

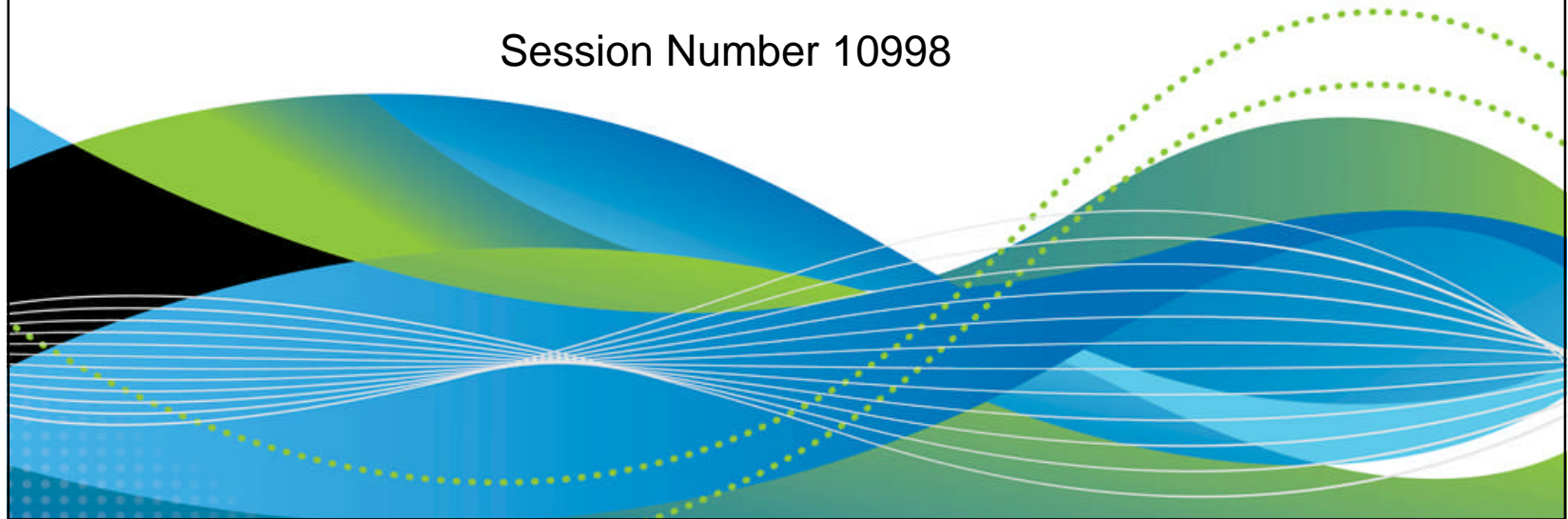
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# Hints and Tips for Improving your DFSMShsm Environment

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## Agenda Topics

- Setting the stage
  - How these Tuning Tips came to be
    - IBM's DFSMSHsm Health Assessment
  - What tuning tips will be covered
    - HSM Log Files
    - Recycle
    - Expirebv
    - HSM Patches
  - Fast Subsequent Migration
  - When to split CDS's
  - Enabling RLS
  - Migration/Backup Errors
  - Compaction
  - Interval Migration
  - Cancelling DFSMSHsm
  - Home Grown Reporting
  - Tuning CDS's
  - Reorganizing Control Data Sets



## Setting the Stage

- The information being presented was gathered while performing IBM DFSMSHsm Health Assessments at different customer sites.
- These sites ranged from small to large shops with a hundred data sets to millions of DFSMSHsm managed migration and backup records and tapes.
- In many assessments performed, sites or administrators are not aware critical SETSYS values are disabled or not active.



## Setting the Stage (continued)

- In most instances SETSYS values and SMS/HSM configurations were defined years ago and usually never revisited or modified over the years.
  - Original administrators are no longer there and environment has been inherited
  - “Not sure why, so we dare not change it”
- These scenarios could be costing companies significant HSM resources and \$\$\$\$s
- These are not necessarily errors, rather examples showing why it is important to have a toolset that can show you where change may be needed and why.



## HSM Log files

- HSM Logfiles are used to track HSM activity
- Required if using an ISV solution that reads the logs
- Disable if not needed
  - Additional overhead when using logging
- One set of log files per HSM started task
- Active logfile is always the HSMLOGX dataset
  - Exclusive enqueue issued by HSM started task
  - HSM swaps the log files by renaming them
    - *Need to reside on the same disk volume*
- HSMLOGY data set can be analyzed using ARCPRLOG/ARCPEDIT programs



## HSM Log files (cont.)

- HSMY logfile has EOF marker written after close
  - No EOF marker when being used as active HSMLOGX
- Some products have the ability to read past current data
  - Some data may therefore be old
- Some customers process log files and then “zero” them
  - Raw log data is not available for further analysis
- Recommendation: Write the HSMLOGY file to a GDG to allow further analysis before “zeroing”



## Log Files (cont.)

- Check DISP in HSM started procedure
  - We often see DISP=SHR or OLD coded
- If LOGSW=YES, then DISP must be OLD
  - PDA data sets are swapped automatically at startup
- If LOGSW=NO, then DISP should be MOD
  - If DISP=OLD or SHR, data will be overwritten at HSM restart





## Recycle

- Recycle's purpose is to consolidate HSM tapes by merging active migrated and backup data to new tape releasing the input tape back to the tape management system for reuse
  - Also used to move HSM data to new tape devices
- Truth or Myth –
  - Virtual Tape Library's
    - *Some sites are under the impression because they have HSM tapes in a VTL they have unlimited tapes available.*
    - *Myth – as the saying goes, you are only as strong as the weakest link. Though there could thousands of tapes defined, the weak link is the back end storage.*



## Recycle

- Truth or Myth (continued) –
  - We aggressively migrate HSM data to the VTL because it uses less resources than physical tape.
    - Truth and Myth –
      - *VTL's do process data faster than physical tape, aside from the regular DFSMSHsm resources. For recycle a VTL also uses these additional cycles –*
        - *Cache for loading data*
        - *Loading of complete tape into memory*
        - *Hardware decompression*
    - Recommended recycle percentage
      - *Physical Tape – 30-40 percent valid data*
      - *Virtual Tape – 10-20 percent valid data*



## “Tapeless” virtual tape systems

- Not backed by physical tape
  - If you run out of room, you need to add capacity
- Managed more like physical tape
- Volumes can be appended to by DFSMSHsm
  - SETSYS PARTIALTAPE(REUSE)
- Consider using smaller virtual volume size
  - Allows tapes to free up quicker
  - Less need to recycle
  - Could cause excessive tape spanning



## EXPIREBV – Scenario 1

- Number of backup data set versions was more than 10 times the number of migrated data sets
  - Customer was expecting to keep maybe 2 backup versions
- **Findings**
  - Expirebv had never been run at this site
  - Ran Expirebv in DISPLAY mode
  - Estimated that out of 78,000 backup versions, 8,000 would remain after 30 days



## EXPIREBV – Scenario 2

- Customer complained that one BCDS component needed to be reorged more often than others
- Checked that EXPIREBV was running every day
- **Findings**
  - Customer was keeping all backup versions for 7 years after migration version was deleted
  - By reducing the retention of test data to 1 year could save
    - 28 % of backup space occupied on tape (1.53 TB)
    - 40% of number of BCDS entries



# EXPIREBV

## Purpose -

- Delete expired DFSMSHsm backup versions of datasets, based on Management Class or supplied values
  - Management Class – Retain Days extra backup version
  - Also deletes expired ABARS versions
- Flags when a data set is detected as uncataloged
  - Either on primary disk or migrated version
- Updates BCDS to store date of Expirebv run
- Subsequent Expirebv run deletes backup version
  - Based on Management Class – Retain Days only backup version



## Patches

- Patches are applied via the DFSMSHsm PATCH command
  - Often included in the ARCCMDxx member
- Supplies functionality not available using standard HSM commands
- Some patches are for tuning, others are for diagnostics
- Supported Patches are documented in the DFSMSHsm Implementation and Customization Guide



## Patches - Tuning

- Examples
  - PATCH .MCVT.+52 bits(..1.....)
    - Alter the default for tape data set recalls from a wait state to a no-wait state
    - Allows TSO users to perform other tasks while recall takes place in the background
  - PATCH .MCVT.+321 'SHORT ' VERIFY(.MCVT.+321 'HSMACT')
    - Change HLQ of HSM DASD activity log from HSMACT to SHORT





## Patches – Problem Determination

- Examples
  - PATCH .MGCB.+26 X'FF'
    - Used to determine why an SMS-managed data set is not selected during volume migration
  - PATCH .BGCB.+24 X'FF'
    - Used to determine why SMS-managed data sets are not being selected during volume backup
- These patches produce a lot of messages
  - ARC1245I with Reason Codes GT 90 for migrations
  - ARC1334I with Reason Codes GT 90 for backups
- We discovered this because the client's error numbers were very high
- Use diagnostic patches only when needed or directed by Level 2 support



## Fast Subsequent Migration

- Discussed in Best Practices Session
- We found very few sites using it
- Easy to implement
  - `SETSYS TAPEMIGRATION(RECONNECT(NONE | ALL | ML2DIRECT))`
- Reduces need for data movement
- Review SETSYS MIGRATIONCLEANUPDAYS
  - E.g. `SETSYS MIGRATIONCLEANUPDAYS(30 30 10)`
    - 1<sup>st</sup> parm: Number of days to keep MCDS record after recall
    - 2<sup>nd</sup> parm: Number of days to keep daily & volume statistic recs.
    - 3<sup>rd</sup> parm: Number of days to retain records for reconnection



## Thrashing

- Thrashing can be described in 2 ways
  - A data set which is migrated and recalled within a few days
  - Data sets which are migrated and recalled multiple times
- Often generation data sets involved
  - Management Class allows GDS early migration
    - MC Class field # GDG Elements on Primary
  - Some jobs recall entire GDG rather than relative generation
    - Data is recalled even when not needed
- Consider not migrating small datasets
  - Migration may not be worth the processing overhead
  - Use ARCMDEXT exit to exclude from migration
    - Can also allow migration to ML1 but exclude from ML2



# Thrashing

- HSM SMF records (FSR) can be used to look for thrashing
  - Products can also be used

```
DFHSM Recall Thrashing Report - Detailed          07/16/10          16:36:17
2010/07/16 : Daily Report
```

Sid	Time	Data Set Name	MigDays	Mclas
SYS1	13:01:00	P390.MIGR.AUDIT.D071510	0	MCDEF
SYS1	15:39:01	BJT230.GLOBAL.CSI	4	MCPRD
SYS1	15:39:12	BJT230.GLOBAL.SMPPTS	4	MCPRD
SYS1	15:44:37	GLO310.GLOBAL.CSI	4	MCPRD
SYS1	15:44:41	HOSM612.GLOBAL.CSI	0	MCPRD
SYS1	15:44:50	ITM621.GLOBAL.CSI	0	MCPRD
SYS1	15:45:11	VTM300.GLOBAL.CSI	0	MCPRD
SYS1	15:53:37	SYS2.BJT230.SMPE.CNTL	4	MCDEF
SYS1	16:07:59	GLO310.SMPPTS	0	MCPRD
SYS1	16:11:52	GLO310.SMPLOG	0	MCPRD
SYS1	16:11:54	GLO310.SMPMTS	0	MCPRD
SYS1	16:20:24	VTM300.SMPMTS	0	MCPRD

- Note: FSR records can also include data sets processed for extent reduction
  - These are not really thrashing
  - Review SETSYS MAXEXTENTS



## Thrashing – IEFBR14

- Production jobs often use IEFBR14 with DISP=(x,DELETE) as first step
- HSM will recall the data set just to delete it
- z/OS V1R11 allows data sets to be deleted without Recall
- Changes in ALLOCxx member in SYS1.PARMLIB
  - SYSTEM IEFBR14\_DELMIGDS(NORECALL)
  - Default value is LEGACY
- Recommend NORECALL unless another product already being used
  - e.g. ZOSEM



## Guaranteed Backup Frequency

- Storage Group parameter
- Specifies the maximum number of days between backups
  - Even if it was not modified
- New backup copy replaces and invalidates old copy
  - Additional I/O required
    - Verify last backup date in BCDS
    - Backup data
    - Create new version in BCDS
    - Delete old version from BCDS
- More recycles required with larger capacity tapes
- Recommend using this feature sparingly

## VSAM Record Level Sharing for DFSMSHsm CDSs



- VSAM RLS can greatly improve throughput and decrease windows
  - Also improves Audit performance
- Requires Coupling Facility access from DFSMSHsm hosts
- If one DFSMSHsm host accesses in RLS mode, all hosts must access the CDSs in the same mode
  - HSM startup will fail if an incompatible serialization mode is found
- Control Data Sets must be SMS-managed
- Define a new VSAM RLS structure for HSM workload
  - Implementation and Customization Guide will be updated to remove recommendation to use existing structures



## VSAM Record Level Sharing Enablement

- Steps for setting up VSAM RLS (Very high-level)
  - Define new CFRM policy in coupling facility
  - Define 3 Share Control data sets (2 active, 1 spare)
  - Add Shared CDSs to SMSVSAM
  - ISMF
    - Define Cache sets
    - Storage class changes
    - Data class changes
  - Changes to IGDSMSxx
    - E.G. RLSINIT(YES)





## Using RLS with DFMSHsm

- Steps to be taken to enable HSM to open the CDSs in RLS mode
  - Control data sets must be altered to change LOG(NONE)
  - DFMSHsm startup proc change to CDSSHR=RLS
- DFMSDss must be used for CDS backups
  - CDSVERSIONBACKUP DATAMOVER(DSS)
- To fallback
  - Stop HSM tasks on all LPARs
  - ALTER cdsname NULLIFY(LOG)
  - CDSSHR=YES
- More detailed RLS info in Session 10967 at 930am



## Common Recall Queue - CRQ

- Discussed in Best Practices (Session 10952 at 3pm)
- Consolidates recall requests and spreads them across HSM instances
  - Balances workloads around the complete HSMplex
- Allows important recalls to be prioritized ahead of lesser ones
- Optimizes Tape mounts
  - Single tape mount satisfies requests from multiple LPARS
- Requests can be carried out by all or some of the systems
  - Allows systems without attached tape to issue recall requests



## Common Recall Queue – Enablement

- Requires Coupling Facility
- I & C guides recommends initial values
  - INITSIZE= 5120KB
  - SIZE=10240KB
    - Allows between 3900 and 8400 concurrent recalls
    - Recommendation assumes that 33% request a unique ML2 tape
    - Also use <http://www-947.ibm.com/systems/support/z/cfsizer/crq/>
- Use IXCMIAPU to define the structure to the CFRM
- Activate new structure
  - SETXCF START,ALTER,STRNAME=name,SIZE=xxxx
- Issue HSM command
  - SETSYS COMMONQUEUE (RECALL(CONNECT(basename)))

## Common Causes of Migration & Backup Failures



- Everyday in most shops DFSMShsm primary, secondary and backup are run at specific times daily. In most cases business's have grown, storage farms have grown and managed data has grown, but when was the last time your scheduled tasks were reviewed or verified?
- Here are some common failures documented while doing the Health Assessments.
  - Data Set in Use (migration/backup) –
    - A common encountered error, everyday DFSMShsm will try to migrate and backup these data sets and fail.
      - *Waste of DFSMShsm resources*

## Common Causes of Migration & Backup Failures



- Common causes of migration/backup failures (continued) —
  - No space on ML1 Volume
    - Usually large data sets
    - Move data quicker to ML2
      - *Straight to ML2 using ARCMDEXT*
    - Implement ML1 Overflow
      - *SETSYS ML1OVERFLOW*
  - HSM Backup Critical Errors (condition code ne 0) —
    - HSM backup is critical to shops using this as their first level data recovery.
      - *Backup window overlaps batch processing*
      - *Ctlg errors (rc30) / DFDSS errors (rc68) / vtoc discrepancy (rc87)*
        - *Waste of DFSMSHsm resources*

## Common Causes of Migration & Backup Failures



- Common causes of migration/backup failures (continued) –
  - The most common migration and backup error noted when doing the Health Assessments were for Unsupported Datasets (rc99, rsn04).
    - Cause of the problem are incorrectly defined data sets (no DSORG).
    - Everyday HSM will try to migrate/backup these data sets and fail. We have seen situations where the same data sets have been failing for nine years and more. The quickest and easiest correction is to update the SMS routines to automatically assign a data class during allocation.
      - *Waste of DFSMSHsm resources.*
  - Other Reason code examples
    - RSN=14 - APF authorized data set
    - RSN=20 – VSAM data set has ERASE parameter specified



## Compaction – Scenario

- Customer reported that DFSMSHsm was one of the 2 largest CPU users when automatic functions were running
  - Sometimes had to hold the running function in order to allow other work to proceed
- Recommendation was made to only use compaction for ML1 or backups to disk volumes, not tape
  - SETSYS COMPACT(DASDMIGRATE,DASDBACKUP)
  - SETSYS COMPACT(NOTAPEMIGRATE,NOTAPEBACKUP)



## Compaction

- DFSMSHsm provides software compression via SETSYS COMPACT
- Compaction can be specified for migration, backup, DASD and/or tape data sets
- Compaction is CPU-intensive
- Ensure that software compaction is not enabled for tape data sets
  - Use SETSYS TAPEHARDWARECOMPACT instead



## Migration and SMS Storage Group Thresholds



- Found sites using unrealistic storage group thresholds
  - E.g. High threshold 80%, low threshold 1%
- Primary Space Management will attempt to process down to low threshold
- Interval Migration starts after halfway between high- & low-threshold is exceeded
  - Ends at low-threshold
- Leads to excessive cycles and missed space management windows
- Set values that are realistic for the storage group



## Stopping a DFSMShsm Started Task

- Normal Shutdown
  - Operator issues shutdown of the DFSMShsm started task
    - HSM clears and updates ghost records.
    - HSM finishes and marks open tapes as completed.
    - HSM completes all remaining requests and scheduled work.
    - HSM finalizes all chained records.



## Stopping a DFSMShsm Started Task

- Cancel HSM task
  - Ghost records are lost
  - Tapes are left in FAILED status
  - Chained records are left orphaned and disconnected
  - Data at HIGH risk for unavailability



## Homegrown Reporting Tools

- Purpose –
  - Report on DFSMSHsm activity.
    - Migration, backup, recall, recover, extent reduction, PSM, SSM, etc.
      - *What and Why?*
      - *Age, times, etc.*
  - Successful/unsuccessful
    - What, Why and How long?
- Things to know –
  - Requires in-depth knowledge of HSM and records.
  - Requires other OEM software license
    - SAS
    - What is the plan for support and knowledge transfer?



## DFSMSrmm Report Generator

- DFSMSHsm reporting added in z/OS V1R10
- Available in ISMF Option G
  - Create Storage Management Reports
- Reports created from FSR and WWFSR SMF records
- Additional reports from data obtained using DCOLLECT
- SMF records need to be dumped from SYS1.MANx or logstream first





# Storage Management Reports

- Various reports available

```

                                DFSMSrmm Report Definitions          Row 1 to 17 of 41
Command ==> _____ Scroll ==> CSR

The following line commands are valid: A,D,G,H,J,L,M,N,S, and T

S Name      Report title                Report type                User id
-----
- ARCGAB01  ABARS ABACKUP Statistics      DFSMSHsm ABARS Report     HSM
- ARCGAR01  ABARS ARECOVER Statistics     DFSMSHsm ABARS Report     HSM
- ARCGDB01  DCOLLECT BACKUP DATA        DFSMSHsm DCOLLECT BACKUP   P390
- ARCGDD01  DCOLLECT DASD CAPACITY PLANNIN DFSMSHsm DCOLLECT DASD CAP   P390
- ARCGDM01  DCOLLECT MIGRATION DATA     DFSMSHsm DCOLLECT MIGRATION P390
- ARCGDT01  DCOLLECT TAPE CAPACITY PLANNIN DFSMSHsm DCOLLECT TAPE CAP   P390
- ARCGS001  Statistics for DFSMSHsm       DFSMSHsm FSR-SMF Records  HSM
- ARCGS002  Statistics for Backup         DFSMSHsm FSR-SMF Records  P390
- ARCGS003  Statistics for Migration      DFSMSHsm FSR-SMF Records  P390
- ARCGS004  Statistics for Recall         DFSMSHsm FSR-SMF Records  P390
- ARCGS005  Statistics for Recovery       DFSMSHsm FSR-SMF Records  HSM
- ARCGS006  Statistics for Volume Dump    DFSMSHsm FSR-SMF Records  HSM
- ARCGS007  Statistics for Restore from Du DFSMSHsm FSR-SMF Records  HSM
- ARCGS008  Statistics for FRBACKUP       DFSMSHsm FSR-SMF Records  HSM
- ARCGS009  Statistics for FRRecover      DFSMSHsm FSR-SMF Records  HSM
- ARCGS010  DFSMSHsm Thrashing Report     DFSMSHsm FSR-SMF Records  P390

```



# Backup Error Report using DFSMSrmm Report Generator



Statistics for Backup - 1 - 02/14/2011 14:59:30

DATE	TIME REQ	DSN	SOURCE	RC	REASON CODE	KB READ
2011040	12003814	SYS2.RMM.CONTROL.FILE	SMS001	68	412	0
2011040	12003937	DSN810.DSNDBC.BJTBASE.BJTARCSP.I0001.A001	SMS0M1	68	412	0
2011040	12004166	ITM622.ADCD.RRNSGRP1	SMS001	19	0	0
2011040	12004220	DSN810.DSNDBC.BJTBASE.BJTATTSP.I0001.A001	SMS0M1	68	412	0
2011040	12004950	DSN810.DSNDBC.BJTBASE.BJTARCSP.I0001.A001	SMS0M1	0	0	16612
2011040	12004959	ITM622.ADCD.RRNSGRP1	SMS001	0	0	8323
2011040	12004962	SYS2.RMM.CONTROL.FILE	SMS001	0	0	2344
2011040	12004994	AKD.AUDIT.CATLIST	SMS001	0	0	1
2011040	12005002	AKD.AUDIT.RMMCNTL	SMS001	0	0	1
2011040	12005039	DSN810.DSNDBC.BJTBASE.BJTACTSP.I0001.A001	SMS0M1	68	412	0
2011040	12005057	AKD.MEDIACTL.V900018.ERRORS	SMS001	0	0	1
2011040	12005129	P390.SPFTEMP0.CNTL	SMS001	19	0	0
2011040	12005157	P390.SPFTEMP0.CNTL	SMS001	0	0	8
2011040	12005264	AKD.AUDIT.OCDS.TTCVAUDT	SMS001	0	0	23
2011040	12005271	IXGLOGR.ATR.ADCDPL.DELAYED.UR.ADCDPL	SMS001	68	412	0
2011040	12005331	ITM622.ADCD.RRVSGRP1	SMS001	19	0	0
2011040	12005739	DSN810.DSNDBC.BJTBASE.BJTATTSP.I0001.A001	SMS0M1	0	0	16612

# Migration Error Report using DFSMSrmm Report Generator



Statistics for Migration - 1 - 02/11/2011 11:04:31

DATE	TIME REQ	DSN	AGE	SOURCE	RC	REASON CODE	KB READ
2011041	13000719	SYS2.TDS.DCOLLECT.G0353V00	0002	SMS002	0	0	18036
2011041	13001273	SYS2.RMM.HSKP.MESSAGE.SAVE.G2712V00	0001	SMS002	0	0	6
2011041	13001399	ITM622.ADCD.RKDSS TSA	0000	SMS002	19	8	0
2011041	13001565	ITM622.ADCD.RKDSC KPT	0000	SMS002	19	8	0
2011041	13001612	ITM622.ADCD.RKDSQ URY	0000	SMS002	19	8	0
2011041	13001633	ITM622.ADCD.RKDSY ST	0000	SMS002	19	8	0
2011041	13001649	ITM622.ADCD.RKDSE PRM	0000	SMS002	19	8	0
2011041	13001666	ITM622.ADCD.RKDSE VMP	0000	SMS002	19	8	0
2011041	13001680	ITM622.ADCD.RKDSE GRPC	0000	SMS002	19	8	0
2011041	13001696	SYS2.BJTBASE.BJTBU CSP.D2011039.T181622	0002	SMS002	0	0	24
2011041	13002005	SYS2.BJTBASE.BJTUAM SP.D2011040.T001701	0002	SMS002	0	0	12
2011041	13002090	SYS2.BJTBASE.BJTDOSP.D2011039.T181622	0002	SMS002	0	0	1903
2011041	13002249	SYS2.BJTBASE.BJTLAY SP.D2011040.T001701	0002	SMS002	0	0	3377
2011041	13002397	SYS2.BJTBASE.BJTATT SP.D2011040.T001701	0002	SMS002	0	0	12
2011041	13002469	SYS2.BJTBASE.BJTBAN SP.D2011040.T001701	0002	SMS002	0	0	96
2011041	13002595	SYS2.BJTBASE.BJTBUISP.D2011040.T001701	0002	SMS002	0	0	8
2011041	13002671	SYS2.BJTBASE.BJTAVR SP.D2011040.T001701	0002	SMS002	0	0	8





## Tuning of DFSMSHsm

- In many shops DFSMSHsm parameters have not been reviewed, analyzed or modified since first activated.
  - Businesses have grown, storage farms have grown, managed data has grown.
    - SMS and HSM routines are usually added to but not reassessed.
- What should you do -
  - Understand the work DFSMSHsm is doing.
    - What is it costing for scheduled tasks?
      - *Successful/Unsuccessful*
    - Are HSM resources being used to perform unnecessary work?
      - *What is the cost?*



## Tuning of DFSMShsm

- Tuning DFSMShsm (continued) –
  - Tuning of DFSMShsm is often overlooked but should be done every so many years or when there is an addition of data (merging of new HSM data)
- When to review SMS and HSM criteria –
  - When Companies grow
    - *A review should be scheduled at minimum annually or semi-annually*
  - Businesses bought and sold
  - HSM managed data has grown exponentially
  - Before the capacity planners start complaining... 😊



## Tuning of DFSMSHsm

- Tuning DFSMSHsm (continued) —
  - An extremely helpful solution is to consider a product that will assist you with understanding HSM costs for better tuning.

HSM Action	Return Code	Records Count	Tracks Read	CPU .01 Seconds	Recycle # Tapes	Estimated Cost
BACK-UP	0	930	366083	8211		20.53
BACK-UP	19	152	0	13		.03
EXBACKV	0	1013	0	130		.33
EXPIRED	70	36	0	0		.00
MIGRATE	0	123	12350	762		1.91
MIGRATE	6	190	0	11		.03
MIGRATE	24	1	0	0		.00
MIGRATE	37	118	0	7		.02
MIGRATE	58	79	0	4		.01
PARTREL	0	57	2657	12		.03
RECALL	0	95	4357	798		2.00
RECYCLE	0	9586	80520	1298	15	40.72



## Reorganizing Control Data Sets

- Should you reorganize a Control Data Set?
  - Some Say Yes, Some Say No.
- Why are you Reorganizing a Control Data Set?
  - Receiving warning messages from DFSMSHsm
    - Incorrect sizing
    - Single cluster at 4Gb limit
    - “That is what we have been doing for years”



## Reorganizing Control Data Sets

- Should you reorganize a Control Data Set (cont) ?
- Think of DFSMSHsm as a part of z/OS
  - Every minute it is down –
    - Migrated data cannot be recalled
      - *Production delays*
    - Backed up data cannot be recovered



## Reorganizing Control Data Sets

- Should you reorganize a Control Data Set (cont) ?
  - Look for alternatives
    - CA Reclaim
    - Correct sizing of CDSs
    - Reorg While Active products
    - Review why and if needed use tested procedure
  - Is there a performance impact after a reorg?
    - Yes, the reorg removes all splits, but when HSM is restarted the split process will begin again
    - Performance impact for a number of weeks



## Hot off the Press

- Ensure HSM components are exempt from EOV intervention
  - Control data sets/journal
  - Small data set packing clusters (SDSPs)
  - ML1 data sets
  - Recalled and recovered data sets
  - HSMLOGX/Y and PDA data sets





## Summary

- HSM Log Files
- Recycle
- Expirebv
- HSM Patches
- Fast Subsequent Migration
- When to split CDS's
- Enabling RLS
- Migration/Backup Errors
- Compaction
- Interval Migration
- Cancelling DFSMSHsm
- Home Grown Reporting
- Tuning CDS's
- Reorganizing Control Data Sets





# Hints and Tips for Improving your DFSMShsm Environment

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