z/OS 2.4 IBM Education Assistance

Installation and Upgrade

Agenda

- Trademarks
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Trademarks

- See url http://www.ibm.com/legal/copytrade.shtml for a list of trademarks.

- Additional Trademarks:
  - None

Session Objectives

- Provide an overview of z/OS V2R4 installation considerations when upgrading from z/OS V2R3
  - This is not a complete list of all upgrade actions
  - This presentation is discussing a ServerPac Installation
  - Those coming from V2R2 to V2R4 will need further instructions

Overview

- Who (Audience)
  - Anyone responsible for Installing or Upgrading to z/OS V2R4
- What (Solution)
  - Overview of Installation and Upgrade considerations
- Wow (Benefit / Value, Need Addressed)
  - Ordering Information and Dates
  - Installation Information such as:
    - New, changed, and removed elements and FMIDs
    - Target System, Driving System, and DASD requirements
  - Preparing for important Upgrade actions

Overview

- Ordering z/OS V2R4
  - Program number 5650-ZOS
  - Order any optional priced or unpriced features that were used with previous z/OS releases
- Key dates
  - z/OS V2R4 GA ordering is planned to begin 09/13/2019
  - z/OS V2R4 General Availability is planned for: 09/30/2019
- Media
  - IBM has discontinued delivery of z/OS platform products and service on magnetic tape. IBM recommends downloading products and service. However, if you have a requirement for physical media, products and service are also available on DVD.
- Terminology
  - Starting in z/OS V2R4, the term *upgrade* will be used in place of *migration* to better identify that each z/OS release contains a higher level of functionality than the prior release. Until the transition to this new terminology is complete, you will see the two terms used interchangeably.

Overview

Elements and Features Changing in z/OS V2R4

- Base Control Program (BCP)
  - Base, Program Management Binder
- Common Information Model (CIM)
- Communications Server
  - Communications Server Security Level 3
- Cryptographic Services
  - ICSF, PKI, System SSL
- DFSMSdfp, DFSMdss, DFSMStvs, DFSMShsm, DFSMSrmm
- DFSORT
- HCD
- HCM
- IBM Knowledge Center for z/OS
- IBM Tivoli Directory Server

Overview

Elements and Features Changing in z/OS V2R4 (continued)

- IBM z/OS Management Facility
- Infoprint Server
  - NetSpool, Print interface
- Integrated Security Services
  - Network Authentication Services
- ISPF
- JES2
- JES3
- Language Environment
- Network File System (NFS)
- OpenSSH for z/OS
- RMF

Overview

Elements and Features Changing in z/OS V2R4 (continued)

- Run-time Library Extensions
- SDSF
- Security Server RACF
- SMP/E
- TSO/E
- XL C/C++
- z/OS File System
- z/OS Font Collection
- z/OS Security Level 3
  - System SSL Security Level 3
  - Network Authentication Service Security Level 3
  - IBM TDS Security Level 3
- z/OS UNIX System Services Application Services

Overview

- SMP/E is now an exclusive base element of z/OS.
- Removed optional language features
  - z/OS is provided in U.S. English (ENU), Uppercase English (ENP), and Japanese (JPN)
    - z/OS elements will no longer provide message and panel translation into languages other than Japanese
    - This change doesn't affect fonts. z/OS will continue to ship double-byte fonts for China, Japan, Korea, etc...
  - The following optional language features are no longer shipped with z/OS V2R4:
    - Brazilian Portuguese
    - Canadian French
    - Danish
    - French
    - German
    - Italian
    - Korean
    - Netherlands Dutch
    - Norwegian
    - Simplified Chinese
    - Spanish
    - Swedish
    - Swiss German
    - Traditional Chinese

Overview

- Elements withdrawn from z/OS V2R4
  - Library Server (FMID HBKQ400)
  - OSA/SF (FMID H0GI400)
  - BookManager READ & NLS
    - HBKM300
    - JBKM310 (English)
    - JBKM311 (Dutch)
    - JBKM312 (French)
    - JBKM313 (German)
    - JBKM314 (Spanish)
    - JBKM315 (Italian)
    - JBKM316 (Brazilian Portuguese)
    - JBKM317 (Can. French)
    - JBKM318 (Danish)
- GDDM NLS - all NLV FMIDs removed except Japanese
  - JGD3220 (Brazilian Portuguese)
  - JGD3221 (Simplified Chinese)
  - JGD3222 (Danish)
  - JGD3223 (French)
  - JGD3224 (German)
  - JGD3225 (Korean)
  - JGD3226 (Italian)
  - JGD3228 (Norwegian)
  - JGD3229 (Canadian French)
  - JGD3230 (Spanish)
  - JGD3231 (Traditional Chinese)
  - JGD3232 (Swedish)

Overview

- FMIDs withdrawn from z/OS V2R4
  - Distributed File Service (DFS/SMB)
    - H0H2410 - Distributed File Service
    - J0H241J - Distributed File Service (Japanese NLS)
      - These FMIDs will be deleted by FMID HZFS440
  - SMP/E
    - HBCND0B - Planning & Migration Assistant
    - JBCND1B - Planning & Migration Assistant (Japanese NLS)
    - HBCNC00 - Software Information Base
      - These FMIDs will be deleted by FMID HMP1K00
  - Deleted NLV languages
    - BCP - JBB77AC/JBB77BC (Simplified Chinese)
    - ISPF - JIF7P11/JIF7R11 (Swiss German), JIF7P15/JIF7R15 (German)
    - TSO/E - JTE77AC/JTE77BC (Simplified Chinese), JTE77AG/JTE77BG (German)
    - UNIX System Services - JOT77AC/JOT77BC (Simplified Chinese)

Overview

- z/OS V2R4 removes support for Distributed File System / Server Message Block (DFS/SMB). Originally, the z/OS Distributed File Service base element consisted of two components: SMB and z/OS File System (zFS). In z/OS V2R4, the name of the base element is changed to z/OS File System. NFS is the strategic file sharing protocol for the z/OS platform.
  - Due to the removal of DFS/SMB in z/OS V2R4, users may need to migrate existing SMB workloads to NFS
  - See the “NFS Enhancements to Aid Migration from DFS/SMB“ IEA presentation for more details
- z/OS V2R4 removes support for the OSA/SF element. The OSA/SF on the HMC functionality can be used to configure and manage OSAExpress4S and newer generation adapters. z/OS continues to support the networking operational use of OSA adapters.
- z/OS V2R4 removes support for the BookManager READ element. IBM recommends that you use IBM Knowledge Center for z/OS, which was introduced in z/OS V2R2, to access product documentation on the web or from your own local repository.
- z/OS V2R4 removes support for the SMP/E Planning and Migration Assistant (PMA) element. The set of functions provided by PMA has largely been supplanted by newer functions provided by Shopz and by z/OSMF Software Management or duplicate other functions available in SMP/E. However, no replacements are planned for the Intermediate Product Migration Changes report or for the PMA ISPF tables.

Overview

- New base element added in z/OS V2R4
  - z/OS Container Extensions (FMID - HZDC7C0)
    - z/OS Container Extensions (zCX) provides the runtime support to deploy and run Linux on Z applications that are packaged as Docker Container images on z/OS
      - This is the capability to run Linux on z Docker images directly in z/OS
      - This workload is planned to be zIIP eligible
      - Learn more at: http://ibm.biz/zOSContainerExtensions
      - See the “z/OS Container Extensions” IEA presentation for more details

- New Fmids added in z/OS V2R4
  - z/OSMF zERT Network Analyzer (FMID - HSMA24E)
    - To use the IBM z/OS Encryption Readiness Technology (zERT) Network Analyzer plug-in, you require Db2 V11 for z/OS (5615-DB2) or later

Interactions & Dependencies

- z/OS V2R4 has an overall dependency on IBM 64-bit SDK for z/OS, Java™ Technology Edition, V8 (5655-DGH) and IBM 31-bit SDK for z/OS, Java™ Technology Edition, V8 (5655-DGG). Generally, this dependency exists for new or enhanced functions in z/OS. Older functions that are unchanged from previous releases, and have lower Java requirements, are expected to work with earlier supported releases of Java.
  - For the specific Java dependencies for each element, see Table 14 in z/OS V2R4 Planning for Installation (GA32-0890)
  - The IBM z/OS Management Facility (z/OSMF) element requires that the following Java level be installed:
    - IBM 64-bit SDK for z/OS, Java Technology Edition, V8 (5655-DGH)
  - The Knowledge Center element requires that the following Java level is installed:
    - IBM 64-bit SDK for z/OS, Java Technology Edition, V8 (5655-DGH)

Installation

- Planning for z/OS V2R4 installation
  - Review installation and upgrade documentation
    - z/OS V2R4 Planning for Installation (GA32-0890)
    - z/OS V2R4 Upgrade Workflow*
    - z/OS V2R4 Program Directory for CBPDO install
    - ServerPac: Installing your Order for ServerPac install
  - Review Preventative Service Planning (PSP) bucket for z/OS V2R4
    - Upgrade ZOSV2R4 includes subsets for z/OS elements
  - Review applicable hardware PSP buckets
    - z/OS Upgrade Workflow* identifies the hardware PSP Buckets

- *Starting with the z/OS V2R4 release, z/OS Migration is replaced by the z/OS Upgrade Workflow
  - See the Upgrade and Coexistence Section for more details

Installation

- IBM z/OS Container Extensions is a new exclusive base element, it installs into its own File System
  - Mountpoint is /usr/lpp/zcx_zos

Installation

- Driving system requirements
  - z/OS V2R2 or later with z/OS V2R4 levels of SMP/E, High-Level Assembler and Program Management Binder
    - Program Management Binder changed in z/OS V2R4
    - SMP/E has been repackaged in z/OS V2R4, and is now an exclusive base element of z/OS
    - HLASM has not changed since z/OS V1R10
    - ServerPac: Installing Your Order for ServerPac install
    - For Service Installation, a Java Runtime Environment using IBM 31-bit SDK for z/OS Java Technology Edition V6.0 or higher (5655-R31), or IBM 64-bit SDK for z/OS Java Technology Edition V6.0 or higher (5655-R32) must be available on the driving system
  - Customized Offerings Driver (COD) may also be used as the driving system
  - z/OS Planning for Installation provides a description of the driving system requirements

Installation

- Target system requirements
  - z/OS Planning for Installation identifies other IBM products that are required to use some elements in z/OS V2R4

- To run z/OS V2R4 as a guest under z/VM®, the minimum release of z/VM required is z/VM 6.4
  - See Upgrade and Coexistence Considerations for more details

- z/OS V2R4 DASD - approximate requirements:
  - Target libraries:
    - V2R4 total space required 11290 3390 cylinders
    - V2R3 total space required 11572 3390 cylinders
      - Delta: -282 3390 cylinders

Installation

- Distribution libraries:
  - V2R4 total space required 19356 3390 cylinders
  - V2R3 total space required 16949 3390 cylinders
    - Delta: +2407 3390 cylinders
- Root file system:
  - V2R4 total zFS space required 5000 3390 cylinders
  - V2R3 total zFS space required 5132 3390 cylinders
    - Delta: -132 3390 cylinders
  - V2R4 total hfs space required 5000 3390 cylinders
  - V2R3 total hfs space required 5120 3390 cylinders
    - Delta: -120 3390 cylinders

Installation

- z/OS Font Collection
  - V2R4 total zFS/hfs space required 2770 3390 cylinders
  - V2R3 total zFS/hfs space requires 2336 3390 cylinders
    - Delta: +434 3390 cylinders
- IBM z/OS Liberty Embedded
  - V2R4 total zFS/hfs space requires 2430 3390 cylinders
  - V2R3 total zFS/hfs space requires 2400 3390 cylinders
    - Delta: +30 3390 cylinders
- IBM z/OS Container Extensions (New Base Element)
  - V2R4 total zFS/hfs space requires 5250 3390 cylinders

Installation

- Install required service for IBM products
  - FIXCAT(IBM.TargetSystem-RequiredService.z/OS.V2R4)
- Processor requirements: (TradeMarked)
  - IBM z14, IBM z13, IBM z13s, IBM zBC12, IBM zEC12
- Refer to z/OS Planning for Installation for IBM I/O devices and subsystems supported by z/OS V2R4

Upgrade & Coexistence Considerations

- BCP
  - No changes to IFAPRDxx PARMLIB member
    - V2R4 can share with V2R3 or V2R2
  - Update BPXPRMxx in PARMLIB to add mount for z/OS Container Extensions file system

Upgrade & Coexistence Considerations

- z/OS V2R4 is supported for coexistence, fallback, and upgrade with z/OS V2R2 and z/OS V2R3
- Coexistence and fallback PTFs must be installed on lower z/OS systems which coexist with z/OS V2R4
  - Use the REPORT MISSINGFIX command with a FIXCAT (fix category) of IBM.Coexistence.z/OS.V2R4 after receiving the latest HOLDDATA

Upgrade & Coexistence Considerations

- New Upgrade actions are introduced with z/OS V2R4
  - z/OS Upgrade Workflow* describes new upgrade actions
    - Upgrade from z/OS V2R2 to V2R4
    - Upgrade from z/OS V2R3 to V2R4

- *Starting with the z/OS V2R4 release, z/OS Migration is replaced by the z/OS Upgrade Workflow
  - When you perform the steps that are described in z/OS Upgrade Workflow, you are performing all of the same migration actions that were described in the publication.
  - In addition to the z/OS Upgrade Workflow, IBM will provide exported files in Knowledge Center, which can be searched, browsed, and printed without z/OSMF.
  - Discovering, performing, and verifying many migration actions through the z/OSMF Workflow function instead of the exported format allows for a tailored and specific upgrade path associated with a particular system. Notice that the exported format will not be tailored for any environment.
  - With the removal of the traditional *z/OS Migration* publication, it is strongly recommended that you plan for your next upgrade by having z/OSMF ready to use in at least one location in your enterprise.
  - After GA, the *z/OS Upgrade Workflow* is planned to be provided using the GitHub repository for IBM/IBM-Z-zOS, which today hosts the *z/OS Migration Workflows.*

Upgrade & Coexistence Considerations

- Starting with z/OS V2R4, running z/OS as a guest requires z/VM V6R4 or later. This requirement means that TX (transactional execution) is available in all configurations.
  - Introduced on the IBM System zEC12, transactional execution (TX) is a hardware-based facility that supports the notion of "transactions”.
- Starting with release V2R4, z/OS no longer supports allocating, obtaining, or changing common areas of virtual storage in a user key (8-15). The use of user key CSA is not recommended because any unauthorized program can modify it.
  - Related to this change, YES is no longer a valid setting for the following statements in the DIAGxx parmlib member:
    - **VSM ALLOWUSERKEYCSA -** Controls the allocation of user key CSA
    - **ALLOWUSERKEYCADS -** Controls the allocation of user key SCOPE=COMMON data spaces
  - If set to YES on a z/OS V2R4 system, these statements are treated as syntax errors
  - For those who cannot immediately eliminate all affected software programs as recommended, or need more assistance in identifying the programs that reference user key CSA storage, the more secure restricted use common service area (RUCSA), an optional priced feature in z/OS V2R4 (and provided in the BCP base element by APAR OA56180 for earlier z/OS releases) can be used.
  - See the “Elimination of user key common storage” IEA presentation for more details

Upgrade & Coexistence Considerations

- Starting with z/OS V2R4, the CIM server is changed to enable HTTPS by default. The CIM server configuration properties default values are changed, as follows:
  - enableHttpConnection=false
  - enableHttpsConnection=true

- Starting with z/OS V2R4, the TSO/E Server-Requester Programming Interface (SRPI) is no longer supported. If your applications use this API, IBM recommends that you upgrade to TCP/IP for z/OS for similar function.

- z/OS V2R4 is planned to be the last release to support the ISPF Workstation Agent (WSA), also known as the ISPF Client/Server Component.
  - WSA is an application that runs on your local workstation and maintains a connection between the workstation and the ISPF host. It is primarily used to transfer files between the workstation and the host.
  - The communication between ISPF and the ISPF Workstation Agent is not secure. Therefore, avoid using the ISPF Workstation Agent.
  - IBM recommends using more current file transfer solutions such as those provided by the Zowe Dataset Explorer, z/OS SFTP, and similar file transfer mechanisms. These solutions have more capabilities, including the ability to provide secure communications.

Upgrade & Coexistence Considerations

- Starting with z/OS V2R4, OpenSSH no longer supports the SSH-1 protocol, or RSA keys smaller than 1024 bits.
  - See the “OpenSSH” IEA presentation for other upgrade considerations, as well as more details

- z/OS V2R4 is planned to be the last release to support the VTAM® Common Management Information Protocol (CMIP).
  - CMIP services is an API that enables a management application program to gather various types of SNA topology data from a CMIP application called the *topology agent* that runs within VTAM
  - IBM recommends using the SNA network monitoring network management interface (NMI) to monitor SNA Enterprise Extender and High Performance Routing data

- z/OS V2R4 is planned to be the last release in which JES2 will support the z11 level for checkpoint data sets
  - z22 mode was introduced in z/OS V2R2. IBM recommends you migrate to z22 mode if you have not already done so
  - When you switch to z22 mode, the system upgrades the JES2 checkpoint

Upgrade & Coexistence Considerations

- z/OS V2R4 is planned to be the last release of the operating system to support the hierarchical file system (HFS) data structure used by the z/OS UNIX environment
  - IBM provides equivalent if not superior functionality with the z/OS File System (zFS). Your installation should upgrade from HFS to zFS. To convert your file system hierarchy to zFS, use the utilities that are provided in the operating system.
  - Starting with the release **after** z/OS V2R4, you can no longer mount a data structure that is DSNTYPE=HFS.

- The release that **follows** z/OS V2R4 is planned to be the last release of z/OS that will include JES3 as a feature. If you are one of the clients who remains on JES3, IBM encourages you to start planning your migration.
  - To help JES3 to JES2 migration efforts, JES2 adds functions, including dependent job control, deadline scheduling, 8-character job classes, and interpreting JES3 JECL control statements.
  - For z/OS V2R4, more function to aid in migrations is added, including Disk Reader capability and enhanced JES3 JECL support in JES2 (ROUTE XEQ).

Upgrade & Coexistence Considerations

- SDSF Upgrade Support:
  - Special ddname ISFSMIGDA to restore prior implementation of DA panel
  - If you are using old style ISFPARMS, you must reassemble using V2R4 macros
    - ISFPARMS cannot be shared with prior levels
  - See the “SDSF” IEA presentation for more details

- GDDM-PGF 2.1.3 is planned to be withdrawn on December 9, 2019

- IBM is declaring that the SCLM component is functionally stabilized. While it will continue to be maintained and supported, it will not be enhanced with new features in the future.

Session Summary

- This presentation provided an overview of installation and upgrade considerations when upgrading from z/OS V2R3 to z/OS V2R4

- For a complete description of all new upgrade actions in z/OS V2R4, see the z/OS Upgrade Workflow

Appendix

- Publications
  - z/OS Upgrade Workflow*
  - z/OS Planning for Installation (GA32-0890)

- References
  - z/OS Workflow GitHub Repository
    - *https://github.com/IBM/IBM-Z-zOS/tree/master/zOS-Workflow/*

- *Starting with the z/OS V2R4 release, z/OS Migration is replaced by the z/OS Upgrade Workflow
  - See the Upgrade and Coexistence Section for more details