include the following in a zEnterprise environment:
- IBM zEnterprise zEC12 server Central Processing Complex (CPC)
- zEnterprise BladeCenter® Extension (zBX) Model 003 with its integrated optimizers or select IBM blades
- zEnterprise Unified Resource Manager (Unified Resource Manager)

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

Recommended migration steps for a System z10 server

Migration and exploitation considerations for System z10 functions

Migrate to a System z9 server

General recommendations and considerations for a System z9 server

Restrictions for a System z9 server

Actions you can take before you order a System z9 server

Actions you can take after you order a System z9 server

Recommended migration steps for a System z9 platform to be discontinued on future servers

Accommodate functions for the System z9 platform to be discontinued on future servers

Migrate to a z990 or z890 server

Actions you can take before you install a z990 or z890 server

Actions you can take when you order a z990 or z890 server

Actions you can take after you install z/OS for a z990 or z890 server

Actions you might need to take once you are using a z990 or z890 server

Replace unsupported devices

Provide for new device installations

Update your CFRM policy with coupling facility structure size changes

Migrate from a Sysplex Timer to STP

Migrate from ICB-4 to Infiniband coupling links

This topic describes hardware migration actions. The information in this topic is not specifically related to migrating to z/OS V1R13; 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).
In a Parallel Sysplex you can include the following servers along with the IBM zEnterprise zEC12:

- zEnterprise servers (z196 or z114)
- z10 EC
- z10 BC servers.

The specific zEC12 functions exploited by z/OS depend on the z/OS release. See Table 5. Availability and other restrictions are noted at the end of the table. PTFs might be required for many of these functions. See “Actions you can take before you order a zEC12 server” on page 54 for information about finding the appropriate PTFs.

**Table 5. New IBM zEnterprise zEC12 server functions supported by z/OS V1R11, z/OS V1R12, and z/OS V1R13**

<table>
<thead>
<tr>
<th>zEC12 function</th>
<th>R11 (For support, see Notes)</th>
<th>R12</th>
<th>R13</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Included in base z/OS support</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Base support</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>OSA-Express4S (GbE LX and SX, 1000BASE-T, 10 GbE LR and SR)</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>FICON® Express® 8S (CHPID FC)</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>InfiniBand Coupling Link</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>CPU measurement facility</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>New z/Architecture® assembler instructions</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Crypto Express4S (#0865) Toleration, which treats Crypto Express4S cryptographic co-processors and accelerators as CryptoExpress3 co-processors and accelerators</td>
<td>Y (requires Cryptographic Support for z/OS V1R9-V1R11 Web deliverable.)</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Crypto Express4S (#0865) support of X9.8 Pin, 64 Bit, HMAC, CKDS Constraint Relief, PCI Audit, Elliptic Curve Cryptography (ECC) Hardware (HW) support, CBC Key Wrap, and PKA RSA OAEP with SHA-256 algorithm</td>
<td>Y (requires Cryptographic Support for z/OS V1R10-V1R12 Web deliverable.)</td>
<td>Y (requires Cryptographic Support for z/OS V1R10-V1R12 Web deliverable)</td>
<td>Y</td>
</tr>
<tr>
<td>Crypto Express4S (#0865) support of Expanded Key support for AES algorithm, enhanced ANSI TR-31 Secure Key Exchange, PIN block decimalization table protection, PKA RSA OAEP with SHA-256 algorithm, or additional Elliptic Curve Cryptography (ECC) functions</td>
<td>Y (requires Cryptographic Support for z/OS V1R11-V1R13 Web deliverable.)</td>
<td>Y (requires Cryptographic Support for z/OS V1R11-V1R13 Web deliverable)</td>
<td>Y (requires Cryptographic Support for z/OS V1R11-V1R13 Web deliverable)</td>
</tr>
<tr>
<td>GRS FICON CTC toleration</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td><strong>Exploitation of z/OS support</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coupling Facility Control Code (CFCC) Level 18</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>IBM zEnterprise Unified Resource Manager</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>IBM zEnterprise BladeCenter Extension (zBX) Model 003</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>zEC12 function</td>
<td>R11 (For support, see Notes)</td>
<td>R12</td>
<td>R13</td>
</tr>
<tr>
<td>----------------</td>
<td>-----------------------------</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>Crypto Express4S (#0865) exploitation including Enterprise Security, PKSC11-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, or Wrapping Keys with Strong Keys</td>
<td>N</td>
<td>Y (requires Cryptographic Support for z/OS V1R12-V1R13 Web deliverable)</td>
<td>Y (requires Cryptographic Support for z/OS V1R12-V1R13 Web deliverable)</td>
</tr>
<tr>
<td>IBM System z Advanced Workload Analysis Reporter (IBM zAware)</td>
<td>N</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Flash Express. (For Flash Express exploitation, see Notes.)</td>
<td>N</td>
<td>N</td>
<td>Y (requires the z/OS V1R13 RSM Enablement Offering Web deliverable)</td>
</tr>
<tr>
<td>Pageable 1 MB Large Page Support. (For availability, see Notes.)</td>
<td>N</td>
<td>N</td>
<td>Y (requires the z/OS V1R13 RSM Enablement Offering Web deliverable)</td>
</tr>
<tr>
<td>Dynamic reconfiguration support for Flash Express. (For availability, see Notes.)</td>
<td>N</td>
<td>N</td>
<td>Y (requires the z/OS V1R13 RSM Enablement Offering Web deliverable and additional PTFs)</td>
</tr>
<tr>
<td>2 GB Large Page support. (For availability, see Notes.)</td>
<td>N</td>
<td>N</td>
<td>Y (requires the z/OS V1R13 RSM Enablement Offering Web deliverable and additional PTFs)</td>
</tr>
<tr>
<td>Optional PLPA/common page data set support. (For availability, see Notes.)</td>
<td>N</td>
<td>N</td>
<td>Y (requires the z/OS V1R13 RSM Enablement Offering Web deliverable and additional PTFs)</td>
</tr>
<tr>
<td>Support for IBM Java exploitation of Transactional Execution Facility.</td>
<td>N</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>New z/Architecture® instructions: XL C/C++ ARCH(10)TUNE(10)</td>
<td>N</td>
<td>N</td>
<td>Y</td>
</tr>
</tbody>
</table>

Legend:
- Y = supported.
- N = not supported

Notes:
1. After September 28, 2012 the z/OS Lifecycle Extension for z/OS V1R11 (5657-A01) is required for support.
2. Planned availability of z/OS exploitation of Flash Express and Pageable 1 MB large pages is December 14, 2012 with the z/OS V1R13 RSM Enablement Offering Web deliverable.
3. Planned availability of dynamic reconfiguration support for Flash Express, 2 GB Large Page, and optional PLPA/common page data set support is 1Q2013 with the PTFs installed on top of the z/OS V1R13 RSM Enablement Offering Web deliverable.
<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>Multiple.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>IBM zEnterprise zEC12, which first shipped September 2012.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11 or when running V1R13.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Anytime before you introduce a zEC12 server into your environment.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you want to run z/OS V1R13, V1R12 or V1R11 on a zEC12 server, or if you want to run a Coupling Facility on a zEC12 server. If you will run only a Coupling Facility on a zEC12 system, then only the sysplex-related actions below are relevant.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>A zEC12</td>
</tr>
<tr>
<td></td>
<td>Additional hardware required for specific functions.</td>
</tr>
<tr>
<td></td>
<td>• 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</td>
</tr>
<tr>
<td></td>
<td>• IBM zAware requires the IBM zAware server firmware (FC #0011, #0101, and #0102)</td>
</tr>
<tr>
<td></td>
<td>• Flash Express requires FC #0402</td>
</tr>
<tr>
<td></td>
<td>• Use of IBM WebSphere 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</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>1. See the list of PTFs in the Software Service Level section of the PSP buckets.</td>
</tr>
<tr>
<td></td>
<td>2. See Support is delivered by service and web deliverables described in &quot;General recommendations and considerations for a zEC12 server&quot; on page 51 and Install the necessary z/OS service, as indicated in PSP buckets described in &quot;Actions you can take before you order a zEC12 server&quot; on page 54.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>It is recommended that you install and run the required service on your existing server. This will enable you to fall back from a hardware perspective, yet maintain your software level.</td>
</tr>
<tr>
<td></td>
<td>• If you have not installed the preconditioning and exploitation PTFs for CFCC Level 17, note that those PTFs are required to be installed throughout your sysplex before you can implement CFCC Level 18.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>See &quot;Restrictions for a zEC12 server&quot; on page 52.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>IBM Health Checker for z/OS check, SUP_HiperDispatchCPUConfig, is added to z/OS V1R12 and available on z/OS V1R11 with APAR OA30476. This check will verify that HiperDispatch is enabled on a zEC12 system.</td>
</tr>
</tbody>
</table>

**Steps to take:** Follow the "General recommendations and considerations for a zEC12 server" on page 51, adhere to the "Restrictions for a zEC12 server" on page 52, and perform the tasks described in the various topics below.
General recommendations and considerations for a zEC12 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, z114, z10 EC or a z10 BC server.** Migration to an IBM zEnterprise zEC12 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 server if you have already migrated to a z196 or z114 server. It is important to note that you can migrate directly to a zEnterprise zEC12 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 61 and “Migrate to a System z10 server” on page 77.

2. **Support is delivered by service and web deliverables.** The base support for an IBM zEnterprise zEC12 server is delivered by service (PTFs). The list of PTFs required is listed in the PSP bucket (Upgrade 2827DEVICE, Subset 2827/ZOS) and identified by the SMP/E Fix Category IBM.Device.Server.zEC12-2827. Some exploitation is delivered by service (PTFs) and is listed in the same PSP bucket. Other exploitation requires a web deliverable to be downloaded and installed. The cryptographic support for the zEC12 server continues to be delivered as an web deliverable packaged as an FMID. Depending on the cryptographic functions that you want to use, you might be able to use earlier cryptographic web deliverables. 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 (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 server” in “Actions you can take before you order a zEC12 server” on page 54 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. IBM zEnterprise zEC12 servers initially ship with CFCC level 18. If, as part of your migration to a zEC12 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, ensure that the CF LPAR has at least 512MB of storage.

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 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/](http://www.ibm.com/eserver/zseries/swprice/scrt/)
Restrictions for a zEC12 server

Restrictions associated with zEnterprise servers are:

1. **Functional limitations:** Not all zEC12 functions are available in every z/OS release. See Table 5 on page 48 for a list of the zEC12 functions available in each z/OS release. Some functions have migration or exploitation considerations (see “Actions you can take before you order a zEC12 server” on page 54 and “Migration and exploitation considerations for zEC12 server functions” on page 58.) 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 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 servers in a sysplex:**
   - A Parallel Sysplex that contains an IBM zEnterprise (zEC12) either for a z/OS image or a CF image can only contain other IBM zEnterprise (zEC12) 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 server to that sysplex; that is, you will not be able to perform rolling IPLs to introduce a zEC12 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 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 server into that sysplex, you must migrate those images to a System z10 (or later) server before introducing the zEC12 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 an IBM zEnterprise (zEC12) 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 148.
   - The Integrated Cluster Bus 4 (ICB-4) Coupling Links are not supported on a zEC12 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 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). See “Migrate from ICB-4 to Infiniband coupling links” on page 108.
   - The zEC12 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, z196, z114, 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. See “Migrate from a Sysplex Timer to STP” on page 106. The STP web site is at [http://www.ibm.com/systems/z/advantages/pso/stp.html](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 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 that the zEC12 will be the last high-end server 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 server that are planned to be discontinued on future servers, see “Accommodate functions for the zEC12 server to be discontinued on future servers” on page 59

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 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

**Carry forward hardware features:** The following hardware features are not orderable on zEC12 servers. If they are installed on your existing server at the time of an upgrade to a zEC12 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
Actions you can take before you order a zEC12 server

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

1. **Review the sysplex configuration in which the zEC12 server will participate.**
   See “Restrictions for a zEC12 server” on page 52 for a description of the limitations when using zEC12 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 servers. See “Migrate from a Sysplex Timer to STP” on page 106.

3. **Migrate from ICB-4 to InfiniBand coupling links.** This action is necessitated because ICB-4 links are not supported on zEC12 servers. If desired, you can take this action after you order a zEC12 server, as you upgrade to the new server. See “Migrate from ICB-4 to InfiniBand coupling links” on page 108.

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 server” on page 52, “Replace unsupported devices” on page 104, and “Provide for new device installations” on page 104.

5. **Install the necessary z/OS service, as indicated in PSP buckets.** For an IBM zEnterprise zEC12 CPC, PTFs are identified in the 2827DEVICE PSP bucket (Subset 2827/ZOS). For an IBM zEnterprise BladeCenter Extension (zBX) attached to your IBM zEnterprise (zEC12) 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/holdata/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.zHighPerformanceFICON
      The report will identify any missing coexistence and fallback PTFs for that system. For complete information about the REPORT MISSINGFIX command, see SMP/E 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.
Notes:

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.** 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. zEC12 servers are initially shipped
with CFCC Level 18; 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/](http://www.ibm.com/systems/support/z/cfsizer/). Also see “Update your CFRM policy with coupling facility
structure size changes” on page 106.

7. **Decide on the steps you will take for your migration to a zEC12 server.** In
addition to the steps listed here in “Actions you can take before you order a
zEC12 server” on page 54, as a guide, also see “Migration and exploitation
considerations for zEC12 server functions” on page 58. 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. For z/OS V1R11
toleration support is provided by PTFs installed on top of the Cryptographic
Support for z/OS V1R9-V1R11 Web deliverable (the z/OS Lifecycle Extension
for z/OS V1.11 (5657-A01) is required for support). Note that toleration PTFs
are available for other cryptographic web deliverables as well. For z/OS
V1R12 and z/OS V1R13 exploitation of IBM zEnterprise (zEC12) Crypto
Express4S requires the installation of the Cryptographic Support for z/OS
V1R12-V1R13 (FMID HCR770A), available 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 V1R11, the z/OS Lifecycle Extension for z/OS V1.11 (5657-A01) is
required for support after September 28, 2012:

   - If you require Crypto Express4S toleration, which treats Crypto Express4S
cryptographic coprocessors and accelerators as Crypto Express3
coprocessors and accelerators on a zEC12 server, minimally you must
install the Cryptographic Support for z/OS V1R9-V1R11 web deliverable
(FMID HCR7770) or higher and a toleration PTF.

   - If you require Crypto Express4S support of X9.8 Pin, 64 Bit, HMAC, CKDS
Constraint Relief, PCI Audit, ECC HW Support, CBC Key Wrap, and PKA
RSA OAEP with SHA-256 algorithm, minimally you must install the
Cryptographic Support for z/OS V1R10-V1R12 web deliverable (FMID
HCR7780) or higher and a toleration PTF.

   - If you require Crypto Express4S support of Expanded key support for
AES algorithm, enhanced ANSI TR-31 Secure Key Exchange, PIN block
decimalization table protection, PKA RSA OAEP with SHA-256 algorithm,
or additional Elliptic Curve Cryptography (ECC) functions, you must
install the Cryptographic Support for z/OS V1R11-V1R13 web deliverable
(FMID HCR7790) and a toleration PTF.

For z/OS V1R12, consider the following:

   - If you require Crypto Express4S toleration, which treats Crypto Express4S
cryptographic coprocessors and accelerators as Crypto Express3
coprocessors and accelerators on a zEC12 server, minimally you must
install the toleration PTFs listed in the PSP bucket.
– If you require Crypto Express4S support of X9.8 Pin, 64 Bit, HMAC, CKDS Constraint Relief, PCI Audit, ECC HW Support, CBC Key Wrap, and PKA RSA OAEP with SHA-256 algorithm, minimally you must install the Cryptographic Support for z/OS V1R10-V1R12 web deliverable (FMID HCR7780) or higher, and a toleration PTF.

– If you require Crypto Express4S support of Expanded key support for AES algorithm, enhanced ANSI TR-31 Secure Key Exchange, PIN block decimalization table protection, PKA RSA OAEP with SHA-256 algorithm, or additional Elliptic Curve Cryptography (ECC) functions, you must install the Cryptographic Support for z/OS V1R11-V1R13 web deliverable (FMID HCR7790) and a toleration PTF.

– If you require Crypto Express4S 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, or Wrapping Keys with Strong Keys, you must install the Cryptographic Support for z/OS V1R12-V1R13 web deliverable (FMID HCR77A0), available September 2012.

For z/OS V1R13 consider the following:

– If you require Crypto Express4S toleration, which treats Crypto Express4S cryptographic coprocessors and accelerators as Crypto Express3 coprocessors and accelerators on a zEC12 server, minimally you must install the toleration PTFs listed in the PSP bucket.

– If you require Crypto Express4S support of Expanded key support for AES algorithm, enhanced ANSI TR-31 Secure Key Exchange, PIN block decimalization table protection, PKA RSA OAEP with SHA-256 algorithm, or additional Elliptic Curve Cryptography (ECC) functions, you must install the Cryptographic Support for z/OS V1R11-V1R13 web deliverable (FMID HCR7790) and a toleration PTF.

– If you require Crypto Express4S 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, or Wrapping Keys with Strong Keys, you must install the Cryptographic Support for z/OS V1R12-V1R13 web deliverable (FMID HCR77A0), available September 2012.

**Note:** ICSF, specifically HCR7770, HCR7780, HCR7790, and HCR77A0 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, the following Fix Categories can be used:

– IBM.Coexistence.ICSFz/OS_V1R9-V1R11-HCR7770
– IBM.Coexistence.ICSFz/OS_V1R10-V1R12-HCR7780
– IBM.Coexistence.ICSFz/OS_V1R11-V1R13-HCR7790
– IBM.Coexistence.ICSFz/OS_V1R12-V1R13-HCR77A0

If you want to exploit Flash Express (including dynamic reconfiguration support and optional PLPA/COMMON page data set support, and pageable 1 MB Large Page support) or 2 GB Large Page Support, the z/OS V1R13 RSM Enablement Offering web deliverable is required. This is a separate web deliverable from any of the Cryptographic Support web deliverables and can be installed independently of those web deliverables.

8. **Review the new mnemonics introduced for the zEC12 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 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 PM49761. 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.

9. Plan for changes to your global resource serialization complex with the zEC12 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 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 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 148.
Migration and exploitation considerations for zEC12 server functions

The following zEC12 functions are available on z/OS V1R11 and later releases:

1. **Consider the number of CPU measurement facility counters for zEC12.** The number of CPU measurement facility counters for zEC12 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.

   For example, consider the following SMF record fields:
   - SMF113_2_CtrVN1 identifies how to interpret the Basic and Problem counter set. 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 (zEC12).
   - SMF113_2_CtrVN2 identifies how to interpret the Crypto and Extended counter sets. As described in SA23-2260 this will be set to 1 (z10), 2 (z196 or z114) or 3 (zEC12).

The following zEC12 functions are available on z/OS V1R13 and later releases:

1. **IBM zAware system.** IBM zAware is designed to offer a 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 you can prepare to set up an IBM zAware environment by defining the IBM zAware logical partition, making PARMLIB updates, defining log streams, and network definitions. For more information, see *IBM System z Advanced Workload Analysis Reporter (IBM zAware) Guide*, (SC27-2623) and *z/OS MVS Setting Up a Sysplex*.

2. **Java exploitation of the Transactional Execution Facility.** z/OS V1.13 with PTFs provides support for Java exploitation of the Transaction Execution Facility on IBM zEnterprise zEC12. This function is designed to help eliminate software locking overhead that can impact performance. 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 SDK7 IBM 64-bit SDK for z/OS, Java Technology Edition, V7.0.0 (5655-W44).

   Also note that the z/OS V1.13 XL C/C++ compiler when ARCH(10) is specified will provide hardware built-in functions to enable applications to use the Transactional Execution Facility.

The following zEC12 functions are available on z/OS V1R13 if you have the z/OS V1R13 RSM Enablement Offering Web deliverable installed:

1. **z/OS V1R13 RSM Enablement Offering Web deliverable.** Installing the z/OS V1R13 RSM Enablement Offering Web deliverable will increase the size of the nucleus by roughly 380K when you IPL. You might need to analyze your private storage usage when you IPL with the web deliverable installed. IPLing with the web deliverable installed will also add 24K of ESQA per CPU defined to that LPAR. See "Accommodate increase in nucleus size for the z/OS V1R13 RSM Enablement Offering Web deliverable" on page 122 and "Accommodate increase in ESQA with the z/OS V1R13 RSM Enablement Offering Web deliverable" on page 123.

2. **Flash Express.** Flash Express is designed to help improve availability and handling of paging workload spikes. Using Flash Express can help availability by reducing latency from paging delays that can occur at the start of the
workday or during other transitional periods. It is also designed to help
eliminate delays that can occur when collecting diagnostic data during failures.
To exploit Flash Express, download and install the z/OS V1R13 RSM
Enablement Offering Web deliverable and optionally update IEASYSxx in
PARMLIB to specify the new PAGESCM parameter. For exploitation details,
see z/OS MVS Initialization and Tuning Reference and z/OS MVS System Commands.

3. **2 GB large pages** (planned for exploitation availability in the first quarter of 2013). 2 GB large pages can help improve processor performance by enabling
middleware to use 2 GB large pages support. 2 GB large pages allow for a
single translation lookaside buffer (TLB) entry to fulfill many more address
translations than either a large page or ordinary base page. 2 GB large pages
provides exploiters much better TLB coverage and therefore provides better
performance by decreasing the number of TLB misses that an application
incurs, less time spent converting virtual addresses into physical addresses, and
the usage of less real storage to maintain DAT structures. Exploitation is
planned for the IBM 31-bit SDK for z/OS, Java technology Edition, V7.0.0
(5655-W43) and SDK7 IBM 64-bit SDK for z/OS, Java Technology Edition,
V7.0.0 (5655-W44). To exploit 2 GB Large pages, install the z/OS V1.13 RSM
Enablement Offering Web deliverable and the appropriate middleware
exploitation support (see the PSP Bucket (Upgrade: 2827/DEVICE, Subset:
2827/ZOS) for more information on the required software requirements); and
update your current LFAREA parameter. For exploitation details, see z/OS MVS
Initialization and Tuning Reference.

4. **Pageable large (1MB) pages.** z/OS is designed to help improve processor
performance by supporting middleware exploitation of pageable large (1 MB)
pages. Exploitation is planned for Language Environment when used with a
run-time option, by IBM DB2 10 for z/OS (5605-DB2) and Java, with the IBM
31-bit SDK for z/OS, Java technology Edition, V7.0.0 (5655-W43) and SDK7
IBM 64-bit SDK for z/OS, Java Technology Edition, V7.0.0 (5655-W44). Ensure
that the exploiting software is installed. For exploitation details, see z/OS MVS
Initialization and Tuning Reference.

5. **Optional pageable link pack area (PLPA) and common page data sets**
optional (planned for availability in the first quarter of 2013). This option is
used only for quick and warm start IPLs. To exploit this capability install the
z/OS V1.13 RSM Enablement Offering Web deliverable and then update your
PLPA and COMMON pages data sets in IEASYSxx. For exploitation details, see z/OS MVS
Initialization and Tuning Reference.

6. **Dynamic reconfiguration for Flash Express** (planned for exploitation
availability in the first quarter of 2013). This function is a follow on for Flash
Express.

**Accommodate functions for the zEC12 server to be discontinued on future servers**

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

- **STP Mixed CTN.** The zEC12 server is planned to be the last high end IBM
  server to support connections to an STP Mixed CTN. This includes the Sysplex
  Timer (9037). Future 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 server is planned to be the last IBM System z server 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.

- **Removal of ISC-3 support on System z.** The 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 a carry forward function on an upgrade. Previously it was announced that the IBM zEnterprise 196 (z196) and IBM zEnterprise 114 (z114) servers were to be 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 server is planned to be the last high-end System z server to offer support of the Open System Adapter-Express3 (OSA-Express3 #3362, #3363, #3367, #3370, #3371) family of features. You should continue to migrate from the OSA-Express3 features to the OSA-Express4S features (#0404, #0405, #0406, #0407, #0408).

- **Removal of FICON Express4 support on System z.** The zEC12 server is planned to be the last high-end System z server to offer support of the FICON Express4 features (#3321, #3322). You should continue to migrate from the FICON Express4 features to the FICON Express8S features (#0409, #0410).

- **Removal of Crypto Express3 support on System z.** The zEC12 server is planned to be the last high-end System z server to offer support of the Crypto Express3 feature (#0864). You should continue to migrate from the Crypto Express3 feature to the Crypto Express4S feature (#0865).

- **IBM System z Application Assist Processor (zAAP):** IBM zEC12 is planned to be the last high-end System z server to offer support for zAAP specialty engine processors. IBM plans to converge zAAP and zIIP specialty engines onto zIIPs. This is intended to help simplify capacity planning and performance management, while still providing the capability to offload many workloads, which can help you control software costs.

**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.

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**Element or feature:** Multiple.

**When change was introduced:** • 28 August 2012 in U.S. Announcement Letter.

**Applies to migration from:** z/OS V1R12 and z/OS V1R11.

**Timing:** Before migrating to a zEC12 server.

**Is the migration action required?** No, but recommended if you are using a zEC12 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.

**Migrate to an IBM zEnterprise z196 or z114 server**

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

The specific zEnterprise functions exploited by z/OS depend on the z/OS release. See Table 6.

<table>
<thead>
<tr>
<th>zEnterprise function</th>
<th>R11</th>
<th>R12</th>
<th>R13</th>
</tr>
</thead>
<tbody>
<tr>
<td>Related IBM Health Checker for z/OS check: None.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 6. zEnterprise functions supported by z/OS V1R11 and z/OS V1R12 and z/OS V1R13**

<table>
<thead>
<tr>
<th>zEnterprise function</th>
<th>R11</th>
<th>R12</th>
<th>R13</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base support</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>OSA-Express3 (GbE LX and SX, 1000BASE-T, 10 GbE LR and SR)</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>InfiniBand Coupling Links</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>New z/Architecture instructions (Support differs by release. z/OS V1R12, z/OS V1R13, and higher, include XL C/C++ support for ARCH(9) and TUNE(9) options.)</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Up to 128 Coupling Links CHPIDs</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>FICON Express8 (CHPID FC)</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>PCIe-based I/O infrastructure - FICON Express8S and OSA Express4S</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>IFAURP reporting</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Tolerate greater than 64 CPs per server (z196 only)</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Crypto toleration (Support differs depending on level of ICSF installed. PTF required.)</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>OSA-Express3 (CHPID type OSD) with or without exploitation of two ports per CHPID</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Up to 32 HiperSockets™</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
</tbody>
</table>
Table 6. zEnterprise functions supported by z/OS V1R11 and z/OS V1R12 and z/OS V1R13 (continued)

<table>
<thead>
<tr>
<th>zEnterprise function</th>
<th>R11</th>
<th>R12</th>
<th>R13</th>
</tr>
</thead>
<tbody>
<tr>
<td>RMF postprocessor crypto activity report - 4096 bit</td>
<td>Y</td>
<td>Y (z196 only)</td>
<td>Y (z196 only)</td>
</tr>
<tr>
<td>CPU measurement facility (HIS)</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Greater than 64 CPs per LPAR</td>
<td>Y (z196 only)</td>
<td>Y (z196 only)</td>
<td>Y (z196 only)</td>
</tr>
<tr>
<td>HiperDispatch cache and affinity node changes</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>HiperDispatch serviceability (Support differs by release.)</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>LE high register resolution</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
</tbody>
</table>

### Exploitation of z/OS support

- **Power save mode**
  - Y (z196 only)  Y (z196 only)  Y (z196 only)
- **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 OAP with SHA-256.**
  - **(z/OS V1R11 and z/OS V1R12 require Cryptographic Support for z/OS V1R10-V1R12 [FMID HCR7780] web deliverable.)**
  - Y  Y  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.**
  - **(Requires Cryptographic Support for z/OS V1R11-V1R13 [FMID HCR7790 web deliverable available September 2011.)**
  - Y  Y  Y
Table 6. zEnterprise functions supported by z/OS V1R11 and z/OS V1R12 and z/OS V1R13 (continued)

<table>
<thead>
<tr>
<th>zEnterprise function</th>
<th>R11</th>
<th>R12</th>
<th>R13</th>
</tr>
</thead>
<tbody>
<tr>
<td>z/OS Discovery and AutoConfiguration (zDAC) support</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>New OSA display command</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>OSA-Express3 and OSA-Express4S Inbound Workload Queuing (IWQ)</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Inbound workload queuing for Enterprise Extender for the OSA-Express4S and OSA-Express3 features when defined as CHPID types OSD or OSX</td>
<td>N</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>OSA-Express4S checksum offload for LPAR-to-LPAR traffic for IPv4 and IPv6 packets (CHPID type OSD or OSX)</td>
<td>N</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>OSA-Express4S large send for IPv6 packets (CHPID types OSD and OSX)</td>
<td>N</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>zHPF performance improvements for FICON Express8S</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Hipersocket optimization for intraensemble data networks (IEDN) (IBM Statement of Direction)</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Non-disruptive CF dump</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
</tr>
</tbody>
</table>

Legend:
- Y = supported.
- N = not supported

Note: PTFs may be required. Refer to “Actions you can take before you order a z196 and z114 server” on page 67 for information about finding the appropriate PTFs.

Element or feature: Multiple.

When change was introduced:
- 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 V1R12 and z/OS V1R11.

Timing: Anytime before you introduce a zEnterprise server into your environment.

Is the migration action required? Yes, if you want to run z/OS V1R13, V1R12 or V1R11 on a zEnterprise server, or if you want to run a Coupling Facility on a zEnterprise server. If you will run only a Coupling Facility on a zEnterprise system, then only the sysplex-related actions below are relevant.
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 77.

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 67 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. 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 6 on page 61 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 71). 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, 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. **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 into a sysplex with z196 or z114, ensure that you have satisfied the zEC12 sysplex restrictions in “Restrictions for a zEC12 server” on page 52. 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](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
- 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 zEnterprise server:

1. **Review the sysplex configuration in which the zEnterprise server will participate.** See “Restrictions for a z196 or z114 server” on page 65 for a description of the limitations when using IBM zEnterprise zEC12 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. See "Migrate from a Sysplex Timer to STP” on page 106.

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. See "Migrate from ICB-4 to Infiniiband coupling links” on page 108.

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 HOLDATA onto your z/OS system(s).
   Use your normal service acquisition portals or download the two (2) year HOLDATA directly from [http://service.software.ibm.com/holdata/390holddata.html](http://service.software.ibm.com/holdata/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.zHighPerformanceFICON
   - IBM.Device.Server.z114-2818
   - IBM.Device.Server.z114-2818.ParallelSysplexInfiniBandCoupling
   - IBM.Device.Server.z114-2818.zHighPerformanceFICON
   - 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 Commands](http://www.ibm.com/systems/support/z/cfsizer/).

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

Notes:

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. 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 are initially shipped with CFCC Level 18; 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/](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 zEnterprise server. As a guide, see “Recommended migration steps for z196 and z114 servers” on page 70. 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. When a subsequent cryptographic web deliverable is available for a particular z/OS level, the previous one is withdrawn. The newer cryptographic web deliverable, however, includes 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 V1R11 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 V1R11 and z/OS V1R12, exploitation of the original zEnterprise cryptographic enhancements was provided by the Cryptographic Support for z/OS 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](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 V1R11: If you require protected key CP Assist for Cryptographic Function, new Crypto Express3 or Crypto Express3 -1P, then minimally you must install the Cryptographic Support for z/OS V1R9-V1R11 web deliverable (FMID HCR7770).
- For z/OS V1R11 and z/OS V1R12: If you require 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 OAE with SHA-256, then minimally you must install the Cryptographic Support for z/OS V1R10-V1R12 web deliverable (FMID HCR7780), which is integrated into z/OS V1R13 orders.
- For z/OS V1R11 and later releases: If 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 OAE with SHA-256 algorithm, additional Elliptic Curve Cryptography (ECC) functions. You must install the Cryptographic Support for z/OS V1R11-V1R13 web deliverable (FMID HCR7790), available September 2011.

**Note:** ICSF, specifically HCR7770, HCR7780, and HCR7790, 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, the following Fix Categories can be used:

- IBM.Coexistence.ICSF.z/OS_V1R9-V1R11-HCR7770
- IBM.Coexistence.ICSF.z/OS_V1R10-V1R12-HCR7780
- IBM.Coexistence.ICSF.z/OS_V1R11-V1R13-HCR7790
9. **Review the new mnemonics introduced for the zEnterprise 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 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 PM49761. 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](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 z196 and z114 servers**

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 67 for information about how SMP/E V3R5 and SMP/E V3R6 can help you 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 V1R11 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. The default is that HiperDispatch is disabled on z/OS V1R7 through z/OS V1R12. Beginning with z/OS V1R13 when running on a zEnterprise server, the IEAOPT:xx 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 the default for the check, matches the actual HiperDispatch state of the system. For more information, see “Accommodate HiperDispatch default of YES on IBM zEnterprise zEC12 and IBM zEnterprise (z196 and z114)” on page 130.

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 and available on z/OS V1R11 with APAR OA30476. 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 CPUSLEFT4NEEDHD parameter indicates the minimum number of CPUs that can be installed and activated on an LPAR running in HIPERDISPATCH=NO. When CPUSLEFT4NEEDHD=0, the check always succeeds. The default is 8, with values 0-63 accepted. The system redrives the check when the HIPERDISPATCH state changes or CPUs are dynamically added. 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/](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 prior to 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, as well as z/OS V1R12 and z/OS V1R11 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.

- **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 zEC12 and z196 servers.

  There is a new SMFPRMxx parmlib option, MAXEVENTINTRECS, that allows governing the number of event interval records to be collected when the processor capacity changes. The default is zero. To collect extra records between regular intervals when the processor capacity changes, the default must be adjusted.

  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.

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

• 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 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 dialog (HCD). 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).

- **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. The TUNE compiler option 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 XL and TUNE compiler options, see [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.

For example, the XL C/C++ ARCH(10) and TUNE(10) option exploits instructions available only on a zEC12 server. When programs exploit the ARCH(10) or TUNE(10) option, those programs can only run on a zEC12 server, or an operation exception will occur.

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 zEC12, 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.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>Multiple.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>12 July 2011 in U.S. Announcement Letter 211-252.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before migrating to a zEnterprise server.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes if you are using a zEC12 server because these servers do not support the functions mentioned in &quot;Description&quot; above.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>See &quot;Description&quot; above.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>None.</td>
</tr>
</tbody>
</table>

**Steps to take:** Take into account the statements in “Description” above 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 (z900, 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 depend on the z/OS release. See Table 7.

### Table 7. System z10 functions supported by z/OS V1R11 and z/OS V1R12 and z/OS V1R13

<table>
<thead>
<tr>
<th>System z10 function</th>
<th>R11</th>
<th>R12</th>
<th>R13</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Included in base z/OS support</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dynamic addition of logical CPs without preplanning</td>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>RMF FICON enhancement</td>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>Greater than 54 CPs (64) for a single LPAR</td>
<td>B (z10 EC only)</td>
<td>B (z10 EC only)</td>
<td>B (z10 EC only)</td>
</tr>
<tr>
<td>XL C/C++ ARCH(8) and TUNE(8)</td>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>Large memory (up to 1 TB on z10 EC now, up to 248 GB on z10 BC planned for 30Jun2009)</td>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>HiperDispatch</td>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>CPACF and Configurable Crypto Express2</td>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>Key management for remote loading of ATM and point-of-sale (POS) keys and support for ISO 16609 CBC Mode T-DES MAC requirements</td>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>New z/Architecture instructions</td>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>65535 MP factors</td>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>OSA-Express3 10 Gigabit Ethernet</td>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>FICON8 enhancement</td>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>OSA-Express3 Gigabit Ethernet</td>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>1000BASE-T Ethernet</td>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>Protected Key CP Assist for Cryptographic Function</td>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>New Crypto Express3 and Crypto Express3 -1P</td>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td><strong>Explicit z/OS support</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HiperSockets Multiple Write Facility</td>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>Capacity Provisioning</td>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>Large page support</td>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>OSA-Express3 double port density</td>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>CPU Measurement Facility architecture</td>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>Service aids support for large dumps</td>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>Layer 3 VMAC support (VMAC Support for OSA-Express2 and OSA-Express3 when configured as CHPID type OSD [QDIO])</td>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
</tbody>
</table>
Table 7. System z10 functions supported by z/OS V1R11 and z/OS V1R12 and z/OS V1R13 (continued)

<table>
<thead>
<tr>
<th>System z10 function</th>
<th>R11</th>
<th>R12</th>
<th>R13</th>
</tr>
</thead>
<tbody>
<tr>
<td>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 auditing</td>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>Support for 13-digit through 19-digit PAN data, ICSF Query service, and enhanced SAF checking</td>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>Coupling facility level 16</td>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>High Performance FICON for System z (zHPF)</td>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>Decimal floating point</td>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>Usage Report Program (IFAURP) support</td>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>Parallel Sysplex InfiniBand (PSIFB) coupling links</td>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
</tbody>
</table>

Legend:
Blank – not supported
B – FMID in base product (assumes service identified in the hardware PSP bucket is installed)
P – PTFs listed in the System z10 PSP bucket are required

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 V1R12 and z/OS V1R11.

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 85.

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 85.

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 topics below.

**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 prior to 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 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 (prior to z9 EC and z9 BC) servers, but you still need to ensure that any migration considerations are satisfied for the servers that you “skipped”. To read about z9 EC and z9 BC migration actions, see “Migrate to a System z9 server” on page 89.

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 now ship 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 Table 7 on page 78 for a list of the System z10 functions.
available in each z/OS release. Some functions have exploitation or migration considerations (see below). 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:**
   - The z9 EC and z9 BC are the last servers to support active participation in the same Parallel Sysplex with z900, z800, and earlier servers. If you are running z/OS on a z900 or z800, you cannot add a System z10 server to that sysplex. That is, you will not be able to perform rolling IPLs to introduce a System z10 server if you have any z900 or z800 images (either as z/OS images or coupling facilities) in the sysplex. Any z900 or z800 servers in the sysplex have to be upgraded to a z990, z890, or later server to have a System z10 server supported in the sysplex. If you have any z/OS images or coupling facilities on a z900 or z800, and you intend to introduce a System z10 server into that sysplex, you must migrate those images to z990 or z890 (or later) prior to introducing the System z10 server.
   - The Integrated Cluster Bus (ICB) connector on the System z10 server is different than on previous servers, requiring new links and connectors to be installed on previous servers in order to connect them to a System z10 server by ICB. This is a hardware-only migration action.
   - The z10 EC model E64 servers cannot use ICB-4 coupling links. On this model, all required coupling link connectivity must be provided using PSIFB and/or ISC-3 coupling links.

**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. You can find the z9 EC restrictions and coexistence requirements in "Migrate to a System z9 server" on page 89.

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 85 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.DecimalFloatingPoint
- IBM.Device.Server.z10-BC-2098.MIDAW
- 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
- IBM.Device.Server.z10-EC-2097.MIDAW
- IBM.Device.Server.z10-EC-2097.ParallelSysplexInfiniBandCoupling
- 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/](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 85. 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. The web deliverables listed in “Recommended migration steps for a System z10 server” on page 85 are the minimum web deliverable level for the function specified. When a subsequent cryptographic web deliverable is available for a particular z/OS level, the previous one is withdrawn. The newer cryptographic web deliverable, however, includes the previous function (when applicable) for that particular z/OS level. Note that you can use the newer cryptographic web deliverables on servers prior to the System z10 server (that is, on System z9 and zSeries servers).
The level of cryptographic support integrated in z/OS is ICSF FMID HCR7751 in z/OS V1R11, ICSF FMID HCR7770 in z/OS V1R12, and ICSF FMID HCR7780 in z/OS V1R13.

Where ICSF FMID HCR7751 is installed, the following coexistence support is needed on other systems:

- PTF UA51214 (APAR OA29839) and PTF UA44731 (APAR OA26579) for FMID HCR7750
- PTF UA51212 (APAR OA29839), PTF UA37971 (APAR OA21807), and PTF UA44730 (APAR OA26579) for FMID HCR7740

Where ICSF FMID HCR7770 is installed, the following coexistence support is needed on other systems:

- PTF UA51255 (APAR OA29997) and PTF UA51213 (APAR OA29839) for FMID HCR7751
- PTF UA51254 (APAR OA29997), PTF UA51214 (APAR OA29839), and PTF UA44731 (APAR OA26579) for FMID HCR7750
- PTF UA51253 (APAR OA29997), PTF UA51212 (APAR OA29839), PTF UA37971 (APAR OA21807), and PTF UA44730 (APAR OA26579) for FMID HCR7740

- You can migrate to z/OS V1R13 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/](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](http://www.ibm.com/servers/resourcelink).

**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](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, z9 BC, z990, and z890 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](http://www.ibm.com/servers/resourcelink).

   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](http://www.ibm.com/servers/resourcelink) 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.
Note: Message IAR026I was introduced in z/OS V1R11, and rolled back to prior releases, by RSM APAR OA27801. It is now integrated into the base of z/OS V1R12.

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 V1R11, 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)
   - The z990 PSP bucket: upgrade 2084DEVICE, subset 2084/ZOS (if not already on a z990 or z890)

2. Upgrade your hardware to a System z10 server. If you are migrating from a z990 or z890 server, see "Migrate to a System z9 server" on page 89 for z9 EC and z9 BC migration considerations that you must also satisfy.

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)
   - The z990 PSP bucket: upgrade 2084DEVICE, subset 2084/ZOS (if not already on a z990 or z890)

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)
   - The z990 PSP bucket: upgrade 2084DEVICE, subset 2084/ZOS (if not already on a z990 or z890)

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 V1R13 systems. Use your normal service acquisition portals or download the HOLDDATA directly from [http://service.software.ibm.com/holdata/](http://service.software.ibm.com/holdata/).
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 V1R13 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 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, refer to the ARCHITECTURE compiler option in the 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 the z/OS XL C/C++ User’s Guide. You must have at least the z/OS V1R9 XL C/C++ compiler to use this function.

   **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.

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.

**Notes:**

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. If LFAREA=0M is explicitly specified on a system where large page support is not desired, message IAR021I THE LFAREA WAS SPECIFIED BUT SUFFICIENT STORAGE IS NOT AVAILABLE is issued. The system correctly does not provide any large frames in this case.

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](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 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.

Migrate to a System z9 server

**Description:** The IBM System z9 servers (z9 EC [formerly z9-109] and z9 BC) are follow-ons to the IBM eServer zSeries servers (z990, z890, z900, and z800). They continue the evolution of the mainframe, building on the structure introduced with the z990 in support of z/Architecture, reliability, availability, scalability, and clustering. System z9 servers expand upon a key attribute of the platform, availability, to help ensure that you have a resilient infrastructure designed to satisfy the requirements of on demand business. With the increased performance and total system capacity possible for System z9 servers, you have an opportunity to continue to consolidate diverse applications on a single platform.

The specific System z9 functions exploited by z/OS V1R13, V1R12, and V1R11 are:
1. Separate LPAR management of processor units (PUs)
2. 63.75K subchannel support
3. OSA-Express2 Gigabit Ethernet (LX and SX)
4. OSA-Express2 1000BASE-T Ethernet
5. OSA-Express2 10 Gigabit Ethernet (LR)
6. OSA/SF IP and MAC addressing
7. FICON Express4 (4KM LX, 10KM LX, and SX)
8. CP Assist for Cryptographic Functions (CPACF) clear key
9. Crypto Express2 as a coprocessor (secure key)
10. Request node identification data (RNID) for native FICON
11. Channel Data Link Control (CDLC) support
12. Up to 60 LPARs on z9 EC and 30 LPARs on z9 BC
13. Crypto Express2 as an accelerator
14. CPACF enhancements (AES, SHA-256, and PRNG)
15. Remote Keyload for ATMs and POSs, and ISO 16609 CBC Mode TDES for MAC
16. Modified Indirect Data Address Word (MIDAW) support
17. zIIP support
18. Multiple subchannel sets
19. HiperSockets support of IPv6
20. Virtual local area network (VLAN) management enhancements
21. FICON link incident reporting
22. XLC C/C++ (enable ARCH(7) and TUNE(7) compiler options)
23. Up to 512 GB real storage on z9 EC (GB equals 1,073,741,824 bytes)

<table>
<thead>
<tr>
<th>Element or feature</th>
<th>Multiple</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced</td>
<td>The first System z9 server, the z9 EC, shipped in September 2005.</td>
</tr>
<tr>
<td>Applies to migration from</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing</td>
<td>Anytime</td>
</tr>
</tbody>
</table>
Is the migration action required?  
Yes, if you want to run z/OS on a System z9 server.

Target system hardware requirements:  
A System z9 server.

Target system software requirements:  
None.

Other system (coexistence or fallback) requirements:  
See the appropriate PSP buckets for required PTFs for specific functions, as described in “Steps to take”.

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 topics below.

General recommendations and considerations for a System z9 server

As you plan your migration to a System z9 server, consider the following:

1. **Relatively few migration actions are new when coming from a z990 or z890.** Migration to a System z9 server has, as its basis, a migration to a z990 or z890. This means that if you are migrating to a System z9 server from a z990 or z890 (and have performed the migration actions associated with the z990 or z890), you have fewer migration actions than if you were migrating from a server prior to the z990 or z890 and have not yet performed the migration actions associated with the z990 and z890. There are, in fact, very few new migration actions to perform on z/OS for a System z9 server if you have already migrated to a z990 or z890. It is important to note that you can migrate directly to a System z9 server without installing the intermediate (prior to z990 and z890) servers, but you still need to ensure that any migration considerations are satisfied for the servers that you “skipped”. To read about z990 and z890 migration actions, see [Migrate to a z990 or z890 server](#) on page 95.

2. **Support is delivered by service and FMIDs.** The delta (from a z990 or z890) support for a System z9 server, excluding cryptographic support, is delivered by service (PTFs), unlike the support that was required for the z990 and z890. The z990 and z890 support was delivered with service and FMIDs (web deliverables and features). The cryptographic support for the System z9 servers continues to be FMIDs, many of which are still available in web deliverables. Different web deliverables, providing different levels of support, are available for different releases of z/OS.

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 z9 servers initially ship with CFCC Level 14. If, as part of your migration to a System z9 server, you change CFCC levels (either by placing a coupling facility on the System z9 server or by moving the coupling facility to a z990 or z890 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 z9 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 CFM 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 z9 server**

Restrictions associated with the System z9 server are:

1. **z/OS as a guest of z/VM:** Modified indirect data address words (MIDAWs) and subchannel sets are not supported by z/OS when z/OS runs as a guest under z/VM on a System z9 server.

2. **System z9 server in a sysplex:**
   - Integrated Cluster Bus-2 (ICB-2) and InterSystem Channel-3 (ISC-3) compatibility mode links are not supported on System z9 servers. If you have ICB-2 or ISC-3 compatibility mode links defined, convert them to a supported link technology.
   - If you have a G5 or G6 coupling facility image, you cannot connect that coupling facility to any System z9 z/OS senders (or, for duplexing, to a System z9 coupling facility). Having a G5 or G6 coupling facility, therefore, introduces coexistence issues if any System z9 z/OS images, or System z9 coupling facilities, participating in that sysplex.

3. **HMC:** The hardware management console (HMC) is for the exclusive use of the HMC application. Customer applications cannot reside on the HMC. The ESCON Directory and Sysplex Timer applications cannot reside on the HMC. TCP/IP is the only supported communication protocol. The HMC supports System z9 servers. It can also be used to support z990, z890, z900, z800, G5, G6, and Multiprise 3000 servers. They must be upgraded to a new AROM level.

4. **Token Ring:**
   - Token Ring is not available as a feature on the System z9 HMC. Current HMCs with Token Ring may be carried forward to a System z9 server during an upgrade from a z990 or z900.
   - Token Ring is not available as a feature on the System z9 Support Element (SE) or Trusted Key Entry (TKE) workstation. Token Ring is not offered as a feature on System z9 servers and cannot be carried forward to a System z9 server during an upgrade from a z990 or z900.
   - The OSA-Express Token Ring feature is not supported on System z9 servers. Token Ring is not offered as a feature on System z9 servers and cannot be carried forward to a System z9 server during an upgrade from a z990 or z900.

5. **C/C++ ARCH(7) and TUNE(7) options:** The ARCHITECTURE C/C++ compiler option selects the minimum level of machine architecture on which your program will run. Certain features provided by the compiler require a minimum architecture level. ARCH(7) exploits instructions available on System z9 servers. For more information, refer to the ARCHITECTURE compiler option in [z/OS XL C/C++ User’s Guide](https://www.ibm.com/support/knowledgecenter/SSLTBK_22.2.0/svc4gi/svc4gi_man0035). 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, see the TUNE compiler option in [z/OS XL C/C++ User’s Guide](#).

**Exploitation restriction:** Once programs exploit the ARCH(7) or TUNE(7) option, those programs can only run on System z9 servers, or 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.

### Actions you can take before you order a System z9 server

You can perform the following migration actions before you order or install your System z9 server:

1. **Review the sysplex configuration in which the System z9 server will participate.** In particular, if you have any existing G5 or G6 coupling facilities in the sysplex, move those coupling facilities to later servers (such as z990 or z890). This action is necessitated by the restriction that System z9 z/OS images in a sysplex cannot use G5 or G6 coupling facilities, nor can G5 or G6 coupling facilities duplex with a System z9 coupling facility.

2. **Review your current link technology.** If you have any ICB-2 or ISC-3 compatibility mode links, convert them to a supported link technology.

3. **Review coexistence requirements.** Because the z990 and z890 support is the basis for the System z9 server support, the coexistence requirements for the z990 and z890 also apply to the System z9 server. For instance, ICKDSF R17 must be installed on all z/OS and z/VM images that will share DASD with the z990 or z890 (and therefore, with System z9 servers). Review the coexistence requirements that were introduced for the z990, if you have not already done so, and take any necessary actions. You can find the z990 coexistence requirements in “Migrate to a z990 or z890 server” on page 95.

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 z9 server” on page 93 and are dependent on the z/OS release you will run on the System z9 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.z9-EC-2094” or “IBM.Device.Server.z9-BC-2096”, the Enhanced PSP Tool [http://www14.software.ibm.com/webapp/set2/spb/srchBroker](http://www14.software.ibm.com/webapp/set2/spb/srchBroker), or ServiceLink's PSP Service Extraction tool.

If you use REPORT MISSINGFIX, some FIXCAT values you can use for specific System z9 functions are:

- IBM.Device.Server.z9-BC-2096.DecimalFloatingPoint
- IBM.Device.Server.z9-BC-2096.MIDAW
- IBM.Device.Server.z9-BC-2096.ParallelSysplexInfiniBandCoupling
- IBM.Device.Server.z9-BC-2096.zAAP
- IBM.Device.Server.z9-BC-2096.zIIP
- IBM.Device.Server.z9-EC-2094.DecimalFloatingPoint
- IBM.Device.Server.z9-EC-2094.MIDAW
- IBM.Device.Server.z9-EC-2094.ParallelSysplexInfiniBandCoupling
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. System z9 servers initially ship with CFCC Level 14. 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/](http://www.ibm.com/systems/support/z/cfsizer/).

6. **Estimate the amount of HSA needed.** If you intend to add more devices, exploit subchannels, or use more LPARs on the System z9 server than you did on your previous server, you should estimate the amount of hardware system area (HSA) that will be necessary on the System z9 server. Use the HSA Estimator tool, which is available on Resource Link [http://www.ibm.com/servers/resourcelink](http://www.ibm.com/servers/resourcelink).

7. **Decide on the steps you will take for your migration to a System z9 server.** As a guide, see “Recommended migration steps for a System z9 server.” Be aware of the following:

   - You should review the cryptographic support you currently have installed versus the support required on the System z9 server. Several cryptographic support web deliverables have been made available for various z/OS releases. The web deliverables listed in “Recommended migration steps for a System z9 server” are the minimum web deliverable level for the function specified. When a subsequent cryptographic web deliverable is available for a particular z/OS level, the previous one is withdrawn. The newer cryptographic web deliverable, however, includes the previous function (when applicable) for that particular z/OS level. Note that you can use the newer cryptographic web deliverables on servers prior to the System z9 server (that is, on zSeries servers).
   
   The level of cryptographic support integrated in z/OS V1R11 is ICSF FMID HCR7751. ICSF FMID HCR7770 (integrated in z/OS V1R10) available as a web deliverable for cryptographic support for z/OS V1R9, z/OS V1R10, and z/OS V1R11.

   - You can migrate to z/OS V1R13 before or after you migrate to a System z9 server.

**Actions you can take after you order a System z9 server**

After you order but before you install your System z9 server, do the following:

1. **Use the CHPID Mapping Tool.** As you might have done with your z990 or z890, use the CHPID Mapping Tool to map logical CHPIDs to physical channels (PCHIDs) and create input to HCD/IOCP for your System z9 server. The tool is a workstation-based Java application available from the Resource Link web site [http://www.ibm.com/servers/resourcelink](http://www.ibm.com/servers/resourcelink). For more information about this tool, refer to the web site.

**Recommended migration steps for a System z9 server**

This topic suggests the steps for migrating your same z/OS release level from your current server to a System z9 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 are:
1. **Install the service in the following PSP buckets:**
   - The z9 EC PSP bucket: upgrade 2094DEVICE, subset 2094/ZOS
   - The z9 BC PSP bucket: upgrade 2096DEVICE, subset 2096/ZOS
   - The z990 PSP bucket: upgrade 2084DEVICE, subset 2084/ZOS

2. **Upgrade your hardware to a System z9 server.** If you are migrating from a z900 or z800 server, see “Migrate to a z990 or z890 server” on page 95 for z990 and z890 migration considerations that you must also satisfy.

**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 V1R13 systems. Use your normal service acquisition portals or download the HOLDDATA directly from [http://service.software.ibm.com/holdata/390holddata.html](http://service.software.ibm.com/holdata/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 V1R13 systems and specify a Fix Category (FIXCAT) value of “IBM.Device.Server.z9-BC-2096” or “IBM.Device.Server.z9-EC-2094”. The report will identify any missing coexistence and fallback PTFs for that system. For complete information about the REPORT MISSINGFIX command, see [SMP/E 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.

### Accommodate functions for the System z9 platform to be discontinued on future servers

**Description:** The following future changes in hardware support could affect your environment:

- **Token ring:** The z990 and z890 are the last servers to offer token ring adapter features on the hardware management consoles (HMCs), Support Elements (SEs), and Trusted Key Entry (TKE) workstations. Thus:
  - Token ring is not available as a feature on the System z10 or System z9 HMC. Current HMCs with token ring may be carried forward to a System z10 or System z9 server during an upgrade from a z990 or z900.
  - Token ring is not available as a feature on the System z10 or System z9 SE or TKE workstation. Token ring is not offered as a feature on System z10 and System z9 servers and cannot be carried forward to a System z10 or System z9 server during an upgrade from a z990 or z900.
  - The OSA-Express Token Ring feature is not supported on System z10 and System z9 servers. Token ring is not offered as a feature on System z10 and System z9 servers and cannot be carried forward to a System z10 or System z9 server during an upgrade from a z990 or z900.

- **HMC:** The z990 and z890 are the last servers on which the HMC is open. Starting with System z9 servers, the HMC is for the exclusive use of the HMC application. Customer applications cannot reside on the HMC. The ESCON Directory and Sysplex Timer applications cannot reside on the HMC. TCP/IP is the only supported communication protocol. The HMC supports System z10 and System z9 servers. It can also be used to support z990, z890, z900, z800, G5, G6, and Mainframe 3000 servers. They must be upgraded to a new AROM level.
• ICB-2s and ISC-3s in compatibility mode: The z990 and z890 are the last servers to support Integrated Cluster Bus-2 (ICB-2) and InterSystem Channel-3 (ISC-3) compatibility mode links. System z10 and System z9 servers do not support them. If you have ICB-2 or ISC-3 compatibility mode links defined, convert them to a supported link technology.

Element or feature: Multiple.
When change was introduced: 27 July 2005 in the z9 EC (formerly z9-109) announcement.
Applies to migration from: z/OS V1R12 and z/OS V1R11
Timing: Before migrating to a System z10 or System z9 server.
Is the migration action required? Yes, if you plan to install a System z10 or System z9 server and are affected by any support 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 make your plans for the future.

Reference information: None.

Migrate to a z990 or z890 server

Description: The IBM eServer zSeries 990 (z990) and zSeries 890 (z890) represent the second generation of zSeries servers. The z990 and z890 servers provide more processing power, memory, and I/O capacity than the first generation of zSeries servers (z900 and z800). By migrating to z/OS V1R13 on a z990 or z890 server, you can take advantage of these improvements.

Element or feature: Multiple.
When change was introduced: The first z990 server shipped in June 2003. The first z890 server shipped in May 2004.
Applies to migration from: z/OS V1R12 and z/OS V1R11.
Timing: Anytime.
Is the migration action required? Yes, if you want to run z/OS on a z990 or z890 server. Also, be aware that if any non-z990, non-z890 systems coexist with z990 or z890 systems, coexistence requirements affect the non-z990, non-z890 systems.
<table>
<thead>
<tr>
<th>Target system hardware requirements:</th>
<th>A z990 or z890 server and, for cryptography, the following hardware features: PCI X Cryptographic Coprocessor (PCIXCC), CP Assist for Cryptographic Functions (CPACF) DES/TDES, and PCI Cryptographic Accelerator (PCICA).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>For shared DASD requirements, see item <a href="#">4 on page 99</a>. For CFCC coexistence requirements, see item <a href="#">6 on page 100</a>.</td>
</tr>
</tbody>
</table>
| Restrictions: | - Only LPAR mode (not basic mode) is supported on a z990 or z890 server.  
  - Also, see the note on page 99. |
| System impacts: | A power-on reset is required when adding or removing a Logical Channel Subsystem (LCSS), changing the maximum number of devices for an LCSS, adding or deleting LPARs, and adding or changing a resource in an LCSS other than LCSS 0. |
| Related IBM Health Checker for z/OS check: | None. |

**Steps to take:** Follow the requirements and recommendations below. Included is information about required HMC levels, configuring a z990 or z890 server, installing software and microcode for coexistence with a z990 or z890 server, cryptographic considerations, and operational considerations.

First, some general considerations and reminders:
- z/OS V1R5 and later contains z990 exploitation support.
- Minimizing the number of changes you make concurrently makes it easier to pinpoint problems. Therefore, avoid upgrading your software release level at the same time that you upgrade your hardware.
- Having members of the sysplex at the same software level, except for brief migration periods, is good software management policy.

### Actions you can take before you install a z990 or z890 server

1. **Upgrade HMC microcode.** Upgrade the hardware management console (HMC) driver level to 1.8.0 or later. IBM recommends migrating z900 and z800 HMCs to HMC driver level 1.8.0 or later before z990 or z890 installation.

2. **Review PSP buckets.** You should review and install all the applicable service in the 2084DEVICE (for z990) or 2086DEVICE (for z890) PSP bucket. 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.z990-2084” or “IBM.Device.Server.z890-2086”, the Enhanced PSP Tool (http://www14.software.ibm.com/webapp/set2/srchBroker), or ServiceLink’s PSP Service Extraction tool.

If you use REPORT MISSINGFIX, some FIXCAT values you can use for specific server functions are:
- IBM.Device.Server.z990-2084.zAAP
3. **Define the z990 or z890 server.** Use HCD to define the z990 or z890 server.

   When installing a new (“net add”) z990 or z890 server, you must define the operating system and processor. You can use the copy or migrate functions of HCD to model these definitions after an existing processor.

   When using a miscellaneous equipment specification (MES) package to upgrade a z900 server to a z990 server, or to upgrade a z800 server to a z890 server, or when replacing one or more z900 servers (or z800 servers) with a z990 or z890 server (a “box swap” or “push/pull”), you must copy or migrate the existing definitions to a z990 or z890 Logical Channel Subsystem (LCSS). IBM recommends the following:

   - Ensure that the production input/output definition file (IODF) that will be used to migrate existing definitions contains all the definitions for all the items to be migrated (operating system configurations, ESCON and FICON switches, logical partitions, channels, control units, devices, and coupling facility processors). Using one source IODF means that there will be no conflict to be resolved during the migration process with any control unit or device for address or number definition conflict, address or number range conflict, or type definition conflict.

   - If you are consolidating two processors into a z990 or z890 server, copy or migrate one processor into LCSS 0 and the other into LCSS 1.

   When making the z990 or z890 hardware definitions, you must:

   - **Define the z990 or z890 processor.** Only LPAR mode is allowed. You also need to define the number of LCSSs that you intend to use. Note that increasing or decreasing the number of LCSSs will require a power-on reset of a new input/output configuration data set (IOCDS). IBM recommends that when you define a z990 or z890 server, you should initially define the number of LCSSs you expect to use — up to two LCSSs on a z890 or up to four LCSSs on a z990.

   - **Define the channel subsystems.** For each channel subsystem, specify an LCSS ID, a description, and the maximum number of devices:

     **Notes:**

     a. There is no hardware system area (HSA) expansion support on the z990 or z890 support element (SE). The maximum number of devices, defined for each LCSS, replaces the HSA expansion percentages in the central processor complex (CPC) activation profile on the support element.

     b. If you change the maximum number of devices in an LCSS, you cannot do an ACTIVATE; you must do a power-on reset. IBM recommends that when you define a z990 or z890 server, you initially define the maximum number of devices that you expect to use in the future.

     c. Because of the increase in the number of LPARs and LCSSs, be sure that the value specified on the MAXDEV keyword is large enough. (Increasing MAXDEV requires a power-on reset). The HCD default for maximum number of devices is 63K. This could result in a large amount of HSA storage being wasted.

   - **Define logical partitions.** The partition names may not be duplicated across LCSSs. On servers other than z990 and z890 servers, partition numbers are the same as Multiple Image Facility (MIF) IDs. On z990 and z890 servers, partition numbers are assigned at power-on reset based on the IOCDS. MIF IDs are still specified using HCD/IOCP. On z990 and z890 servers, the partition number can be in the range 1–30 (X’1–1E’) and the MIF ID must be
in the range 1–15 (X’1–F’). The partition number will be unique across all LCSSs. The MIF ID must be unique within each LCSS, but can be duplicated across LCSSs. Note that partition numbers are not related to LPAR IDs, which are specified in the HMC image profile.

**Notes:**

a. IBM recommends when you define a z990 or z890 server, you should initially define the number of logical partitions that you expect to use. If you plan to exploit more than 15 LPARs, then define the number of LCSSs (two or more) that you expect to use. For exploiting more than 15 LPARs and more than one LCSS, ensure that you have the correct hardware driver level. You only need to define the LCSS and LPARs (and specify the maximum devices for the LCSS). The LPAR can be defined with no I/O resources. I/O configuration definitions can be dynamically added later to a logical partition (nondisruptively). The newly defined I/O configuration definition change can be dynamically activated. Note that any z800 or z900 server used as a coupling facility image in this environment needs to have the CFCC z990 Compatibility MCL installed (see item 6 on page 100 for details).

b. There is no correlation between LPAR ID and the LCSS under which an LPAR runs. There can be LPARs in LCSS 0 with LPAR IDs greater than 15, and there can be LPARs in LCSS 1 (and LCSS 2 and LCSS 3) with LPAR IDs less than or equal to 15.

• **Define channel paths.** The processor name is qualified by the LCSS ID. Channel path IDs (CHPIDs) only need to be unique within an LCSS.

**Notes:**

a. There are no default CHPIDs on the machine when configured or shipped. Physical channel IDs (PCHIDs) must be defined.

b. Cryptography functions do not require CHPIDs.

c. Spanned channels access and candidate lists are by LCSS and partition.

d. The internal queued direct (IQD) CHPID on the VTAM® start option IQDCHPID=xx must be defined as a spanned CHPID if communication with systems in other LCSSs is desired.

• **Recommended:** Use the CHPID Mapping Tool to map logical CHPIDs to physical channels (PCHIDs) and create input to HCD/IOCP. The tool is a workstation-based Java application available from the IBM Resource Link web site: [http://www.ibm.com/servers/resourcelink](http://www.ibm.com/servers/resourcelink). It updates the z990 or z890 IOCP input file with the “PCHID” keyword and can generate reports to help with cabling. To obtain and use the tool, do the following:

  – If this is an initial z990 or z890 order, download a machine order file (CFReport or manufacturing order file) from Resource Link to a workstation.

  – Create a validated work IODF (an IODF that is valid except that it is missing PCHIDs) using HCD option 2.12 (Build Validated Work I/O Definition File).

  – Create an IOCP deck without PCHIDs or with some PCHIDs missing using HCD option 2.3 (Build IOCP Input Deck).

  – Download the IOCP file (which can include PCHID keywords) to the workstation.

  – Download the tool.

  – Run the tool selecting the 2084 hardware configuration file (.hwc or .cfr) and import the IOCP statements.
Upload the updated IOCP deck with the PCHIDs assigned using HCD option 5.1 (Migrate IOCP/OS Data). Choose migrate option 3 (PCHIDS).

Build a production IODF.

Write the IOCDS to the z990 or z890 support element using HCD or stand-alone IOCP.

*Define control units.* A control unit is defined once in the IODF but the CHPID.link combinations for a z990 or z890 processor are defined for each LCSS because each LCSS has its own set of CHPIDs.

*Define devices.* The channel subsystem data (for example, the preferred path and candidate lists) must be specified for each LCSS (and may be different for each LCSS).

**Note:** The following features and functions are not supported by the z990 and z890 servers:

- Parallel channels. Use the IBM ESCON Converter or the Optica Technologies 34600.
- OSA-2 adapters. Use the equivalent OSA-Express adapter. (For FDDI, use a multiprotocol switch or router with the appropriate network interface.)
- OSA-Express ATM adapters. Use a multiprotocol switch or router with the appropriate network interface, for example, 1000BASE-T or Gigabit Ethernet.
- 4-Port ESCON cards. Replace these with new 16-Port ESCON cards during upgrade. The 16-Port ESCON card has a MTRJ-45 connector.
- FICON cards (pre-FICON Express). Replace these with FICON Express during upgrade. FICON Express has a different connector.
- PCICC. This feature is replaced with PCIXCC for most of the commonly used cryptography functions.
- Activation of an over-defined channel configuration.
- Systems Network Architecture (SNA) Operations Management commands and SNA based APIs are not supported on z990 and z890 servers. These commands were previously used by the System Automation for OS/390® product as well as NetView®. It is recommended that you now use the Simple Network Management Protocol (SNMP) application programming interfaces (APIs) for your automation needs.

4. **Install coexistence software.** All images that share DASD with any z/OS, z/VM, or z/VSE® operating system images running on a z990 or z890 server need to have ICKDSF R17 installed. IBM recommends that ICKDSF R17 be deployed to all other systems that share DASD, before any z990 or z890 server is brought into use in the sysplex.

5. **Plan for coupling facility images.** Coupling facility images on G2, G3, G4, or equivalent processors cannot be connected to operating system images on a z990 or z890 server and therefore any structures in these coupling facility images also need to be moved to a coupling facility that can connect to this environment (G5, G6, z800, z900, z990, or z890 server).

Only coupling facility images on G5, G6, z800, and z900 servers are supported. While z990 and z890 servers do not offer a stand-alone coupling facility option, you could have a coupling facility image as the only image in the z990 or z890 server, making it look effectively like a stand-alone coupling facility, or you could have an ICF image along with other partitions running z/OS, or other...
workloads, on your z990 or z890 server (possibly using coupling facility duplexing). Alternatively, you can continue to use your existing z900 or z800 coupling facilities (2064-100) and G5/G6 coupling facilities. However, workloads such as data sharing, global resource serialization, and DB2 (users of locking structures) are likely to require newer technology for performance reasons. If you have such workloads, you should plan to upgrade G5 coupling facilities (9672-R06) to z900 coupling facilities, or move your coupling facilities to z990s or z890s. IBM does not recommend using G5 coupling facilities in a Parallel Sysplex cluster with z990 or z890 servers for these workloads. You should only use them as a temporary migration step.

6. **Install z990 CFCC coexistence microcode.** If you intend to have an operating system image or a coupling facility image on a z990 or z890 server and have more than 15 LPARs defined (even if 15 or fewer are activated), you need to have CFCC compatibility code installed on:

- Any coupling facility image (stand-alone or ICF) on a G5, G6, z800, or z900 server that will connect to an operating system image on the z990 or z890 server.
- Any coupling facility image (stand-alone or ICF) that will be duplexed with a z990 or z890 coupling facility image.

IBM recommends that the CFCC z990 compatibility MCL be rolled out on all coupling facility images that will reside on a G5, G6, z800, or z900 server that will connect to an operating system image on a z990 or z890 server or be duplexed with a coupling facility image on a z990 or z890 server, before any z990 or z890 server is brought into use in the sysplex.

**Notes:**

a. The CFCC z990 compatibility code is provided with the GA level of CFCC Level 11 (for G5 and G6 servers) and as an MCL on CFCC Level 12 (for z900 and z800 servers). The CFLEVEL 12 MCL is disruptive, so IBM recommends that you coordinate the installation of this MCL with other disruptive MCLs, if possible.

b. If you are MES-upgrading to a z990 or z890 server, or replacing (“box swap”) an existing server, then the “old” server does not require the CFCC compatibility MCL. However, any remaining G5, G6, z800, or z900 servers that will be connecting to the z990 or z890 server will require the MCL upgrade (if more than 15 LPARs will be defined).

c. If 15 or fewer LPARs will be defined on the z990 or z890 server, then the CFCC compatibility code is not required on z900 and z800 servers. If at any time in the future you define more than 15 LPARs, then the CFCC compatibility code will be required at that time.

d. If you have a coupling facility image (stand-alone or ICF) on a G5 or G6 server that will either connect to an operating system image on a z990 or z890 server or be duplexed with a z990 or z890 coupling facility image, then the CFCC level of the G5 or G6 coupling facility image must be CFCC Level 11 (or later).

e. If you have a coupling facility image (stand-alone or ICF) on a z900 or z800 server that will either connect to an operating system image on a z990 or z890 server or be duplexed with a z990 or z890 coupling facility image, then the CFCC level of the z900 or z800 coupling facility image must be CFCC Level 12.
Table 8. Summary of z990 CFCC coexistence support

<table>
<thead>
<tr>
<th>Server</th>
<th>CFCC level</th>
<th>15 or fewer LPARs defined on a z990 or z890 server</th>
<th>More than 15 LPARs defined on a z990 or z890 server</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-G5, G5, or G6</td>
<td>CFCC Level 9 (or below)</td>
<td>Not supported</td>
<td>Not supported</td>
</tr>
<tr>
<td>G5 or G6</td>
<td>CFCC Level 11</td>
<td>Supported</td>
<td>Supported</td>
</tr>
<tr>
<td>z800 or z900</td>
<td>CFCC Level 9 or 10</td>
<td>Not supported</td>
<td>Not supported</td>
</tr>
<tr>
<td>z800 or z900</td>
<td>CFCC Level 12</td>
<td>Supported</td>
<td>Not supported</td>
</tr>
<tr>
<td>z800 or z900</td>
<td>CFCC Level 12 with CFCC compatibility code, or CFCC Level 13</td>
<td>Supported</td>
<td>Supported</td>
</tr>
</tbody>
</table>

7. **Install cryptographic software, if necessary.** If you use cryptographic services, ensure that you have the level of cryptographic support that you require on your z/OS system. For a cross reference of ICSF FMIDs, web deliverables, and z/OS releases, see [http://www.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/TD103782](http://www.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/TD103782).

**Note:** The following infrequently used cryptographic functions that are in z900 and z800 servers are not in z990 and z890 servers:
- Digital Signature Algorithm support
- ANSI x9.17 services and key types
- Cipher_Text Translate (CSNBCTT)
- German Bank Pool - Pin Offset
- CSFUDK (replaced with CSNBDKG)
- Commercial Data Masking Facility (CDMF) – 40-bit Encryption

**Actions you can take when you order a z990 or z890 server**

Determine future target I/O requirements before placing your order.

If required, use “Plan Ahead” for I/O cages and associated base infrastructure (adding I/O cages later is disruptive).

PCIXCC installation will be nondisruptive. Use “Plan Ahead” for the PCIXCC to ensure that slots are reserved in advance. This also balances the configuration when PCIXCC is available and installed.

Once I/O infrastructure is planned ahead, model upgrades or adding I/O cards can be nondisruptive, and Self-Timed Interconnect buses (STIs) are hot-pluggable.

Ensure that proper hardware features are ordered. For example, hardware features for cryptography are:
- PCIXCC (feature code 0868), if required
- CP Assist for Cryptographic Functions (CPACF) DES/TDES (feature code 3863)
- PCICA (feature code 0862), if required

Ensure that Driver 55 or later is ordered if you want support for the following features and functions on the z990 server:
- Four Logical Channel Subsystems
- Spanned external channels
- PCIX Crypto Adapter Integrated Console Controller
- OSA Integrated Console Control (OSA-ICC)
• Extended Translation Facility
• System z Application Assist Processor (zAAP) (requires Driver 55K or later)

**Actions you can take after you install z/OS for a z990 or z890 server**

1. **Update CFRM policies.**
   - If a coupling facility image resides on a G5, G6, z800, or z900 server, then the partition number currently specified in the CFRM policy is the same as the partition number defined in HCD. No change is required for the partition number.
   - If a coupling facility image resides on a z990 or z890 server, then the partition number specified in the CFRM policy is the logical partition identifier specified in the HMC Image Profile (Partition ID). The CFRM policy utility was changed to accept a two-digit hexadecimal PARTITION value for an LPAR ID greater than 15.

   **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.

2. **Update automation for new and changed messages.**
   - The following messages are changed to display two-digit LPAR IDs: IOS431I, IXC101I, IXC105I, IXC357I, IXC360I, IXC361I, IXC362I, IXC500I, IXC505I, IXC506I, IXC507I, IXC515I, IXC517I, IXC518I, IXC519E, IXC551I, IXC579I, IXL008I, IXL010E, IXL141I, IXL150I, IXL157I, IXL158I, IXL160E, and IOX50xI.
   - PCHID information is now displayed, when appropriate.
   - The following messages are associated with changed command output:
     - IEE174I – display output for D M=CPU command
     - IOS506I display output for D IOS,CONFIG(HSA) and D IOS,CONFIG(ALL) command output

3. **Notify those affected by changed command output.** Command syntax is not changed for z990 and z890 support but rather the display output for the following commands is changed:
   - The D M=CPU command can now display a two-hexadecimal-digit LPAR ID from partitions running on a z990 or z890 server, which supports two-digit LPAR IDs. (The message number is IEE174I.) The logical CPU address no longer appears in the CPU ID. CSS ID, MIF ID, and the like are now formatted.
   - The D IOS,CONFIG(HSA) command will display zeros for the unshared subchannel and logical CUs lines in the message. (The message number is IOS506I.) On z/OS V1R5 and later, subchannel and logical CUs will be displayed by LCSS.
   - The D M=CHP command is changed to add PCHID to the display.
   - The D CF command is changed to support two-hexadecimal-digit LPAR IDs and PCHIDs.
   - The D XCF command is changed to support two-hexadecimal-digit LPAR IDs.

4. **Modify programs affected by changed SMF records.** If you currently process SMF records 70, 74, 79, and 89, you will need to review changes and modify any user-written programs if they are affected. The changes are:
• SMF Record 70 Subtype 1 (CPU and PR/SM™ Activity) is now split into multiple records if the number of LPARs and CPs requires more than 32K. Each piece is self-containing, that is, records can be processed without reassembling the broken pieces.

• SMF Record 74 Subtype 1 (Device Activity) is changed because of I/O architecture.

• SMF Record 79 Subtype 9 (Device Activity) is changed because of I/O architecture.

• SMF Record 89 (product usage data) is changed to support 4-bit and 8-bit LPAR identifiers and more than 15 LPARs.

• SMF Record 99 Subtype 8 (WLM LPAR Management – CPU Period Table Entry) is changed to add the CSS ID.

• SMF Record 99 Subtype 9 (I/O Subsystem Info – Channel Path Data Entry) is changed to add the CSS ID.

5. **Update parmlib members.** Review parmlib changes and update members as appropriate:

   • If you use cryptography, then you should be aware that ICSF provides IPCS support. A parmlib member, CSFIPCSP, will be installed into the library specified on the SMP/E PARMLIB DDDEF statement (and delivered in SYS1.IBM.PARMLIB in ServerPac). Ensure that this library is included in your IPCS concatenation. If you copy members from that library to another library, you have to copy CSFIPCSP.

   • There is no change to member SMFPRMxx. However, there is a change in the description of the serial number in the SID parameter when a z990 or z890 is involved; the first two digits are the LPAR ID instead of the logical CPU address and LPAR ID.

6. **Modify programs affected by macro changes.** As with any software upgrade, you need to review any macro changes and update any user programs if they are affected.

**Actions you might need to take once you are using a z990 or z890 server**

**ACTIVATE actions:**

• You can perform a software ACTIVATE (the number of defined LCSSs is irrelevant).

• You can only perform a hardware ACTIVATE if the changed or new resources are restricted to LCSS 0.

• A power-on reset is required when adding or removing an LCSS, changing the maximum number of devices for an LCSS, adding or deleting LPARs, and adding or changing a resource in an LCSS other than LCSS 0.

• You can perform full hardware or software ACTIVATE (regardless of the LCSS where the new or changed resources are defined).

Be aware that removing (restoring) the CFCC compatibility code from a G5, G6, z800, or z900 server will reintroduce sysplex coexistence considerations. That is, removing the CFCC compatibility support from a coupling facility image elsewhere in the sysplex will prohibit that coupling facility from participating in a sysplex with operating system or coupling facility images on a z990 or z890 with more than 15 LPARs defined on it (regardless of the number of LPARs that are activated).
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.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>Multiple.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>General migration action not tied to a specific release.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Anytime.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you use any of the devices that are no longer supported.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>Replacement devices as necessary.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>None.</td>
</tr>
</tbody>
</table>

**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.

<table>
<thead>
<tr>
<th>Element or feature:</th>
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</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>General migration action not tied to a specific release.</td>
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<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Anytime.</td>
</tr>
</tbody>
</table>
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 device requirements 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.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>Multiple.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>General migration action not tied to a specific release.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Anytime.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you are migrating to a new CFCC level.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>None.</td>
</tr>
</tbody>
</table>

**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/](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](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/psos/cfctable.html](http://www.ibm.com/systems/z/advantages/psos/cfctable.html).

### Migrate from a Sysplex Timer to STP

**Description:** The Server Time Protocol (STP) feature is the follow-on to the Sysplex Timer (9037-002). 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, z196, z114, z10 EC, z10 BC, z9 EC, z9 BC, z990, and z890.
<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>Multiple.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>When change was introduced:</strong></td>
<td>STP was announced on 27 July 2005 in the z9 EC announcement (US letter 105-241) and on 10 October 2006 in the STP announcement (US letter 106-715). STP became generally available in January 2007.</td>
</tr>
<tr>
<td><strong>Applies to migration from:</strong></td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td><strong>Timing:</strong></td>
<td>Anytime.</td>
</tr>
</tbody>
</table>
| **Is the migration action required?** | - Yes, if you are planning to use a zEC12, z196, or z114 server because the Sysplex Timer (9037-002) is not supported with these servers. **Note:** You do not need an STP-only configuration with a zEC12, z196 or z114 server. The z196 and z114 servers can participate in a Mixed-CTN configuration if the other servers connect to an ETR and are STP enabled. The other server becomes the stratum 1 server for the Mixed-CTN and the zEC12, z196, and z114 servers connect to the stratum 1 server using coupling link technology.  
  - No, but recommended if you are using a System z10 or earlier server because these are the last servers that will support the Sysplex Timer (9037-002). |
| **Target system hardware requirements:** | The servers and coupling facilities that are capable of supporting STP are the zEC12, z196, z114, Systems z10 EC, z10 BC, z9 EC, z9 BC, z990, and z890. The STP feature number is 1021.  
STP is a server-wide facility that is implemented in the Licensed Internal Code (LIC) of the zEC12, z196, z114, Systems z10 ECs, z10 BCs, z9 ECs, z9 BCs, z990s, z890s, and coupling facilities, and presents a single view of time to PR/SM.  
The Sysplex Timer’s LIC has been upgraded to support using STP in a Mixed Coordinated Timing Network (CTN). The required Sysplex Timer LIC is shipped along with the STP feature and must be installed by the IBM Service Support Representative prior to migrating from a Sysplex Timer based External Time Reference (ETR) network to any STP Coordinated Timing Network (CTN). |
| **Target system software requirements:** | Even though z/OS has function to support STP, additional PTFs are required. Consult the PSP buckets for STP-related maintenance. Use FIXCAT IBM.Device.Server.device-type.ServerTimeProtocol to get this information. |
| **Other system (coexistence or fallback) requirements:** | None. |
Restrictions: None.

System impacts: None.

Related IBM Health Checker for z/OS check: Use ZOSMIGREC_SUP_TIMER_INUSE on z/OS V1R11 or later to determine whether the timing mode on the current system is ETR.

Steps to take: To implement STP, see the STP web site and the publications and other resources that are listed there. The STP web site is at [http://www.ibm.com/systems/z/advantages/pso/stp.html](http://www.ibm.com/systems/z/advantages/pso/stp.html).

Reference information: See “Steps to take” above.

---

**Migrate from ICB-4 to Infiniband coupling links**

**Description:** System z10 is the last server to support Integrated Cluster Bus-4 (ICB-4) links. IBM does not intend to offer ICB-4 links on future servers.

**Element or feature:** Multiple.

**When change was introduced:** The intention to not offer ICB-4 links on future servers was originally stated in the IBM System z10 EC announcement on 26 February 2008.

**Applies to migration from:** z/OS V1R12 and z/OS V1R11.

**Timing:** Anytime.

**Is the migration action required?**
- Yes, if you are planning to use a zEC12, z196, or z114 server because ICB-4 links are not offered with these servers.
- No, but recommended if you are using a System z10 or earlier server because these are the last servers to offer ICB-4 links.

**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 InfiniBand coupling links instead of ICB-4 links. Updates to zEnterprise Parallel Sysplex coupling connectivity allow attachment between zEnterprise and System z10 and System z9 general purpose servers (no longer just standalone coupling facilities) using 12X InfiniBand attachment at 6 gigabytes per second (Gbps). If a zEC12, z196, z114, z10 EC, or z10 BC server is attached to a z9 EC or z9 BC server, they operate at 3 gigabytes per second (Gbps) using 12X IFB. InfiniBand coupling can provide significantly improved service times compared to ISC-3 for distances up to 150 meters.

**Reference information:** You can read about InfiniBand coupling links in *IBM System z Connectivity Handbook*, SG24-5444.
Chapter 4. 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

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<th>Title of migration action</th>
<th>Page or topic</th>
</tr>
</thead>
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<tr>
<td>Migrate from ICB-4 to Infiniband coupling links</td>
<td>108</td>
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<tr>
<td>Migrate to an IBM zEnterprise z196 or z114 server</td>
<td>61</td>
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<tr>
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<td>77</td>
</tr>
<tr>
<td>Migrate to a System z9 server</td>
<td>89</td>
</tr>
<tr>
<td>Migrate to a z990 or z890 server</td>
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</tr>
</tbody>
</table>

### Sysplex actions to perform before installing z/OS V1R13

<table>
<thead>
<tr>
<th>Element or feature</th>
<th>Title of migration action</th>
<th>Page or topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple</td>
<td>Install coexistence and fallback PTFs</td>
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<tr>
<td>DFSMSdfp</td>
<td>DFSMSdfp: Back up SMS control data sets</td>
<td>209</td>
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<tr>
<td>Distributed File Service</td>
<td>zFS: Ensure sysplex=filesys is available on all zFS R11 and R12 systems in a shared file system</td>
<td>253</td>
</tr>
</tbody>
</table>

### Sysplex actions to perform before the first IPL of z/OS V1R13

<table>
<thead>
<tr>
<th>Element or feature</th>
<th>Title of migration action</th>
<th>Page or topic</th>
</tr>
</thead>
<tbody>
<tr>
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This topic describes migration actions for the base element BCP (Base Control Program).

BCP actions to perform before installing z/OS V1R13

This topic describes BCP migration actions that you can perform on your current (old) system. You do not need the z/OS V1R13 level of code to make these changes, and the changes do not require the z/OS V1R13 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 V1R12 and z/OS V1R11.

**Timing:** Before installing z/OS V1R13.

**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:**

- 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 prior to 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:**
- 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.*

### 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 message IEA660I 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 V1R13 systems.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>BCP.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R13, and rolled back to z/OS V1R12 and z/OS V1R11 with APAR OA35929.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before installing z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>No, but recommended to assist in sharing IEASYSxx members between z/OS V1R13, and pre-z/OS V1R13 systems, when new enhancements in z/OS V1R13 are to be exploited.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>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.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>Certain restrictions are identified when using WARNUND in IEASYSxx. See reference information below.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>None.</td>
</tr>
</tbody>
</table>

**Steps to take:**

1. Install the PTF for APAR OA35929 on all pre-z/OS V1R13 systems.
2. As you add new statements in IEASYSxx for functional exploitation and you wish to share those modified IEASYSxx members with pre-z/OS V1R13 systems, add WARNUND to the beginning of IEASYSO0 as that will cover updates in all IEASYSxx members.

Reference information:
- 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 249.

**Element or feature:** BCP.

**When change was introduced:** z/OS V1R13.

**Applies to migration from:** z/OS V1R12 and z/OS V1R11.

**Timing:** Before installing z/OS V1R13.

**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 V1R11 (HBB7760)**
200 cylinders primary; 50 cylinders secondary on a 3390 device.

**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.
### Migrate from SNMP to z/OS BCPii for communication to the HMC or SE

**Description:** IBM intends for z/OS V1R13 to be the final release in which SNMP as supported protocol for the communication to the Hardware Management Console (HMC) or Support Element (SE) is available. If you are currently using SNMP for the communication from the Capacity Provisioning Manager to SE/HMC, it is recommended that you migrate to BCPii.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>BCP.</th>
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</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R13.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before installing z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>No, but recommended because the migration to BCPii will be required in a future release.</td>
</tr>
</tbody>
</table>

- **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 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 V1R12 or z/OS V1R11 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:**
- 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. Tracking facility" in [z/OS MVS Planning: Operations](#).
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 syntax error during CONSOLExx parmlib processing indicated by message IEA195I or message IEA196I as shown in the example below:

- IEA196I CONSOLM1 03E0: NAME REQUIRED FOR CONSOLE.
- IEA196I CONSOLM1 03E0: DUPLICATE SPECIFICATION IGNORED.
- IEA196I CONSOLM1 03E0: UNRECOGNIZED KEYWORD INITIDS(Y) IGNORED.
- IEA196I CONSOLM1 03E0: UNRECOGNIZED KEYWORD INITIDS(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 and z/OS V1R11.
Timing: Before installing z/OS V1R13.
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:
1. Examine your CONSOLExx 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 CONSOLExx parmlib member by entering one or more blanks between the major keyword statements and their associated keywords.

Reference information: For more information about the CONSOLExx parmlib member, see z/OS MVS Initialization and Tuning Reference.
Upgrade Java support for Capacity Provisioning

**Description:** Starting with z/OS V1R13, the Provisioning Manager component of Capacity Provisioning requires Java 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.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>BCP.</th>
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<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R13.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before installing z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you use Capacity Provisioning.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>None.</td>
</tr>
</tbody>
</table>

**Steps to take:**
- 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 PGSE macro difficult because the macro can only handle virtual storage pages backed by 4 KB pages. Therefore, the PGSE 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.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>BCP.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R13. z/OS V1R12 by APAR OA33782.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 without APAR OA33782, and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before installing z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you use the PGSE macro to protect or unprotect the READONLY nucleus.</td>
</tr>
</tbody>
</table>
### Target system hardware requirements:
None.

### Target system software requirements:
None.

### 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," below.

### 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:

## Review changes to XES Event Exit Parameter List (IXLYEEPL) field length

### 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 provided by greater-than-32 connectors. This additional information is mapped by EEPLSTRSTATECHANGEINFO. The following fields have been added to the EEPLSTRSTATECHANGEINFO mapping:
- EEPLSSCSTRFACILITYUSERLIMIT
- EEPLSSCSTROCKNUMUSERS

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 z/OS V1R10 in the service stream through APAR OA34061.

### Element or feature:
BCP

### When change was introduced:
z/OS V1R13 with APAR OA34061 (rolled back to z/OS V1R10).

### Applies to migration from:
z/OS V1R13, z/OS V1R12, and z/OS V1R11 without APAR OA34061.

### Timing:
Before the first IPL of z/OS V1R13.
Is the migration action required? Yes, if any of your programs have relied on the length field of EEPELEVENTSPECIFICINFO 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 EEPELEVENTSPECIFICINFO in IXLYEEPL. If you rely on the length of field EEPELEVENTSPECIFICINFO, 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: For details, see z/OS MVS Data Areas, Volume 2, GA32-0854.

Track CSVRTLS services

Description: z/OS V1R5 was the last release of z/OS to support Run-Time Library Services (RTLS) for Language Environment. In z/OS V1R12, the underlying CSVRTLS services were removed from z/OS. A way to track CSVRTLS usage, and to let you find any programs that might be using these services, is available in z/OS V1R11, and rolled back to z/OS V1R10 with APAR OA29019.

Element or feature: BCP.

When change was introduced: z/OS V1R12.

Applies to migration from: z/OS V1R11 with APAR OA29995.

Timing: Before installing z/OS V1R13.

Is the migration action required? Yes, if you are using CSVRTLS services.

Target system hardware requirements: None.

Target system software requirements: None.

Other system (coexistence or fallback) requirements: None.

Restrictions: None.

System impacts: As of z/OS V1R12, failure to remove references to the SET RTLS or DISPLAY RTLS command will result in error messages indicating the entry is unknown or not supported, as shown below:

IEE309I SET UNIDENTIFIABLE KEYWORD
IEE305I DISPLAY COMMAND INVALID

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

- Exploit the z/OS tracking facility to help determine if you are using any of the CSVRTLS services (SET RTLS command, DISPLAY RTLS command, CSVRTLS macro, and RTLS system parameter in IEASYSxx parmlib member) removed from z/OS V1R12:
  - For z/OS V1R11, install PTF UA49184 for APAR OA29995.

Reference information:

- See APAR OA29995.
- To learn more about the tracking facility, see Appendix A in z/OS MVS Planning: Operations.
- To activate or deactivate the tracking facility, use the SETCON TRACKING command. When you activate the OPERCMDS FACILITY class, you must have the CONTROL access authority to the profile when issuing the SETCON TRACKING command. For information about this command, see z/OS MVS System Commands.
- To display the recorded events, use the DISPLAY OPDATA,TRACKING command. For information about this command, see z/OS MVS System Commands. This command displays message CNZ1001I. For information about this message, see z/OS MVS System Messages, Vol 4 (CBD-DMO).

BCP actions to perform before the first IPL of z/OS V1R13

This topic describes BCP 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.

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.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>BCP.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>General migration action not tied to a specific release.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>None.</td>
</tr>
</tbody>
</table>

**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.

Notes:
1. When the IPLTXEXIST parameter (which was introduced by ICKDSF R17 APAR PK16403) is specified with the REFORMAT command using the IPLDD parameter, WTO message ICK21836D is suppressed if IPL text already exists.
2. ICKDSF APAR PM42057 introduced a new parameter called REMOVEIPLTXT to the REFORMAT command that allows you to remove IPL text from the volume. If you wish to remove IPLTEXT from a volume that is not the IPL volume, ICKDSF APAR.

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.

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.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>BCP.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>General migration action not tied to a specific release. See &quot;Steps to take&quot; for required changes to generate a stand-alone dump program using one-stage JCL.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>None.</td>
</tr>
</tbody>
</table>

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.

If you are migrating from a pre-z/OS V1R12 system where the PTF for OA31077 is not applied, stand alone dump one-step (now called one-stage) JCL needs to be updated to specify DDNAME of TRK0TEXT and DSFSYSIN. Also, another job step (for DASD) to invoke ICKDSF must be added. Sample JCL can be found in z/OS MVS Diagnosis: Tools and Service Aids and DOC APAR OA34383.
Note: Starting with z/OS V1R12, NUCLIB=(volser,unit) parameter can be specified with the AMDSADMP macro in one-stage generation JCL. Prior to z/OS V1R12, this parameter was allowed only when using the two-stage generation JCL.

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

Accommodate increase in nucleus size for the z/OS V1R13 RSM Enablement Offering Web deliverable

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.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>BCP</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R13 RSM Enablement Offering Web deliverable.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R13 without the z/OS V1R13 RSM Enablement Offering Web deliverable or from z/OS V1R11 or z/OS V1R12 to z/OS V1R13 with z/OS V1R13 RSM Enablement Offering Web deliverable.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of z/OS V1R13 with the z/OS V1R13 RSM Enablement Offering Web deliverable installed.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if the increase in nucleus size will affect the private storage available to applications on your system above the 16MB line.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None. The migration action is relevant on all servers.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>The z/OS V1R13 RSM Enablement Offering Web deliverable is only available for z/OS V1R13, z/OS V1R13 without the z/OS V1R13 RSM Enablement Offering Web deliverable, z/OS V1R12, and z/OS V1R11 are not affected by this change.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>Failure to have sufficient private storage available might result in errors that affect the running of your applications.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>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.</td>
</tr>
</tbody>
</table>

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.
Accommodate increase in ESQA with the z/OS V1R13 RSM Enablement Offering Web deliverable

Description: With the introduction of the z/OS V1R13 RSM Enablement Offering Web deliverable, there is an increase of 24K (6 pages) in ESQA per CPU per LPAR. This increase in ESQA per CPU includes general purpose CPs, zIIPs, and zAAPs. Because of this increase, the available private storage may affect application execution on your system.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>BCP</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R13 RSM Enablement Offering Web deliverable.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R13 without the z/OS V1R13 RSM Enablement Offering Web deliverable or from z/OS V1R11 or z/OS V1R12 to z/OS V1R13 with z/OS V1R13 RSM Enablement Offering Web deliverable.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of z/OS V1R13 with the z/OS V1R13 RSM Enablement Offering Web deliverable on z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if the increase in ESQA will affect the private storage available to applications on your system.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>The migration action is relevant on all servers.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>The z/OS V1R13 RSM Enablement Offering Web deliverable is only available for z/OS V1R13. z/OS V1R13 without the z/OS V1R13 RSM Enablement Offering Web deliverable, z/OS V1R12, and z/OS V1R11 are not affected by this change.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>Failure to have sufficient private storage available might result in errors that affect the running of your applications.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>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.</td>
</tr>
</tbody>
</table>

Steps to take: Review your current available private storage usage above the 16 MB line using reports from RMF or an equivalent product. Ensure that an ESQA increase of 24K per CPU used on the LPAR will not adversely affect your system. Adjust values accordingly.

Reference information: See z/OS MVS Initialization and Tuning Guide and 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 V1R13, the z/OS problem documentation upload utility (PDUU) is a standard part of the base operating system with entry point name AMAPDUPL.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>BCP.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R13.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>No, but recommended if you previously used the stand-alone version of PDUU (MTFTPS).</td>
</tr>
</tbody>
</table>

| 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 on [The z/OS Problem Documentation Upload Utility](https://www.ibm.com) in [z/OS MVS Diagnosis: Tools and Service Aids](https://www.ibm.com).

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, z/OS V1R12, z/OS V1R11, and z/OS V1R10. 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. ARM performs cross-system restart when member cleanup completes or when the CLEANUP_TIMEOUT expires, whichever comes first.

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

If the member cleanup does not occur within the time specified by the
CLEANUP_TIMEOUT parameter, automatic restart management will proceed with
processing the element for cross-system restart, and, if CLEANUP_TIMEOUT(120)
is not being used, the system will issue IXC815I to the system log to record the
time out.
IXC815I MEMBER CLEANUP FOR SYSTEM sysname1 NUMBER sysnum1 INCOMPLETE. JOBNAME jobname,
ELEMENT elementname RESTART DELAY TIMED OUT AFTER dec SECOND(S).

When a CLEANUP_TIMEOUT value greater than 120 is specified (or defaulted to),
and additional delay is introduced to wait for member cleanup processing to
complete, message IXC815I is issued to the system log to record the delay in
performing restart processing.
IXC815I MEMBER CLEANUP FOR SYSTEM sysname1 NUMBER sysnum1 INCOMPLETE. JOBNAME jobname,
ELEMENT elementname RESTART IS DELAYED FOR UP TO dec SECOND(S). RESTART IS FOR THE FAILURE OF SYSTEM sysname2 NUMBER sysnum2.

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 and z/OS V1R11 without the
PTFs for OA35357 applied.
Timing: Before the first IPL of z/OS V1R13.
Is the migration action required? Yes, if you have the PTF for APAR OA35357
applied and a five-minute timeout for
member cleanup is not acceptable.
Target system hardware requirements: None.
Target system software requirements: None.
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.
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**
  
  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: cpltserc faileddatetime retcode
  SYSTEM ABEND CODE: abendcode ABEND REASON CODE: abendrsncode
  TIME OF FAILURE: abenddatetime

- **D XCF,SYSPLEX,ALL | system name**
  
  IXC3371 hh.mm.ss DISPLAY XCF
  SYSplex sysplex-name MODE: plex_mode
  SYSTEM system-name 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 and z/OS V1R11.
Timing: Before the first IPL of z/OS V1R13.
Is the migration action required? Yes, if you use automation programs or other procedures to handle message IXC335I and IXC334.
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.


### 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.

**Element or feature:** BCP.

**When change was introduced:** z/OS V1R13.

**Applies to migration from:** z/OS V1R12 and z/OS V1R11.

**Timing:** Before the first IPL of z/OS V1R13.

**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.

Note: If you issue the F LLA,UPDATE=xx command in between the start and stop, the update is not made by the restarted LLA, which is brought up without specifying LLA=xx.
Accommodate OPERLOG EMCS console name change

Description: Starting with z/OS V1R13 (and z/OS V1R12, z/OS V1R11, and z/OS V1R10 with the PTF for APAR OA31913 applied), the OPERLOG EMCS console name *OPLOGyy is generated using the two character System Clone value (&SYSCLONE). The default &SYSCLONE value is obtained from the System Name (&SYSNAME) (for example, System Name = SYSTEM1 / System Clone = M1 ). This naming convention is similar to the SYSLOG EMCS console (*SYSLGyy).

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>BCP.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R13 (z/OS V1R12, z/OS V1R11, z/OS V1R10, and z/OS V1R9 by APAR OA31913).</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11, both without the PTF for APAR OA31913 installed.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you depend on the OPERLOG EMCS console name.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>None.</td>
</tr>
</tbody>
</table>

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 IEE1291)
D EMCS,CN=OPLOG* (message IEE1291)

Note: With the PTF for APAR OA30757 applied to z/OS V1R11 or z/OS V1R10, and in 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.

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 is changing from SHARED mode to DISTRIBUTED mode. A release later than z/OS V2.1 is planned to be the last release in which the consoles component will support
shared mode. SHARED mode will be removed in that future release. DISTRIBUTED mode is now the preferred mode of operations.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>BCP.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R13.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if there is no specification on the CON= system parameter and SHARED mode is required.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>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 <a href="https://www.ibm.com">z/OS MVS Planning: Operations</a>.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>Use check ZOSMIGV1R13_CNZ_CONS_OPER_MODE, available with APAR OA32930, to determine if your installation has explicitly identified your console service operating mode.</td>
</tr>
</tbody>
</table>

**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 command 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. If you are in a in a MULTISYSTEM sysplex environment, use the SETCON MODE=SHARED command to request SHARED mode.

**Tip:** When you activate the OPERCMDS FACILITY class, you must have the CONTROL access authority to the profile when issuing the SETCON MODE command.

**Reference information:** For more information, see:

- DOC APAR OA34738.
- [z/OS MVS Initialization and Tuning Reference](https://www.ibm.com)
- [z/OS MVS Planning: Operations](https://www.ibm.com)
Accommodate HiperDispatch default of YES on IBM zEnterprise zEC12 and IBM zEnterprise (z196 and z114)

**Description:** Beginning with z/OS V1R13 when running on a z196 or z114 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.

<table>
<thead>
<tr>
<th>Element or feature:</th>
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</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R13.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>No, but it is recommended. You should be aware of changes in how system resources are being managed.</td>
</tr>
</tbody>
</table>

| Target system hardware requirements: | IBM zEnterprise zEC12, z196, or z114. |
| 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 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.

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 types(s) where HiperDispatch(NO) is acceptable using the MachTypes parameter; for example, MachTypes(2817).

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).

**Steps to take:**

Examine one or more of the IEAOPTxx members used for each z/OS V1R13 image that will be IPLed on a zEC12, z196, or a z114. Then find the HIPERDISPATCH keyword and take one of the following actions:

- 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.

Tip: You can issue the RMF Monitor-II OPT command introduced in z/OS V1R11
to get the current IEAOPTxx parmlib setting.

HiperDispatch=YES considerations:
• 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
• 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:
• “Planning Considerations for HiperDispatch Mode” white paper at IBM Techdocs
  http://www-03.ibm.com/support/techdocs/atsmastr.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

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 and z/OS V1R11.

Timing: Before the first IPL of z/OS V1R13.

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: None.

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 V1R13:

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 COMMANDxx 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 on Runtime Diagnostics overview in z/OS Problem Management.

Ensure all modules of an application are compiled with the same version of the IRARASD macro

Description: Starting with z/OS V1R12, the IRARASD macro (field RQFASDWA) defines a 512-byte (changed from 338-byte) work area for SYSEVENT REQFASD. When you recompile a module that includes the IRARASD macro, you must also recompile all other modules that include the IRARASD macro and belong to the same application.

It is only necessary to ensure that all modules of an application use the same version of the IRARASD macro; it is not necessary to recompile all modules with the z/OS V1R12 version of the IRARASD macro.

Element or feature: BCP.

When change was introduced: z/OS V1R12.

Applies to migration from: z/OS V1R11.

Timing: Before the first IPL of z/OS V1R13.

Is the migration action required? No, but recommended to avoid incompatible work area sizes between program and declaration when declaration of the work area is done outside the program (DSECT).

Target system hardware requirements: None.

Target system software requirements: None.
Steps to take: Ensure all modules of an application are compiled with the same version of the IRARASD macro.

Reference information:
- See APAR OA33666.
- See macro IRARASD in SYS1.MACLIB

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.

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. For z/OS V1R12 you must apply APAR OA34731 in order to use the ALLOWCMD option. Note that commands can be issued from the system console by default regardless of problem determination mode.

**Reference information:**
- PTF HOLD information for APAR OA34731.

**Update automation that handles messages IEF374I and IEF376I**

**Description:** Starting in z/OS V1R12, message IEF374I is replaced by message IEF032I, and message IEF376I is replaced by message IEF033I. 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.

Sample output of new messages for z/OS V1R12:

```plaintext
IEF142I BEANSZZ STEP1 - STEP WAS EXECUTED - COND CODE 0000
IEF373I STEP/STEP1 /START 2010272.2014
IEF032I STEP/STEP1 /STOP 2010272.2014
CPU: 0 HR 00 MIN 00.00 SEC SRB: 0 HR 00 MIN 00.00 SEC
VIRT: 4K SYS: 232K EXT: 0K SYS: 11936K
IEF375I JOB/BEANSZZ /START 2010272.2014
IEF033I JOB/BEANSZZ /STOP 2010272.2014
CPU: 0 HR 00 MIN 00.00 SEC SRB: 0 HR 00 MIN 00.00 SEC
```

**Element or feature:** BCP.

**When change was introduced:** z/OS V1R12.

**Applies to migration from:** z/OS V1R11.

**Timing:** Before the first IPL of z/OS V1R13.

**Is the migration action required?** Yes, if you use automation programs or other procedures to handle messages IEF374I and IEF376I.

**Target system hardware requirements:** None.

**Target system software requirements:** APAR PM23467 is needed for the Tivoli® Workload Scheduler (TWS) product.

**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 IEF374I so they now work with message IEF032I.
- Modify automated actions for IEF376I so they now work with message IEF033I.

**Reference information:** For details about messages IEF032I and IEF033I, see z/OS MVS System Messages, Vol 8 (IEF-IGD).
Use the new 16M default buffer size for trace options with the CTIGRSxx member

Description: Before z/OS V1R12, the default buffer value (BUFSIZE) for the trace option with the GRS component in the IBM-supplied CTIGRS00 parmlib member was 128K, the maximum value was 16MB, and the buffer was in GRS below the bar private storage. Starting with z/OS V1R12, the default size in CTIGRS00 is increased to 16MB, the maximum is 2047MB, and the buffer is in GRS above the bar private storage in its own memory object. If you specify your own CTIGRSxx member on the CTRACE option in GRSCNFxx parmlib member, change the BUFSIZE in CTIGRSxx to 16MB. Until OA39771 has been applied, supply a buffer size for GRS or the default will not be used correctly.

Element or feature: BCP.
When change was introduced: z/OS V1R12.
Applies to migration from: z/OS V1R11.
Timing: Before the first IPL of z/OS V1R13.
Is the migration action required? Yes, if you modified any IBM-supplied procedures.
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 the trace option BUFSIZE in CTIGRSxx parmlib member to 16M or make the new default value (16M) active.

Reference information: For more information, see "Trace buffer values" in z/OS MVS Diagnosis: Tools and Service Aids and z/OS MVS JCL Reference.

Specify valid user exits for the IFASMFDL and IFASMFDP programs

Description: When you run the SMF log stream dump program (IFASMFDL) or the SMF data set dump program (IFASMFDP), the name of an installation-written exit routine that is given control at the indicated times can be specified by the USERRx (x=1, 2, or 3) parameter.

Beginning with z/OS V1R12 (and z/OS V1R11 with the PTFs for APAR OA29894 applied), to allow user exits to be called by the SMF dump programs, the exits must now be pre-defined to the system using the new keywords shipped in the SMFPROMxx parmlib member. The SMFDLEXIT keyword allows exits to be specified for the IFASMFDL program, and the SMFDPEXIT keyword allows exits to be specified for the IFASMFDP program.

Both keywords have the same suboptions, USER1, USER2 and USER3. The suboptions allow multiple exits to be specified for each user exit point in the respective dump program. The syntax follows.
SMFDLEXIT( USER1( exit1, exit2, ...) | NOUSER1 ,
USER2( exit1, exit2, ...) | NOUSER2 ,
USER3( exit1, exit2, ...) | NOUSER3 )
SMFDPEXIT( USER1( exit1, exit2, ...) | NOUSER1 ,
USER2( exit1, exit2, ...) | NOUSER2 ,
USER3( exit1, exit2, ...) | NOUSER3 )

Note: In z/OS V1R13, or with the PTF for SMF APAR OA33696 applied to z/OS V1R12 or z/OS V1R11, IFASMFDP can once again run in a non-APF authorized environment when using the DUMP option. Also, when IFASMFDP is executed in an unauthorized environment, the exits specified with USER1, USER2 and USER3 will not be verified against what is in the SMFPRMxx parmlib member.

Element or feature: BCP.
When change was introduced: z/OS V1R12. z/OS V1R11, z/OS V1R10, and z/OS V1R9 with APAR OA29894.
Applies to migration from: z/OS V1R11 without the PTF for APAR OA29894 applied.
Timing: Before the first IPL of z/OS V1R13.
Is the migration action required? Yes, if you use the user exit routines.
Target system hardware requirements: None.
Target system software requirements: None.
Other system (coexistence or fallback) requirements: You must apply the PTF for APAR OA29894 if you share the SMFPRMxx parmlib member, with the keyword SMFDLEXIT or SMFDPEXIT specified, on multiple systems.
Restrictions: None.
System impacts: None.
Related IBM Health Checker for z/OS check: None.

Steps to take:
- Register an exit specified for IFASMFDL or IFASMFDP using the USER1, USER2 or USER3 parameters through the SMFPRMxx parmlib member. If you fail to do this, you will receive the following error message, and IFASMFDL or IFASMFDP will stop the processing:
  IFA840I USER EXIT xxxxxxxx NOT REGISTERED WITH SYSTEM
- View the D SMF,O command output to determine if the exits are successfully registered.

Note: You do not need to explicitly define the exits used by the operation of RACF SMF unload utility; they are registered by default.
Default: SMFDLEXIT(USER2(IRRADU00),USER3(IRRADU86))
          SMFDPEXIT(USER2(IRRADU00),USER3(IRRADU86))

Reference information:
- For details about the SMFPRMxx parmlib member, see z/OS MVS Initialization and Tuning Reference
- For details about SMF dump programs, see z/OS MVS System Management Facilities (SMF)
Make IFASMFDL and IFASMFDP run in an authorized environment

Description: When you run the SMF log stream dump program (IFASMFDL) or SMF data set dump program (IFASMFDP), the DUMP function is permitted even in an unauthorized environment. (Note: The CLEAR function of the SMF data set dump program requires APF authorization. No such function exists for the SMF log stream dump program.

Beginning with z/OS V1R12 (and z/OS V1R11 with the PTFs for APAR OA29894 applied), the IFASMFDL and IFASMFDP programs are required to run in an authorized environment. Otherwise, the programs will lose authorization and you will get an S338 followed by a S330 abend, especially if the programs are being executed under TSO/E.

Note: In z/OS V1R13, or with the PTF for SMF APAR OA33696 applied to z/OS V1R12 or z/OS V1R11, IFASMFDP can once again run in a non-APF authorized environment when using the DUMP option.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>BCP.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R12, z/OS V1R11, z/OS V1R10, and z/OS V1R9 with APAR OA29894.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R11 without the PTF for APAR OA29894 applied.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you do not invoke the SMF dump program as a jobstep task.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>None.</td>
</tr>
</tbody>
</table>

Steps to take:

- If you run the SMF dump program using JCL, the APF-authorization assigned to it is preserved, and no action is required.
- For the TSO/E environment, you need to add IFASMFDL and IFASMFDP to the AUTHPGM section of the IKJTSOxx parmlib member when the programs are being invoked using a TSO/E CALL command.
- If LINKMVS or ATTCHMVS is used in a REXX program to invoke IFASMFDL or IFASMFDP, change the invocations of IFASMFDL and IFASMFDP using LINKMVS or ATTCHMVS to use the TSO/E CALL command. In addition, add the IFASMFDL and IFASMFDP program to the AUTHPGM section of the IKJTSOxx parmlib member.
- If calling IFASMFDL or IFASMFDP from another program, that program must be authorized.
**Note:** A ++HOLD(ACT) is being shipped with the PTFs for APAR OA32258 to notify that IFASMFDL and IFASMFDP need to be executed in an authorized environment.

**Reference information:**
- For details about IKJTSOxx parmlib member, see [z/OS MVS Initialization and Tuning Reference](#).
- For details about SMF dump programs, see [z/OS MVS System Management Facilities (SMF)](#).

**Provide the migrate or new parameter when running the PFA install script**

**Description:** Before z/OS V1R12, when installing Predictive Failure Analysis (PFA) it was not necessary for you to specify how to handle the existing data in the check directories. Beginning with z/OS V1R12, you must append a parameter, *migrate* or *new*, on the installation script to specify if the PFA check directories retain data from the prior release. If you do not append the *migrate* or *new* parameter, the AIRSHREP.sh script fails.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>BCP.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R12.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you are using PFA.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>Refer to <a href="#">z/OS Problem Management</a> for considerations and actions required for Predictive Failure Analysis (PFA) when falling back to z/OS V1R12 or z/OS V1R11 from z/OS V1R13.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>None.</td>
</tr>
</tbody>
</table>

**Steps to take:** Provide the *migrate* or *new* parameter when running the PFA install script, AIRSHREP.sh, or when using the sample JCL for batch provided in SYS1.SAMPLIB.

- **migrate:** Use the *migrate* parameter to preserve PFA history data from the prior release. The *migrate* option is recommended for all installations that previously used PFA. When you specify the *migrate* parameter, the install script preserves data from the prior release and creates new directory structures for checks not previously installed on your system.

- **new:** Use the *new* parameter if you are installing PFA for the first time or if you want to delete everything from prior releases and start PFA with new directories. When you specify the *new* parameter, the install script deletes the existing check directories and creates a new directory structure for all the checks.

For example, to run the install script from your home directory:
1. On the OMVS command line, go to the home directory for the PFA user: 
   `cd var/pfa`
2. Run the install script appending the migrate parameter: 
   `/usr/lpp/bcp/AIRSHREP.sh migrate`

**Reference information:** For complete details, see the topic on Steps for installing PFA in z/OS Problem Management.

### Change default locations for LCCA or PCCA control blocks to retain 24-bit virtual storage location

**Description:** In parmlib member DIAGxx, you can specify the virtual location of the LCCA control block (mapped by the IHALCCA macro) or the location of the PCCA control block (mapped by the IHAPCCA macro) to be used when a CPU is brought online. Before z/OS V1R12, if the IHALCCA or IHAPCCA structures specified on the CBLOC VIRTUAL24 or VIRTUAL31 keyword of DIAGxx did not specify either the 24-bit (VIRTUAL24) or 31-bit (VIRTUAL31) location, the default location for the LCCA or PCCA was in 24-bit virtual storage.

Beginning with z/OS V1R12, the default location for the LCCA and PCCA is now in 31-bit virtual storage if you do not specify VIRTUAL24 or VIRTUAL31 for the structures IHALCCA and IHAPCCA. If only one standard processor is online during the IPL, the LCCA and PCCA of the IPL CPU will be in 24-bit storage regardless of the specification. If there is more than one processor, and DIAGxx permits it, you'll have the LCCA and PCCA in 31-bit storage.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>BCP.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R12.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you want to keep the 24-bit virtual storage location for IHALCCA or IHAPCCA.</td>
</tr>
</tbody>
</table>

| 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:** The following z/OS V1R12 migration checks, (available with APAR OA32015 on z/OS V1R11), determine if your current settings match RMODE 31 for the LCCA or PCCA control blocks:

- CHECK(IBMSUP,ZOSMIGV1R12_SUP_LCCA_ABOVE_16M)
- CHECK(IBMRCF,ZOSMIGV1R12_RCF_PCCA_ABOVE_16M)

As is the convention, these checks are shipped inactive and are to be activated when exploring migration actions.
**Steps to take:** If you want to retain the 24-bit virtual storage location for IHALCCA or IHAPCCA, specify VIRTUAL24 on the CBLOC keyword in DIAGxx parmlib member:

VIRTUAL24(IHALCCA)
VIRTUAL24(IHAPCCA)

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

---

**Remove reference to Unicode Services pre-built image CUNIDHC2**

**Description:** Starting in z/OS V1R7, Unicode Services provided support to dynamically load tables into storage when a Unicode service request is made and the table is not already in storage. This enhancement is colloquially known as “Unicode On Demand.” If the appropriate table needed to satisfy the service request is not in storage, Unicode Services will load the table dynamically without disrupting the caller’s request. All tables needed for character conversion, case conversion, normalization, and collation services are now loaded automatically into storage when they are required and not already present. These tables are added to other tables already in storage.

Starting in z/OS V1R12, the pre-built image CUNIDHC2 has been eliminated. This pre-built image contained all the conversion tables supported by DB2 and would be loaded into storage when you had an empty Unicode environment (no UNI=xx in the IEASYSxx member) and the first requestor of a Unicode conversion service would be DB2. Given that most customers would use only a handful of these tables and given that Unicode Service has the capability to dynamically load tables into storage, the need for pre-built image has become obsolete. Unicode Services will no longer ship the pre-built image SYS1.SCUNIMG(CUNIDHC2) and will no longer automatically load the pre-built image. We recommend that you use the Unicode On Demand capability to load all tables.

<table>
<thead>
<tr>
<th>Element or feature:</th>
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</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R12.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if the SYS1.SCUNIMG is in the LNKLST specification.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
</tbody>
</table>

**Steps to take:**

- Remove SYS1.SCUNIMG from the LNKLST specification.
- Remove SYS1.SCUNIMG from the APF authorization list. Note that if your installation is running with the entire LNKLST as APF authorized (LNKAUTH=LNKLST), you do not need to take any additional action. If your
installation is not running with the LNKLST as APF authorized (LNKAUTH=APFTAB), you need to explicitly remove the APF authorization for this data set.

- Remove the catalog entry for SYS1.SCUNIMG.
- Remove the following DDDEF entries:

<table>
<thead>
<tr>
<th>Name</th>
<th>Data Set Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACUNIMG</td>
<td>SYS1.ACUNIMG</td>
</tr>
<tr>
<td>SCUNIMG</td>
<td>SYS1.SCUNIMG</td>
</tr>
</tbody>
</table>

**Note:** If you want to create and load an image with the same conversion tables as the eliminated pre-built image, do the following:

1. Invoke the image generator program using the JCL provided in SYS1.SCUNJCL(CUNJIUTL). Use the conversion statements specified in SYS1.SAMPLIB(CUNSISM6). CUNSISM6 contains all the conversion statements needed to build the pre-built image.
2. After building the image, specify the image name in the CUNUNIxx parmlib member.
3. Specify the corresponding UNI=xx parameter in your IEASYSxx parmlib member and re-IPL.

**Reference information:** For more information about how to create an image, see the section on Creating a Unicode Services Environment in z/OS Unicode Services User's Guide and Reference.

### Remove classification rules with the ETC work qualifier

**Description:** Beginning with z/OS V1R12, the workload management (WLM) service definition no longer supports the work qualifier EWLM transaction class name (ETC) for classification rules of the subsystem type EWLM.

If the activated service definition contains classification rules with qualifier type ETC, they are simply ignored by WLM. However, the next time you modify the classification rules for subsystem EWLM with the WLM ISPF Application, you have to delete the ETC rules before you save your modifications. Although z/OS V1R12 disregards classification rules with the ETC work qualifier, we recommend that you remove them. If you do not remove the rules, you will have to delete them the next time you use the WLM ISPF application to modify the EWLM subsystem type.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>BCP:</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R12.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>No, but recommended, otherwise you will have to delete the classification rules the next time you use the WLM ISPF application to modify the EWLM subsystem type.</td>
</tr>
</tbody>
</table>

| 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 WLM service definitions contain classification rules for subsystem type EWLM with the ETC work qualifier, start the WLM ISPF application and choose the Classification Rules option from the Definition Menu. Use the Modify option (3) for the IBM-supplied subsystem type EWLM. Delete all rows with the ETC qualifier type by using the Delete row Option (D).

**Reference information:** For a description of how to modify a WLM service definition, see [z/OS MVS Planning: Workload Management](http://z/OS MVS Planning: Workload Management).

---

**Update the SFM policy to control automatic termination of impaired critical members**

**Description:** Starting with z/OS V1R12, a member of an XCF group can identify itself as being critical to the operation of the group or the system. If a critical member appears to be inoperative (impaired) and the condition persists long enough, XCF automatically terminates the member in an attempt to resolve the problem. For a member that is critical to the operation of the system, this termination causes the system to be removed from the sysplex. For more information about XCF groups, see [z/OS MVS Setting Up a Sysplex](http://z/OS MVS Setting Up a Sysplex).

Members of the SYSGRS group, for instance, are critical to the operation of the system. If any GRS member is impaired, ENQ processing is likely impacted throughout the sysplex. Failure to perform ENQ processing in a timely fashion has significant negative impact. Thus if a GRS member appears to be impaired, XCF will automatically remove from the sysplex, the system on which that member resides.

You can set the MEMSTALLTIME parameter in your sysplex failure management (SFM) policy to control how long XCF allows a critical member to persist in an impaired state before it initiates termination of the member (or the member's system). If the MEMSTALLTIME specification resolves to NO (either implicitly or explicitly), XCF will terminate an impaired critical member if the condition persists as long as the failure detection interval (INTERVAL) of the system on which the member resides, or if the condition persists as long as two minutes, whichever is greater. To determine which groups are using the critical support, issue the appropriate XCF display command.

The MEMSTALLTIME parameter also determines how long XCF allows a signalling sympathy sickness condition to persist before terminating a stalled group member that is contributing to the problem.

The MEMSTALLTIME parameter indicates the number of seconds that XCF should wait before it terminates a member that is impacting the sysplex. A MEMSTALLTIME value of 120 (two minutes) seems to suit many installations as it provides some additional time for the system to resume normal operation, yet allows automatic action to resolve the problem before the sympathy sickness condition critically impacts the sysplex. Installations that resolve such conditions through manual intervention sometimes use a higher value to allow time for such intervention to be accomplished. Installations that are less able to tolerate sympathy sickness conditions sometimes set lower values.
Element or feature: BCP.
When change was introduced: z/OS V1R12.
Applies to migration from: z/OS V1R11.
Timing: Before the first IPL of z/OS V1R13.
Is the migration action required? No, but recommended when you want to designate how long XCF will wait before initiating termination of the impaired critical members.

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 do not have an SFM policy, or if the SFM policy specifies (either implicitly or explicitly) MEMSTALLTIME(NO), determine if the default time that XCF will wait before terminating an impaired critical member is acceptable. The default time is the maximum of the effective failure detection interval, or two minutes, whichever is greater.

If you have an SFM policy that specifies MEMSTALLTIME other than NO, confirm that the current specification is also acceptable for the termination of critical members.

If changes are necessary, take the following steps:
1. As needed, use the IXCMIAPU utility to create a function couple data set for SFM policies.
2. Use the IXCMIAPU utility to create or modify an SFM policy with an acceptable MEMSTALLTIME specification.
3. Issue the SETXCF command to activate the desired SFM policy.

Notes:
1. On a sysplex-wide reIPL, the policy cannot be activated until some system is up far enough to process the SETXCF command.
2. For an existing sysplex, the appropriate SFM policy must be activated before the z/OS V1R12 system is IPLed to ensure that the z/OS V1R12 system will use the desired MEMSTALLTIME specification.
3. If you currently specify or default to an effective action of MEMSTALLTIME(NO), activating a policy with MEMSTALLTIME(n) might change the behavior of the existing sysplex (since XCF is then permitted to terminate stalled XCF members that are causing signaling sympathy sickness).

Enhance operational and automation procedures to deal with stalled or impaired members. Relevant messages to consider for dealing with stalled members in general, and signaling sympathy sickness specifically, are IXC431I, IXC432I, IXC430E, IXC640E, IXC631I, and IXC632I. Additional messages to consider for impaired members are IXC633I, IXC634I, IXC635E, IXC636I.

For more information about XCF messages, see Handling Signaling Sympathy Sickness in z/OS MVS Setting Up a Sysplex.
Reference information: For details about using SFM policy see Z/OS MVS Setting Up a Sysplex.

Accommodate new REUSASID default

Description: In z/OS V1R9, the REUSASID(YES|NO) parameter in parmlib member DIAGxx was introduced with a default of NO. Starting with z/OS V1R12, the default is changed to YES.

When a reusable ASID is requested by the START command or the ASCRE macro, this reusable ASID is assigned if REUSASID(YES) is specified in DIAGxx. If REUSASID(NO) is specified in DIAGxx, an ordinary ASID is assigned. The default is REUSASID(YES). The use of reusable ASIDs might result in system 0D3 abends, if products or programs have not been upgraded to tolerate reusable ASIDs.

Element or feature: BCP.
When change was introduced: z/OS V1R12.
Applies to migration from: z/OS V1R11.
Timing: Before the first IPL of z/OS V1R13.
Is the migration action required? Yes. If this migration action is not taken, the 0D3 abends might occur with downlevel products that provide no tolerance support for reusable ASIDs. Because reusable ASIDs have been available since z/OS V1R9, it is reasonable to expect that the current levels of products are tolerant of reusable ASIDs.

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

Steps to take:
1. On z/OS V1R11 systems, specify REUSASID(YES) in the parmlib member DIAGxx. On z/OS V1R12 and z/OS V1R13 systems, keep REUSASID(YES), or allow it to default to YES. You can use the SET DIAG=xx command to change the REUSASID (YES|NO) option.
2. Verify that no 0D3 abends occur as a result.
3. If 0D3 abends do occur, apply appropriate maintenance to the affected code.
4. If this is not possible, specify REUSASID(NO) in DIAGxx on z/OS V1R13 to override the new default of REUSASID(YES).

Reference information:
• For more information about reusable ASIDs, see Z/OS MVS Programming: Extended Addressability Guide.
• For more information about the REUSASID parameter in the parmlib member DIAGxx, see Z/OS MVS Initialization and Tuning Reference.
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.

<table>
<thead>
<tr>
<th>Element or feature</th>
<th>BCP.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R12.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>None.</td>
</tr>
</tbody>
</table>

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.

Notes:
1. If you have created an AUTORxx parmlib member, update the IEASYSyx parmlib member that you use for IPL. Add the following statement to the IEASYSyx member:
   AUTOR=(xx,00)

   Here xx corresponds to the AUTORxx parmlib member that you created. The IEASYSyx members specifying AUTOR cannot be shared with prior z/OS releases. If you only need the default AUTOR00 settings, you can omit specifying AUTOR= in IEASYSyx, and other z/OS levels can continue to use IEASYSyx. Even if AUTOR= is not specified in IEASYSyx, AUTOR00 is used if it exists.

   If you have automation already in place for a WTOR and that WTOR now appears in AUTOR, the AUTOR version still can be used. Review the WTORs in AUTOR and your automation; either remove the WTOR from AUTOR or from your automation.

2. On a z/OS V1R11 system with APAR OA35929, you can specify the AUTOR keyword in IEASYSxx with the WARNUND specification, but the AUTOR keyword is ignored, and the IPL will continue. If you do not specify WARNUND and you have specified AUTOR on z/OS V1R11, the IPL will be stopped.
3. If you don't want to activate auto-reply processing, specify AUTOR=OFF in the
parmlib member IEASYSxx or in response to message IEA101A SPECIFY
SYSTEM PARAMETERS. It is not recommended that you remove AUTOR00
from parmlib, because service or new releases might reinstall AUTOR00. If
there is no AUTOR00 member in parmlib, auto-reply is not activated and the
following messages are produced:
  CNZ2600I AUTO-REPLY POLICY ATTEMPTING TO USE AUTOR=00.
  IEA301I AUTOR00 NOT FOUND IN PARMLIB
  CNZ2601I AUTO-REPLY POLICY NOT ACTIVATED.
  NO ENTRIES SPECIFIED

4. If you do not specify the WARNUND option, the IEASYSyy members
specifying AUTOR=OFF cannot be shared with earlier z/OS releases.

Reference information: For more information about the AUTORxx and IEASYSyy
parmlib members, see z/OS MVS Initialization and Tuning Reference

Adjust LOGRECSUMMARY statement value in CEAPRMxx
member

Description: As of z/OS V1R12, the default and maximum values are changed for
this parmlib statement from 24 to 4 hours. Parmlib members that use the old
default value (24) are subject to a parsing error message (ASA008I). CEA
automatically adjusts the value to the new default value (4) and continues
processing.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>BCP.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R12.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of z/OS V1R12.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>No, but recommended to avoid the ASA008I messages received during parsing of the CEAPRMxx member.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>The system is not impacted. CEA automatically adjusts to the new supported default and continues with IPL if anything higher than 4 hours is encountered. The parsing error is effectively ignored by the system.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>None.</td>
</tr>
</tbody>
</table>

Steps to take: Review which CEAPRMxx member you are using, if any, that
overrides CEAPRM00. If you are using an override parmlib member, specify the
new value of (04:00:00) for the LOGRECSUMMARY statement instead of the
unsupported value of 24. There are three LOGRECSUMMARY statements to adjust
in a CEAPRMxx member: one for the SLIP, DUMP, and ABEND operands on the
DUMPCAPTURETIME statement. Adjust all three to be within the supported
maximum of 4 hours.
BCP actions to perform after the first IPL of z/OS V1R13

This topic describes BCP 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.

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

Description: If you set up your Provisioning Manager in z/OS V1R11 or earlier, and you are not using the default installation path /usr/lpp/wbem/jclient for your CIM component, you need to set up the Capacity Provisioning Manager for the use of CIM Client for Java Version 2.

<table>
<thead>
<tr>
<th>Element or feature</th>
<th>BCP:</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced</td>
<td>General migration action not tied to a specific release.</td>
</tr>
<tr>
<td>Applies to migration from</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing</td>
<td>After the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you use Capacity Provisioning Manager and are not using the default installation path for your CIM component.</td>
</tr>
</tbody>
</table>

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 Provisioning Manager user CPOSRV needs read access to CIM Client for Java Version 2 sblim-cim-client2.jar. These access rights are usually sufficient by default. If the current access rights are insufficient, you must set the "other" read access permissions of the file accordingly, using the 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 appropriate authorization.

- 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 sblim-cim-client2.jar to the CLASSPATH entry. If you have already specified the location of a previous version of the CIM Client for 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, 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 the default values, the data set name would be CPO.DOMAIN1.PARM.
Migrate to GRS-managed FICON CTCs

**Description:** Prior to 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), 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.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>BCP.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R13, z/OS V1R12 and z/OS V1R11 with APAR OA38230</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R13, z/OS V1R12 and z/OS V1R11 without APAR OA38230.</td>
</tr>
<tr>
<td>Timing:</td>
<td>After the first IPL of z/OS V1R13.</td>
</tr>
</tbody>
</table>

This migration action only applies to installations where GRS directly manages CTCs as specified in GRSCNFxx. There are two applicable configurations:

- A GRS Ring where the GRS complex is greater than the sysplex, or
- A GRS ring that does not utilize sysplex communications at all.

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.

| Target system hardware requirements: | None. |
| Target system software requirements: | None. |
| Other system (coexistence or fallback) requirements: | There are coexistence PTFs for the GRS-managed FICON CTCs. See the migration actions “Install coexistence and fallback PTFs” on page 8. |
| 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 above: “Is this 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 example.

Example:

A GRSCNFxx CTC example.

```plaintext
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: 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),QUISC command. Wait for message ISG013I; SYSTEM X QUIESCED GLOBAL RESOURCE SERIALIZATION. The VARY GRS(X),QUISC 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.

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 QUIET. If the CTC device is IN-USE or ALTNERATE, the TARGET SYSNAME field must be accurate. If a CTC status is QUIET, 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 QUIET status is expected. Scenario II in [Figure 1 on page 151](#) 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 QUIET. If there are one or more QUIET 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 method: 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 QUIET before starting the remaining systems. See 152.

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:
- For more information, 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
  - z/OS HCD Reference Summary

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: ARCDSN,
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 (ARCDSN,
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.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>BCP</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R13.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>After the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, to protect authorized programs utilizing these qnames from denial-of-service attacks.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
</tbody>
</table>
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:

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 GRSCNF:xx 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

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, or with the PTFs for APAR OA30527 installed on z/OS V1R11 and z/OS V1R10, 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 message CNZ6002I. 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 and z/OS V1R11.

Timing: After the first IPL of z/OS V1R13.

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 COMMAND command WITH ID id NOT ABENDABLE in [z/OS MVS System Messages, Vol 4 (CBD-DMO)](#).

Ensure Runtime Diagnostics is installed before invoking Predictive Failure Analysis

Description: Beginning with z/OS V1R13, Predictive Failure Analysis (PFA) calls Runtime Diagnostics to analyze and report insufficient metric activity from the following checks:

- PFA_ENQUEUE_REQUEST_RATE
- PFA_MESSAGE_ARRIVAL_RATE
- PFA_SMF_ARRIVAL_RATE

Therefore, PFA requires the Runtime Diagnostics address space (HZR) to be active on any system it analyzes.

Element or feature: BCP.

When change was introduced: z/OS V1R13.

Applies to migration from: z/OS V1R12 and z/OS V1R11.

Timing: After the first IPL of z/OS V1R13.
Is the migration action required?  
Yes, if you plan on using the following checks:
- PFA_ENQUEUE_REQUEST_RATE
- PFA_MESSAGE_ARRIVAL_RATE
- PFA_SMF_ARRIVAL_RATE

Target system hardware requirements: None.
Target system software requirements: None.
Other system (coexistence or fallback) requirements: None.
Restrictions: None.
System impacts: If RTD isn’t running and PFA calls it, the call to RTD returns with a return code of 12 and a reason code of 3074 (C02), and PFA processing skips the potential exception because it could not be confirmed through RTD (as in previous releases without this z/OS V1R13 enhancement). If or when RTD ever becomes active, the calls will become successful. The return code and reason code are logged in the systemnameRUN.LOG for the check, as follows:
Calling to determine too low
Return code = 000000C
Reason code = 00000C02

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

Steps to take: Ensure the HZR is defined as a system address space. See “Start Runtime Diagnostics at system initialization” on page 131.

Reference information: For complete details about using Runtime Diagnostics, see the topics Runtime Diagnostics overview and Predictive Failure Analysis overview and installation in z/OS Problem Management.

Carry over your existing CPCC policy
Description: The Capacity Provisioning Control Center (CPCC) can coexist with older versions of the CPCC on a workstation. However, z/OS V1R13 CPCC uses a different default workspace. If you want to continue using your existing CPCC workspace, point to the respective directory during the installation of z/OS V1R13 CPCC. It is also possible to change the workspace when the CPCC starts.

Element or feature: BCP.
When change was introduced: z/OS V1R13.
Applies to migration from: z/OS V1R12 and z/OS V1R11.
Timing: After the first IPL of z/OS V1R13.
Is the migration action required? Yes, if you want to continue using your existing CPCC workspace.
Target system hardware requirements: None.
Target system software requirements: None.
Other system (coexistence or fallback) requirements:

You must run a level of the CPCC client that corresponds to the z/OS system that you target. For example, run the z/OS V1R13 CPCC client on the workstation when interacting with the z/OS V1R13 Capacity Provisioning Manager, and run the z/OS V1R12 CPCC client on the workstation when interacting with the z/OS V1R12 Capacity Provisioning Manager.

Restrictions:

None.

System impacts:

None.

Related IBM Health Checker for z/OS check:

None.

Steps to take:

- Install z/OS V1R13 CPCC using information in documentation referenced below.

  Note: With z/OS V1R13, the location of the default workspace changes from, for example,
  C:\Documents and Settings\user\Application Data\IBM\IBM Capacity Provisioning Control Center

  to
  C:\Documents and Settings\user\Application Data\IBM\IBM Capacity Provisioning Control Center V1R13

  The actual directories depend on the Windows version that you are using.

- If you want to continue using your existing (pre-z/OS V1R13) CPCC workspace, point to the desired workspace during the installation process. You can also switch the workspace at a later time by navigating to the desired workspace when the CPCC starts.

Reference information: For more information about installing and uninstalling CPCC, see z/OS MVS Capacity Provisioning User’s Guide

Evaluate applications that parse AMBLIST command LISTLOAD or LISTIDR output

Description:

1. Prior to z/OS V1R12, the AMBLIST command LISTLOAD output for load modules, in the MODLIST area of the output, AMBLIST printed only the hexadecimal representation of TEXT records.

   Beginning with z/OS V1R12, AMBLIST command LISTLOAD output for load modules is made to work similarly to the same output for program objects. In particular, the output now includes the TEXT records output in EBCDIC format to the right of the hexadecimal representation. This also means that some of the columns for the hexadecimal output have been shifted.

2. Prior to z/OS V1R12, the AMBLIST commands LISTLOAD and LISTIDR output header for UNIX program objects printed the constant **UNIX** for both MEMBER NAME and LIBRARY, in the output header for each processed UNIX program object.

   Beginning in z/OS V1R12, AMBLIST commands LISTLOAD and LISTIDR output header for UNIX program objects display the actual directory path
name and file name of the UNIX file. It is represented this way regardless of whether or not the MEMBER is specified as a relative path name. Note that MEMBER NAME and LIBRARY still only utilize a single output line each, therefore, if either exceeds the number of allotted characters they will be truncated on the left and preceded by two periods and a space (...).

<table>
<thead>
<tr>
<th>Element or feature</th>
<th>BCP.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced</td>
<td>z/OS V1R12.</td>
</tr>
<tr>
<td>Applies to migration from</td>
<td>z/OS V1R11.</td>
</tr>
<tr>
<td>Timing</td>
<td>After the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if your application depends on the output generated by the AMBLIST command LISTLOAD or LISTIDR control statement processing.</td>
</tr>
</tbody>
</table>

**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:** Output from the AMBLIST command is not an intended programming interface.

1. Evaluate applications that parse AMBLIST command LISTLOAD output to ensure that there is no dependency on the TEXT output alignment or the additional data to the right of the hexadecimal output.

2. Evaluate applications that parse AMBLIST command LISTLOAD or LISTIDR output to ensure that there is no dependency on either the MEMBER NAME or LIBRARY in the output header being the constant **UNIX** or any other particular format.

To reduce future impact and maintenance, IBM suggests migrating the parsing routines or applications to use an IBM provided programming interface such as the Program Management APIs. See [Using the binder application programming interfaces (APIs)] in [z/OS MVS Program Management: Advanced Facilities](#).

The following example shows the TEXT output from LISTLOAD OUTPUT=MODLIST of a load module (note that the MODLIST output is included with other output specifications, including when the OUTPUT option is not specified). The output for load modules now has the same alignment as for program objects, except that the offset field for load modules continues to 6 characters wide whereas it is 8 characters wide for program objects:

- **Before z/OS V1R12:**
  ```plaintext
  RECORD# 6  T E X T
  000000 E3C1E2E3 C5E240C1 D9C540C4 C9C6C6C5 D9C5D5E3 F0F1F2F3 F4F5F6F7 F8F9F0F1
  000020 F2F3F4F5 F6F7F8F9
  *****END OF LOAD MODULE LISTING
  ```

- **With z/OS V1R12:**
  ```plaintext
  RECORD# 6  T E X T
  000000 E3C1E2E3 C5E240C1 D9C540C4 C9C6C6C5 D9C5D5E3 F0F1F2F3 F4F5F6F7 F8F9F0F1
  000020 F2F3F4F5 F6F7F8F9
  *****END OF LOAD MODULE LISTING
  ```
The following example shows the output header from LISTLOAD of a UNIX program object.

- Before z/OS V1R12:
  ```
  LISTLOAD MEMBER=llllllll/a.out
  ***** MODULE SUMMARY *****
  MEMBER NAME: **UNIX**
  LIBRARY: **UNIX**
  ```

- With z/OS V1R12:
  ```
  LISTLOAD MEMBER=llllllll/a.out
  ***** MODULE SUMMARY *****
  MEMBER NAME: a.out
  LIBRARY: .. eeeeee/ffffffff/gggggggg/hhhhhhhh/iiiiiiii/jjjjjjjj/llllllll
  ```

Reference information: For details about the AMBLIST command, see z/OS MVS Diagnosis: Tools and Service Aids.

### Ensure analysis tools interacting with HIS output accommodate HIS state change events

**Description:** Hardware instrumentation services (HIS) is a function that collects hardware event data for processors in SMF records type 113, subtype 2, as well as UNIX System Services output files. You can only use HIS for IBM System z10 or later machines. In z/OS V1R12 (and in z/OS V1R11 with the PTF for APAR OA30486 installed), functionality is added to the HIS component which causes changes in the output filename formats produced by HIS (.CNT, .SMP, .MAP), as well as introducing additional lines to the .CNT file possibly causing incompatibilities. In addition, an increase in SMF Type 113 records might be noticed.

Any tools that programmatically open the HIS output files (.CNT, .MAP, or .SMP), and any tools that programmatically analyze the HIS output .CNT file, should be analyzed and updated to accommodate the new formats.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>BCP.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R12.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>After the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you start HIS and have programs that analyze the HIS output.</td>
</tr>
</tbody>
</table>

| 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:

What to look for:
- The new filename output format is an indication that the support is installed.
- The first line of the .CNT file indicates output version 2.
- New output message HIS032I “STATE CHANGE DETECTED ACTION=action.”
- An additional line in the output of DISPLAY HIS command, which describes the action that should be taken should a state change event occur (specified by the operator at the start of a collection run).

What to do:
- If programmatically opening files, ensure the new output file format is handled.
- If programmatically parsing the .CNT file, ensure to check the VERSION identifier in the header. If the identifier is VERSION 2, be prepared for the new STATECHANGE line.

Reference information: For additional information about HIS state change events, see z/OS MVS System Commands.

Detect program objects that have multiple INITIAL LOAD segments

Description: Prior to z/OS V1R12, the binder RMODE option only applied to the first module segment, which contains some but possibly not all the initial load classes, though always the class wherein lies the entry point. Subsequent segments containing other initial load classes were not affected by the RMODE option, and thus the binder determined the RMODE based on the attributes of the classes contained therein.

Beginning with z/OS V1R12, the binder RMODE option applies to all initial load classes by default. Thus all segments containing initial load classes are affected. This new behavior takes affect only when the RMODE binder option is specified. Also the RMODE option has been expanded so that either the new or previous behavior can be explicitly requested.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>BCP.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R12.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>After the first IPL of z/OS V1R13.</td>
</tr>
</tbody>
</table>
**Is the migration action required?**

Yes, with the following conditions.

Only users or ISVs that produce program object programs, which might have multiple INITIAL LOAD segments, need to take action if all of the items listed below are true:

- Program is required to reside in a program object.
- Program has multiple segments.
- Program has multiple initial load classes.
- Program has mixed RMODEs.
- Program is link-edited with the RMODE option to override the binder default.

**Note:** In most cases, even if a program has multiple segments containing INITIAL LOAD classes, no action is required.

**Target system hardware requirements:**
None.

**Target system software requirements:**
None.

**Other system (coexistence or fallback) requirements:**
Install compatibility PTFs for APAR OA30988 on z/OS V1R11 systems.

**Restrictions:**
None.

**System impacts:**
Above-the-line and below-the-line storage usage might change.

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

**Steps to take:** To determine whether you might be affected by this change, you can run the AMBLIST service aid against your program objects and examine the output. However, if you do not explicitly specify the RMODE option when you bind the program, it is not affected even if the following two conditions are true.

Run AMBLIST using the LISTLOAD control statement. Using the OUTPUT=MAP option results in a smaller amount of output that still contains the pertinent information.

The following two conditions must both be true for the program to be affected by the new RMODE option behavior:

1. In the Module Summary, only programs that are program objects and are
   
   `PO FORMAT: 3`

   or higher are affected.

2. In the SEGMENT MAP, only programs for which there is class entry SEGMENT 2, and TYPE INITIAL, are affected.

   **Note:** The RMODE differs for the SEGMENT 1, INITIAL load classes, and the SEGMENT 2, INITIAL load classes.

Given that these two conditions are true, there are then generally three possible situations:

1. If the RMODE option is not being specified, there is no need to do anything, as the behavior is identical to z/OS V1R11.
2. If you specified RMODE=ANY, expected all segments to be RMODE=31, but find that one segment is RMODE=24, part of the program is using below-the-line storage. In most cases, this is not desirable and the new binder behavior will remedy the situation.

It is possible that you rely on having part of the program use below-the-line storage. You can use RMODE(ANY,COMPAT) to revert to the pre-z/OS V1R12 behavior.

3. If you specified RMODE=24, expected all segments to be RMODE=24, but find that one segment is RMODE=31, part of the program is using above-the-line storage. In most cases, this is desirable and the new binder behavior could cause a problem by causing the program to use more below-the-line storage.

It is also possible that you rely on having part of the program use above-the-line storage. You can use RMODE(24,COMPAT) to revert to the pre-z/OS V1R12 behavior.

Reference information: For more information about using the RMODE option, see z/OS MVS Program Management: User’s Guide and Reference.

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.

Note: If your installation has a BPXPRMxx MAXFILEPROC value greater than 5000, this action is not required.

<table>
<thead>
<tr>
<th>Element or feature</th>
<th>BCP</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced</td>
<td>z/OS V1R13.</td>
</tr>
<tr>
<td>Applies to migration from</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing</td>
<td>After the first IPL of z/OS V1R13 and before the start of PFA.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you use PFA and MAXFILEPROC is less than 5000.</td>
</tr>
</tbody>
</table>

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: 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:
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.
Chapter 6. Communications Server migration actions

Communications Server actions to perform before installing z/OS V1R13

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.

SNA Services: Ensure VTAMSG2 in not used in your VTAMLST definitions.
**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

**Reference information:** For messages sent to the MCS/SMCS consoles, see [z/OS MVS System Messages, Vol 1 (ABA-AOM)].

**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. The system issues the following:
**Element or feature:** Communications Server.

**When change was introduced:** z/OS V1R13.

**Applies to migration from:** z/OS V1R12 and z/OS V1R11.

**Timing:** Before installing z/OS V1R13.

**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:** 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.

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

**Steps to take:**

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.

```bash
//*================================= RESOLVER =================================
//*============================================================================
//*============================================================================
//* Create the userid and its OMVS Segment for the daemon and
//* add it to the STARTED Class which is activated in this job.
//* If you chose not to use the RACF STARTED Class,
//* the entry should be placed in the started procedures table ICHRIN03.
//*```
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 queueing 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 SBAALs) 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.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>Communications Server.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R13.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before installing z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>No, but recommended if you have the WORKLOADQ parameter specified on the INTERFACE statement and you have concerns about using additional storage.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>This migration action is required only if you are using OSA-Express3, or later, features on an IBM zEnterpise z196.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
</tbody>
</table>
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:

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 total number of OSA-Express3, and later. 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 total number of 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 CSFPDKV 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.
## IP Services: Migrate from BIND 9.2.0

**Description:** IBM intends for z/OS V1R13 to be the final release in which the z/OS BIND 9.2.0 function is available. If you are using this function as a server, you must find a replacement as soon as you can.

<table>
<thead>
<tr>
<th>Element or feature</th>
<th>Communications Server</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>The removal of the BIND 9.2.0 function was first announced in February 2009. z/OS V1R13 is the final release in which the BIND 9.2.0 function is available.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Applies to migration from:</th>
<th>z/OS V1R12 and z/OS V1R11.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timing:</td>
<td>Before installing z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you are using the BIND 9.2.0 function as a server.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
</tbody>
</table>

Reference information: For details, see the steps for setting up profiles in the CSFSERV resource class in z/OS Communications Server: IP Configuration Guide.
Related IBM Health Checker for z/OS check: Use ZOSMIGV1R11_CS_BIND9 for BIND 9.2.0 to determine if a z/OS BIND 9.2.0 name server is in use.

Steps to take:
- If you have been 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 have been 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.

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: 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.

<table>
<thead>
<tr>
<th>Element or feature</th>
<th>Communications Server.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced</td>
<td>z/OS V1R13.</td>
</tr>
<tr>
<td>Applies to migration from</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing</td>
<td>Before installing z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you are using IDS on a stack that is being run as a dual-mode stack (IPv4 and IPv6).</td>
</tr>
</tbody>
</table>

| 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. 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
- IDS 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 routine, and your exit routine meets one or both criteria listed in Is the migration action required? below, then you must take action.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>Communications Server.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R13.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before installing z/OS V1R13.</td>
</tr>
</tbody>
</table>
Is the migration action required? Yes, if your installation uses the FTCHKPWD user exit routine, and if one of the following conditions is true:

- 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:
- 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
- The FTCHKPWD user exit in 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:
  - 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 and z/OS V1R11.

**Timing:** Before installing z/OS V1R13.

**Is the migration action required?**

Yes, if you have defined the EZB.BINDDVIPARANGE.sysname.tcpname 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](https://www.ibm.com/support/docview.ws?id=67514).
- Defining a security profile for binding to DVIPAs in the VIPARANGE statement in [z/OS Communications Server: IP Configuration Guide](https://www.ibm.com/support/docview.ws?id=67523).

**IP Services: Update IP filter policy to filter IP fragments correctly for RFC 4301 compliance**

**Description:** Beginning with z/OS V1R12, all IP security filters must be compliant with RFC 4301. You can no longer use the RFC4301Compliance parameter on the IpFilterPolicy statement to specify whether Policy Agent enforces compliance. The RFC4301Compliance parameter is ignored and Policy Agent enforces the rule that ensures all IP filters are compliant.

IP filter policy support for filtering fragments was improved in z/OS V1R10. Before z/OS V1R10, Communications Server filtered all IP fragments using a policy of first possible filter match and filtered IPv6 fragments as protocol IPv6Frag. Beginning with z/OS V1R10, Communications Server follows rules and restrictions established by RFC 4301 ([http://www.ietf.org/rfc/rfc4301.txt](http://www.ietf.org/rfc/rfc4301.txt)) to ensure proper classification of fragments. RFC 4301, "Security Architecture for the Internet Protocol", specifies the base architecture for IPSec-compliant systems, including restrictions on the routing of fragmented packets.
Communications Server does not implement stateful fragment checking, therefore, restrictions were added as required by RFC 4301 to require that IP filter rules for routed traffic do not allow specific ports, types, or codes. The configuration parameter RFC4301Compliance could be used in z/OS V1R10 and z/OS V1R11 to optionally configure whether the RFC 4301 rules should be applied. Beginning with z/OS V1R12, this parameter (RFC4301Compliance on the IpFilterPolicy statement) is deprecated. All IP filter rules must support the RFC 4301 rules and restrictions.

<table>
<thead>
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<tbody>
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<td>When change was introduced:</td>
<td>z/OS V1R12.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before installing z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if your IP filter policy selectively matches routed traffic based on TCP port, UDP port, ICMP type and code, ICMPv6 type and code, OSPF type, or MIPv6 type. If you configured the RFC4301Compliance parameter on the IpFilterPolicy statement, it is recommended that you remove the parameter because it is deprecated beginning with z/OS V1R12.</td>
</tr>
</tbody>
</table>

**Steps to take:** If you currently use the IBM Configuration Assistant for z/OS Communications Server to configure your IP security policy, perform the following steps:

- If each configured TCP/IP stack has the RFC 4301 setting marked compliant, no migration action is required. By default, the RFC 4301 setting is marked compliant.
- Otherwise, for each stack with the RFC 4301 setting marked not compliant:
  1. Change the setting to compliant. Click Apply Changes and a report will be displayed.
  2. Study the report. The report indicates if any rules were detected that are not RFC 4301 compliant, and it explains the reasons why.
  3. If the report indicates a user action is required, go to each rule marked as incomplete, select the rule, and click the View Details button to determine the user action required. Edit each rule to make the correction.

If you manually configure your IP security policy, use Policy Agent to identify any IP security filter rules that are not compliant with RFC 4301.

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If you have implemented the RFC4301Compliance parameter on the IpFilterPolicy statement with a setting of Yes in your current release, no migration action is required. You may optionally remove the parameter because it is deprecated in V1R12. Beginning with V1R12, Policy Agent will log a warning message if the RFC4301Compliance parameter is configured. Policy Agent will enforce that all IP security rules are compliant with RFC 4301.

Otherwise (you have not implemented the RFC4301Compliance parameter with a setting of Yes in your current release), review your Policy Agent log file to determine if there are any configured rules that are not compliant with RFC 4301. Policy Agent will identify any filter rules that are not compliant with RFC 4301 as warnings in release V1R11.

1. If Policy Agent does not identify any filter rules that are not compliant with RFC 4301, no migration action is required.

2. If Policy Agent identifies filter rules that are not compliant with RFC 4301, perform the following steps to ensure that all IpFilterRule objects pertaining to routed traffic do not distinguish between port, type, or code values. For this process, identify all IpFilterRule objects that pertain to routed traffic (for example, objects that have an IpService Routing specification of Routed or Either). For each of these IpFilterRule objects, perform the following steps:
   a. If the IpService Routing specification is Either but the filter rule applies only to local traffic, correct the Routing specification to read Local.
   b. If the IpService Routing specification is Routed and the filter rule applies to certain specific ports, types, or codes, perform the following steps:
      1) Identify all IpFilterRule objects that apply to routed traffic between the same or overlapping endpoints as the IpFilterRule under consideration.
      2) z/OS V1R12 Communications Server requires that the same filter policy action be applied to all ports, types, or codes between the same routed endpoints. This is necessary because of the inherent ambiguity in determining the correct policy action to take for fragments in which these values are unknown. At your choice, you may apply the same policy action to a single IP protocol or to all IP protocols between the same routed endpoints. Consult the filter rules identified in the previous step and choose an appropriate filter action of deny, permit, or ipsec to be applied to all of this traffic. If you choose an action of ipsec, choose an appropriate level of IPSec protection for all of this traffic.
      3) Create a single IpFilterRule for the traffic identified in the previous step pertaining to all port, type, or code values or to all protocols, at your choice and with the filter action of your choice.
      4) Remove all port-, type-, and code-specific IpFilterRule objects that were previously identified as pertaining to routed traffic between the same pair of endpoints as the IpFilterRule under consideration.
      5) Change the policy at the corresponding security endpoint to match the changes made to local policy.
      6) For this routed traffic, enforce sufficient IP filter policy at the final IP traffic destination node to ensure that unwanted traffic is denied based on the port-, type-, or code-specific IpFilterRule objects that were previously removed from the local policy.
   c. If the IpService Routing specification is Either and the filter rule applies to certain specific ports, types, or codes, perform the following steps:
1) Create two copies of this filter rule, one of which has a Routing specification of Local and one of which has a Routing specification of Routed.

2) Leave the Local filter rule unchanged; for the Routed filter rule, perform the steps listed in 2b to apply new routed traffic restrictions.

d. Otherwise, no change is necessary for this IpFilterRule.

Reference information:

- [IpService statement](#) in [z/OS Communications Server: IP Configuration Reference](#)

IP Services: Remove customization of SNMP sysObjectID MIB object in OSNMPD.DATA file

**Description:** The SNMP agent allows you to provide some initial settings for a small set of MIB objects by using the OSNMPD.DATA file. One of the objects for which an initial value can be provided is sysObjectID.0. The sysObjectID.0 object is the vendor’s authoritative identification of the network management subsystem contained in the entity. That is, it is intended to uniquely identify the SNMP agent. Changing this value is not recommended and the ability to change it will be disabled in a future release. As of z/OS V1R4, warning message EZZ6317I is written to the syslog daemon if the object is set by using the OSNMPD.DATA file. As of z/OS V1R8, message EZZ6317I is also written to the console.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>Communications Server.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>Future removal of the ability to customize the sysObjectID value was announced in the z/OS V1R4 time frame. Message EZZ6317I is written to the syslog daemon as of z/OS V1R4, and to both the syslog daemon and console as of z/OS V1R8.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before installing z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>No, but recommended because the ability to customize the sysObjectID value is planned to be removed in a future release.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td></td>
</tr>
</tbody>
</table>

**Steps to take:** Review the statements in your OSNMPD.DATA configuration file. If this file contains a statement for the sysObjectID object, remove the statement from the file.

**Reference information:** For details about statements in the OSNMPD.DATA configuration file, see the network management topic of [z/OS Communications Server: IP Configuration Guide](#).
IP Services: Restore resolver UDP request timeout interval duration

Description: Prior to z/OS V1R12, the default setting for considering UDP requests to a name server to have timed out (as specified by the TCPIP.DATA RESOLVERTIMEOUT statement) was 30 seconds. Starting with z/OS V1R12, the default is 5 seconds. If you want the resolver to continue to use the old value, you must take action.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>Communications Server.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R12.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before installing z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if your network requires longer than 5 seconds for resolver queries to be processed by a name server under normal network conditions.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>None.</td>
</tr>
</tbody>
</table>

Steps to take:
- Code the RESOLVERTIMEOUT 30 statement in each TCPIP.DATA dataset where the previous UDP timeout duration interval is needed.
- If the resolver is active when all the TCPIP.DATA datasets are updated, issue the MODIFY resolver,REFRESH command to cause the resolver to refresh the TCPIP.DATA settings.
- If the resolver is not active, start the resolver.

Reference information:
- RESOLVERTIMEOUT statement in z/OS Communications Server: IP Configuration Reference
- MODIFY command: Resolver address space in z/OS Communications Server: IP System Administrator’s Commands

IP Services: Ensure applications tolerate a larger addrinfo structure

Description: The addrinfo structure is used by the getaddrinfo() function to hold host address information. In z/OS V1R12, the addrinfo structure (struct addrinfo) is enhanced to comply with RFC 5014. As a result, the struct addrinfo is larger than it was prior to z/OS V1R12. When the res parameter returned by getaddrinfo() is a chain of pointers to struct addrinfo structures, the pointers point to the larger struct addrinfo.

| Element or feature: | Communications Server. |
When change was introduced: z/OS V1R12.
Applies to migration from: z/OS V1R11.
Timing: Before installing z/OS V1R13.
Is the migration action required? Yes, because your application might have a dependency on the size of the struct addrinfo structures returned by the getaddrinfo() subroutine points.

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 res parameter returned by the getaddrinfo() subroutine will point to larger struct addrinfo structures.
- Change your application as necessary to accommodate larger struct addrinfo structures.

Reference information:
- z/OS XL C/C++ Run-Time Library Reference
- z/OS UNIX System Services Programming: Assembler Callable Services Reference

IP Services: Release addrinfo storage after resolver thread task terminates

Description: The resolver allocates storage in the application address space to contain the addrinfo data returned by the getaddrinfo() function. Prior to z/OS V1R12, the resolver released this storage when the task that issued the getaddrinfo() function terminated. With z/OS V1R12, the resolver releases the addrinfo storage when the process task that owns the task that issued the getaddrinfo() function terminates. Applications with long-running tasks that do not explicitly release addrinfo storage using the freeaddrinfo() function might experience an increase in storage usage.

Element or feature: Communications Server.
When change was introduced: z/OS V1R12.
Applies to migration from: z/OS V1R11.
Timing: Before installing z/OS V1R13.
Is the migration action required? No, but recommended to prevent excessive consumption of application virtual storage by resolver functions.

Target system hardware requirements: None.
Target system software requirements: None.
Other system (coexistence or fallback) requirements: None.
<table>
<thead>
<tr>
<th>Restrictions:</th>
<th>None.</th>
</tr>
</thead>
<tbody>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>None.</td>
</tr>
</tbody>
</table>

**Steps to take:** Update application source code to ensure that the `freeaddrinfo()` function is issued to release all `addrinfo` storage obtained using the `getaddrinfo()` function.

**Reference information:**
- Protocol-independent nodename and service name translation in [z/OS Communications Server: IPv6 Network and Application Design Guide](#).
- `FREEADDRINFO` for the macro API in [z/OS Communications Server: IP Sockets Application Programming Interface Guide and Reference](#).
- `GETADDRINFO` for the macro API in [z/OS Communications Server: IP Sockets Application Programming Interface Guide and Reference](#).
- `FREEADDRINFO` for the CALL instruction API in [z/OS Communications Server: IP Sockets Application Programming Interface Guide and Reference](#).
- `GETADDRINFO` for the CALL instruction API in [z/OS Communications Server: IP Sockets Application Programming Interface Guide and Reference](#).
- [z/OS Communications Server: IP IMS Sockets Guide](#).

**IP Services: Update syslogd configuration for archiving rules with shared z/OS UNIX file destinations**

**Description:** Starting with z/OS V1R11, you can configure the syslogd daemon (syslogd) to perform automatic archiving for z/OS UNIX files. You do this by specifying the `-N` parameter on the appropriate syslogd rules in the configuration file, along with specific configuration statements for the archive function. Beginning with z/OS V1R12, if you use the same z/OS UNIX file destination on multiple syslogd rules, the automatic archiving function is not supported on any of these rules.

**Element or feature:** Communications Server.

**When change was introduced:** z/OS V1R12.

**Applies to migration from:** z/OS V1R11.

**Timing:** Before installing z/OS V1R13.

**Is the migration action required?** Yes, if you configure multiple syslogd rules that use the same z/OS UNIX file destination, and if you configure automatic archiving for that destination 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:** If you configure multiple syslogd rules that use the same z/OS UNIX file destination, and configure automatic archiving for that destination file, perform the following steps:

- If you do not require automatic archiving, remove the -N parameter from all rules that share the same z/OS UNIX file destination.
- If you do require automatic archiving, change the destination to a unique z/OS UNIX file for each rule that shares the same z/OS UNIX file destination.

**Note:** If you do not perform either of these steps, message FSUM1273 jobname AUTOMATIC ARCHIVE NOT USED FOR RULES WITH SHARED DESTINATION is issued to the operator console, and one or more instances of message FSUM1272 WARNING: ARCHIVE FUNCTION DISABLED FOR RULES WITH SHARED DESTINATION filename is written to the syslogd error destination. The automatic archiving function is turned off for all syslogd rules that share z/OS UNIX file destinations. Although automatic archiving is turned off, syslogd continues to log messages to the destination file.

**Reference information:** For more information, see syslog daemon in [z/OS Communications Server: IP Configuration Reference](#).

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**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."

<table>
<thead>
<tr>
<th>Element or feature</th>
<th>Communications Server.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced</td>
<td>z/OS V1R13.</td>
</tr>
<tr>
<td>Applies to migration from</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before installing z/OS V1R13.</td>
</tr>
</tbody>
</table>

**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.

**Steps to take:** To prevent application failures because of 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: Ensure VTAMSG2 in not used in your VTAMLST definitions

Description: Starting in z/OS V1R12, VTAMSG2 is a new reserved name of an internal major node built by VTAM. As such, there should be no other use of the name VTAMSG2 in the VTAM definitions that are used by your system.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>Communications Server.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R12.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before installing z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you have used the name VTAMSG2 in any of your VTAM definition statements.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>None.</td>
</tr>
</tbody>
</table>

Steps to take:
1. Investigate all your VTAM definitions.
2. If you find the name VTAMSG2 in any of them, change the name to a non-reserved name. Note that if you continue to configure and try to activate VTAMSG2, message IST607I VARY ACT FOR VTAMSG2 FAILED - INVALID NODE TYPE OR STATE will be issued.

Reference information: For details about your VTAM definitions, see Resources automatically activated by VTAM in z/OS Communications Server: SNA Network Implementation Guide.

Communications Server actions to perform before the first IPL of z/OS V1R13

This topic describes Communications Server 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.
IP and SNA Services: Remove TCPIPDS1 and ISTITDS1 specification from dump commands

Description: z/OS V1R13 Communications Server relocates trace records in the TCP/IP data space TCPIPDS1 and in the VTAM data space ISTITDS1 to 64-bit common (HVCOMMON) storage. Beginning with V1R13, you should not include these data spaces when you dump the TCP/IP stack or VTAM data space.

Element or feature: Communications Server.

When change was introduced: z/OS V1R13.

Applies to migration from: z/OS V1R12 and z/OS V1R11.

Timing: Before the first IPL of z/OS V1R13.

Is the migration action required? Yes, if you issue commands to dump TCP/IP including the TCPIPDS1 dataspace, or VTAM including the ISTITDS1 dataspace and do not want to receive the message ASA104I.

Target system hardware requirements: None.

Target system software requirements: None.

Other system (coexistence or fallback) requirements: None.

Restrictions: None.

System impacts: Failure to remove the DSPNAME for the non-existent data spaces continues with a dump taken as normal and with message ASA104I:

```
R 5,DSPNAME=('TCPCS'.TCPIPDS1,'OMVS'.*),CONT
IEE600I REPLY TO 05 IS,DSPNAME=('TCPCS'.TCPIPDS1,'OMVS'.*),CONT
ASA104I SYNTAX ERROR IN POSITION 18. 288
ERROR IN VALUE FOR KEYWORD DSPNAME -
NO MATCH FOUND.
DETECTING MODULE IS IEAVTS0A
*06 IEE094D SPECIFY OPERAND(S) FOR DUMP COMMAND
```

Because FFST™ dumps do not include data spaces, they are not affected.

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

Steps to take:
1. Check for dump commands that use DSPNAME=('TCPIP'.*) or DSPNAME=('TCPIP'.TCPIPDS1) and remove the DSPNAME parameter.
2. 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.

Reference information: For details, see the following:

- Topic "Obtaining component trace data with a dump." in z/OS Communications Server: IP Diagnosis Guide
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.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>Communications Server.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R13.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>No, but recommended to ensure DVIPAs are created as intended.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>None.</td>
</tr>
</tbody>
</table>

**Steps to take:**
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

IP Services: Update automation that keys on TN3270E Telnet server messages

**Description:** Prior to z/OS V1R12, all Telnet messages began with the word "TELNET" after the message identifier. The DEBUG, LUNS, and LUNR messages began with "TELNET jobname" after the message identifier. Starting with z/OS V1R12, the first word "TELNET" is replaced with the jobname. For the DEBUG, LUNS, and LUNR messages, all other words in the message are shifted to the left. If you have automation which assumes certain positions for these messages, you must make accommodations to accept the new format of these messages.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>Communications Server.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R12.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you have automation checking Telnet server messages.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
</tbody>
</table>
Restrictions: None.

System impacts: None.

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

**Steps to take:** Ensure that no automation expects the first word of a Telnet message to be "TELNET" and ensure that any automation that keys on the DEBUG message EZZ6035I, or the LUNS and LUNR messages EZZ6091I - EZZ6099I, is updated to handle the word shift to the left.

**Reference information:** For details about the TN3270E Telnet messages and jobnames, see [EZZ6xxx messages](https://www.ibm.com/support/knowledgecenter/SSLTBK_21.0.0/com.ibm.zos.zosicms25.html#message) in [z/OS Communications Server: IP Messages Volume 4 (EZZ, SNM)].

**IP Services: Ensure the TN3270E Telnet server can end automatically when an OMVS shutdown command is issued**

**Description:** Prior to z/OS V1R12, if the Telnet application was active when you issued the F OMVS,SHUTDOWN command, Telnet continued to be active but in an unusable state. Starting with z/OS V1R12, Telnet stops automatically when you issue the F OMVS,SHUTDOWN command. Messages are issued in the order they appear below:

BPXI055I OMVS SHUTDOWN REQUEST ACCEPTED
EZZ6008I tnproc STOPPING
EZZ6010I tnproc SERVER ENDED FOR PORT 23
EZZ6009I tnproc SERVER STOPPED

**Element or feature:** Communications Server.

**When change was introduced:** z/OS V1R12.

**Applies to migration from:** z/OS V1R11.

**Timing:** Before the first IPL of z/OS V1R13.

**Is the migration action required?** Yes, if you issue an F OMVS,SHUTDOWN command when the Telnet application is 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:** None.

**Steps to take:** Review your procedures for issuing the F OMVS,SHUTDOWN command and be aware the Telnet server will stop when the command is issued.

IP Services: Disable resolver monitoring of name server responsiveness

Description: Prior to z/OS V1R12, the z/OS Communications Server system resolver did not provide notification of situations where a Domain Name System (DNS) name server was not responding to resolver queries sent to the name server. Starting with z/OS V1R12, the resolver will notify the operator when an unresponsive name server is detected. This function provides critical diagnostic information to the network operator and allows the operator to take steps to avoid performance and availability problems. If you do not want the resolver to provide these notifications, you must take action.

Element or feature: Communications Server.
When change was introduced: z/OS V1R12.
Applies to migration from: z/OS V1R11.
Timing: Before first IPL of z/OS V1R13.
Is the migration action required? Yes, if you do not want notification of potential problems with name servers in your network.

Steps to take:
- If you do not already have a resolver setup file, create one.
- Code the UNRESPONSIVETHRESHOLD(0) statement in a resolver setup file. A percentage of queries value of 0 indicates that resolver should not monitor name server responsiveness. The default percentage is 25% of resolver queries.
- If resolver is active, issue the MODIFY resolver,REFRESH,SETUP=resolver_setup_file command to cause the resolver to stop monitoring name server responsiveness.
- If the resolver is not active, start the resolver.

Reference information:
- Steps for creating a resolver setup file in z/OS Communications Server: IP Configuration Guide
- Monitoring the responsiveness of Domain Name System name servers in z/OS Communications Server: IP Configuration Guide
- UNRESPONSIVETHRESHOLD statement in z/OS Communications Server: IP Configuration Reference
- MODIFY command: Resolver address space in z/OS Communications Server: IP System Administrator’s Commands
IP Services: Disable IP validation checks when defining key exchange policy rules for a dynamic VPN

**Description:** You can configure policy rules for IP security when defining key exchange policy for dynamic virtual private networks (DVPNs). Prior to z/OS V1R12, there was no automatic way to verify that the identity of the remote peer matched the IP address of the remote peer. Beginning with z/OS V1R12, such IP validation checks are enforced by default. If you do not want the IP validation checking enabled on your policy rules for security key exchanges, you must disable it.

**Notes:**
1. The new default to enable IP validation checking is a benefit; however, one example of why you might want to disable the checking is if your remote security endpoint is expected to be behind a network address translation (NAT) device.
2. A value coded on the parameter to disable the automatic IP validation checking is ignored if the identity of the peer is not an IPv4 or IPv6 address.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>Communications Server.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R12.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you want bypass the IP security key exchange validation check that verifies that the identity of the remote peer matches the IP address of the remote peer.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>None.</td>
</tr>
</tbody>
</table>

**Steps to take:** Specify the value YES on the BypassIpValidation parameter of the KeyExchangePolicy or KeyExchangeAction statements. (The value of NO is the default).

**Reference information:** For details, see the [KeyExchangeAction](#) and [KeyExchangePolicy](#) statements in [z/OS Communications Server: IP Configuration Reference](#).

IP Services: Update modified Netstat message catalogs to include timestamp

**Description:** z/OS V1R12 enhances Netstat to verify that its message catalogs are at the same maintenance level as the Netstat program. If the message catalog time stamp does not match the Netstat program time stamp, Netstat uses the default messages. If you are customizing the netmsg.cat or netmsg6.cat message catalogs, you must take action to preserve the time stamp.
### Communications Server

<table>
<thead>
<tr>
<th>Element or feature</th>
<th>Communications Server</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced</td>
<td>z/OS V1R12.</td>
</tr>
<tr>
<td>Applies to migration from</td>
<td>z/OS V1R11.</td>
</tr>
<tr>
<td>Timing</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required</td>
<td>Yes, if you are customizing either the netmsg.cat or netmsg6.cat message catalog.</td>
</tr>
<tr>
<td>Target system hardware requirements</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check</td>
<td>None.</td>
</tr>
</tbody>
</table>

### Steps to take:

1. Issue the `dspcat` command with the `-t -g` options against the netmsg.cat (for example, issue `dspcat netmsg.cat -g -t`) to retrieve the necessary output to supply to the `gencat` command to generate your translated message catalog. The z/OS Communications Server netmsg.cat is installed in the z/OS UNIX file system directory `/usr/lpp/tcpip/lib/nls/msg/C`. The output file displays as follows:

   - `The time stamp of catalog netmsg.cat is: 2009 11 2 00:11 UTC`
   - `$delset 1$
   - `$set 1$
   - `$quote "`

2. Remove the first line of the output file generated by the `dspcat` command and replace it with a `$timestamp` directive and the time stamp value from the same output file. The new output file displays as follows:

   - `$timestamp 2009 11 2 00:11 UTC$
   - `$delset 1$
   - `$set 1$
   - `$quote "`

3. Make any other appropriate changes to customize your message catalog and issue the `gencat` command to generate the new message catalog.

4. Repeat steps 1-3 for the netmsg6.cat message catalog.

### Reference information:

For additional information on customizing message catalogs, see [Customize TCP/IP messages](Z/OS Communications Server: IP Configuration Guide) in z/OS Communications Server: IP Configuration Guide.

### 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.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>Communications Server.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>Various releases. See <a href="#">Table 9</a></td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you have customized a configuration file (listed in <a href="#">Table 9</a>) that IBM has changed.</td>
</tr>
</tbody>
</table>

| 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 9](#), 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 9. Changed Communications Server configuration files**

<table>
<thead>
<tr>
<th>Utility</th>
<th>IBM-provided sample file</th>
<th>Target location</th>
<th>What changed and when</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internet Key Exchange Daemon (IKED)</td>
<td><code>/usr/lpp/tcpip/samples/iked.conf</code></td>
<td><code>/etc/security/iked.conf</code></td>
<td>In z/OS V1R12, a new configuration statement is provided to enable FIPS 140 mode for the IKE daemon.</td>
</tr>
<tr>
<td>Network Security Services Server Daemon (NSSD)</td>
<td><code>/usr/lpp/tcpip/samples/nssd.conf</code></td>
<td><code>/etc/security/nssd.conf</code></td>
<td>In z/OS V1R12, new configuration statements are provided to configure new functions of the IPSec discipline, including FIPS 140 mode and HTTP retrieval and caching of certificates, certificate bundles, and certificate revocation lists.</td>
</tr>
<tr>
<td>Policy Agent</td>
<td><code>/usr/lpp/tcpip/samples/pagent_CommonIPSec.conf</code></td>
<td>N/A</td>
<td>In z/OS V1R12, new IPSec configuration options enable the use of IKEv2, and of new cryptographic algorithms for IPSec traffic.</td>
</tr>
<tr>
<td>Policy Agent</td>
<td><code>/usr/lpp/tcpip/samples/pagent.conf</code></td>
<td><code>/etc/pagent.conf</code></td>
<td>In z/OS V1R12, the RFC4301Compliance parameter is deprecated on the IpFilterPolicy statement.</td>
</tr>
</tbody>
</table>
Table 9. Changed Communications Server configuration files (continued)

<table>
<thead>
<tr>
<th>Utility</th>
<th>IBM-provided sample file</th>
<th>Target location</th>
<th>What changed and when</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNMP agent</td>
<td>/usr/lpp/tcpip/samples/osnmpd.data</td>
<td>/etc/osnmpd.data</td>
<td>Every release, the value of the sysName MIB object is updated to the current release.</td>
</tr>
</tbody>
</table>

Reference information:
- 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 Network File System Guide and 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:

- The SIZE parameter of the TRACE start option and the MODIFY TRACE command is used to set the size of the VTAM Internal Trace (VIT) table. Prior to z/OS V1R13, the value of the SIZE parameter specified the number of pages of ECSA (for example, SIZE=999). Starting with z/OS V1R13, the value of the SIZE parameter of the TRACE start option and the MODIFY TRACE command specifies the number of megabytes of HVCOMMON (for example, SIZE=4M).
- Starting with z/OS V1R13, the DSPSIZE parameter is not valid.
  - The DSPSIZE parameter was used to set the size of the VIT data space. Prior to z/OS V1R13, the value of the DSPSIZE parameter specified the number of megabytes of data space in 10 megabytes increments (for example, DSPSIZE=5 for 50 megabytes).
  - If DSPSIZE is coded in the VTAM start list, the following informational message is displayed: IST448I DSPSIZE OPTION IGNORED - NO LONGER SUPPORTED. Processing then continues disregarding the specification.
  - If DSPSIZE is specified on a MODIFY TRACE command, the following informational message is displayed: IST448I DSPSIZE OPTION IGNORED - NO LONGER SUPPORTED. The entire MODIFY TRACE command is ignored. When you apply the VTAM APAR OA39214, the message will be changed as follows. IST2365I MODIFY TRACE COMMAND REJECTED - DSPSIZE NO LONGER SUPPORTED.
- Numerous messages are no longer issued and are retired.

Element or feature: Communications Server.

When change was introduced: z/OS V1R13.

Applies to migration from: z/OS V1R12 and z/OS V1R11.

Timing: Before the first IPL of z/OS V1R13.
### Is the migration action required?
Yes, if one or more of the following conditions are true:
- 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.

### Restrictions:
- 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 29 for more information.

### Steps to take:
- 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 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
IST17411 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:

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.

Reference information:

• 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.

SNA Services: Disable Enterprise Extender connection health verification

Description: Starting in z/OS V1R12, VTAM verifies the health of the Enterprise Extender (EE) connection while the connection is being activated. VTAM sends a Logical Data Link Control (LDLC) probe to the remote partner using all five ports during the activation. If the partner is not reachable by any port for any reason, VTAM does not start the EE connection. VTAM issues the following health verification failure message group if the attempt to connect failed during the activation of the EE connection when VTAM sent the LDLC probe to the remote partner:

IST2330I EE HEALTH VERIFICATION FAILED FOR puname AT time
IST1680I type IP ADDRESS ip_address
IST1680I type IP ADDRESS ip_address
IST314I END

If you do not want VTAM to verify the health of the EE connection, code the start option EEVERIFY=NEVER before starting VTAM.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>Communications Server.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R12.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
</tbody>
</table>
Is the migration action required? Yes, if you used fewer than five ports to start an EE connection in a previous release, you must code the start option EEVERIFY=NEVER before you start VTAM.

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 are using less than five ports for all of your EE connections, then you need to specify the EEVERIFY=NEVER start option.
- If you have specific EE connections, you need to specify EEVERIFY=NEVER on the PU or GROUP statement for that EE connection.

Reference information: Refer to start option EEVERIFY in z/OS Communications Server: SNA Resource Definition Reference.

SNA Services: Code MULTPATH start option when using multipath

Description: Prior to z/OS V1R12, multipath support was enabled by a single switch in the TCP/IP profile for both Enterprise Extender (EE) and TCP/IP traffic. Beginning with z/OS V1R12, multipath support is disabled (by default) for EE connections. If you want to continue to use multipath for your EE connections, you must code the start option MULTPATH=TCPVALUE before starting VTAM.

Element or feature: Communications Server.
When change was introduced: z/OS V1R12.
Applies to migration from: z/OS V1R11.
Timing: Before the first IPL of z/OS V1R13
Is the migration action required? Yes, if you want to continue using multipath for EE connections.

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: Add MULTPATH=TCPVALUE to the VTAM start option file ATCSTRxx.
Communications Server actions to perform after the first IPL of z/OS V1R13

This topic describes Communications Server 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.

**IP Services: Ensure that preference values associated with IPv6 router advertisement routes are as expected**

Starting in z/OS V1R12, TCP/IP processes preference values that are provided in IPv6 router advertisement messages. Prior to z/OS V1R12, all router advertisement routes were generated with a medium preference value.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>Communications Server</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R12.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>After the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if your stack is IPv6 enabled and your adjacent routers are originating IPv6 router advertisement messages that contain preference values other than the default value (medium) for either the default route or an indirect prefix route.</td>
</tr>
</tbody>
</table>

| 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. Review the reference information for a description of how z/OS Communications Server uses the preference values that are received in IPv6 router advertisement messages.
2. Ensure that the preference values associated with the router advertisement routes generated from information received in router advertisement messages are as expected.
3. If any preference values differ from what you expected, make the necessary configuration changes on the advertising routers.

**Reference information:** For details about RTP performance problems over EE with multipath routing enabled see z/OS Communications Server: SNA Diagnosis Vol 1, Techniques and Procedures.
Chapter 7. Cryptographic Services migration actions

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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).

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This topic describes Cryptographic Services migration actions that you can perform on your current (old) system. You do not need the z/OS V1R13 level of code to make these changes, and the changes do not require the z/OS V1R13 level of code to run once they are made.

ICSF: Ensure PKCS #11 applications call C_Finalize() prior to calling dlclose()

Description: A PKCS #11 application initializes the environment by calling dllopen() to load the PKCS #11 DLL into storage, and then calling C_Initialize(). Later, when processing is complete, the application terminates processing by calling C_Finalize(), and then calling dlclose(). Reinitialization, if desired, can be achieved by calling dllopen() and C_Initialize() a second time.

In prior releases, z/OS PKCS #11 allowed an application to implicitly finalize the environment by calling dlclose() without first calling C_Finalize(). Starting with ICSF FMID HCR7770, this is no longer be supported. If an application does not call C_Finalize() prior to calling dlclose(), a subsequent attempt to re-initialize PKCS #11 by calling C_Initialize() will result in error CKR_FUNCTION_FAILED being returned.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>Cryptographic Services.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>ICSF FMID HCR7770, which was initially made available in web deliverable Cryptographic Support for z/OS V1R9-R11 and is now integrated into z/OS V1R12.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R11 without ICSF FMID HCR7770 installed.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before installing z/OS V1R13.</td>
</tr>
</tbody>
</table>
Is the migration action required? Yes, if you use the following sequence of calls: dlopen(), C_Initialize(), processing functions, dlclose(), dlopen(), C_Initialize().

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: PKCS #11 application developers must:
1. Scan their source code for the following sequence of calls: dlopen(), C_Initialize(), processing functions, dlclose(), dlopen(), C_Initialize().
2. Change all such sequences to insert a call to C_Finalize() before the call to dlclose().

Reference information: For more information on writing PKCS #11 applications, refer to [z/OS Cryptographic Services ICSF Writing PKCS #11 Applications](#).

Cryptographic Services actions to perform before the first IPL of z/OS V1R13

This topic describes Cryptographic Services 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.

**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.

<table>
<thead>
<tr>
<th>Element or feature</th>
<th>Cryptographic Services.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced</td>
<td>ICSF FMID HCR7780, which was initially made available in web deliverable <em>Cryptographic Support for z/OS V1R10-R12</em> and is now integrated into z/OS V1R13.</td>
</tr>
<tr>
<td>Applies to migration from</td>
<td>z/OS V1R12 or z/OS V1R11 without ICSF FMID HCR7780 installed.</td>
</tr>
<tr>
<td>Timing</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
</tbody>
</table>
### 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](#).

### ICSF: Modify ICSF startup procedure

**Description:** The program that started ICSF in earlier releases was named CSFMMAIN. In ICSF FMID HCR7770 (initially made available in the web deliverable Cryptographic Support for z/OS V1R9-R11 and now integrated into z/OS V1R12), the CSFMMAIN program is replaced by the CSFINIT program. If your ICSF startup procedure is not modified to run this new program, the procedure will not start the HCR7770 level of ICSF.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>Cryptographic Services.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>When change was introduced:</strong></td>
<td>ICSF FMID HCR7770, which was initially made available in web deliverable Cryptographic Support for z/OS V1R9-R11 and now integrated into z/OS V1R12.</td>
</tr>
<tr>
<td><strong>Applies to migration from:</strong></td>
<td>z/OS V1R11 without ICSF FMID HCR7770 installed.</td>
</tr>
<tr>
<td><strong>Timing:</strong></td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td><strong>Is the migration action required?</strong></td>
<td>Yes, if you use CSFMMAIN as the ICSF startup program.</td>
</tr>
<tr>
<td><strong>Target system hardware requirements:</strong></td>
<td>None.</td>
</tr>
<tr>
<td><strong>Target system software requirements:</strong></td>
<td>None.</td>
</tr>
<tr>
<td><strong>Other system (coexistence or fallback) requirements:</strong></td>
<td>None.</td>
</tr>
<tr>
<td><strong>Restrictions:</strong></td>
<td>None.</td>
</tr>
<tr>
<td><strong>System impacts:</strong></td>
<td>None.</td>
</tr>
</tbody>
</table>

#### Steps to take:
- In your startup procedure for ICSF:
1. Find the job step that identifies the ICSF startup program (CSFMMAIN) that was used in earlier releases. For example:
   CSFSTART EXEC PGM=CSFMMAIN,REGION=0M,TIME=1440
2. Modify the PGM parameter on this EXEC statement to identify the new startup program (CSFINIT):
   CSFSTART EXEC PGM=CSFINIT,REGION=0M,TIME=1440
3. Save your changes to the startup procedure.

**Tips:**
- Member CSF in SYS1.SAMPLIB contains a sample JCL code for an ICSF startup procedure.
- The new PPT entry for CSFINIT is shipped in the IBM default PPT table by APAR OA26245 for z/OS V1R9 and z/OS V1R10.
- Refer to Washington Systems Center (WSC) Flash FLASH10620 for tips about sharing the ICSF startup procedure between ICSF release levels.
- In HCR7770 and later, ICSF PKCS11 requests above the bar memory. ABENDDC2-16 in CSFKSTDC can be encountered because of a large number of TKDS requests. System programmers can code MEMLIMIT=NOLIMIT in the new ICSF startup procedures to prevent an ABENDDC2 when system limits for above the bar memory are set too low. For more information, see [http://www-01.ibm.com/support/docview.wss?uid=iss1OA34077](http://www-01.ibm.com/support/docview.wss?uid=iss1OA34077).

**Reference information:** For more information on ICSF startup procedures, refer to [z/OS Cryptographic Services ICSF System Programmer’s Guide](http://www.ibm.com)

## 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.

**Note:** If you want to take advantage of the new Software Cryptographic Service Provider 2 (SWCSP2), you should bypass this migration action. When your z/OS V1R11 system is up and running, install OCSF by running the install script and then the IVP.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>Cryptographic Services.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>General migration action not tied to a specific release.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>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.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
</tbody>
</table>
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 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 stated above).

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 20. 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
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:** [z/OS Open Cryptographic Services Facility Application Programming](https://www.ibm.com)

**System SSL: Ensure PKCS #11 tokens contain complete certificate chains**

**Description:** The PKCS #11 token certificate validation process should retrieve and validate the complete chain of certificates up to a root (self-signed) certificate. Prior to V1R12, however, System SSL may have successfully validated an incomplete certificate chain when retrieving a certificate from a PKCS #11 token. In System SSL V1R12, the certificate validation process has been improved, and access to the complete certificate chain is required for successful certificate validation. Implementations using PKCS #11 tokens containing incomplete certificate chains may find that certificates that passed validation in releases prior to z/OS V1R12 now fail validation in z/OS V1R12.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>Cryptographic Services.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R13.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if PKCS #11 tokens are being used by a System SSL application.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
</tbody>
</table>
Related IBM Health Checker for z/OS check: None

Steps to take: Ensure that PKCS #11 tokens being used by System SSL applications contain the complete certificate issuer chain up to a root (self-signed) certificate. You can use the z/OS shell-based program gskkyman or the z/OS Security Server (RACF) RACDCERT command to display supported tokens and their certificates.

Reference information:
- For additional information about certificate validation and the gskkyman command, refer to z/OS Cryptographic Services System SSL Programming.
- For additional information about the RACDCERT command, refer to z/OS Security Server RACF Command Language Reference.

System SSL: Modify applications to address disablement of SSL V3 and TLS session renegotiation

Description: Session renegotiation allows an existing SSL V3 or TLS session to perform a re-handshake. A common reason for this is to refresh the session keys used to encrypt data transmitted across the secure connection. In z/OS V1R11, z/OS V1R10, and z/OS V1R9 without the PTFs for APAR OA31172 installed, the default behavior of System SSL was to permit applications to perform SSL V3 and TLS server session renegotiations according to the SSL V3 Protocol Specification and RFC2246. The new default behavior for z/OSV1R11, with the PTFs for APAR OA31172 installed, is to disable session renegotiation.

If you run System SSL applications that handle session renegotiation, server renegotiation will fail unless renegotiation is explicitly enabled. The gsk_secure_socket_read API will return with error code 432. The gsk_secure_socket_read API will return with error code -7.

Element or feature: Cryptographic Services.
When change was introduced: z/OS V1R11, z/OS V1R10, and z/OS V1R9 by APAR OA31172.
Applies to migration from: z/OS V1R11 without the PTFs for APAR OA31172 installed.
Timing: Before first IPL of z/OS V1R13.
Is the migration action required? Yes, if you run any System SSL applications that request or receive requests for session renegotiation.

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:
1. Identify the System SSL applications your installation runs, and determine whether any of those applications require session renegotiation. If no applications require session renegotiation, no further action is needed.
2. If any System SSL applications your installation runs attempts session renegotiation, determine whether this renegotiation is required.
   - If the renegotiation is not required, modify the application so that it does not attempt session renegotiation.
   - If server session renegotiation is necessary, and you are willing to accept potential risks, server session renegotiation can be explicitly enabled.
     - For applications that accept the specification of environment variables, the GSK_RENEGOTIATION environment variable should be used.
       - Specify GSK_RENEGOTIATION=None to disable SSL V3 and TLS handshake renegotiation as a server. This is the default.
       - Specify GSK_RENEGOTIATION=ALL to allow SSL V3 and TLS handshake renegotiation as a server. This is equivalent to the System SSL behavior for session renegotiation.
       - Specify GSK_RENEGOTIATION=ABBREVIATED to allow SSL V3 and TLS abbreviated handshake renegotiation as a server for resuming the current session only, while disabling SSL V3 and TLS full handshake renegotiation as a server. The System SSL session ID cache is not checked when resuming the current session with this value set.
     - For applications that don't allow the specification of environment variables or want to tailor individual SSL environments within an application, use the enumeration identifier GSK_RENEGOTIATION on the gsk_attribute_set_enum API. For the GSK_RENEGOTIATION enumeration identifier:
       - Specify GSK_RENEGOTIATION_NONE to disable SSL V3 and TLS handshake renegotiation as a server. This is the default.
       - Specify GSK_RENEGOTIATION_ALL to allow SSL V3 and TLS handshake renegotiation as a server.
       - Specify GSK_RENEGOTIATION_ABBREVIATED to allow SSL V3 and TLS abbreviated handshake renegotiation as a server for resuming the current session only, while disabling SSL V3 and TLS full handshake renegotiation as a server. With this enumeration value set, the System SSL session ID cache is not checked when resuming the current session.

The gsk_attribute_get_enum API also accepts the enumeration identifier GSK_RENEGOTIATION, and will return one of the preceding enumeration values indicating the current renegotiation setting for the specified SSL environment.

Reference information: For information about System SSL programming, refer to z/OS Cryptographic Services System SSL Programming.

System SSL: Ensure all RACF user IDs that start SSL applications can access the CSFIQA resource of the CSFSERV class

Description: When the System SSL DLLs are loaded, System SSL determines which hardware is available. Starting in z/OS V1R13, System SSL uses the ICSF Query Algorithm callable service (CSFIQA) to retrieve information about the cryptographic algorithms that are available. However, if the user ID that starts the SSL application cannot access the CSFIQA resource of the CSFSERV class, System SSL will not be be able to retrieve information using the CSFIQA callable service, and the informational message ICH408I (which indicates insufficient authorization) may be issued to the console. Although System SSL processing will continue, System SSL may not be aware of all the hardware that is currently available.
Element or feature: Cryptographic Services.
When change was introduced: z/OS V1R13.
Applies to migration from: z/OS V1R12 and z/OS V1R11.
Timing: Before the first IPL of z/OS V1R13.
Is the migration action required? Yes, if:
  - Your installation uses ICSF,
  - the CSFSERV general resource class is active, and
  - a profile covering the CSFIQA resource of the CSFSERV class is defined and does not grant READ access to all users.
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 uses ICSF, you should ensure that any RACF user ID that will start SSL applications can access the CSFIQA 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 CSFIQA callable service) is unrestricted. No configuration is necessary.
   To determine which RACF classes are currently active, enter the SETROPTS command with LIST parameter specified:
   SETROPTS LIST

2. If the SETROPTS LIST command shows that the CSFSERV class is active, identify the profile that covers the CSFIQA resource. This could be a discrete profile named CSFIQA or, if generic profile checking is activated, a generic profile.
   To determine if a profile has been defined to protect the CSFIQA resource, enter the following RLIST command:
   RLIST CSFSERV CSFIQA

   When you enter this command, RACF lists information for the discrete resource profile CSFIQA. 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 CSFIQA 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 CSFIQA resource. If necessary, use the PERMIT command to give the appropriate users or groups access. For example, if a discrete profile CSFIQA exists, the following command would give user BAILEY access:
   PERMIT CSFIQA 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](https://www.ibm.com/support/knowledgecenter/SC24-5901), SC24-5901.

For additional information about ICSF CSFSERV resource class, see [z/OS Cryptographic Services ICSF Administrator’s Guide](https://www.ibm.com/support/knowledgecenter/SA22-7521).

---

### Cryptographic Services actions to perform after the first IPL of z/OS V1R13

This topic describes Cryptographic Services 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.

**ICSF: Ensure the expected master key support is available**

**Description:** In versions of ICSF prior to FMID HCR7780, in order for a coprocessor to become active, a DES master key needed to be set on the coprocessor. Once the coprocessor was active, DES master key support, and the support of any other master key (an AES master key or an asymmetric master key) set on the coprocessor, would then be available.

Starting with ICSF FMID HCR7780, the activation procedure for non-CCF systems is 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. Before you use ICSF FMID HCR7780, you must understand the new method of coprocessor activation in order to ensure that the expected master keys will be available. You may need to set master keys on additional coprocessors to ensure the same master key support you had in earlier versions of ICSF is available in ICSF FMID HCR7780.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>Cryptographic Services.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>When change was introduced:</strong></td>
<td>ICSF FMID HCR7780, which was initially made available in web deliverable Cryptographic Support for z/OS V1R10-R12 and is now integrated into z/OS V1R13.</td>
</tr>
<tr>
<td><strong>Applies to migration from:</strong></td>
<td>z/OS V1R12 or z/OS V1R11 without ICSF FMID HCR7780 installed.</td>
</tr>
<tr>
<td><strong>Timing:</strong></td>
<td>After the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td><strong>Is the migration action required?</strong></td>
<td>Yes.</td>
</tr>
<tr>
<td><strong>Target system hardware requirements:</strong></td>
<td>None.</td>
</tr>
<tr>
<td><strong>Target system software requirements:</strong></td>
<td>None.</td>
</tr>
<tr>
<td><strong>Other system (coexistence or fallback) requirements:</strong></td>
<td>None.</td>
</tr>
</tbody>
</table>
Restrictions: None.
System impacts: None.
Related IBM Health Checker for z/OS check: None.

**Steps to take:** Make sure you understand the new method of coprocessor activation described in this migration action to ensure the expected master key support is available.

To further illustrate the change in coprocessor activation introduced in ICSF FMID HCR7780, let's say you have the following four coprocessors with these master keys set (as indicated by the letter “Y”).

**Table 10. Coprocessor activation example**

<table>
<thead>
<tr>
<th></th>
<th>E00</th>
<th>E01</th>
<th>E02</th>
<th>E03</th>
</tr>
</thead>
<tbody>
<tr>
<td>DES</td>
<td>Y</td>
<td></td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>AES</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>RSA (ASYM)</td>
<td>Y</td>
<td></td>
<td></td>
<td>Y</td>
</tr>
</tbody>
</table>

In releases prior to ICSF FMID HCR7780, a DES master key was required in order for a coprocessor to become active. In our example, coprocessors E00 and E02 have the DES master key set, so they become active. The DES master key is available as well as the AES and RSA (ASYM) master keys which are set on the E00 and E02 coprocessors. Coprocessors E01 and E03 do not have a DES master key set, and so are not active.

Starting with ICSF FMID HCR7780, any master key is enough for a coprocessor to become active and the activation procedure tries to maximize the number of active coprocessors. The AES master key is set on all four of these coprocessors, so all four of the coprocessors become active. However, since the DES and RSA master keys are not set on all four of the coprocessors, DES and RSA support is not available. As coprocessor master keys are set or changed, however, additional function may become available. In this case, setting the DES and RSA master keys on coprocessors E01 and E03 would make the DES and RSA support available.

ECC master key support is based on the existence of CEX3C coprocessors. If a mixture of CEX3C coprocessors and older coprocessors exist on a system, then ECC support will be based solely on the state of the CEX3C coprocessors. For example, let's change our example so that two of the coprocessors are CEX3C coprocessors (as identified by the G prefix in the name) with the ECC master key set.

**Table 11. Coprocessor activation example (ECC support based only on CEX3C coprocessors)**

<table>
<thead>
<tr>
<th></th>
<th>G00</th>
<th>E01</th>
<th>G02</th>
<th>E03</th>
</tr>
</thead>
<tbody>
<tr>
<td>DES</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AES</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>RSA (ASYM)</td>
<td>Y</td>
<td></td>
<td></td>
<td>Y</td>
</tr>
<tr>
<td>ECC</td>
<td>Y</td>
<td></td>
<td></td>
<td>Y</td>
</tr>
</tbody>
</table>
In this example, the AES master key is still the one set on the majority of coprocessors and makes the coprocessors active. The DES and RSA master keys are not set on all the coprocessors, and so DES and RSA support is not available. The ECC master key cannot be set on all coprocessors (because it is not available on the CEX2C). However, unlike the DES and RSA support, ECC support is still available. This is because the ECC master key is set on all CEX3C coprocessors.

To ensure the master key support that you expect is available, follow these steps:

1. To ensure AES support, set the AES master key on each CEX2C and CEX3C.
2. To ensure DES support, set the DES master key on each CEX2C, CEX3C, and (as long as AES support is not also needed) PCIXCC.
3. To ensure RSA support, set the RSA master key on each CEX2C, CEX3C, and (as long as AES support is not also needed) PCIXCC.
4. To ensure ECC support, set the ECC master key on each CEX3C.

To verify the master key support is available, select option 1, COPROCESSOR MGMT, from the ICSF Primary menu. This will display the coprocessor management panel, which shows which coprocessors are active, and the state of the master keys for coprocessors.

Reference information:

- For information about entering master key parts, see [z/OS Cryptographic Services ICSF Administrator’s Guide](http://www.ibm.com/support/docview.wss?rs=136&context=icgs&ssgnumber=5121).

PKI Services: Change the time at which the daily maintenance task runs

**Description:** Before z/OS V1R12, PKI Services ran a daily maintenance task when you started the PKI Services daemon, and every twenty-four hours after that. Starting with z/OS V1R12, by default the task runs when you start the PKI Services daemon, and daily at midnight local time. If running this task at midnight causes problems, for example performance problems because you have other tasks scheduled to run at midnight, you can change the time at which the PKI Services daily maintenance task runs.

<table>
<thead>
<tr>
<th>Element or feature</th>
<th>Cryptographic Services.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R12.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>After the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you do not want the PKI Services daily maintenance task to run at midnight.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
</tbody>
</table>
Related IBM Health Checker for z/OS check: None.

Steps to take: Change the value of the MaintRunTime variable in the PKI Services configuration file to specify the time at which you want the daily maintenance task to run.

Reference information: For details about updating the MaintRunTime variable, see z/OS Cryptographic Services PKI Services Guide and Reference.
Chapter 8. DFSMS migration actions

DFSMS actions to perform before installing z/OS V1R13

DFSMSdfp: Back up SMS control data sets
DFSMSdfp: Accommodate deletion of NOIMBED and NOREPLICAT LISTCAT command attributes
DFSMSdfp: Modify exit routines to support 31-bit UCB addresses
DFSMSdfp and DFSMSdss: Redefine existing VSAM data sets that contain the IMBED, REPLICATE, and KEYRANGE attributes
DFSMSrmm: Replace CIM providers and CIM classes
DFSMSdfp: Define IGGCATxx parmlib member

DFSMS actions to perform before the first IPL of z/OS V1R13

DFSMSdfp: Ensure that the Language Environment runtime library is available for DLLs
DFSMSdfp: Update SYS1.IMAGELIB
DFSMSdss: Build the IPLable stand-alone DFSMSdss image
DFSMSdss: Review changes to the messages that result from a COPY or RESTORE operation with COPYVOLID
DFSMSdfp: Update operator procedures and system automation for new DADSM pre- and post-processing dynamic exits
DFSMSdfp: Update procedures that use IEBDSCPY alias name to access IEBCOPY
DFSMSdfp: Evaluate applications and modify for EAV enhancements
DFSMSdfp: Accommodate new DCBE macro option
DFSMSdss: Recompile and link-edit exit routines or applications that change options in the ADRUFO block
DFSMSdss: Modify applications to handle larger I/O buffers

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

DFSMSdfp: Accommodate 64-bit and AR mode rules enforcement in DFSMS macros.
DFSMSdfp: Run OAM configuration database migration job
DFSMSdfp: Run OAM DB2 BIND jobs
DFSMSdfp: Use indirect zFS file system data set catalog support
DFSMSdss: Accommodate Catalog Search Interface default change
DFSMSdfp: Stop using the HOLD command to quiesce activity prior to control data set backup

DFSMS actions to perform before installing z/OS V1R13

This topic describes DFSMS migration actions that you can perform on your current (old) system. You do not need the z/OS V1R13 level of code to make these changes, and the changes do not require the z/OS V1R13 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.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>DFSMSdfp.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>General migration action not tied to a specific release.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before installing z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>No, but recommended to ensure data integrity.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>Install the PTFs in &quot;Install coexistence and fallback PTFs&quot; on page 8 if they are not already installed.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>None.</td>
</tr>
</tbody>
</table>

**Steps to take:** Do the following on your pre-z/OS V1R13 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 8.

In addition, if you modified and activated a higher-level policy on a pre-z/OS V1R13 system, do the following to ensure that the ACDS can be accessed on z/OS V1R13:

1. On the pre-z/OS V1R13 system, save the active ACDS as an SCDS with the SETSMS SAVESCDS command.
2. On z/OS V1R13, update, translate, validate, and activate the saved SMS policy.

Reference information:
- z/OS DFSMS Implementing System-Managed Storage
- z/OS DFSMSdfp Storage Administration

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
RKF---------------0  MAXLRECL-------------80
STRIPE-COUNT-------1
SHROPTS (4,3) RECOVERY UNIQUE NOERASE INDEXED NOWRTECHK 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
RKF---------------0  MAXLRECL-------------80
STRIPE-COUNT-------1
SHROPTS (4,3) RECOVERY UNIQUE NOERASE INDEXED NOWRTECHK
UNORDERED NOREUSE NONSPANNED EXTENDED EXT-ADDR
```

Element or feature: DFSMSdfp.

When change was introduced: z/OS V1R13.

Applies to migration from: z/OS V1R12 and z/OS V1R11.

Timing: Before installing z/OS V1R13.

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

**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: Modify exit routines to support 31-bit UCB addresses**

**Description:** Before z/OS V1R12, DADSM captured the unit control block (UCB) address passed to it in its interfaces. Starting in z/OS V1R12, DADSM will no longer capture the UCB address passed to it and will use the actual 31-bit UCB address. The UCB address will either be above or below the 16 MB line. This address in turn will be passed into the DADSM pre- and post-installation exit routines (IGGPRE00, IGGPOST0) in the current 4-byte IEXUCB field. Therefore, the address in IEXUCB may now contain a 31-bit UCB address. Exit routines that do not support 31-bit UCB addresses will need to be upgraded to support a 31-bit UCB address.

**Element or feature:** DFSMSdfp.

**When change was introduced:** z/OS V1R12.

**Applies to migration from:** z/OS V1R11.

**Timing:** Before installing z/OS V1R13.

**Is the migration action required?** Yes. If an exit routine does not support 31-bit UCB, it will need to be upgraded to support 31-bit UCB addresses.

**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 the exit to support a 31-bit UCB address.

**Reference information:** For details about DADSM pre- and post-installation exit routines, see *z/OS DFSMS Installation Exits*.

**DFSMSdfp and DFSMSdss: Redefine existing VSAM data sets that contain the IMBED, REPLICATE, and KEYRANGE attributes**

**Description:** No supported release of z/OS honors the IMBED, REPLICATE, and KEYRANGE attributes for new VSAM data sets. In fact, using these attributes can waste DASD space and often degrades performance. Servicing these VSAM data sets has become increasingly difficult. In some cases, unplanned outages have
occurred. For these reasons, IBM recommends that you stop using IMBED and REPLICATE, and that you minimize or eliminate your use of KEYRANGE.

IMBED and REPLICATE were intended as performance improvements and have been rendered obsolete by newer, cached DASD devices. Striped data sets provide much better performance than KEYRANGE and should be viewed as a candidate for any existing KEYRANGE data sets.

Starting in z/OS V1R12, DFSMSdss provides some assistance in identifying and converting data sets with KEYRANGES, IMBED or REPLICATE attributes:

- Data set dump processing and restore processing issue a message ADR508I (ttt-mm-y yyy), THE FOLLOWING DATA SETS REQUIRE SOME ACTION TO BE TAKEN when data sets with those attributes are encountered.
- Logical restore processing automatically converts indexed VSAM data sets with the IMBED or REPLICATE attributes, but not the KEYRANGES attribute, to key-sequenced data sets (KSDS) that do not have those attributes. It also issues message ADR507I (ttt-mm-y yyy), DATA SET dsn WAS RESTORED WITHOUT THE IMBED OR REPLICATE ATTRIBUTES indicating that the data set has been converted.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>DFSMSdfp and DFSMSdss.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>The recommendation to migrate from IMBED, REPLICATE, and KEYRANGE was originally made in the z/OS V1R6 timeframe. In Software Announcement 204-180 (RFA39951), dated August 10, 2004, IBM announced its intent to withdraw support for VSAM IMBED, REPLICATE, and KEYRANGE attributes in a future release. Based on customer feedback, IBM no longer plans to remove this support from z/OS in the foreseeable future. IBM still recommends that you stop using these attributes and plans to remove IMBED and REPLICATE attributes during logical DFSMSdss restore operations and DFSMShsm recall operations as announced in Software Announcement 207-175 4 (RFA45594), dated August 7, 2007. The DFSMSdss function to aid in conversion was added in z/OS V1R12.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before installing z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>No, but recommended to avoid degraded performance and wasted DASD space.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>HSM only logs messages for non-zero return codes (non I-type), so the messages for this line item won’t be logged by HSM for any function.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
</tbody>
</table>
Related IBM Health Checker for z/OS check: Use check CATALOG IMBED REPLICATE on z/OS V1R11 to detect IMBED and REPLICATE attributes in your master catalog and any connected user catalogs.

Steps to take:

1. Determine which VSAM data sets and ICF catalogs were defined with the IMBED, REPLICATE, or KEYRANGE attribute. Data set dump processing and restore processing issue message ADR508I (ttt)-mmmmm(yyyy), THE FOLLOWING DATA SETS REQUIRE SOME ACTION TO BE TAKEN to indicate data sets with the attributes.

To further help you identify the data sets, you can get a tool that reads existing VSAM data sets and ICF catalogs, and reports which ones have these attributes. The tool is available from the software server (ftp.software.ibm.com) in the s390/mvs/tools directory as IMBDSHIP.JCL.TRSD. Download the file in binary format and unterse it on your z/OS system using AMATERSE or TRSMAIN. Instructions for using the tool are included in the downloaded JCL.

Notes:

a. The tool only checks data sets that are on DASD.

b. “AMATERSE” and “TRSMAIN” are names for a service aid that compresses and decompresses data exchanged with IBM. “AMATERSE” is the preferred program name since its integration into z/OS V1R9. “TRSMAIN” is the original program name and is now shipped as an alias entry point to AMATERSE. For more information about AMATERSE, including several differences with TRSMAIN, see z/OS MVS Diagnosis: Tools and Service Aids.

2. Schedule a time for the affected VSAM data sets and ICF catalogs to be unavailable, and redefine them.

For VSAM data sets you can use JCL similar to the following:

```aplus
//* EXPORT A KSDS
//STEP1 EXEC PGM=IDCAMS
//SYSPRINT DD SYSOUT=* 
//INDD   DD DSN=EXAMPLE.KSDS,DISP=OLD
//OUTDD  DD DSN=EXAMPLE.KSDS.EXPORTED,DISP=(NEW,CATLG),
//       SPACE=(CYL,(1,1)),UNIT=SYSDA 
//SYIN   DD *
//       EXPORT EXAMPLE.KSDS -
//       INFILE(INDD) -
//       OUTFILE(OUTDD) -
//       TEMPORARY

//* NOW IMPORT THE EXPORTED COPY
//STEP1 EXEC PGM=IDCAMS
//SYSPRINT DD SYSOUT=*
//INDD   DD DSN=EXAMPLE.KSDS.EXPORTED,DISP=SHR
//SYIN   DD *
//       IMPORT -
//       INFILE(INDD) -
//       OUTDATASET(EXAMPLE.KSDS)
```

For ICF catalogs, see informational APAR II13354 for step-by-step instructions on using IDCAMS EXPORT/IMPORT with ICF catalogs.

Reference information:

- For more information about IDCAMS EXPORT and IMPORT, see z/OS DFSMS Access Method Services for Catalogs.

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For more information about the AMATERSE service aid, see *z/OS MVS Diagnosis: Tools and Service Aids*.

For more information about data set dump and restore processing, see *z/OS DFSMSdss Storage Administration*.

For more information about messages ADR507I and ADR508I, see *z/OS MVS System Messages, Vol 1 (ABA-AOM)*.

**DFSMSrmm: Replace CIM providers and CIM classes**

**Description:** In z/OS V1R10, the keys used for the DFSMSrmm CIM classes were changed. Prior to z/OS V1R12, you had the option of using a backward-compatible CIM provider, rather than updating your code to handle the new key formats. Beginning with z/OS V1R12, the backward-compatible CIM provider is no longer supported. If you have not done so already, you must unregister the previous CIM providers and CIM classes, and register the currently supported CIM providers and CIM classes.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>DFSMSrmm.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R12.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before installing z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you have not yet updated your code to handle the current key formats and are still using the backward-compatible CIM provider (provided as rmmcim19.tar.Z compressed tar archive).</td>
</tr>
</tbody>
</table>

| 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. Update your code to handle the key formats used in z/OS V1R11 and later. For the current formats, see Table 12 on page 216.

2. Using the rmmutil.sh tool, unregister all the z/OS V1R9 CIM providers and unload all the z/OS V1R9 CIM classes.

3. Using the same rmmutil.sh tool, register the complete set of z/OS V1R12 CIM providers and load the z/OS V1R12 CIM classes.

Table 12 on page 216 shows the old (V1R9) keys of DFSMSrmm CIM classes and the current (V1R11 and later) compound keys, which have formats of concatenated strings containing the values of the old keys delimited with "+" and appended with spaces by the fix length, if needed.
<table>
<thead>
<tr>
<th>Class Name</th>
<th>Key Transformation</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBMRRM_Dataset</td>
<td>DataSetName, PhysicalFileSequenceNumber, VolumeSerialNumber, and CdsID keys have been replaced with Name key of format DatasetName+FileSeq+Volser+CdsID.</td>
</tr>
<tr>
<td>IBMRRM_Location</td>
<td>LocationName, LocationType, and CdsID keys have been replaced with Tag key of format LocationName+LocationType+CdsID.</td>
</tr>
<tr>
<td>IBMRRM_LogicalVolume</td>
<td>VolumeSerialNumber and CdsID keys have been replaced with DeviceID key of format Volser+CdsID.</td>
</tr>
<tr>
<td>IBMRRM_Owner</td>
<td>OwnerId and CdsID keys have been replaced with InstanceID key of format OrgId:OwnerId+CdsID.</td>
</tr>
<tr>
<td>IBMRRM_PhysicalVolume</td>
<td>VolumeSerialNumber and CdsID keys have been replaced with Tag key of format Volser+CdsID.</td>
</tr>
<tr>
<td>IBMRRM_PolicyRule</td>
<td>PolicyRuleType, PolicyRuleName, JobNameMask, and CdsID keys have been replaced with PolicyRuleName key of format RuleType+RuleName+JobNameMask+CdsID.</td>
</tr>
<tr>
<td>IBMRRM_Product</td>
<td>ProductNumber and CdsID keys have been replaced with IdentifyingNumber key of format ProductNumber+CdsID.</td>
</tr>
<tr>
<td>IBMRRM_ShelfLocation</td>
<td>LocationName, MediaName, ShelfLocationNumber, and CdsID keys have been replaced with Tag key of format LocationName+MediaName+Number+CdsID.</td>
</tr>
</tbody>
</table>

Starting with z/OS V1R10, in order to simplify processing of the compound keys, every changed class has the KeyWithCdsIdName attribute containing the name of its compound key. Additionally, xxxFormat and xxxMask attributes are provided, where xxx is the name of the compound key. For example, TagFormat property of IBMRRM_PhysicalVolume is set to "Volser+CdsID" and TagMask string contains the consecutive concatenation of six blanks, symbol "+", and eight blanks.

**Reference information:** For additional details, see the topic “Setting up DFSMSrmm CIM provider” in z/OS DFSMSrmm Implementation and Customization Guide.

**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 IGGCATT00 NOT FOUND IN PARMLIB.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>DFSMSdfp</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R13</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before installing z/OS V1R13</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>No, but recommended to avoid message IEA301I referencing missing parmlib member IGGCATTxx.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
</tbody>
</table>
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 V1R13

This topic describes DFSMS 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.

DFSMSdfp: Ensure that the Language Environment runtime library is available for DLLs

Description: Language Environment provides common services and language-specific routines in a single runtime environment. You can use Language Environment to build and use dynamic link libraries (DLLs) for applications.
System impacts: None.
Related IBM Health Checker for z/OS check: None.

Steps to take: If your installation builds or references DLLs, either you must set up the system link list to refer to the Language Environment runtime libraries (SCEERUN and SCEERUN2), or each job that creates or uses a DLL must include a STEPLIB DD statement referencing these libraries.

Reference information:
- [z/OS Language Environment Run-Time Application Migration Guide](#)
- [z/OS Language Environment Customization](#)
- [z/OS Language Environment Programming Guide](#)

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 V1R12 and z/OS V1R11.
Timing: Before the first IPL of z/OS V1R13.
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:
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](#)
**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 they did in z/OS V1R11.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>DFSMSdss.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>General migration action not tied to a specific release.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you intend to use the Stand-Alone Services provided by DFSMSdss.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>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.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>Stand-Alone Services does not support the creation of the core image on an SMS-managed volume.</td>
</tr>
</tbody>
</table>
| System impacts: | • 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:**

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.
The BUILDSA 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 DFSMSdss 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, 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 SYSLOG no longer contains:

- VARY device-number,OFFLINE DFSMSDSS INTERNAL VARY
- IEF281I device-number NOW OFFLINE.

Instead, the SYSLOG 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 SYSLOG or job logs should be updated.

Element or feature: DFSMSdss.

When change was introduced: Z/OS V1R13.

Applies to migration from: Z/OS V1R12 and Z/OS V1R11.

Timing: Before the first IPL of Z/OS V1R13

Is the migration action required? Yes, if the PTF for APAR OA36296 has been applied and 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 new message:
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, refer to [z/OS DFSMSdss Storage Administration](#).

### 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).

<table>
<thead>
<tr>
<th>Element or feature</th>
<th>DFSMSdfp.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced</td>
<td>z/OS V1R13.</td>
</tr>
<tr>
<td>Applies to migration from</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if DADSM installation exits IGGPRE00 or IGGPOST0 are in use.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>None.</td>
</tr>
</tbody>
</table>

**Steps to take:**

- 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

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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 (CVFDPRI31, 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.

**DFSMSdfp: Update procedures that use IEBDSCPY alias name to access IEBCOPY**

**Description**: Before z/OS V1R13, the IEBCOPY utility was an APF-authorized program that had to run from an APF-authorized library. If another program called IEBCOPY, that program also had to be APF-authorized. Starting in z/OS V1R13, the IEBCOPY utility is no longer APF-authorized and can be run from non-authorized libraries; callers of IEBCOPY no longer need to be APF-authorized. In addition to this authorization change, other performance improvements have been made to IEBCOPY as well.

IEBCOPY is a data set library management utility that is used to perform many critical system build and maintenance activities. If this utility does not work correctly, then key library data sets could be rendered as unusable and the z/OS user would be left without a fallback method. A fallback copy of the z/OS V1R12 level of IEBCOPY is provided, named IEBCOPYO, for use if you experience problems with the updated version of IEBCOPY in z/OS V1R13. The old IEBCOPYO utility with its alias of IEBDSCPY is installed into SYS1.LINKLIB with authorization code one, AC(1).

Since the code in IEBCOPY is now different from the code in IEBCOPYO, IBM recommends that you do not copy and replace IEBCOPY with IEBCOPYO because of maintenance issues. PTFs will update IEBCOPY and IEBCOPYO load modules appropriately as each load module requires service.

The IEBDSCPY alias name of IEBCOPY that exists in earlier versions of DFSMS is no longer an alias name in the z/OS DFSMS V1R13 IEBCOPY load module. The IEBDSCPY alias name continues to exist as the alias to the IEBCOPYO load module in z/OS V1R13, but will be eliminated as an alias of the IEBCOPYO load
module in future releases of DFSMS. If you currently access the IEBCOPY utility by using the IEBDSCPY alias name, you need to make the necessary change to use the IEBCOPY primary name.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>DFSMSdfp.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R13.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>No, but recommended if you don’t want to be connected to the pre-z/OS V1R13 version of IEBCOPY.</td>
</tr>
</tbody>
</table>

| Target system hardware requirements: | None. |
| Target system software requirements: | None. |
| Other system (coexistence or fallback) requirements: | None. |
| Restrictions: | None. |
| System impacts: | It is important to note with the changes introduced in z/OS V1R13 IEBCOPY, the requirement for SMP/E to be APF-authorized remains. That is, these IEBCOPY changes have no effect on the requirement that SMP/E is APF-authorized. |

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

**Steps to take:**
- Programs or procedures that use the IEBDSCPY alias name to access IEBCOPY should be changed to use the IEBCOPY primary name. Programs that continue to use the alias name will connect to the old, pre-z/OS V1R13 version, currently called IEBCOPYO.
- IEBCOPY can now be called by programs that are not APF-authorized.

**Reference information:** For more information about the IEBCOPY utility, see z/OS DFSMSdfp Utilities.

**DFSMSdfp: Evaluate applications and modify for EAV enhancements**

**Description:** Starting with z/OS V1R12, additional non-VSAM data set types in the extended addressing space (EAS) are supported. This includes support for sequential (BASIC or LARGE), partitioned (PDS or PDSE), Catalogs, and BDAM data sets in EAS. Before z/OS V1R12, any program trying to open one of these types of non-VSAM data sets that have been allocated with extended attribute DSCBs (format 8 DSCB from a z/OS V1R12 system) failed with abend IEC144I 313-0C. Now on a z/OS V1R12 system, applications can open these non-VSAM data sets allocated with extended attribute DSCBs with standard BSAM, BPAM and QSAM access.

In many cases, application programs will function as usual. However, application programs that reference the data set extents found in the DEB or access the DSCB or its extents must change to either support format 8 DSCBs and 28-bit cylinder addressing or to abend when they encounter such data sets.
DFSMSdfp: Accommodate new DCBE macro option

Description: Before z/OS V1R12, the DCB access methods did not support the nocapture UCB option of a dynamic allocation. Starting in z/OS V1R12, the DCB access methods will support a new DCBE option, LOC=ANY, to signify that the application program supports the XTIOT, UCB nocapture and DSAB-above-the-line options of dynamic allocation. The new DCBE option also signifies that the application program has no dependency on any of XTIOT, UCB address or DSAB-above-the-line options of dynamic allocation.
<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>DFSMSdftp.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R12.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you use the XTIOT, UCB nocapture and DSAB-above-the-line options of dynamic allocation, or if any of the callers of your program might have used those options to allocate files which your program will open.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>None.</td>
</tr>
</tbody>
</table>

**Steps to take:**

1. Review, and modify if needed, the installation exit routines that receive a TIOT entry or UCB address directly or indirectly. These include:
   - DADSM pre- and post-processing exits (IGGPRE00 and IGGPOST0).
   - Tape management exits (IFG019LA (label anomaly), IFG019VM (volume mount), IFG019FV (file validation), IFG019FS (file start on volume) and IFG055FE (file end on volume)). They receive UCB addresses from TEPMUCB in IFGTEP, from DEBUCBA and from TIOEFSRT. All three sources will allow a 31-bit UCB address. TEPMUCB sometimes will be an uncaptured 31-bit address. If the new DEB31UCB bit is on, the UCB address and modeset byte will be different as described in IEZDEB.
   - NSL tape exits (NSLOHDRDRI, NSLEHDRDRI, NSLOHDRRO, NSLEHDRDRO, NSLETURLI, NSLETURLRO, NSLCTRLO, IEFXVNSL and NSLREPOS). OPEN, EOV and CLOSE will always turn DEB31UCB on in the work area to signify that DXDEBUCB is a 31-bit UCB address and the modeset byte is moved as described above. Even though the UCB address field will be four bytes, it typically will still contain a three-byte address.
   - Volume label editor routines (IFG0193C and IFG0553C). Same work area changes as described for the NSL routines.
   - DCB OPEN installation exit (IFG0EX0B).
   - The IGXMSGEX installation exit for the MSGDISP macro already supports its caller passing a 31-bit UCB address but there might be more cases in which this occurs.
   - The data management ABEND installation exit (IFG01991) passes a UCB address in field OAIXUCBA. It might now be 31-bit.
   - IECIEUCB as mapped by the IECIEPRM macro for the ISO/ANSI Version 3 and Version 4 installation exits (IFG0193G) contains the tape UCB address. In the past this has always been a 24-bit address. Now it might be a 31-bit address.
The above exits are documented in *z/OS DFSMS Installation Exits*. IEFDB401, a dynamic allocation input validation exit, is documented in *z/OS MVS Installation Exits*.

2. Verify that the installation exit routines will not be affected adversely.

3. Set the NON_VSAM_XTIOT option to YES or NO in the DEVSPxx parmlib member. (The default is NON_VSAM_XTIOT=NO.)

4. Change the program to set LOC=ANY in the DCBE macro. The default is LOC=BELOW.

**Note:** The new DCBELOCANY flag can only be used in z/OS V1R12 or later. If a program has the DCBELOCANY flag defined, and is compiled or assembled using a z/OS V1R11 level of the DFSMS macros, then a compile or assemble error will occur. See APAR OA33409 for more information.

**Reference information:** For details about the new DCBE option, see *z/OS DFSMS Macro Instructions for Data Sets* and *z/OS DFSMS Using the New Functions*.

### DFSMSdss: Recompile and link-edit exit routines or applications that change options in the ADRUFO block

**Description:** Starting with z/OS V1R12, if you change options in the ADRUFO block with either:

- the options installation exit routine, ADRUIXIT, or
- an application that invokes DFSMSdss with the API or XMAPI and then uses the Presenting ADRUFO Record exit (Eioption exit 13),

you must recompile and link-edit the exit routine or application using macro libraries provided with z/OS V1R12.

<table>
<thead>
<tr>
<th>Element or feature</th>
<th>DFSMSdss.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced</td>
<td>z/OS V1R12.</td>
</tr>
<tr>
<td>Applies to migration from</td>
<td>z/OS V1R11.</td>
</tr>
<tr>
<td>Timing</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you change options in the ADRUFO block with either the exit routine or application.</td>
</tr>
<tr>
<td>Target system hardware requirements</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check</td>
<td>None.</td>
</tr>
</tbody>
</table>

**Steps to take:** Recompile and link-edit the exit routine or application using macro libraries provided with release z/OS V1R12.

**Reference information:** For details, see *z/OS DFSMS Installation Exits*.
DFSMSdss: Modify applications to handle larger I/O buffers

Description: Starting with z/OS V1R12, DFSMSdss uses BSAM instead of EXCP to read from and write to DFSMSdss dump data sets during DUMP, COPYDUMP, and RESTORE operations. This allows DFSMSdss to support 256K blocksize when writing to and reading from a tape. Before z/OS V1R12, the maximum was 65,520 bytes. If you have an application that invokes DFSMSdss with the API or XMAPI, you should ensure that the application handles I/O buffers up to the new maximum of 262,144 bytes. The affected exit options are EIOP03 and EIOP06. For these exits, the storage (buffer) pointed to by EIRECPTR may now be greater than 65,520 bytes, up to a maximum of 262,144 bytes.

Element or feature: DFSMSdss.
When change was introduced: z/OS V1R12.
Applies to migration from: z/OS V1R11.
Timing: Before the first IPL of z/OS V1R13.
Is the migration action required? Yes, if the application invokes DFSMSdss with the API or XMAPI.
Target system hardware requirements: None.
Target system software requirements: None.
Other system (coexistence or fallback) requirements: Note: Tapes with greater than 65,520 bytes BLKSIZE can be read by z/OS V1R11 systems with the PTFs for APAR OA30822 installed. If you try to restore from a tape that has greater than 64K blocksize, but do not have the PTFs for OA30822 installed on your system, the restore will fail. Most likely, it will fail with an ADR370E INVALID SEQUENCE NUMBER error message.
Restrictions: None.
System impacts: None.
Related IBM Health Checker for z/OS check: None.

Steps to take:
• Ensure that the application can handle I/O buffers that are up to 262,144 bytes.
  If the application cannot handle I/O buffers that are up to 262,144 bytes, you can:
  – Specify PARM='USEEXCP=YES' in OPTPTR of the API or the EXEC PARM with PGM=ADRDSSU (for example, EXEC PGM=ADRDSSU,PARM='USEEXCP=YES'). You can also specify PARM='USEEXCP=YES' in OPTPTR of the API that invokes ADRXMAIA, or specify it on the EXEC PARM with PGM=ADRXMAIA (for example, EXEC PGM=ADRXMAIA,PARM='USEEXCP=YES').
  – Set a block size to an acceptable value either with the JCL DD statement or when dynamically allocating the DD for your application during processing of the Presenting ADRUFO Record exit (Eioption exit 13).
  – Code BLKSIZE and set the BLKSIZE value to 65,520. Note that DSS only supports BLKSIZE of 65,520 and above; for a backup to be compatible with releases earlier than z/OS V1R10, the backup must have no larger than 65,520 byte blocks. BLKSIZE can be set in the following places:
1. BLKSZLIM keyword on the DD statement or dynamic allocation. The BLKSZLIM keyword on a DD statement keyword is described in [z/OS MVS ICL Reference](https://www.ibm.com/docs/en/zos/2.4.0?topic=main).

2. Block size limit in data class. Set by storage administrator. Available even if the data set is not SMS-managed. The block size in the data class is described in [z/OS DFSMS Implementing System-Managed Storage](https://www.ibm.com/docs/en/zos/2.4.0?topic=fmsms).

3. System default set in TAPEBLKSZLIM keyword in DEVSUPxx parmlib member in SYS1.PARMLIB. Also available in DFA. The TAPEBLKSZLIM parameter is described in [z/OS MVS Initialization and Tuning Reference](https://www.ibm.com/docs/en/zos/2.4.0?topic=init).

   - If the application inspects the DTVBLKSZ field in the volume record of physical dumps or the DTHBLKSZ field in the data set header of logical dumps, you may need to make further changes. When a physical backup is created on tape with a block size that is greater than 65,520 bytes, the DTVBLKSZ field is X'FFFE'. The block size is stored in an extended volume record following the volume record, DTSDEVOL. When a logical backup is created on tape with a block size greater than 65,520 bytes, the DTHBLKSZ field is X'FFFE'. The block size is stored in a new extended tape header record, $s$, following the data set header record.

**Note:** You need to apply the PTF of DFSMSdss APAR OA35349 to avoid the ABEND002-030 problem during the RESTORE and COPYDUMP operation from either a standard label tape with a blocksize of zero in the tape label or a non label tape. If you have created DUMP or COPYDUMP data sets in z/OS V1R7 or earlier systems and you do not apply the APAR, the BLKSIZE in tape SL header contains zero (0). For details, see the documentation for APAR OA13742.

**Reference information:** For information about the API, see [z/OS DFSMSdss Storage Administration](https://www.ibm.com/docs/en/zos/2.4.0?topic=adms). For information about the Presenting ADRUFO Record exit (Eoption exit 13), see [z/OS DFSMS Installation Exits](https://www.ibm.com/docs/en/zos/2.4.0?topic=adms).

---

**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.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>DFSMShsm.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R13.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you do not want the new default.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
</tbody>
</table>
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.

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 

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 and z/OS V1R11.

Timing: Before the first IPL of z/OS V1R13.

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:
1. Determine which fast replication data set recovery preference you want to use.
2. Add a fast replication data set recovery preference to the ARCCMD\textit{xx} parmlib member of SYS1.PARMLIB.
   \begin{itemize}
   \item If a fast replication data set recovery preference is specified and matches the preference you want to use, no action is required.
   \item If no fast replication data set recovery preference is specified, add \texttt{SETSYS FASTREPLICATION (DATASETRECOVERY (PREFERRED))} to continue using the same preference as before z/OS V1R13.
   \end{itemize}

Alternatively, if your preference is to require fast replication data set recovery, you can specify \texttt{SETSYS FASTREPLICATION (DATASETRECOVERY (REQUIRED))}.

Notes:
1. If you previously specified \texttt{SETSYS FASTREPLICATION (DATASETRECOVERY (NONE))} in the ARCCMD\textit{xx} parmlib member of SYS1.PARMLIB, you can optionally remove it and use the default.
2. The \texttt{FRRECOV} command ALLOWPPRCP options \texttt{PRESERVEMIRRORREQUIRED}, \texttt{PRESERVEMIRRORPREFERRED}, \texttt{PRESERVEMIRRORNO}, and \texttt{YES} cannot be used if fast replication data set recovery is not allowed. That is, if the z/OS V1R13 \texttt{SETSYS FASTREPLICATION} command \texttt{DATASETRECOVERY} parameter default is used or if \texttt{SETSYS FASTREPLICATION (DATASETRECOVERY (NONE))} setting is in effect.

Reference information: For more information about fast replication, the \texttt{FRRECOV} command, and the \texttt{SETSYS} command, see \textit{z/OS DFSMShsm 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 \texttt{VOLUMEPAIRMESSAGES} parameter is added to the existing \texttt{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 and z/OS V1R11.

**Timing:** Before the first IPL of z/OS V1R13.

**Is the migration action required?** Yes, if the ARCCMD\textit{xx} parmlib member of SYS1.PARMLIB contains: \texttt{PATCH .FRGCB+.9 BITS(.1.........)}

**Target system hardware requirements:** None.

**Target system software requirements:** None.

**Other system (coexistence or fallback) requirements:** None.

**Restrictions:** The \texttt{SETSYS FASTREPLICATION (VOLUMEPAIRMESSAGES(YES))} statement in ARCCMC\textit{xx} is not supported on pre-z/OS V1R13 systems.

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

Steps to take:
1. Remove PATCH .FRGC8,+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.

Reference information: For more information about using the SETSYS FASTREPLICATION command and VOLUMEPAIRMESSAGES parameter to disable unwanted ARC1809I messages, see z/OS DFSMShsm 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 and z/OS V1R11.

Timing: Before the first IPL of z/OS V1R13.

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 do the following:
• 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.


### 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 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.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>DFSMS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R13.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>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 has been discovered in the past that leaving unnecessary useless patches in DFSMShsm’s startup procedures can cause confusion and potential problems.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>Remove this patch when all systems are at z/OS V1R13 if a common DFSMShsm’s startup procedure is shared with downlevel systems.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
</tbody>
</table>
### DFSMS: Update operator procedure in the Multicluster CDS environment

**Description:** In the DFSMS:sm Multicluster control data sets environment, the same number of clusters must be specified to all DFSMS:shsm hosts that are sharing a multicluster MCDS or BCDS, or both. If a DFSMS:shsm host is started with a different number of clusters than the other currently active hosts, the CDS will be logically corrupted and may require extensive recovery actions.

In z/OS V1R12 (and in z/OS V1R11, z/OS V1R10, and z/OS V1R9 when the PTF for OA29346 is installed), DFSMS:shsm is modified to detect a conflict between the number of CDS clusters specified to a host in the startup proclib JCL and the number recorded in the MHCR record.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>DFSMS:shsm.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R12 (z/OS V1R11, z/OS V1R10, and z/OS V1R9 by APAR OA29346).</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R11 without the PTF for APAR OA29346 applied.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you use the DFSMS:shsm Multicluster CDS environment.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>None.</td>
</tr>
</tbody>
</table>

**Steps to take:** A new WTOR message, ARC0264A, is issued asking if the change to the cluster number is intended. If the reply is Y, the DFSMS:shsm host is allowed to start with the new cluster count. If the reply is N, the DFSMS:shsm host is not allowed to start, which results in error message ARC0130I RC20.

ARC0264A {MCDS|BCDS} CLUSTERS CHANGED FROM m TO d. IF NOT INTENDED, STARTUP WILL RESULT IN CDS CORRUPTION. INTENDED? (Y OR N)

ARC0130I CONTROL DATA SET DEFINITION RULES FOR THE {MCDS|BCDS} WERE NOT FOLLOWED, RETURN CODE=20

The WTOR message is issued at the first DFSMS:shsm host initialization right after switching into the multicluster CDS environment.
DFSMShsm: Remove user-defined patch that disables or enables use of the DFSMSdss cross memory API

Description: In z/OS V1R10 and later, DFSMShsm’s use of the DFSMSdss cross memory API can be disabled or enabled by including a patch or the SETSYS DSSXMMODE (Y | N) command in the ARCCMDxx parmlib member of SYS1.PARMLIB. Starting with z/OS V1R12, support is added to the existing SETSYS DSSXMMODE command to permit the Y and N setting to individually control backup, CDS backup, dump, migration, full-volume recovery, and data set recovery. Because of this, disabling or enabling DFSMSdss cross memory mode should be done exclusively with the SETSYS DSSXMMODE command. Instances of patching the MCVT at offset +433 should be removed from ARCCMDxx.

Element or feature: DFSMShsm.

When change was introduced: z/OS V1R12.

Applies to migration from: z/OS V1R11.

Timing: Before the first IPL of z/OS V1R13.

Is the migration action required? Yes, if the ARCCMDxx parmlib member of SYS1.PARMLIB contains: PATCH .MCVT.+433

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. Remove PATCH .MCVT.+433 from the ARCCMDxx parmlib member of SYS1.PARMLIB.
2. Add the corresponding SETSYS DSSXMMODE command in the ARCCMDxx parmlib member of SYS1.PARMLIB.

Reference information: For more information about using the SETSYS DSSXMMODE command, see z/OS DFSMShsm Storage Administration.

DFSMShsm: Configure your security system to permit started procedures using new address space identifier

Description: Before z/OS V1R12, when using the DFSMSdss cross memory API, the address space identifier for full-volume and data set recovery from dump was ARCnREST. Starting in z/OS V1R12, when using the DFSMSdss cross memory API, the address space identifier for full-volume recovery from dump is changed...
to ARC\textsubscript{n}RST\textsubscript{y} where \(n\) is the DFSMShsm host ID and \(y\) is the instance of the DFSMSdss started task (a number 1 - 4). Data set recovery from dump will still use ARC\textsubscript{n}RST.

With the addition of multitasking volume recovery from DUMP in z/OS V1R12, the address space names for the DSS cross memory address spaces are separated so that four DSS volume recovery address spaces and only one DSS data set recovery address space can be created. ARC\textsubscript{n}REST is used for data set recovery from dump; ARC\textsubscript{n}RST\textsubscript{y} is used for volume recovery from dump.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>DFSMShsm.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R12.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if DFSMSdss cross memory support is used for full-volume recovery from dump.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>None.</td>
</tr>
</tbody>
</table>

**Steps to take:** Before attempting full-volume recovery from dump, configure your security system to permit started procedures using the new address space identifier for DFSMSdss cross memory support for full-volume recovery from dump.

**Reference information:** For more information about controlling use of DFSMSdss cross memory support using the SETSYS DSSXMMODE command, see [z/OS DFSMShsm Storage Administration](https://www.ibm.com). For more information about DFSMSdss address spaces started by DFSMShsm and configuring your security system, see [z/OS DFSMShsm Implementation and Customization Guide](https://www.ibm.com).

**DFSMShsm: Update applications that depend on QUERY COPYPOOL output**

**Description:** Before z/OS V1R12, the DFSMShsm QUERY COPYPOOL command output did not display FlashCopy® “background copy percent-complete” information. Starting in z/OS V1R12, the QUERY COPYPOOL command output in message ARC1820I will display applicable “background copy percent-complete” (PCT-COMP) information for full-volume FlashCopy pairs with an incomplete background copy. Percent-complete information (a percentage) is available for full-volume FlashCopy pairs with an incomplete background copy only. A full-volume FlashCopy relationship is established when the FlashCopy technique (such as fast reverse restore or incremental) designates it, or when SETSYS FASTREPLICATION(FCRELATION(FULL)) has been specified.

This change can affect applications that depend on QUERY COPYPOOL output.
### DFSMShsm: Update applications that depend on LIST command output

**Description:** The DFSMShsm LIST command output changed in z/OS V1R11 and in z/OS V1R12.

- Starting in z/OS V1R11, the LIST DSNAME(dsname) BCDS and LIST LEVEL(hlq) BCDS output no longer display the RACF IND field when OUTDATASET or SYSOUT (default) is specified as the destination for the output. The RACF IND field is displayed when TERMINAL is specified as the destination for the output.
- Starting in z/OS V1R12, the LIST COPYPOOL(cpname) output includes: a new FASTREPLICATION state (FCFRRINCOMPLETE), fast reverse restore status field (FCFRR=), and recovery complete status field (RECOVERYINCOMPLETE=). This new output is displayed when OUTDATASET, SYSOUT (default), or TERMINAL is specified as the destination for the output.

These changes can affect applications that depend on LIST output.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>DFSMShsm.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R12 and z/OS V1R11 (as explained in the description).</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if your applications depend on the RACF IND field value in the output with the OUTDATASET or SYSOUT destination, or if your applications depend on LIST COPYPOOL(cpname) output.</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>None.</td>
</tr>
</tbody>
</table>

Steps to take:
1. Remove any dependency on the RACF IND field on the LIST DSNAME(dsname) BCDS or LIST LEVEL(hlg) BCDS output when using OUTDATASET or SYSOUT.
2. Update applications that depend on LIST COPYPOOL(cpname) output to handle the new FASTREPLICATION state and new fields.

Reference information: See Using the LIST Command in z/OS DFSMSHsm Storage Administration.

**DFSMShsm: Accommodate the change of ARCBDEXT exit**

**Description:** Prior to DFSMShsm z/OS V1R10, ARCBDEXT was called during volume-level backup operations (AUTOBACKUP for automatic and BACKVOL for command-based operations). Users examined information in the exit's input data structure to determine whether to allow or disallow backup of a data set. Starting with DFSMShsm z/OS V1R10, ARCBDEXT is called during individual data set backup operations, as well as volume-level backup operations. When called for individual data set backup, the exit's input data structure differs, but the return code values and meanings remain the same as for volume-level backups. Users must examine the level information in the input data structure, at offset x'04', to determine whether ARCBDEXT is being invoked for volume-level or for individual data set backup.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>DFSMShsm.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R11 by APAR OA28948 and z/OS V1R10 by APAR OA28136.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R11 without APAR OA28948.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you want to allow command backup but disallow autobackup for some data sets.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
</tbody>
</table>
System impacts: None.

**Steps to take:** Examine the level information in the input data structure at offset x'04' to determine whether ARCBDEXT is being invoked for volume-level or for individual data set backup. The level field will contain ‘*EXPAND1’ for volume-level requests and ‘*EXPAND2’ for individual data set backup requests. For individual data set backup requests, the field at offset x'0C' contains additional status information about whether the backup request is the result of a backup data set command or the result of retry from a volume command.

**Reference information:** For more information, see [z/OS DFSMS Installation Exits](https://www.ibm.com).
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.

**Reference information:** For details about DFSMS macros, refer to [z/OS DFSMS Macro Instructions for Data Sets](https://www.ibm.com) and [z/OS DFSMSdfp Advanced Services](https://www.ibm.com).

### 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.

<table>
<thead>
<tr>
<th>Element or feature</th>
<th>DFSMSdfp.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced</td>
<td>z/OS V1R13.</td>
</tr>
<tr>
<td>Applies to migration from</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing</td>
<td>After the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you use OAM object support.</td>
</tr>
<tr>
<td>Target system hardware requirements</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check</td>
<td>None.</td>
</tr>
</tbody>
</table>

**Steps to take:**
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](https://www.ibm.com).

**Reference information:** For more information, see the topic [Migrating, Installing, and Customizing OAM](https://www.ibm.com) in [z/OS DFSMS OAM Planning, Installation, and Storage Administration Guide for Object Support](https://www.ibm.com).

### 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 V1R12 and z/OS V1R11.
Timing: After the first IPL of z/OS V1R13.
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.

DFSMSdfp: Use indirect zFS file system data set catalog support

Description: Starting in z/OS V1R12, zFS file systems may be cataloged using a system symbol. This allows zFS file system data sets to be indirectly cataloged the same way as non-VSAM data sets.
Element or feature: DFSMSdfp.
When change was introduced: z/OS V1R12.
Applies to migration from: z/OS V1R11.
Timing: After the first IPL of z/OS V1R13.

Is the migration action required? No, but recommended to make deployment easier for zFS file system data sets.

Target system hardware requirements: None.

Target system software requirements: None.

Other system (coexistence or fallback) requirements: Systems prior to z/OS V1R12 cannot process the indirectly-cataloged zFS file system data sets and will fail with volume not found errors.

Restrictions: This support is limited to zFS file system data sets only. That is, all VSAM linear data sets are not included in this support; only data sets formatted as zFS file systems are included in this support. Also, this support is limited to single-volume zFS file system data sets.

System impacts: None.

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

Steps to take: Use the reference information below to use this new support.

Reference information:
- For setting up the indirect catalog entry, see “Define Cluster” in [z/OS DFSMS Access Method Services for Catalogs](https://www.ibm.com/support/docview.wss?uid=ssg1S100111) and DOC APAR OA34695.
- For information about the steps required to establish an indirect catalog entry for zFS file system data sets and what the IDCAMS LISTCAT output will produce, see [z/OS DFSMS Access Method Services for Catalogs](https://www.ibm.com/support/docview.wss?uid=ssg1S100111).
- For cloning processes to use this support, see [z/OS Planning for Installation](https://www.ibm.com/support/docview.wss?uid=ssg1S100111).

**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. Prior to 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 and z/OS V1R11), 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.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>DFSMSdss.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R13 (z/OS V1R12 and z/OS V1R11 by APAR OA32120).</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11, both without the PTF for APAR OA32120 installed.</td>
</tr>
<tr>
<td>Timing:</td>
<td>After the first IPL of z/OS V1R13.</td>
</tr>
</tbody>
</table>
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:
- 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 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 III4616.

**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 data set (CDS) backup. Starting with z/OS V1R13, the ARCCAT resource is released by all functions running on z/OS V1R13 DFSMShsm hosts, and the functions are quiesced when CDS backup starts. Manually or programmatically holding DFSMShsm activity is no longer necessary.

Element or feature: | DFSMShsm.
---|---
When change was introduced: | z/OS V1R13.
Applies to migration from: | z/OS V1R12 and z/OS V1R11.
Timing: | After the first IPL of z/OS V1R13.
Is the migration action required? | No, but recommended because DFSMShsm 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 DFSMShsm 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. |
| | • In a record-level sharing (RLS) CDS environment, all DFSMShsm 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 DFSMShsm hosts without changing hosts running on prior releases of z/OS. |
| | • Some DFSMShsm environment configuration do not require XCF services. Specifically, a non-RLS CDS non-multiple address space DFSMShsm (MASH) configuration typically does not require XCF services. However, XCF services are required and must be available and configured in all DFSMShsm RLS CDS and MASH configurations. |
| **System impacts:** | If you continue to issue a HOLD command to quiesce DFSMShsm activity before a CDS backup and a corresponding RELEASE command to resume activity after CDS backup completes, 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 DFSMShsm hosts:
1. Remove the procedures, processes, or programs that issue the HOLD command to quiesce DFSMShsm activity prior to starting CDS backup.
2. 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](https://www.ibm.com/support/docview.wss?uid=swg21416695).
Chapter 9. DFSORT migration actions

DFSORT actions to perform before installing z/OS V1R13
None.

DFSORT actions to perform before the first IPL of z/OS V1R13
This topic describes DFSORT 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.

Update automation for changed DFSORT messages

Description: In z/OS V1R12, the text for some DFSORT messages (ICExxxx) is changed. Text and insert fields have been added, changed, or removed in the messages listed below in “Steps to take”. These changes can affect automation programs that examine the text of the messages.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>DFSORT.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R12.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you have automation routines that examine the message text of the messages listed below in “Steps to take”.</td>
</tr>
</tbody>
</table>

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 release level has changed from "V1R10" to "V1R12" in message ICE0001.

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The following new messages have been added:

- ICE236I
- ICE248I
- ICE249I
- ICE264I
- ICE278I
- ICE299I
- ICE801I

Text and insert fields have been changed in the following messages to provide new information:

- ICE199I
- ICE255I
- ICE289A
- ICE897I
- ICE898I

Reference information: For details about the ICE messages, see z/OS DFSORT Messages, Codes and Diagnosis Guide.

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

This topic describes DFSORT 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.

Use new MOWRK option to prevent the use of memory object storage for work space sort applications

Description: Beginning with z/OS V1R12, DFSORT uses memory object storage as intermediate work space. A new installation option, MOWRK, specifies whether memory object storage can be used for intermediate work space or as an extension of main storage, as appropriate, or only as an extension of main storage. Using memory object storage as intermediate work space is the preferred choice.

DFSORT's shipped installation default for MOWRK is YES (use memory object storage as work space or as an extension of main storage). If appropriate, you can change MOWRK for all DFSORT sort applications to only use memory objects as an extension of main storage by specifying NO.

The MOSIZE installation default will still limit the total amount of memory object storage that can be used by a sort application.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>DFSORT.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R12.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>After the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if the default value YES is not acceptable.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
</tbody>
</table>
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 prevent the use of memory object storage for work space for all DFSORT sort applications, use ICEPRMxx members activated by a START ICEOPT started task command to set the MOWRK=NO option, as appropriate.
- Alternatively, you can set MOWRK=NO with the previous (less preferred) method of using the ICEMAC macro and usermods.
- To prevent the use of memory object storage for work space for individual DFSORT sort applications, use the NOMOWRK run time option as described in the referenced documentation below.

Reference information:

- For details about the MOWRK installation option, see z/OS DFSORT Installation and Customization.
- For details about the MOWRK and NOMOWRK run time options, see z/OS DFSORT Application Programming Guide.

Change the number of dynamically allocated work data sets using new DYNAPCT option

Description: Beginning with z/OS V1R12, you will see an increase in the number of dynamically allocated work data sets for sort applications. A new installation option, DYNAPCT, specifies a percentage that is applied to the DYNALOC/DYNALLOC value in effect to determine the number of additional work data sets to be dynamically allocated. These additional work data sets will be allocated with 0 space and only used if needed to complete a sort when the disk work space requirement is unexpectedly larger than anticipated. The total disk work space initially allocated by DFSORT will not increase.

DFSORT’s shipped installation default for DYNAPCT is 10 (percent). If appropriate, you can adjust DYNAPCT for all DFSORT sort applications or for individual DFSORT sort applications by specifying 0 to 254 (percent) or OLD (no change from previous releases). DYNAPCT=0 indicates a 0 percentage, so no additional work data sets will be added.

Note: DYNAPCT=OLD tells DFSORT to operate the way it did previously:

- OLD specifies that additional work data sets should only be allocated when DFSORT cannot determine the file size. When DFSORT is able to determine the file size, additional work data sets will not be allocated (y=0), and the total number of work data sets will be n.

DYNAPCT=0 tells DFSORT to use 0%, which means no additional work data sets will be allocated.
Applies to migration from: z/OS V1R11.

Timing: After the first IPL of z/OS V1R13.

Is the migration action required? Yes, if the default of 10 (percent) is not acceptable.

Note: If DYNAPCT=10 is not sufficient to avoid out of space ABENDs, then you might want to raise the value of n.

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 change the number of dynamically allocated work data sets for all DFSORT sort applications, use ICEPRMxx members activated by a START ICEOPT started task command to set the DYNAPCT=x or DYNAPCT=OLD option, as appropriate.
- Alternatively, you can set DYNAPCT=x or DYNAPCT=OLD with the previous (less preferred) method of using the ICEMAC macro and usermods.
- To change the number of dynamically allocated work data sets for individual DFSORT applications, use the DYNAPCT=x or DYNAPCT=OLD run time option as described in the referenced documentation below.

Reference information:
- For details about the DYNAPCT installation option, see z/OS DFSORT Installation and Customization.
- For details about the DYNAPCT run time option, see z/OS DFSORT Application Programming Guide.
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This topic describes migration actions for base element Distributed File Service.

Distributed File Service actions to perform before installing z/OS V1R13

This topic describes Distributed File Service migration actions that you can perform on your current (old) system. You do not need the z/OS V1R13 level of code to make these changes, and the changes do not require the z/OS V1R13 level of code to run once they are made.

zFS: Accommodate new DASD space requirements

Description: zFS always reads and writes data in 8K blocks. However, 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, zFS R13 no longer stores data in 1K fragments. zFS R13 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 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.

- **Scenario 1**: If every file in the file system is 1K or less, zFS 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, zFS R13 could require up to twice as much DASD space to store these files.
- **Scenario 3**: If the file system contains 1000 files that are 1K in size, zFS in R13 could take a maximum of 10 cylinders more than zFS in previous releases.

Typically, however, any increase in the DASD storage used by zFS R13 will be negligible. For example, the z/OS V1R13 version root file system copied using zFS R13 takes approximately 2% more space than the same file system copied using zFS R11. Note that zFS R13 packs multiple ACLs and symbolic links into an 8K block which previous releases did not do. To minimize the chance of application failure because of 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: Distributed File Service.
When change was introduced:  

z/OS V1R13.

Applies to migration from:  
z/OS V1R12 and z/OS V1R11.

Timing:  
Before installing z/OS V1R13.

Is the migration action required?  
Yes, if you will be using zFS V1R13 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 aggrgrow option in your IOEFSPRM configuration options file.

Target system hardware requirements:  
None.

Target system software requirements:  
None.

Other system (coexistence or fallback) requirements:  
None.

Restrictions:  
None.

System impacts:  
zFS R13 may 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 zFS R13 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 V1R13 will attempt to 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:

   ```bash
   find <mountpoint> -size -3 -type f -xdev | wc -l
   ```


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 because of 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.

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 zSeries File System Administration, SC24-5989](#).
- For information about VSAM extended addressability and SMS-managed data sets, see [z/OS DFSMS Implementing System-Managed Storage, SC26-7407](#).
- For information about the pax command, see [z/OS UNIX System Services Command Reference, SA22-7802](#).

## 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.
<table>
<thead>
<tr>
<th>When change was introduced:</th>
<th>z/OS V1R13 (previewed in z/OS V1R13 Software Announcement 211-007, dated 15 February 2011).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before installing z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if your installation uses cloned file systems.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>None.</td>
</tr>
</tbody>
</table>

**Steps to take:**
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 zSeries File System Administration, SC24-5989](#).

**zFS: Copy data from zFS multi-file system aggregates to zFS compatibility mode aggregates**

**Description:** z/OS V1R13 is planned to be 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.

When this support is withdrawn, only zFS compatibility mode aggregates will be supported.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>Distributed File Service.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R13 (previewed in z/OS V1R13 Software Announcement 211-007, dated February 15, 2011).</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before installing z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if your installation uses multi-file system aggregates.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
</tbody>
</table>
### Other system (coexistence or fallback) requirements:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>None.</td>
<td></td>
</tr>
</tbody>
</table>

### Restrictions:

<table>
<thead>
<tr>
<th>Restriction</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>None.</td>
<td></td>
</tr>
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</table>

### System impacts:

<table>
<thead>
<tr>
<th>Impact</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>None.</td>
<td></td>
</tr>
</tbody>
</table>

### Related IBM Health Checker for z/OS check:

<table>
<thead>
<tr>
<th>Check</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use check ZOSMIGV1R11_ZFS_RMMULTIFS or check ZOSMIGREC_ZFS_RMMULTIFS to help determine if any multi-file system aggregates are attached on your system.</td>
<td></td>
</tr>
</tbody>
</table>

### Steps to take:

1. Use the IBM Health Checker for z/OS check referenced above.
2. Scan your zFS IOEFSRPM configuration options file for define_aggr statements.
3. Scan your /etc/rc file for any zfsadm attach commands.
4. 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:

- For more information about zFS commands and administration tasks, see [z/OS Distributed File Service zSeries File System Administration, SC24-5989](#).
- For more information about IBM health checks, refer to [IBM Health Checker for z/OS: User’s Guide](#).

### zFS: Ensure sysplex=filesys is available on all zFS R11 and R12 systems in a shared file system environment

**Description:** In 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.

<table>
<thead>
<tr>
<th>Element or feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distributed File Service.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>When change was introduced</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>z/OS V1R13.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Applies to migration from</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>z/OS V1R12 and z/OS V1R11.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Timing</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before installing z/OS V1R13.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Is the migration action required?</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes, if you have a shared file system environment with more than one system in that environment.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Target system hardware requirements</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>None.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Target system software requirements</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>None.</td>
<td></td>
</tr>
</tbody>
</table>
**Other system (coexistence or fallback) requirements:**

Install the PTF for APAR OA32925 on z/OS V1R11.

If a problem occurs when zFS is running sysplex=filesys on a z/OS V1R11 or z/OS V1R12 system, you can perform the following steps:

- Remove the sysplex specification from each system or specify sysplex=off on each system (this is equivalent to the default).
- Perform a rolling IPL or restart zFS on each system.

This procedure cannot be done after zFS on the z/OS V1R13 system has joined the sysplex. If you try to start zFS on another z/OS V1R13 system after you have changed zFS to sysplex=off on the z/OS V1R11 or 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 sysplex=filesys.

Also, if you try to bring in zFS z/OS V1R13 when sysplex=filesys is not active on all systems, you will receive message IOEZ00721I Sysplex member sysname is not running sysplex=filesys. zFS on this initializing member will terminate, where sysname is the sysplex member that is not running sysplex=filesys.

**Restrictions:**

None.

**System impacts:**

Specifying zFS sysplex=filesys in a shared file system environment causes zFS to run sysplex-aware 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 and z/OS V1R11).

**Steps to take:** Perform the following steps to ensure that sysplex=filesys is available on all zFS z/OS V1R11 and z/OS V1R12 systems in a shared file system environment.

1. Install the PTF for APAR OA32925 (UA55765) on all z/OS V1R11 systems, and make it active on all systems through a rolling IPL. This provides the enhanced connect function required by zFS V1R13.

2. 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 V1R11 and 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.

```
f zfs,query,level
IOEZ00639I zFS kernel: z/OS zSeries File System
Version 01.11.00 Service Level OA33895 - 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 V1R11 or 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 shown in Table 13 DCEIMGVM, DCEIMGVN and DCEIMGVQ are three sysplex members in a shared file system environment.

### Table 13. Examples of zFS error messages

<table>
<thead>
<tr>
<th>Example</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>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.</td>
</tr>
<tr>
<td>Results</td>
<td>DCEIMGVM (z/OS V1R13) issues:</td>
</tr>
<tr>
<td></td>
<td>IOEZ00675E zFS will terminate... system DCEIMGVN does not support the following feature(s) used by this system (DCEIMGVM): enhanced connect</td>
</tr>
<tr>
<td></td>
<td>IOEZ00675E zFS will terminate... system DCEIMGVQ does not support the following feature(s) used by this system (DCEIMGVM): enhanced connect</td>
</tr>
<tr>
<td></td>
<td>IOEZ00057I zFS kernel program IOEFSKN is ending</td>
</tr>
<tr>
<td>2</td>
<td>DCEIMGVN (running z/OS V1R11 without coexistence APAR) tries to enter the sysplex environment. DCEIMGVM and DCEIMGVQ are running z/OS V1R13.</td>
</tr>
<tr>
<td>Results</td>
<td>DCEIMGVM (z/OS V1R11) issues the following messages:</td>
</tr>
<tr>
<td></td>
<td>IOEZ00677E zFS will terminate... system DCEIMGVM uses feature(s) not supported by the initializing system (DCEIMGVM).</td>
</tr>
<tr>
<td></td>
<td>IOEZ00677E zFS will terminate... system DCEIMGVQ uses feature(s) not supported by the initializing system (DCEIMGVN).</td>
</tr>
<tr>
<td></td>
<td>IOEZ00571 zFS kernel program IOEFSBM is ending</td>
</tr>
<tr>
<td></td>
<td>DCEIMGVM (z/OS V1R13) issues:</td>
</tr>
<tr>
<td></td>
<td>IOEZ00676E DCEIMGVN will terminate... it does not support the following feature(s) used by this system[DCEIMGVM]: enhanced connect</td>
</tr>
<tr>
<td></td>
<td>DCEIMGVQ (z/OS V1R13) issues:</td>
</tr>
<tr>
<td></td>
<td>IOEZ00676E DCEIMGVM will terminate... it does not support the following feature(s) used by this system[DCEIMGVQ]: enhanced connect</td>
</tr>
<tr>
<td>3</td>
<td>DCEIMGVM (running z/OS V1R13) tries to enter the sysplex environment. DCEIMGVN and DCEIMGVQ (running z/OS V1R11 with the coexistence APAR installed) are not running sysplex=filesys.</td>
</tr>
<tr>
<td>Results</td>
<td>DCEIMGVM (z/OS V1R13) issues:</td>
</tr>
<tr>
<td></td>
<td>IOEZ00721I Sysplex member DCEIMGVM is not running sysplex=filesys. zFS on this initializing member will terminate.</td>
</tr>
<tr>
<td></td>
<td>IOEZ00721I Sysplex member DCEIMGVQ is not running sysplex=filesys. zFS on this initializing member will terminate.</td>
</tr>
<tr>
<td></td>
<td>IOEZ00057I zFS kernel program IOEFSKN is ending.</td>
</tr>
<tr>
<td>4</td>
<td>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.</td>
</tr>
</tbody>
</table>
Table 13. Examples of zFS error messages (continued)

| Results 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).  
| IOEZ006571 zFS kernel program IOEFSCM is ending  
| DCEIMGVM (z/OS V1R13) issues:  
| IOEZ00720I Initializing system DCEIMGW will not be allowed to join the sysplex.  
It is not running sysplex=filesys.  
| DCEIMGVQ (z/OS V1R13) issues:  
| IOEZ00720I Initializing system DCEIMGW 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, SC24-5917](#).
- For more information about running zFS in a shared file system environment, see [z/OS Distributed File Service zSeries File System Administration, SC24-5989](#).
- For more information about IBM health checks, refer to [IBM Health Checker for z/OS: User’s Guide](#).

zFS: Verify virtual storage usage

Description: Applying PTF UA55765 (zFS APAR OA33451) to z/OS V1R11 fixes a performance problem that occurs because of too many storage obtains and releases in zFS. The resolution of the problem involves obtaining a new block of storage at zFS initialization. This storage obtain is for approximately 60 MB.

| Element or feature: | Distributed File Service. |
| When change was introduced: | z/OS V1R11 by APAR OA33451. |
| Applies to migration from: | z/OS V1R11 without APAR OA33451. |
| Timing: | Before installing z/OS V1R13. |
| 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: | If your zFS virtual storage usage is close to the limit of the zFS address space, this additional virtual storage request at zFS initialization could cause zFS to fail to initialize and not come up, or zFS may come up but with insufficient remaining storage to handle zFS requests such as mount. In these cases, you would likely see zFS the warning message IOEZ00662I: ZFS is low on storage. |
Related IBM Health Checker for z/OS check: None.

Steps to take:
1. Verify that PTF UA55765 (zFS APAR OA33451) is installed.
2. Check zFS storage usage by using the operator command `MODIFY ZFS,QUERY,STORAGE`. If you compare the third line of data (USS/External Storage Access Limit) to the fourth line (Total Bytes Allocated (Stack+Heap+OS)), you will be able to see how close zFS is to using its maximum storage. The Total Bytes Allocated should be less than the USS/External Storage Access Limit. For example:

```
MODIFY ZFS,QUERY,STORAGE
10EZ00438I Starting Query Command STORAGE.

zFS Primary Address Space Storage Usage
---------------------------------------
Total Storage Available to zFS: 1938817024 (1893376K) (1849M)
Non-critical Storage Limit: 1917845504 (1872896K) (1829M)
USS/External Storage Access Limit: 1875902464 (1831936K) (1789M)
Total Bytes Allocated (Stack+Heap+OS): 245559296 (239804K) (234M)
Heap Bytes Allocated: 213411011 (208409K) (203M)
Heap Pieces Allocated: 295003
Heap Allocation Requests: 295610
Heap Free Requests: 607

Heap Usage By Component
------------------------
<table>
<thead>
<tr>
<th>Bytes</th>
<th>No. of Allocs</th>
<th>No. of Frees</th>
<th>Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>66836</td>
<td>10</td>
<td>10</td>
<td>Interface</td>
</tr>
<tr>
<td>5112</td>
<td>8</td>
<td>12</td>
<td>Media Manager I/O driver</td>
</tr>
<tr>
<td>1828</td>
<td>5</td>
<td>5</td>
<td>Trace Facility</td>
</tr>
<tr>
<td>431452</td>
<td>7</td>
<td>7</td>
<td>Message Service</td>
</tr>
<tr>
<td>282789</td>
<td>1701</td>
<td>2216</td>
<td>Miscellaneous</td>
</tr>
<tr>
<td>34632</td>
<td>41</td>
<td>43</td>
<td>Aggregate Management</td>
</tr>
<tr>
<td>1006220</td>
<td>31</td>
<td>31</td>
<td>Filesystem Management</td>
</tr>
<tr>
<td>33128</td>
<td>23</td>
<td>29</td>
<td>Administration Command Handling</td>
</tr>
<tr>
<td>35115496</td>
<td>100692</td>
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<td>Vnode Management</td>
</tr>
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<td>17030164</td>
<td>36313</td>
<td>36315</td>
<td>Anode Management</td>
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<tr>
<td>34838428</td>
<td>7140</td>
<td>7146</td>
<td>Directory Management</td>
</tr>
<tr>
<td>475992</td>
<td>6170</td>
<td>6172</td>
<td>Log File Management</td>
</tr>
<tr>
<td>34459280</td>
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<td>12300</td>
<td>Metadata Cache</td>
</tr>
<tr>
<td>420312</td>
<td>4014</td>
<td>4014</td>
<td>Transaction Management</td>
</tr>
<tr>
<td>9740</td>
<td>24</td>
<td>24</td>
<td>Asynchronous I/O Component</td>
</tr>
<tr>
<td>58288</td>
<td>156</td>
<td>156</td>
<td>Lock Facility</td>
</tr>
<tr>
<td>169224</td>
<td>443</td>
<td>443</td>
<td>Threading Services</td>
</tr>
<tr>
<td>249200</td>
<td>5968</td>
<td>5972</td>
<td>Cache Services</td>
</tr>
<tr>
<td>46058</td>
<td>6</td>
<td>8</td>
<td>Configuration parameters processing</td>
</tr>
<tr>
<td>11842136</td>
<td>98386</td>
<td>98386</td>
<td>User File Cache</td>
</tr>
<tr>
<td>56100</td>
<td>99</td>
<td>118</td>
<td>Storage Management</td>
</tr>
<tr>
<td>63319828</td>
<td>942</td>
<td>950</td>
<td>XCF Services</td>
</tr>
<tr>
<td>11640</td>
<td>8</td>
<td>10</td>
<td>Cross system attach validation</td>
</tr>
<tr>
<td>2338560</td>
<td>20489</td>
<td>20489</td>
<td>Server Token Manager (STKM)</td>
</tr>
<tr>
<td>12048</td>
<td>16</td>
<td>16</td>
<td>Server Token Cache (STKC)</td>
</tr>
<tr>
<td>11996704</td>
<td>8</td>
<td>8</td>
<td>Client Token Cache (CTKC)</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Server Vnode Interface (SVI)</td>
</tr>
<tr>
<td>816</td>
<td>4</td>
<td>38</td>
<td>Name Space (NS)</td>
</tr>
</tbody>
</table>
```

You can see that, in this case, the Total Bytes Allocated (234M) is much less than the USS/External Storage Access Limit (1789M). If the Total Bytes
Allocated becomes greater than or equal to the USS/External Storage Access Limit, zFS will issue an IOEZ00662I message.

If you see that the Total Bytes Allocated approaches the value of the USS/External Storage Access Limit, you should take steps to decrease your cache sizes using the z/OS UNIX zfsadm config command. See the z/OS Distributed File Service zSeries File System Administration (SC24-5989) for more information on the zfsadm command.

3. If zFS has failed to initialize and is not active, you should decrease some of your zFS IOEFSprm settings, such as dir_cache_size, meta_cache_size, recovery_max_storage, token_cache_size, tran_cache_size, vnode_cache_size (especially if they are significantly larger than the default for these values) and restart zFS. If zFS is active but warning message IOEZ00662I has been issued, you can attempt to decrease the caches dynamically using the zfsadm config command. (You should also make the corresponding changes in your IOEFSprm file for the next zFS restart.) Alternatively, you can stop and restart zFS after making cache size changes to your IOEFSprm file.

As a general practice, it is a good idea to periodically check zFS storage usage by using the operator command MODIFY ZFS,QUERY,STORAGE.

Reference information:
- For more information about the zfsadm command, see z/OS Distributed File Service zSeries File System Administration.
- For more information about zFS administration, see z/OS Distributed File Service zSeries File System Administration.

Distributed File Service actions to perform before the first IPL of z/OS V1R13

This topic describes Distributed File Service 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.

**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.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>Distributed File Service.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R13 (previewed in z/OS V1R12 Software Announcement 210-235, dated July 22, 2010).</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
</tbody>
</table>
**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. You require TSO/E APAR OA37218 for z/OS V1R13 to update samplib member IKJTSO00 to add a new entry for IOEDFSXP to the AUTHPGM list.

If your installation uses the DFS client, you must remove the following statement from the BPXPRMxx parmlib member to prevent the client from initializing:

```plaintext
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 V1R13, 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.

**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, SC24-5917](#).
- For information about setting up a zFS file system, see [z/OS Distributed File Service zSeries File System Administration, SC24-5989](#).
- For information about the `pax` command, see [z/OS UNIX System Services Command Reference, SA22-7802](#).
- For information about NFS, see [z/OS Network File System Guide and Reference](#).
- For information about SMB, see [z/OS Distributed File Service SMB Administration](#).
Distributed File Service actions to perform after the first IPL of z/OS V1R13

This topic describes Distributed File Service 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.

None
Chapter 11. Infoprint Server migration actions

Infoprint Server actions to perform before installing z/OS V1R13
- Increase space in the Printer Inventory file system
- Remove Version 2 Printer Inventory files at fallback to z/OS V1R11
- Upgrade Java support for IPP Server

Infoprint Server actions to perform after the first IPL of z/OS V1R13
- Remount the Printer Inventory and copy files that were customized
- Update or remove the region size in the AOPSTART startup procedure
- Upgrade XML for Infoprint Central
- Migrate from IP PrintWay basic mode to extended mode
- Infoprint Server actions to perform after the first IPL of z/OS V1R13
- Run aopsetup
- Remove Version 1 Printer Inventory files after deploying z/OS V1R13

This topic describes migration actions for optional feature Infoprint Server.

Infoprint Server actions to perform before installing z/OS V1R13

This topic describes Infoprint Server migration actions that you can perform on your current (old) system. You do not need the z/OS V1R13 level of code to make these changes, and the changes do not require the z/OS V1R13 level of code to run once they are made.

Increase space in the Printer Inventory file system

Description: In z/OS V1R12, the format of the Infoprint Server Printer Inventory files has changed from Version 1 to Version 2 format. When you migrate from z/OS V1R11 and start Infoprint Server on z/OS V1R13 for the first time, Infoprint Server reformats the Version 1 Printer Inventory files and creates Version 2 Printer Inventory files. The Version 1 Printer Inventory files are not removed so that if you need to fall back to z/OS V1R11, Infoprint Server can use the Version 1 Printer Inventory files. Therefore, the Printer Inventory file system requires more space in z/OS V1R13 than in z/OS V1R11. You might need to increase space in the Infoprint Server Printer Inventory file system.

Element or feature: Infoprint Server.

When change was introduced: z/OS V1R12.

Applies to migration from: z/OS V1R11.

Timing: Before installing z/OS V1R13.

Is the migration action required? Yes.

Target system hardware requirements: None.

Target system software requirements: None.

Other system (coexistence or fallback) requirements: None.

Restrictions: On z/OS V1R11 systems, Infoprint Server cannot read or export the Version 2 Printer Inventory. If you want to use the Version 2 Printer Inventory on z/OS V1R11, use the pidu command to export the Version 2 Printer Inventory while running on z/OS V1R13 and then use the pidu command to import the exported copy to z/OS V1R11.
System impacts: None.

IBM Health Checker for z/OS check: ZOSMIGV1R12_INFOPRINT_INVSIZE available with APAR OA32093.

Steps to take:

1. Do one of these:
   - Run the IBM Health Checker for z/OS check ZOSMIGV1R12_INFOPRINT_INVSIZE.
   - Run the `df` command to display the current utilization of the Printer Inventory file system. Printer Inventory files are located in the Infoprint Server base directory. The default base directory name is `/var/Printsrv`. You might have changed the base directory name in the `base-directory` attribute in the `aopd.conf` configuration file. The `aopd.conf` default location is `/etc/Printsrv/aopd.conf`. However, you might have specified a different location in environment variable AOPCONF.

   The free space required is 200% of the sum of the Version 1 Printer Inventory and historical Printer Inventory files (master.db, jestoken.db, pwjestoken.db, hinv/hinv.db, and logdb/log.db).

   If the “Capacity” is greater than 33%, increase the size of the file system.

   **Example:**
   ```
   df -P /var/Printsrv
   Filesystem 512-blocks Used Available Capacity Mounted on
   OE17A.S1.VAR 64800 54184 10616 84% /DEVE/var
   ```

2. To increase the size of the file system, you can use the z/OS UNIX `zfsadm` grow (zFS) or `confighfs` (HFS) command.

   **Tip:** Set the `aggrfull` (zFS) or `FSFULL` (HFS) file system option so that warning messages are issued if the Infoprint Server base directory (/var/Printsrv) is getting full.

Reference information:

- For information about the `/var/Printsrv` directory and how to use the `pidu` command to export and import the Printer Inventory, see [z/OS Infoprint Server Customization](#).
- For information about how to start and stop Infoprint Server, see [z/OS Infoprint Server Operation and Administration](#).
- For information about managing file systems, see [z/OS UNIX System Services Planning](#).
- For information about the `zfsadm` `grow` command and the `aggrfull` option, see [z/OS Distributed File Service zSeries File System Administration](#).
- For information about the `confighfs` command, see [z/OS UNIX System Services Command Reference](#).

Remove Version 2 Printer Inventory files at fallback to z/OS V1R11

**Description:** In z/OS V1R12, the format of the Infoprint Server Printer Inventory files has changed from Version 1 to Version 2 format. When you migrate from z/OS V1R11 and start Infoprint Server on z/OS V1R13 for the first time, Infoprint Server reformats the Version 1 Printer Inventory files and creates Version 2 Printer Inventory files. Both Version 1 and Version 2 Printer Inventory files exist in the
Infoprint Server base directory. Infoprint Server on z/OS V1R13 uses the Version 2 Printer Inventory files. If you fall back to z/OS V1R11, Infoprint Server uses the Version 1 Printer Inventory files.

If you start Infoprint Server on z/OS V1R13 a second time after falling back to z/OS V1R11, Infoprint Server uses the existing Version 2 Printer Inventory files that it created the first time you started Infoprint Server on z/OS V1R13. It does not reformat the Version 1 Printer Inventory files again.

If you want Infoprint Server to reformat the Version 1 Printer Inventory files again, remove the Version 2 Printer Inventory files before you start Infoprint Server on z/OS V1R13. Because the Version 2 Printer Inventory files no longer exist, Infoprint Server reformats the Version 1 Printer Inventory files and creates a new set of Version 2 Printer Inventory files.

In most cases, you should remove the Version 2 Printer Inventory files if they exist. If you do not remove the Version 2 Printer Inventory files, any changes that the administrator made to the Version 1 Printer Inventory on z/OS V1R11 are not in the Version 2 Printer Inventory.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>Infoprint Server</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R12.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before installing z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>No, but recommended if you want Infoprint Server to reformat the Version 1 Printer Inventory files after a fallback.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>IBM Health Checker for z/OS check:</td>
<td>INFOPRINT_V2DB_CHECK available with APAR OA32093.</td>
</tr>
</tbody>
</table>

Steps to take:
1. Run the IBM Health Checker for z/OS check INFOPRINT_V2DB_CHECK.
2. If Version 2 Printer Inventory files exist after falling back to z/OS V1R11, remove them from the Infoprint Server base directory. Be careful not to remove any Version 2 files while running z/OS V1R13 because Infoprint Server on z/OS V1R13 requires Version 2 Printer Inventory files. Version 2 files have the extension “v2db”. The default base directory is /var/Printsrv.

You might have changed the base directory name in the base-directory attribute in the aopd.conf configuration file. The aopd.conf default location is /etc/Printsrv/aopd.conf. However, you might have specified a different location in environment variable AOPCONF.

Example: These z/OS UNIX commands switch to an effective UID of 0, remove all files with the “v2db” extension from directory /var/Printsrv, and switch back to the original UID:
su
rm -f $(find /var/Printsrv/ -name ".*v2db")
exit

Note: To remove Printer Inventory files, you must have an effective UID of 0 or be a member of the RACF AOPADMIN group.

Reference information: For information about the /var/Printsrv directory, see z/OS Infoprint Server Customization.

Upgrade Java support for IPP Server

Description: In z/OS V1R12, the Internet Printing Protocol (IPP) Server component of Infoprint Server requires Java V6.0. If the JAVA_HOME environment variable specifies the location of an earlier version of Java, you must update the JAVA_HOME environment variable.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>Infoprint Server.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R12.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before installing z/OS V1R13, if APAR OA28720 is applied. Otherwise, after installing z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you use IPP Server and specify the JAVA_HOME environment variable. You are using IPP Server if the start-daemons=(ippd) 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.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>IBM 31-bit SDK for z/OS, Java Technology Edition, V6 (5655-R31)</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>IBM Health Checker for z/OS check:</td>
<td>None.</td>
</tr>
</tbody>
</table>

Steps to take:
2. If you use the IPP Server, edit the aopstart EXEC to update the directory path specified in the JAVA_HOME environment variable. IPP Server requires the 31-bit version of Java V6.0.
3. If you use the z/OS HTTP Server, update the setting of JAVA_HOME in the z/OS HTTP Server environment variables file httpd.envvars.

Note: If you installed Java V6.0 in the default Java directories, you do not need to specify the JAVA_HOME environment variable. If JAVA_HOME is not specified, IPP Server looks for Java files in the /usr/1pp/java/J6.0 directory.
Infoprint Server actions to perform before the first IPL of z/OS V1R13

This topic describes Infoprint Server 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.

Remount the Printer Inventory and copy files that were customized

**Description:** When migrating to z/OS V1R13 Infoprint Server, you must bring forward the customized data from your previous system.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>Infoprint Server.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>General migration action not tied to a specific release.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>None.</td>
</tr>
</tbody>
</table>

**Steps to take:**

- **Printer Inventory:**
  - Remount the /var/Printsrv directory from the z/OS V1R11 or V1R12 system on the z/OS V1R13 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.

**Notes:**

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 V1R13 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 original system and restore it on the z/OS V1R13 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.)

3. Configure the Infoprint Server environment variables (for example, AOPCONF, PATH, LIBPATH, NLSPATH, MANPATH) in /etc/profile.

Reference information: For information about how to edit the aopstart EXEC and the z/OS HTTP Server environment variables file, see [z/OS Infoprint Server Customization](#).
• **Configuration file:** If you modified the Infoprint Server configuration file, copy the file to the z/OS V1R13 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 V1R13 system.

• **IP PrintWay™:** If you currently use the IP PrintWay component of Infoprint Server, copy to the z/OS V1R13 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 V1R13.

• **NetSpool:** If you currently use the NetSpool component of Infoprint Server, copy to the z/OS V1R13 system any NetSpool exit routines you have written. It is a good practice to recompile the exits and filters on z/OS V1R13.

• **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 V1R13 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 V1R13 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 V1R13 system. The default locations of these files are /etc/httpd.conf and /etc/httpd.envvars.

**Reference 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.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>Infoprint Server.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R13.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>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.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Target system hardware requirements:</th>
<th>None.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
</tbody>
</table>
**Other system (coexistence or fallback) requirements:** None.

**Restrictions:** None.

**System impacts:** None.

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

### Steps to take:

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:

- 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](#).

### Upgrade XML for Infoprint Central

**Description:** In z/OS V1R12, the Infoprint Central component of Infoprint Server, which you can use to work with IP PrintWay extended mode print jobs and printers, requires the IBM XML Toolkit for z/OS V1.10 (5655-J51) product.

<table>
<thead>
<tr>
<th>Element or feature</th>
<th>Infoprint Server.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced</td>
<td>z/OS V1R12.</td>
</tr>
<tr>
<td>Applies to migration from</td>
<td>z/OS V1R11.</td>
</tr>
<tr>
<td>Timing</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you use Infoprint Central. You are using Infoprint Central if the <code>start-daemons=ssid</code> attribute is specified in the Infoprint Server configuration file. The file's default location is <code>/etc/Printsrv/aopd.conf</code>. However, you might have specified a different location in environment variable AOPCONF.</td>
</tr>
</tbody>
</table>

**Target system hardware requirements:** None.
Target system software requirements: IBM XML Toolkit for z/OS V1.10 (5655-J51).

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. Install IBM XML Toolkit for z/OS V1.10 (5655-J51).
2. Specify the XML Toolkit for z/OS V1.10 libraries in the LIBPATH environment variable in your z/OS IBM HTTP Server environment variables file (default location is /etc/httpd.envvars). After z/OS V1R13 is installed, Infoprint Central requires the XML Toolkit for z/OS V1.10 libraries:
   - LIBPATH: change /usr/lpp/ixm/IBM/xml4c-5_6/lib to /usr/lpp/ixm/IBM/xml4c-5_7/lib
   - LIBPATH: change /usr/lpp/ixm/IBM/xslt4c-1_10/lib to /usr/lpp/ixm/IBM/xslt4c-1_11/lib
   - ICU_DATA: You can remove this variable because XML no longer uses this variable.
3. Restart the z/OS IBM HTTP Server to pick up the changes to the environment variables file.

Reference information: For information about how to customize Infoprint Central, see [z/OS Infoprint Server 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 SYSPUT 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 V1R13. In future releases, IBM will make enhancements only to IP PrintWay extended mode.

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.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>Infoprint Server.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>Basic mode was stabilized in z/OS V1R5. Extended mode was introduced in z/OS V1R5.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
</tbody>
</table>
Is the migration action required? | No, but recommended because it will become a requirement in a future release.
---|---
Target system hardware requirements: | None.
Target system software requirements: | - If you use Infoprint Central to work with IP PrintWay extended mode print jobs and printers, you need:
  - An operating IBM HTTP Server base element of z/OS
  - The XML Toolkit for z/OS V1.10 (5655-J51)
  - Microsoft Internet Explorer 5.5, Netscape Navigator 7.0, or IBM Home Page Reader 4.0 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:
  - 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](z/OS Infoprint Server Customization) in z/OS Infoprint Server Customization.

Reference information:
- [z/OS Infoprint Server Customization](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.
- [z/OS Infoprint Server Operation and Administration](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 Messages and Diagnosis](z/OS Infoprint Server Messages and Diagnosis) describes how to trace IP PrintWay extended mode.
Infoprint Server actions to perform after the first IPL of z/OS V1R13

This topic describes Infoprint Server 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.

Run aopsetup

**Description:** When migrating to z/OS V1R13 Infoprint Server, you must run the `aopsetup` shell script to establish the correct file permissions for Infoprint Server directories and files.

<table>
<thead>
<tr>
<th>Element or feature</th>
<th>Infoprint Server.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced</td>
<td>General migration action not tied to a specific release.</td>
</tr>
<tr>
<td>Applies to migration from</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing</td>
<td>After the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required</td>
<td>Yes.</td>
</tr>
<tr>
<td>Target system hardware requirements</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check</td>
<td>None.</td>
</tr>
</tbody>
</table>

**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 running `aopsetup` see z/OS Infoprint Server Customization.
Remove Version 1 Printer Inventory files after deploying z/OS V1R13

**Description:** When you migrate from z/OS V1R11 and start Infoprint Server in z/OS V1R13 for the first time, Infoprint Server reformats the Version 1 Printer Inventory files and creates Version 2 Printer Inventory files. The Version 1 Printer Inventory files are not removed so that if you need to fall back to z/OS V1R11, Infoprint Server can use the Version 1 Printer Inventory files.

After you have fully deployed z/OS V1R13 and are sure that you will not need to fall back to z/OS V1R11, you can remove the Version 1 Printer Inventory files to free up space in the Infoprint Server base directory.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>Infoprint Server.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R12.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>After the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>No, but recommended to free up space in the Infoprint Server base directory.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>If you need to fall back to z/OS V1R11 after removing the Version 1 Printer Inventory files, use the <strong>pidu</strong> command to export the Version 2 Printer Inventory on the z/OS V1R13 system and import the exported copy to the z/OS V1R11 system.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>IBM Health Checker for z/OS check:</td>
<td>None.</td>
</tr>
</tbody>
</table>

**Steps to take:**

1. Remove the Printer Inventory Version 1 database files in the Infoprint Server base directory. Version 1 files have a “db” extension. The default base directory is /var/Printsrv.

   You might have changed the base directory name in the **base-directory** attribute in the aopd.conf configuration file. The aopd.conf default location is /etc/Printsrv/aopd.conf. However, you might have specified a different location in environment variable AOPCONF.

   Example: These z/OS UNIX commands switch to an effective UID of 0, remove all files with the “db” extension from directory /var/Printsrv, and switch back to the original UID:

   ```
   su
   rm -f $(find /var/Printsrv/ -name ".*db")
   exit
   ```

   Note: To remove Printer Inventory files, you must have an effective UID of 0 or be a member of the RACF AOPADMIN group.

**Reference information:** For information about the /var/Printsrv directory and how to use the **pidu** command to export and import the Printer Inventory, see [z/OS Infoprint Server Customization](#).
Chapter 12. ISPF migration actions

ISPF actions to perform before installing z/OS V1R13

None.

ISPF actions to perform before the first IPL of z/OS V1R13

This topic describes ISPF 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.

None.

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

This topic describes ISPF 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.

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 and z/OS V1R11

Timing: After the first IPL of z/OS V1R13.

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.
<table>
<thead>
<tr>
<th>Target system software requirements:</th>
<th>None.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>None.</td>
</tr>
</tbody>
</table>

**Steps to take:** Notify users that the referred date for a non-SMS 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](#).
Chapter 13. JES2 migration actions

This topic describes migration actions for base element JES2.

JES2 actions to perform before installing z/OS V1R13

This topic describes JES2 migration actions that you can perform on your current (old) system. You do not need the z/OS V1R13 level of code to make these changes, and the changes do not require the z/OS V1R13 level of code to run once they are made.

Update code to remove references to PDBLENG

Description: Starting with z/OS V1R12, JES2 supports variable size PDDBs, though the PDDBs generated in this release remain a fixed size. Installation exits that examine PDDBs or step through PDDBs using the compile time length of the PDDB need to be updated to use a run time length field. To facilitate locating an exit code that is assuming a fixed PDDB size, the compile time length equate PDBLENG has been deleted. Code that used this compile time length should be updated to use the run time field PDBSIZE to determine the size of the PDDB. The field PDBSIZE has correctly contained the length of the PDDB since z/OS V1R7 (the field existed in earlier releases but was not consistently set).

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>JES2.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R12 JES2.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R11 JES2.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before installing z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if installation exits use PDBLENG equate.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>None.</td>
</tr>
</tbody>
</table>

Steps to take: Before installing z/OS V1R13 JES2, review installation exits for references to the field PDBLENG. If any references are found, the code needs to be updated to use the run time PDDB length field PDBSIZE.
Ensure calls to JES Property Information Services SSI can handle multiple members

Description: In z/OS V1R11 JES2, the Initiator information function of the JES Property Information Services SSI (SSI 82) returned information for the local member only, even if multiple members matched the value that was specified on the member filter. In z/OS V1R12 JES2, if information for multiple members is requested by specifying wildcards on the member filter, the Initiator information function will return information for all members that match the filter request.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>JES2.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R12 JES2.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R11 JES2.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before installing z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you are using the Initiator information function of the JES Property Information Services SSI.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>None</td>
</tr>
</tbody>
</table>

Steps to take: Before installing z/OS V1R13 JES2, ensure that all calls to the Initiator information function of the JES Property Information Services SSI (SSI 82) that request information for multiple members can correctly handle information being returned for multiple members.

Reference information: See z/OS MVS Using the Subsystem Interface for more information.

JES2 actions to perform before the first IPL of z/OS V1R13

None.

JES2 actions to perform after the first IPL of z/OS V1R13

This topic describes JES2 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.

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 functionality 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 the reference links below.

<table>
<thead>
<tr>
<th>Element or feature</th>
<th>JES2</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced</td>
<td>z/OS V1R11 JES2</td>
</tr>
<tr>
<td>Applies to migration from</td>
<td>z/OS V1R11 JES2 and z/OS V1R12 JES2</td>
</tr>
<tr>
<td>Timing</td>
<td>After the first IPL of z/OS V1R13</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>No, but recommended to activate the full-function level of z/OS V1R13 JES2 processing</td>
</tr>
</tbody>
</table>

| Target system hardware requirements: | None |
| Target system software requirements: | None |
| Other system (coexistence or fallback) requirements: | None |
| Restrictions:                      | In order to activate z11 mode, all systems in the JES2 MAS must be at z/OS V1R11 or later. You may 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 IBM Health Checker for z/OS: User's Guide |

Steps to take:

- **After migrating to z/OS V1R11 JES2, or later, on all systems in your MAS, determine your z11 checkpoint activation readiness:**
  1. Use the SD 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 278.
  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 $SACTIVATE 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.

**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 below shows the output of the command:

  \[
  \begin{array}{lll}
  \text{TYPE} & \text{COUNT} & \text{CB COUNT} \\
  \text{INTERNAL} & 11 & 1, \\
  \text{JQE} & 211 & 108, \\
  \text{CAT} & 114 & 38, \\
  \text{WSCQ} & 1 & 1, \\
  \text{DJBQ} & 0 & 0, \\
  \text{JOE} & 0 & 0, \\
  \text{FREE} & 763 & 0 \\
  \end{array}
  \]

  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 below shows the output of the $D ACTIVATE command:

  \[
  \begin{array}{ll}
  \text{JES2 CHECKPOINT MODE IS CURRENTLY Z2} \\
  \text{THE CURRENT CHECKPOINT:} \\
  \text{-- CONTAINS 1100 BERTS AND BERT UTILIZATION IS 30 PERCENT.} \\
  \text{-- CONTAINS 158 4K RECORDS.} \\
  \text{z11 CHECKPOINT MODE ACTIVATION WILL:} \\
  \text{-- EXPAND CHECKPOINT SIZE TO 165 4K RECORDS.} \\
  \text{-- REQUIRE 22 ADDITIONAL BERTS AND UTILIZATION WOULD REACH 32 PERCENT.} \\
  \text{z11 ACTIVATION WILL SUCCEED IF ISSUED FROM THIS MEMBER.} \\
  \end{array}
  \]

  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:

\[
\begin{array}{ll}
\text{$HASP895 z11 ACTIVATION WILL FAIL IF ISSUED FROM THIS MEMBER.} \\
\text{$HASP895 THE FOLLOWING ISSUES PREVENT ACTIVATION:} \\
\text{$HASP895 -- LARGEDS SUPPORT MUST BE ACTIVATED.} \\
\end{array}
\]
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
```

Reference 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](#).
Chapter 14. JES3 migration actions

This topic describes migration actions for optional feature JES3.

JES3 actions to perform before installing z/OS V1R13

Modify code that depends on the format of suppressed split messages in the DLOG

Modify code that uses DATLOREC and DATINPTR (IATYDAT) as a programming interface

Update automation that handles message IAT3100

This topic describes JES3 migration actions that you can perform on your current (old) system. You do not need the z/OS V1R13 level of code to make these changes, and the changes do not require the z/OS V1R13 level of code to run once they are made.

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. Prior to 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 1144003 &SY1 R= XXX33913 +XXX100I 901234567890123456789012345678901234567890123456789012345678901234567890123456789012345
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 1000490 &SY1 R= XXX33913 +XXX100I 9012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345
10305 1000492 SY1 R= XXX33913 IEF404I XXX33913 - ENDED - TIME=10.00.49
```

Element or feature: JES3.

When change was introduced: z/OS V1R13 JES3.

Applies to migration from: z/OS V1R12 JES3 or z/OS V1R11 JES3.

Timing: Before installing z/OS V1R13.

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.
**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](#).

---

### JES3 actions to perform before the first IPL of z/OS V1R13

This topic describes JES3 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.

#### Avoid redundant *S main,FLUSH command in response to XCF messages

**Description:** Before 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.

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 JES3 or z/OS V1R11 JES3.

**Timing:** Before the first IPL of z/OS V1R13.

**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.
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 or z/OS V1R11 JES3 without the PTF for APAR OA34642 applied.

Timing: Before the first IPL of z/OS V1R13.

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 Guide.
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 V1R11 and 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.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>JES3.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R13 JES3.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 JES3 or z/OS V1R11 JES3.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you have automation routines that examine the message text instead of the message number.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>None.</td>
</tr>
</tbody>
</table>

**Steps to take:** Change your automation routines to account for the additional space.

**Reference information:** For more information, see [z/OS JES3 Messages](#).

**JES3 actions to perform after the first IPL of z/OS V1R13**

None.
Chapter 15. Language Environment migration actions

Language Environment actions to perform before installing z/OS V1R13

None.

Language Environment actions to perform before the first IPL of z/OS V1R13

This topic describes Language Environment 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.

Determine the impact of added and changed runtime options

Description: Periodically, Language Environment introduces new runtime options, adds new suboptions to existing runtime options, and changes the defaults of runtime options. For z/OS V1R12 and z/OS V1R13, no runtime options were changed or new suboptions added. Therefore, no migration action is required for your migration to z/OS V1R13.

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 may be used for systems at lower releases that can co-exist with this level of z/OS.

<table>
<thead>
<tr>
<th>Element or feature</th>
<th>Language Environment.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced</td>
<td>General migration action not tied to a specific release.</td>
</tr>
<tr>
<td>Applies to migration from</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes.</td>
</tr>
<tr>
<td>Target system hardware requirements</td>
<td>None.</td>
</tr>
</tbody>
</table>
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 V3.1 or later releases) 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 Run-Time 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 V1R12 and z/OS V1R11.

Timing: Before the first IPL of z/OS V1R13.

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 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 IEALPA*Ann 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

**Convert to CEEPRMxx to set system-level default runtime options**

**Description:** In the IBM z/OS V1.12 Software Announcement 210-235 dated 22 July 2010, IBM announced plans to remove, in a future release, the capability to change the default Language Environment runtime options settings using SMP/E installable USERMODs. If you are still using assembler modules to specify your
installation-wide default runtime options (CEEDOPT, CEEOPT, or CELQDOPT), IBM recommends that you convert to using the CEEPRMxx parmlib member to set your system-level default Language Environment runtime options. z/OS V1R13 is planned to be 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 V1R13. (Previewed in IBM z/OS V1.12 Software Announcement 210-235, 22 July 2010.)
Applies to migration from: z/OS V1R12 and z/OS V1R11.
Timing: Before the first IPL of z/OS V1R13.
Is the migration action required? No, but recommended because even though the runtime option usermods continue to be supported in this release, IBM plans to remove this functionality in a future release of z/OS.
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:
• If you are no longer using the Language Environment runtime option assembler usermods, you have no further action.
• If you are using the Language Environment runtime option assembler usermods, you should now convert to CEEPRMxx. Taking this step now will eliminate a migration action in a future release.

Reference information: For details about specifying CEEPRMxx, see z/OS Language Environment Customization.

Examine programs that read output when a D CEE command is issued

Description: Starting in z/OS V1R12, changes are made to the Language Environment runtime options report when a D CEE command is issued. Before z/OS V1R12, the Language Environment runtime options report displayed all suboptions, even if they were not explicitly set for any runtime option that was specified. Starting in z/OS V1R12, when a valid option is specified with a parmlib member or a SETCEE command, only the suboptions specified are displayed when a D CEE command is issued. A comma is displayed as a place holder for those suboptions not specified.

Element or feature: Language Environment.
When change was introduced: z/OS V1R12.
Applies to migration from: z/OS V1R11.

Timing: Before the first IPL of z/OS V1R13.

Is the migration action required? Yes, if you have an application that reads the output of a D CEE 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:

Examine any programs that read the output of a D CEE command to ensure compatibility with the updated runtime options report. Commas are now displayed for any suboptions that are not explicitly specified in a parmlib member or with a SETCEE command.

For example, if the following SETCEE command is issued:

```
SETCEE CEEDOPT,ALL31,ANYHEAP(4K),FILETAG(,AUTOTAG)
```

A subsequent D CEE,CEEDOPT command displays the following:

```
CEE3745I 09.32.13 DISPLAY CEEDOPT
NO MEMBERS SPECIFIED
LAST WHERE SET OPTION

-----------------------------------------------
SETCEE command ALL31()
SETCEE command ANYHEAP(4096,)
FILETAG(,AUTOTAG)
```

Reference information: For more information, see [z/OS Language Environment Customization](#) and [z/OS MVS System Commands](#).

Set runtime options as overrideable or nonoverrideable in CEEPRMxx parmlib member

Description: Before z/OS V1R12, all runtime options specified in a CEEPRMxx parmlib member were overrideable by default. Beginning with z/OS V1R12, you can set runtime options as overrideable or nonoverrideable in the CEEPRMxx parmlib member or with a SETCEE command using the OVR or NONOVR attribute. The ability to specify an option as overrideable or nonoverrideable removes a barrier to using CEEPRMxx.

Element or feature: Language Environment.

When change was introduced: z/OS V1R12.

Applies to migration from: z/OS V1R11.

Timing: Before the first IPL of z/OS V1R13.
Is the migration action required?  No, but recommended so you can eliminate use of the assembler language usermods to specify installation-wide runtime options, and use parmlib member CEEPRMxx instead.

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 verify use of the CEEPRMxx parmlib member.

Steps to take: Set runtime options as overrideable or nonoverrideable in the CEEPRMxx parmlib member or by issuing the SETCEE command using the OVR or NONOVR attribute.

Now that runtime options can be specified as overrideable or nonoverrideable in a CEEPRMxx parmlib member, and with a SETCEE command, you can eliminate the use of assembler language usermods to specify installation-wide runtime options.

Reference information:
- For details about specifying a CEEPRMxx parmlib member, see z/OS Language Environment Customization.
- For the updated CEEPRM00 sample parmlib member, which includes every option specified as overrideable, see the CEE.SCEESAMP data set.

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

This topic describes Language Environment 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.

Examine programs that read output from a CICS CLER transaction

Description: Starting with z/OS V1R12, the Language Environment runtime options report displayed from the CICS CLER transaction is changed. The report is modified to have a wider LAST WHERE SET column to accommodate longer values, such as "Installation Non-overrideable." In addition, the report heading OPTIONS is changed to OPTION to match the other runtime options reports.

Element or feature: Language Environment.
When change was introduced: z/OS V1R12.
Applies to migration from: z/OS V1R11.
Timing: After the first IPL of z/OS V1R13.
Is the migration action required? Yes, if you have an application that reads the output of a CICS CLER transaction.
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 programs that read the output of a CICS CLER transaction to ensure compatibility with the updated CLER runtime options report. The LAST WHERE SET column is now wider and the OPTIONS heading is changed to OPTION. The following is a subset of the new report to show the formatting changes:

<table>
<thead>
<tr>
<th>LAST WHERE SET</th>
<th>OPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installation default</td>
<td>ABPERC(NONE)</td>
</tr>
<tr>
<td>Installation default</td>
<td>ABTERMENC(ABEND)</td>
</tr>
<tr>
<td>Installation default</td>
<td>NOAIXBLD</td>
</tr>
</tbody>
</table>

Reference information: For more information, see [z/OS Language Environment Programming Guide](#) and [z/OS Language Environment Debugging Guide](#).

### Use Unicode Services to create conversion tables

**Description:** Beginning with z/OS V1R12, the C/C++ runtime library will no longer include any ucmap source code or genxlt source code for character conversions now being performed by Unicode Services.

<table>
<thead>
<tr>
<th>Element or feature</th>
<th>Language Environment.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R12.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>After the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you use the icnv() family of functions to test to a &quot;known conversion result&quot;and experience testcase failures. Also, if you use custom conversion tables replacing those listed in either ucmapt.lst or genxlt.lst.</td>
</tr>
</tbody>
</table>

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 customized conversion tables, you should now generate custom Unicode Services conversion tables.
• If you use the iconv() family of functions testing to a “known conversion result” and experience test case failures, you need to update your expected results to the new conversion results.

• If you want to create custom conversion tables involving any of the CCSIDs related to the conversion table source no longer being shipped, you should now generate custom Unicode Services conversion tables instead of custom Language Environment conversion tables.

The installation prefix.SCEEUMAP data set will no longer be shipped.

The /usr/lib/nls/locale/ucmap HFS directory will no longer be shipped.

**Note:** The _ICONV_TECHNIQUE environment variable must be set to the same technique search order value used for the customized Unicode Services table in order for the iconv() family of functions to use the customized Unicode Services table. For example, if you want the iconv() family of functions to use a user-defined Unicode Services table with a technique search order of 2, the _ICONV_TECHNIQUE environment variable should be set to 2LMREC.

**Reference information:** For information about how to generate and use custom Unicode Services conversion tables, see [z/OS Unicode Services User’s Guide and Reference](https://www.ibm.com).
Chapter 16. Library Server migration actions

Library Server actions to perform before installing z/OS V1R13

None.

Library Server actions to perform before the first IPL of z/OS V1R13

This topic describes Library Server 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.

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 MVS data sets and the names of the HFS directories that Library Server reads and writes during execution. The information in booksrv.80 includes the HFS directory names of book collections, shelves, and bookcases. 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.)

<table>
<thead>
<tr>
<th>Element or feature</th>
<th>Library Server.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced</td>
<td>General migration action not tied to a specific release.</td>
</tr>
<tr>
<td>Applies to migration from</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you intend to preserve your Library Server configuration.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>None.</td>
</tr>
</tbody>
</table>
**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.

<table>
<thead>
<tr>
<th>Element or feature</th>
<th>Library Server.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced</td>
<td>General migration action not tied to a specific release.</td>
</tr>
<tr>
<td>Applies to migration from</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you intend to preserve notes from release to release.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>None.</td>
</tr>
</tbody>
</table>

**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 V1R13

None.
Chapter 17. RMF migration actions

RMF actions to perform before installing z/OS V1R13

None.

RMF actions to perform before the first IPL of z/OS V1R13

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.

Check your automation for Monitor III messages ERB812I and ERB813I

Description: Starting with z/OS V1R13, RMF Monitor III messages ERB812I (introduced in z/OS V1R11) 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.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>RMF.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R13.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you use automation products for RMF messages ERB812I and ERB813I.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>None.</td>
</tr>
</tbody>
</table>
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. Message ERB812I was introduced in z/OS V1R11.

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:
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'

New output 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 V1R13

This topic describes RMF 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.

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 V1R11, 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.

<table>
<thead>
<tr>
<th>Element or feature</th>
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</thead>
<tbody>
<tr>
<td>When change was introduced</td>
<td>General migration action not tied to a specific release.</td>
</tr>
<tr>
<td>Applies to migration from</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing</td>
<td>After the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you had planned to use an earlier-level RMF reporter on data that was collected with a later-level RMF gatherer.</td>
</tr>
<tr>
<td>Target system hardware requirements</td>
<td>None.</td>
</tr>
</tbody>
</table>
Target system software requirements: None.

Other system (coexistence or fallback) requirements: See “Steps to take” below.

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 the z/OS RMF User’s Guide.

---

**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.

<table>
<thead>
<tr>
<th>Element or feature</th>
<th>RMF</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced</td>
<td>z/OS V1R13</td>
</tr>
<tr>
<td>Applies to migration from</td>
<td>z/OS V1R12 and z/OS V1R11</td>
</tr>
<tr>
<td>Timing</td>
<td>After the first IPL of z/OS V1R13</td>
</tr>
<tr>
<td><strong>Is the migration action required?</strong></td>
<td>No, but recommended if you do not want to collect SMF data for the Postprocessor Serialization Delay report</td>
</tr>
</tbody>
</table>

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 72.5 for started tasks like RMF.

Reference information: For details about specifying SMF data collection, see [z/OS MVS Initialization and Tuning Reference](#).

## Retrieve the distribution of the IN-READY QUEUE

**Description:** Before z/OS V1R12, the Postprocessor CPU Activity report provided a graphical representation of how many address spaces have been waiting in the IN-READY QUEUE. Starting with z/OS V1R12, the DISTRIBUTION OF IN-READY QUEUE is replaced by a more precise DISTRIBUTION OF WORK UNIT QUEUE representation.

You can retrieve the old IN-READY QUEUE distribution values using the corresponding Overview control statements and display a numerical representation in the Postprocessor Overview report or a graphical representation in the Spreadsheet Reporter.

<table>
<thead>
<tr>
<th>Element or feature:</th>
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</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R12.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>After the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you want to retrieve the old IN-READY QUEUE information as presented in the CPU Activity reports earlier than z/OS V1R12.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
</tbody>
</table>

**Steps to take:** Use the available OCPU1, OCPU2, ... OCPU80 Overview control statements to retrieve the information presented in the DISTRIBUTION OF IN-READY QUEUE of the CPU Activity reports earlier than z/OS V1R12. With these statements, you can produce either a numerical representation in the Postprocessor Overview report or you can use the RMF Spreadsheet Reporter to see a graphical representation: Select the *System Overview Report* spreadsheet macro and click on the *OneCpuCont* sheet to see the graphical output.

Reference information: For details about using Overview conditions for the Overview Report and the Spreadsheet Reporter, see [z/OS RMF User’s Guide](#).
Chapter 18. SDSF migration actions

SDSF actions to perform before installing z/OS V1R13

None.

SDSF actions to perform before the first IPL of z/OS V1R13

This topic describes SDSF 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.

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 V1R13 level of the SDSF macro library.

<table>
<thead>
<tr>
<th>Element or feature:</th>
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</tr>
</thead>
<tbody>
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</tr>
<tr>
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</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if user exit routines are in use.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>None.</td>
</tr>
</tbody>
</table>
**Steps to take:** Review user exit routines to ensure they are appropriate for z/OS V1R13. Make changes as necessary. Regardless of whether you have made changes, reassemble the user exit routines with the z/OS V1R13 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](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.

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</tr>
<tr>
<td>Timing:</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>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.)</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
</tbody>
</table>
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(HZSADDCHECK) 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 V1R13. 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:** Sample job ISFPARME has been removed from the samples supplied with SDSF. This job contained SMP/E control statements to receive the sample assembler macro ISFPARMS as a user modification (usermod). 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 SDSF JES2 feature FMID (JJE778S) and not the base SDSF FMID (HQX7780). The correct SMP/E syntax is ++VER(Z038) FMID(JJE778S), not ++VER(Z038) FMID(HQX7780).

**Reference 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 ISFPRMxxx parmlib member, see “ISFPARMS format alternatives” in z/OS SDSF Operation and Customization.

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

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.

#### 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.

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.

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.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>SDSF.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R13.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
</tbody>
</table>
Timing: After the first IPL of z/OS V1R13.

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 level, and others at a lower level, and you want to include the lower 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 ISFPARMxx parmlib member.

Reference information:

• For more information about the SET CMODE command, refer to the online help. For more information about ISFPARMxx, 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, SA22-7670.

• For information about ISFPARMS and the ISFPARMxx parmlib member, see “ISFPARMS format alternatives” in z/OS SDSF Operation and Customization.

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 and z/OS V1R11.

Timing: After the first IPL of z/OS V1R13.

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 and z/OS V1R11.
Timing: After the first IPL of z/OS V1R13.
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.
Set a default for the Initiators panel

**Description:** Starting with z/OS V1R12, SDSF shows WLM-managed initiators as well as JES-managed initiators on the Initiators (INIT) panel. This may result in a significantly greater number of rows than were previously shown. New parameters, JES | WLM | ALL (ALL is the default), on the INIT command allow users to specify which initiators should be displayed. However, system programmers might want to set a custom property so that only JES-managed initiators are shown by default.

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R12.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>After the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you have WLM-managed initiators but want only JES-managed initiators to be displayed on the INIT panel, by default, as in previous releases.</td>
</tr>
</tbody>
</table>

**Steps to take:** To set JES-managed initiators as the default for the INIT panel, set custom property Command.INIT.DefaultJESManage to TRUE in ISFPRMxx.

**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, SA22-7670.

Set the format of device names on the Printers panel

**Description:** Starting with z/OS V1R12, SDSF shows device names on the Printers (PR) panel 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.

<table>
<thead>
<tr>
<th>Element or feature:</th>
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</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R12.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>After the first IPL of z/OS V1R13.</td>
</tr>
</tbody>
</table>

**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.
Is the migration action required? Yes, if you want device names on the PR panel 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:** To use the short form of device names on the PR panel, set custom property Panel.PR.DevNameAlwaysShort to TRUE in ISFPRMxx.

**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](#).

**Update batch programs or REXX execs for changes to message ISF770W**

**Description:** Starting with z/OS V1R12, the text of message ISF770W has changed. This might affect batch programs or REXX execs that depend on the message text. The message is issued when the number of requests (system commands) exceeds a limit set by a REXX special variable.

The text of the message changed from:

SYSTEM COMMAND LIMIT limit FROM VARIABLE name REACHED.
to
REQUEST LIMIT limit FROM VARIABLE name REACHED.

**Element or feature:** SDSF
**When change was introduced:** z/OS V1R12.
**Applies to migration from:** z/OS V1R11.
**Timing:** After the first IPL of z/OS V1R13.
**Is the migration action required?** Yes, if you have batch programs or REXX execs that depend on the text of message ISF770W.

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 batch programs or REXX execs for dependence on the text of message ISF770W, and make changes as necessary.

**Reference information:** For details about SDSF’s batch and REXX support, see [z/OS SDSF Operation and Customization](#).

### Set the view of the OPERLOG

**Description:** Starting with z/OS V1R12, SDSF sets the view to include only active log data when displaying the OPERLOG. Before z/OS V1R12, SDSF included both active and inactive log data. Inactive log data is data for which there has been a delete request but which is still in the log stream. If you have SDSF batch programs or local procedures that depend on the presence of inactive log data on SDSF’s OPERLOG panel, you might need to update them.

<table>
<thead>
<tr>
<th>Element or feature</th>
<th>SDSF.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R12.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>After the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you have batch programs or local procedures that depend on the presence of inactive log data on SDSF’s OPERLOG panel.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>None.</td>
</tr>
</tbody>
</table>

**Steps to take:** Review batch programs or local procedures for a dependence on the presence of inactive log data on the OPERLOG panel, and make changes as necessary. Alternatively, you can use the PROPLIST and PROPERTY statements in ISFPRMxx to set custom property Log.Operlog.ViewAll to TRUE, to cause the OPERLOG panel to continue to include inactive log data.

**Reference information:** For information about the OPERLOG panel, see SDSF’s online help. For details about SDSF’s batch support and custom properties in ISFPRMxx, see [z/OS SDSF Operation and Customization](#). For details about active and inactive log data, see [z/OS MVS Programming: Assembler Services Guide](#).
Chapter 19. Security Server migration actions

Security Server actions to perform before installing z/OS V1R13

- Normalize user names specified as X.500 distinguished names in distributed identity filters

Steps to take:

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

- Update database templates
- Normalize user names specified as X.500 distinguished names in distributed identity filters
- Use new RACDCERT GENCERT and REKEY defaults for digital certificates

This topic describes migration actions for optional feature Security Server.

Security Server actions to perform before installing z/OS V1R13

This topic describes Security Server migration actions that you can perform on your current (old) system. You do not need the z/OS V1R13 level of code to make these changes, and the changes do not require the z/OS V1R13 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.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>Security Server.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R13, and rolled back to z/OS V1R12 and z/OS V1R11 by APARs OA34259 and OA34258.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11 without the PTFs for APARs OA34259 and OA34258 applied.</td>
</tr>
</tbody>
</table>
Timing:

- Before installing z/OS V1R13 for determining if your installation has already defined any distributed identity filters. Go to “Before installing z/OS V1R13” in this migration action.
- Before the first IPL of z/OS V1R13 for customizing and executing the sample REXX exec IRR34258. Go to “Before the first IPL of z/OS V1R13” on page 311 in this migration action.
- After the first IPL of z/OS V1R13 for redefining a filter for an X.500 user identity. Go to “After the first IPL of z/OS V1R13” on page 311 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 V1R12 or z/OS V1R11 system without the normalization function provided with APARs OA34259 and OA34258.

Target system hardware requirements: None.
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 or z/OS V1R11 system without the normalization function provided with APARs OA34259 and OA34258, the filter might not function properly in z/OS V1R13.

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

Steps to take:

Before installing z/OS V1R13: The following steps can be performed by the RACF security administrator or a RACF user with the SPECIAL attribute.

1. Determine whether your installation has already defined any distributed identity filters. To do this, issue the following RACF command to search for profiles in the IDIDMAP class. For details about the SEARCH command, see z/OS Security Server RACF Command Language Reference.

   SEARCH CLASS(IDIDMAP)

   If there are no profiles in the IDIDMAP class, your installation is unaffected by this change. Skip to step 2. 

2. If you find profiles in the IDIDMAP class, discontinue defining distributed identity filters until after the first IPL of z/OS V1R13.

3. Execute the RACF database unload utility (IRRDBU00) to create a sequential file from a RACF database. For details about running IRRDBU00, see z/OS Security Server RACF Security Administrator’s Guide.
Save the output dataset. You will use it for the steps in "Before the first IPL of z/OS V1R13."

4. Determine whether the RACGLIST function is in effect for the IDIDMAP class. To do this, issue the following command and review the output listing for the status of the RACGLIST function.
   
   ```
   SETROPTS LIST
   ```
   
   If RACGLIST is not active, skip to step 7.

5. If RACGLIST is active, issue the following command:
   
   ```
   SEARCH CLASS(RACGLIST)
   ```
   
   Review the output for RACGLIST profile names prefixed by the class name IDIDMAP, such as the following:
   
   ```
   IDIDMAP
   IDIDMAP_00001
   IDIDMAP_00002
   ...
   IDIDMAP_0000n
   ```
   
   If you find no RACGLIST profiles like these, skip to step 7.

6. If you find RACGLIST profiles names prefixed by the class name IDIDMAP, disable the RACGLIST function of the IDIDMAP class. To do this, issue the following RACF command:
   
   ```
   RDELETE RACLIST IDIDMAP
   ```
   
   You can re-enable the RACLIST function in the steps in "After the first IPL of z/OS V1R13."

7. Notify the programmer to install z/OS V1R13.

**Before the first IPL of z/OS V1R13:** Perform the following steps only after you complete the steps in "Before installing z/OS V1R13" on page 310

1. Customize the sample REXX exec IRR34258 (shipped in the IRR34258 member of SYS1.SAMPLIB) by specifying the name of the input data set and the name and size of the output data set.

   The IRR34258 program reads the IRRDBU00 output data set (created in the steps in "Before installing z/OS V1R13" on page 310) and locates any IDIDMAP profiles that are affected by this change.

2. Execute IRR34258 and review the output for the list of affected IDIDMAP profiles.

3. Plan to complete the following actions after the first IPL of z/OS V1R13.
   
   - If the output of IRR34258 identifies any affected IDIDMAP profiles, plan to redefine the filters associated with each one.
     
     The IRR34258 output lists the USERDIDFILTER user name, REGISTRY name, RACF user ID, and label associated with each filter to be redefined.
   
   - Ensure that no CICS, DB2, WebSphere DataPower, or other application that exploits the z/OS identity propagation APIs is restarted after the first IPL of z/OS V1R13 until all the steps required for this change are completed.

4. Proceed to IPL z/OS V1R13 for the first time.

**After the first IPL of z/OS V1R13:** Perform the following steps only after you complete the steps in "Before the first IPL of z/OS V1R13."

1. Ensure that no CICS, DB2, WebSphere DataPower, or other application that exploits the z/OS identity propagation APIs is restarted after the first IPL of z/OS V1R13 until these steps are completed.
2. If the output from the sample REXX exec IRR34258 identified any affected IDIDMAP profiles, use the RACF RACMAP command to define a new distributed identity filter for each affected IDIDMAP profile.

When you define a new filter:

- Be sure to issue the RACMAP command from the V1R13 system, or from a V1R11 or V1R12 system with the PTFs for APARs OA34258 and OA34259 applied.
- Follow the steps in “Defining a filter for an X.500 user identity” in \textit{z/OS Security Server RACF Security Administrator’s Guide}.
- Use the same USERDIDFILTER user name, REGISTRY name, and RACF user ID that was associated with the old filter, as listed in the IRR34258 output.
- Do not use the label name that was associated with the old filter. You must specify a new label name.

3. Install z/OS V1R13, or the PTFs for APARs OA34258 and OA34259, on each member system in the sysplex using a rolling IPL (one system at a time).

4. Delete the affected IDIDMAP profiles that were identified in the output of the IRR34258 program. To delete the profiles, issue the RACMAP DELMAP command specifying the label names listed in the IRR34258 output.

5. If you disabled the RACGLIST function for the IDIDMAP class in step 6 on page 311 in “Before installing z/OS V1R13” on page 310, enable it again by issuing the following RACF command:

\texttt{RDEFINE RACGLIST IDIDMAP}

6. Restart any CICS, DB2, WebSphere DataPower, or other application that exploits the z/OS identity propagation APIs, as needed.

Reference information:

- Documentation in the PTFs for APARs OA34258 and 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 \textit{z/OS Security Server RACF Security Administrator’s Guide}.
- For details about the normalization rules, see the USERDIDFILTER operand of the RACMAP command in \textit{z/OS Security Server RACF Command Language Reference}.

\section*{Security Server actions to perform before the first IPL of z/OS V1R13}

This topic describes Security Server 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.

\section*{Check for duplicate class names}

\textbf{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 \textit{z/OS Summary of Message and Interface Changes}.

<table>
<thead>
<tr>
<th>Element or feature</th>
<th>Security Server.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced</td>
<td>General migration action not tied to a specific release.</td>
</tr>
<tr>
<td>Applies to migration from</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
</tbody>
</table>
Timing: Before the first IPL of z/OS V1R13.
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](#).

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 309.

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

This topic describes Security Server 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.

Update database templates

Description: To ensure that the RACF utilities function properly, use the IRRMIN00 utility to update the primary and backup 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 V1R12 and z/OS V1R11.
Timing: After the first IPL of z/OS V1R13.
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 IRR025 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:
- 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 309.

Use new RACDCERT GENCERT and REKEY defaults for digital certificates

Description: Before z/OS V1R12, when RACDCERT GENCERT was issued, the hashing algorithm signed the certificate by an RSA key and was always SHA1. Starting in z/OS V1R12, the hashing algorithm relies on the size of the RSA signing key.

Also, before z/OS V1R12, when RACDCERT REKEY was issued, the default key type was always software key, if ICSF or PCICC was not specified, and the default key size was always 1024 bits if SIZE was not specified. Starting in z/OS V1R12, instead of using these hard coded values, the key type and the key size of the original certificate, which REKEY is based on, is used.

Element or feature: Security Server.

When change was introduced: z/OS V1R12.

Applies to migration from: z/OS V1R11.

Timing: After the first IPL.

Is the migration action required? Yes, if RACDCERT GENCERT or REKEY command is issued.

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 issuing RACDCERT GENCERT, be aware the default hashing algorithm in signing is changed.

• The hashing algorithm now relies on the size of the RSA signing key. If key size is:
  – less than 2048 bits, SHA1 is used
  – greater than or equal to 2048 bits, SHA256 is used

Also, if you need a SHA1 hashing algorithm, use a RSA signing key less than 2048 bits.

If issuing RACDCERT REKEY, be aware the defaults for key size and key type are changed.

• The key type and the key size of the original certificate, which REKEY is based on, are now used.

• You can no longer REKEY to a software key, if the original key is a hardware key.

  If you must downgrade a hardware key to a software key, use GENCERT and specify the same certificate information as in the original certificate in the input but without specifying ICSF or PCICC. ICSF or PCICC are the keywords in the GENCERT command for hardware key.

Note: RACDCERT REKEY cannot be used to create a software key if the original key is a hardware key.

Reference information: See the z/OS Security Server RACF Command Language Reference for more information about the RACDCERT GENCERT and REKEY commands.
Chapter 20. SMP/E migration actions

SMP/E actions to perform after installing SMP/E V3R6 (z/OS V1R13 SMP/E) but before starting to use it ........................................... 317

Authorize use of SMP/E commands and services ..................................... 317

This topic describes migration actions for base element SMP/E.

Note: SMP/E is a driving system element and, as such, is fully usable from your driving system by accessing the installed SMP/E target libraries before an IPL. For this reason, SMP/E migration actions are presented in two categories rather than the three categories normally used for migration information. The two categories are:

• SMP/E actions to perform after installing SMP/E V3R6 (z/OS V1R13 SMP/E) but before starting to use it.
• SMP/E actions to perform after starting to use SMP/E V3R6 (z/OS V1R13 SMP/E).

SMP/E actions to perform after installing SMP/E V3R6 (z/OS V1R13 SMP/E) but before starting to use it

This topic describes SMP/E migration actions that you can perform after installing SMP/E V3R6 (which is in V1R13), but before you start to use it.

Authorize use of SMP/E commands and services

Description: Beginning with SMP/E V3R5 (which is in z/OS V1R10, z/OS V1R11, and z/OS V1R12), with the PTF for APAR IO11698 applied, System Authorization Facility (SAF) checks are added to SMP/E. With this change, only users who have sufficient access authority are able to invoke SMP/E functions, including all SMP/E commands (for example, RECEIVE, APPLY, LIST), the GIMZIP and GIMUNZIP service routines, and the GIMIAP copy utility invocation program.

To ensure current users have the access authority to invoke SMP/E functions, you must define appropriate SAF facility class profiles in the active security manager and specify all user IDs that need to use SMP/E functions in the access lists of these profiles. These functions include:

• All SMP/E commands processed by program GIMSMP. For example, SET, RECEIVE, APPLY, ACCEPT, UCLIN, LIST, REPORT, and so on.
• The GIMZIP and GIMUNZIP service routines, used for packaging and file extraction.
• The GIMIAP copy utility invocation program used in jobs created by the SMP/E GENERATE command.

Element or feature: SMP/E.

When change was introduced: SMP/E V3R5 (z/OS V1R10, z/OS V1R11, and z/OS V1R12) with APAR IO11698.

Applies to migration from: SMP/E V3R5 (which is in z/OS V1R10, z/OS V1R11, and z/OS V1R12), without the PTF for APAR IO11698 applied.
Timing: Before starting to use SMP/E V3R6 (which is in z/OS V1R13).

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: Authorize use of SMP/E commands and services before you apply the PTF for APAR IO11698. For further information see:

- Authorizing use of SMP/E commands and services in SMP/E User’s Guide
- INFO APAR II14489.
- APAR IO12263

Reference information: For details about authorizing use of SMP/E commands and services, see SMP/E Messages, Codes, and Diagnosis and SMP/E User’s Guide

SMP/E actions to perform after starting to use SMP/E V3R6 (z/OS V1R13 SMP/E)

None.
Chapter 21. TSO/E migration actions

This topic describes migration actions for base element Time Sharing Option/Extensions (TSO/E).

TSO/E actions to perform before installing z/OS V1R13

This topic describes TSO/E migration actions that you can perform on your current (old) system. You do not need the z/OS V1R13 level of code to make these changes, and the changes do not require the z/OS V1R13 level of code to run once they are made.

None.

Do not rely on TSO/E to check the syntax of passwords

Description: Starting with z/OS V1R12, TSO/E LOGON will no longer check syntax of eight character or less passwords before passing them on to the security product for verification. Prior to this change, TSO/E would only allow alphanumeric or national characters (a-z, A-Z, 0-9, @, #, $) to be entered in an eight character or less new or existing password on the TSO/E LOGON panel. If any other characters were entered, an error message would be displayed and the user would be prompted again:

IKJ56464I
You have entered unacceptable characters in the highlighted field(s)

IKJ56465I
Press PF1 or PF13 for help

With this change, TSO/E will no longer limit the characters that can be entered for a new or existing password on the TSO/E LOGON panel. If the security product limits the acceptable characters, then a user will see the following error messages, instead:

IKJ56414I
NEW-PASSWORD IS INVALID FOR RACF

IKJ56429A
REENTER -

Or, alternatively:

IKJ56421I
PASSWORD NOT AUTHORIZED FOR USERID

IKJ56429A
REENTER -
Only the TSO/E LOGON panel is affected by this change. Line mode LOGON will still restrict user passwords to alphanumerical or national characters (a-z, A-Z, 0-9, @, #, $) to be entered in an eight character or less. Other applications such as JCL might still fail certain special characters entered in eight character passwords. In addition, the unrelated MIXEDCASE setting for passwords in RACF will still control whether or not lowercase letters are converted to uppercase during LOGON using the TSO/E LOGON panel. Similarly, password phrases with nine characters or more entered during TSO/E LOGON are not affected by this change.

<table>
<thead>
<tr>
<th>Element or feature</th>
<th>TSO/E</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced</td>
<td>z/OS V1R11 with PTF for APAR OA29028 applied.</td>
</tr>
<tr>
<td>Applies to migration from</td>
<td>z/OS V1R11 without PTF for APAR OA29028 applied.</td>
</tr>
<tr>
<td>Timing</td>
<td>Before installing z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>No, but recommended to avoid problems, for example, if a user or application is relying on the existing behavior of the LOGON panel.</td>
</tr>
<tr>
<td>Target system hardware requirements</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts</td>
<td>None.</td>
</tr>
</tbody>
</table>

Steps to take:

- In a sysplex with multiple levels of z/OS or multiple security products, check if there is a compatibility mode that can be used to ensure the security products enforce the password syntax rules uniformly between the different systems.
- Note that systems prior to z/OS V1R12 will continue to enforce the previous syntax rules unless the PTF for APAR OA29028 is applied.
- Update automation or software that relies on message IKJ56464I to indicate that invalid characters were entered for a new or existing password.

Reference information: For additional information about controlling user logons, see z/OS TSO/E Customization.

**TSO/E actions to perform before the first IPL of z/OS V1R13**

This topic describes TSO/E 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.

None.

**TSO/E actions to perform after the first IPL of z/OS V1R13**

This topic describes TSO/E 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.
Specify the SMSINFO keyword on LISTDSI to retrieve detailed PDSE information

**Description:** APAR OA35217 updated the LISTDSI function for REXX and the LISTDSI statement for CLIST to avoid updating the last referenced date for PDSE data sets unless the SMSINFO keyword is specified. However, the detailed information provided in the SYSDSSMS variable to describe whether a PDSE is a LIBRARY, DATA_LIBRARY, or PROGRAM_LIBRARY can only be retrieved by opening the data set and updating the last referenced date. This information was being retrieved unconditionally for PDSEs, which caused the last referenced date to be updated whenever LISTDSI was used to check a PDSE. With this change, the information will only be retrieved, and the last referenced date will only be updated if the SMSINFO keyword is specified when LISTDSI is invoked.

**Element or feature:** TSO/E

**When change was introduced:** z/OS V1R11, V1R12, and V1R13 with the PTF for APAR OA35217 applied.

**Applies to migration from:** z/OS V1R11, V1R12, and V1R13 without the PTF for APAR OA35217 applied.

**Timing:** After the first IPL of z/OS V1R11, V1R12, and V1R13 with the PTF for APAR OA35217 applied.

**Is the migration action required?** Yes, if REXX or CLIST applications expect to see detailed PDSE information returned by the SYSDSSMS variable for the LISTDSI function when the SMSINFO keyword is not specified.

**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 updated REXX execs of CLISTs that expect the SYSDSSMS variable set by LISTDSI to return either 'LIBRARY', 'DATA_LIBRARY', or 'PROGRAM_LIBRARY' for PDSE data sets but have not specified SMSINFO, add the SMSINFO keyword to the invocation of the LISTDSI function or the REXX exec, or update the CLIST so that the expected value of the SYSDSSMS variable is 'PDSE' instead.

**Reference information:** For additional information about the REXX LISTDSI function, see [z/OS TSO/E REXX Reference, SA22-7790](#). For additional information about the CLIST LISTDSI statement, see [z/OS TSO/E CLISTs, SA22-7781](#)

Accommodate changes for data sets allocated by the RECEIVE command

**Description:** New data set allocation during RECEIVE command processing has changed as follows:
Before z/OS V1R9, TSO/E would allocate a data set during RECEIVE command processing without using the AVGREC option. As a result, the ISPF data set information panel would display the size of the data set in blocks, tracks or cylinders.

In z/OS V1R10 and z/OS V1R11, without the PTF for APAR OA27537 applied, TSO/E will allocate a data set during RECEIVE command processing using the AVGREC option. As a result, the ISPF data set information panel would display the size of the data set in bytes.

In z/OS V1R11, with the PTF for APAR OA27537 applied, the behavior is changed back to what it was before z/OS V1R9.

Regardless of the release, the following has been, and continues to be, true: the LISTDSI function in REXX or CLIST returns the size in blocks or tracks, and data sets that are preallocated (that is, not allocated by RECEIVE command processing) are not affected by the changes.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>TSO/E.</th>
</tr>
</thead>
</table>
| When change was introduced: | • z/OS V1R8 and earlier had the original behavior.  
• z/OS V1R9, V1R10 and V1R11 without the PTF for APAR OA27537 applied have the new behavior.  
• z/OS V1R9, V1R10 and V1R11 with the PTF for APAR OA27537 applied return to the original behavior. |
| Applies to migration from: | z/OS V1R11 without the PTF for APAR OA27537. |
| Timing: | After the first IPL of z/OS V1R13. |
| Is the migration action required? | Yes, if users expect to see data set allocation information in bytes in ISPF for data sets allocated during TSO/E RECEIVE 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:** Notify users that ISPF displays the size of data sets in blocks or tracks, instead of bytes, if the data sets are allocated by TSO/E RECEIVE command processing.

**Reference information:** None.
Chapter 22. XL C/C++ migration actions

XL C/C++ actions to perform before installing z/OS V1R13 .......................................................... 323
  Review the XL C/C++ Migration Guide for the Application Programmer ...................................... 323
XL C/C++ actions to perform before the first IPL of z/OS V1R13 .................................................... 324
  Update IPA compiler option IPA(OBJECT) .................................................................................. 324

This topic describes migration actions for optional feature C/C++ without Debug Tool.

Note: As of z/OS V1R7, the C/C++ compiler has been rebranded to XL C/C++. However, the name of the optional feature that contains the XL C/C++ compiler remains C/C++ without Debug Tool.

XL C/C++ actions to perform before installing z/OS V1R13

This topic describes XL C/C++ migration actions that you can perform on your current (old) system. You do not need the z/OS V1R13 level of code to make these changes, and the changes do not require the z/OS V1R13 level of code to run once they are made.

Review the XL C/C++ Migration Guide for the Application Programmer

Description: The publication *z/OS XL C/C++ Compiler and Run-Time Migration Guide for the Application Programmer* is written for application programmers, whereas this publication (*z/OS Migration*) is written for system programmers. However, in some customer locations, job scope could 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. Therefore, you ought to review the XL C/C++ publication if you use XL C/C++.

Element or feature: C/C++ without Debug Tool.

When change was introduced: General migration action not tied to a specific release.

Applies to migration from: z/OS V1R12 and z/OS V1R11.

Timing: Before installing z/OS V1R13.

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 the z/OS XL C/C++ Compiler and Run-Time Migration Guide for the Application Programmer for migration information that is relevant to your installation.

Reference information: z/OS XL C/C++ Compiler and Run-Time Migration Guide for the Application Programmer

XL C/C++ actions to perform before the first IPL of z/OS V1R13

None.

XL C/C++ actions to perform after the first IPL of z/OS V1R13

This topic describes XL C/C++ 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.

Update IPA compiler option IPA(OBJECT)

Description: Starting with z/OS V1R12, the XL C/C++ compiler option IPA(OBJECT) matches the behavior of IPA on other platforms and generates object code with additional optimization. The suboption IPA(OBJECT) is deprecated.

Element or feature: C/C++ without Debug Tool.
When change was introduced: z/OS V1R12.
Applies to migration from: z/OS V1R11.
Timing: After the first IPL of z/OS V1R13.
Is the migration action required? Yes, if the suboption IPA(OBJECT) is 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: Use the XL C/C++ IPA(OBJECT | NOOBJECT) compiler options to perform IPA compile-time optimizations.

Reference information: For details about the changes to the IPA(OBJECT | NOOBJECT) compiler options, see the z/OS XL C/C++ Compiler and Run-Time Migration Guide for the Application Programmer.
Chapter 23. 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 V1R13

Update invocations of /usr/sbin/mount commands

Update invocations of /usr/sbin/unmount commands

Review programs that invoke the BPX1EXM/BPX4EXM callable service

Accommodate the new Shell and Utilities version of the tsocmd command

Remove MAXSOCKETS values from AF_UNIX in the BPXPRMxx parmlib member

Discontinue use of z/OS UNIX System Services Connection Scaling

Migrate from HFS file systems to zFS file systems

z/OS UNIX actions to perform before the first IPL of z/OS V1R13

Update invocations of MOUNT statements in the BPXPRMxx parmlib member

Accommodate changes to support read-only z/OS root for the z/OS UNIX System Services cron, mail, and uucp utilities

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

Discontinue use of invalid REXX variables in z/OS UNIX syscalls

Consider skulker invocations because of updated restriction

Use the BPX.UNIQUE.USER profile instead of BPX.DEFAULT.USER

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 and z/OS V1R11.

Timing: Before installing z/OS V1R13.

Is the migration action required? Yes, because invocations of /usr/sbin/mount 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 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.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>z/OS UNIX.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R13.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before installing z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, because invocations of /usr/sbin/unmount might fail if the path name is not the name of the mount point.</td>
</tr>
</tbody>
</table>

| 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: path-name. |

| 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:** Refer to the `unmount` command in *z/OS UNIX System Services Command Reference* for further information.

**Review programs that invoke the BPX1EXM/BPX4EXM callable service**

**Description:** Before z/OS V1R12 (and without the PTFs for APAR OA30897 installed on z/OS V1R11, z/OS V1R10, and z/OS V1R9), an unauthorized caller could pass a parameter greater than 100 characters on the BPX1EXM/BPX4EXM (execmvs) syscall. Beginning with z/OS V1R12 (and with the PTFs for APAR OA30897 installed to z/OS V1R11, z/OS V1R10, and z/OS V1R9), EC6 abends with reason code 0B26C048 will occur if: (1) the caller is not authorized, (2) the parameter is greater than 100 characters, and (3) the program would be executed in an authorized state.

Message BPXP0271 goes to the system hardcopy log. See message BPXP0271 for the program name and the argument length:

```
BPXP0271 JOBNAME_jobname, ATTEMPTED TO ISSUE AN EXEC OF THE APF AUTHORIZED MVS PROGRAM, pgmname, WITH A PARM LENGTH OF xxx
```

**Element or feature:** z/OS UNIX.

**When change was introduced:** z/OS V1R12, and z/OS V1R11, z/OS V1R10 and z/OS V1R9 with the PTFs for APAR OA30897 installed.

**Applies to migration from:** z/OS V1R11, without the PTF for APAR OA30897 installed.

**Timing:** Before installing z/OS V1R13.

**Is the migration action required?** Yes, if you have a program that fits the criteria in the Description section above.

**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 BPX1EXM/BPX4EXM calls from unauthorized callers that might call an APF-authorized program with an argument parameter greater than 100 characters.
  - If the program can handle an argument greater than 100 characters, define a profile for the FACILITY class resource name BPX.EXECMVSAPF:program_name.
Note: Individual users do not need to be given access to the profile; the profile just needs to be defined. Also, the program_name defines the target APF-authorized program.

- If the program cannot handle an argument greater than 100 characters, change the BPX1EXM/BPX4EXM calls to pass an argument that is 100 characters or less.

Reference information: For more information about BPX.EXECMVSAFP:program_name, see z/OS UNIX System Services Planning.

**Accommodate the new Shell and Utilities version of the tsocmd command**

*Description:* Before z/OS V1R11, the tsocmd command was obtained from the Tools and Toys section of the z/OS UNIX web site. Starting with z/OS V1R12, Shell and Utilities support of the tsocmd command has been added. The supported version differs from the Tools and Toys version in a number of ways. For example:

- Exit values are consistently sent if the issued TSO/E command fails.
- The tsoin and tsout environment variables are not supported. Instead, stdin and stdout are supported, as is done for most other Shell and Utilities commands.
- The TSOPROFILE environment variable is supported.
- The READY and END lines are no longer part of the tsocmd command output.

<table>
<thead>
<tr>
<th>Element or feature</th>
<th>z/OS UNIX</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced</td>
<td>z/OS V1R12</td>
</tr>
<tr>
<td>Applies to migration from</td>
<td>z/OS V1R11</td>
</tr>
<tr>
<td>Timing</td>
<td>Before installing z/OS V1R13</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, if you currently use the Tools and Toys version of the tsocmd command</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>None</td>
</tr>
</tbody>
</table>

*Steps to take:* Look for current use of the Tools and Toys version of tsocmd. If there is no current use of the Tools and Toys version of tsocmd, then no actions or changes are required.

If there is current use of the Tools and Toys version of tsocmd, determine if the command is located 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.

1. If you want to preserve the Tools and Toys version, ensure the Tools and Toys version of tsocmd is not located in /bin prior to the installation of z/OS V1R13.
2. If you do not want to preserve the Tools and Toys version, and it is located in /bin, then the installation of z/OS V1R13 will automatically replace the Tools and Toys version with the new officially supported version. If the Tools and
Toys version is not located in /bin, remove it from its current location. In either case, you will also need to remove the Tools and Toys tsocmd load module from the authorized load library (either prefix.TSOCMD.LOADLIB or SYS1.LINKLIB) as described in the tsocmd Tools and Toys README documentation available at ftp://ftp.software.ibm.com/s390/zos/tools/tsocmd/tsocmd.readme.txt.

**Note:** A new version of tsocmd that matches the version shipped with z/OS V1R12 is available at the Tools and Toys web site. If you have multiple systems at different releases and you want to have the same version of the tool on all releases, or if you want to try out the new command prior to z/OS V1R12, you can download the new version to the earlier systems and replace the previous Tools and Toys version of tsocmd if appropriate. If this action is taken, you will need to clean up the authorized load library as described in Step 2 on page 328 prior to downloading the new tool.


### Remove MAXSOCKETS values from AF_UNIX in the BPXPRMxx parmlib member

**Description:** Before z/OS V1R12, a value had to be specified for the MAXSOCKETS keyword in the NETWORK statement for AF_UNIX in the BPXPRMxx parmlib member of SYS1.PARMLIB if the maximum number of AF_UNIX sockets for the system needed to be greater than the default of 100. As of z/OS V1R12, the value does not need to be specified because a maximum value of 10,000 has been set for MAXSOCKETS for AF_UNIX. The MAXSOCKETS keyword is still allowed on the NETWORK statement for AF_UNIX, but will be ignored on a z/OS V1R12 system.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>z/OS UNIX.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R12.</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before installing z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>No, but recommended to avoid confusion if users do not know that a value does not need to be specified for the MAXSOCKETS keyword on the NETWORK statement for AF_UNIX for z/OS V1R12.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>If you share your BPXPRMxx parmlib member with lower level systems, only remove your MAXSOCKETS statement from your AF_UNIX domain if you will accept the default MAXSOCKETS value for AF_UNIX for those lower level systems. (The default on z/OS V1R11 for MAXSOCKETS in the AF_UNIX domain is 100.) Otherwise, remove the MAXSOCKETS statement from the AF_UNIX domain when all systems that share the BPXPRMxx parmlib member are at z/OS V1R12 or later.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
</tbody>
</table>
### System impacts:

None.

### Related IBM Health Checker for z/OS check:

None.

**Steps to take:** Remove any MAXSOCKETS statement from NETWORK statements for DOMAINNAME(AF_UNIX). In a configuration with a shared BPXPRMxx parmlib, MAXSOCKETS should only be removed when all systems are at z/OS V1R12 or later.

**Reference information:** For information about the BPXPRMxx member, see [z/OS UNIX System Services Planning](https://www.ibm.com) and [z/OS MVS Initialization and Tuning Reference](https://www.ibm.com).

#### 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.

<table>
<thead>
<tr>
<th>Element or feature:</th>
<th>z/OS UNIX.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced:</td>
<td>z/OS V1R13 (previewed in z/OS V1R12 Software Announcement 210-235, dated July 22, 2010).</td>
</tr>
<tr>
<td>Applies to migration from:</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before installing z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>No, but recommended because it will become a requirement in a future release.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions:</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts:</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>None.</td>
</tr>
</tbody>
</table>

**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

#### 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.

<table>
<thead>
<tr>
<th>Element or feature</th>
<th>z/OS UNIX.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When change was introduced</td>
<td>zFS became the strategic file system in z/OS V1R7.</td>
</tr>
<tr>
<td>Applies to migration from</td>
<td>z/OS V1R11.</td>
</tr>
<tr>
<td>Timing</td>
<td>Before installing z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>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.</td>
</tr>
<tr>
<td>Target system hardware requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements:</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions</td>
<td>Understand the zFS recommendations and limits. For more information, see Minimum and maximum file system sizes in z/OS Distributed File Service zSeries File System Administration.</td>
</tr>
<tr>
<td>System impacts</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check:</td>
<td>Use check USS_HFS_DETECTED to verify all file systems mounted. This check issues exception message BPXH068E if any HFS file systems are found. To use this check on z/OS V1R11, you must first install the PTF for APAR OA29947.</td>
</tr>
</tbody>
</table>

Steps to take:
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.
- Have the migration run in TSO 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 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: Consider migrating the sysplex root file system to zFS after you IPL z/OS V1R12. You can now dynamically migrate the HFS sysplex root in a shared file system configuration to zFS while the root is in use, without disrupting workloads. Before z/OS V1R10, you could not migrate without disrupting active 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 below.

3. Change policies and scripts, and so forth, to reflect the change from the HFS file system to zFS file system.

Tip: Use the RMF Monitor III option to report on zFS activity.

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 zSeries File System 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 zSeries File System 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.

**Reference information:**

- For more information about the HFS and zFS file systems, see [z/OS UNIX System Services Planning](#).
- To read about setting up zFS, see [z/OS Distributed File Service zSeries File System 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 V1R13

This topic describes z/OS UNIX 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.

**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.

<table>
<thead>
<tr>
<th>Element or feature</th>
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</tr>
</thead>
<tbody>
<tr>
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</tr>
<tr>
<td>Applies to migration from</td>
<td>z/OS V1R12 and z/OS V1R11.</td>
</tr>
<tr>
<td>Timing</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td>Is the migration action required?</td>
<td>Yes, because required file systems might not be mounted.</td>
</tr>
<tr>
<td>Target system hardware requirements</td>
<td>None.</td>
</tr>
<tr>
<td>Target system software requirements</td>
<td>None.</td>
</tr>
<tr>
<td>Other system (coexistence or fallback) requirements</td>
<td>None.</td>
</tr>
<tr>
<td>Restrictions</td>
<td>None.</td>
</tr>
<tr>
<td>System impacts</td>
<td>None.</td>
</tr>
<tr>
<td>Related IBM Health Checker for z/OS check</td>
<td>None.</td>
</tr>
</tbody>
</table>

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.

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 tsmail, mailx, and Communications Server sendmail.

<table>
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</tr>
<tr>
<td>Timing</td>
<td>Before the first IPL of z/OS V1R13.</td>
</tr>
<tr>
<td><strong>Is the migration action required?</strong></td>
<td>Yes, if either of the following is true:</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>--------------------------------------</td>
</tr>
<tr>
<td>- You have performed the post-installation activities to make <strong>uucp</strong>, <strong>cron</strong>, or <strong>mail</strong> 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 <a href="#">z/OS UNIX System Services Planning</a>.</td>
<td></td>
</tr>
<tr>
<td>- You have used <strong>uucp</strong>, <strong>cron</strong>, or <strong>mail</strong> facilities and have not performed the post-installation customization as described in <a href="#">z/OS UNIX System Services Planning</a>.</td>
<td></td>
</tr>
</tbody>
</table>

| **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:**

**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
   - /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 20. 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: z/OS UNIX System Services Planning

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

This topic describes z/OS UNIX 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.
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 System Services.

**When change was introduced:** z/OS V1R13.

**Applies to migration from:** z/OS V1R12 and z/OS V1R11.

**Timing:** After the first IPL of z/OS V1R13.

**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 (rexx-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.

Consider skulker invocations because of updated restriction

**Description:** Before z/OS V1R12, if the skulker command was issued and there were objects in the specified directory (and in any subdirectories if the -r option was used) whose path name included single quotes or a newline character, those objects were not deleted, a warning message (skulker terminated without removing any files, because of the following pathnames that include a single quote or newline) was issued, and all processing stopped. Starting with z/OS V1R12, a warning message is not issued, those objects are ignored, and processing continues.
Element or feature: z/OS UNIX.

When change was introduced: z/OS V1R12.

Applies to migration from: z/OS V1R11.

Timing: After the first IPL of z/OS V1R13.

Is the migration action required? Yes, if you are concerned about not getting a warning message if objects in the specified directory or subdirectories whose path name includes single quotes or a newline character are found.

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 find command to determine if there are any objects in the specified directory or subdirectories whose path name includes single quotes or a newline character. Do not use the find command to locate the objects whose path name include single quotes or a newline character as a standard practice before using the skulker command if you want the directories removed because issuing the find command will modify the access times of directories that are part of that find request.

Reference information: For information about the find and skulker commands, see z/OS UNIX System Services Command 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.

Note: 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.
Is the migration action required? No, but recommended because z/OS V1R13 is planned to be the last release to support BPX.DEFAULT.USER (as previewed in z/OS V1R13 Software Announcement 211-007, dated February 15, 2011). IBM recommends that you either use the BPX.UNIQUE.USER support, or assign unique UIDs to users who need them and assign GIDs for their groups. The use of BPX.UNIQUE.USER increases security because shared IDs are not 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 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

Reference information:
- [z/OS UNIX System Services Planning]
- [z/OS Security Server RACF Security Administrator’s Guide]
Accessibility

Publications for this product are offered in Adobe Portable Document Format (PDF) and should be compliant with accessibility standards. If you experience difficulties when using PDF files, you may view the information through the z/OS Internet Library web site or the z/OS Information Center. If you continue to experience problems, send an email to mhvrcfs@us.ibm.com or write to:

IBM Corporation
Attention: MHVRCFS Reader Comments
Department H6MA, Building 707
2455 South Road
Poughkeepsie, NY 12601-5400
USA

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.

z/OS information

z/OS information is accessible using screen readers with the Library Server versions of z/OS books in the Internet library at:

http://www.ibm.com/systems/z/os/zos/bkserv/
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Policy for unsupported hardware

Various z/OS elements, such as DFSMS, HCD, JES2, JES3, and MVS, contain code
that supports specific hardware servers or devices. In some cases, this
device-related element support remains in the product even after the hardware
devices pass their announced End of Service date. z/OS may continue to service
element code; however, it will not provide service related to unsupported
hardware devices. Software problems related to these devices will not be accepted
for service, and current service activity will cease if a problem is determined to be
associated with out-of-support devices. In such cases, fixes will not be issued.
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