#SHAREorg

SHARE
Technology · Connections · Results

DFSMS™: Latest and Greatest
The Best of z/OS® R13 → R11

Barbara McDonald, IBM
IBM DFSMS Product Management
bawhite@us.ibm.com

August 6, 2012
Session 12015

SHARE in Anaheim 2012

#SHAREorg

SHARE
Technology · Connections · Results

Disclaimer

The information on the new product is intended to outline our general product direction and it should not be relied on in making a purchasing decision. The information on the new product is for informational purposes only and may not be incorporated into any contract. The information on the new product is not a commitment, promise, or legal obligation to deliver any material, code or functionality. The development, release, and timing of any features or functionality described for our products remains at our sole discretion.

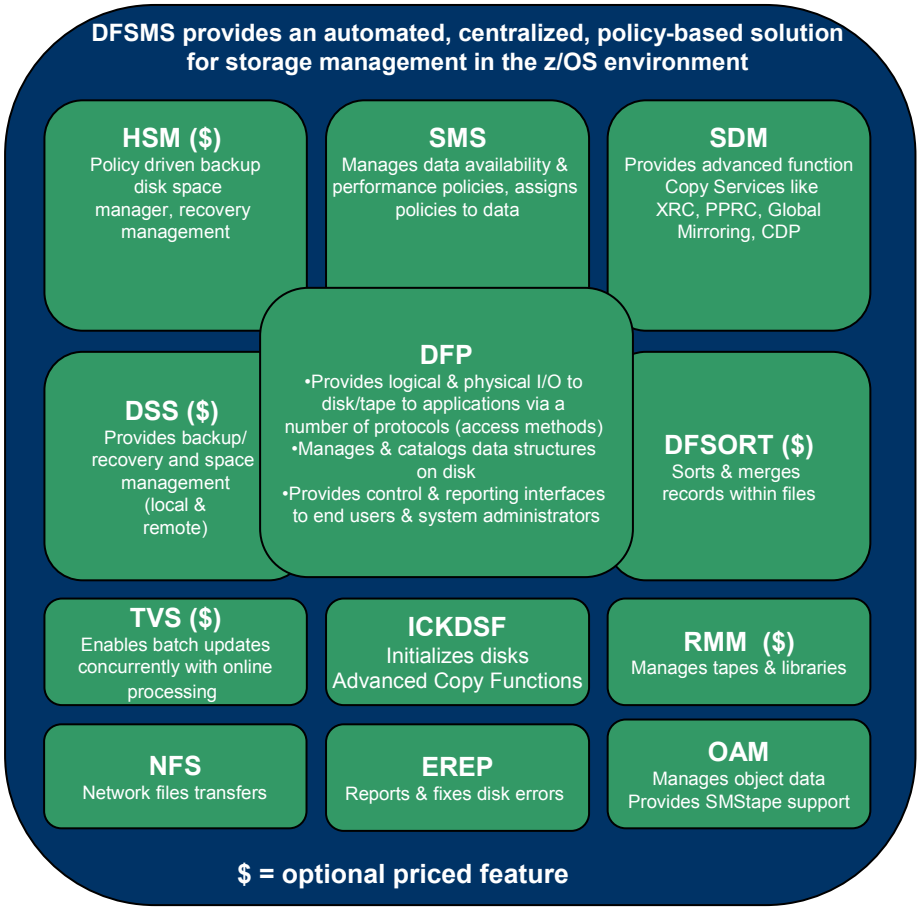
SHARE in Anaheim 2012

DFSMS™: Providing System Managed Storage on z/OS®

Storing, managing, protecting, and serving data on a zEnterprise System

DFSMS is the standard methodology worldwide for managing enterprise data and storage on the z/OS platform

DFSMS strategy addresses explosive growth and management of customer data



- **DFSMS drives value as the data hub for System z:**
  - **Creates integrated solutions by exploiting new hardware features**
    - Improved Security with exclusive media encryption capability, integration with z/OS Key Management
  - **Maintains leadership in policy based storage management**
    - Improved storage administrator productivity and simplified management of the z/OS environment
  - **Strengthens business resiliency by exploiting new opportunities and advancements in data protection solutions**
    - Point-in-time copy, fast replication, and continuous data mirroring functions while preserving consistency
  - **Supports growing businesses and mission critical workloads by providing continuous availability, scalability/performance and flexibility of storage and data**
    - Increased data storage capacity and scalability to cope with explosive growth of data volumes and database sizes
    - High Availability with simpler, faster, and more reliable recovery operations
    - Ability to cope with increased security and compliance requirements
  - **Enables cross platform data and storage**
    - Data availability at all levels of the storage hierarchy

z/OS® DFSMS™ V1.13 Highlights
(September 2011)

- **DFSMShsm**
  - **DFSMShsm CDS Backup Improvements**
  - **DFSMShsm "On Demand" Migration**
  - **DFSMShsm RAS and Usability Enhancements**
- **DFSMSrmm**
  - **DFSMSrmm Simplified Monitoring & Management**
  - **DFSMSrmm RAS Enhancements**
- **SDM**
  - **SDM RAS Enhancements**
- **OAM**
  - **OAM Filesystem Support**
  - OAM Usability & Reliability Enhancements
- **NFS**
  - NFS Windows 7 Support
- **DFSMSdfp**
  - **OCE Descriptive Text for Errors**
  - OCE Support for XTIOT and Uncaptured UCBs
  - OCE Tape Error Recovery for missing and out of sequence volumes
  - OCE FREEVOL=EOV Support
  - OCE RAS
  - **EAV Enhancements**
- **Access Methods**
  - VSAM RLS Buffer Enhancements
  - BAM RAS Enhancements
  - **BAM Support for zHPF**
  - **Media Manager Support for DB2 List Prefetch**
- **Catalog**
  - Catalog PARMLIB Support
  - **Catalog VVDS Expansion**
  - **Catalog Alias Constraint Relief**
  - Catalog Search Interface Redrive
  - Replace Catalog Pseudo-Close with VSAM Close
- **IDCAMS**
  - IDCAMS LISTCAT LEVEL
  - **IDCAMS DELETE UCAT Message**
- **SMS / ISMF**
  - ISMF Sort Capability & Space in GB
  - **SMS Best Practices Enhancements**
  - SMS Support for Increased Retention Period
  - **SMS RAS Enhancements**
- **PDSE**
  - **IEBPDSE Command**
  - PDSE Fairness/Sharing Policy
  - **IEBCOPY Enhancements**
- **DADSM / CVAF / Device Services**
  - **DADSM / CVAF Availability Enhancements**
  - Update Volume Information

z/OS® DFSMS™ Highlights

- Where to find additional information:
  - **R13**
    - **DFSMS Using the New Functions (SC26-7473-08) –** (http://publibz.boulder.ibm.com/cgi-bin/bookmgr/Shelves/ez2zo111?filter=DFSMS+Using+the+New+Functions+&SUBMIT=Search+titles)
    - **z/OS V1.13 DFSMS Technical Update** (http://www.redbooks.ibm.com/redpieces/pdfs/sg247961.pdf)
  - **R12**
    - **DFSMS Using the New Functions (SC26-7473-07) -** http://publibz.boulder.ibm.com/epubs/pdf/dgt2g570.pdf
    - **z/OS V1.12 DFSMS Technical Update -** http://www.redbooks.ibm.com/abstracts/sg247895.html?Open
  - **R11**
    - **z/OS V1R11.0 DFSMS Using the New Functions (SC26-7473-06) -** http://www-03.ibm.com/systems/z/os/zos/bkserv/r11pdf/#dfsms

z/OS DFSMS Highlights
(September 2011)

- **DFSMShsm**
  - **R13**
    - DFSMShsm CDS Backup Improvements
    - DFSMShsm "On Demand" Migration
    - DFSMShsm RAS and Usability Enhancements
  - **R12**
    - DFSMS Fast Reverse Restore Enhancements
    - DFSMShsm Space Management Performance
  - **R11**
    - DFSMShsm Fast Replication Enhancements
    - DFSMShsm ML1 Enhancements

Session 12011: The Wonderful World of DFSMShsm SETSYS Commands, Monday 4:30PM

Session 12010: The Life and Times of a Data Set: You Wouldn't Want Your Relatives Hanging Around, Why Your Data?, Thursday 8AM

Refer to Atlanta 2012 Conference proceedings:
•Session 10950: What's New In DFSMShsm

DFSMShsm R13

- **DFSMShsm CDS Backup Improvements**
  - During the backup of DFSMShsm Control Data Sets (CDS), DFSMShsm activity is quiesced to ensure integrity of the backup.
    - While Concurrent Copy can reduce the backup of each control data set to a few seconds, the backup of the journal can take many minutes.
    - This can impact production processing as jobs may be waiting for DFSMShsm recalls, recoveries, or backups.
  - ***New enhancement***: CDS backup processing will begin the backup function immediately instead of waiting for DFSMShsm requests to complete.
    - The backup of the Journal will begin before the CDSes are quiesced
      - *The journal is a sequentially written data set and as such, allowing DFSMShsm activity to continue during the backup of the unchanged data would not impact the integrity of the backup.*
      - *DFSMShsm activity will be quiesced only during the backup of the new records at the end of the journal.*

? **Why it Matters:** Improve system responsiveness with less-disruptive DFSMShsm journal and control data set (CDS) backups.

DFSMShsm R13

- **DFSMShsm "On Demand" Migration**
  - Interval migration (IM) -- at the top of every hour, DFSMShsm performs a space check on every volume that it manages.
    - Causes a spike in DFSMShsm CPU usage and can consume a lot of wall clock time.
  - ***New enhancement:*** Specify that space management be done when any volume in a storage group for which auto-migration is enabled exceeds the utilization threshold, rather than waiting for Interval Migration processing – On Demand Migration (ODM)
    - The hourly check is replaced with an exit that will listen for an existing ENF 15 signal that indicates that an SMS configuration change has occurred.
    - Installations can select which type of space management processing they would like DFSMShsm to perform – IM or ODM

? **Why it Matters:** Make DFSMShsm space management more responsive when On Demand Migration replaces Interval Migration processing.

DFSMShsm R13

- **DFSMShsm RAS and Usability Enhancements**
  - **RELEASE RECALL (DASD)**
    - After a HOLD RECALL command is issued, there is no command to release the tasks recalling from DASD volumes without also releasing the hold on recalls from tape volumes.
      - *If an operator experiences a major problem with a tape subsystem, there is no way to release DASD recalls without issuing a general RELEASE RECALL.*
    - ***New enhancement:*** A new subparameter for the RELEASE RECALL command you can use to specify that DFSMShsm avoid recalling data sets from missing or faulty tapes while releasing the hold on recalls from DASD.
    - ***Share Requirement MET:*** SSMVSS09005
      - *Once a HOLD RECALL command has been issued, there is no way to release DASD recalls without also releasing tape recalls.*

? **Why it Matters:** If a tape subsystem will be down for an extended period of time, work can continue for those datasets only migrated to DASD.

DFSMShsm R12

- **DFSMS Fast Reverse Restore Enhancements**
  - Currently Disk recovery cannot be performed until the physical background copy is complete (hours after the logical backup was created) and disk recovery from a NOCOPY version is not supported.
  - ***New enhancement:*** DFSMSdss and DFSMShsm will exploit the Fast Reverse Restore feature.
    - Enable DFSMShsm to flash back for disk recovery even though the background copy has not completed and enable fast replication disk recovery from a NOCOPY version
    - Fast Reverse Restore function will support the recovery of a
      - *Copy pool without waiting for physical background copy to complete*
      - *Copy pool from a disk version in either COPY or NOCOPY environment*
      - *Copy pool from space efficient volumes in NOCOPY environment*
    - Only supported for recovery of entire copy pool and source volumes cannot be in any other FlashCopy relationships
      - *Since the background copy does not complete, the backup version is invalidated and backup volumes are initialized as part of the recovery*
    - New SMS copy pool setting indicates whether Fast Reverse Restore is enabled
      - *YES indicates it is acceptable to recover a version before the background copy is complete and for the backup version to become invalidated*
      - *The copy pool setting is stored for each backup version at the time of backup*
      - *Recovery of the copy pool uses Fast Reverse Restore if the backup version is FCFRR-enabled (FlashCopy fast reverse restore) and flash back is possible*
    - A new DFSMShsm SETSYS parameter indicates whether extent or full-volume FlashCopy relationships are to be established between volume pairs when DFSMShsm invokes DFSMSdss to perform fast replication backup and recovery.

? **Why it Matters:** Enables DFSMShsm to FlashBack for recovery even though the background copy has not completed – could save hours!

DFSMShsm R12

- **DFSMShsm Space Management Performance**
  - Intended to address performance issues due to vertical growth (increasing the number of data sets on individual disk volumes - EAVs) and horizontal growth (increasing number of data sets across more disk volumes).
    - Volume level space management functions may not finish within expected timeframes.
  - ***New enhancement:*** New option to overlap volume pre-processing with volume data movement in order to reduce elapsed time.
    - Volume data movement can be started while volume pre-processing is occurring for the next volume.
    - Supported for Primary Space Management, On Demand Migration, Interval Migration, and the MIGRATE PRIMARY command (non-SMS)

? **Why it Matters:** Potentially could save a lot of time in large DFSMShsm environments.

DFSMShsm R11

- **DFSMShsm Fast Replication Enhancements**
  - In V1.8, DFSMShsm introduced support to recover individual data sets from copy pool backup versions.
    - DFSMShsm provided support for preallocated, cataloged data sets residing on the same volumes they were on when backed up.
    - Deleted or moved data sets had to be reallocated and cataloged to the same volumes on which they resided when backed up in order to recover them.
  - ***New enhancement:*** Capture catalog information for the data sets within a copy pool at the time of the backup, and use that information to recover the dataset.
    - When DFSMShsm processes a Fast Replication recover command, it will reference the catalog information stored at backup time and use that information to recover the dataset.
    - New fields in the SMS copy pool definition enable the user to define up to 10 catalogs associated with the copy pool.
      - *The field "Capture catalog information for data set recovery(R | P | N)" will let the user define whether or not DFSMShsm should capture catalog information at the time of backup for the specified catalogs. If no value is set by the user, the default value will be "N".*

? **Why it Matters:** Added flexibility for users of HSM Fast Replication by supporting recovery of data sets which have previously been deleted or moved.

DFSMShsm R11

DFSMShsm ML1 Enhancements

- Today, HSM data sets (migration and backup) that are allocated on ML1 volumes are physical sequential data sets.
  - Prior to R11, there existed a ML1 volume restriction against migrating or backing up a data set whose expected size after compaction (if active and used) is greater than 65 536 tracks.
- ***New enhancement:*** Allow data sets larger than 64K tracks in size to be migrated and backed up to disk.
  - Data sets larger than 58K tracks will target a Large Format physical sequential data set for the migration/backup data set, which can be larger than 64K tracks.
  - ML2 disk is also supported.
  - The new limit for backed up or migrated copies is equal to the maximum size limit for the largest volume available.

? **Why it Matters:** Provide added scalability to HSM and avoid errors and back-out processing if the data set did not compress under 64K tracks.

DFSMShsm R11

DFSMShsm ML1 Enhancements

- Prior to R11, ML1 overflow volumes are used for data set backup processing only.
  - At any given time, there may not be enough free space on any ML1 volume for larger data sets because all of the volumes are filled up evenly. **OR**
  - There might be enough total free space on a ML1 volume to allocate a data set, but the allocation may fail because there is not enough contiguous free space.
- ***New enhancement:*** Enable Migration Level 1 (ML1) overflow volumes to be selected for migration processing, in addition to backup processing.
  - New SETSYS command will be introduced to manage the minimum size a data set must be to prefer OVERFLOW ML1 volume selection for migration or backup copies.
    - *Use a new ML1OVERFLOW parameter with the subparameters of DATASETSIZE(dssize) and THRESHOLD(threshold) to determine when to prefer ML1overflow volumes.*
    - *Default value is 2000000 (about 36K tracks)*

? **Why it Matters:** Provide added scalability to HSM.

z/OS DFSMS Highlights

- **DFSMSrmm**
  - **R13**
    - DFSMSrmm Simplified Monitoring & Management
    - DFSMSrmm RAS Enhancements
  - **R12**
    - DFSMSrmm Ease of Use Enhancements
    - DFSMSrmm TS7700 Reporting Enhancements
    - DFSMSrmm Active and Queued Task Management
  - **R11**
    - DFSMSrmm Reporting Enhancements

Session 11752: RMM Power Tools – How to Tame RMM Vital Record Specifications (VRS), Tuesday 1:30PM

Session 12009: DFSMS Basics: Storage Reporting Using the Report Generator, Wednesday 3PM

Refer to Atlanta 2012 Conference proceedings:
•Session 10551: What's New With DFSMSrmm V1R13 Big Changes

DFSMSrmm R13

- **DFSMSrmm Simplified Monitoring & Management**
  - **VRS Management Updates**
    - All data in the RMM inventory is managed by dynamic VRS policies. With every housekeeping run, the retention for a volume or a data set can change.
    - ***New enhancement:*** Exclude single data sets from VRSEL.
      - *VRSEL processing is reduced by eliminating certain types of data from VRSEL processing*

    ? **Why it Matters:** Help simplify retention policies, avoid batch VRS policy management, and enable you to determine how long a tape data set will be retained.

    - ***New enhancement:*** Optionally assign a retention method at the time a tape data set is created enabling a choice of whether data is managed by expiration date or by VRS policies.
      - *Retention information for expiration date retained data can be known when a tape data set is created.*

    ? **Why it Matters:** Enables use of simpler retention policies and helps to avoid batch VRS policy management.

DFSMSrmm R13

- **DFSMSrmm RAS Enhancements**
  - **VRS Last Reference Date**
    - After some time the number of Vital Record Specifications in a customer installation may grown to a number that is hard to manage.
      - *No longer used VRSes are especially hard to identify.*
    - ***New enhancement:*** Display the VRS last reference date in the dialog and provide sorting of search results by it.

    ? **Why it Matters:** The user can now quickly and easily cleanup unused VRSes.

DFSMSrmm R12

- **DFSMSrmm Ease of Use Enhancements:**
  - **DFSMSrmm ISPF dialog search results can be bypassed when using the CLIST option**
    - Sometimes when a user gets large search results these results can't be displayed due to memory limitations.
    - ***New enhancement:*** Write the results to a CLIST dataset and use a new input field, NOLIST, to skip the display of the search results.
    - ***SHARE Requirement MET***: SSMVSS09006
      - *Implement NOLIST option for RMM CLIST commands in dialog*

    ? **Why it Matters:** Bypasses system memory size limitations and reduces the run time

  - **RMM exploitation of a new Timed Auto Reply Function**
    - DFSMSrmm issues several messages requiring operator intervention.
      - *In case of missing or incorrect operator replies there could be an impact on production tape processing*
    - ***New enhancement:*** Provide an additional way for the system to respond automatically to write to operator with reply (WTOR) messages.
    - ***SHARE Requirement MET***: SSMVSS09007
      - *Prevent RMM impact when issuing WTOR in parallel*
  - **Why it Matters:** Can define autoreplies to DFSMSrmm messages to minimize the risk of operator intervention.

DFSMSrmm R12

- **DFSMSrmm TS7700 Reporting Enhancements**
  - The TS7700 library provides information about copy exported data based on volume serial numbers only.
    - There is no information regarding the exported data sets.
  - ***New enhancement:*** DFSMSrmm will help with reporting of data sets and logical volumes which are copy exported from a TS7700 virtualization engine.
    - Reports can be created either from the export list file of up to three copy exports, or from the information created from the TS7700 Bulk Volume Information Retrieval Function (BVIR).
      - *Sample report job located in SYS1.SAMPLIB(EDGJCEXP)*

? **Why it Matters:** Quick and easy way to create a list of data sets on the volumes copy exported.

DFSMSrmm R12

- **DFSMSrmm Active and Queued Task Management**
  - There was no way to retrieve information about the DFSMSrmm subsystem requests and task status except the MODIFY operator command.
  - ***New Enhancement:*** New TSO subcommand, RMM LC STATUS
    - Provides information about the DFSMSrmm subsystem, subsystem requests, and task status
      - *The information returned is very similar to the results of the operator QUERY ACTIVE command*
    - Issued using TSO, the RMM API, HLL API, and the Web Service
    - RMM dialog panel EDGPCC00 can be used to view RMM status and to use Hold, Release and Cancel commands against tasks

? **Why it Matters:** Enables storage applications to monitor and act on the available information.

DFSMSrmm R11

- **DFSMSrmm Ease of Use Enhancements**
  - ***New enhancement:*** Report Generator updates which include improved usability, additional customization of reports, and simplified specification of selection information for DFSMSrmm, DFSMShsm and other DFSMS components.
    - Exploitation of recent changes to DFSORT and ICETOOL
    - Data typing
    - Report type inheritance
  - ? **Why it matters:** Enhanced DFSMSrmm reporting functionality

z/OS DFSMS Highlights

- **DSS**
  - **R12**
    - BSAM I/O for DUMP output, COPYDUMP, and RESTORE input

DFSMSdss R12

- **BSAM I/O for DUMP output, COPYDUMP, and RESTORE input**
  - ***New enhancement:*** DFSMSdss will use larger blocks when possible for DUMP, COPYDUMP, and RESTORE operations, and to support Extended Format Sequential dump data sets on DASD for DUMP, RESTORE, and COPYDUMP.
    - Create copy and restore backups on tape with larger than 65520 byte blocks
    - Create copy and restore backups in the extended format on DASD
    - Fallback to the old method of EXCP instead of BSAM at the JOB, application or installation level.
  - The use of larger block sizes is intended to provide
    - Increased flexibility for dump data set types
    - Faster throughput, shorten batch window for backups
    - Backups greater than 4GB, SMS compression, striped backups (ie support
  - DFSMShsm functions that will exploit this enhancement
    - BACKVOL/FRBACKUP DUMP
    - AUTOMATIC DUMP
    - RECOVER/FRRECOV FROMDUMP

? **Why it Matters:** Improve DFSMSdss performance, elapsed time improvement up to 36% (average~20-30%)

z/OS DFSMS Highlights

- **SDM**
  - **R13**
    - SDM RAS Enhancements
  - **R12**
    - SDM Support of ATTREXX Interface

Session 11677 Performance and Tuning an XRC (zGM) Environment, Wednesday 1:30PM

Session 12037: IBM DS8000 Advanced Copy Services, Thursday 11AM

SDM R13

- **SDM RAS Enhancements**
  - **EAV 1TB Volume Bitmaps**
    - Bitmaps for 1TB volumes take up 31,457,280 bytes.
    - ***New enhancement:*** Place bitmap above the 2GB bar.
    - **Why it Matters:** Cut down on space used in an XRC primary address space and provide XRC exploitation of EAV volumes.
  - **XRC Timestamp Suppression**
    - Continuation of APAR OA24780
      - *Timestamping of writes is an essential mechanism that XRC uses to maintain sequence consistency of writes to the secondary volumes.*
      - *When the XRC System Data Mover is run on a remote Recovery system that does not share a common time reference with the Application systems, it's important to configure the system in a way that avoids introduction of incorrect timestamps into the XRC storage control sessions.*
    - Today, users must zap or patch a bit in a SYS1.NUCLEUS module which is problematic due to system change control standards in use at many installations
    - ***New enhancement:*** New ANTXIN00 PARMLIB parameter, SuppressTimestamp(NO|YES) checked at ANTAS000 startup only

SDM R12

- **SDM Support of ATTREXX Interface**
  - Currently, SDM has an unsupported REXX interface that has been used as a test tool for the ANTRQST API and has been used by a small set of customers.
  - ***New enhancement:*** The System Data Mover (SDM) component will provide a REXX interface for many of the functions of the SDM programming interface (ANTRQST)
    - Provides interfaces to FlashCopy®, Global Mirror, z/OS Global Mirror (XRC), Metro Mirror (PPRC), and other misc. SDM services.
    - CLISTs will be provided in SYS1.SAMPLIB for the invocation of ANTTREXX.
    - Results from ANTTREXX will be in the form of messages indicating the success or failure of the request.
    - Complete documentation provided in z/OS V1R11.0 DFSMS Advanced Copy Services (SC35-0428-16).
  - ***SHARE Requirement MET:*** SSMVSS07014
    - Provide a supported REXX interface for the System Data Mover

? **Why it Matters:** Provides advanced users with a better programming interface.

z/OS DFSMS Highlights

- **OAM**
  - **R13**
    - OAM Filesystem Support
  - **R12**
    - OAM Performance
  - **R11**
    - OAM Archive Retention Enhancements

Refer to Anaheim 2011 Conference proceedings:

Session 9009: What's New With OAM Object Support

Session 9008: DFSMS Object Support: Data Archiving with OAM

OAM R13

- **OAM Filesystem Support**
  - OAM's storage hierarchy supports disk, tape, and optical storage levels.
  - ***New enhancement:*** OAM adds support for file systems to the disk level for zSeries File System (zFS) and Network File System (NFS) file systems, in addition to the existing support for DB2-backed object storage.
    - Support of file systems for primary OAM object storage allows z/OS UNIX file systems to store, retrieve, and delete objects, and to move objects between file systems and other locations in the OAM hierarchy.

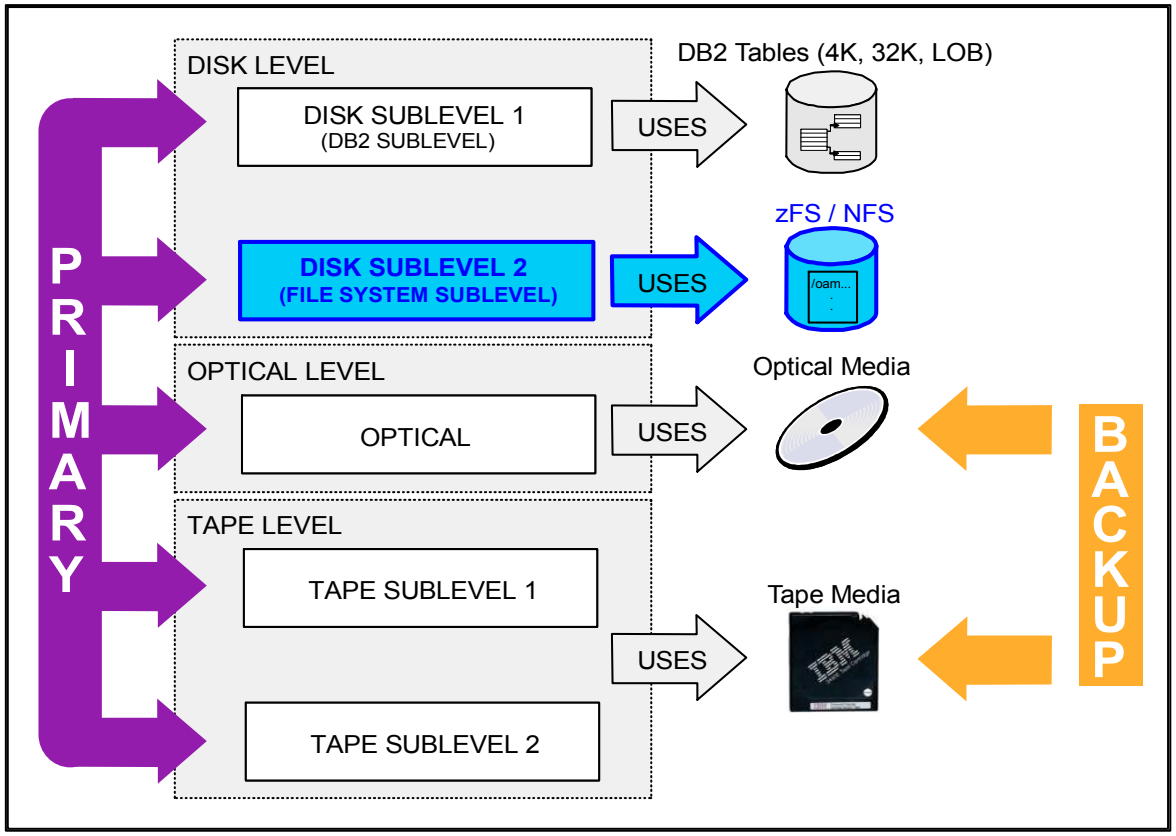
? **Why it Matters:** Provides new, more flexible ways to configure OAM storage hierarchy.

OAM R13

- **OAM Filesystem Support**
  - Disk Level
    - DB2/DASD sublevel
    - **File System sublevel**
  - Optical Level
  - Tape Level
    - Tape sublevel 1
    - Tape sublevel 2
  - Each object stored as a file in z/OS UNIX storage hierarchy
  - Supported File System Types
    - zFS (on native attached DASD)
    - NFS (using wide variety of storage technologies on NFS server)

NEW

New OAM hierarchy file system sublevel to the Disk Level for primary objects



OAM R12

- **Volume Recovery Improvements**
  - ***New enhancement:*** Improved performance with the Volume Recovery utility in certain situations when recovering object data stored on optical and tape media.
    - Utility redesigned to more efficiently access object information.
  - Improvements most noticeable when recovering a backup volume containing objects with primary copies in a large number of different collections on a large number of different volumes.
  - Statistics displayed now include the count of objects remaining on the recovered volume (i.e. that were NOT recovered)

? **Why it Matters:** Improved performance when recovering objects.

OAM R11

- **OAM Archive Retention Enhancements**
  - Added new retention-related enhancements
  - Enhance protection against inadvertent object deletion and provide a mechanism for complying with government regulations
    - Deletion-hold: Prevent object deletion while object is in deletion-hold mode.
    - Deletion-protection: Prevent object deletion prior to object's expiration date.
    - Retention-protection: Prevent object deletion prior to object's expiration date, and don't allow expiration date to be changed (explicitly or implicitly) to an earlier date.
      - *Note: RP in effect for life of object. If expiration date is ever set to 'forever' the object can never be deleted.*
    - Event-based-retention: Object expiration date dependent on external event notification.

? **Why it Matters:** Adding archival features to z/OS to enable it to meet industry and Legal requirements.

z/OS DFSMS Highlights

- **DFSMSdfp**
  - **R13**
    - OCE Descriptive Text for Errors
    - OCE RAS
    - EAV Enhancements
  - **R12**
    - DFSMS Support for XTIOT and Uncaptured UCBs
  - **R11**
    - DFSMSdfp Enhancements
    - DS8K Dynamic Volume Expansion Enhancements

Session 12040: What's New With the DS8000, Wednesday 9:30AM

OCE R13

- **OCE Descriptive Text for Errors**
  - OCE and the OPEN or CLOSE access method executors detect hundreds of error conditions that result an abend message containing a numeric abend code and return code value but with no explanatory text.
  - ***New enhancement:*** An installation option, ***originally set*** via DEVSUPxx, to additionally include the descriptive text appended to the associated abend message.
  - ***NEW UPDATES:*** Problem identified by ESP customers: no way to restrict descriptive text only to JOBLOG
    - MPFLSTxx allows users to specify whether system components that support verbose messages (multi-line message that contains additional lines of explanation) should produce the messages or not.
    - If requested, they will be included in their entirety in the JOBLOG but the extra lines of explanation will not be included in the SYSLOG or OPERLOG and will not be queued to any consoles.
      - *MPFLSTxx recognizes one statement type .MSGOPTION VERBOSE[(Y)] [(N)]*
      - *If the VERBOSE setting is Y, then the system writes all of the lines to the job's log. If the VERBOSE setting is N (the default), the system discards the optional lines.*

? **Why it Matters:** Improved RAS and first time data capture. Eliminates the need to reference the message manuals to interpret the abend and return codes.

OCE R13

- **OCE FREEVOL=EOV Support**
  - Long running programs that read or write multivolume tape data sets prevent other jobs from accessing any of the volumes until the job unallocates all of the volumes.
  - ***New enhancement:*** Allow different systems in the sysplex to concurrently read multivolume tape files in a way similar to the Deq at Demount Facility.
    - A new JCL keyword (FREEVOL=EOV) will allow a tape for part of a multivolume data set to be available at end of volume rather than end of step.
    - Limitations:
      - *Does not require APF authorization, and since it is implemented in the JCL, no changes to the application are required.*
      - *Honored only for input processing.*
      - *EOV and CLOSE volume disposition processing will unload the volume when the disposition would otherwise be REWIND.*

  ? **Why it Matters:** Allow other jobs to use the tape immediately and overlap processing of multivolume tape data sets.

What is an EAV?

- **What is an Extended Address Volume (EAV)?**
  - A volume with more than 65,520 cylinders
  - Size limited to 223 GB (262,668 Max cylinders)
  - Supported in z/OS V1R10 and higher
- **What is EAS Eligible?**
  - A data set on an EAV that is eligible to have extents in the extended addressing space and described by extended attribute DSCBs (format 8/9)
    - Can reside in track or cylinder-managed space
    - SMS-managed or non-SMS managed
    - Any data set type can reside in track-managed space

Breaking the 65,520 cylinder limit

EAV Support

- **Data set types supported:**
  - VSAM data types (KSDS, RRDS, ESDS and linear)
    - This covers DB2, IMS, CICS, zFS and NFS
    - CA sizes: 1, 3, 5, 7, 9 and 15 tracks
  - Sequential (Extended Format)
  - Sequential (Basic and Large Format)
  - Direct (BDAM)
  - Partitioned (PDS, PDSE)
  - Catalog (VVDS and BCS)
  - All data sets used by DFSMSrmm (journal and dynamically allocated temporary files)
    - One exception is the RMM CLIST data set when created automatically by SEARCH subcommand processing.
- **Data set types *not* supported:**
  - VSAM data sets with IMBED or KEYRANGE attributes
  - VSAM data sets with incompatible CA sizes
  - Page data sets, HFS data sets, logrec
  - NUCLEUS, SVCLIB, VTOC, VTOC index
  - XRC Control, Master or Cluster non-VSAM data sets
  - RACF® databases
  - DFSORT work data sets used for Peervale sorts
  - Parmlib concatenation data sets
- **Vendor Support**
  - For a list of vendor products that support EAV, refer to the following table:
    - R12: http://www-03.ibm.com/systems/z/os/zos/software/isv112.html
    - R13: http://www-03.ibm.com/systems/z/os/zos/software/isv113.html

EAV R13

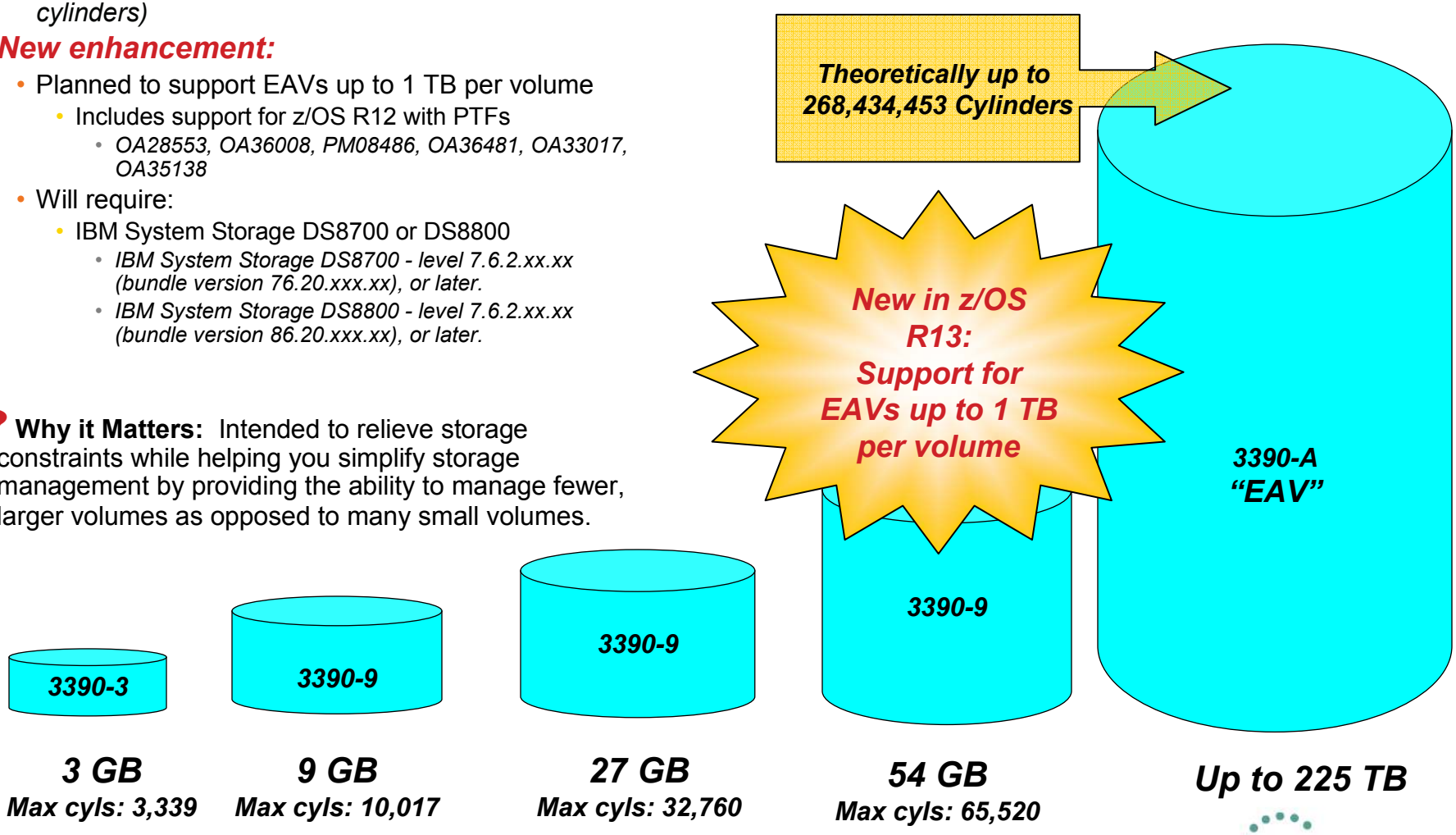
- **z/OS R13 Exploitation**
  - Communications Server FTP support for more data set types in the EAS of EAVs, enabling FTP to access this additional DASD capacity when allocating, storing, and retrieving data sets that are eligible to reside there.
    - SMS-managed and non-SMS-managed physical sequential
    - Basic and large format data sets
    - PDS and PDSE data sets
    - GDG data sets
  - ISPF provides support for Displaying job and step names stored by the system for data sets that are eligible to reside in the EAS of an EAV in the Data Set List utility (option 3.4), and retrieving this information using the DSLIST and LMDLIST services.
    - Intended to allow users to find the creating job and step names easily.
  - SDSF is designed to support extended format sequential (DSNTYPE=LARGE) print files, and print files that are placed in the EAS of an EAV.

? **Why it Matters:** Scalability for customers constrained by 4 character UCB's

EAV R13

- **Maximum cylinders**
  - *Today, size limited to 223 GB (262,668 Max cylinders)*
- ***New enhancement:***
  - Planned to support EAVs up to 1 TB per volume
    - Includes support for z/OS R12 with PTFs
      - *OA28553, OA36008, PM08486, OA36481, OA33017, OA35138*
  - Will require:
    - IBM System Storage DS8700 or DS8800
      - *IBM System Storage DS8700 - level 7.6.2.xx.xx (bundle version 76.20.xxx.xx), or later.*
      - *IBM System Storage DS8800 - level 7.6.2.xx.xx (bundle version 86.20.xxx.xx), or later.*

? **Why it Matters:** Intended to relieve storage constraints while helping you simplify storage management by providing the ability to manage fewer, larger volumes as opposed to many small volumes.



XTIOT and Uncaptured UCBs R12

- **DFSMS Support for XTIOT and Uncaptured UCBs**
  - In many z/OS environments, some workloads require an increasing number of open data sets.
  - ***New enhancement:*** Support the use of an extended task I/O table (XTIOT) with uncaptured UCBs and data set association blocks (DSABs) above the 16 MB line for BSAM, QSAM, and BPAM (basic and queued sequential, and basic partitioned access methods), OPEN/CLOSE/EOV, CVAF, DADSM, EXCP, and RACF processing.
  - Exploiters include:
    - SNAP/SNAPX services and dump processing (including that for SVC, SYSABEND, SYMDUMP, and SYSUDUMP)
    - AMASPZAP
    - The Program Management Binder
    - TSO/E
    - DFSORT
    - **z/OS R13 will allow**
      - ***Subsystems to use BAM DCBs and ACBs with XTIOT***
      - ***Unauthorized programs to use XTIOTs when a captured UCB is not requested***

? **Why it Matters: Help provide virtual storage constraint relief for address spaces that allocate a large number of data sets.**

DFSMSdfp R11

- **DFSMSdfp Enhancements**
  - Processing will be changed to indicate end-of-file (EOF) during the allocation of data sets on DASD that are not SMS-managed and have either sequential or an undefined data set organization
  - This is intended to make this processing for both SMS-managed and non-SMS-managed data sets consistent, to make it unnecessary to open data sets solely to indicate EOF, and to help prevent programs from accidentally* reading old data when a data set is read after being allocated.
  - ***NOTE:** This writing of a file mark at the beginning of new data sets clears only the first track of the new data set. All subsequent tracks are unchanged, and there is still a need to use the erase-on-scratch function to clear any residual data.
- ***SHARE Requirement MET:*** SSMVSS07016
  - Writing EOF (end-of-file) for non-SMS data sets at create time

? **Why it Matters:** Avoids accidentally reading old data – this is a data integrity improvement, not a security improvement.

DFSMSdfp R11

- **Dynamic Volume Expansion Enhancements**
  - DS8000® Dynamic Volume Expansion simplifies management by enabling easier, online, volume expansion to support application data growth.
    - Copy services relationships must be removed before volume expansion.
    - Some manual intervention was required.
  - ***New enhancement:*** Automatic VTOC and VTOC index rebuild
    - When a volume increase in size is detected by the system
      - *Triggered by state change interrupts (SCIs)*
    - Controlled with new DEVSUP*xx* PARMLIB option
      - *ENABLE(REFVTOC)*
      - *DISABLE(REFVTOC) – default*
  - The refresh of the index occurs under protection of an exclusive SYSTEMS ENQ macro for major name SYSZDMO, minor name DMO.REFVTOC.VOLSER.volser.

? **Why it matters:** Yields more highly available, simplified volume expansion.

z/OS DFSMS Highlights

- **Access Methods**
  - **R13**
    - BAM Support for zHPF
    - Media Manager Support for DB2 List Prefetch
  - **R12**
    - VSAM KSDS CA Reclaim

Session 11294: Using List Prefetch Optimizer and Solid State Disk to Improve DB2 Perf and Avoid DB2 Reorgs, Monday 3PM

Session 11980: BSAM, QSAM, and BPAM Support of zHPF, Wednesday 9:30AM

Session 11699: zHPF Demystified, Update and User Experience, Wednesday 11AM

Refer to Atlanta 2012 Conference proceedings: Session 10964: Reclaim Those Empty CAs!

BAM R13

- **High-Performance FICON (zHPF) improvements**
- ***New enhancement:*** zHPF to support certain I/O transfers for QSAM, BPAM, and BSAM
  - Significant I/O performance improvements are expected without the need for application changes.
  - Extends current zHPF support for VSAM, Extended Format sequential, zFS, and PDSE data sets to support:
    - Basic nonextended format Physical Sequential data sets
    - Basic and large format sequential data sets
  - Enable via:
    - IECIOSxx member of PARMLIB: SETIOS ZHPF=YES
      - *Also use SETIOS ZHPF=YES command*
    - IGDSMSxx member of PARMLIB: SAM_USE_HPF(YES|NO)
      - *Default NO on z/OS R11-R12, YES on z/OS R13*
      - *Also use SETSMS SAM_USE_HPF=YES command*

BAM R13

- **High-Performance FICON (zHPF) improvements**
  - Requires the following:
    - z/OS V1.13, z/OS V1.12 or z/OS V1.11 with PTFs
      - *OA34662 (Device Support)*
      - *OA34663 (AOM)*
      - *OA34661 (Media Manager)*
      - *OA34671 (SMS)*
      - *OA34672 (BSAM)*
      - *OA34673 (O/C/EOV)*
      - *OA34674 (Checkpoint Restart)*
      - *OA33089 (IOS)*
    - zEnterprise System server with channels that support zHPF and a minimum Machine Change Level (MCL)
    - HMC V2.11.1
    - Support Element V2.11.1
    - IBM System Storage DS8700 or DS8800 series with new DS8000 licensed machine code
      - *IBM System Storage DS8700 - level 7.6.2.xx.xx (bundle version 76.20.xxx.xx), or later.*
      - *IBM System Storage DS8800 - level 7.6.2.xx.xx (bundle version 86.20.xxx.xx), or later.*

? **Why it Matters:** Better I/O performance expected with no application changes

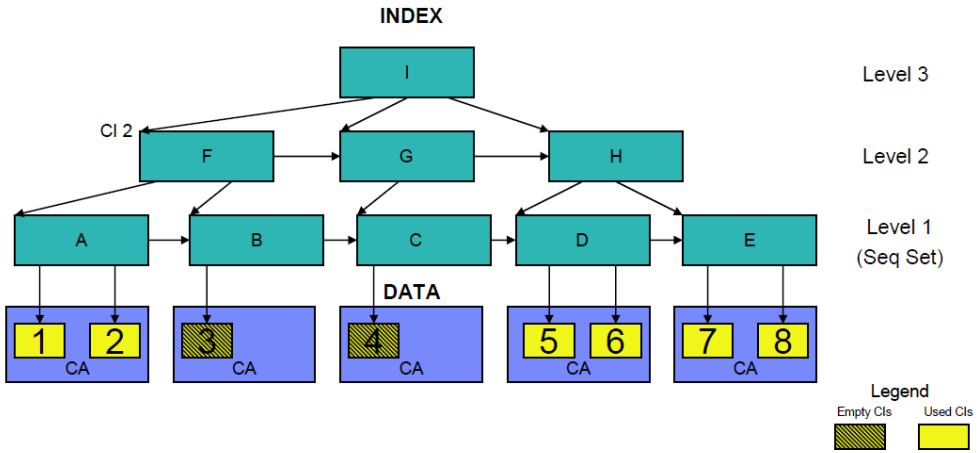
Media Manager R13

- **DB2 List Prefetch**
  - **Media Manager Support**
    - ***New enhancement:*** Provide improvements for DB2 list prefetch.
      - *Expected to provide significant performance improvements for certain DB2 queries and some DB2 utility operations.*
      - *Requires the following:*
        - *IBM System Storage DS8700 - level 7.6.2.xx.xx (bundle version 76.20.xxx.xx), or later.*
        - *IBM System Storage DS8800 - level 7.6.2.xx.xx (bundle version 86.20.xxx.xx), or later.*
      - *Also planned to be available on z/OS V1.11 and z/OS V1.12 with PTFs.*
        - *See previous list from zHPF*

? **Why it Matters:** Synergy and improved performance with a combination of z/OS, DB2, and System Storage.

VSAM KSDS CA Reclaim R12

- **24/7 Availability**
  - CA Reclaim circumvents VSAM KSDS files from being taken offline to reclaim unused space.
    - When records are erased from a VSAM KSDS, the empty CAs are not often reused, resulting in a “fragmented” data set
  - Applications that use VSAM key-sequenced data sets (KSDS) can benefit from improved performance, minimized space utilization, and improved application availability.
    - For example, IBM system tests indicate performance of dedicated VSAM workload could improve by up to 44%, in addition to helping avoid outages that used to be required to defragment and reorganize this data.
    - Performance improvements are anticipated for many applications using CICS®, VSAM, VSAM RLS, IMS™ VSAM, and Catalog processing.
  - **? Why it Matters: Avoids planned down time for VSAM KSDS reorg**



z/OS DFSMS Highlights

- **Catalog**
  - **R13**
    - Catalog VVDS Expansion
    - Catalog Alias Constraint Relief
  - **R12**
    - Catalog Partial Release
    - Extended Addressable Catalogs

Refer to Atlanta 2012 Conference proceedings:

Session 10976: ICF Catalog Management Overview, Wednesday 8AM

Catalog R13

- **Catalog VSAM Volume Data set (VVDS) Expansion**
  - The max of x'FFFF' CI's in a VVDS is the limiting factor for the number of VSAM data sets or number of data sets on an SMS managed volume.
  - ***New enhancement:*** Increase the max usable size of the VVDS
    - Maximum VVDS space increased from 5,460 tracks to 5,825 cylinders.
    - For most data set types, this is expected to be an increase from hundreds of thousands of data sets to millions of data sets per volume.

? Why it Matters: Allows the number of data sets per volume to scale with extended address volume (EAV) sizes.

Catalog R13

- **Catalog Alias Constraint Relief**
  - Approximately 3500 catalog aliases are allowed per user catalog.
    - In order to have more aliases, additional catalogs must be defined.
  - ***New enhancement:*** Increase the number of aliases defined for a user catalog.
    - New limit expected to be over 500,000 (depending on alias lengths). Creates a new catalog connector extension record (Type V).
    - Catalog parmlib member (IGGCATxx) keyword
      - *EXTENDEDALIAS(YES|NO)*
      - ***Do not specify YES until all systems that will process the catalog are at R13!***

? Why it Matters: Scalability; reduces the number of user catalogs to be defined and managed.

Catalog R12

- **Catalog Partial Release Enhancements**
  - Currently VSAM partial release, only releases space on volumes where the high-used RBA (HURBA) and the high-allocated RBA (HARBA) are on the same volume, **NOT sp**ace which spans multiple volumes.
  - ***New enhancement:*** VSAM partial release will release unused volumes in addition to releasing space on the last volume of a multi-volume VSAM data set that contains data.
- ***SHARE Requirement Partially Addressed:*** SSMVSS08002
  - Space Release Will not Release Over-Allocated Space for Multi-Volume Files
    - **Note:** This line item only addresses SMS, Extended Format (EF) datasets.

? **Why it Matters: More efficient use of storage resources**

Catalog R12

- **Extended Addressable Catalogs**
  - Catalogs are limited to 4 GB in size which affects the scalability needed as volumes grow and the number of data sets increases.
  - ***New enhancement:*** DFSMS will allow catalogs to be defined with extended addressability (EA)
    - This will make it possible to define and use Integrated Catalog Facility (ICF) Basic Catalog Structures (BCS) with EA, allowing catalogs larger than 4 GB.
  - ***SHARE Requirement MET:*** SSMVSS08006
    - DFSMS – ICF Catalog Size Relief

? Why it Matters: Allow more data sets in a single catalog

z/OS DFSMS Highlights

- **IDCAMS**
  - **R13**
    - IDCAMS DELETE UCAT Message
  - **R12**
    - IDCAMS DCOLLECT Enhancements
    - IDCAMS GDG Enhancements
  - **R11**
    - IDCAMS Delete Masking

Refer to Anaheim 2011 Conference proceedings:

Session 8977 What's New with DFSMS ICF Catalog and IDCAMS

AMS R13

- **IDCAMS DELETE UCAT**
  - When DELETE User-catalog with FORCE option is issued, IDCAMS issues a WTOR warning message to confirm the deletion.
  - ***New enhancement:*** Issue an operator message that requires a response before allowing a user catalog to be deleted when RECOVERY is specified.
    - Enabled using new operands of the MODIFY CATALOG command
  - ? **Why it Matters:** Help prevent inadvertent deletion of user catalogs in batch jobs using IDCAMS.

IDCAMS R12

- **IDCAMS DCOLLECT Enhancements**
  - ***New enhancement:*** **DCOLLECT data class (DC) records will be updated to include information about all data class attributes:**
    - VSAM SPEED and REUSE
    - Tailored Compression
    - CICSVR Forward Log
    - RLS Greater Than 4K Cache
    - Block Size Limit SPE
    - Dynamic Volume Count
    - RLS 64 Bits Virtual
    - Scaling Constants for Tape Support use
    - Tape Control Unit Performance Segmentation
    - SMB VSP
    - Tape Encryption
    - CA Reclaim

IDCAMS R12

- **Data set (D) records will be updated to include job names:**
  - In z/OS V1R11, new fields in the Format 9 DSCB added for the job name, step name and time of data set creation in mapping macro IECSDSL1.
  - ***SHARE Requirement MET:*** SSMVSS064955 - DFSMS: Add Jobname to Catalog Record When Data Sets Are Created.

- **Storage group (SG) records will be updated**
  - Include information about OAM Protect Retention and Protect Deletion settings provided in z/OS V1R11
  - ***SHARE Requirement MET:*** SSMVSS053125 - DFSMS: DCOLLECT Needs to Include More Fields

? **Why it Matters:** Ensure Data Class information is captured and available.

IDCAMS R12

- **IDCAMS GDG Enhancements**
  - Currently, IDCAMS, when deleting entire generation data groups (GDGs), invokes DFSMShsm recalls for any generation data sets that are migrated.
  - ***New enhancement:*** **IDCAMS will call DFSMShsm to delete such data sets without recalling them**
    - Expected to reduce processing time, particularly when one or more generation data sets have been migrated to tape.
  - ***SHARE Requirement MET:*** SSMVSS064933
    - Catalog Support of HDELETE for DELETE GDG FORCE

? **Why it Matters:** Potentially saves lots of time / avoids wasted recalls.

IDCAMS R11

- **IDCAMS Delete Masking**
  - IDCAMS DELETE command is enhanced to include a new function called DELETE MASK. It allows users to specify the data set name selection criteria desired with a mask-entry-name and a keyword “MASK”.
  - A mask-entry-name (also called a filter key) can have two consecutive asterisks (**) or one or more percentage signs (%).
    - ***Enhancement:*** OA29880 - Delete Masking will accept multiple qualifiers
  - Delete Masking not deleting entries from the master catalog unless the catalog name is specified.
    - ***Enhancement:*** OA30208 – Correction to have DELETE MASK follow normal catalog serch order
  - Delete up to 100 data sets without specifying multiple entry-names
    - ***Enhancement:*** OA30916/OA31658/OA32220 – Removes the limitation of allowing deletion of up to only 100 data sets.
  - Additional fixes to be provided with OA31658:
    - Delete Masking not deleting entries from the master catalog unless the catalog name is specified.
    - Delete Masking does not follow normal catalog search order.
  - TSO Support for Delete Masking
    - ***Enhancement:*** OA31526 – TSO support for Delete Masking
    - ***Enhancement:*** *OA32763* – Help text for TSO DELETE updated to include Delete Masking

? **Why it Matters:** Single command deletion of related DSN’s without qualifier considerations and 100 DSN Limit.

z/OS DFSMS Highlights

- **SMS / ISMF**
  - **R13**
    - SMS Best Practices Enhancements
    - SMS RAS Enhancements
  - **R12**
    - SMS Storage Group Mgmt & Volume Selection Enhancements
    - ISMF COPY Storage Group Enhancements
  - **R11**
    - SMS Data Set Separation by Volume

Refer to Atlanta 2012 Conference proceedings:

Session 10936: DFSMS Basics: How To Create/Modify An SMS Configuration And Write ACS Routines, Wednesday 11AM

Session 10954: Making The Most Of DFSMSdss And SMS: Hints, Tips, And Best Practices In Your z/OS Environment, Wednesday 1:30PM

SMS R13

- **SMS Best Practices**
  - R12 added new SMS health checks for the communications and active configuration data sets (COMMDS and ACDS)
    - Best practice to specify the REUSE option to avoid running into space problems (SMS reason code 6068) as result of subsequent ACDS updates, or IMPORT/EXPORT functions.
      - *SMS will run into space problems when a lot of updates happen on the CDS without REUSE option specified.*
    - SMS Health Check only acts as a detective without enforcing the requirement of the REUSE option.
  - ***New enhancement:*** SMS determines whether the configuration data set (CDS) has the REUSE attribute, and if not changes it to REUSE automatically during activation.

? **Why it Matters:** Avoid out of space conditions for SMS CDS.

SMS R13

- **SMS RAS Enhancements**
  - **Provide More Current Volume Space Statistics**
    - The volume statistics in the SMS control data set (SCDS) are not updated until the specific volume status is changed, i.e. varied online or offline or being allocated to.
      - *There is increasing demand by applications needing to calculate the actual available space in the entire storage group.*
    - ***New enhancement:*** When SMS is requested to retrieve the volume list for a storage group, if any of the volume statistics in the list are not updated, then SMS will issue an LSPACE macro to obtain the latest statistics for that volume.
      - *For performance reasons, only a maximum of 500 volumes in the list will be updated each time.*
      - *If there are more then 500 volumes in the list, then the remaining will be updated when the same SG is requested again.*

    ? **Why it Matters:** The storage administrator will see more recent volume statistics.

SMS R12

- **SMS Storage Group Mgmt & Volume Selection Enhancements**
  - Currently the HIGH Allocation/Migration Threshold value is 1-99%
    - Optimal value depends on the user's specific requirements; however, default value is 85%.
    - Best practices suggest a value for HIGH Threshold below 90%.
    - As volume sizes increase, one percent of a volume represents an increasingly large amount of storage. For example, on a 223 GB volume, 1% is over 2 GB of storage.
  - ***New enhancement:*** Increase HIGH Allocation/Migration Threshold max to 100%
    - The 100% specification is intended to be used to make more storage capacity available for storage groups that hold static data.
  - Large installations frequently have thousands of volumes and the candidate Storage Groups for a single allocation may also have hundreds if not thousands of volumes.
  - ***New enhancement:*** SMS processing of volume lists will be changed in a way intended to improve allocation performance for large volume lists.

? **Why it Matters:** With the new 223GB EAV size volumes, getting that last 1% is worthwhile! Also large volume list processing is improved.

ISMF R12

- **ISMF COPY Storage Group Enhancements**
  - Currently installations can copy storage group definitions from one control data set (CDS) to another.
    - However, the volumes defined in the storage groups cannot be copied. The Storage administrator will have to manually add volumes to the storage groups.
  - ***New enhancement:*** Specify that the volume list for pool-type storage groups be copied at the same time.
    - This allows you to copy entire storage groups from one configuration to another without having to add their volumes to the destination CDS afterward.

? Why it Matters: Saves (potentially much) time and effort

SMS R11

- **SMS Data Set Separation by Volume**
  - ***New enhancement:*** SMS will support the allocation of critical data sets (such as DB2partitions) on different volumes
    - Designed to expand the existing data set separation function, to allow you to specify that critical SMS-managed data sets be separated across extent pools and volumes that are not used by other data sets specified in the separation group.
  - ? **Why it matters: H**elp reduce I/O contention and provide improved performance and avoid single points of failure

z/OS DFSMS Highlights

- **PDSE**
  - **R13**
    - IEBPDSE Command
    - IEBCOPY Enhancements
  - **R12**
    - PDSE EMPTY Command

Refer to Orlando Conference proceedings:

Session 9939: What We've Done for You Lately With PDSE

Session 9940: IEBCOPY – Teaching an Old Dog New Tricks

PDSE R13

- **IEBPDSE Command**
  - Over the years there have been a number of customer requirements requesting the ability to verify the structural integrity of a PDSE.
    - In some instances, customers back-up broken data sets as part of their routine operations, only to become aware of the problem months after the operation occurred, or multiple backups after the first one.
  - ***New enhancement:*** A new utility, IEBPDSE, will verify the structure of a PDSE is valid.
    - The PDSE validation utility may be invoked using job control statements. Like most utilities, IEBPDSE can be invoked from TSO if SYSLIB is allocated to a PDSE.
      - *EXEC statement invokes the PDSE validation utility using PGM=IEBPDSE. The PARM keyword may be specified.*
      - *PARM=[DUMP|NODUMP] If the DUMP option is specified, the PDSE validation utility will issue an ABEND in the PDSE address space when an error has been found in the analysis of the PDSE.*
    - PDSE validation utility does not validate the data in the members.
    - IEBPDSE does not require APF authorization.
  - ? **Why it Matters:** Help detect errors in PDSE structures that might otherwise go undetected.

PDSE R13

- **IEBPDSE Command**
  - **Examples:**
    - The following JCL can be used to invoke the PDSE validation utility:

```
//STEPCHK  EXEC PGM=IEBPDSE
//SYSPRINT DD SYSOUT=A
//SYSLIB   DD DSN=IBMUSER.SIMPLE.V2.PDSE,DISP=OLD
//STEPCHK2 EXEC PGM=IEBPDSE
//SYSLIB   DD DSN=IBMUSER.SIMPLE.V2.PDSE,DISP=OLD
//         DD DSN=IBMUSER.SIMPLE.V3.PDSE,DISP=OLD
//         DD DSN=SYS1.TCPIP.SEZALOAD,DISP=SHR
//STEPLINK EXEC PGM=IEBPDSE,PARM='DUMP'
//SYSLIB   DD DSN=SYS1.TCPIP.SEZALOAD,DISP=SHR
```

PDSE R13

- **IEBPDSE Command**
  - **Example 1: will validate IBMUSER.SIMPLE.V2.PDSE and send the results to SYSPRINT.**

```
//STEPCHK EXEC PGM=IEBPDSE
//SYSPRINT DD SYSOUT=A
//SYSLIB   DD DSN=IBMUSER.SIMPLE.V2.PDSE,DISP=OLD
```

  - **Example 2: will validate IBMUSER.SIMPLE.V2.PDSE and IBMUSER.SIMPLE.V3.PDSE and send the results to the job log.**

```
//STEPCHK2 EXEC PGM=IEBPDSE
//SYSLIB   DD DSN=IBMUSER.SIMPLE.V2.PDSE,DISP=OLD
//         DD DSN=IBMUSER.SIMPLE.V3.PDSE,DISP=OLD
//         DD DSN=SYS1.TCPIP.SEZALOAD,DISP=SHR
```

PDSE R13

IEBCOPY Enhancements

- Today, IEBCOPY employs inefficient channel programming and 24-bit addressing, which inhibits use of virtual storage. In addition, IEBCOPY uses the EXCP access method and special I/O appendages which require it to be run from an authorized library.
- ***New enhancement:*** Enhancements for the IEBCOPY utility to improve performance when copying a partitioned data set (PDS) to another PDS.
  - IEBCOPY will exploit 31-bit storage for track buffers
- ***New enhancement:*** Removes the current requirement for APF authorization.
  - If your program calls IEBCOPY, you probably can remove APF authorization from your program, making it safer.

? **Why it Matters:** Improved performance and usability for IEBCOPY.

PDSE R12

- **PDS/PDSE EMPTY Command**
  - Currently, IDCAMS DELETE can only delete one specific member in a PDS or PDSE by specifying the member name in parenthesis.
    - Wildcards are not allowed for member names.
  - ***New enhancement:*** DELETE all members of a partitioned data set in a single operation
    - Specifying a wildcard character (*) as the member name for a data set when using the DELETE command
  - ***SHARE Requirement MET:*** SSMVSS063069/70
    - DFSMS – Method to Empty a PDS/PDSE

? **Why it Matters:** Allows you to remove all members of a PDS or PDSE data set in a single command.

z/OS DFSMS Highlights

- **DADSM / CVAF / Device Services**
  - **R13**
    - DADSM / CVAF Availability Enhancements
    - Update Volume Information
  - **R11**
    - Save Jobname when data sets are created

DADSM / CVAF R13

- **DADSM Availability Enhancements**
  - **Concurrent Service**
    - ***New enhancement:*** DADSM and CVAF components will support concurrent service.
      - *Allow users to dynamically update their programs without IPL.*

  ? **Why it Matters:** Help improve system and application availability.

  - **Reuseable Address Space**
    - ***New enhancement:*** DEVMAN address space is planned to be marked reusable
      - *Restarting it does not subtract from the system's maximum number of address spaces or from the system's reserve of non-restartable address spaces when REUSASID(YES) is specified in DIAGxx.*

  ? **Why it Matters:** Help improve system and application availability.

DADSM R11

- **Save Jobname when data sets are created**
  - New fields in the Format 9 DSCB added for the job name, step name and time of data set creation in mapping macro IECSDSL1 and documented in the DFSMSdfp Advanced Services.
  - Prior to this item being implemented, the only way to determine what JOB and STEP created the data set was to track down the SMF records associated with that data set's creation, which took a considerable amount of work.
  - IEHLIST LISTVTOC FORMAT and DUMP options will externalize the value.
- ***SHARE Requirement Partially MET:*** SSMVSS064955
  - DFSMS: Add Jobname to Catalog Record When Data Sets Are Created.
  - Remaining support for DCOLLECT provided in z/OS V1R12.

? **Why it Matters:** For new DSN's, the creating job name will stay with the DSN instead of possibly getting lost if SMF records "wrap" or get lost.

Simplifying access to z/OS® skills!

- **IBM Academic Initiative -** https://www.ibm.com/developerworks/university/academicinitiative/
  - Global program that facilitates the collaboration between IBM and educators to teach students the information technology skills they need to be competitive and keep pace with changes in the workplace.
  - Links to many publicly available tutorials, IBM Redbooks, technical articles, and white papers to help you learn about System z and Power systems.

- **System z Academic Initiative -** https://www.ibm.com/developerworks/university/systemz/
  - The System z program provides significant benefits to everyone who participates.
    - Educators: can build relationships with industry, create enhanced employment opportunities for their students, and gain no-charge access to mainframe systems, courseware, and training.
    - Students: can compete in contests and get scholarships and IBM professional certification. Find out more.
    - Customers: can establish relationships with schools worldwide that are teaching Enterprise Computing, and post jobs at Systemzjobs.com to locate qualified students for internships and jobs.
- **Education Opportunities**
  - IBM is designing education packages for System z and would like your input and feedback.
  - Please talk to Neal Bohling for more detailed information.

Sources for more information

- Information about DFSMS and components
  - http://publib.boulder.ibm.com/infocenter/zos/basics/index.jsp?topic=/com.ibm.zos.zdatamgmt/zsysprogc_dfsmselements.htm
- Information about DFSORT
  - http://www-01.ibm.com/support/docview.wss?rs=0&uid=isg3T7000077
- Information about z/OS Storage Management Tools
  - http://www-03.ibm.com/systems/storage/software/zos/index.html
- Information about IBM Tivoli Storage Productivity Center
  - http://www-03.ibm.com/systems/storage/software/center/index.html
- Information about IBM System Storage Disk systems
  - http://www-03.ibm.com/systems/storage/disk/ds8000/index.html
- Information about IBM System Storage Tape systems
  - http://www-03.ibm.com/systems/storage/tape/?lnk=mprST-tsys

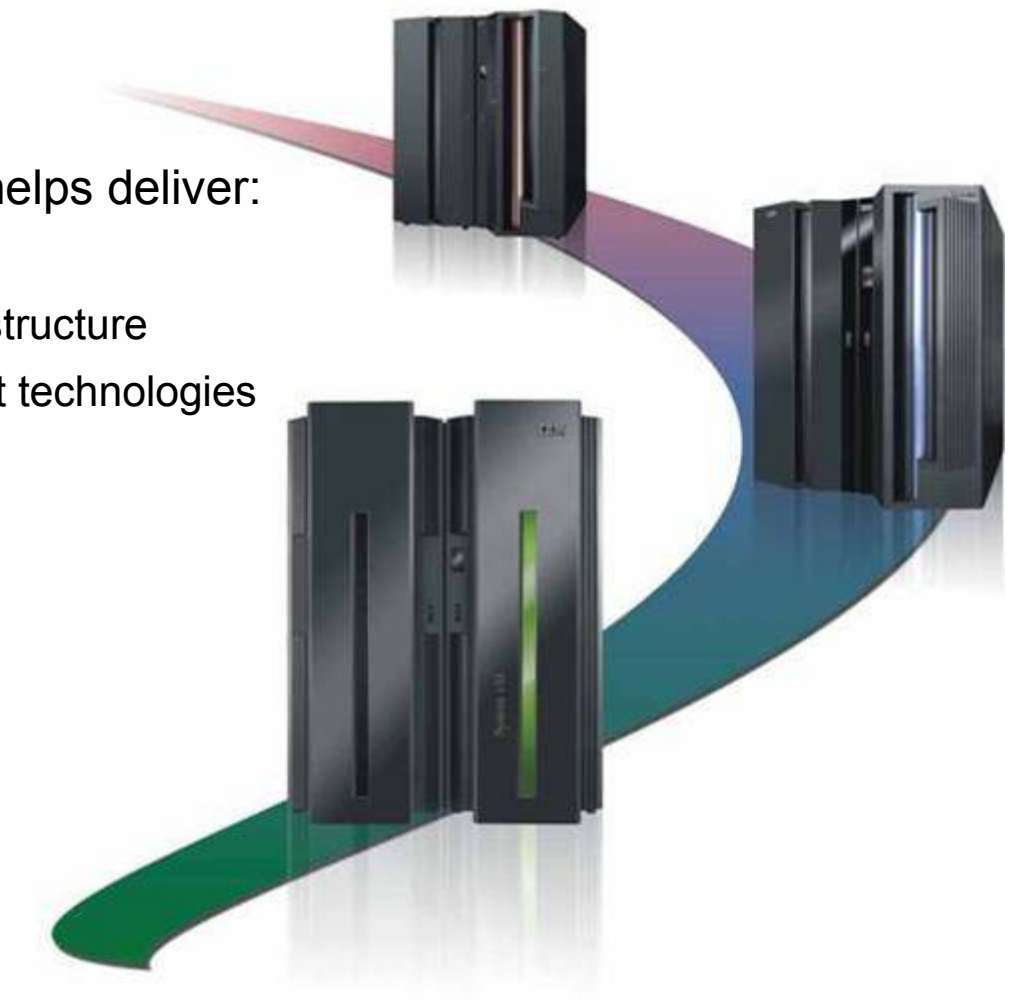
System z Social Media

- System z official Twitter handle:
  - @ibm_system_z
- Top Facebook pages related to System z:
  - Systemz Mainframe
  - IBM System z on Campus
  - IBM Mainframe Professionals
  - Millennial Mainframer
- Top LinkedIn Groups related to System z:
  - Mainframe Experts Network
  - Mainframe
  - IBM Mainframe
  - System z Advocates
  - Cloud Mainframe Computing
- YouTube
  - IBM System z

- Leading Blogs related to System z:
  - Evangelizing Mainframe (Destination z blog)
  - Mainframe Performance Topics
  - Common Sense
  - Enterprise Class Innovation: System z perspectives
  - Mainframe
  - MainframeZone
  - Smarter Computing Blog
  - Millennial Mainframer

Thank you!

- IBM's commitment to the mainframe helps deliver:
  - Extreme scalability, and availability
  - Reduced costs and simplified IT infrastructure
  - High performance and energy efficient technologies
  - a resilient and security rich system



Trademarks and Disclaimers

The following are trademarks of the International Business Machines Corporation in the United States and/or other countries. For a complete list of IBM Trademarks, see www.ibm.com/legal/copytrade.shtml:

CICS*
DB2*
DFSMS
DFSMSdfp
DFSMSdss
DFSMShsm
DFSMSrmm
DFSORT
DFSMS
DS4000
DS6000
DS8000
Enterprise Storage Server*
ESCON*
FICON*
FlashCopy*
GDDM*
GDPS*
geoManager*
HiperSockets
HyperSwap
IBM*
IBM logo*
ImagePlus*
IMS
Intelligent Miner
Language Environment*
Lotus*
MQSeries*
Multiprise*
OMEGAMON*
OS/390*
Parallel Sysplex*
PR/SM
QMF
RACF*
Rational*
RMF
System i
System z
System z9
System Storage
Tivoli*
TotalStorage*
Virtualization Engine
VisualAge*
VM/ESA*
VSE/ESA
VTAM*
WebSphere*
z/Architecture*
z/OS*
z/VM*
z/VSE
zEnterprise
zSeries*
zSeries Entry License Charge

The following are trademarks or registered trademarks of other companies:

Java and all Java based trademarks and logos are trademarks of Sun Microsystems, Inc., in the United States and other countries or both

Microsoft, Windows,Windows NT and the Windows logo are registered trademarks of Microsoft Corporation in the United States, other countries, or both.

Intel, Intel logo, Intel Inside, Intel Inside logo, Intel Centrino, Intel Centrino logo, Celeron, Intel Xeon, Intel SpeedStep, Itanium, and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

UNIX is a registered trademark of The Open Group in the United States and other countries or both.

Linux is a trademark of Linus Torvalds in the United States, other countries, or both.

Other company, product, or service names may be trademarks or service marks of others.

NOTES:

Any performance data contained in this document was determined in a controlled environment. Actual results may vary significantly and are dependent on many factors including system hardware configuration and software design and configuration. Some measurements quoted in this document may have been made on development-level systems. There is no guarantee these measurements will be the same on generally-available systems. Users of this document should verify the applicable data for their specific environment.

IBM hardware products are manufactured from new parts, or new and serviceable used parts. Regardless, our warranty terms apply.

Information is provided “AS IS” without warranty of any kind.

Trademarks and Disclaimers (continued)

NOTES:

All customer examples cited or described in this presentation are presented as illustrations of the manner in which some customers have used IBM products and the results they may have achieved. Actual environmental costs and performance characteristics will vary depending on individual customer configurations and conditions.

This publication was produced in the United States. IBM may not offer the products, services or features discussed in this document in other countries, and the information may be subject to change without notice. Consult your local IBM business contact for information on the product or services available in your area.

All statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only.

Information about non-IBM products is obtained from the manufacturers of those products or their published announcements. IBM has not tested those products and cannot confirm the performance, compatibility, or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

Prices are suggested US list prices and are subject to change without notice. Starting price may not include a hard drive, operating system or other features. Contact your IBM representative or Business Partner for the most current pricing in your geography.

Any proposed use of claims in this presentation outside of the United States must be reviewed by local IBM country counsel prior to such use.

The information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product and use of those Web sites is at your own risk.

IBM makes no representation or warranty regarding third-party products or services including those designated as ServerProven, ClusterProven or BladeCenter Interoperability Program products. Support for these third-party (non-IBM) products is provided by non-IBM Manufacturers.

IBM may have patents or pending patent applications covering subject matter in this document. The furnishing of this document does not give you any license to these patents. Send license inquires, in writing, to IBM Director of Licensing, IBM Corporation, New Castle Drive, Armonk, NY 10504-1785 USA.