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DFSMS Freebies and Hidden Gems

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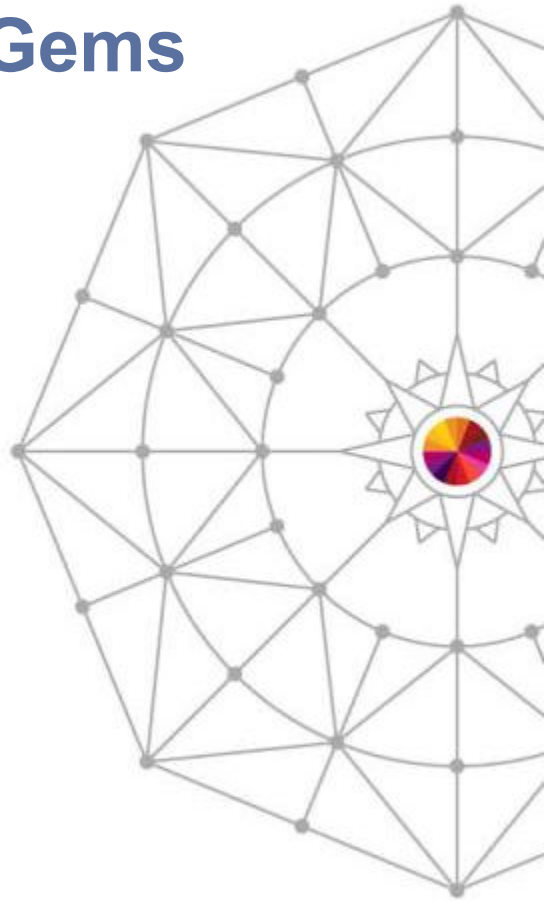
Session 15078



SHARE in Anaheim

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Agenda

- **TS7700 R3.1 Enhancements**
  - DFSMS RAS Enhancements
- **DFSMShsm**
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  - DFSMShsm Fast Replication Enhancements
  - DFSMShsm RAS & Usability Enhancements
- **DSS**
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- **IDCAMS**
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  - VSAM RLS and VSAM D-APARs
  - zEDC QSAM/BSAM Compression
- **PDSE**
  - PDSE Larger Member Size
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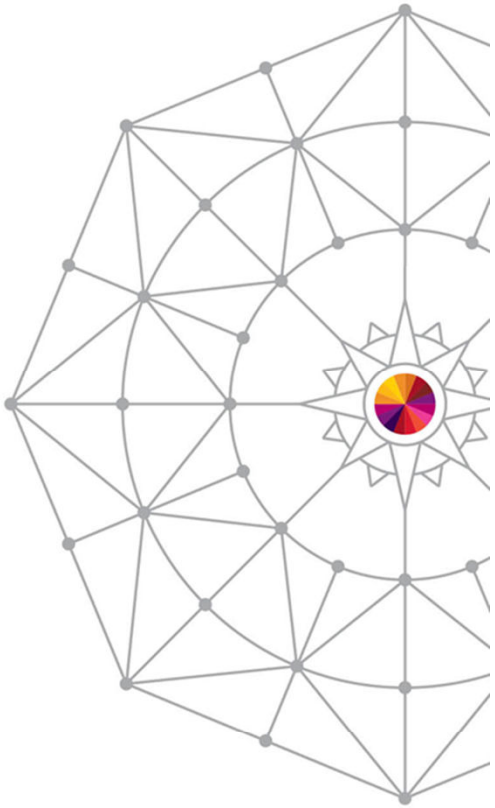
  - IEBCOPY Enhancements

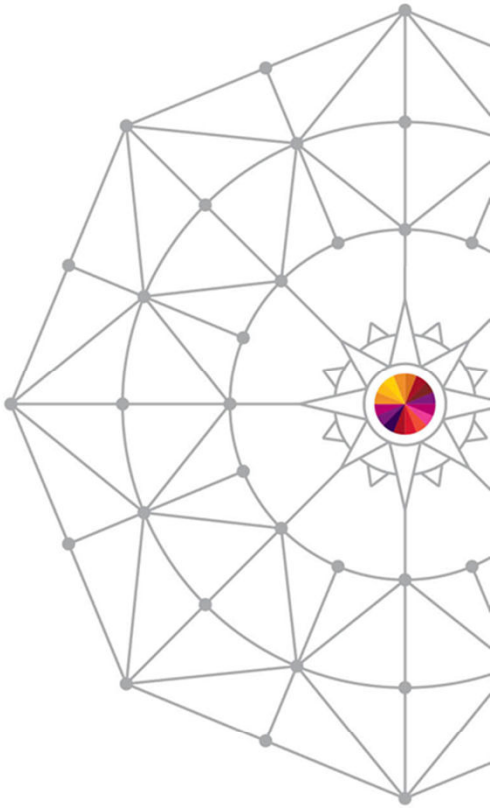
Agenda

- **SMS**
  - Provide Option to Suppress Messages
  - Alter ACDS/COMMDS to SHAREOPTIONS(3 3)
  - SMS ACS Read-only Variable for EAVs
- **DFSMSdfp**
  - OCE Partial Release Enhancements
  - OCE RAS Enhancements
- **SDM**
  - D-APARs
- **DFSORT**
  - Functional Enhancements
  - Improve DFSORT/DB2 Synergy
- **DFSMSrmm**
  - DFSMSrmm RAS Enhancement
- **NFS**
  - NFS Server RPCBIND Enhancements



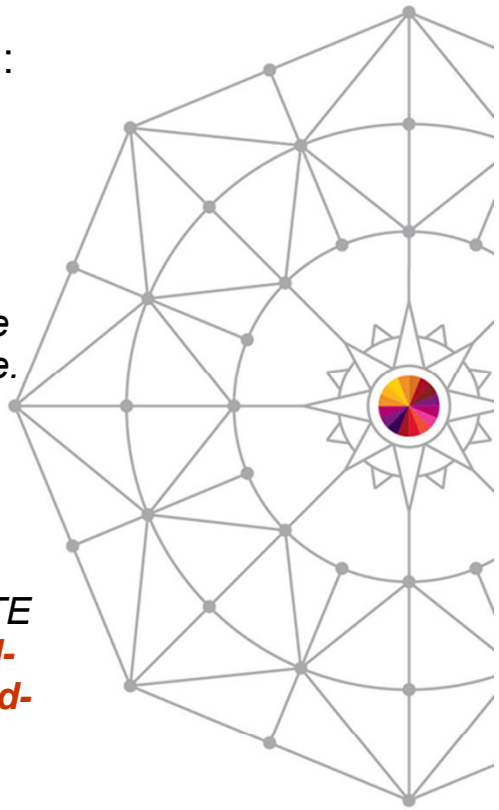
z/OS DFSMS Highlights

- **TS7700**
  - **V3.1 (GA December 2013)**
    - Highlights of the TS7700 R3.1 support include:
      - *8 Gb Dual-Port FICON adapter support*
      - *FlashCopy for Disaster Recovery (DR) test capability*
  - **DFSMS RAS Enhancements**
    - Refer to OAM APAR OA40572 for additional details; it will pre-req all other support.
      - *UA90673 – R12*
      - *UA90674 – R13*
      - *UA90675 – V2R1*



TS7700 R3.1

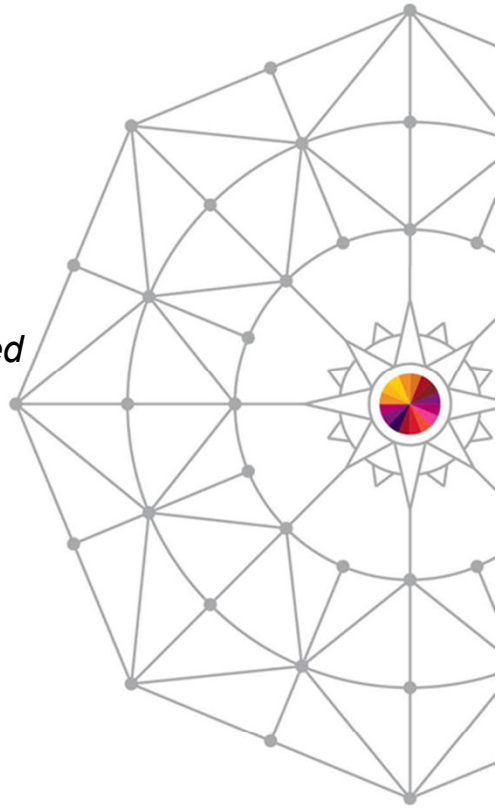
- **DFSMS RAS Enhancements**
  - **Diagnostic Enhancements**
    - ***New enhancement:*** Additional system and job-related information is passed to the TS7700 on the mount command:
      - *8-CHAR sysplex name*
      - *8-CHAR program name*
      - *First 17-CHARs of the data set name*
      - *Note: The job-related information is only passed when the first file sequence (scratch or private; DISP=NEW) is written to the volume.*
    - ***New enhancement:*** Enhanced messages:
      - *CBR3710I LIBSERV failure occurred for library <library-name>. RC=return-code, RSN=reason-code,* ***REQTYPE=request-type****.*
      - *IEA439I TAPE LIBRARY(XXXXX),DEVICE(DDDD) FOUR MINUTE I/O TIMEOUT,* ***REQTYPE=request-type, CMDCODE=command-code, CMDORDER=command-suborder, CMDTYPE=command-type.***



? **Why it Matters:** Improved diagnostics.

TS7700 R3.1

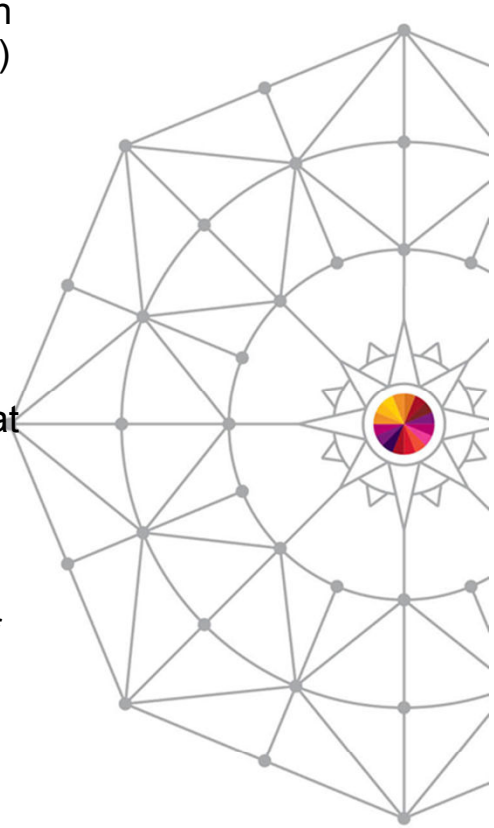
- **DFSMS RAS Enhancements**
  - **Bulk Volume Information Retrieval (BVIR) Interface Enhancements**
    - Today RMM uses the returned BVIR data to generate customizable reports.
    - ***New enhancement:*** Additional “Volume Map” options, "Volume Map Primary" and "Volume Map Secondary“, are introduced:
      - *With Release 3.0 of the TS7700, the number of volumes supported in a TS7700 Grid was increased to 4 million logical volumes (and with backup copies this could be 8 million logical volumes).*
      - *Sample RMM JCL (EDGJCEXP) is updated to reference the new “Volume Map Backup” option.*



? **Why it Matters:** Improved RMM reporting capabilities.

TS7700 R3.1

- **DFSMS RAS Enhancements**
  - **Cartridge Entry Recovery Processing**
    - Today during cartridge entry processing, an out of synch condition can occur between the library and the tape configuration database (TCDB) if the I/O request to move the volume out of the insert category time outs and is successfully retried.
    - When this happens, all of the hosts that are processing the list of volumes, think that another host processed the volume.
    - This results in the TCDB volume record not being added or updated (and the volume missing from the CBR3610I message).
    - Job processing can later fail, if the library selects a scratch volume that is not in the TCDB.
    - ***New enhancement:*** AOM was enhanced to better handle I/O error conditions during cartridge entry processing.
      - *Additional logic is put in place to detect the time out and retry condition and if this condition is detected, an attempt is made to add (or update) the volume record in the TCDB.*



? **Why it Matters:** Improved tape recovery processing.

TS7700 R3.1

- **DFSMS RAS Enhancements**
  - **Permanent Error Detection Enhancements**
    - When device services sends a request (MOUNT, DEMOUNT, AUDIT, EJECT) to the library, it will check on the request every few minutes.
    - If a permanent error occurs and the state of the request cannot be determined, the request can hang (for example, in CBRLLACS MOUNT processing).
    - ***New enhancement:*** Enhancements to device services and OAM on detection of a permanent error.
      - *Logic has been added for device services to detect this condition with a unique failure back to its caller. This results in OAM issuing the following new messages (as appropriate):*

      CBR4121I Request for status volume volser in library <library-name> failed.

      CBR3718I {MOUNT | DEMOUNT | AUDIT | EJECT} completion status for volume <volser>, library <library-name>, message ID <msgid>, unable to obtain.

? **Why it Matters:** Improved tape error detection and diagnostics.

TS7700 R3.1

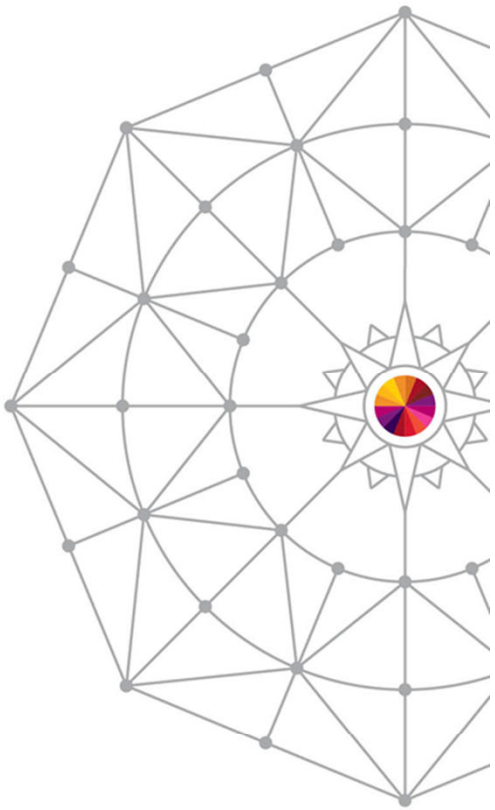
- **DFSMS RAS Enhancements**
  - **Scratch Threshold Monitoring Enhancements**
    - With APAR OA39381, a new scratch threshold monitoring task was added (in OAM) so that every 10 minutes, the task would wake-up and perform scratch threshold processing.
    - It was discovered that scratch threshold processing was also being performed for the distributed tape libraries associated with a virtual tape library.
    - Since all volumes and drives are associated with the composite library, there is no need to do the extra I/O to the distributed libraries of a composite library.
    - ***New enhancement:*** Enhancements to the scratch threshold monitoring task.
      - *Enhancements are made to bypass threshold processing for distributed libraries. This support will also reset the scratch counts, associated with a distributed library back to zero.*

? **Why it Matters:** Improved tape error detection and diagnostics.

TS7700 R3.1

- **DFSMS RAS Enhancements**
  - **MOUNT Processing Enhancements**
    - Today when a TS7700 Virtualization Engine is put in write protect mode, a CBRLLACS ABEND0B6 can occur on a specific mount, but not for a scratch mount.
    - ***New enhancement:*** Enhancements to OAM mount processing.
      - *If a scratch or a private mount fails with this error, LACS message CBR4126I, will be issued instead of the abend.*

? **Why it Matters:** ABEND reduction and improved tape error diagnostics.



z/OS DFSMS Highlights

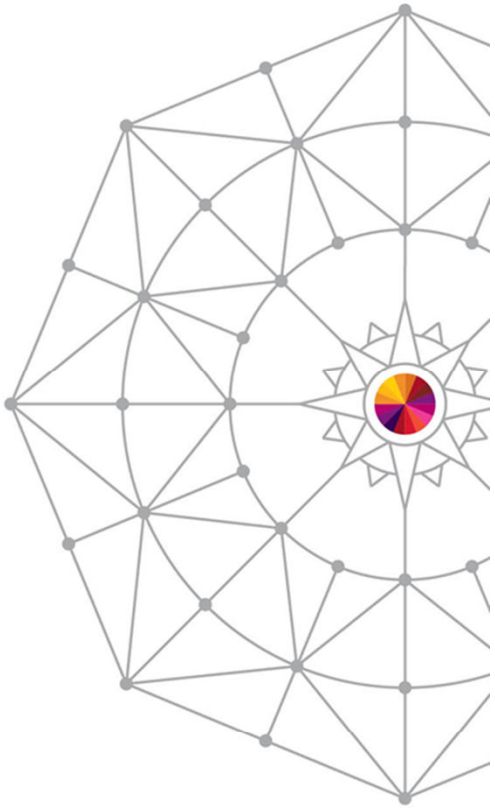
- **DFSMShsm**
  - **V2.1**
    - DFSMShsm Tape Enhancements
    - DFSMShsm Fast Replication Enhancements
    - DFSMShsm RAS & Usability Enhancements

Session 15076: What's New in DFSMShsm, **Tuesday 9:30AM**

Session 15109: Implementing DFSMShsm Best Practices with Tivoli Advanced Products, **Tuesday 1:30PM**

Session 14110: What You Need to Know About the Way HSM Uses SMS, **Wednesday 9:30AM**

Session 14135: DFSMShsm Best Practices, **Wednesday 4:30PM**



DFSMShsm

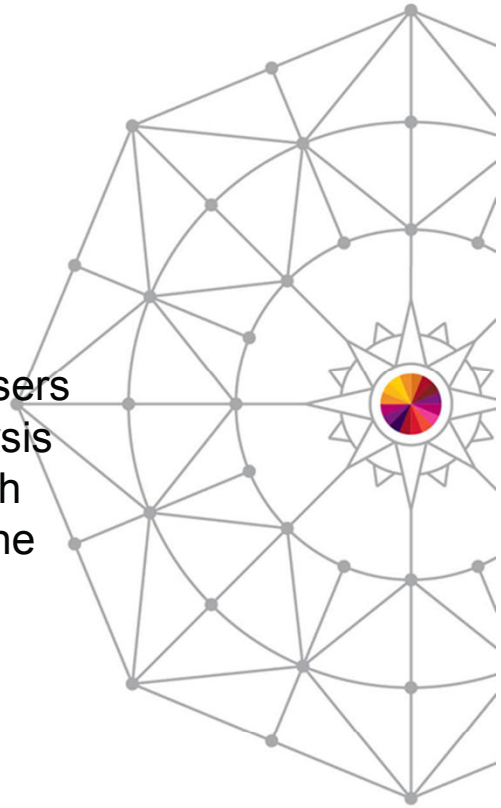
- **DFSMShsm Tape Enhancements**
  - DFSMShsm migration and backup data sets can span up to a maximum of 40 tape volumes.
    - Prevents DFSMShsm from managing larger data sets in a virtual tape environment.
  - ***New enhancement:*** Extend the maximum number of volumes that a migration or backup tape data set can span from 40 to 254 volumes.
    - Existing DFSMShsm architecture prevents the limit from being extended to the Allocation limit of 255 volumes.
    - Allow Recycle to process connected sets of up to 254 volumes.

? **Why it Matters:** Allows migration and backup of larger data sets, which is particularly useful when using the typically small tape volume sizes configured for virtual tape subsystems.

DFSMShsm

- **DFSMShsm Fast Replication Enhancements**
  - **Physical Data Set Recovery RENAME**
  - ***New enhancement:*** Physical VSAM Data Set Restore RENAME support
    - Currently, DFSMShsm does not support renaming of a VSAM data set using the RECOVER data set FROMDUMP command.
    - With the DFSMSdss support for physical data set RENAME described above, DFSMShsm will extend the RECOVER data set NEWNAME FROMDUMP support to VSAM data sets.

? **Why it Matters:** Renaming a data set during recovery enables users to be able to recover a broken data set to another name for analysis to determine what caused the breakage and to determine to which point in time the data set should be recovered, before replacing the production version of the data set.



DFSMShsm

- **DFSMShsm Fast Replication Enhancements**
  - **Dataset Recovery Performance**
    - Today, DSS Scans the entire VVDS to locate the VVR for the data set being processed. When many data sets are being processed, potentially a large performance impact, especially if the VVDS is large.
  - ***New enhancement:*** HSM will capture the VVR RBA along with other catalog data at time of backup.
    - HSM passes this to DSS during FRRECOV processing so that DSS can directly access the VVR.

? **Why it Matters:** Performance improvements when recovering a large number of data sets.

DFSMShsm

- **DFSMShsm RAS and Usability Enhancements**
  - **UCB Capture**
    - HSM's large customers face periodic 878-Abends in the DFSMShsm address space.
    - These abends have repetitively been shown to be caused by DFSMShsm capturing a high number UCBs below-the-line.
    - Historically, DFSMShsm was required to capture UCBs below-the-line due to certain called services requiring UCBs to reside below-the-line.
  - ***New enhancement:*** HSM will no longer capture UCBs into below the line storage.

? **Why it Matters:** Provides storage constraint relief by increasing the available storage below-the-line.

DFSMShsm

- **DFSMShsm RAS and Usability Enhancements**
  - **QUERY ACTIVE**
    - Today, if there's a problem with a tape drive and a need to cancel the associated HSM task, there's no easy way to tell which one to cancel.
    - ***New enhancement:*** New QUERY ACTIVE command includes the needed information to cancel the HSM tasks:
      - **Tape volser**
      - **Device address**
      - **Task name**

? Why it Matters: Provides improved serviceability and diagnostics.

DFSMShsm

- **DFSMShsm RAS and Usability Enhancements**
  - **SMSVSAM Server Termination Handling**
    - Today, when DFSMShsm accesses the CDSes in RLS mode and an SMSVSAM server error occurs, DFSMShsm simply takes a fatal abend and shuts down.
      - *If RESTART is not specified in the DFSMShsm startup procedure or if DFSMShsm is unable to restart within the allotted amount of time, the user is required to determine when the SMSVSAM server has initialized and manually restart all DFSMShsm hosts.*
      - *All DFSMShsm requests that were in progress at the time of the SMSVSAM server error are lost and must be reissued to complete.*
    - ***New enhancement:*** When an SMSVSAM server error occurs, DFSMShsm detects the error, and quiesces all CDS I/O activity.
      - *Once the SMSVSAM server initializes, DFSMShsm automatically closes and reopens the CDSes and resumes all requests waiting on CDS I/O operations.*

? **Why it Matters:** Greatly improve the usability and robustness of DFSMShsm in regards to it's response to SMSVSAM server errors.

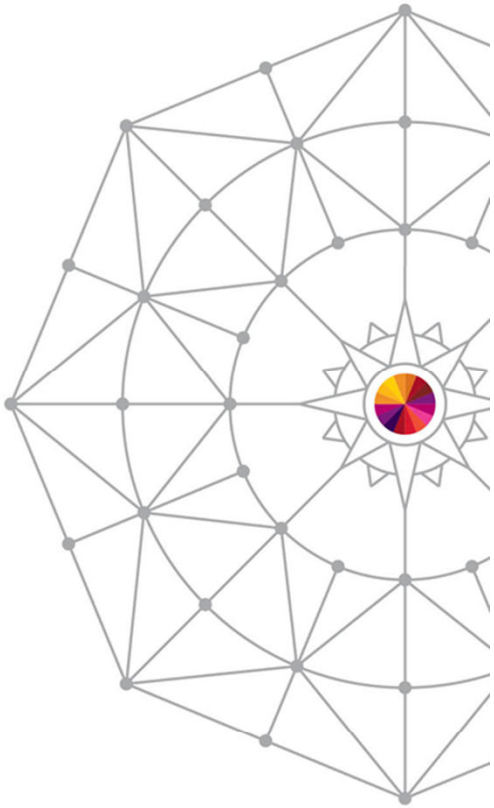
DFSMShsm / Allocation

- **DFSMShsm RAS and Usability Enhancements**
  - **Batch Parallel Recall**
    - Today, during Batch processing, when Allocation determines data sets need to be recalled by HSM, it's done sequentially for each data set in the job step.
    - ***New enhancement:*** Allocation updated to enable you to specify that migrated data sets be allocated by a batch job be recalled in parallel, before each job step starts
      - *Allocation will issue recall requests during step initiation, wait for all recalls to complete, and continue with Allocation processing needed to start the step.*
      - *New ALLOCxx keyword to enable, and SETALLOC support:*
        - ***ALLOCxx Parmlib: BATCH_RCLMIGDS(PARALLEL)***
        - ***SETALLOC: SETALLOC SYSTEM, BATCH_RCLMIGDS=PARALLEL***

? **Why it Matters:** Provides improved elapsed recall time.

z/OS DFSMS Highlights

- **DSS**
  - **V2.1**
    - COPY Enhancements for EAV Migrations

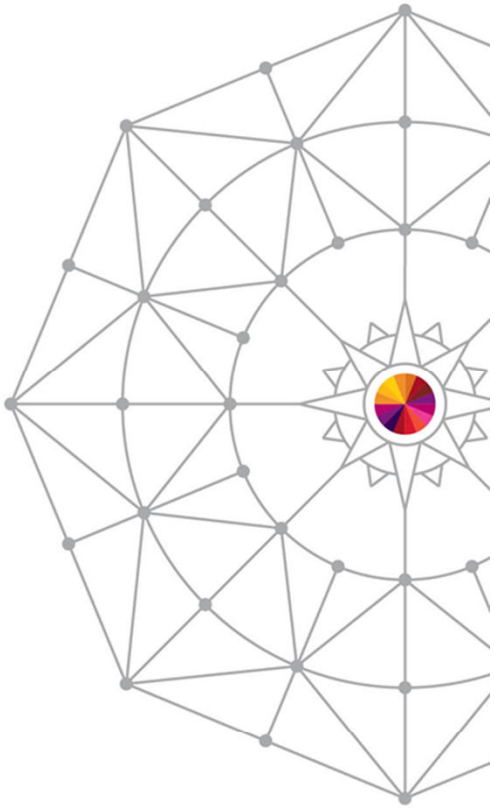


Session 15322: zGM, XRC, PPRC, GM, GC, MM, FC, CC, VCC: Introduction to the Alphabet Soup of IBM Copy Services, **Tuesday 3PM**

Session 15077: Continuing the understanding of IBM Copy Services: Peer-to-Peer-Remote-Copy (PPRC) and Point in Time Copy (FlashCopy) for High Availability and Disaster Recovery, **Wednesday 11AM**

DFSMSdss

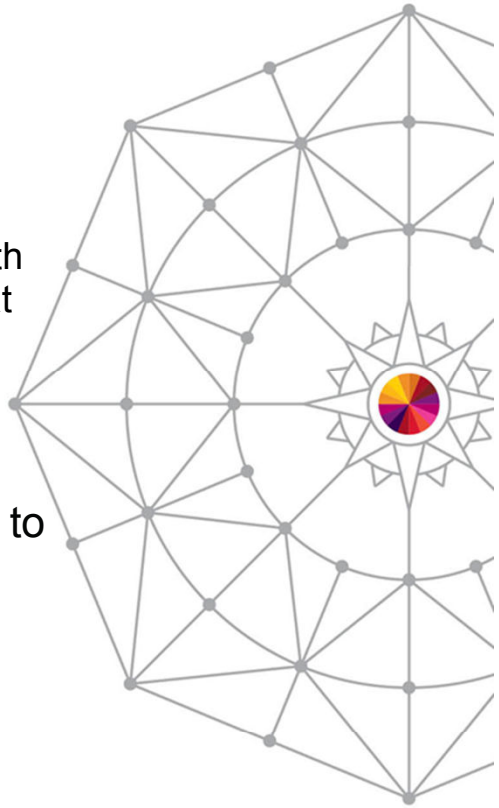
- **DSS COPY Enhancements for EAV Migrations**
  - Today customers migrating non-VSAM data sets to EAV cannot use DSS logical COPY to get the data sets allocated into the EAS without first pre-allocating the target data set.
    - When a non-VSAM data set has a an EATTR of 'not specified' the EATTR value by default is NO, meaning the data set is not eligible to be allocated in the EAS on a EAV.
      - *DSS does not drive the dataclass ACS routines during a COPY.*
  - ***New enhancement:*** DFSMSdss provides a patch byte that allows users to change the EATTR type for non-VSAM allocations to EATTR=OPT when the source has an EATTR value of EATTR=NS or EATTR=NO during logical data set COPY.



DFSMSdss

- **DSS COPY Enhancements for EAV Migrations**
  - The new patch byte at offset X'5B' can only be enabled using the SET PATCH command:
    - SET PATCH 5B = FF.
    - When the patch at offset X'5B' is set to a non-zero value, all non-VSAM data sets that are selected and copied will have the EATTR value set to EATTR=OPT.
    - It is recommended to run the COPY using the SET PATCH command with TYPRUN=NORUN to ensure the data sets selected are the data sets that you are wanting the EATTR value set to OPT.
  - See OA42848. PTFs available 10/18/13 on R12 and above.

? **Why it Matters:** Enables easier migration of non-VSAM data sets to EAV volumes without having to pre-allocate the target data sets.

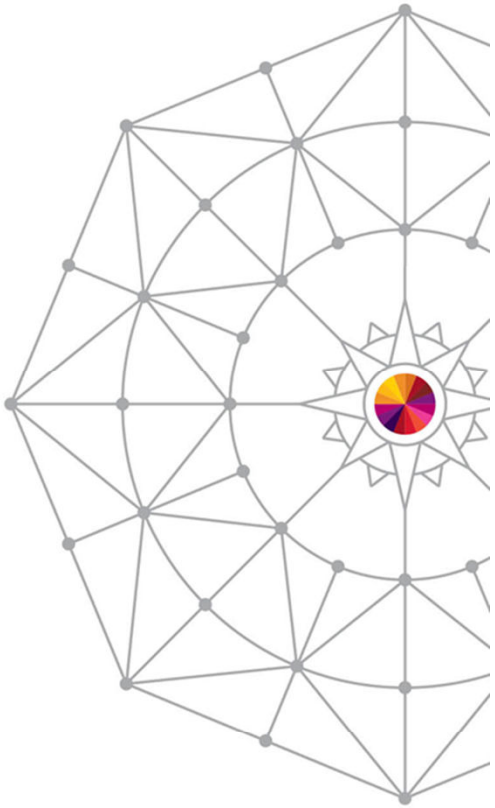


z/OS DFSMS Highlights

- **Catalog**
  - **V2.1**
    - Catalog Contention Detection Enhancements
    - Catalog DFSMS GDG Enhancements
    - Catalog Externals Enhancements
    - Catalog Security Enhancement
    - Catalog D-APARs

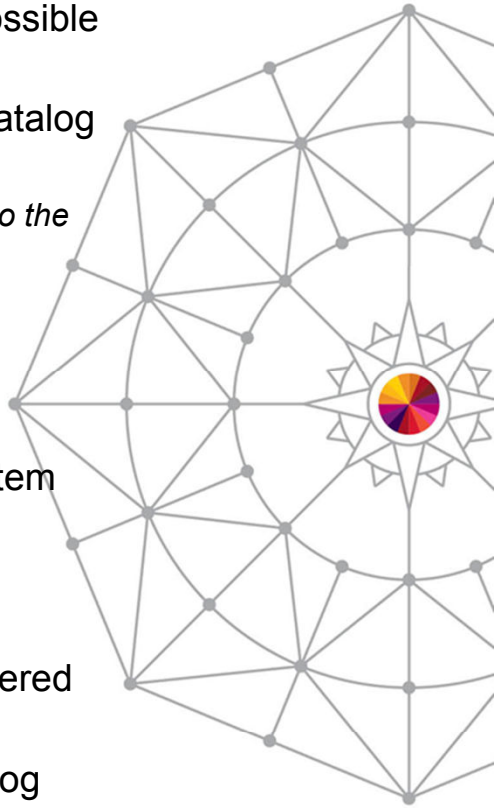
Session 14633: The Catalog Search Interface, **Monday 11AM**

Session 15089: Using RLS with Your Catalogs – a How-To, **Tuesday 11AM**



Catalog

- **Catalog Contention Detection Enhancements**
  - CAS (Catalog Address Space) Contention Management was introduced in R12.
    - CAS Contention Management monitors Catalog address space for possible contention for resources among Catalog tasks.
    - It was designed initially to ONLY detect SYSZTIOT contention with Catalog and introduced a new catalog modify command.
      - *The only action taken when the wait threshold was crossed was notification to the console and a one time symrec to the logrec.*
  - ***New enhancement:*** Expand the resources being monitored to include:
    - **SYSZVVDS** – Serialization on the VVDS dataset of a volume.
    - **SYSIGGV2** – provides an essential mechanism to facilitate cross system sharing of catalogs.
    - **ALLOCLCK** -- an internal CAS lock which protects allocations, de-allocations, opens and closes.
    - A new action, **REDRIVE**, can be associated with a resource and triggered when the wait threshold is breached.
    - Contention wait-time and actions per resource can be set in the Catalog parmlib.

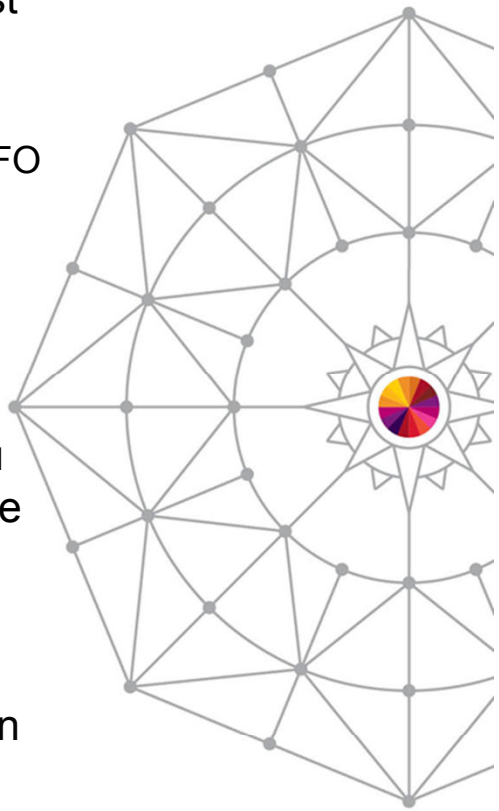


? **Why it Matters:** More efficient use of storage resources; better diagnostics to determine the cause of serialization contention problems that impact CAS.

Catalog

- **Catalog DFSMS GDG Enhancements**
  - ***New enhancement:*** Allows users to specify that all the members of a generation data group (GDG) be returned in order from oldest to newest when the generation data set (GDS) name is specified without a generation number.
    - This function can be exploited via new IDCAMS keywords LIFO and FIFO for DEFINE and ALTER.
      - ***LIFO - the order is the newest GDS allocated to the oldest GDS. (Default and current order)***
      - ***FIFO - the order is the oldest GDS allocated to the newest GDS.***
    - Catalog Parmlib option **GDGFIFOENABLE** must be set
  - New GDGORDER JCL DD statement keyword to specify that you get the generation datasets oldest generation first to newest or the reverse.
    - JCL keyword overrides whatever is specified for GDG on DEFINE or ALTER

? **Why it Matters:** Allows all the members of a GDG to be processed in chronological order without being sorted or concatenated.



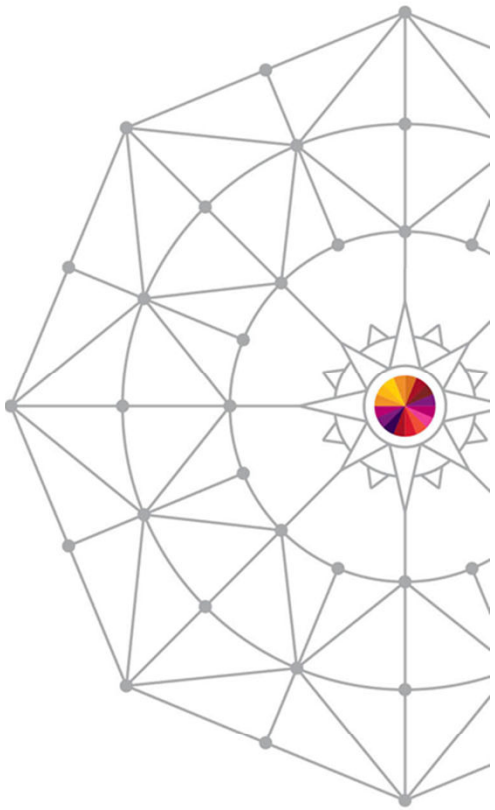
Catalog

- **Catalog External Enhancements**
  - ***New enhancement:*** Latch number added to F CATALOG,LIST.
    - Added to message IEC347I when there is latch contention.
      - *Where 00001 is the latch number in hexadecimal*

```
IEC347I LIST CATALOG TASK(S)
*CAS*************************************************************
* FLAGS - TASK ADDR - JOBNAME / STEPNAME - ELAPSED TIME - ID     *
* ------ 00891D78 DUMPSRV / DUMPSRV 00.01.55 02                 *
*  WAITING FOR Get LatchShr # 00001 FROM 09F06730 FOR 00.01.23   *
*****************************************************************
* O-OLDEST, W-WAIT, A-ABEND, E-ENQ, R-RECALL, L-RLS              *
*CAS*************************************************************
```

  - ***New enhancement:*** Provide date and time for export data set used by ICFRU.
    - Added new line to CRURRAP as follows:

```
                RECORD SELECTION AND VALIDATION REPORT
                           EXECUTION PARAMETERS
CATALOG NAME                 CATEI001.UCAT1
RECORD SELECTION START       01/31/13 (13.031)  11:16:11
RECORD SELECTION STOP        01/31/13 (13.031)  11:16:29
SIGNIFICANT GAP TIME         0030 MINUTES
MAXIMUM CLOCK DIFFERENCE     NONE SECONDS
CATALOG WAS EXPORTED ON      01/31/13 AT 11:16:11
```



Catalog

- **Catalog External Enhancements**
  - ***New enhancement:*** Fix return & reason code returned to HSM as described in APAR OA23698.
    - Enhances the HSM message ARC0936I so that it is more meaningful when the system detects an error other than in the VVDS.
    - **ARC0936I ERROR RETRIEVING SMS VTOC/VVDS DATA, FUNC = (ACCESS | FREE), RC=retcode, REASON=reas1, SUBREAS=reas2**
      - *It might end with "RC=12, REASON=98-CATALOGENTRYMGR SUBREAS=reas2" where reas2 is four characters:*
      - *1 - Catalog RC (See IDC3009I)*
      - *2 - Catalog reason. (See IDC3009I)*
      - *3, 4 - Catalog module identifier*
  - ***New enhancement:*** IEC363D to accept 'Yes' and 'No'.
    - For message **IEC363D IS THIS RESTART RELATED TO AN EXISTING CATALOG PROBLEM (Y OR N)**?
      - *Added capability to respond with "YES" or "NO" in addition to "Y" or "N"*
      - *Message text was not changed and remains as seen above*
      - *Follow on message IEC364D will also accept "YES" or "NO"*

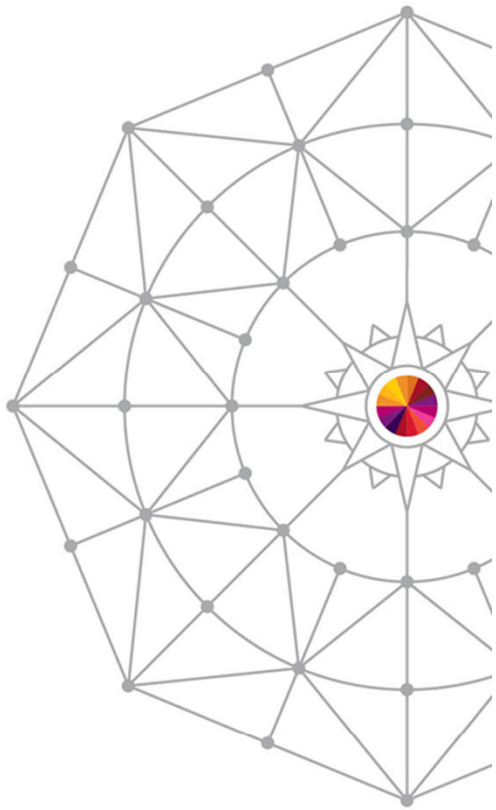
Catalog

- **Catalog External Enhancements**
  - ***New enhancement:*** Support ABEND Async Events Task Support.
    - Support added so three additional CAS specialty tasks (Async Events, Sysplex Command, and Sysplex Quiesce) can be ABENDed by the Modify command.
      - *Added TCB addresses for each task to the F CATALOG,REPORT output in message IEC359I*

```
16.48.03 SYSTEM1 IEC359I CATALOG REPORT OUTPUT
*CAS*************************************************************
* CATALOG COMPONENT LEVEL = HDZ2210                              *
* CATALOG ADDRESS SPACE ASN = 002A                               *
* CAS ANALYSIS TASK = 00995A28                                   *
* CAS ALLOCATION TASK = 00995C58                                 *
* CAS ASYNC TASK = 009957F8                                      *
* CAS SYSPLEX COMMAND TASK = 00996AC8                            *
* CAS SYSPLEX QUIESCE TASK = 00996BC0                            *
* VOLCAT HI-LEVEL QUALIFIER = SYS1                               *
```

    - Added to F CATALOG,ABEND command as follows:
      - *F CATALOG,ABEND(ASYNC)*
      - *F CATALOG,ABEND(SYSPCMD)*
      - *F CATALOG,ABEND(SYSPQUI)*

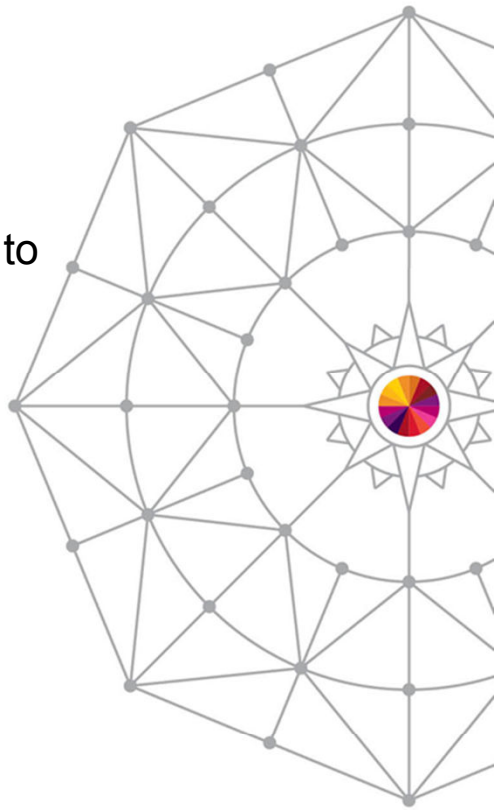
? **Why it Matters:** Improved diagnostics.



Catalog

- **Catalog Security Enhancement**
  - ***New enhancement:*** Change STGADMIN.IGG.DEFINE.RECAT and STGADMIN.IGG.DEFDEL.UALIAS from LOG=NONE to LOG=NOFAIL.
    - These facility classes are used by Catalog Administrators to perform REPRO MERGECATs without having ALTER access to the catalogs involved.

? **Why it Matters:** Unauthorized use can be detected (logged) and audited.



Catalog

- **Catalog D-APAR OA41707**
  - When issuing the IDCAMS commands VERIFY, REPRO and PRINT for a catalog that is extended addressable and SMB is invoked, the open of these catalogs will fail with an IEC161I 032-015 message and cause the IDCAMS commands to fail.
  - ***New enhancement:*** Catalogs will be excluded from SMB processing.
    - SMB was not designed for use with a catalog and could interfere with Catalog Address Space's processing.
    - PTFs available 11/20/13 on R13 and above.

? **Why it Matters:** Avoid open failures for Catalogs defined as Extended Addressable (EA).

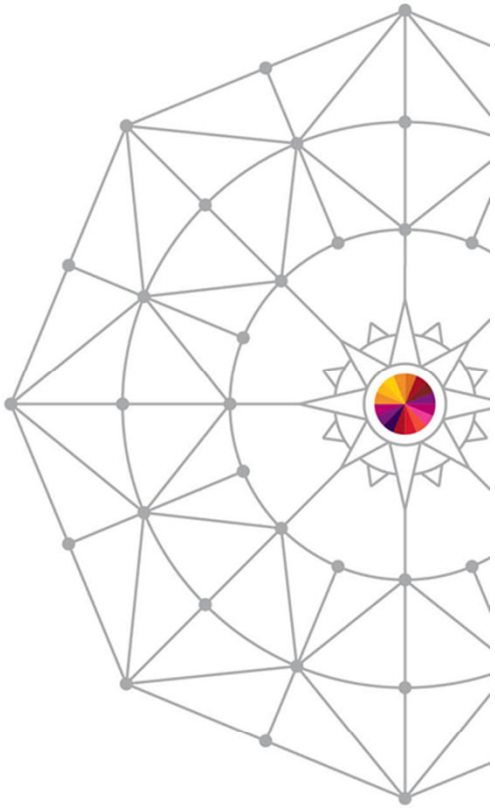
Catalog

- **Catalog D-APAR OA44318**
  - Extended Alias support was introduced in 1.13 that increased the number of aliases that could be associated to a single user catalog from 3000 to more than 500,000.
  - The CSI is the interface to Catalog where the issuer can provide a work area of up to 1mb.
    - However it has been found that this 1mb limit is too small to accommodate a single catalog record exploiting extended alias support to a high degree.
  - ***New enhancement:*** Alter the CSI maximum work area size to a value that can accommodate the new larger records.
    - APAR opened 1/28/14. PTFs available TDB on R13 and above.

? **Why it Matters:** Allow users of the Catalog Search Interface (CSI) to exploit the extended alias support.

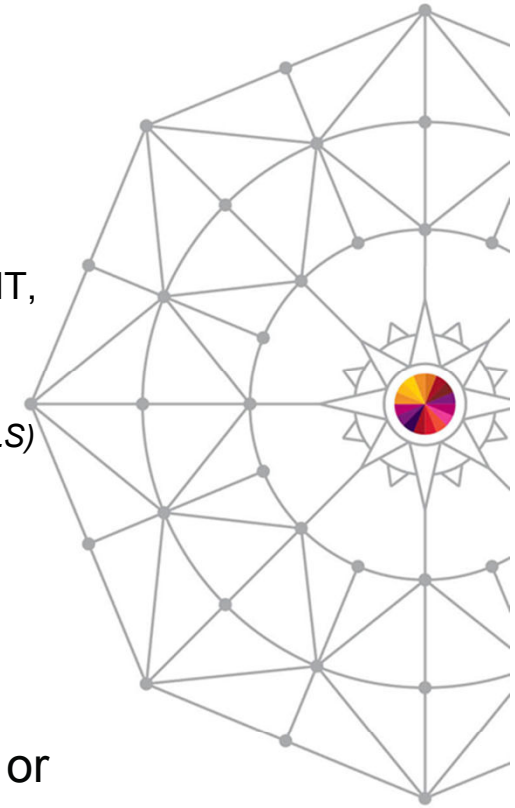
z/OS DFSMS Highlights

- **IDCAMS**
  - **V2.1**
    - IDCAMS Support for RLS
    - DELETE PDS/PDSE with Mask
    - ALTER NULLIFY Management Class
    - IDCAMS D-APAR



IDCAMS

- **IDCAMS Support for RLS**
  - Customer requirement to copy, print and backup VSAM data sets while sharing the VSAM data set with other applications.
  - ***New enhancement:*** Enhance IDCAMS commands PRINT, REPRO, IMPORT and EXPORT to be able to open VSAM data sets using RLS.
    - A new optional keyword **RLSSOURCE ({NO|YES| QUIESCE})** and/or **RLSTARGET ({NO|YES|QUIESCE})** will be implemented for the PRINT, REPRO, IMPORT and EXPORT commands.
      - ***NO*** *– Default uses Non-Shared Resources (NSR). Abbreviation: N*
      - ***YES*** *- Indicates that the data set will be opened using record level sharing (RLS) and the data set will have consistent read integrity. Abbreviation: Y*
      - ***QUIESCE*** *– Indicates that the data set will be quiesced before opening and processing any entries. Abbreviation: Q*
  - ***SHARE Requirement Met:*** **SSMVSS01007**



? **Why it Matters:** Provides applications the ability to read or print records from a data set being used in RLS mode.

IDCAMS

- **DELETE PDS/PDSE with Mask**
  - In R12, IDCAMS provided a DELETE option to delete all members of a partitioned data set in a single operation.
  - ***New enhancement:*** Enhance the IDCAMS DELETE command to be more flexible in performing the deletion of the members in a partitioned data set (PDS/PDSE).
    - Allows a mask for member names to be specified in a DELETE command for PDS/PDSEs.
    - A mask for a member name can contain an asterisk (*) or percent sign (%).
      - *Asterisk means 0 or more characters*
      - *% means 1 and only 1 character*
    - Double asterisk (**) still means delete all members in the PDS/PDSE.

? **Why it Matters:** Improved usability and flexibility of the DELETE command for PDS/PDSE processing.

IDCAMS

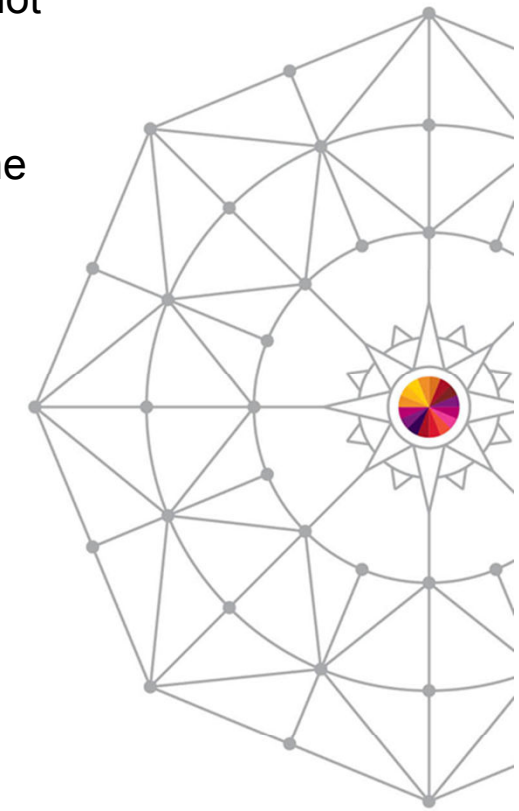
- **ALTER NULLIFY Management Class**
  - Currently, IDCAMS ALTER does not allow a user to nullify a management class, but ISMF provides support to remove the management class from a dataset by specifying '-'.
  - ***New enhancement:*** Allow a user to specify 'ALTER NULLIFY' to nullify a Management Class.
    - Users can specify NULLIFY(MANAGEMENTCLASS) to nullify the Management Class of a dataset.
    - The abbreviation is NULLIFY(MGMTCLAS).

? **Why it Matters:** Improved usability of the ALTER function.

IDCAMS

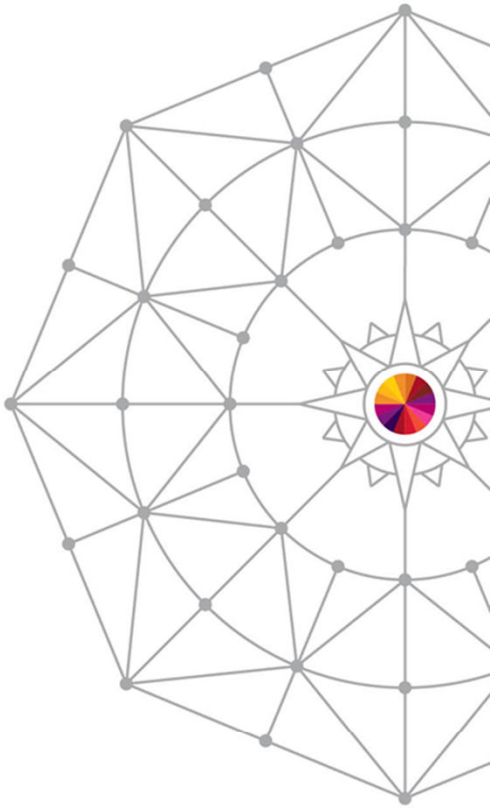
- **IDCAMS D-APAR OA44292**
  - Intermittent broken data set problem that has been impossible to collect traces for the right time period because EXAMINE does not recognize that there is a problem with the index structure.
  - ***New enhancement:*** Add support to EXAMINE to detect a mismatch between the index key of a higher index record with the index key of the lower level index record.
    - APAR opened 1/20/14. PTFs available TDB on R13 and above.

? **Why it Matters:** Improved VSAM broken index error detection.



z/OS DFSMS Highlights

- **Access Methods**
  - **V2.1**
    - VSAM RLS Dynamic Volume Count
    - VSAM RLS OMXE for Storage Support
    - VSAM RLS and VSAM D-APARs
    - zEDC QSAM/BSAM Compression



Session 14614: OMEGAMON XE for Storage V5.2 Enhancements for z/OS 2.1, **Tuesday 3PM**

Session 15090: DFSMS Advanced: Leveraging VSAM RLS Best Practices, **Wednesday 1:30PM**

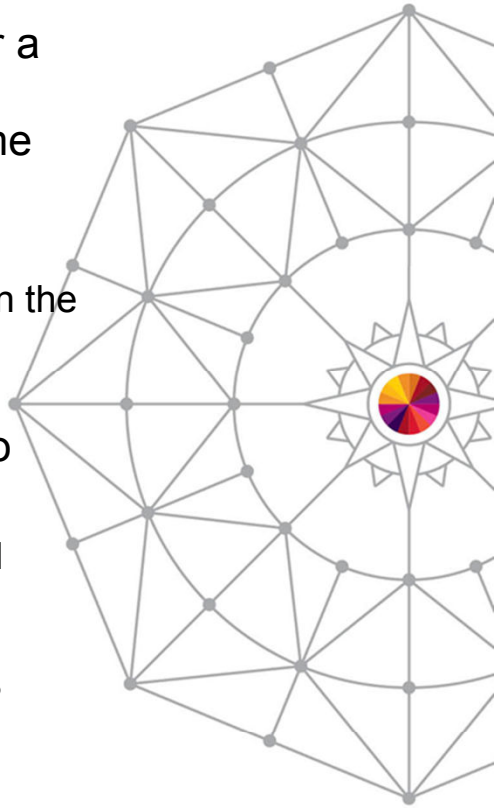
Session 15110: zEnterprise Data Compression: What is it and How Do I Use it?, **Wednesday 4:30PM**

Session 15080: z/OS zEnterprise Data Compression Usage and Configuration , **Thursday 1:30PM**

Access Methods

- **VSAM RLS Dynamic Volume Count**
  - Currently setting Dynamic Volume Count (DVC) along with the Space Constraint Relief attribute in the SMS data class used for a data set can be used to determine the maximum number of volumes it will be allowed to span, to increase the original volume count specified for data sets in JCL or when using Dynamic Allocation.
    - Enables the data set to be extended later should it run out of space on the volumes on which it was originally allocated, and is intended to help prevent space-related abends, and is only supported by base VSAM.
  - ***New enhancement:*** Remove the restriction and extend DVC to support VSAM RLS data sets.
    - Note: To be activated, all sharing systems must be running z/OS V2.1

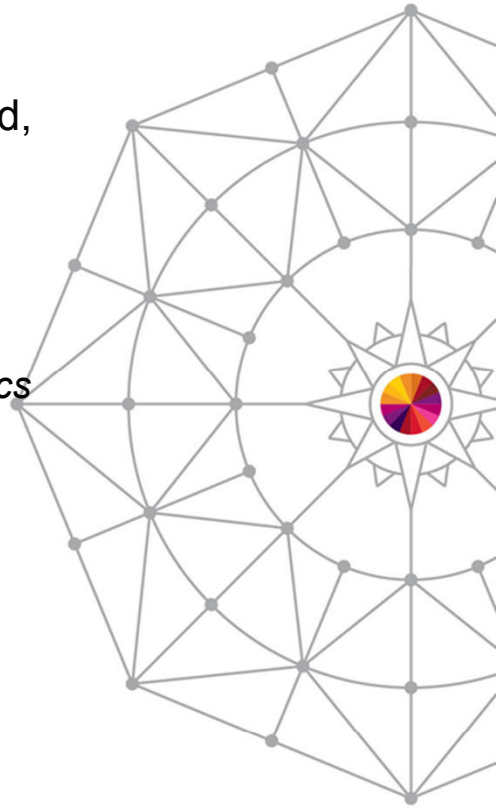
? **Why it Matters:** Prevent space-related abends when data sets grow during VSAM RLS processing.



Access Methods

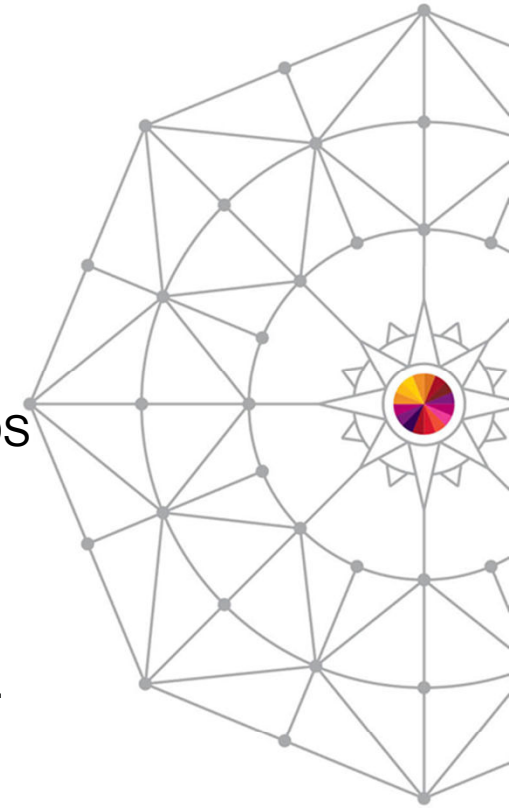
- **VSAM RLS Omegamon XE for Storage Support**
  - ***New enhancement:*** Add RLS Support to OMXE for Storage V5.2.
    - GA'd September 6, 2013 with the following VSAM RLS Support to monitor RLS behavior more easily and on demand, as well as to obtain historic data:
      - *Dataset and Storage Class RLS statistics including CA splits and lock contention are presented*
      - *Report on coupling facility lock structure statistics*
      - *Report on local buffer manager Last Recently Used (LRU) statistics*

? **Why it Matters:** Improved monitoring and reporting of VSAM RLS behavior via what's currently available from OMXE for Storage.



Access Methods

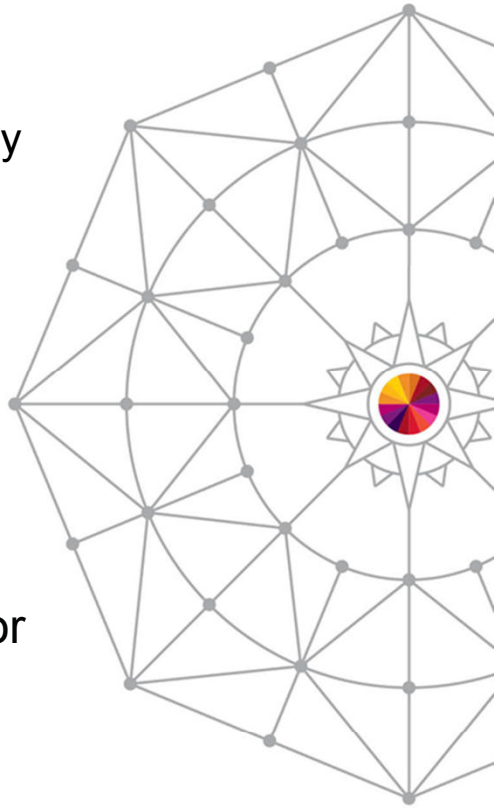
- **VSAM RLS D-APAR OA43921**
  - ***New enhancement:*** Enhance CTRACE data for get buffer and free buffer requests.
    - Each get buffer and free buffer request will be captured in CTRACE data entries for diagnostic purposes.
    - To enable the CTRACE, use the "cb" and subcomp=(blc) options:
      - ***trace ct,32m,comp=syssms***
      - ***r xx,options=(cb,subcomp=(blc)),end***
    - Refer to the "VSAM RLS component trace" chapter in the z/OS DFSMSdfp Diagnosis Reference for more information.
    - PTFs available on R13 and above.



? **Why it Matters:** Improved VSAM RLS buffering diagnostics.

Access Methods

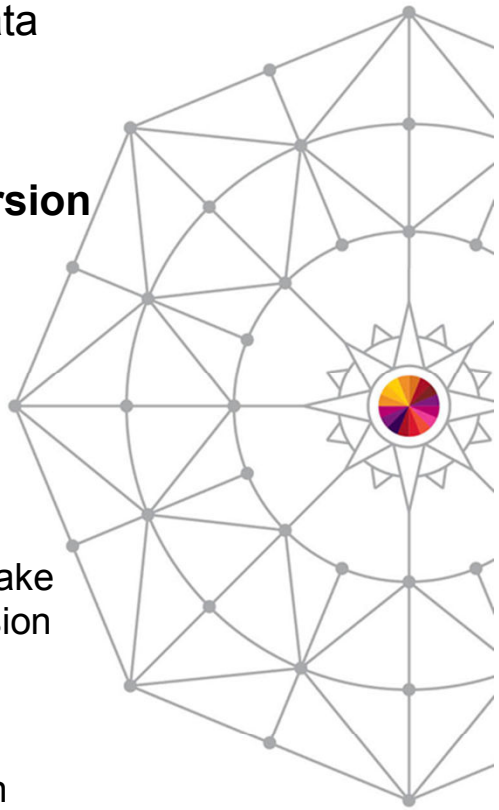
- **VSAM D-APAR OA42582**
  - Various VSAM striped EOV error messages may indicate that a striped data set may overlay an extent of another non-striped data set.
    - VSAM striped data set EOV error messages may be caused by incorrect values in the catalog. This might be only a one time occurrence.
  - ***New enhancement:*** Generate a diagnostic dump on an extend of a VSAM striped data when there is a possible catalog error.
    - PTFs available 1/9/14 on R13 and above.



? **Why it Matters:** Improved first failure data capture (FFDC) for VSAM striped data sets.

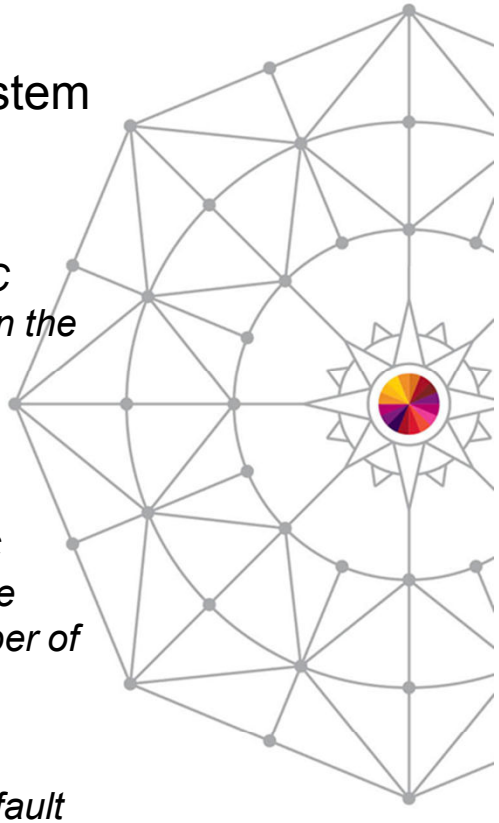
zEDC QSAM/BSAM Data Set Compression

- The new zEDC compression for new data sets is Optional
  - Only turn on after ALL systems that might access compressed data have zEDC acceleration
  - All previous compression options are still supported
  - **Note: zEDC Compressed Format data sets are created as Version 2 data sets**
- Setup is similar to setup for existing types of compression (generic and tailored)
- Who benefits?
  - Customers who don't use BSAM/QSAM compression today
    - Customers who don't currently compress their BSAM/QSAM data can take advantage of the disk space savings available through zEDC compression with minimal CPU overhead.
  - Customers who currently compress their BSAM/QSAM data
    - The CPU cost of compressing BSAM/QSAM data can be reduced when using zEDC compression compared to existing BSAM/QSAM compression options. Note that the disk space savings may vary depending on the type of compression used.



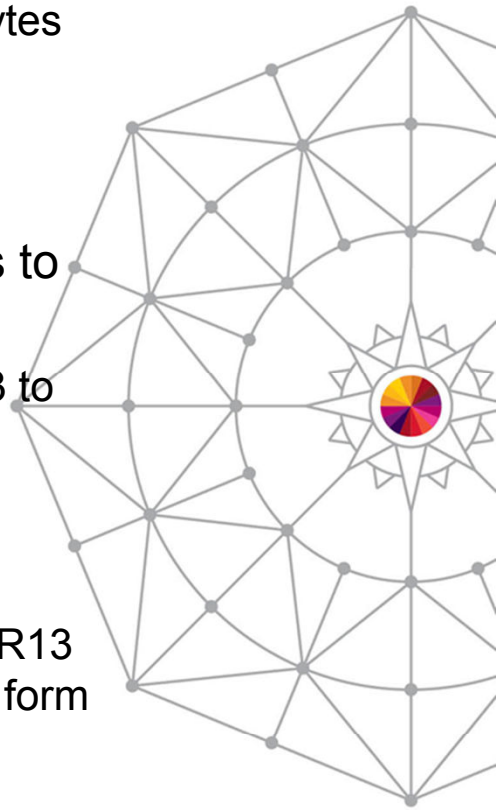
zEDC QSAM/BSAM Data Set Compression

- Setup is similar to setup for existing types of compression (generic and tailored)
  - It can be selected at either or both the data set level or system level.
    - **Data set level**
      - *In addition to existing tailored (T) and generic (G) values, new zEDC **Required (FR)** and zEDC **Preferred (FP)** values will be available on the COMPACTION option in data class.*
      - *When not found in data class, the system level is used*
    - **System level**
      - *In addition to existing TAILORED and GENERIC values, new zEDC **Required (ZEDC_R)** and zEDC **Preferred (ZEDC_P)** values will be available on the COMPRESS parameter found in IGDSMSxx member of SYS1.PARMLIB.*
    - **Activated using SET SMS=xx or at IPL**
      - *Data class continues to take precedence over system level. The default continues to be GENERIC.*



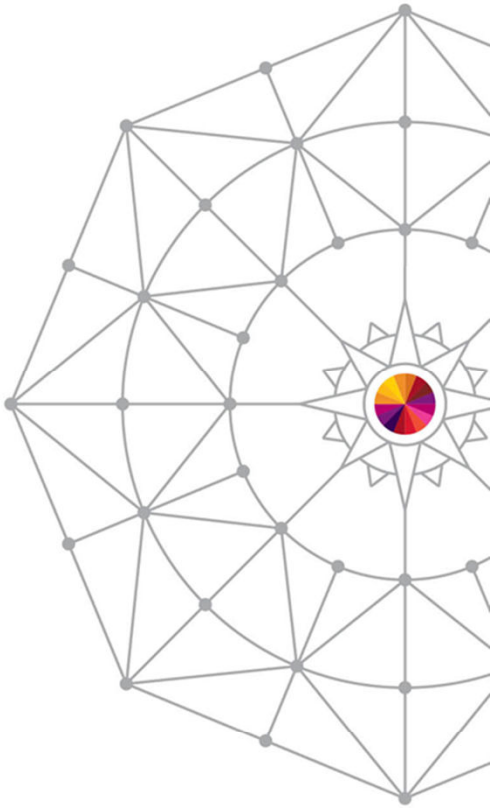
zEDC QSAM/BSAM Data Set Compression

- Use SMF records to determine compression ratio
  - SMF Type 14/15 contains existing compressed/uncompressed bytes to calculate compression ratio and new bits to identify zEDC compressed format data set.
- Coexistence PTFs for DFSMS components to support access to existing zEDC compressed format data sets.
  - DFSMS coexistence PTFs will allow a user on V1R12 and V1R13 to read/write existing zEDC compressed format data sets
- Coexistence PTFs for DFSMSdss (COPY/DUMP/RESTORE)
  - DFSMSdss coexistence PTFs will allow a user on V1R12 and V1R13 to RESTORE a compressed format sequential data set when the form of compression used was zEDC compression.



z/OS DFSMS Highlights

- **PDSE**
  - **V2.1**
    - PDSE Larger Member Size
    - GDG support for PDSEs
    - IEBCOPY Enhancements

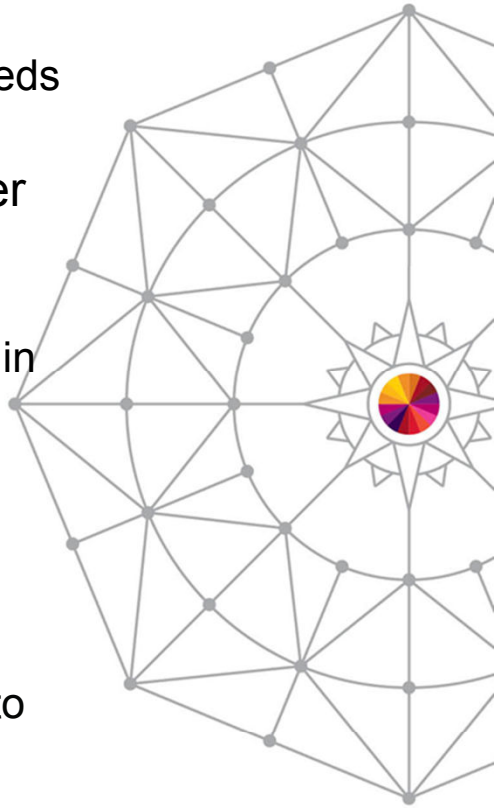


Session 15084: DFSMS Advanced: PDSE Diagnostics and Recovery, **Wednesday 3PM**

Session 15083: The Future of PDSE: The Version 2 Format, **Thursday 11AM**

PDSE

- **PDSE Larger Member Size**
  - Currently PDSE members are limited to 15,728,639 records.
    - Message IEC036I 002-A8 is issued if a PDSE member exceeds 15,728,639 lines. This limit does not exist for PDS datasets.
  - ***New enhancement:*** Increase the limit on PDSE member size.
    - PDSE member size is planned to be over 125 times larger (approximately 2,146,435,071 records) than the current limit in many circumstances, and substantially larger than the maximum supported size of a PDS member.
  - ***SHARE Requirement met:*** **SSMVSS11010**

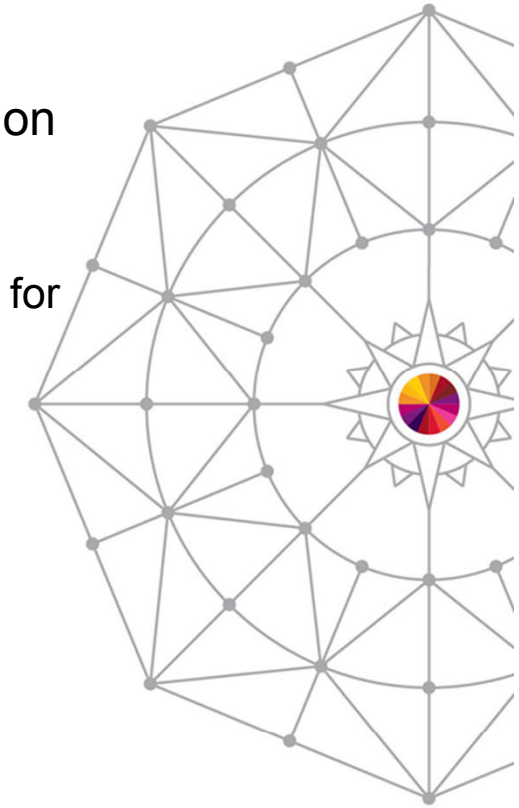


? **Why it Matters:** Provide additional scalability and usability benefits of using PDSEs in place of PDSs and make it feasible to use PDSEs instead of multiple large sequential data sets.

PDSE

- **GDG support for PDSEs**
  - Currently PDSs are supported as GDSs (generation data sets). However, PDSEs are not supported as GDSs.
  - ***New enhancement:*** Provide support for using generation data groups (GDGs) comprising PDSE generation data sets.
    - This support, planned to be similar to existing GDG support for PDS data sets.
    - PDSE can be defined as a GDS by specifying DSNTYPE=LIBRARY or a DATACLAS that specifies DSNTYPE=LIBRARY on the GDS define command.

? **Why it Matters:** Extend usage of PDSEs.

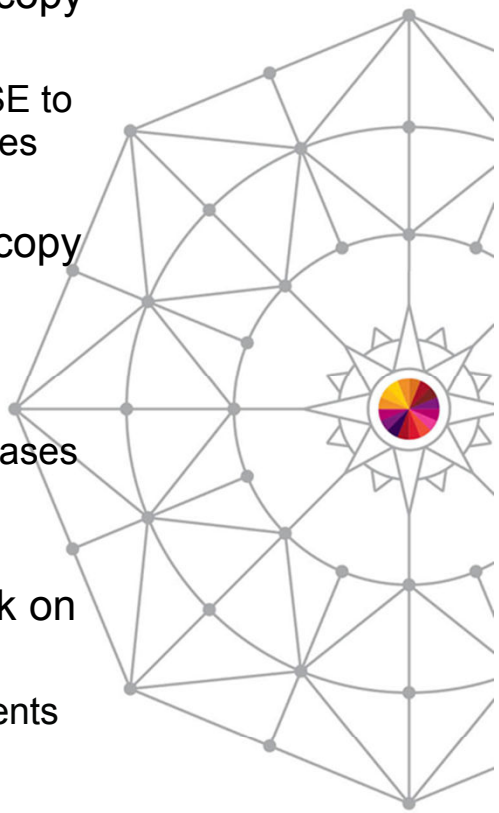


PDSE

IEBCOPY Enhancements

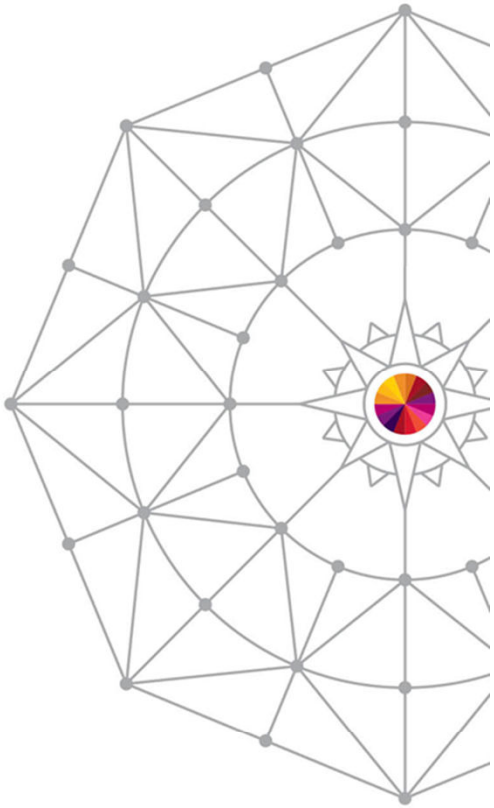
- Currently, IEBCOPY can be used to copy to or from a PDSE data set a member and its aliases, together as a group. In addition, copy functions require that member names be fully qualified.
  - COPYGRP supports all combinations of group copy requests for PDSE to PDSE, PDSE to PDS and PDS to PDSE, but PDS to PDS group copies are currently treated as a COPY operation.
- ***New enhancement:*** New COPYGROUP function designed to copy members and all aliases for any combination of PDS and PDSE data sets.
  - A superset of the existing COPYGRP function.
  - All aliases in a group will be copied with the member or neither the aliases nor the member in a group will be copied.
  - The EXCLUDE statement is not supported.
- ***New enhancement:*** Allow the user to pass a filter pattern mask on COPYGROUP functions
  - The MEMBER sub parameter of the SELECT and EXCLUDE statements will be enhanced to accept the "*" and '%' filter control characters.

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



z/OS DFSMS Highlights

- **SMS**
  - **V2.1**
    - Provide Option to Suppress Messages
    - Alter ACDS/COMMDS to SHROPT(3 3)
    - SMS ACS Read-only Variable for EAVs



Session 15093: DFSMS Intermediate: Naviquest – Streamlining SMS work, **Monday 11AM**

Session 15097: DFSMS Basics: How to Write ACS Routines - Hands-on Lab, **Wednesday 11AM**

SMS

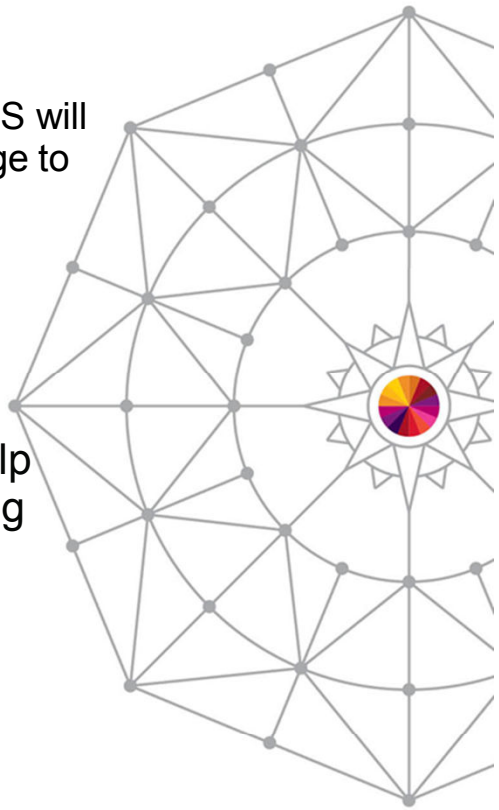
- **Provide Option to Suppress Messages**
  - Some users complained that SMS may issue too many IGD17054I, IGD17227I and IGD17395I messages to the joblog and hardcopy log:
    - *IGD17054I DATA SET NOT FOUND FOR DELETE/RENAME ON VOLUME*
    - *IGD17227I DATA SET WAS ALLOCATED TO A SUBSEQUENT MULTI-TIERED STORAGE GROUP*
    - *IGD17395I DATA SET WAS NOT ALLOCATED IN THE SAME STORAGE FACILITY IMAGE*
    - These messages can not be suppressed by the Message Processing Facility (MPF) or installation exits
  - ***New enhancement:*** SMS provides a new parameter in IGDSMSxx to allow the user to selectively suppress these messages:
    - **SUPRESS_SMSMSG(YES|NO, IGD17054I,IGD17227I,IGD17395I)**
    - **NO is the default and the message(s) will not be suppressed**
  - SMS provides a new command to selectively alter the setting of these messages
    - **SETSMS SUPRESS_SMSMSG(YES|NO,IGD17054I,IGD17227I,IGD17395I)**

? **Why it Matters:** Enables users to suppress unwanted/unneeded mesages.

SMS

- **Alter ACDS/COMMDS to SHROPT(3 3)**
  - ***New enhancement:*** SMS will be enhanced to check whether or not the SHAREOPTIONS(3,3) or higher is specified for ACDS or COMMDS.
    - If a lower share option is detected by SMS during CDS activation, SMS will attempt to alter the share option to (3,3) or higher and issue a message to inform the user of the result of the change.
    - If the change is successful, SMS will issue new message IGD098I. Otherwise new message IGD099I will be issued. In both cases the activation process continues as before.

? **Why it Matters:** "Soft" enforcement of SMS best practice to help users avoid potential problems with SMS due to incorrect sharing options.



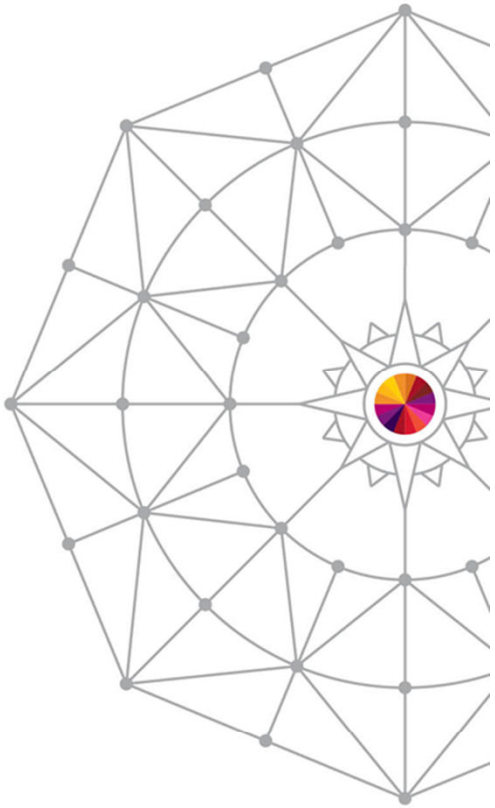
SMS

- **SMS ACS Read-only Variable for EAVs**
  - Currently, the EATTR keyword can be specified on
    - JCL
    - Dynamic allocation
    - AMS DEFINE
    - DATACLAS
  - **However, it's NOT available to the installation's ACS routines**
  - ***New enhancement:*** Provide a new ACS Read-only Variable for EAV:
    - **&EATTR - contains the extended attributes for EAV**
    - Expected Values:
      - ***OPT: extended attributes are optional***
      - ***NO: no extended attributes***
      - ***Blank : not specified (This is a default value)***

? **Why it Matters:** ACS routines can be more intelligent to select proper SMS constructs for EAV, so a data set can be allocated to an EAV storage group.

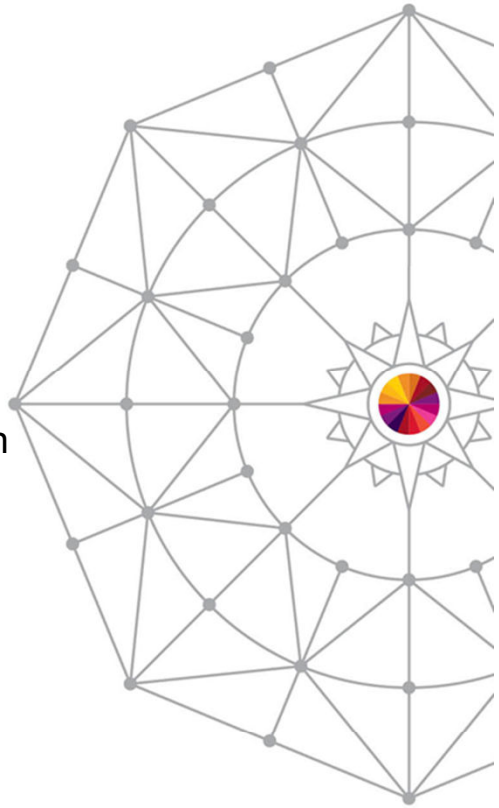
z/OS DFSMS Highlights

- **DFSMSdfp**
  - **V2.1**
    - OCE Partial Release Enhancements
    - OCE RAS Enhancements



OCE

- **OCE Partial Release Enhancements**
  - Currently unused space at the end of a data set is released under these conditions:
    - Sequential or partitioned data set
    - RLSE was coded on the DD statement or the management class specifies it
    - It happens during HSM space management or when a program closes the data set that is open for writing.
  - If the data set has multiple volumes, the space is released only on one volume, not on subsequent volumes that the data set might have been extended to previously.
    - An exception is striped data sets, where space is released on all stripes if possible.
  - ***New enhancement:*** If SMS-managed, then all the space in the data set on subsequent volumes will be released.
    - The format 1 or 8 DSCB will remain with no extents.
    - The catalog entry will still show the volume serials.
    - Space is released even if the storage class says “guaranteed space”.
  - ***SHARE Requirement Fully Addressed:*** SSMVSS08002
    - Partially addressed in R12 which addressed SMS, Extended Format (EF) datasets.
    - Now fully addressed with support for sequential data sets



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

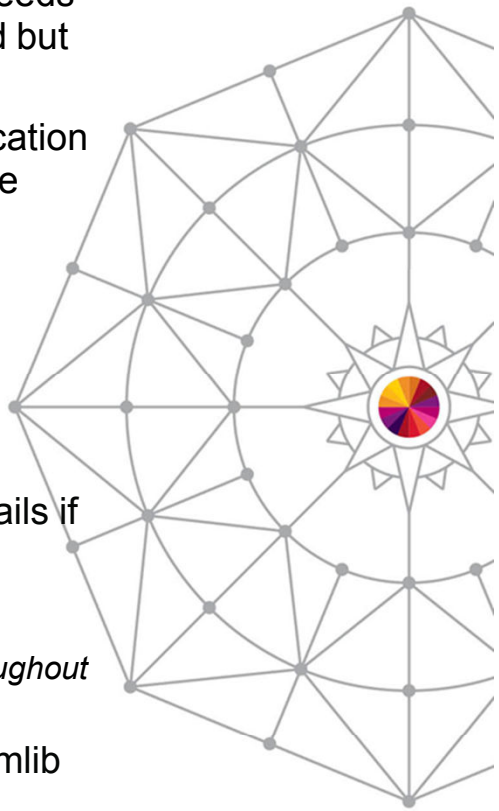
OCE

- **OCE RAS Enhancements**
  - Eliminate ABEND 837 RC08
    - Currently during EOV tape output processing when another volume needs to be added to the JFCB volume list and a JFCB extension is required but does not exist, an abend 837 RC08 is issued.
    - ***New enhancement:*** Eliminate the abend by dynamically calling Allocation to create the JFCB extension required to add the current volume to the volume list.

    ? **Why it Matters:** Automatic error recovery and avoidance of abends.

  - Parmlib member IEAAPP00 should allow comments
    - Parmlib member IEAAPP00 can be used to define authorized I/O appendage routines. Currently IEAAPP00 processing in IEAVNP16 fails if comments are included.
    - ***New enhancement:*** Allow comments in parmlib member IEAAPP00
      - *Comments will be allowed both at the start of a member or interspersed throughout the member.*

    ? **Why it Matters:** Improved communication regarding changes to parmlib members.



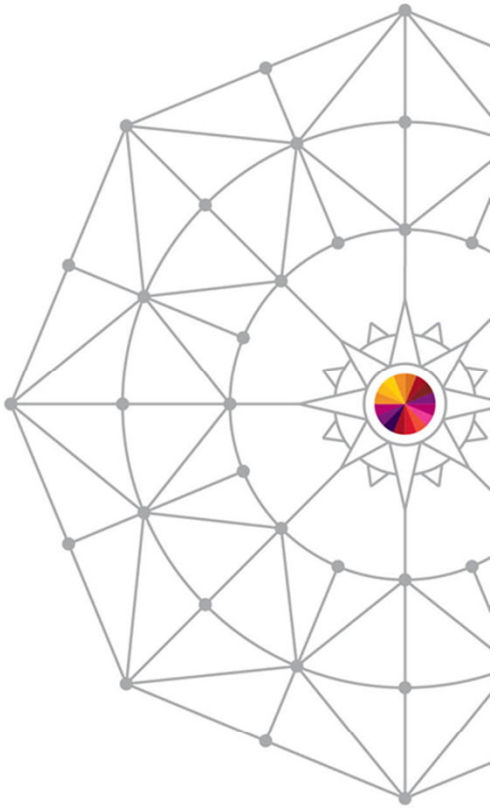
z/OS DFSMS Highlights

- **SDM**
  - **V2.1**
    - D-APARs

Session 15322: zGM, XRC, PPRC, GM, GC, MM, FC, CC, VCC: Introduction to the Alphabet Soup of IBM Copy Services, **Tuesday 3PM**

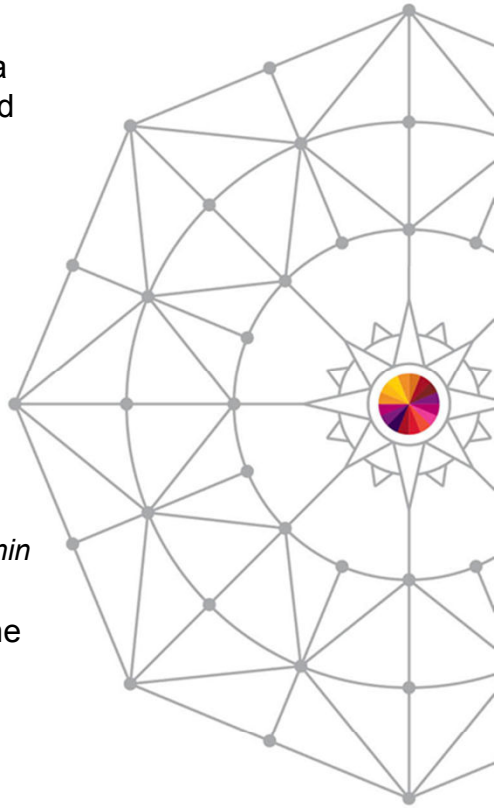
Session 15077: Continuing the understanding of IBM Copy Services: Peer-to-Peer-Remote-Copy (PPRC) and Point in Time Copy (FlashCopy) for High Availability and Disaster Recovery, **Wednesday 11AM**

Session 14615: Extending z/OS Mainframe Workload Availability with GDPS/Active-Active , **Thursday 1:30PM**



SDM

- **D-APAR OA44191**
  - XRC Dynamic Volume Compare provides the capability to validate XRC integrity while mirroring is active.
    - This is accomplished by reading tracks from primary and secondary devices, comparing them, and repeating the compare for any mismatches at a later time. If a match on all tracks is achieved at least once, mirroring for that volume is considered validated.
    - The XRC Dynamic Volume Compare (DVC) utility currently only allows a volume Exclude list to be specified.
  - ***New enhancement:*** Enhance the utility to also allow for an Include list, so that a subset of devices within an LSS can more easily be compared.
    - ANTUXDVC has been enhanced to allow specification of an Include list which will define the specific volumes to be compared.
    - Volumes are first matched against the Include list. Any matching volumes are then compared to the Exclude list.
      - *This allows specifying a large volume range for Inclusion and then specific ranges within be excluded.*
    - In addition, new PARM field options can be specified to cause WTORs issued by the utility to be suppressed.
    - APAR closed; PTFs available on R12 and above.



? **Why it Matters:** Improved usability for SDM DVC utility which allows users to validate XRC integrity.

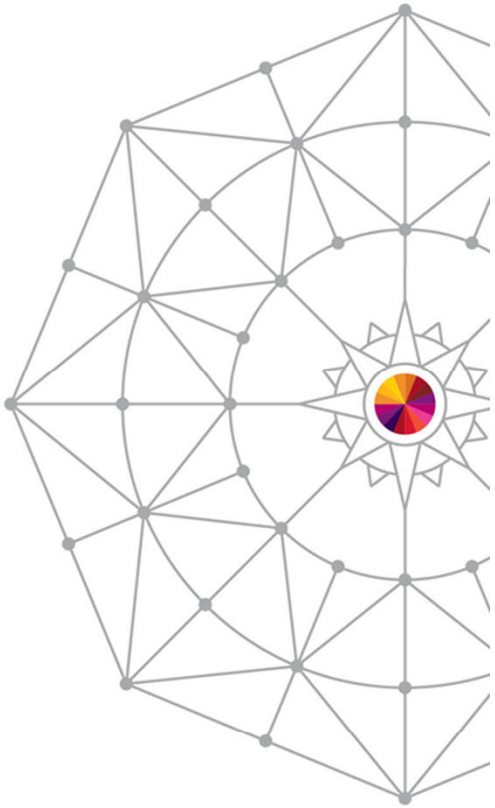
SDM

- **D-APAR OA44413**
  - **SDM CTRACE Enhancements**
    - The SDM CTRACE data is a crucial piece of information used to diagnose SDM problems and obtain first failure data capture (FFDC). New requirements have been submitted to improve the usability of the function.
  - ***New enhancement:*** The following enhancements are being made for SDM CTRACE to address ease of use:
    - Trace records are maintained in one of nine sub-areas in the component trace data space called partitions which often hinders record formatting and analysis.
      - *Use the IPCS MERGE command to display trace records from different partitions in timestamp order. To help with this new OPTIONS parameter PARTITION will be added.*
    - Trace records at the end of a table's current buffer are not displayed.
      - *Pass back the address and length of the buffer area after the point in the current buffer where new trace entries are to be added.*
    - Multiple ?ALESERV calls to obtain the data space's STOKEN impact performance.
      - *The STOKEN will be saved and passed as needed, rather than obtaining it each time.*
    - APAR opened 2/6/14; PTFs TBD on R12 and above.

? **Why it Matters:** Improved XRC FFDC and Serviceability.

z/OS DFSMS Highlights

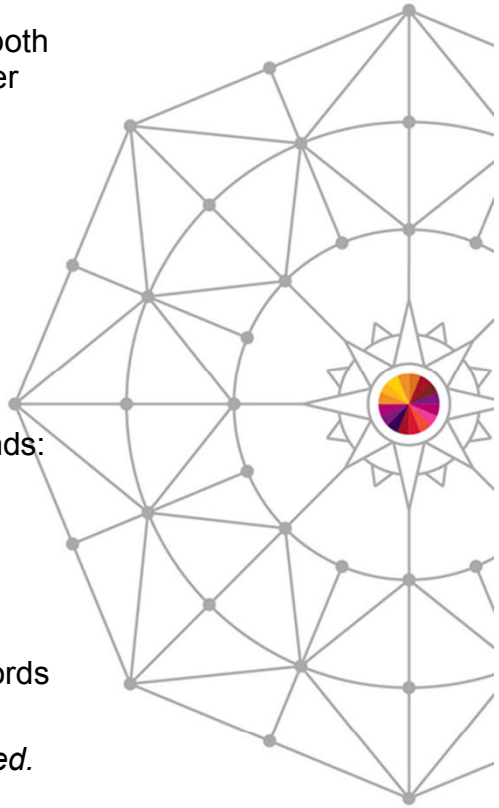
- **DFSORT**
  - **V2.1**
    - Functional Enhancements
    - Improve DFSORT/DB2 Synergy



DFSORT

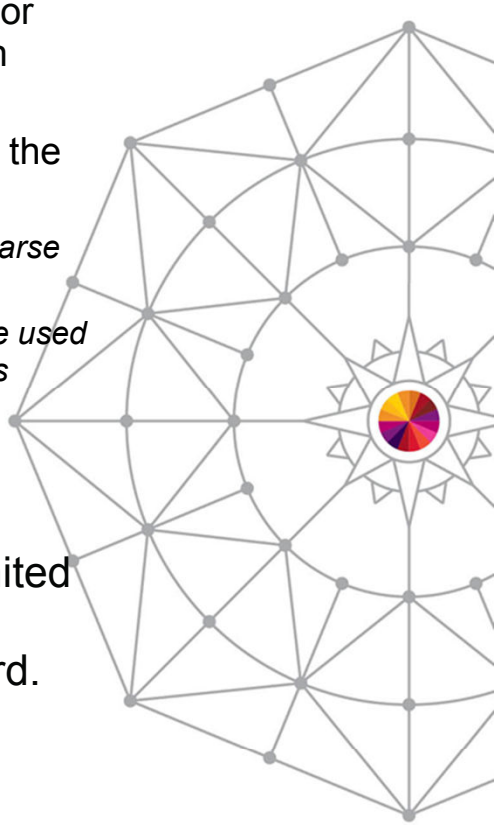
- **Functional Enhancements**
  - **Alphanumeric Tests**
    - Users often want to do comparison tests to see if a field only contains characters in a specific set (e.g. A-Z, a-z and/or 0-9).
    - ***New enhancement:*** Support new alphanumeric tests, using binary format, for both compare fields and parse fields, including combinations of alphanumeric character sets (uppercase and lowercase, and numeric).
      - ***UC:*** *Uppercase characters (A-Z)*
      - ***LC:*** *Lowercase characters (a-z)*
      - ***MC:*** *Mixed case characters (A-Z, a-z)*
      - ***UN:*** *Uppercase and numeric characters (A-Z, 0-9)*
      - ***LN:*** *Lowercase and numeric characters (a-z, 0-9)*
      - ***MN:*** *Mixed case and numeric characters (A-Z, a-z, 0-9)*
    - The alphanumeric test keywords can be used in the following comparison operands: COND, INCLUDE, OMIT, BEGIN, END, WHEN and TRLID.
    - PARSE function can now be used with alphanumeric test to start or end with a character from any of various alphanumeric character sets.
  - Migration / Coexistence Consideration
    - The alphanumeric test fields, LC, LN, MC, MN, UC and UN, are new reserved words which are no longer allowed as symbols.
      - *If any of these words were used as a symbol previously they must be changed. For example, if MC was used, it can be changed to "mc".*

? **Why it Matters:** Allows users to specify various sets of characters using a single compare condition or PARSE keyword rather than coding multiple compare conditions.



DFSORT

- **Functional Enhancements**
  - **PARSE Enhancements**
    - Users often have records with a very large number of delimited fields or with consecutive fields that they want to parse in the same way. Often they want to parse fields based on a specific set of characters.
    - ***New enhancement:*** Allow up to 1000 parsed fields (%0-%999) with the PARSE function; the previous limit was 100 parsed fields (%0-%99).
      - ***REPEAT=v*** *is a new PARSE option that can be used to repeat a particular parse field definition multiple times.*
      - ***STARTAFT=an, STARTAT=an, ENDBEFR=an and ENDAT=an*** *can now be used with the PARSE function to start or end when a character from any of various alphanumeric character sets is found.*

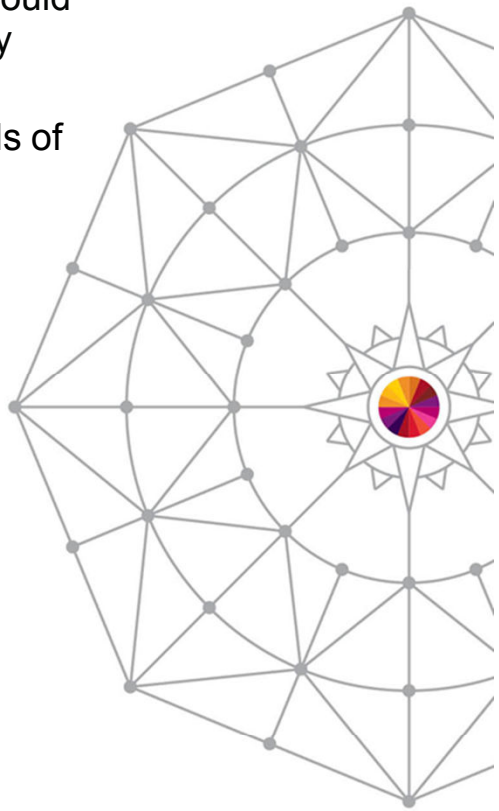


? **Why it Matters:** Allows users to parse up to 1000 fields. With REPEAT=v they can easily ignore or process consecutive delimited fields of the same form. The alphanumeric tests allow them to specify various sets of characters using a single PARSE keyword.

DFSORT

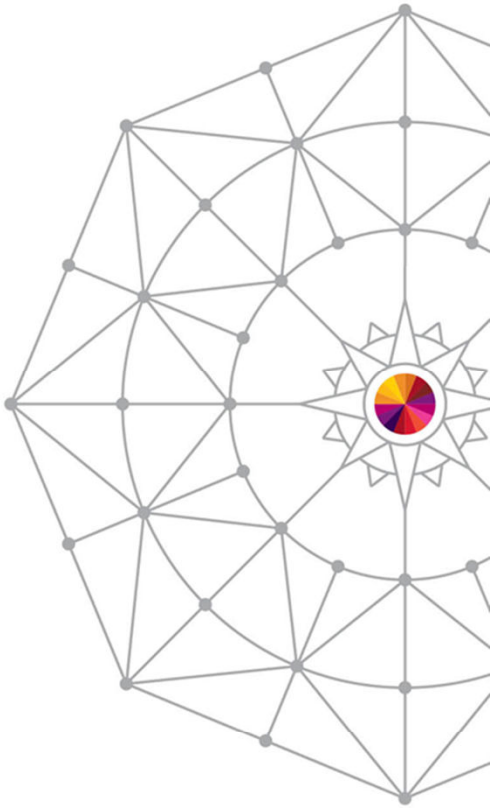
- **Functional Enhancements**
  - **Symbol Enhancements**
    - Feedback indicates users really like DFSORT symbols support and would like to see symbols supported for more DFSORT operands, especially those of the form KEYWORD=n.
    - ***New enhancement:*** KEYWORD=sym will be supported for operands of the form KEYWORD=n where n is a number.
      - *Symbols can now be used with more DFSORT features such as ID=sym, SEQ=sym, ABSPOS=sym and FIXLEN=sym.*
      - *If New_Length,25 is defined in SYMNAMES, you can use LENGTH=New_Length wherever you can use LENGTH=25*

? Why it Matters: Improved DFSORT usability.



DFSORT

- **Functional Enhancements**
  - **Add String at End of Variable-Length Records**
    - Users often have variable-length files that need a particular string added to the end of each record.
    - ***New enhancement:*** Allow users to specify that a string up to 50 characters in length be appended to variable-length output records.
      - *Previously, users would have had to write their own E35 exit logic to add a string to each VB record.*
      - ***VLTRAIL=string*** *is a new OUTFIL option that allows users to insert a character string (C'string') or hexadecimal string (X'yy...yy') at the end of each variable-length OUTFIL output record.*



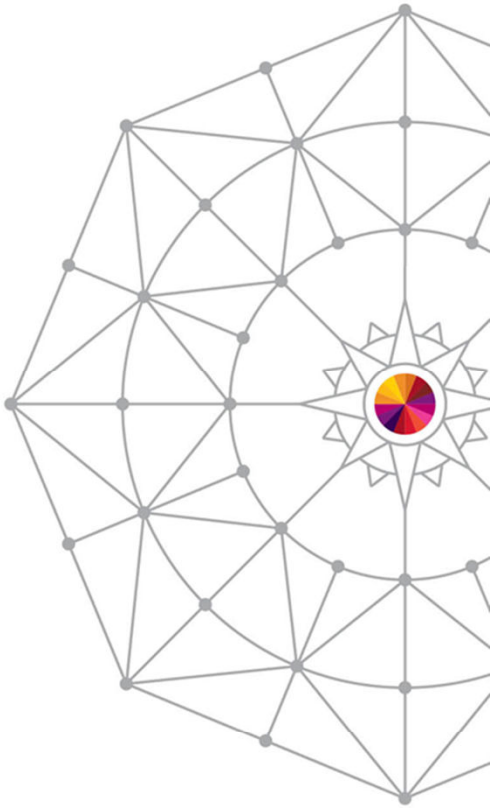
? **Why it Matters:** Improved DFSORT usability.

DFSORT

- **Improve DFSORT/DB2 Synergy**
  - Wanted to improve reliability and performance of DFSORT:
    - Provide virtual storage constraint relief below 16MB
    - Reduce disk work space related failures
    - Improve scalability for very large sorts
  - ***New enhancements:***
    - **Exploit Extended TIOT, uncaptured UCB and above the line DSAB options for dynamically allocated work data sets**.
      - *Uncaptured UCBs (S99UCACB option) is always exploited.*
      - *Extended TIOT (S99TIOEX option) and DSAB above 16 megabyte virtual (S99DSABA option) are used if DFOSRT is running authorized.*
    - **Expand "additional" work data sets capability provided in previous release.**
      - *R12 provided capability for dynamic allocation of additional work data sets that are only used if needed (ie primary space of zero and secondary space only allocated if needed).*
      - *V2R1 now provides capability to provide similar function for JCL or pre-allocated work data sets. Work data sets with primary allocation of zero are only used when work data sets with non-zero primary have been exhausted.*
    - **Increase maximum size of disk and memory object work files.**
      - *To further exploit Extended Address Volumes, the maximum number of tracks that can be used for a single work data set has been increased from 1,048,576 to 16,777,216 when full track blocking is used.*
      - *To further exploit large central storage configurations, the maximum amount of memory object storage that can be used as intermediate work space has been increased from 64 gigabytes to 1 terabyte.*
  - ? **Why it Matters:** Improved reliability and scalability for all users of DFSORT.

z/OS DFSMS Highlights

- **DFSMSrmm**
  - **V2.1**
    - DFSMSrmm RAS Enhancements

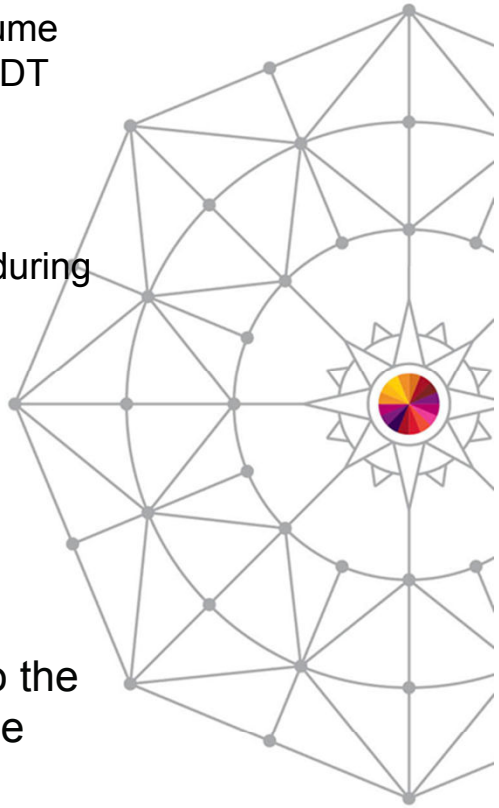


DFSMSrmm

- **RAS Enhancements**
  - **Conversion Support Changes**
    - RMM implemented a new data set attribute LASTREF and a new volume attribute RETAINBY, for data sets and volumes managed by the EXPDT retention method.
      - *If a customer wants to use these new attributes he has to use TSO RMM CHANGEDATASET and CHANGEVOLUME commands.*
    - ***New enhancement:*** set the LASTREF and RETAINBY attributes during conversion.
      - *A default value can be set via new EDGCNVT SYSIN statements :*

        OPTION EXPDT_RETAINBY

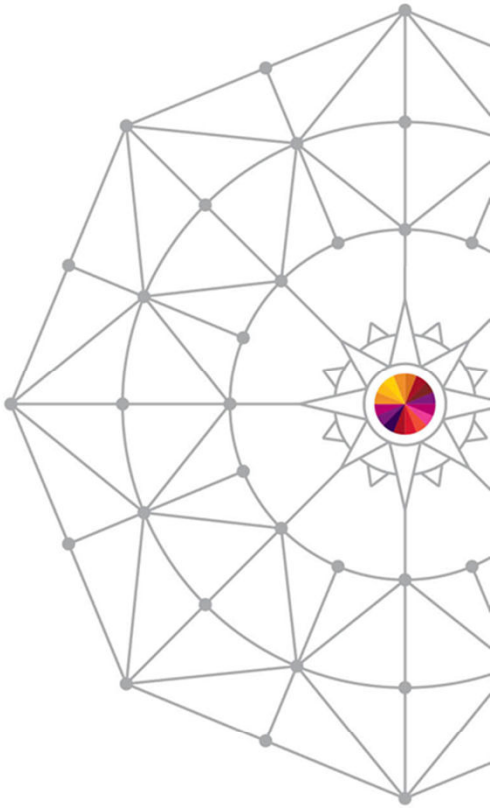
        OPTION EXPDT_LASTREF.
      - *APAR OA35808 provides toleration support.*



? **Why it Matters:** At conversion time, for the EXPDT retention method, similar attributes of the input data can be translated to the RMM data set and volume attributes. No extra updates of these attributes are needed after the conversion.

z/OS DFSMS Highlights

- **NFS**
  - **V2.1**
    - NFS Server RPCBIND Enhancements



NFS

- **NFS Server RPCBIND Enhancements**
  - Currently on the z/OS system, when the RPCBIND fails, the z/OS NFS Server has no capability to re-register with RPCBIND when it is restarted.
    - All existing connections to the NFS Server remain operative. However, no new NFS V2 or NFS V3 mounts can be established to the NFS Server.
    - In order for the NFS Server to reconnect to RPCBIND, it must be restarted, which impacts the existing mounts to the NFS Server.
  - ***New enhancement:*** The RPCBIND and NFS Servers are designed to allow the NFS Server to re-register with RPCBIND when RPCBIND is restarted, without an NFS Server restart.
    - This is designed to help preserve existing connections to the NFS Server and to allow new mounts when RPCBIND is restarted.

? **Why it Matters:** Potentially helps to improve the NFS Server resiliency and availability by eliminating a reason for NFS Server restarts.

z/OS® DFSMS™ Highlights

- Where to find additional information:
  - **V2.1**
    - **DFSMS Using the New Functions (SC23-6857-00) -** http://www-05.ibm.com/e-business/linkweb/publications/servlet/pbi.wss?CTY=US&FNC=SRX&PBL=sc23-6857
  - **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/abstracts/sg247961.html?Open)
  - **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

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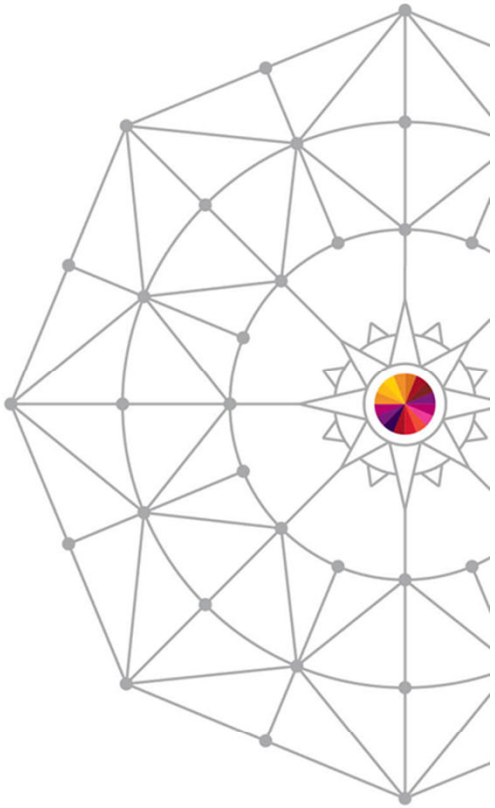
Backup

- **Includes charts from previous “What’s New in DFSMS V2.1” presentation.**



z/OS V2.1 Statement of Direction

- **DFSMS Exploitation of zEDC**
  - zEnterprise Data Compression (zEDC) for z/OS V2.1, running on zEC12 and zBC12 servers with the zEDC Express adapter, is designed to support a new data compression function designed for low-latency compression. Initially, z/OS is designed to allow you to specify that SMF data written to log streams be compressed.
    - *In addition, IBM intends to provide support for the BSAM and QSAM access methods. This function, planned to be made available by the end of the first quarter of 2014, is intended to help you save disk space, improve effective channel and network bandwidth without incurring significant CPU overhead, and improve the efficiency of cross-platform data exchange.*
    - *IBM also plans to provide support for DFSMSdss to exploit zEDC by the end of the third quarter 2014. This function is designed to be available for dumping and restoring data, and also when DFSMShsm uses DFSMSdss to move data. This is intended to provide efficient compression with lower CPU overheads than the processor- and software-based compression methods already available.*

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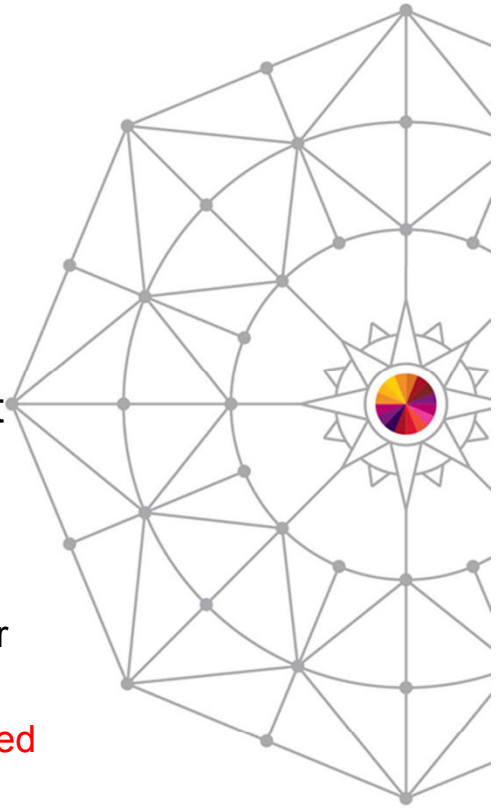
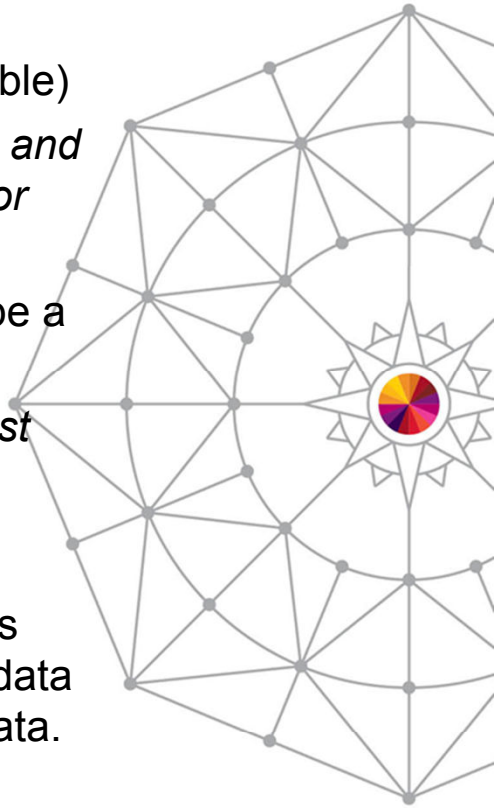
DFSMShsm

- **DFSMS Storage Tiers**
  - Today, DFSMS provides policy-based...
    - Data Creation
    - Backup / Recovery Management
    - Space Management
    - Expiration
  - No policy-based automation for moving data within the Primary Storage Hierarchy (Level 0)
  - No policy-based management of Active (open) data
  - ***New enhancement***: Automated, policy-based space management that moves SMS-managed data from tier to tier within the Primary (Level 0) Hierarchy.
    - Movement is referred to as a 'Class Transition'
    - Data remains in its original format and can be immediately accessed after the movement is complete
    - Policies implemented via the existing Class Transition policies and updated Management Class policies
    - Enhanced support for DB2, CICS and zFS data
      - *Open data temporarily closed to enable movement*



DFSMShsm

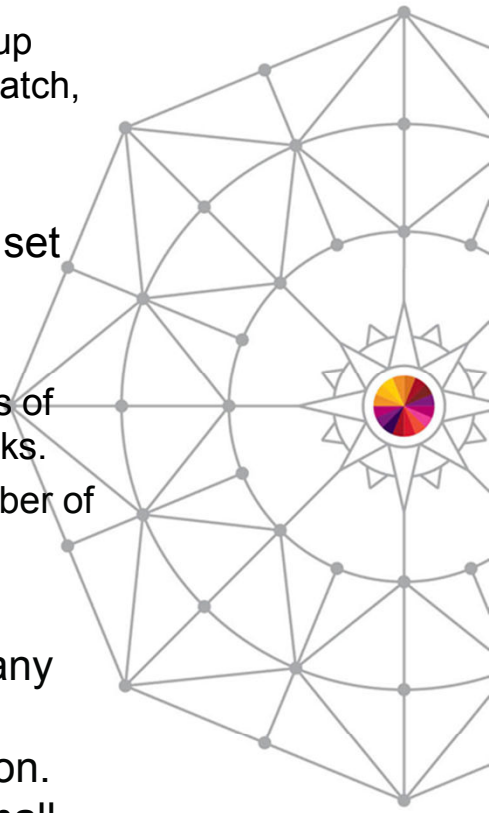
- **DFSMS Storage Tiers**
  - Data sets that would benefit from this solution:
    - Those currently not eligible for migration because they always need to be immediately accessible (ie recall delay is unacceptable)
      - *Data sets could be allocated on a particular class of storage and then later transitioned to a less expensive class of storage for permanent retention*
    - Data sets that are eligible for migration today, but there would be a benefit to keep them online for a longer period of time.
      - *Convert the migration of data sets to transition to a lower cost storage, then migrate directly to ML2*



? **Why it Matters:** Better align storage costs with changing business value; minimize the TCO for System z Data by actively managing data on the lowest cost storage that meets the business needs of the data.

DFSMShsm

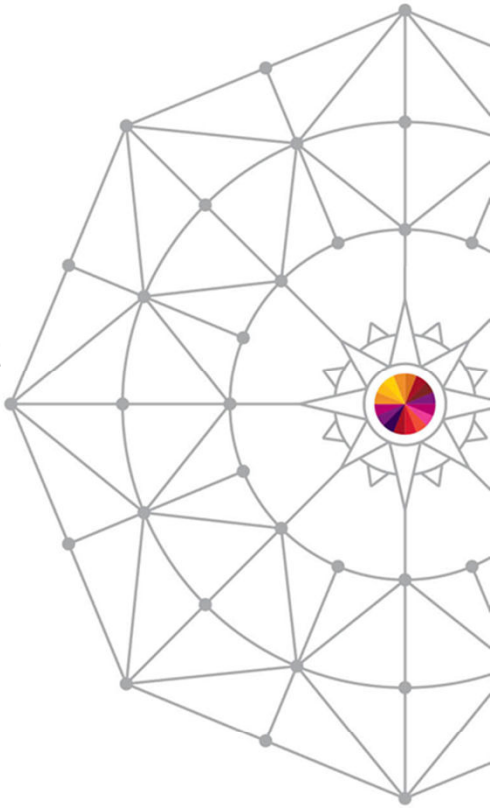
- **DFSMShsm Tape Enhancements**
  - Today, although the migration function consists of multiple tasks, the actual migration of a data set is performed by a single task.
    - The migration of a data set may be broken down into three phases: setup (enqueue, verification), data movement, post processing (recatalog, scratch, dequeue).
    - In a single task, those three phases are performed sequentially.
  - ***New enhancement:*** Allow a migration task to start multiple data set migration sub-tasks, where each sub-task manages the data set migration from beginning to the end as it does today.
    - By supporting multiple sub-tasks, the setup and post-processing phases of data set migration can be run concurrently across the migration sub-tasks.
    - The synchronization of data to tape can be deferred after a certain number of sub-tasks/data sets having completed data movement.



? **Why it Matters:** Potential marked reduction of elapsed time for any migration function managing multiple data sets such as interval migration, primary space management, ODM and volume migration. Greatest improvement expected with moving large numbers of small data sets to tape.

DFSMShsm

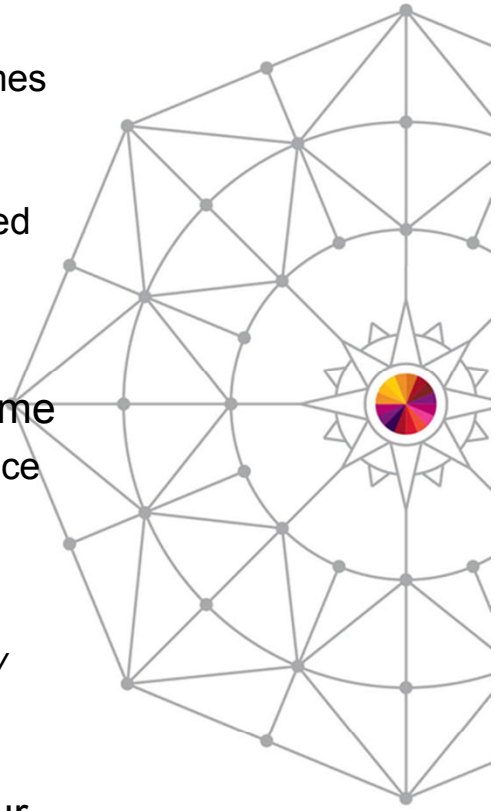
- **DFSMShsm Fast Replication Enhancements**
  - Fast replication is an HSM function that manages Point-in-Time copies
    - Combined with DB2 BACKUP SYSTEM, provides non-disruptive backup and recovery to any point in time for DB2 databases and subsystems (SAP) (ie continuous data protection).
    - Recovery at all levels from either disk or tape - entire copy pool, individual volumes and data sets.
  - **FlashCopy Consistency Group Support**
  - ***New enhancement:*** Add FlashCopy Consistency Group support
    - DFSMShsm will exploit the existing DFSMSdss capabilities.
    - Requirement from DB2 to use the FlashCopy consistency group feature to create a backup of the log copy pool with point-in-time data consistency so that a conditional restart of DB2 is not required.



? **Why it Matters:** By adding support for consistency groups, DFSMShsm will enable the DB2 BACKUP SYSTEM / RESTORE SYSTEM utilities to be used as a method to easily clone DB2 systems.

DFSMShsm

- **DFSMShsm Fast Replication Enhancements**
  - **Physical Data Set Recovery to Any Volume**
    - Previous enhancements in R8 and R11allowed data set recovery support for data sets that were currently cataloged on the same volumes and recovery for deleted and moved data by capturing catalog information.
    - Requirement to remove the restriction that data sets must be recovered back to the original volumes.
      - *This is a very undesirable restriction because there may not be space on the volumes at the time of the recovery.*
  - ***New enhancement:*** Add Fast Replication recovery to any volume
    - Enables DFSMS to select the volumes with the most highest preference weight, to which the data sets will be recovered.
    - Enables DB2 customers to discontinue the creation of object-level backup copies.
      - *These object-level backup copies must be created today in case the recovery cannot be performed back to the original volumes.*



? **Why it Matters:** Avoids of out-of-space conditions that can occur during recovery.

DFSMShsm

- **DFSMShsm RAS and Usability Enhancements**
  - **New Recycle Command**
    - Today, when a take-away occurs from a Recycle task, the Recycle task relinquishes the tape it is processing and terminates.
      - *This requires customers to potentially have to re-issue the Recycle request multiple times until all of the data on the original tape gets moved to new tapes..*
    - ***New enhancement:*** Automatically generate a new Recycle command for the same original tape when the original Recycle must terminate due to the take-away process.
    - ***Share Requirement MET:*** SSMVSS10004

? **Why it Matters:** Provides improved usability and recovery during Recycle processing.

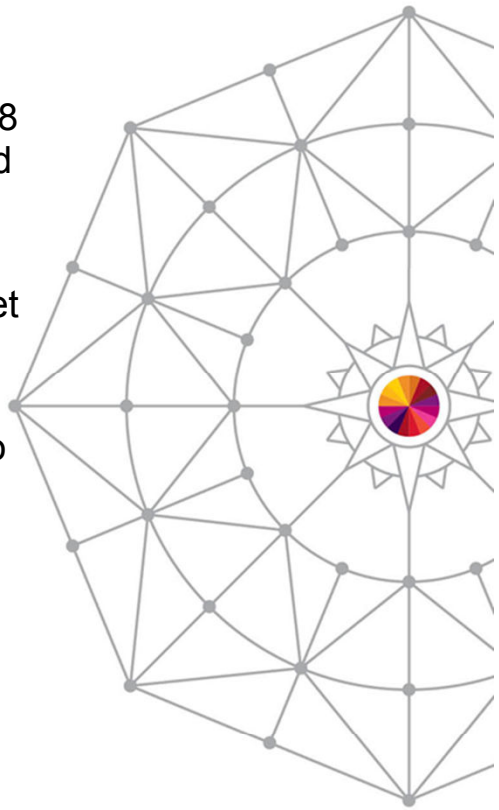
DFSMShsm

- **DFSMShsm RAS and Usability Enhancements**
  - **Use Recycle instead of Tape Copy for failed alternate tape**
    - Today, when an alternate tape of a duplex copy pair fails to be created, DFSMShsm generates an automatic request to create a tape copy of the original.
      - *DFSMShsm tape copy function is single tasked and does not have a resume capability; almost impossible to create a copy of a tape (a recall request can take-away the tape from tape copy, causing tape copy to have to start from the beginning).*
    - ***New enhancement:*** Provide an option for customers to specify that DFSMShsm should automatically generate a Recycle request in response to an alternate tape failure, as opposed to generating a tape copy request.
    - ***Share Requirement MET:*** SSMVSS10003

? **Why it Matters:** Provides improved usability, recovery, and potentially performance for the Duplex Tape function.

DFSMSdss

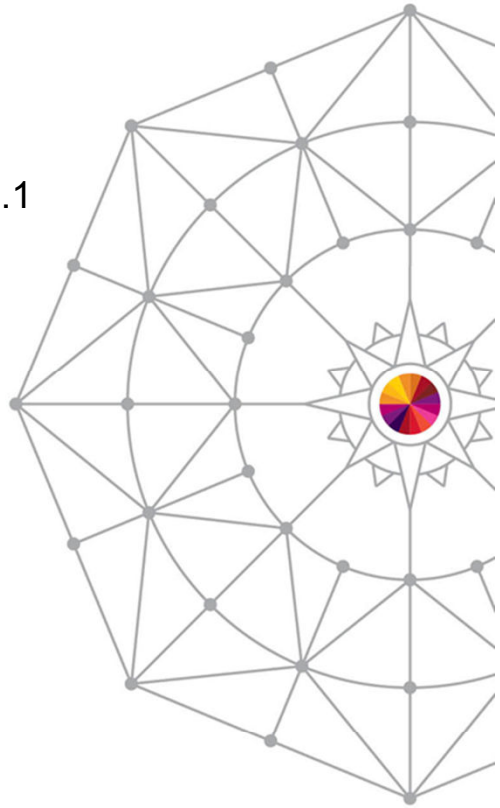
- **Reset with RESTORE**
  - The DFSMSdss Full Volume RESTORE command allows users to restore a volume from a DFSMSdss dump data set.
    - The DS1DSCHA (data-set-changed) bit that is found in the Format-1/8 DSCB in the VTOC indicates whether or not the data set has changed since its last backup.
    - During DUMP processing, the user may specify the RESET keyword which tells DFSMSdss to turn off the DS1DSCHA bit once the data set is successfully dumped.
    - During full volume RESTORE, DFSMSdss unconditionally resets (turns off) the data-set-changed indicator for each data set restored to the target volume.



DFSMSdss

- **Reset with RESTORE**
  - ***New enhancement:*** New RESET keyword, RESET(DUMP|YES|NO), for RESTORE Full and Tracks.
    - Used to turn off the "data set changed since last backup" indicator (DS1DSCHA) for all data sets restored from the dump.
    - DUMP – If RESET was specified on the DUMP command at z/OS R2.1 or higher, then the indicators will be turned off. If RESET was not specified, then the indicators will not be touched.
    - YES – Turn the DS1DSCHA indicators off
    - NO – Do not change the DS1DSCHA indicators from what they are in the backup.
  - ***SHARE Requirement met:*** **SSMVSS07002**

? **Why it Matters:** Intended to make policy-based storage management more effective for recently restored volumes.



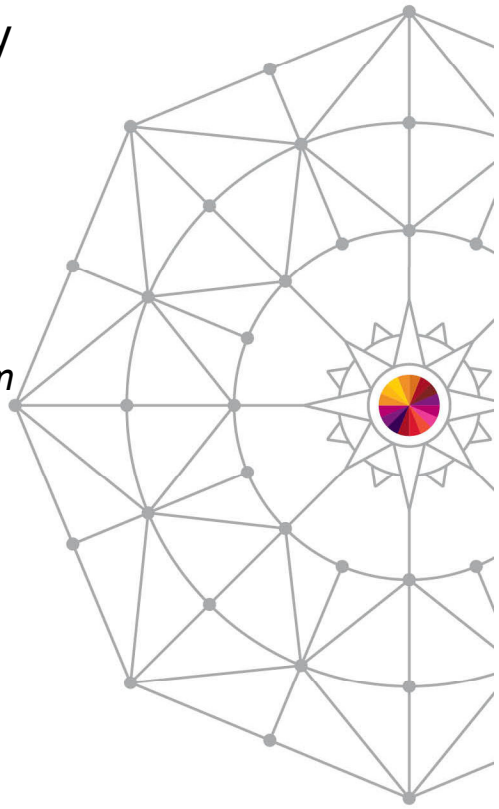
OAM

- **OAM RAS Enhancements**
  - OAM Support for Tape Block Sizes > 32 KB
    - ***New enhancement:*** Improved tape performance by supporting larger block sizes for tape.
      - *Optionally enabled via new keyword on SETOAM statement in CBROAMxx member of PARMLIB*
      - *Volume supports larger block sizes if support enabled when first object written to that volume*
      - *Volumes that support block sizes > 32 KB not accessible from prior releases*

    ? **Why it Matters:** Improved performance and scalability for OAM tape processing.

OAM

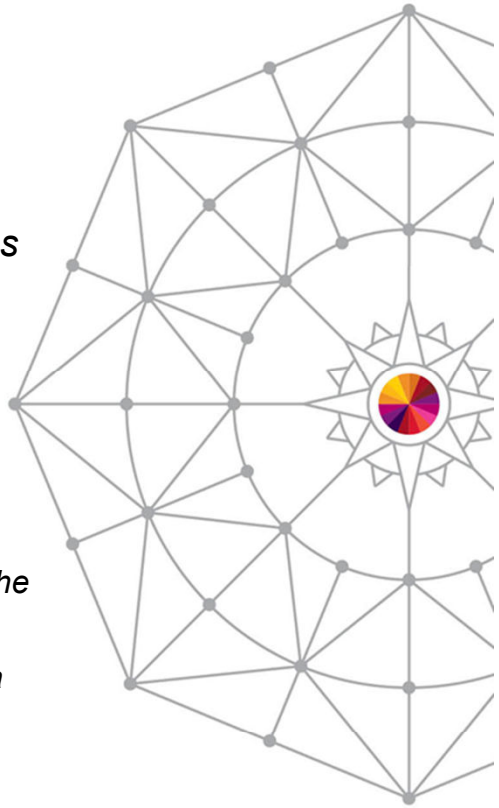
- **OAM RAS Enhancements**
  - New SETTLIB PARMLIB option for tape library tuning
  - ***New enhancement:*** ability to tune several cartridge entry messages that today can flood the console
    - *Optionally enabled via a new SETTLIB statement in the CBROAMxx member of PARMLIB*
    - *Keywords added to direct how the cartridge entry ignore (CBR3620I) and successful (CBR3610I) messages are handled*
    - *Also provides the ability to direct these messages to just the system log*
  - ? **Why it Matters:** provides the ability to reduce the frequency of the messages and direct how and where the messages get issued. Provides the foundation for future tuning-related options.



OAM

- **OAM RAS Enhancements**
  - OAM Support for Automatic Backup Deletions
    - ***New enhancement:*** Improved tape performance by automatically removing unneeded backup copies.
      - *Optionally enabled via new keyword on SETOSMC statement in CBROAMxx member of PARMLIB*
      - *When enabled, OSMC processing will delete existing backup copies that exceed the number required by object's current management class (e.g. when object transitions to TS7700 Virtualization Engine with multi-cluster grid support, OAM backups may no longer be needed).*
      - *SMF – Existing OAM SMF Record Type 85 (x'55') Subtype 32 changes:*
        - *New flag will indicate whether automatic backup deletion was enabled at the time of OSMC processing*
        - *New fields will show number of backup copies and total bytes deleted as a result of automatic backup deletion*

    ? **Why it Matters:** More automated space management and exploitation of IBM Tape HW functionality.



OAM

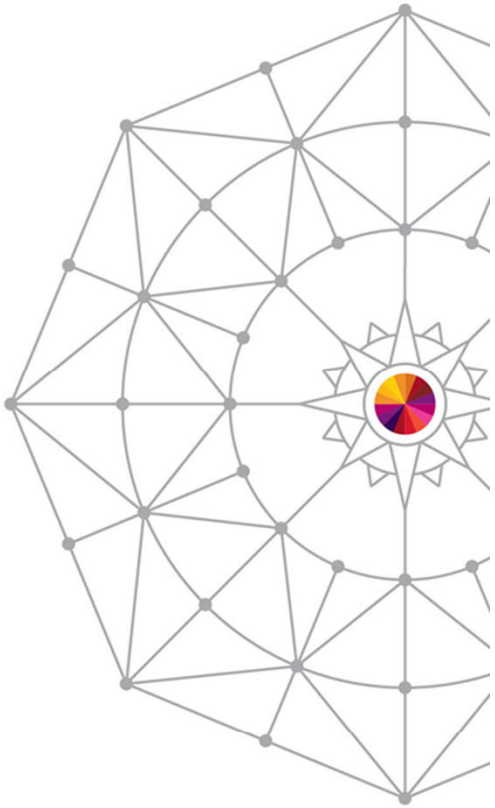
- **OAM RAS Enhancements**
  - Reduced Size Limit for OAM Store Sequence Processing
    - ***New enhancement:*** Improved performance by enabling the OSREQ Store Sequence support on small object sizes.
      - *Minimum size required for OSREQ Store Sequence processing (STOREBEG/STOREPRT/STOREEND) reduced from 256 MB+1 to 50 MB+1*
      - *Provides option for storing objects in 50 MB+1 to 256 MB size range*
      - *Not supported when writing to optical*

    ? **Why it Matters:** Improved OAM usability and reduced application virtual storage requirements.

OAM

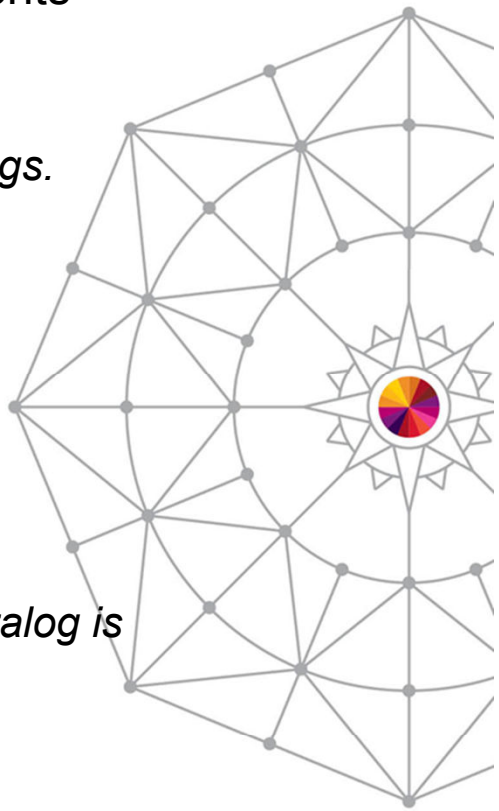
- **OAM RAS Enhancements**
  - OAM ATAM Coexistence Enhancement
    - ***New enhancement:*** Allow users to specify how long OAM's object support should wait before issuing a message when no tape devices are available.
      - *New keyword on SETOAM statement in CBROAMxx member of PARMLIB to specify retry time period.*
        - *Can be set to 0 to indicate no retries.*

    ? **Why it Matters:** Improved OAM interoperation with products such as IBM Tivoli Automated Tape Allocation Manager for z/OS (ATAM, 5698-B15),.



Catalog

- **RLS Support for Catalog**
  - Customers have raised a number of issues and requirements around Catalogs and Catalog processing:
    - **Performance**
      - *Contention on SYSIGGV2 bcsname when updating catalogs.*
      - *Limited catalog buffering and buffer invalidation.*
      - *Limited VSAM buffers/strings/storage.*
    - **Availability**
      - *Catalogs need to be split for contention issues.*
      - *Catalogs unavailable for splitting, recovering, and other maintenance activities.*
    - **Integrity**
      - *Catalogs damaged by utilities updating a catalog while catalog is opened by CAS.*
      - *Lack of sysplex control of closing and serializing catalogs.*
    - **Recovery**
      - *Long/error prone forward recovery procedures.*

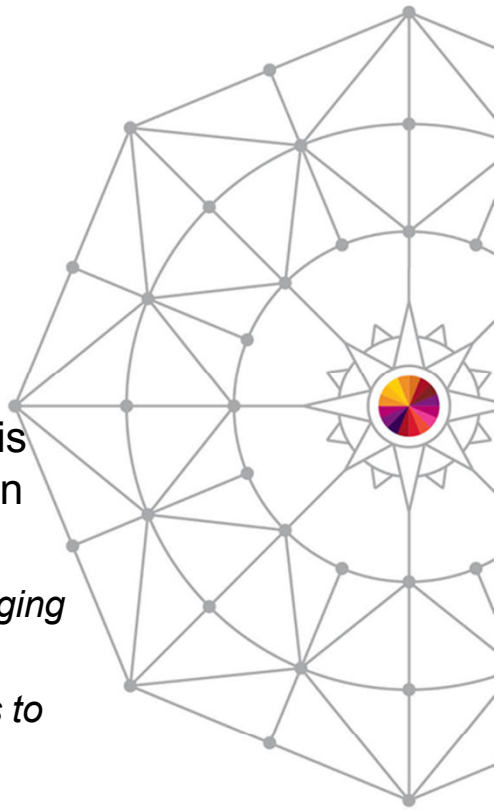


Catalog

- **RLS Support for Catalog**
  - ***New enhancement:*** Exploit VSAM Record Level Sharing (RLS) for Catalogs.
    - Addresses customer concerns related to catalog performance, usability, availability, and recovery.
    - Replaces current BCS sharing and buffering protocols with more efficient functionality.
    - RLS will provide record level locking, and 64 bit local/global buffer pools.
      - *Performance is expected to improve by eliminating contention on current catalog serialization (SYSIGGV2 resource), reduced i/o activity (via larger local/global buffering), and improved cross system buffer invalidation (via XES/XCF Cross Invalidation).*
        - *SMSVSAM will hold SYSIGGV2 bcsname SHARE while a catalog is opened for RLS access (ensures catalog data integrity from programs relying on SYSIGGV2 to serialize the catalog)*

Catalog

- **RLS Support for Catalog**
  - ***Additional enhancements:***
    - Enhance IDCAMS commands PRINT, REPRO, IMPORT and EXPORT to be able to open VSAM data sets using RLS.
    - New Catalog MODIFY commands to switch access between RLS and non-RLS.
    - New vendor interface to quiesce updates or suspend lock/catalogs to improve integrity.
    - New performance measurements at a catalog level.
    - Usability and availability are expected to improve since there is no longer a need to split catalogs in order to reduce contention and improve performance.
      - *Catalog size should no longer be a factor in maintaining and managing user catalogs.*
      - *Improve integrity and availability with new sysplex wide commands to control access to individual usercatalogs within a parallel sysplex.*



Catalog

- **RLS Support for Catalog**
  - ***Additional enhancements (applies to ALL catalogs RLS and non-RLS):***
    - *Preserve user catalog connector alias entries when you temporarily delete a user catalog so they need not be redefined when the catalog is reallocated, and prevent new catalog entries using those aliases from being defined until the new catalog is available.*
    - *Suspend / Resume catalog requests for a specified catalog across a sysplex to allow users to minimize application disruption during catalog maintenance.*
    - *DSS DUMP processing will invoke a Quiesce for Copy (QUICOPY/QUICEND) for catalogs opened for RLS.*
      - *The QUICOPY will suspend update requests only in order to obtain a sharp copy of the catalog. The QUICEND will resume update requests.*
      - *For nonRLS catalogs, DSS will use existing serialization (SYSIGGV2).*
    - *DSS RESTORE processing has new LOCK / SUSPEND options*
      - *LOCK will invoke a sysplex wide close of the catalog and lock the catalog (failing new unauthorized requests), if the catalog is not already locked or suspended.*
      - *SUSPEND will invoke a sysplex wide close of the catalog and suspend new unauthorized requests in the client space if the catalog is not already locked or suspended.*

? **Why it Matters:** Addresses several critical customer constraint requirements around Batch Window, Mean Time to Recover (MTTR), and Catalogs as a Single Point of Failure (SPOF).

Catalog

- **Catalog Alias Enhancements**
  - ***New enhancement:*** Improvements in the processing catalog aliases:
    - Save creation date for Catalog aliases; listed by IDCAMS
      - *Clients are attempting to cleanup obsolete HLQs (High Level Qualifiers). If an alias has no associated datasets, there is no easy way to determine whether this is a new alias and no data sets have been created or this is an obsolete alias that should be deleted.*
      - ***SHARE Requirement Met:*** ***SSMVSE10018***
    - Add a check when deleting a catalog entry that has an associated alias to verify that the alias is only related to the entry being deleted, before deleting the alias record.
    - Ensure requests are oriented to the correct catalog when the data set aliases in the master catalog specify a different high-level qualifier.

? **Why it Matters:** Ease of use and improved catalog alias processing.

Catalog

- **Catalog Parmlib Member Enhancements**
  - The Catalog PARMLIB member, IGGCATxx, was introduced in R13 and will allow:
    - The specification of most Catalog parameters that now can only be specified in SYSCATLG/LOADxx and/or by the Modify command
    - Parameters in the catalog PARMLIB member override equivalent parameters in SYSCATLG or LOADxx.
  - The options take effect on the next IPL or catalog address space restart
  - ***New enhancement:*** Include additional parameters for the remaining Modify Catalog command and for other specifications not required early during IPL processing.

? **Why it Matters:** These enhancements are intended to make it easier to specify options for catalog processing.

Catalog

- **Catalog RNLs HealthCheck**
  - IBM makes specific recommendations about what to specify in global resource serialization resource name lists (GRS RNLs) to prevent catalog-related deadlocks when using shared volumes and catalogs.
  - ***New enhancement:*** New GRS RNLs Health Check to help prevent lockouts due to shared volumes:
    - The check will perform the system check and indicate when GRS RNLs do not match IBM recommendations for SYSIGGV2, SYSZVVDS and SYSVTOC.
    - IBM now recommends that ALL reserves be converted; the SYSIGGV2, SYSZVVDS and SYSVTOC reserves should all be converted, unless the user shares DASD outside the sysplex.
    - Deadlocks can be prevented by always converting the SYSIGGV2, SYSZVVDS and SYSVTOC reserves to SYSTEMS ENQUEUEs using GRS or an equivalent product.

? **Why it Matters:** Automatic checking (via Healthchecker) of IBM best practice recommendations.

Catalog

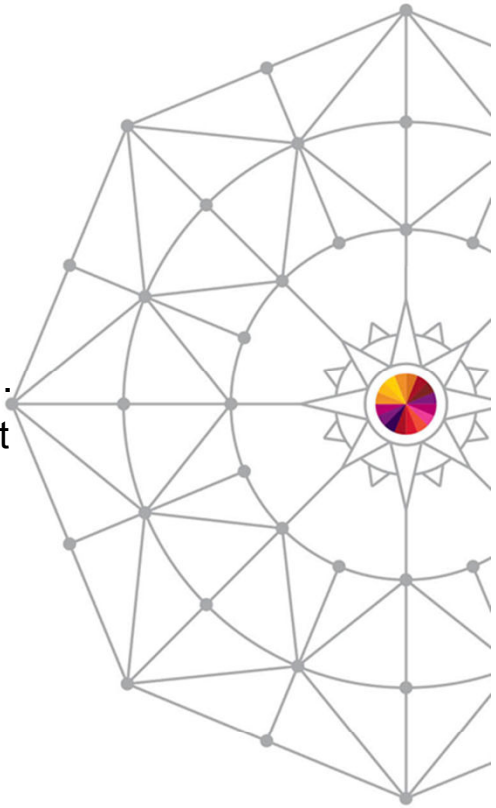
- **Catalog CSI Enhancements**
  - Today, some data set information can only be accessed by group field names.
  - ***New enhancement:*** New field names will be externalized for clients to retrieve the requested information:
    - STRNO: Number of concurrent requests
    - BUFND: Number of buffers requested for Data component
    - BUFNI: Number of buffers requested for Index component
    - INDXLVLS: Number of Index Levels SEQ-SET-RBA
    - HILVLRBA: RBA of High Level Index Record
    - ASSOC: Repeating list of catalog records associated w/this entry.
    - ASSOCSYB: Indicates if the entry is a symbolic-relate
    - TRACKS: Total tracks per volume.

? **Why it Matters:** Improved usability for CSI requests.

IDCAMS

- **Larger BlockSize for LBI Support**
  - The large block interface (LBI) was introduced ten years ago.
    - It uses less tape storage and transfers data faster
  - IDCAMS has not supported LBI, and this restriction can stop the use of the LBI feature
    - IDCAMS REPRO and PRINT utilities fails with error message IDC3300I followed by IDC3321I and a return code of 12.
    - The max block size for IDCAMS REPRO and PRINT is 32760.
  - ***New enhancement:*** IDCAMS REPRO and PRINT will support a block size up to the access method limit, which currently is 256 KB.
    - The block size is still limited to 32 KB when the data set does not support LBI, such as with a unit record device or TSO terminal.
    - SYSIN and SYSPRINT do not support LBI.

? **Why it Matters:** Allow processing of data sets created using LBI.



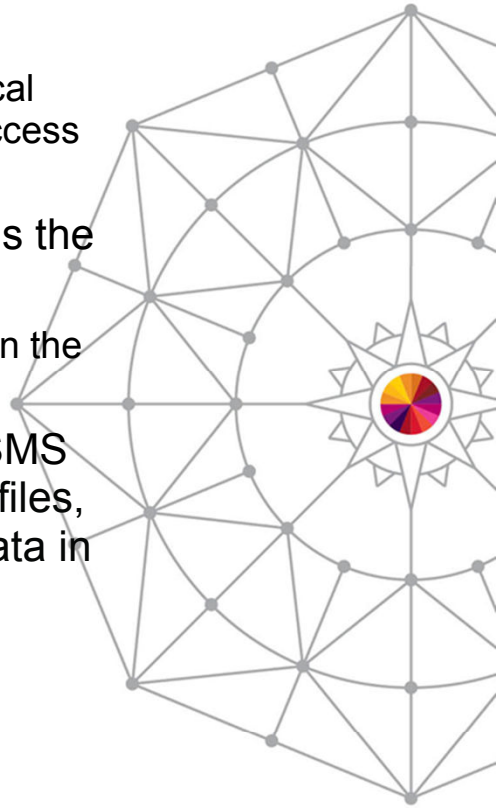
IDCAMS

- **DIAGNOSE of GDGs**
  - Currently, IDCAMS DIAGNOSE command does not detect a mismatch in the actual number of extension cells versus how many GDG BCS records exist.
    - This can lead to GDG processing errors that are undetectable until batch processing fails.
  - ***New enhancement:*** Enhance AMS DIAGNOSE to crosscheck the extension cells and the GDG BCS record, so the mismatch can be detected.
    - DIAGNOSE will return a failing return code, if there is a mismatch of the actual number of extension cells and the number of BCS records of a GDG.
      - ***IDC31378I GDG BASE EXT CELL COUNT IS ZERO, BUT EXT CELLS EXIST***
      - ***IDC31379I GDG BASE EXT CELL COUNT DOES NOT MATCH THE EXT CELLS COUNT***

? **Why it Matters:** Intended to help users easily and quickly identify the cause of GDG processing errors.

Access Methods

- **VSAM RLS Directory Only Caching**
  - Accessing data stored in the local buffers is the quickest way for a user to access shared data.
    - However, in a sysplex environment if a system has invalidated the local copy because another user has updated the data, users must gain access to the data in another way.
  - Accessing data from the cache structure in the coupling facility is the next fastest way for the user to access the shared data.
    - Data in the XCF cache structure is directly accessible to any system in the sysplex that has access to the structure.
  - ***New enhancement:*** Provides a new keyword, DIRONLY, for SMS DATACLAS RLSCFCACHE to bypass caching all RLS data for files, including the index component, when the cost of caching any data in the coupling facility outweighs the benefits.



Access Methods

- **VSAM RLS Directory Only Caching**

? Why it Matters:

- Directory only cache will benefit RLS customers with limited coupling facility storage but who still need to share VSAM data sets across a parallel sysplex.
  - They will be able to define small cache structures and exploit them only to maintain data consistency.
- Customers with single system plexes configuration still need to define XCF cache structures and have their data sets connected to them to use RLS; however these cache structures can be very small with directory only caching.
- Depending on an applications design and workload, some RLS customers, including single system sysplex users, will also experience performance improvements when using Directory Only Cache.
  - RLS will skip writing the data to XCF cache structure every time the data is updated.

Access Methods

- **VSAM RLS 64-bit Enhancements**
  - As customers have taken advantage of 64 bit buffers, the number of control blocks needed to support additional buffers has increased dramatically.
  - ***New enhancement:*** Move of a number of RLS buffer-related control blocks from the SMSVSAM data space into 64-bit storage.

? **Why it Matters:** Increase the amount of available SMSVSAM data space storage and is expected to help improve performance when processing a large amount of VSAM RLS data.

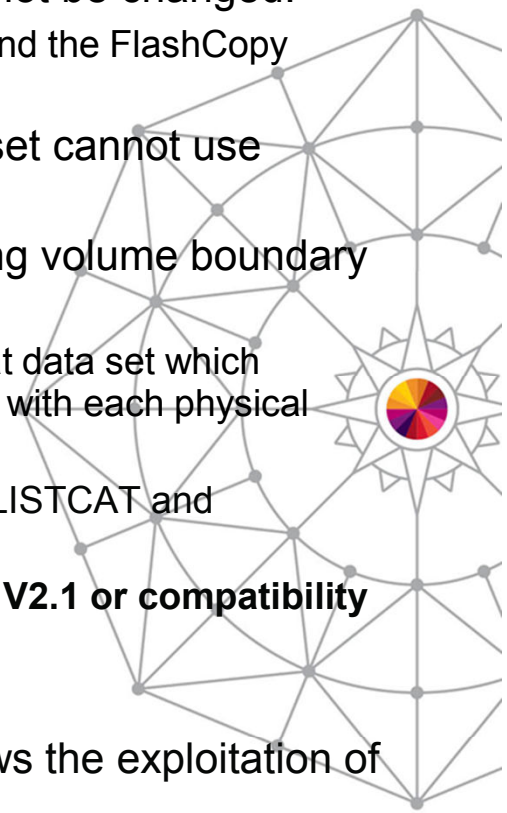
Access Methods

- **DFSMS Support for zHPF**
  - z/OS R11 provided the initial support for System z High-Performance FICON (zHPF) and exploited data sets accessed using the media manager component of DFSMS, including VSAM data sets.
  - z/OS R13 added support for QSAM, BSAM, and BPAM and allowed EXCPVR callers to use zHPF channel programs.
  - ***New enhancement:*** Add zHPF support for EXCP
    - The function is also available for z/OS V1.12 and V1.13 with the PTF for OA38185 and OA40697* (DFSMS).

? **Why it Matters:** provide function that programmers can use to achieve significant I/O performance improvements for programs using EXCP.

Access Methods

- **SAM EF Support for FlashCopy**
  - Multi-volume, single-striped extended format sequential data set cannot use FlashCopy with DFSMSdss because the volume boundary cannot be changed.
    - The suffix in each block contains the block number on that volume, and the FlashCopy process cannot adjust those numbers.
  - Similarly a single-volume, single-striped extended format data set cannot use FlashCopy if the destination requires multiple volumes.
  - ***New enhancement:*** Support the use of FlashCopy by removing volume boundary awareness from sequential extended format data sets.
    - The system will create a new format, Format 2, of an extended format data set which contains no volume boundary awareness within the suffix associated with each physical block.
    - The data set's catalog entry will indicate the data set's version., and LISTCAT and DCOLLECT will display the version.
    - **Do not set version 2 until all sharing and backup systems are at V2.1 or compatibility PTFs have been installed.**



? **Why it Matters:** Removes a long standing restriction and allows the exploitation of FlashCopy with single striped extended format data sets.

Access Methods

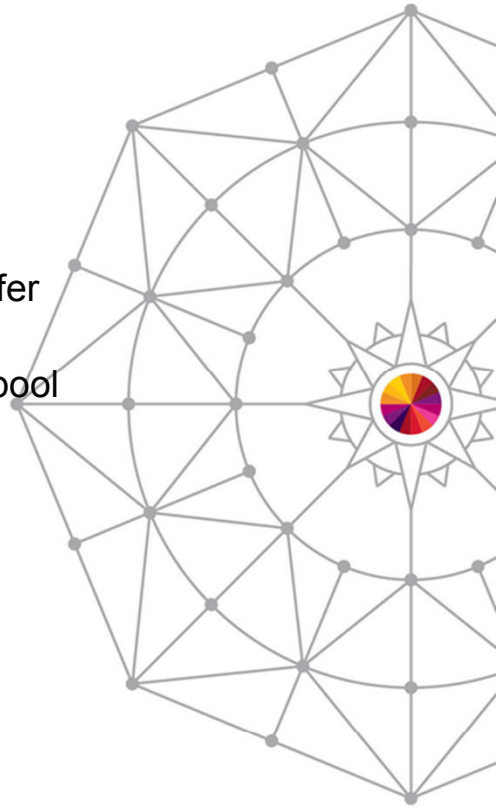
- **VSAM SMB Enhancements**
  - VSAM supports the use of system-managed buffering (SMB) for VSAM data sets. In prior releases, SMB access bias (ACCBIAS) specifications could be made in JCL, but not specified at the system level.
    - Currently, to change the SMB and RMODE31 options for the data sets in a data class, potentially hundreds of JCL DD AMP statements would need to be changed.
  - ***New enhancement:*** Specify SMB Record Access Bias values for VSAM data sets in the SMS data classes and override the ACB RMODE31 parameter with SMS data class specifications.

? **Why it Matters:** Users, who need to update SMB in hundreds or thousands of their jobs, can save time by simply modifying the data class to satisfy their SMB needs instead of individually changing the JCL “AMP=” SMB attributes in each job.

Access Methods

- **VSAM SHOWCB Enhancements**
  - The VSAM SHOWCB macro provides information about open VSAM data sets.
  - ***New enhancement:*** Enhances two sub-parameters for the SHOWCB macro to display fields of an Access Method Control Block (ACB):
    - BUFNOL – to return the number of buffers that was obtained during BLDVRP or SMB for a particular data set component and its LSR buffer pool.
    - BUFUSE – to return the number of buffers in the LSR or NSR buffer pool that are currently being used.

? **Why it Matters:** Help application programs to tune their VSAM buffering; for example, determine whether to change their LSR buffer pool sizes.



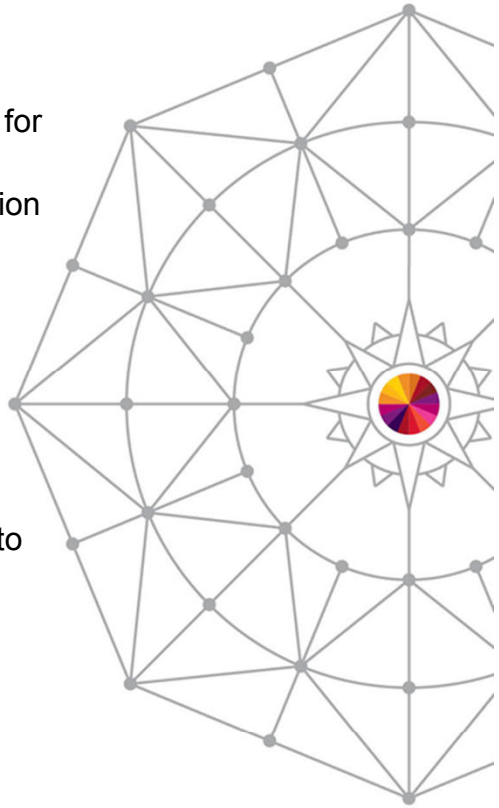
PDSE

- **PDSE Version 2 Enhancements**
  - ***New enhancement:*** Simplify PDSEs to be able to make partial release more effective and to improve general PDSE performance.
    - The system will create a new PDSE format, Format 2, which will allow all unused space to be released, consolidate directory pages when possible, improve read performance, and reduce virtual storage utilization for PDSE processing.
      - *Toleration of the new PDSE format is planned for z/OS V1.12 and z/OS V1.13*
    - Overall PDSE performance will be improved.
      - *The path length of almost all PDSE related operations will be reduced, and index searches will be improved.*
      - *Unnecessary structures from the directory will be removed allowing space to be used more efficiently.*

? **Why it Matters:** These enhancements are intended to provide additional scalability and usability benefits of using PDSEs in place of PDSs, make it feasible to use PDSEs instead of multiple large sequential data sets, and help reduce the space required for PDSEs.

PDSE

- **PDSE Member Generations**
  - ***New enhancement:*** When you create a PDSE, you will be able to specify the maximum number of generations for the system to retain for replaced members.
    - MAXGENS keyword on the DD statement or dynamic allocation or Data class
    - PARMLIB will have a system limit on the generations limit.
    - Users will need to allow for more space for the data set
    - Applies to both SMS-managed and non-SMS-managed PDSEs and is supported for program objects and data members
    - Each time that a member is replaced (not updated in place) the replaced generation will be retained.
      - *If the generations limit has been reached, the oldest generation will be deleted permanently.*
    - Old generations will not be visible to current APIs
      - *Reading the directory will see no change*
      - *New options on the DESERV macro will reveal old generations and their aliases.*
    - The aliases for each generation will be retained with it
    - ISPF and IPT will provide ways to display information about old generations and to recover them
      - *TSO commands or JCL cannot be used to see old generations*
  - **Support for recovering prior levels of a PDSE member is planned to be made available with a PTF for APAR OA42358 in the first quarter of 2014.****
    - Additional PTFs will tolerate and ignore old generations.



? **Why it Matters:** Allows deleted or replaced PDSE members to be recovered.

** IBM's statements regarding its plans, directions, and intent are subject to change or withdrawal without notice at IBM's sole discretion. The development, release, and timing of any future features or functionality described for our products remains at our sole discretion.

SMS

- **Provide Accurate Volume Space Statistics**
  - Currently, SMS updates space statistics of SMS-managed DASD volumes in the Active Configuration when
    - CVAF informs SMS that volume space usage has changed
    - A volume is varied online at the first time
    - User issues IGDCNS call to retrieve volume definition that does not contain updated space statistics
    - SMS issues LSPACE and updates the volume definition with most current space statistics
  - **SMS does not refresh volume space statistics when resizing is done from a different SMS-plex.**
  - ***New enhancement:*** SMS is enhanced to detect the size change and also provides a new command for the user to refresh volume space statistics when needed.
    - DCE contains the newly resized value
    - SMS issues LSPACE to obtain space statistics after resize and updates volume definition in active configuration
    - SMS also provides a new command for the user to refresh volume space statistics when needed:
      - ***V SMS,VOL(volser)|SG(sgname),SPACE***

? **Why it Matters:** Ensures volume space statistics are current and accurate.

SMS

- **New PARMLIB Option to Generate PDSE**
  - Currently, the DSNTYPE={LIB|HFS} does not guarantee that a partitioned data set will be created
    - A partitioned data set is created if DSORG=PO or directory blocks are specified
    - Otherwise, a sequential data set is created.
  - ***New enhancement:*** SMS provides a new parameter in IGDSMSxx that directs SMS to create a PDSE:
    - **HONOR_DSNTYPE_PDSE(YES|NO); NO is the default and the processing remains as before**
    - **HONOR_DSNTYPE_PDSE(YES) applies only when DSNTYPE={LIB|HFS}**
      - *A PDSE is created regardless of the specification of DSORG and directory blocks when HONOR_DSNTYPE_PDSE(YES)*
    - SMS provides a new SETSMS command to modify the setting

? **Why it Matters:** Allows the user to specify that partitioned data sets be unconditionally allocated as PDSE when DSNTYPE=LIBRARY is specified, whether or not directory space is also specified in JCL.

OCE

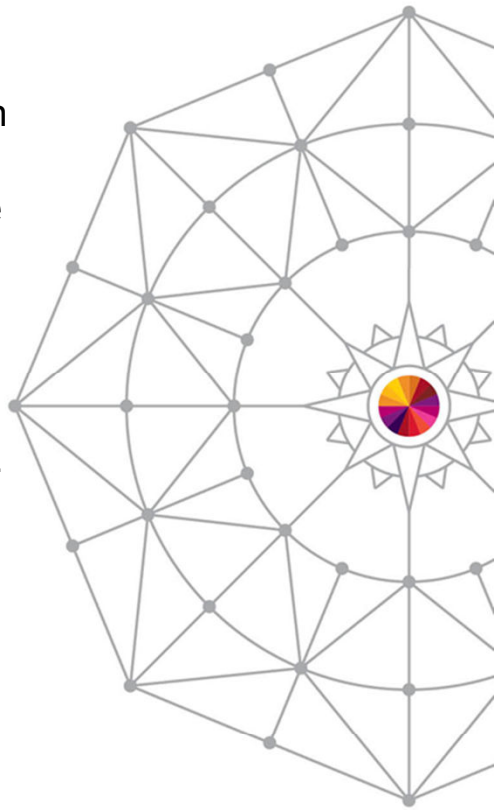
- **OCE RAS Enhancements**
  - Externalize reason for DCBE invalidation
    - Function was introduced in z/OS V1.13 that allows users to specify that explanatory text, for a number of DFSMS abends, be included in job output.
    - ***New enhancement:*** Externalize in a new version of message IEC190I issued to joblog and syslog the reason for OPEN processing invalidating the DCBE.
      - *When OPEN processing finds a problem with the DCBE, OPEN processing continues but without processing the DCBE.*
      - *The additional diagnostics is intended to help avoid problems related to unexpected processing results due to not processing the DCBE.*

? **Why it Matters:** Improved problem diagnostics.

OCE

- **XTIOT HealthCheck**
  - IBM recommends that all users set NON_VSAM_XTIOT=YES in the DEVSUPxx member of PARMLIB.
    - Enables application programs to exploit options on dynamic allocation with BSAM, BPAM and QSAM and affects EXCP.
  - ***New enhancement****:* To remind system programmers to enable it, a new OPEN/CLOSE/EOV health check, OCE_SMSOCE1 will be supplied.
    - It needs to be run only once per IPL.
    - It has no options.
    - It issues a warning message if NON_VSAM_XTIOT is not set to YES.

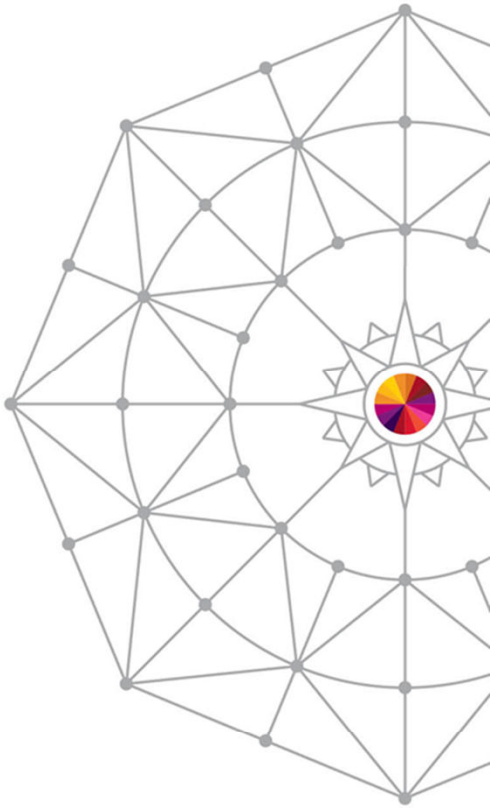
? **Why it Matters:** Using XTIOTs is recommended because it provides virtual storage constraint relief (VSCR) below the 16 MB line**.**



DFSMSdss

- **zFS Change Activity Support**
  - DFSMSdss will provide support to reset the data set changed (DS1DSCHA) flag in the Format-1/8 during logical data set dump processing.
  - ***New enhancement:*** Set an indication that a file system has changed, allow its use in DFSMSdss dump command filtering to back up changed file systems, and reset it after a successful dump.

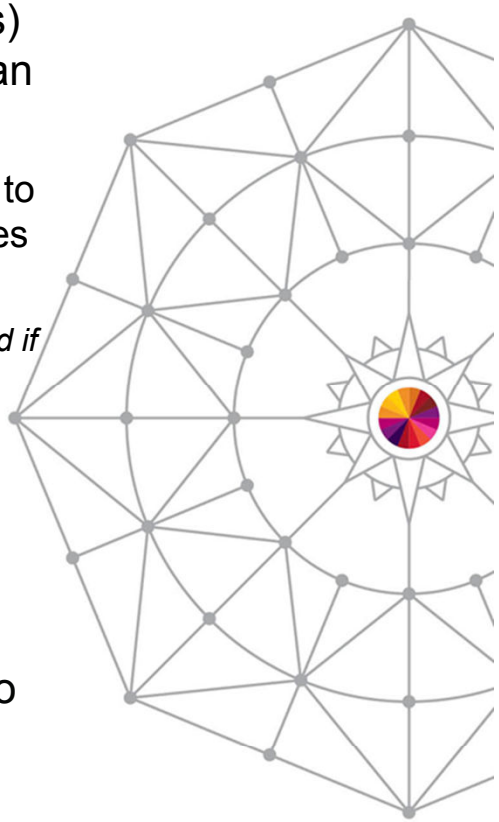
? **Why it Matters: Helps reduce unnecessary backups for mounted file system data sets.**



SDM

- **XRC (ie z/OS Global Mirror) Offline Volumes**
  - The current implementation of XRC requires that primary volumes (the volumes being written to by application programs) be online to the XRC system when the volumes are added to an XRC session, and when a XRC session is restarted.
    - As customer installations have grown from hundreds, to thousands, to tens of thousands of primary volumes, the time to vary these volumes online has become quite large.
      - *"Vary online processing before XSTART takes excessive amount of time, and if vary 'missed', XADD processing fails."*
      - *"Volumes offline, XDELPAIR fails after XSTART, unable to locate UCBs"*
  - ***New enhancement:*** Allow XRC primary volumes to be offline when the XSTART and XADDPAIR commands are issued to start or restart mirroring for existing volumes.

? **Why it Matters:** Improve availability by eliminating the need to wait for all devices to be varied online.



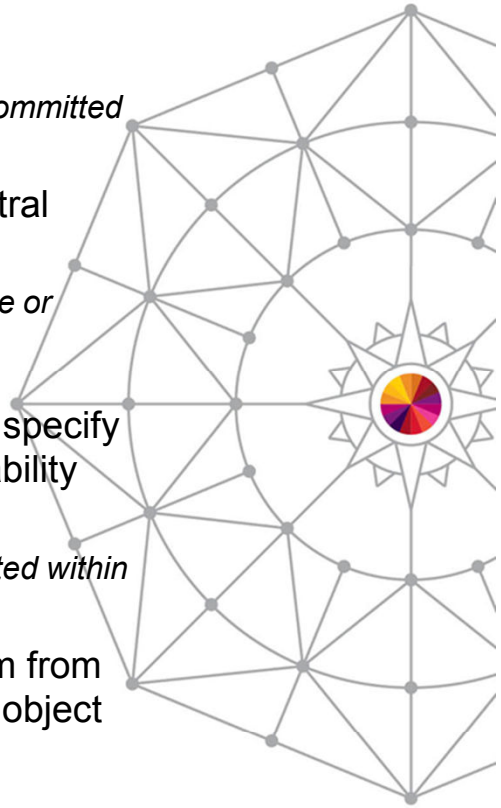
DFSORT

- **64-bit Enhancements**
  - Programs can call (invoke) DFSORT and use an invocation parameter list to pass information from the program to DFSORT.
  - During DFSORT processing, exits can be optionally called. Information is passed between DFSORT and exits in 2 different ways:
    - User exit parameter lists
    - COBOL interface used only for E15, E32, and E35 exits written by customers in COBOL
  - ***New enhancement:*** Provide Blockset sorting support for programs running in 64-bit addressing mode.
    - This new function is designed to be available to programs, using new parameter lists for DFSORT applications that use E15, E35, or E32 exits to process 64-bit addressed records.

? **Why it Matters:** Helps relieve storage constraints for programs calling DFSORT to perform certain sort operations.

DFSORT

- **Dynamic Sort Enhancements**
  - While DFSORT has installation defaults designed to control the use of central storage resources by all SORT applications running concurrently on a system, customers still often experience degraded performance due to over commitment of resources and high paging.
    - *This is usually due to changes in available resources after a sort has already committed to using large amounts of central storage.*
  - Often the first submitted DFSORT job can possibly use most of the central storage for creating dataspaces, hiperspaces or memory objects.
    - *Any DFSORT job(s), submitted later, use very little or no dataspace, hiperspace or memory objects because the central storage is not available at that time.*
  - ***New enhancement:*** A new TUNE option is designed to allow users to specify that DFSORT obtain storage incrementally and check on storage availability before allocating additional storage.
    - *Helps to better balance utilization for sort operations and other workloads initiated within a short time.*
  - ***New enhancement:*** Increase the memory object work space maximum from 64 GB to 1 TB, to allow users to sort larger amounts of data in memory object work files.



? **Why it Matters:** Improved memory resource management to better balance the memory requirements of multiple large concurrent sort operations and other workloads.

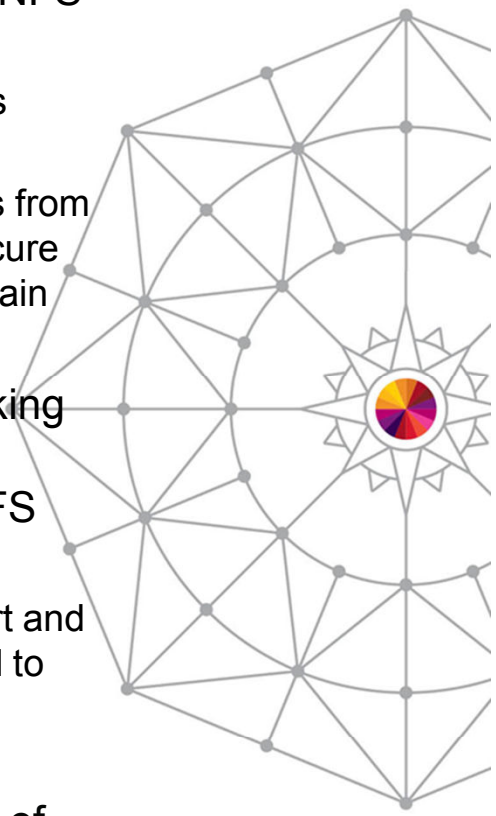
NFS

- **Server 64-bit Enhancements**
  - The z/OS NFS Server provides two data paths, one for the z/OS UNIX file systems (such as zFS), and the other for the traditional z/OS MVS data sets.
    - When writing to z/OS MVS data sets, the z/OS NFS Server has to buffer the RPC WRITE data so the buffered data logically appears sequential before the z/OS NFS Server call DFSMSdfp to write the blocks of data.
    - With the large data sets and the random write from the NFS Clients, the z/OS NFS Server 2GB Address Space is now required to handle concurrent and random writes to large data sets.
  - ***New enhancement:*** NFS Server exploits 64-bit addressing to support larger sequential data sets, PDS members, and PDSE members.
    - Designed to support processing for files as large as 4 TB, up from the prior limit of 800 MB.

? **Why it Matters:** Potentially helps to improve application performance for random access.

NFS

- **RPCSEC Performance Enhancements**
  - RPCSEC_GSS is an authentication flavor of the Remote Procedure Call (RPC) protocol that is supported by the z/OS NFS server for its NFS V4 workloads.
    - Kerberos V5 is the underlying security mechanism supported for this authentication flavor.
    - Currently the z/OS NFS server invokes the GSS and Kerberos API's from a single thread (Main task). This affects the performance of the secure mount workloads, as those requests have to be routed to a single main task for the invocation of the relevant Kerberos and GSS APIs.
  - ***New enhancement:*** NFS Server is designed to use multi-tasking for the RPCSEC_GSS authentication type of the Remote Procedure Call (RPC) protocol, which is supported by z/OS NFS server for NFS V4 workloads.
    - The Kerberos and GSS API's will now be invoked from the Transport and Worker tasks of the NFS server and will no longer need to be routed to the Main task.



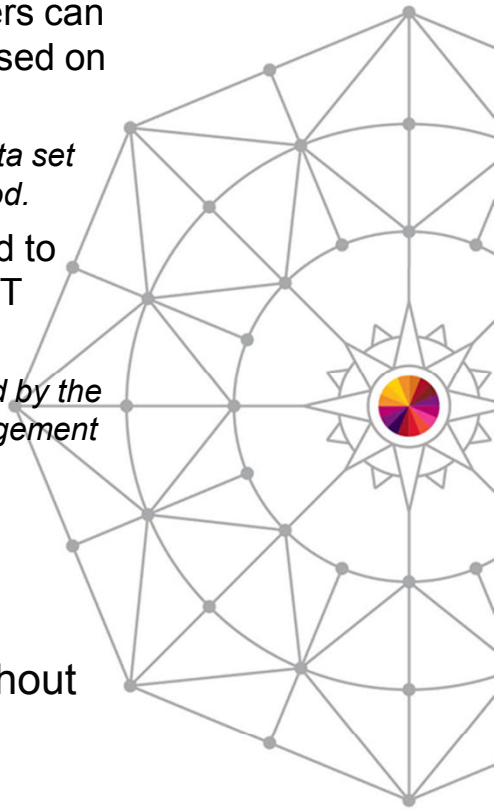
? **Why it Matters:** Potentially helps to improve the performance of secure mount workloads in the NFS server.

DFSMSrmm

- **SMS Management Class for Tape**
  - Continuation of the strategy of moving DFSMSrmm expiration and retention decisions outside VRSEL inventory management, and enabling the use of DFSMS Management Class attributes for tape data sets.
  - Currently, users who want the benefits of the EXPDT retention method must assign the expiration date and Last reference days to each data set explicitly by the JCL, DataClass, TSO RMM command or use the DFSMSrmm parmlib default.
    - New requirement to automate these settings.
  - ***New enhancement:*** To automate the setting of expiration date and Last reference days DFSMSrmm now gives the user the possibility to obtain management class attributes relevant for tape data set management.
    - New RMM parmlib option MCATTR
      - *When Management Class attributes are enabled, the expiration information is retrieved by DFSMSrmm during OPEN for output and used to set the expiration date and the LASTREF extra days for the tape data set.*
      - *Provides an option to use the Management Class attributes for all volumes **except** the Management Class expiration attributes for volumes managed by the VRSEL retention method.*
      - *Regardless of whether the Management Class attributes are used or not for a tape data set, the Management Class name is recorded, just as is done today, in the data set record, and if the volume is managed by VRSEL retention method will be used in the normal VRS matching (same as done today).*
      - *APAR OA35808 provides toleration support.*
  - ? **Why it Matters:** Provides simplification by allowing the user to automate setting the expiration date or LASTREF extra days, without using the JCL expiration date or Data Class or TSO command.

DFSMSrmm

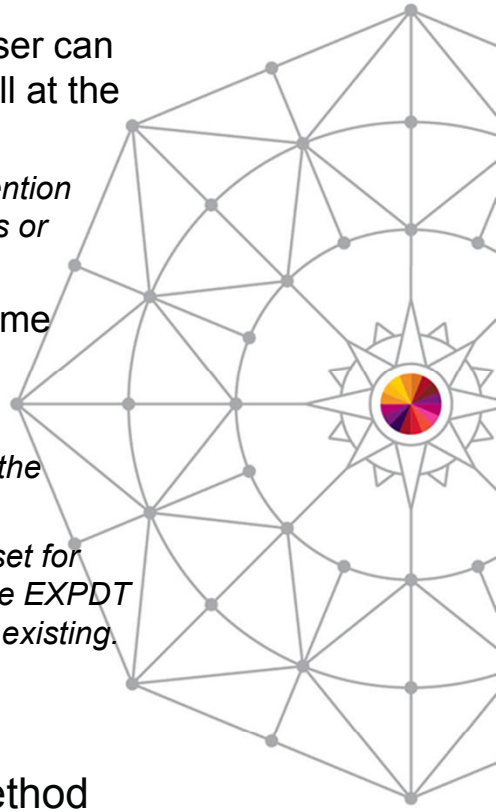
- **RAS Enhancements**
  - **Expire after days non-usage/Last reference date**
    - Currently, for volumes managed by the VRSEL retention method, users can define vital record specifications to retain all copies of the data set based on the number of days since the data set was last read or written.
      - *New requirement to manage data based on the number of days since the data set was last read or written on volumes managed by the EXPDT retention method.*
    - ***New enhancement:*** A new attribute, LASTREF extra days is added to the data set record for data sets on volumes managed by the EXPDT retention method.
      - *The LASTREF extra days can only be set for data sets on volumes managed by the EXPDT retention method. It can be set explicitly, via PARMLIB, or by Management Class.*
      - *APAR OA35808 provides toleration support.*



? **Why it Matters:** The user can manage his data based on the number of days since the data set was last read or written without VRSEL processing.

DFSMSrmm

- **RAS Enhancements**
  - **'Retain by' options for volumes managed by the EXPDT retention method**
    - Currently, for volumes managed by the VRSEL retention method, the user can specify whether a volume set is to be retained as a whole set expiring all at the same time or as individual volumes.
      - *New requirement to manage volume sets that are managed by the EXPDT retention method with the choice of retaining them as individual volumes or as whole sets or based on the expiration date of the first file.*
    - ***New enhancement:*** A new attribute, RETAINBY is added to the volume record for volumes managed by the EXPDT retention method.
      - *Possible values for RETAINBY attribute are VOLUME, FIRSTFILE and SET.*
      - *A new sub-parameter RETAINBY for the EXPDT retention method is added to the DFSMSrmm PARMLIB member to specify a system wide default.*
      - *RETAINBY attribute is the same for all volumes in a set, it cannot explicitly be set for volumes other than the first. DFSMSrmm ensures that volumes managed by the EXPDT retention method inherit the RETAINBY attribute from their previous volumes if existing.*
      - *APAR OA35808 provides toleration support.*



? **Why it Matters:** The user can manage his EXPDT retention method volume sets as individual volumes, as a whole set or based on the expiration date of the first file.