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z/VM 6.3 Upgrade Installation

Session 13564

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Agenda

- New installation option with z/VM 6.3
- What are the objectives
- What is different
- Planning
- Stage 1
- Stage 2
- Finish Upgrade Installation
- Mixed Clusters
- Open APARs
- Summary

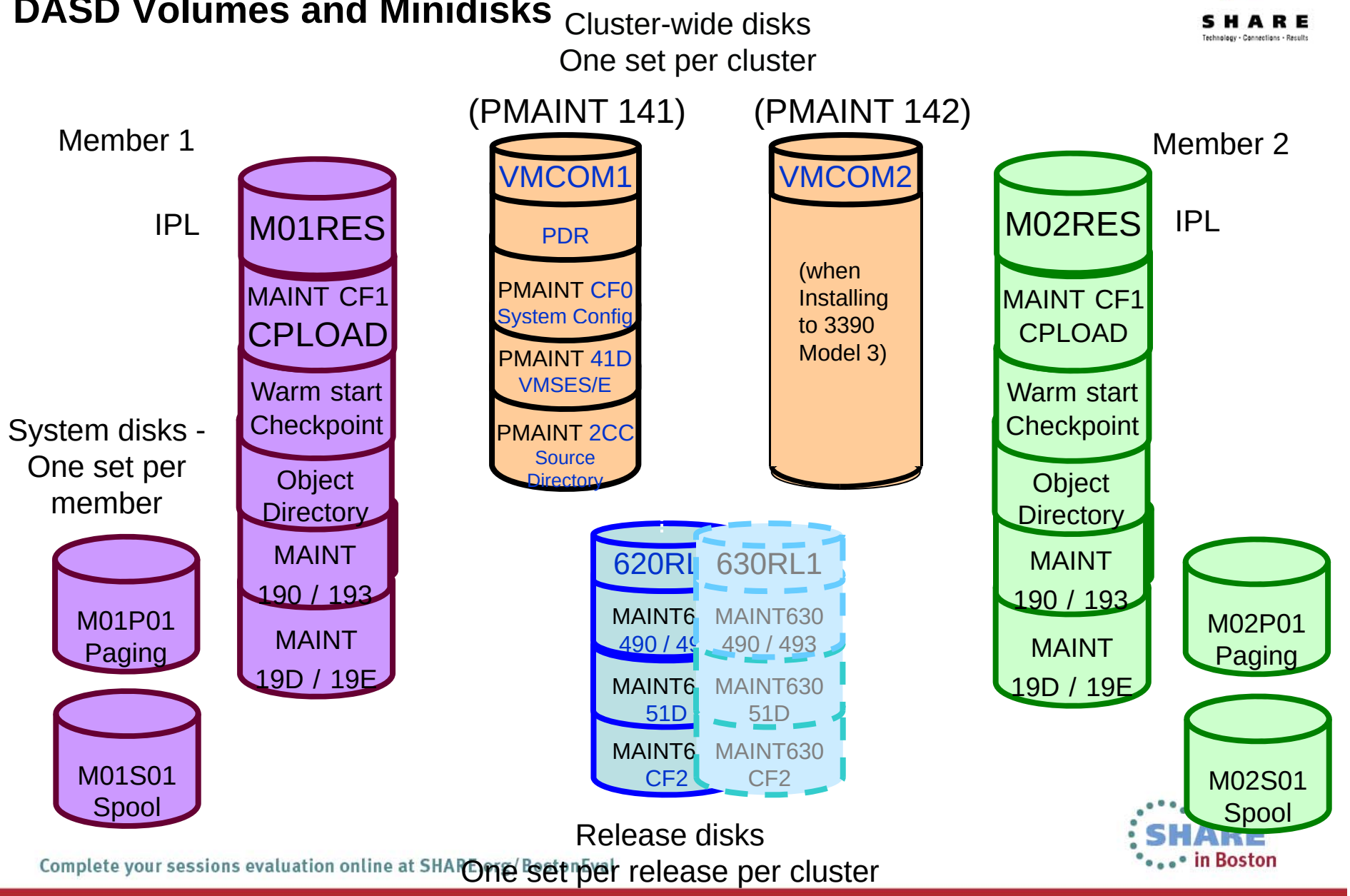
New Installation Option with z/VM 6.3

- Upgrade Installation
  - Documented in Part 5 of the z/VM 6.3 Installation Guide (GC24-6246-01)
  - Only applies to upgrading from z/VM 6.2
    - Traditional methods apply for migrations from z/VM 5.4 or z/VM 6.1.
  - Restrictions
    - Must not have changed identity/subconfig definitions with user entries for all entries in the initial directory shipped by IBM for z/VM 6.2
    - Must not have changed IBM supplied USER or IDENTITY names
    - Must not have changed IBM supplied minidisk addresses
    - Must not have moved IBM supplied minidisks to different virtual machine definitions
    - Must not have changed the default values in VMSESE PROFILE or VMFINS DEFAULTS

Objectives of Upgrade Installation

- Upgrade a z/VM 6.2 system with minimal impact to the current running system.
  - No manual merge of directories
  - Add new userids to current system
  - Upgrade files on existing disks under VMSES control
  - Flag local modifications for review and customized files
- Support upgrading single members of an SSI cluster
- Support upgrading non-SSI systems
- Support notion of mixed SSI clusters
  - Where individual members of the cluster are at different levels

DASD Volumes and Minidisks



What is Different?

Traditional Migration

- New release installed on separate volumes
- Users and Data from current running system migrated to system running new release
- IPL from new volumes
- Keep old system around for backout

Upgrade Installation

- Install new release as temporary work system second level
- Move new level of code to current system with minimal impact
- Support upgrade of single member in a cluster
- Create system backup for reversing upgrade

Workflow

- Plan and prepare
- Backup current system
- Install z/VM 6.3 work system from MIGMAINT userid
- Generate the stage1 changes file
- Execute stage1 changes
- Finish stage1 changes
  - This may involve reworking local modifications and reviewing the user directory, and ESM
- Backup current system again
- Generate the stage2 changes file
- Execute the stage2 changes
- Review SYSTEM CONFIG, USER DIRECT, and Upgrade Warning File
- Shutdown and IPL the upgraded system or member

Planning

- Select installation media type. Supported types are:
  - Tape
  - Physical DVD
  - FTP server with access to content of DVD
  - CMS-formatted minidisk
- Review and Comply with Requirements
  - General
  - Hardware
  - System Software
  - MIGMAINT
  - DVD Installation
  - Other System Requirements such as SFS space, directory and security managers

Planning (cont)

- Complete Worksheets
  - Backup current system before beginning and before Stage2
  - Note location of DVD content (ftp server information, CMS minidisk address)
  - Edit user directory, or use a directory manager?
  - Security manager active?
  - Name and location of SYSTEM CONFIG file
  - Products loaded into VMPSFS filepool?
  - DASD type and model for work system
    - FBA – 5 volumes if each is over 9.5, 6 volumes if each is under 9.5G
    - 3390-03 – 10 volumes (9 if all products loaded to SFS)
    - 3390-09 – 5 volumes
  - Additional member specific space on current (6.2) system
    - New space must be allocated on same device type as used to install 6.2 system
    - 3390 – need total of 6,682 cylinders of space
    - FBA – need total of 9,622,080 FBA blocks of space
    - Space used for ZHCP, XCAT, and SMAPI worker machines (VSMGUARD, VSMWORK1, VSMWORK2, VSMWORK3)

Planning (cont)

- Complete Worksheets (cont).
  - Allocate additional common space
    - Must allocate additional space on DASD type used for original z/VM 6.2 system
    - Only allocate this additional space for first member to be upgraded in a cluster
    - Make sure additional common space available to all members of cluster
    - 3390 – need 731 additional cylinders on a common volume
    - FBA – need 1,052,640 additional FBA blocks on a common volume
    - Allocate this additional space on a volume that will be considered common if upgrading a non-SSI system (in anticipation of future conversion to SSI).

Preparation

- On your existing z/VM 6.2 system
  - Make sure directory manager will allow MIGMAINT to make changes without specifying a password
    - For DIRMAINT ALLOW_ASUSER_NOPASS_FROM= MIGMAINT
  - Make sure directory manager will support disk cleanup and disk operations
    - For DIRMAINT this is DISK_CLEANUP= YES and DATAMOVE_MACHINE= DATAMOVE * *
  - Make sure MIGMAINT is authorized to use directory manager
    - For DIRMAINT this is done by adding MIGMAINT to AUTHFOR CONTROL for both 140A and 150A command sets and ADGHMOPS classes.
  - Make sure MIGMAINT is able to link the MAINT620 4CC minidisk if installing from DVD
  - Make sure all of the new volumes created during installation of the work system and the new space added to the z/VM 6.2 system is available for automatic minidisk allocation within your directory manager
    - For DIRMAINT this is done by adding REGION statements in EXTENT CONTROL for all volumes
  - Make sure directory manager excludes MAINT630 013* overlap minidisks from free space calculations.
    - For DIRMAINT this is done by adding MAINT630 013* to EXCLUDE section of EXTENT CONTROL
  - Format, label, allocate and attach to the z/VM 6.2 system volumes designated as additional space allocated to current system

Work System

- Load the install tools (instpipe along with pipe commands to load 2222 and DVDPRIME to load 24CC and 2CF0)
- Run INSTPLAN with dvd or tape and (UPGRADE
- Upgrade installation panels will be displayed
  - Different from the normal instplan panels
  - Display current z/VM 6.2 information
  - Prompt for license agreement for previously installed optional features that require 6.3 license also
  - Prompt for DASD type and size for installation of work system (DASD type will match DASD type for system being upgraded, e.g. 3390).
  - Specify location of SYSTEM CONFIG, how directory is maintained, and whether RACF or a different security manager is used
  - Specify labels and addresses for z/VM 6.3 work system
  - Specify label of DASD to be used for allocation of additional space on current system
    - Note: these volumes should be attached to the z/VM 6.2 system prior to proceeding)
- Attach DASD devices to be used for the z/VM 6.3 system to MIGMAINT
- Execute INSTALL command

Stage 1

- When the work system has been completely installed, the INSTALL EXEC will end
  - Your work system is still running within the MIGMAINT userid
  - Enter the CP Shutdown command to shutdown the work system
  - Enter IPL CMS to restore the CMS environment to MIGMAINT
  - The work system now exists on the DASD devices attached to MIGMAINT
- The upgrade process is automated and coordinated by a new EXEC named INSTUPGR
- INSTUPGR is used to generate a table of tasks to complete
- INSTUPGR may be used to execute the tasks, or you may choose to manually execute the tasks in the table by hand.
- At each stage, the PRIME option is used to instruct INSTUPGR to generate a table of tasks.
- Tables are written to MIGMAINT's 2CF0 minidisk
- Warnings issued by INSTUPGR while building the stage1 table will be displayed and written to $STAGE1$ $WRNFILE on MIGMAINT's 2CF0 minidisk
  - Review any warnings and resolve the problems before continuing
- Errors that occur are written to the INSTUPGR $CONSLOG on MIGMAINT's 2CF0 minidisk.
  - If errors occur consult this file and resolve any errors before continuing

Stage 1 (Cont)

- The stage1 changes add new maintenance userids and updated versions of service and installation userids to your system
- Changes include:
  - Attaching the new release disks to the current system (630RL1 and 630RL2 if 3390-03)
  - Updating SYSTEM CONFIG to automatically attach these new volumes to the system during IPL
  - Add MAINT630 to the directory, and update links defined in the MAINT subconfig for this system to link to the new MAINT630 disks
  - Add 6VMPTK30, 6VMRAC30, 6VMRSC30, 6VMTCP30, and 6VMDIR30
  - DDR minidisks for new 6VMDIR30 to the additional space volume designated during INSTPLAN
  - Update LINKs for current service machines to the new install and service userids (for example PERFSVM linking to 6VMPTK30 instead of 6VMPTK20)
  - Enable 6VMDIR30 on z/VM 6.2 system
  - Add enable records to SYSTEM CONFIG file
  - Add ZHCP and XCAT to current system
  - Add new minidisks and update directory entries for SMAPI Worker Servers along with other SMAPI environment changes
  - Enroll MAINT630 as ADMIN in shared filepool servers

Stage 1 (Cont.)

- The stage 1 table is named $STAGE1$ $TABLE$ and it is stored on MIGMAINT's 2CF0
  - The table is an ordered list of actions to be taken against the current system.
  - Each entry is described by comments such that the change can be manually performed
- Execute the stage1 changes
  - Use INSTUPGR with the COMMIT option
    - INSTUPRG will generate a back out file that will allow you to reverse these changes
    - If a directory manager is being used that provides an exit to work with the IBM upgrade code the exit will be called to perform directory functions.
    - INSTUPGR is able to change the user direct file if you do not use a directory manager
  - Manually update your system with the stage1 changes
    - You must perform the changes in the order specified in the stage1 table
    - You will not have an automated back out capability
    - You must edit the stage1 table to mark each change as completed when you finish each change
  - Combination of automatic and manual changes
    - Perform the manual changes first and update the stage1 table
    - Run INSTUPGR with COMMIT to complete all changes not marked finished
    - Be careful of dependencies when following this path

Stage 1 (Cont.)

- All stage1 changes must be successfully completed before moving to Stage2.
- After completing all stage1 changes manually:
  - Run INSTUPGR stage1 (commit done
- Post stage1 directory considerations
  - Updating a member of a cluster and directory manager is not used
    - Bring changed directory online to all cluster members with DIRECTXA command
    - Run DIRECTXA on all cluster members if directory manager did not provide an exit for INSTUPGR
  - For non-SSI, or one member SSI cluster, or first member of an SSI cluster
    - Copy configured DIRMAINT files from 6VMDIR20 to 6VMDIR30 (491, 492, 11F, and 41F).
    - Copy DVHPROFA DIRMSAT * files from 6VMDIR20 491 and 492 to 6VMDIR30 491 and 492
    - Make sure new userids such as MAINT630 are in AUTHFOR CONTROL if needed
    - Recycle all DIRMAINT servers (i.e. DIRMAINT, DIRMSATx, DATAMOVE, DATAMOVx) to begin using the 6.3 DIRMAINT code.

Stage1 (Cont.)

- Post stage1 ESM considerations
  - Only applies if you are running an ESM
  - Ensure MAINT630 is authorized to:
    - Link to any minidisk on the system without a password
    - Perform security authorizations on behalf of other users
    - Perform all SFS admin functions
  - Define to ESM new userids added to directory
    - ZHCP, XCAT, MAINT630, 6VMDIR30, 6VMPTK30, 6VMRAC30, 6VMRSC30, 6VMTCP30
  - Make sure that the userids above have same disk access as the corresponding z/VM 6.2 userids.
  - Make sure userids such as RACMAINT, TCPMAINT, DIRMAINT, and MAINT are authorized to link to the new userid minidisks above instead of the 6.2 counterparts
  - Review table of indirect links in the z/VM 6.3 Installation Guide Chapter 25 to ensure that necessary ESM changes are made.
  - If your ESM manages SFS administrator authorizations make sure that MAINT630 and the SMAPI workers are authorized as admins for VMPSFS, VMSYS, VMSYSR, and VMSYSU
  - If your ESM manages CP command authorizations and access to other CP resources
    - Ensure that MAINT630 and the 6VMxxx30 userids are properly authorized

Stage1 (Cont.)

- Rework local modifications
  - This step is not required for the 2nd – 4th member of an SSI cluster to be upgraded
  - Local modifications to components were copied to 6.3 service disks
  - 6.3 VM SYSLMOD table was updated with the local modifications copied to the 6.3 service disks
  - Review and update status of each local modification
  - This step must be performed from MAINT630
  - Use VMFUPDAT SYSLMOD
    - To see if any local modifications need rework
    - To mark local modifications as complete when reworked

Stage2

- The changes implemented in stage2 might affect your production workload
  - Best to stop your production workload
  - Also logoff PERFSVM and other users of MONDCSS
  - Backup the system prior to executing stage2
  - SFS servers should still be running along with directory manager and or security manager servers
- Stage2 moves the new release code into production
  - Replaces content on minidisks such as 190, 193, etc.
- Back out of stage2 requires restoring system backup
- INSTUPGR stage2 (prime
  - Creates the $STAGE2$ $TABLE$
  - Table resides on MIGMAINT's 2CF0
  - Warnings placed in $STAGE2$ $WRNFILE on MIGMAINT's 2CF0
  - Errors placed in INSTUPGR $CONSLOG on MIGMAINT's 2CF0

Stage2 (Cont.)

- Move and copy mdisks for 6MVHCD20 to new common volume
- Delete DHCPD, LPSERVE
- Erase 6.2 content from minidisks with VMFERASE, then VMFCOPY from 6.3 minidisks
  - 190, 193, 19E, 19D
  - Copy from 6.3 alternate minidisks
- Erase 6.2 content from TCPMAINT 591, 592 and copy from 6VMTCP30 491 and 492
- Erase 6.2 content from PERFSVM 201 and copy from 6VMPTK30 200
- Copy customized files for VMSES, CP, DVF, REXX, AVS, GCS, TSAF, CMS, TCPIP, RSCS, DIRM, RACF, PERFKIT
  - If file has been customized copy new 6.3 file to new name on target alternate minidisk
  - For example copy 6.3 sample file to 6.2 TCPMAINT 491
- Copy updated VMSES inventory files
- VMFINS BUILD (SERVICED
  - REXX, CMs, CP, GCS, DVF, AVS, TSAF, TCPIP, RSCS, DIRM, RACF, PERFTK
- BLDNUC
  - CMS, GCS, CP, RACF
- PUT2PROD
- PUT2PROD SEGMENTS ALL

Stage2 (Cont.)

- Implement stage2 changes
- Automatically
  - INSTUPGR stage2 (COMMIT
- Manually
  - Follow implementation steps written as comments in stage2 table
  - Order of items in table must be followed
  - Update table items when complete
- Manual and Automatic
  - Manually implement some tasks in table
  - Must follow order of table
  - INSTUPGR stage2 (COMMIT to automatically process all entries not marked complete

Finish Upgrade Installation

- Directory
  - If upgrading a member of an SSI cluster make sure directory is put online on all other members
  - Verify definitions added to directory comply with your local standards (i.e. minidisk passwords, etc)
- SYSTEM CONFIG
  - Review changes under “Upgrade Statements” comment at end of file
    - User_Volume statements
    - Product enable records
  - Make sure new volumes added to the 6.2 system before upgrade began are in appropriate User_Volume statement
    - New volumes for xCAT and zHCP
    - New common volume for 6VMDIR30
- $WRNFILE Messages
  - Created on MIGMAINT 2CF0 minidisk by INSTUPGR
  - Edevice warnings
  - Customizable file warnings
  - Warnings for parts residing on PMAINT 551

Finish Upgrade Installation (Cont).

- Delete obsolete saved segments
  - helpseg
  - nslameng
  - These were shipped with 6.2 and are no longer used
  - Use purge nss name helpseg and purge nss name nlsameng commands
- Shutdown and IPL upgraded system
  - If running ESM other than RACF consult vendor documentation prior to shutdown for any special requirements before IPLing
  - If using RACF
    - Test disks updated with new level of code
    - On IPL bring up test RACF/VM server (RACMAINT)
    - Move updated code to production RACF server
- Use MIGR51D for licensed products that are not preinstalled on the system DDR
  - E.g. High Level Assembler
  - System software inventory files not updated for these products
  - Involves also merging segmap information and rebuilding segments

Finish Upgrade Installation (Cont).

- Change default passwords for new virtual machine definitions added to directory
- If you have created stand alone dump in the past it will need to be recreated
  - Create a tape using the z/VM 6.3 program
  - Use the new utility SDINST to dump to DASD
  - Previous release stand along dump should not be used with z/VM 6.3
- Review links in directory for non-IBM virtual machines that might link to release specific minidisks
  - E.G. links to 6VMPTK20 200 and 29D for perfkit usage
- Review new program directories for any additional configuration steps needed for new levels of the enabled pre-installed features
- Return work volumes to DASD pool
- If DIRMAINT is used disable old level (i.e. 6VMDIR20)
  - If this is first member of an SSI cluster consider manually moving the 630 level of DIRMAINT help files to other members not yet upgraded
- Create final backup of system

Remove Old Release

- Only do this step if upgraded non-SSI 6.2 system or completed upgrading last member of an SSI cluster
- Remove old release level userids no longer used on the 6.3 system
  - MAINT620, 6VMDIR20, 6VMPTK20, 6VMRAC20, 6VMRSC20, 6VMTCP20
  - Do not delete 6VMLEN20 or 6VMHCD20 these continue to be used in the 6.3 system
  - Remove from the user directory and shared filepool servers (if applicable)
- When old release volumes no longer contain minidisks they can be returned to DASD pool
- Update SYSTEM CONFIG
  - Remove product enable records for old pre-installed features no longer used
  - 6VMPTK20, 6VMRAC20, 6VMRSC20
  - Set old features to DISABLED on the system
  - Note: DIRMAINT (if used) was already disabled

Life In a Mixed Release Cluster

- Need to make sure that common utilities are at the highest release level in the cluster
  - Utilities maintained on PMAINT 550/551 mdisks
- Install new service on z/VM 6.2 members to support highest release level processing
  - VM65317 - VMSES
    - UM34006 – not currently on any RSU
    - http://www.vm.ibm.com/service/tips/vm65317.pdf (for pubs changes)
  - VM65318 - CP
    - UM34029 – not currently on any RSU
  - VM65319 - CMS
    - UM34030 – not currently on any RSU
  - VM65320 – RACF VM
    - UV61196 – not currently on any RSU

z/VM 6.3 Upgrade Installation APARs

- VM65297 – currently open
  - Problems with DVHSAPI (the Dirmaint synchronous programming interface) hanging on purge of identity and subconfig.
- VM65384 – currently open
  - Problem with instupgr stage2 (prime processing. Invalid data detected in the SYSSUF file. Problem involves parsing lines properly in the SYSSUF file.

Summary

- SSI clusters with more than one member represent a challenge for upgrading using traditional methods
- New Upgrade Installation path provides capability to upgrade an existing member of a cluster
  - Minimal disruption to existing system
  - Ensures that cluster wide utilities and directory manager are at new release level for entire cluster
- Upgrade Installation path provides a quick and easy method of upgrading non-SSI and single member SSI clusters as well
- Upgrade Installation currently only applies to upgrading z/VM 6.2 systems to z/VM 6.3.
- Minimal downtime of production workload

Thank you!

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