What’s New in DFSMSshsm

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Agenda

• General
  • NonDisruptive CDS Backup
  • ONLYIF
  • Usability
  • CA Reclaim
  • Deduplication
  • EAV Support
  • Cross Memory

• Migration
  • On Demand Migration
  • Performance Improvements

• Backup
  • Dump Block Size
  • Dump Stacking Limit
  • Multitask Recovery from Dump Tapes

• Fast Replication
  • Copy Pool Recovery from Dump Tape
  • Fast Reverse Restore
  • Space Efficient
  • Preserve Mirror
  • UCB Refresh

• Miscellaneous
General: V1R13
Nondisruptive CDS Backup

- Today, CDS Backup can be very disruptive to other HSM activity
  - All other HSM activity must be quiesced before CDS Backup can start
    - Some customers HOLD all HSM activity prior to the start of CDS Backup to ensure that it can begin at its scheduled time
  - Functions that start while CDS Backup is waiting to start have to wait until the completion of CDS Backup
  - Higher impact in an RLS environment than nonRLS
- Journal is backed up using Standard I/O, even when Concurrent Copy is specified
  - Since there is a chance for Concurrent Copy to fail the physical copy after logical completion, Standard I/O is always used for the journal to ensure it is not nulled without being copied in its entirety
  - Outage for CDS backup is at least as long as the time it takes to backup the journal
| Function    | t₁ | t₂ | t₃ | t₄ | t₅ | t₆ | t₇ | t₈ | t₉ | t₁₀ | t₁₁ | t₁₂ | t₁₃ | t₁₄ | t₁₅ | t₁₆ | t₁₇ | t₁₈ | t₁₉ | t₂₀ |
|-------------|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Recall 1    |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |
| Recall 2    |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |
| Recall 3    |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |
| CDS Backup  |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |
| Recall 4    |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |
| Recall 5    |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |
| Recall 6    |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |

New HSM Activity Quiesced

Pre-V1R3
General: V1R13
Nondisruptive CDS Backup

• nonRLS Environment
  • Only HSM activity on the same LPAR impacts/is impacted by CDS Backup
    • Serialization scheme uses enqueue scope of SYSTEM and a Reserve to cover other systems

• RLS Environment
  • HSM activity on any host in the HSMplex impacts/is impacted by CDS Backup
    • Serialization scheme uses enqueue scope of SYSTEMS
General: V1R13
Nondisruptive CDS Backup

• V1R13 Enhancements
  • CDS Backup serialization scheme has been enhanced such that all active
    HSM activity *does not* have to complete before CDS Backup can begin
    • CDS and Journal I/O is quiesced before and during copy of control data sets and
      journal to ensure a data consistent backup
    • When concurrent copy is used, this is a brief disruption
  • The backup of the Journal will begin before the CDSes are quiesced
    • HSM activity can continue while the ‘static’ portion of the journal is backed up
    • Activity is quiesced during brief time required to backup the remainder of the
      journal
  • Requirements:
    • All CDS clusters are SMS-managed
    • Concurrent Copy specified
    • SETSYS CDSVERSIONBACKUP(DATAMOVER(DSS))
    • SETSYS JOURNAL(RECOVERY)
General: V1R13
Nondisruptive CDS Backup

| Function | t1 | t2 | t3 | t4 | t5 | t6 | t7 | t8 | t9 | t10 | t11 | t12 | t13 | t14 | t15 | t16 | t17 | t18 | t19 | t20 |
|----------|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Recall 1 |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |
| Recall 2 |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |
| Recall 3 |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |
| CDS Backup |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |
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| Recall 5 |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |
| Recall 6 |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |

- Freed up Time!
- No CDS I/O during backup

HSM Activity Quiesced

V1R3: Not CC
### General: V1R13

**Nondisruptive CDS Backup**

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- **HSM Activity Quiesced**
- **V1R3: CC**

- **Freed up Time!**
- **Allow CDs I/O while backing up static journal records**
### General: V1R13
#### Nondisruptive CDS Backup

**Journal Backup Detail**

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- **HSM Activity Quiesced**
- **Full HSM Activity**

**SHARE in Orlando 2011**
General: V1R13
Nondisruptive CDS Backup

• CDS Recovery process is unchanged
• Migrating to new function
  • The journal backup enhancement requires the coexistence APAR to be active for a full backup cycle before becoming fully enabled
  • If you use the function on a V1R13 system that never had the coexistence applied, then not until the second and subsequent CDS backups will the function be fully enabled
  • Remove DFSMSHsm HOLD commands scheduled before the start time of CDS Backup
• Coexistence
  • When using RLS, the full benefit isn’t seen until all hosts are at V1R13
General: V1R13
ONLYIF

- IBM recommends a single, shared ARCCMDnn member for all DFSMSHsm hosts
  - Eliminates chance of discrepancies between ARCCMDnn members across systems
- Pre-V1R13 ONLYIF support is very basic
  - Used when commands are unique to one or more DFSMSHsm hosts
  - Example: Only hosts A & B run Automatic Dump:

  ```
  ONLYIF HSMHOST(A)
  SETSYS ADSTART(1800 2400)
  ONLYIF HSMHOST(B)
  SETSYS ADSTART(1800 2400)
  ONLYIF HSMHOST(A)
  SETSYS MAXDUMPTASKS(7)
  ONLYIF HSMHOST(B)
  SETSYS MAXDUMPTASKS(7)
  ```
General: V1R13
ONLYIF

- V1R13
  - Support for BEGIN and END operators
  - Enables multiple host IDs on the HSMHOST keyword

```
ONLYIF HSMHOST(A,B)
BEGIN
  SETSYS ADSTART(1800 2400)
  SETSYS MAXDUMPTASKS(7)
END
```

- Coexistence
  - Pre-V1R13 systems will correctly parse new syntax introduced on a V1R13 system
General: V1R13
Usability

- **RELEASE RECALL(DASD)**
  - If there is an issue with tape drives and HOLD RECALL is issued, there used to be no way to release just ML1 recalls without also releasing tape recalls
  - New RELEASE RECALL(DASD) converts a HOLD RECALL state to a HOLD RECALL(TAPE) state

- **QUERY COMMONQUEUE(RECALL)** output shows the host that initiated each recall request
  - If a request in the CRQ needs to be canceled, the cancel must be done on the host that initiated the Recall
  - New information on ARC1543I eliminates need to issue QUERY on each HSM host
General: V1R12
CA Reclaim

• Necessity to reorganize the DFSMSHsm CDSs impacts…
  • Availability – Must stop all DFSMSHsm hosts
  • Performance – increased CI/CA splits afterwards
  • Integrity - Doing it incorrectly is a common cause for CDS breakage

• **VSAM** provided a **CA (Control Area) Reclaim** function
  • Reclaims empty CAs that remain after all records are deleted
  • Common for DFSMSHsm
    • Many records written with the date in the key

• What this means for DFSMSHsm…
  • Significantly *reduces* the need for CDS reorgs
  • Significantly *reduces* the need for SDSP reorgs
  • *Doesn’t eliminate* need to reorg

• Session 9007
**General: V1R12**

**CA Reclaim**

---

**CDS w/o CA Reclaim**

- Empty CA

- Empty CA

- Empty CA

- Empty CA

---

**CDS w/ CA Reclaim Enabled**

- Why reorgs aren’t eliminated

- Reorg required to reclaim empty CAs!
General Deduplication

- **TS7680 ProtecTier Deduplication**
  - Virtual Tape Library
  - Inline data deduplication
  - Replication – Only deduplicated data is transmitted

- **DFSMShsm data**
  - DFSMShsm ‘wraps’ blocks of native data with meta data, making all blocks unique
  - TS7680 has logic specific for DFSMShsm blocks so that it can deduplicate them
General

Extended Address Volumes

V1R12

• Support for all data set types
  ★ ML1 / ML2_disk and Backup volumes may now use all space

  SETSYS USECYLINDERMANAGEDSPACE(Y|N)

  ! DO NOT specify (Y) until ALL hosts are V1R12 or higher
  ★ Good candidates for ML1 Overflow volumes

  ! Use caution when using as standard ML1
  • All of the unused space cannot be released from migration data sets because allocation is done in Multi-Cylinder Units
  • Leaves free space in migration copy
More granular control of which functions use DFSMSdss Cross Memory

- All functions can be turned on or off using the existing

  SETSYS DSSXMMODE(Y|N)…

  or individual functions can be specified using

  SETSYS DSSXMMODE(BACKUP(Y|N) CDSBACKUP(Y|N) DUMP(Y|N)
  MIGRATION(Y|N) RECOVERY(Y|N))

- Must be specified in ARCCMDxx member
Agenda

- General
  - NonDisruptive CDS Backup
  - ONLYIF
  - Usability
  - CA Reclaim
  - Deduplication
  - EAV Support
  - Cross Memory

- Migration
  - On Demand Migration
  - Performance Improvements

- Backup
  - Dump Block Size
  - Dump Stacking Limit
  - Multitask Recovery from Dump Tapes

- Fast Replication
  - Copy Pool Recovery from Dump Tape
  - Fast Reverse Restore
  - Space Efficient
  - Preserve Mirror
  - UCB Refresh

- Miscellaneous
General: V1R13
On Demand Migration

Interval Migration Today

HSM CPU Spike from SMS Scan and Space Check on all volumes in SMSplex
General: V1R13
On Demand Migration

No Spike!
General: V1R13
On Demand Migration

- New SMS ENF 72
  - When an allocation (new data set or extent) causes a volume to go over its high threshold, SMS issues ENF 72
    - For EAVs, issued for both track-managed and cylinder-managed space
  - Additional ENFs issued at each 25% increment of (100% - High threshold)
    - If the high threshold is 80%, then an ENF is issued at 80%, 85%, 90%, …
    - If the high threshold is 92%, then an ENF is issued at 92%, 94%, 96%, …
    - ENF issued for every allocation after threshold exceeds 97% increment of high threshold
  - SMSplex wide ENF
General: V1R13
On Demand Migration

- DFSMSshsm SETSYS command to enable function

  `SETSYS ONDEMANDMIGRATION (Y|N)`

- Y - Enables ODM
  - ODM performed for volumes in storage group with AM=Y
  - SETSYS INTERVALMIGRATION is ignored for SMS volumes
    - Except, storage groups with AM=I
  - Interval Migration will still run for nonSMS volumes
- If you use AM=I, consider changing to ODM and AM=Y
  - AM=I: Volume eligible when space exceeds midpoint between low and high threshold (used for TMM)
  - AM=Y: Volume eligible when space exceeds high threshold
General: V1R13
On Demand Migration

- When ODM is enabled, DFSMSHsm host will listen for ENF 72
  - When ENF 72 is received, volume is added to work queue
  - Multiple hosts should be enabled. Only one host will process the volume.
    - Don’t setup a single point of failure (single host enabled)
- Standard volume-level space management is performed
  - Volume processed below low threshold or until no more eligible data sets
  - If no data sets are processed, then there are no eligible data sets
    - To prevent the volume from being repetitively processed, the volume will not be reselected for 14 hours
      - PATCH .MGCB.+138 X '00015180' /* 24 hours in seconds – default value*/
- In order to catch exception cases where a large number of volumes are concurrently going over threshold, DFSMSHsm issues a highlighted message to the console
  - ARC1901E NUMBER OF VOLUMES ELIGIBLE FOR ON DEMAND MIGRATION HAS REACHED nnnnn
    - Updated as number of volumes increases/decreases. Removed from console after the number of volumes drops below the specified number
      - SETSYS ODMNOTIFICATIONLIMIT(nnnnn)
        - (100 is default)
General: V1R13
Space Management

- PreV1R13
  - During every interval migration window and before every Primary Space Management window, DFSMS/hsm scanned every volume in SMSplex to look for changes

- V1R13
  - DFSMS/hsm now listens for ENF 15 – SMS configuration change
  - Scan is only done if there was a configuration change
    - If you use this patch to turn off the scan, you can remove it:
      ```c
      PATCH .MCVT.+C8 BITS(1…….)
      ```
  - If running ODM, you can remove any patches for changing the frequency of running Interval Migration
    - There are several. They are documented in the DFSMS/hsm Implementation and Customization Guide
To improve performance, two phases of volume migration process are overlapped

- **Phase 1**
  - Obtain a list of all data sets on the volume
  - Process the data set list
    - Expire
    - Partial Release
    - Reconnect
    - Generate migration/extent reduction Queue

- **Phase 2**
  - Process Queue

- New task started for Phase 2
- Phase 1 task continues to the next volume
Migration: V1R12 & 13
Performance Improvement (cont)
Migration: V1R12

Performance Improvement *(cont)*

Supported for Volume Level Space Management

- Primary Space Management
- On Demand Migration
- Interval Migration
- MIGRATE PRIMARY command (nonSMS volumes)
Agenda

- **General**
  - NonDisruptive CDS Backup
  - ONLYIF
  - Usability
  - CA Reclaim
  - Deduplication
  - EAV Support
  - Cross Memory

- **Migration**
  - On Demand Migration
  - Performance Improvements

- **Backup**
  - Dump Block Size
  - Dump Stacking Limit
  - Multitask Recovery from Dump Tapes

- **Fast Replication**
  - Copy Pool Recovery from Dump Tape
  - Fast Reverse Restore
  - Space Efficient
  - Preserve Mirror
  - UCB Refresh

- **Miscellaneous**
Backup: V1R12

Full Volume Dump – Optimal Block Size

DFSMSdss enhanced DUMP and RESTORE to use the optimal block size for the output tape device
- Up to 256KB for newer devices

DFSMSHsm BACKVOL/FRBACKUP DUMP, AUTOMATIC DUMP and RECOVER/FRRECOV FROMDUMP will take advantage of this enhancement
- If you use these functions, examine your setting for SETSYS DUMPIO(n,m)
  - n indicates the number of tracks that DFSMSdss reads at a time for DUMP.
    - 1 is the default for 1 track
    - 4 specifies that a cylinder should be read – requires much more storage
Backup: V1R12
Multitask Recovery From Dump Tape

Full Volume Recovery from Dump Tape enhanced to support multiple concurrent tasks

SETSYS MAXDUMPRECOVERTASKS(1-64)

★ Multiple concurrently queued volume recovery requests on the same tape will be processed with a single tape mount

Stacking

• Use a stacking value that will enable you to maximize the parallelism of the recovery
Backup: V1R12

Dump Stacking

Dump Stacking limit increased from 99 to 255

```
DEFINE DUMPCLASS(class STACK(nnn))
BACKVOL SGROUP(sgroup) DUMP(DCLASS(class) STACK(nnn))
```

Coexistence

- Increased values can only be specified on V1R12 and higher
- Lower level releases will honor a Dump Class stack value > 99
Agenda

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- **Miscellaneous**
Fast Replication Overview

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)

★ Recovery at all levels from either disk or tape!

- Entire copy pool, individual volumes and …
- Individual data sets
Fast Replication: V1R12
Copy Pool Recovery from Tape

Copy Pool recovery from tape
- Prior to V1R12, HSM could only recover an entire copy pool from disk
- DB2 or native DSS had to be used to recover from tape

With this enhancement...
- DFSMSHsm supports recovery of entire copy pool from tape
  - Made possible with the multitask recovery from dump tape support
  - Fast Replication tape copies are full-volume dump copies that represent the
time that FlashCopy disk copy was created
- Enables solution to be used for Disaster Recovery
- Once again, stacking level of dump tapes may limit recovery parallelism
Fast Replication: V1R12
Copy Pool Recovery from Tape

Retry Logic

- If there is an error recovering one or more volumes…

- Correct the problem
- Reissue the FRRECOV command
  - DFSMSHsm will only process those volumes that previously failed
  - LIST COPYPOOL output indicates if a particular version recovery is resumable

RESUME(NO) option to retry all volumes (YES) is the default
Fast Replication: V1R12
Copy Pool Recovery from Tape

QUERY ACTIVE indicates the progress of the recovery...

```
ARC1822I  FRRECOV OF COPY POOL cpname FOR USER userid, REQUEST request-number ON HOST host_id IS IN PROGRESS: NOT PROCESSED = xx, TOTAL = yy
```

- **TOTAL** indicates the total number of volumes being recovered
- **NOT PROCESSED** indicates the number of volumes that have not yet been recovered

Helpful messages

- ARC1802 will list overall return code when all volumes complete
- ARC1803 will summarize failed volumes with DFSMSdss message ids

CANCEL REQUEST(reqnum)

- All volumes being recovered will have the same request number
- A single CANCEL command will cancel all volumes
Fast Replication: V1R12

Fast Reverse Restore

Prior to V1R12

- Disk recovery could not be performed until the physical background copy was complete (*hours* after the logical backup was created)
- Disk recovery from a NOCOPY version was not supported
Fast Replication: V1R12

Fast Reverse Restore

- Enables DFSMSHsm to FlashBack for recovery even though the background copy has not completed
- Enables recovery from NOCOPY versions

[Diagram showing a process flow with labeled stages: Copy Pool Application, Initiate FlashCopy, FC Relationships Established, Background Copy, Disk Recovery Available!!]
Fast Replication: V1R12
Fast Reverse Restore

Restrictions

! Since the background copy does not complete, the backup is invalidated as part of the recovery
! Source volumes can’t be in any other active relationships
! Only supported for recovery of entire copy pool

Resume after failure

• If one or more volumes fail, similar to recovery from tape, just reissue the command and only the set of previously failed volumes is retried
Fast Replication: V1R12

Fast Reverse Restore

• New copy pool setting indicates if FRR is enabled for the copy pool
  • YES indicates that it is acceptable to recover a version before the
    background copy is complete and for the backup to become invalidated

• QUERY COPYPOOL indicates percent complete
  • Determine if you should just wait for background copy to complete

ARC1820I THE FOLLOWING VOLUMES IN COPY POOL CP1, VERSION 003, HAVE AN ACTIVE FLASHCOPY BACKGROUND COPY

<table>
<thead>
<tr>
<th>SGNAME</th>
<th>FR-PRIMAY</th>
<th>FR-BACKUP</th>
<th>PCT-COMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>SGRP1</td>
<td>SRC01B</td>
<td>TGT01B</td>
<td>70</td>
</tr>
<tr>
<td>SGRP1</td>
<td>SRC02B</td>
<td>TGT02B</td>
<td>80</td>
</tr>
</tbody>
</table>

• FORCE keyword if the disk copy is currently being dumped to tape
  • Incomplete dump volumes will be discarded
Fast Replication: V1R12
Fast Reverse Restore

● Hardware Dependencies
  - DS8000 series storage servers with the following minimum LMC:
    .5.3.1.450
    .5.4.21.540
    .5.4.30.253
    .6.5.0.220

● Software Dependencies
  - PK99337 ICKDSF – Support DFSMSHsm invocation of INIT
Space Efficient Volumes

• Space Efficient volumes don’t take physical space until the space is actually needed
• Only a fraction of the space is required for target volumes
  ✓ License is required
• Valid when NOCOPY is the FlashCopy technique
Fast Replication: OA30816
Space Efficient FlashCopy

HSM selects available Space Efficient target volumes when NOCOPY (VERSIONS=0) is selected

(V1R9 and higher)

**Fully Provisioned**
- 1 TByte copy pool needs 1 TByte of copy space

**Space Efficient Target Volumes**
- 1 TByte copy pool that changes <10% in-between copies only needs 100 GBytes of target space
Fast Replication: V1R12
Space Efficient FlashCopy

With Fast Reverse Restore…
- In addition to being able to recover from tape, a disk recovery can be performed!
Fast Replication: New Function APARs
FlashCopy to PPRC Primary

- Without new support, DFSMShsm does not support FlashCopy to mirrored volumes
- This means that you have to break pairs before each FlashCopy and re-establish pairs after FlashCopy
Fast Replication: New Function APARs
FlashCopy to PPRC Primary (Cont)

OA23849 (V1R9) – Enable FlashCopy to a PPRC Primary Volume
- Enables easier implementation of backup volumes at remote site (*Metro Mirror Only*)
- Pair is put into a ‘Duplex Pending’ state until volumes re-synched
- Enabled for Recovery, but you generally don’t want production volumes to go in a ‘Duplex Pending’ state
Fast Replication: New Function APARs
FlashCopy to PPRC Primary (Cont)

OA24814 (V1R9) – Preserve Mirror Support SPE

- “Remote Pair FlashCopy” DS8000 Support
- FlashCopy to PPRC Primary volume *while maintaining Full Duplex*
  - Fast Reverse Restore and Space Efficient cannot be used in this environment
Fast Replication: OA32494
Volume Preferencing

**DFSMShsm will select target volumes in same cluster**

- FlashCopy background copy is more efficient when the source and target are within the same DS8000 cluster
- When selecting target volumes, DFSMShsm will prefer target volumes in the same cluster as the source

- Pre-V1R12, enable with `PATCH .FRGCB.+A BITS(....1...)`
- V1R12+, enabled by default
Fast Replication: V1R13

Usability

SETSYS replaces patch for volume pairing messages

SETSYS FASTREPLICATION(VOLUMEPAIRMESSAGES(YES|NO))
SETSYS FR(VPM(Y|N))

• Controls issuing ARC1809I message for volume pairing failures
• Replaces PATCH .FRGCB.+9 BITS(.1……)

Reduced messaging

• ARC1809I RC2 used to be issued for every source volume that attempted to be paired to a target volume that was already paired
• Now the message is only issued once per target volume for each storage group in the copy pool
Fast Replication: V1R13

Usability

FASTREPLICATION(DataSetRecovery) default changed to NONE

• When fast replication is used for data set recovery, a subsequent FRBACKUP cannot be performed until the background copy of the recovery completes
  • FRBACKUP will fail, but the reason will just say that there is an existing relationship
  • When standard I/O is used for the recovery, HSM will fail the FRBACKUP with a specific message indicating that another function hasn’t completed

AUDIT COPYPOOLCONTROLS detects and fixes orphaned records

• ‘Orphaned’ target volume records (FRTV) will prevent a target volume from being selected
• AUDIT will now identify these records and optionally delete them
Fast Replication: V1R13
UCB Refresh

Pre-V1R13

• If the FlashCopy moves the VTOC (source VTOC is in a different location than the target VTOC), then the target volume has to be varied offline/online before it can be accessed on systems other than the one that did the FlashCopy

V1R13

• DSS builds an ENF64 that can be used to automatically refresh the UCB on all systems in sysplex
• To enable the function
  • PARMLIB member DEVSUPxx: ENABLE(REFUCB)
  or
  • MODIFY DEVMAN ...
• To disable the function
  • DISABLE(REFUCB)
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• Miscellaneous
Miscellaneous

(V1R11) IEFBR14 DELETE will not recall a migrated data set before it is deleted

• Change made to Allocation
  • SETALLOC SYSTEM,IEFBR14_DELMIGDS=NORECALL
  or
  • ALLOCxx keyword: IEFBR14_DELMIGDS(NORECALL)

(V1R12) DELETE GDG FORCE will not recall a migrated GDS before it is deleted

• Change made to Catalog
Miscellaneous

(V1R12) GDG Serialization
• For existing Migration, GDG base is serialized when migrating a generation
• Serialization scheme is changed to not require the GDG base to be serialized

(V1R12) 100% Threshold
• SMS allows value of 100 for High Threshold
• Primary Space Management and Interval Migration are unchanged
  • DFSMSHsm rounds up values, so 99.1% and higher are considered 100%

(V1R12) WTOR support
• Based on z/OS support, default responses have been established for DFSMSHsm WTOR messages
Summary

• Significant number of new and enhanced functions
  • Emphasis on addressing customer requirements, increasing throughput and reducing MIPS
• Some critical new functions provided as “Development APARS”
• Expanded functionality of DFSMSHsm Fast Replication Support
• These items demonstrate IBM’s commitment to continual improvement of the DFSMSHsm product