

# What You Need to Know About the Way HSM uses SMS

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March 12, 2014  
Session Number 15110



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## Session Abstract

- One of the key features of DFSMSHsm is the integration with DFSMSdfp. The settings in the Management Class and Storage Group constructs can greatly influence the smooth running and the overall efficiency of your HSM environment. The speaker will discuss the various settings in detail and how these, in conjunction with the ARCCMDxx member, affect space management and backup processing . He will also discuss the new management class values available in z/OS V2R1 to enable Class Transition policies.

# Agenda

- Introduction
- HSM and NONSMS
- Space Management
- Automatic Backup
- Automatic Dump
- V2R1 Transition Class Policies and Storage Group Processing Priority

# DFSMSHsm

- Introduced in 1978
  - HSM (Hierarchical Storage Manager)
  - Often still referred to as DFHSM
- Provides space management and availability management for z/OS
- Automated policy and life-cycle management (mostly)
- Enforcer of policies defined in SMS

# DFSMS

- Introduced in the late 1980s/early 1990s
  - MVS/SP Version 3
  - MVS/DFP Version 3
- Improve disk utilization
- Make life easier for storage administrators
- Simplify allocation based on usage and data characteristics
  - Questions
    - Cylinders vs tracks?
    - What is the tracksize of a 3350 vs 3380 vs 3390???
    - Which volume can I use?

# Using HSM to manage nonSMS volumes

- Limitations exist when using HSM to manage nonSMS volumes
- Processing is performed on a single volume basis
- Certain data sets will not be processed
  - Most notably data sets allocated on multiple volumes
- Automatic expiration requires explicit expiration date in VTOC or catalog
- EXPIREBV processing run with additional parameters
  - NONSMSVERSIONS
    - DELETEIFBACKEDUP, CATALOGEDDATA, UNCATALOGEDDATA, DAYS(xxx)



# ADDVOL command for NonSMS volumes

- Each volume must be specifically defined in the ARCCMDxx member
  - No generic options available
- All data sets on a volume processed per ADDVOL settings in ARCCMDxx member
- If not specified in ADDVOL statement, then following SETSYS parms are used
  - SETSYS DAYS
  - SETSYS MIGRATIONLEVEL1DAYS
  - SETSYS VERSIONS
  - SETSYS FREQUENCY
  - SETSYS RECALL
  - SETSYS SCRATCHFREQUENCY

# ADDVOL command for ML1 volumes

- Migration Level-1 volumes are nonSMS volumes
- Must be defined explicitly using ADDVOL command
- Used for
  - Data sets migrated to ML1
  - Data sets backed up using BACKDS or HBACKDS
  - VTOC and DUMP data sets
    - Used for volume based recovery
- THRESHOLD initiates migration from ML1 to ML2 during secondary space management
- OVERFLOW ML1 volumes can be used for larger data sets
  - SETSYS ML1OVERFLOW specifies data set size

# Specific rules for NonSMS data sets (SETMIG)

- Some customization available for nonSMS data set processing
- SETMIG command controls migration of data sets
  - DATASETNAME, LEVEL or VOLUME
  - MIGRATION, NOMIGRATION or COMMANDMIGRATION
- Useful to prevent migration for data sets used at IPL time
- DATASETNAME does not need to be repeated every time HSM is started
  - LEVEL and VOLUME need to be specified at HSM restart

# Specific rules for NonSMS data sets (ALTERDS)

- ALTERDS controls number and frequency of backups
- ALTERDS command
  - Requires fully-qualified data set name or list of fully-qualified data set names
- FREQUENCY(xxx)
  - How many days to wait between backups
- VERSIONS
  - 0 – 100
    - 0 means do not backup the data set
- SYSFREQUENCY and SYSVERSIONS resets to defaults supplied in ARCCMDxx member

# Enter SMS and the management class

- Designed to provide more granularity rather than just one size fits all
- Allows different services levels to be applied within volumes/storage groups
- Allows multiple applications to use common storage groups
- Service levels set for space and availability management

# Where do Storage Group definitions fit in?

- Specify whether HSM is to process the particular storage group automatically
  - Auto Migrate
  - Auto Backup
  - Auto Dump
- Define thresholds for allocation and HSM processing
  - High Threshold
    - Allocation (and HSM for certain settings)
  - Low Threshold
    - HSM space management

# Space Management – Storage Group

```
Panel  Utilities  Scroll  Help
                                POOL STORAGE GROUP DISPLAY                Page 1 of 2
Command ==> █
CDS Name      . . . . . : USER.SCDS
Storage Group Name : SGOM
Description   : STORAGE GROUP FOR OM
Auto Migrate  . . . . . : YES
Auto Backup   . . . . . : YES
Auto Dump     . . . . . : YES
Overflow      . . . . . : NO
Migrate Sys/Sys Group Name . : ADCD113S
Backup Sys/Sys Group Name   . : ADCD113S
Dump Sys/Sys Group Name     . : ADCD113S
Extend SG Name . . . . . : SGOVFL
Copy Pool Backup SG Name    . :
Dump Class . . . . . : DAILY
Dump Class . . . . . :

Use DOWN Command to View the next Page;
Use HELP Command for Help; Use END Command to Exit.

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```

# Space Management - Storage Group

- Auto Migrate
  - Yes (Y)
    - Primary space management
    - Interval migration, if SETSYS INTERVALMIGRATION in ARCCMDxx
    - On-demand migration, if SETSYS ONDEMANDMIGRATION(Y)
  - Interval (I)
    - Primary space management and interval migration
    - On-demand migration not performed
  - Primary (P)
    - Primary space management , no interval migration, No on-demand migration
  - No (N)
    - No automatic migration



# Space Management - Storage Group

- Migrate Sys/Sys Group Name
  - Specify System or System Group where space management is to be performed
  - Allows selective migration approach
    - If space management does not run on that system or group, then volumes are not processed
  - Also a way of prioritizing a storage group during primary space management

# Space Management - Storage Group

```
Panel  Utilities  Scroll  Help
POOL STORAGE GROUP DISPLAY                               Page 2 of 2
Command ==>
CDS Name . . . . . : USER.SCDS
Storage Group Name : SGOM
Dump Class . . . . . :
Dump Class . . . . . :
Dump Class . . . . . :
Allocation/Migration Threshold - High . . . : 35
                                   Low . . . : 30
Alloc/Migr Threshold Track-Managed - High : 35
                                   Low . . . : 30
Guaranteed Backup Frequency . . . . . : NULIMIT
BreakPointValue . . . . . :
Use UP Command to View previous Page;
Use DOWN Command to View SMA ATTRIBUTES Page if there is SMA data.
Use HELP Command for Help; Use END Command to Exit.
*S01IPT -S02IPT
```

# Space Management - Storage Group

- Allocation/Migration Threshold
  - High
    - Used by Allocation and Interval Migration
    - Also used by on-demand migration, via ENF 72 event
  - Low
    - Used by DFSMSHsm during primary, interval and on-demand migration
- Alloc/Migr Threshold Track-Managed
  - Same as above, but for track-managed space on Extended Attribute Volume (EAV)
  - If not specified, uses existing thresholds defined above

# Space Management - Storage Group

- Primary Space Management
  - Performed when SG low occupancy threshold is exceeded
  - Auto Migrate = P, I or Y
  - Performs 2 passes
  - Pass 1
    - Flags unmatched data sets
      - Catalog entry, data set VTOC entry or both missing
    - Deletes temporary data sets
    - Deletes expired data sets
    - Determines data sets eligible for migration
    - Excludes data sets from migration to tape that need backup
    - Determines data sets eligible for extent reduction
    - Releases unused space for eligible data sets
    - Performs fast subsequent migration

# Space Management - Storage Group

- Primary Space Management (cont.)
  - Pass 2
    - Migrates candidates for migration and extent reduction
    - Migrates candidates for extent reduction only
    - Places remaining migration candidates in priority order
    - Migrate data sets in priority order until SG-defined low occupancy is reached
  - Out of Space condition on ML1 will not automatically trigger migration to ML2
    - HSM will retry to ML1 volume with largest freespace
    - If failure occurs again,
      - If data set is less than 5 tracks, it will try again to all ML1 volumes (1<sup>st</sup> time), after that ML1 migration is terminated
      - If larger than 5 tracks, it moves on to next data set
      - In case of full VTOC, HSM marks the ML1 volume full and tries another

# Space Management - Storage Group



- Interval Migration
  - Performed when
    - Auto Migrate=I and volume exceeds midpoint between low and high occupancy threshold
    - Auto Migrate=Y and volume exceeds high occupancy threshold
    - If Auto Migrate=Y, on-demand migration (ODM) must not be enabled, otherwise ODM is performed
  - Functions not performed
    - Partial release
    - Extent Reduction



# Space Management - Storage Group

- On-demand migration
  - *Near-immediate* space management
  - Performed when
    - SETSYS ONDEMANDMIGRATION(Y)
      - SETSYS ODM(Y) can also be specified
    - Auto Migrate=Y & volume exceeds high occupancy threshold
      - Auto Migrate=I performs interval migration
    - Only performed against SMS volumes
      - DFSMSHsm listens for ENF72 event code from SMS
    - Volume is queued for processing
  - If volume is still above threshold, it will not be selected again for 24 hours (default)
    - ODM re-selection frequency can be changed via Patch

# Space Management - Storage Group



- On-demand migration (cont.)
  - SETSYS MAXINTERVALTASKS is used
  - Alternatively, use SETSYS MAXEVENTDRIVENMIGTASKS or MAXEDMT
  - SETSYS ODMNOTIFICATIONLIMIT(xx) shows number of concurrent queued volumes above xx as ARC1901E message
    - Default is 100
    - Review APAR [OA38880](#)
      - Various changes and patches available
- Functions not performed
  - Partial release
  - Extent Reductoin





# Migration – Management Class

```
Panel Utilities Scroll Help
MANAGEMENT CLASS DISPLAY Page 2 of 5
Command ==> █
CDS Name . . . . . : USER.SCDS
Management Class Name . . . . . : MCOMLONG
Partial Release . . . . . : YES_IMMED

Migration Attributes
Primary Days Non-usage . . . . . : 3
Level 1 Days Date/Days . . . . . : 7
Command or Auto Migrate . . . . . : BOTH

GDG Management Attributes
# GDG Elements on Primary :
Rolled-off GDS Action . . . . . :

Use UP Command to View previous Panel; Use DOWN Command to View next Panel;
Use HELP command for Help; Use END Command to Exit;

*S01IPT -DSLST
```

# Migration – Management Class

- Primary Days Non-usage
  - Number of days after which a data set is *eligible* for normal migration
- Level-1 Days/Date
  - Used by secondary space management
  - Number of days since last reference before a data set can migrate from ML1 to ML2
  - Value needs to be more than primary days non-usage
  - For example
    - PDNU = 10, L1DAYS = 20
      - Data set is eligible to go from primary to ML1 after 10 days and to ML2 after another 10 days
    - Setting L1 days to 0 means that the data set will move straight to ML2 if migrated
  - Command or Auto-migrate
    - None, Command or Both

# Space Management – Management Class

```
Panel Utilities Scroll Help
MANAGEMENT CLASS DISPLAY Page 2 of 5
Command ==> █

CDS Name . . . . . : USER.SCDS
Management Class Name . . . . : MCOMLONG
Partial Release . . . . . : YES_IMMED

Migration Attributes
Primary Days Non-usage . . : 3
Level 1 Days Date/Days . . : 7
Command or Auto Migrate . . : BOTH

GDG Management Attributes
# GDG Elements on Primary : 3
Rolled-off GDS Action . . : MIGRATE

Use UP Command to View previous Panel; Use DOWN Command to View next Panel;
Use HELP command for Help; Use END Command to Exit;

*S01IPT
```

# Migration – Management Class

- # GDG Elements on Primary
  - Specifies how many generations use normal migration criteria
    - Any more than this are *eligible* for early migration
  - Standard Primary/L1 values are ignored
  - Does not ensure that GDSs will remain on primary disk
    - If primary days non-usage is reached, data set could be migrated anyway
- Rolled-off GDG Action
  - GDG elements defined with NOSCRATCH attribute
    - Become “normal” data sets, outside of GDG
  - Migrate
    - Migrate data set per normal management class rules
  - Expire
    - Expire data set, if no unexpired F1-DSCB EXPDT

# Space Management – Management Class

```
Panel Utilities Scroll Help
MANAGEMENT CLASS DISPLAY Page 1 of 5
Command ==> █
CDS Name . . . . . : USER.SCDS
Management Class Name : MCOMLONG
Description : LONGTERM OUTPUT MANAGER MC

Expiration Attributes
Expire after Days Non-usage . . . : 365
Expire after Date/Days . . . . . : 365
Retention Limit . . . . . : NO LIMIT

Use DOWN Command to View next Panel;
Use HELP Command for Help; Use END Command to Exit.

*S01IPT -DSLST
```

# Expiration - Management Class

- Used during primary and secondary space management
- Expire after Days Non-usage
  - Data set *eligible* to expire xxx days after last reference
- Expire after Date/Days
  - Data set *eligible* to expire xxx days after creation
    - If Expire after Days Non-usage specifies NOLIMIT
- If both fields specify NOLIMIT, then the data set will not automatically expire
- If both fields are specified, then the later date is used

**UNLESS.....**

# Expiration – Management Class

- If explicit expiration date is specified, then management class expiration criteria will not be used
  - Expiration date in VTOC or catalog entry
  - Common reason why data sets are kept longer than expected
- Check SETSYS EXPIREDDATASETS(SCRATCH) in ARCCMDxx member
  - Any data sets with past explicit expiration dates will be deleted
    - Even if used recently

# Space Management – Management Class

```
Panel Utilities Scroll Help
MANAGEMENT CLASS DISPLAY Page 2 of 5
Command ==> █
CDS Name . . . . . : USER.SCDS
Management Class Name . . . . . : MCOMLONG
Partial Release . . . . . : YES_IMMED
Migration Attributes
Primary Days Non-usage . . . . . : 3
Level 1 Days Date/Days . . . . . : 7
Command or Auto Migrate . . . . . : BOTH
GDG Management Attributes
# GDG Elements on Primary :
Rolled-off GDS Action . . . . . :
Use UP Command to View previous Panel; Use DOWN Command to View next Panel;
Use HELP command for Help; Use END Command to Exit;
*S01IPT -DSLST
```



# Space Management – Management Class – Partial Release

- Partial Release
  - Used to release allocated but unused space in a data set
- Values are:
  - Yes
    - Space release during HSM primary space management
  - Yes Immed
    - Space release at data set close
  - Conditional
    - Space release during HSM primary space management, if data set has secondary allocation
  - Conditional Immed
    - Space release at data set close, if data set has secondary allocation
  - No
    - Automatic space release not performed

# Some ARCCMDxx parameters for space management

- DEFINE PRIMARYSPMGMTCYCLE
- SETSYS PRIMARYSPMGMTSTART
- DEFINE SECONDARYSPMGMTCYCLE
- SETSYS SECONDARYSPMGMTSTART
- SETSYS MAXMIGRATIONTASKS
- SETSYS TAPEMIGRATION
  - RECONNECT used to activate fast subsequent migration
- SETSYS MAXEXTENTS
  - Used to activate extent reduction

# Backup - Storage Group

```
Panel  Utilities  Scroll  Help
                                POOL STORAGE GROUP DISPLAY                Page 1 of 2
Command ==>
CDS Name      . . . . . : USER.SCDS
Storage Group Name : SGOM
Description   : STORAGE GROUP FOR OM
Auto Migrate  . . . . . : YES
Auto Backup   . . . . . : YES
Auto Dump     . . . . . : YES
Overflow      . . . . . : NO
Migrate Sys/Sys Group Name . : ADCD113S
Backup Sys/Sys Group Name   . : ADCD113S
Dump Sys/Sys Group Name    . : ADCD113S
Extend SG Name . . . . . : SGOVFL
Copy Pool Backup SG Name . . :
Dump Class . . . . . : DAILY
Dump Class . . . . . :
Use DOWN Command to View the next Page;
Use HELP Command for Help; Use END Command to Exit.

*S01IPT -S02IPT
```

# Backup – Storage Group

- Auto Backup
  - Yes
    - Backup data sets, per management class requirements
  - No
    - Do not select volumes during automatic backup
    - Volumes can still be backed up using BACKVOL command
- Backup Sys/Sys Group Name
  - Specify System or System Group where backup is to be performed
  - Allows targeted backup approach
    - If automatic backup does not run on that system or group, then backup is not performed
  - Also a way of prioritizing a storage group during automatic backup

# Backup - Storage Group

```
Panel  Utilities  Scroll  Help
-----
                                POOL STORAGE GROUP DISPLAY                                Page 2 of 2
Command ==>  █

CDS Name      . . . . . : USER.SCDS
Storage Group Name : SGOM

Dump Class . . . . . :
Dump Class . . . . . :
Dump Class . . . . . :
Allocation/Migration Threshold - High . . . . . : 35
                                   Low . . . . . : 30
Alloc/Migr Threshold Track-Managed - High: 35
                                   Low : 30
Guaranteed Backup Frequency . . . . . : NOLIMIT
breakpointvalue . . . . . :

Use UP Command to View previous Page;
Use DOWN Command to View SMA ATTRIBUTES Page if there is SMA data.
Use HELP Command for Help; Use END Command to Exit.

*S01IPT  -S02IPT
```

# Backup - Storage Group

- **Guaranteed Backup Frequency**
  - Specifies the number of days that should elapse between backup versions
    - Regardless of change indicator being set
  - Values are 1 to 9999 or NOLIMIT
  - Must be specified if Auto Backup = Yes
- NOLIMIT means use management class specifications for backup
- If set too low, excessive backups can be taken
  - Backup checks BCDS to see when last backup was taken
  - If GBF is met, then perform backup
  - Update BCDS with new backup version
  - Zero out old version
- Recommendation: Only use if service level demands a regular backup

# Backup – Management Class

```
Panel Utilities Scroll Help
MANAGEMENT CLASS DISPLAY Page 3 of 5
Command ==>
CDS Name . . . . . : USER.SCDS
Management Class Name : MCOMLONG

Backup Attributes
Backup frequency . . . . . : 1
Number of backup versions . . . . . : 1
(Data Set Exists)
Number of backup versions . . . . . : 1
(Data Set Deleted)
Retain days only backup version . . . . . : 30
(Data Set Deleted)
Retain days extra backup versions . . . . . : 10

Admin or User Command Backup . . . . . : BOTH
Auto Backup . . . . . : YES
Backup copy technique . . . . . : STANDARD

Use UP Command to View previous Panel; Use DOWN Command to View next Panel;
Use HELP Command for Help; Use END Command to Exit.

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```

# Backup – Management Class

- Number of backup versions (Data Set Exists)
  - Number of backup versions to keep while data set is still cataloged
  - Data set could exist as migrated data set
- Number of backup versions (Data Set Deleted)
  - Number of versions to keep after data set has been deleted
  - HSM detects that data set has been uncataloged during EXPIREBV
- Retain days only backup version
  - Days to retain most recent backup version
- Retain days extra backup versions
  - Days to retain extra backup versions (other than most recent)
- Frequency
  - 0 every time Autobackup runs
  - Delay by 1 - 9999 days



# Backup – Management Class

```
Panel Utilities Scroll Help
MANAGEMENT CLASS DISPLAY Page 3 of 5
Command ==>
CDS Name . . . . . : USER.SCDS
Management Class Name : MCOMLONG

Backup Attributes
Backup frequency . . . . . : 1
Number of backup versions . . . . . : 1
(Data Set Exists)
Number of backup versions . . . . . : 1
(Data Set Deleted)
Retain days only backup version . . . . . : 30
(Data Set Deleted)
Retain days extra backup versions . . . . . : 10

Admin or User Command Backup . . . . . : BOTH
Auto Backup . . . . . : YES
Backup copy technique . . . . . : STANDARD

Use UP Command to View previous Panel; Use DOWN Command to View next Panel;
Use HELP Command for Help; Use END Command to Exit.

*S01IPT
```

# Backup – Management Class

- Admin or User Command Backup
  - Both, Admin or None
  - Setting **Admin** prevents user from issuing backup command (HBACKDS)
- Auto Backup
  - Yes or No
  - Yes, if auto backup should process
  - Both storage group and management class auto backup need to be set to yes for data sets to be processed
- Backup copy technique
  - Specifies whether to use concurrent, virtual concurrent copy or standard access

# Some ARCCMDxx parameters for backup

- **DEFINE BACKUP**
  - Specifies the number of backup cycles
  - Seen as D(01), D(02), etc.
  - CYCLESTARTDATE
- **SETSYS AUTOBACKUPSTART**
- **SETSYS CDSVERSIONBACKUP**
- **SETSYS BACKUP**
  - INUSE(RETRY)
- **SETSYS DSBACKUP**
- **SETSYS MAXBACKUPTASKS**
- **SETSYS INCREMENTALBACKUP**
  - ORIGINAL or CHANGEDONLY

# Storage Group - Dump

```
Panel  Utilities  Scroll  Help
                                POOL STORAGE GROUP DISPLAY                Page 1 of 2
Command ==>
CDS Name      . . . . . : USER.SCDS
Storage Group Name : SGOM
Description   : STORAGE GROUP FOR OM
Auto Migrate  . . . . . : YES
Auto Backup  . . . . . : YES
Auto Dump    . . . . . : YES
Overflow     . . . . . : NO
Migrate Sys/Sys Group Name . : ADCD113S
Backup Sys/Sys Group Name . : ADCD113S
Dump Sys/Sys Group Name . . : ADCD113S
Extend SG Name . . . . . : SGOVFL
Copy Foot Backup SG Name . . :
Dump Class   . . . . . : DAILY
Dump Class   . . . . . :

Use DOWN Command to View the next Page;
Use HELP Command for Help; Use END Command to Exit.

*S01IPT  -S02IPT
```

# Storage Group – Dump

- Auto Dump
  - Yes
    - Automatically dump volumes in storage group during dump window
  - No
    - Do not dump volumes in storage group
- Dump Sys/Sys Group Name
  - Specify System or System Group where backup is to be performed
- Dump Classes
  - Up to 5 dump classes may be specified
  - Dump classes are defined in ARCCMDxx member

# ARCCMDxx – Dump

- **DEFINE DUMPCYCLE**
  - Days when dump should run (up to 31)
- **DEFINE DUMPCLASS**
  - Name to be assigned to the dumpclass
  - Typical sub-parameters include
    - DAY – target day of the dump cycle
    - DATASETRESTORE – whether a data set restore can be performed from the full volume dump
    - VTOCCOPIES – number of versions of dump VTOC data sets are to be retained (0 means no data set restore, for example)
    - RESET – data set change indicator is reset after dump

# V2R1 – Management Class - Class Transition Policies

- The SMS **Management Class** provides the **Class Transition policies**:
  - **Class Transition Criteria:** If and when a data set should be transitioned
  - **Serialization Error Exit:** Indicates what type of special processing should occur if the data set cannot be serialized
  - **Transition Copy Technique:** Which copy technique should be used to move the data set

# Class Transition Criteria

Panel Utilities Scroll Help

MANAGEMENT CLASS ALTER

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Command ==>

SCDS Name . . . . . : IBMUSER.MYSCDS  
Management Class Name : MCAA

To ALTER Management Class, Specify:

## Class Transition Criteria

Time Since Creation	Years . . .	(0 to 9999 or blank)
	Months . . .	(0 to 9999 or blank)
	Days . . .	(0 to 9999 or blank)
Time Since Last Use	Years . . .	(0 to 9999 or blank)
	Months . . .	(0 to 9999 or blank)
	Days . . .	(0 to 9999 or blank)

## Periodic

Monthly	On Day . . .	(1 to 31, FIRST, LAST or blank)
Quarterly	On Day . . .	(1 to 92, FIRST, LAST or blank)
	In Month . . .	(1 to 3 or blank)
Yearly	On Day . . .	(1 to 366, FIRST, LAST or blank)
	In Month . . .	(1 to 12 or blank)

Use ENTER to Perform Verification; Use UP/DOWN Command to View Other Panels;  
Use HELP Command for Help; Use END Command to Save and Exit; CANCEL to Exit.



# V2R1 – Management Class



- The **Class Transition Criteria** specifies if and when a data set should be transitioned.
  - **Default:** Class transitions are *not* performed
  - **Time since Creation:** Data set is eligible for a transition on or after this time.
    - This is a *subjective* setting. It indicates that regardless of the usage of the data set, it should be transitioned.
  - **Time since Last Use:** Data set is eligible for a transition on or after this time.
    - This is an *objective* setting. It indicates that a data set should not be transitioned until it has not been referenced for a certain period of time.
  - **Periodic:** Data set is eligible for a transition on a specific date.
    - This is a *subjective* setting. It indicates that regardless of the usage of the data set, it should be transitioned.
- Only one criteria may be specified.

# Class Transition Criteria

Panel Utilities Scroll Help

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MANAGEMENT CLASS ALTER

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Command ==>

SCDS Name . . . . . : IBMUSER.MYSCDS  
Management Class Name : MCAA

To ALTER Management Class, Specify:

Class Transition Criteria

Transition Copy Technique . . . . . STD (FRP, FRR, STD, PMP or PMR)  
Serialization Error Exit . . . . . NONE (DB2, CICS, ZFS, EXIT or NONE)

Use ENTER to Perform Verification; Use UP/DOWN Command to View Other Panels;  
Use HELP Command for Help; Use END Command to Save and Exit; CANCEL to Exit.

## V2R1 – Management Class - Invocation

- The **Transition Copy Technique** indicates what type of copy technique should be used to move the data set
  - **Standard:** (Default) Use standard I/O
  - **Fast Replication Preferred:** Prefer Fast Replication. If it cannot be used, then use standard I/O.
  - **Fast Replication Required:** Require Fast Replication. If it cannot be used, fail the data movement.
    - Requires the target volume to be in the same storage controller.
  - **Preserve Mirror Preferred:** Prefer Preserve Mirror. This indicates that a Metro Mirror primary volume is allowed to become a FlashCopy target volume. If Preserve Mirror cannot be used, FlashCopy or standard I/O may be used.
  - **Preserve Mirror Required:** Require Preserve Mirror. The transition is only performed if the Metro Mirror primary target volume will not go duplex pending. This parameter has no affect if the target volume is not a Metro Mirror primary volume.

# V2R1 – Management Class - Invocation

- The **Serialization Error Exit** indicates what type of special processing should occur if the data set cannot be exclusively serialized
  - Since '**Time since Creation**' and '**Periodic**' may specify that a transition occur during a period of time when a data set is being accessed, this setting specifies what to do if a data set cannot be exclusively serialized for data movement
  - For database data, it may be expected that the data is always open and special processing must be done to transition the data at any time
- Since it is expected that data sets may be open, the default is to not issue an error message if a data set cannot be exclusively serialized, it is just skipped (*similar to migration processing*)
  - To issue a DFSMSHsm message for this condition, issue  
PATCH .MGCB.+EF BITS( . . .1 . . . . )
  - An FSR record is created to enable reporting for this condition



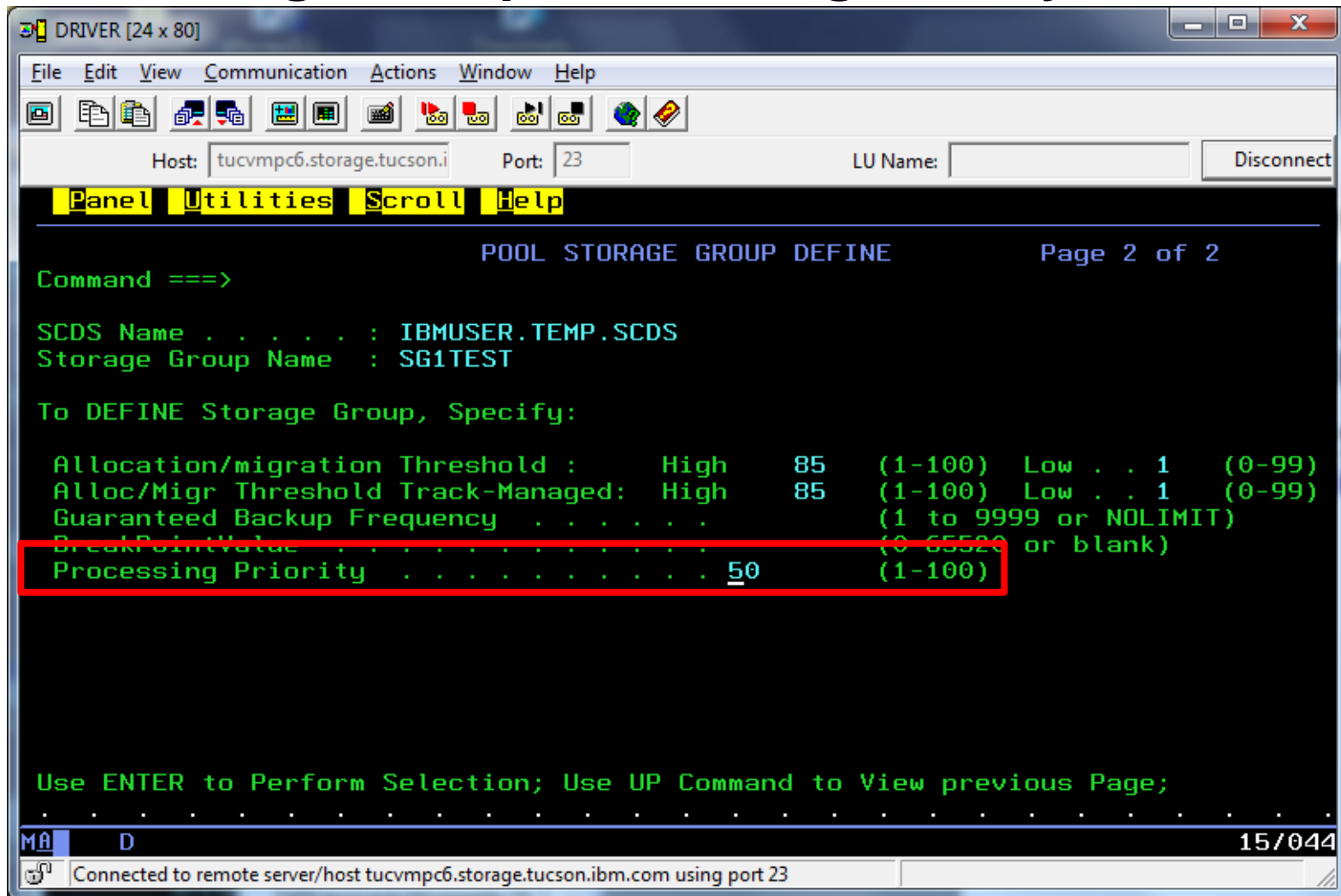
# V2R1 – Management Class - Invocation



- **Serialization Error Exit** settings
  - **NONE:** (Default) If a data set cannot be exclusively serialized, the data set is not transitioned
  - **DB2:** Data assigned to this management class are DB2 objects
    - Invoke DB2 to close and unallocate the object. If this is successful, the object is serialized and moved and DB2 is invoked to reopen the object
  - **CICS:** Data assigned to this management class are CICS objects
    - Invoke CICS to take the object offline. If this is successful, the object is serialized and moved and CICS is invoked to reopen the object
  - **zFS:** Data assigned to this management class are zFS data sets
    - Invoke zFS to unmount the data set. If this is successful, the data set is serialized and moved and zFS is invoked to remount the data set
  - **EXIT:** User exit is invoked to preprocess and post-process the data set
    - Enables users / ISVs to provide an exit that will be invoked before and after transitioning an allocated data set. The data set is only transitioned if serialization is obtained after the first invocation of the exit
    - Documented in *DFSMS Installation Exits (SC26-7396)*



# V2R1 - Storage Group Processing Priority



DRIVER [24 x 80]

File Edit View Communication Actions Window Help

Host: tucvmc6.storage.tucson.i Port: 23 LU Name: Disconnect

Panel Utilities Scroll Help

POOL STORAGE GROUP DEFINE Page 2 of 2

Command ==>

SCDS Name . . . . . : IBMUSER.TEMP.SCDS  
Storage Group Name : SG1TEST

To DEFINE Storage Group, Specify:

Allocation/migration Threshold :	High	85	(1-100)	Low . . . 1	(0-99)
Alloc/Migr Threshold Track-Managed:	High	85	(1-100)	Low . . . 1	(0-99)
Guaranteed Backup Frequency . . . . .			(1 to 9999 or NOLIMIT)		
BreakPointValue . . . . .			(0-5520 or blank)		
Processing Priority . . . . .		<u>50</u>	(1-100)		

Use ENTER to Perform Selection; Use UP Command to View previous Page;

MA D 15/044

Connected to remote server/host tucvmc6.storage.tucson.ibm.com using port 23

# V2R1 – Storage Group - Invocation

- The new Storage Group **Processing Priority** specifies the relative order in which storage groups should be processed during Primary Space Management
  - *Class Transition processing will move data from one storage group to another*
  - In order to help ensure that the 'receiving' storage groups have enough space for the data sets that will be moved to them, a new storage group **Processing Priority** is provided
    - These storage groups should be assigned a higher priority
  - Storage Groups will be processed in the order of their priority
    - A higher value means a higher priority
    - Valid values are 1-100
    - Default value is 50
- ✓ Applies to Primary Space Management and automatic backup processing



# Questions?





# What You Need to Know About the Way HSM uses SMS

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March 12, 2014  
Session Number 15110

