



Implementing DFSMShsm Best Practices with Tivoli Advanced Products

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March 11, 2014
Session Number 15109



Implementing DFSMSHsm Best Practices

- DFSMSHsm Best Practices is not a one time process.
 - Usually requires constant monitoring and updating.
 - What was acceptable before may not be acceptable today.
 - Is an extension to current DFSMSHsm best practices.
 - Data allocation, retention and management.
- Question:
 - How many of you have the time and resources to look at DFSMSHsm work everyday?
 - Not just failed work, but also successful work.

Implementing DFSMShsm Best Practices

- What makes DFSMShsm Best Practices successful?
 - Remember, DFSMShsm Best Practices is not only allocation of data; it includes Management Movement and the Availability of data.
 - DFSMShsm Best Practices can also help reduce the amount of system and task resources needed and used.

Implementing DFSMSHsm Best Practices

- Where could current Best Practices fall through or be missed?
 - Purchase of a new company/business
 - In most cases, the purchased company/business standards and procedures are copied over.
 - Business growth
 - In many situations, current practices were defined years ago and may no longer apply or be correct.



Hints and Tips Reminders

2/13/2014



Prior SHARE Hints and Tips

Recycle



- Recycle purpose is to free-up HSM tape by merging no longer needed migrated and backup data to new tape releasing the cycled 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*

Prior SHARE Hints and Tips

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 says to 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

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

Prior SHARE Hints and Tips

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.

Prior SHARE Hints and Tips

Reorganizing Control Data Sets



- Should you reorganize a Control Data Set (cont) ?
- Think of DFSMSHsm as a crucial part of the OS
 - Every minute it is down –
 - Migrated data cannot be recalled
 - *Production delays*
 - Backed up data cannot be recovered
 - *Simple HSM lost revenue calculation*
 - *Total seconds HSM is working times cpu second divided by time HSM is down equals lost HSM revenue.*

Reorganizing Control Data Sets



- Should you reorganize a Control Data Set (cont) ?
 - Look for alternative solutions
 - Correct sizing of CDSs
 - Reorg While Active products
 - Review why and if needed use tested procedure
 - Is there a performance increase after a reorg?
 - Yes, the reorg removes all splits, but when HSM is restarted the first thing it will do inside a CDS is a split.
 - Performance impact for a number of weeks



Helping Customers Understand Current Practices

Some actual customer discussions.

2/13/2014



Best Practices – HSM Tasks

```

Vista Session A
File Edit Font Transfer Macro Options Window Help
Menu Utilities Navigate Help
HSMFUNCS ----- Adv Reporting and Management for HSM ----- 12:59
Command ==> _____ scroll ==> CSR
SCOPE in effect '*'
DFSMShsm Function Statuses: Row 8 of 22

```

Function	Status	Job Name	Job Number	Host Id	Scope System	Scope Plex
List	Not Held	HSM	50022020	1	DVLP	RSPLEXRS
Migration	Not Held	HSM	50022020	1	DVLP	RSPLEXRS
Recall	Not Held	HSM	50022020	1	DVLP	RSPLEXRS
Recover	Not Held	HSM	50022020	1	DVLP	RSPLEXRS
Recycle	Not Held	HSM	50022020	1	DVLP	RSPLEXRS
Report	Not Held	HSM	50022020	1	DVLP	RSPLEXRS
TapeCopy	Not Held	HSM	50022020	1	DVLP	RSPLEXRS
TapeDsn Recall	Not Held	HSM	50022020	1	DVLP	RSPLEXRS
TapeDsn Recover	Not Held	HSM	50022020	1	DVLP	RSPLEXRS
Tape Replace	Not Held	HSM	50022020	1	DVLP	RSPLEXRS
TSD TapeDsn	Not Held	HSM	50022020	1	DVLP	RSPLEXRS
BCDS Backup	Inactive	HSM	50022020	1	DVLP	RSPLEXRS
MCDS Backup	Inactive	HSM	50022020	1	DVLP	RSPLEXRS
OCDS Backup	Inactive	HSM	50022020	1	DVLP	RSPLEXRS
Journal Backup	Inactive	HSM	50022020	1	DVLP	RSPLEXRS

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- Know the status of HSM tasks.
 - Someone may have held a task without communicating to team.
 - Unknown held tasks can cause –
 - Unexplained events
 - *Space issues*
 - *Backup issues*
 - Unnecessary task load when restarted
 - *Back workload*

Best Practices – DFSMSHsm Daily Work

```

Vista Session A
File Edit Font Transfer Macro Options Window Help
-----
Menu Utilities Navigate Reports Help
-----
CollSumm ----- Adv Reporting and Management for HSM ----- 10:25
Command ==> Scroll ==> CSR
-----
DFSMSHsm Activity Collection Summary: Row 1 of 34
Line Commands are . . . : S
-----
HSM Return
Cmd Action Code Count Description
-----
MIGRATE 37 847 NO SPACE ON MIG VOL
MIGRATE 58 7568 MIGRATION OR DBA DBU FAILED
MIGRATE 6 7662 DUPLICATE DSN IN MCDS
MIGRATE 19 699 DATA SET IN USE
MIGRATE 35 273 INPUT OPEN ERROR
REDUCED 37 41 NO SPACE ON MIG VOL
EXPIRED 70 4113 SMS DS ERROR
BACK-UP 24 61 MCDS RECORD UPDATE FAILURE
BACK-UP 68 73 BKUP FAILED BECAUSE OF DFSS ERR
BACK-UP 19 1499 DATA SET IN USE
RECOVER 45 3 TOVOL ERROR
RECOVER 28 32 NO BACKUP COPY
ARECOVER 101 3 Aggregate recover
ARECOVER 158 2 Aggregate recover
MIGRATE 30 24 DATA SET NOT CATALOGED
MIGRATE 73 10 POSE DSN COULDN'T MIGRATE
BACK-UP 70 15 SMS DS ERROR

```

- Just because HSM is working does not mean it's correct.
 - That's the way we have always done it.
- Ask yourself –
 - Are we migrating too much data?
 - Are we backing up too much data?

DFSMSHsm Best Practices

HSM Administration

2/13/2014

Best Practices – HSM CDS Administration

Sharing: Justin Davis

```

start
Unread Mail - M...
RE: What I han...
6 BlueZone M...
In Control: Justin Davis
Microsoft Of...
Windows Meda...
12:38

S6 - rs70 - rs70 - BlueZone Mainframe Display
File Edit Session Options Transfer View Script Help
Menu Utilities Navigate Help
-----
REORGST ----- HSM Reporter/Manager 10.01 ----- 13:39
Command >>> Scroll <<<< PAGE
SCOPE in effect "RS7*"
Status of Reorg Processing: Row 1 of 10

Job      Host      Description      Status      Scope      Scope
Name     Id          Description      Status      System     Plex
-----
DFSMHSN 0      Queue Draining  Completed  RS70      RSPLXR5
DFSMHSN 0      CDS Release     Completed  RS70      RSPLXR5
DFSMHSN 0      CDS Obtain      Completed  RS70      RSPLXR5
DFSMHSN 0      Queue Resume    Completed  RS70      RSPLXR5
DFSMHSN 0      Overall Status  Completed  RS70      RSPLXR5
DFSMHSN 1      Queue Draining  Completed  RS71      RSPLXR5
DFSMHSN 1      CDS Release     Completed  RS71      RSPLXR5
DFSMHSN 1      CDS Obtain      Completed  RS71      RSPLXR5
DFSMHSN 1      Queue Resume    Completed  RS71      RSPLXR5
DFSMHSN 1      Overall Status  Completed  RS71      RSPLXR5
  
```

S8 Ready(1) 192.168.55.170 S707CP05 12:39:54 2/14/2011 INJM 00:00:141 05.015

- To Reorg or Not to Reorg – That is the Question...

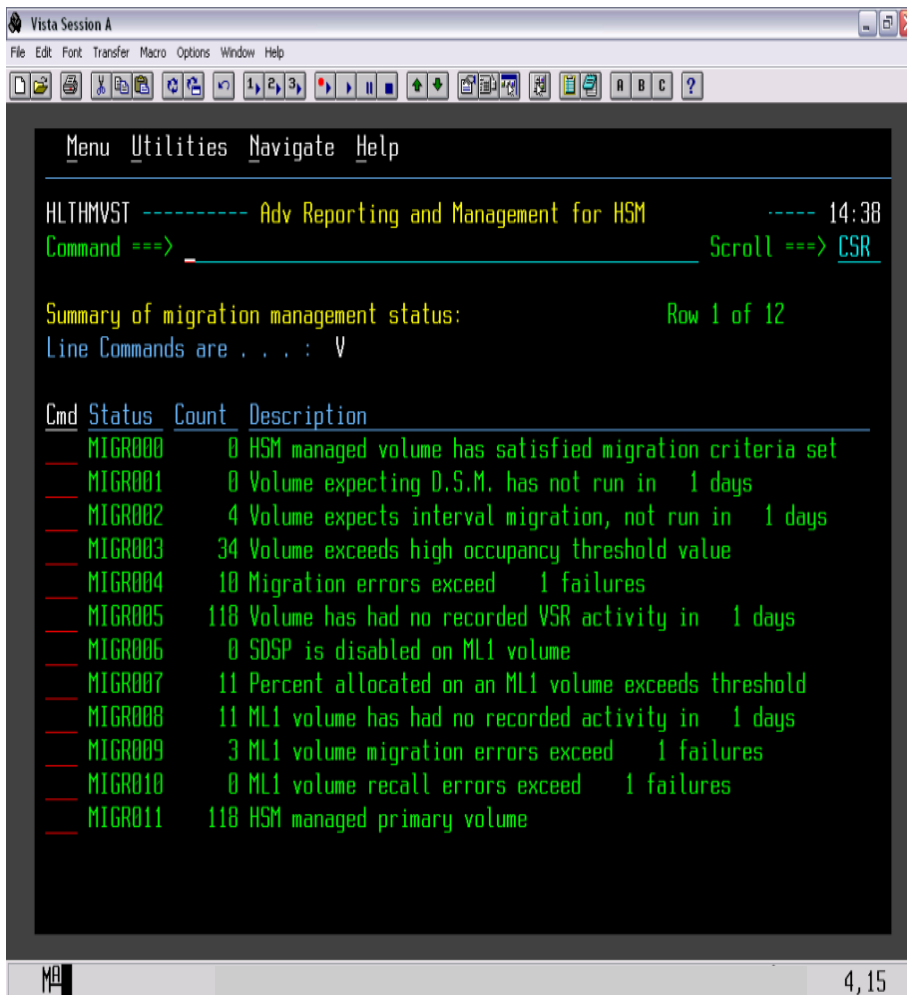
- Some say yes – Some say no ..

- If you need to reorg or you still reorg on a scheduled basis –

- *It's always better to schedule when technical staff are still available.*

- *Reduces chance of CDS corruption due to human error.*

Best Practices – HSM Work Administration



```

Vista Session A
File Edit Font Transfer Macro Options Window Help
Menu Utilities Navigate Help
HLTHMVST ----- Adv Reporting and Management for HSM ----- 14:38
Command ==> _____ Scroll ==> CSR
Summary of migration management status: Row 1 of 12
Line Commands are . . . : V
Cmd Status Count Description
-----
MIGR000 0 HSM managed volume has satisfied migration criteria set
MIGR001 0 Volume expecting D.S.M. has not run in 1 days
MIGR002 4 Volume expects interval migration, not run in 1 days
MIGR003 34 Volume exceeds high occupancy threshold value
MIGR004 10 Migration errors exceed 1 failures
MIGR005 118 Volume has had no recorded VSR activity in 1 days
MIGR006 0 SDSP is disabled on ML1 volume
MIGR007 11 Percent allocated on an ML1 volume exceeds threshold
MIGR008 11 ML1 volume has had no recorded activity in 1 days
MIGR009 3 ML1 volume migration errors exceed 1 failures
MIGR010 0 ML1 volume recall errors exceed 1 failures
MIGR011 118 HSM managed primary volume
  
```

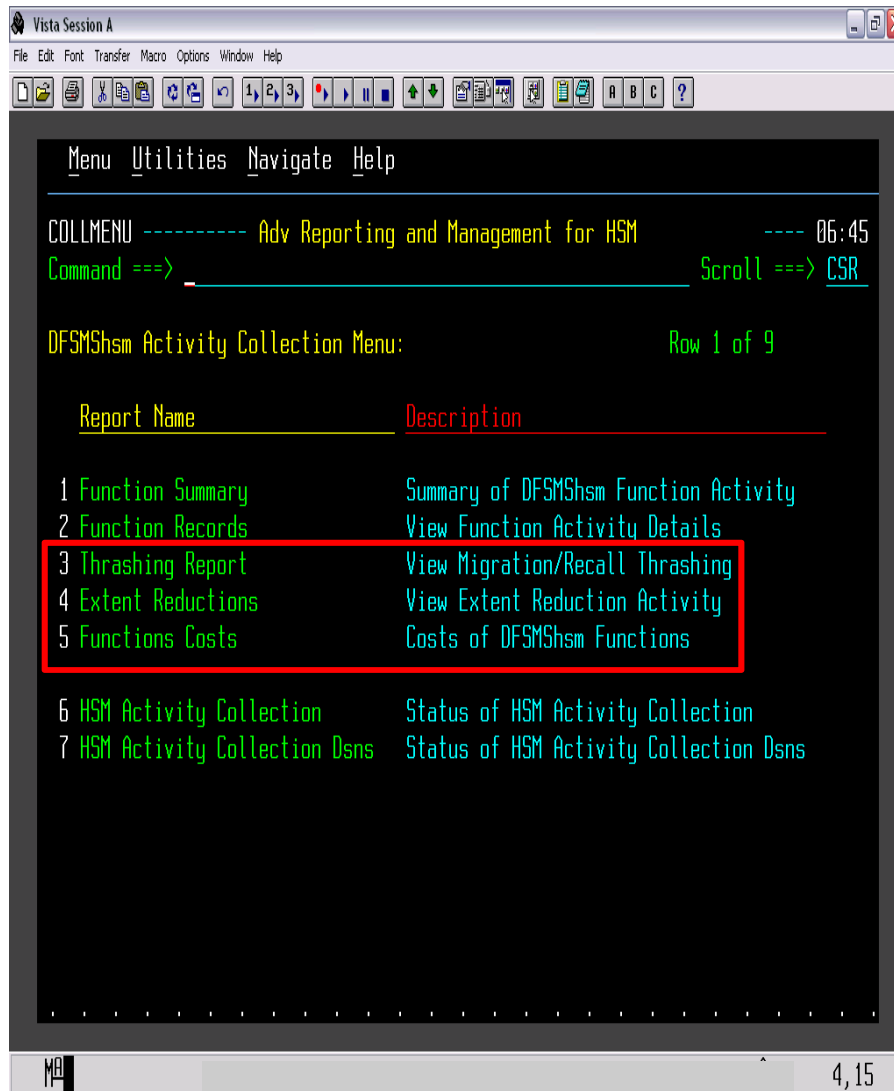
- Daily Scheduled Work
 - Is HSM doing everything you think it is?
 - RC-0 as long as the task starts and stops as defined.
 - *Are all volumes being touched as expected?*
 - *What volumes are having issues?*

DFSMShsm Best Practices

HSM Management and Tuning

What is it using and where can I make changes?

Best Practices for – HSM Tuning

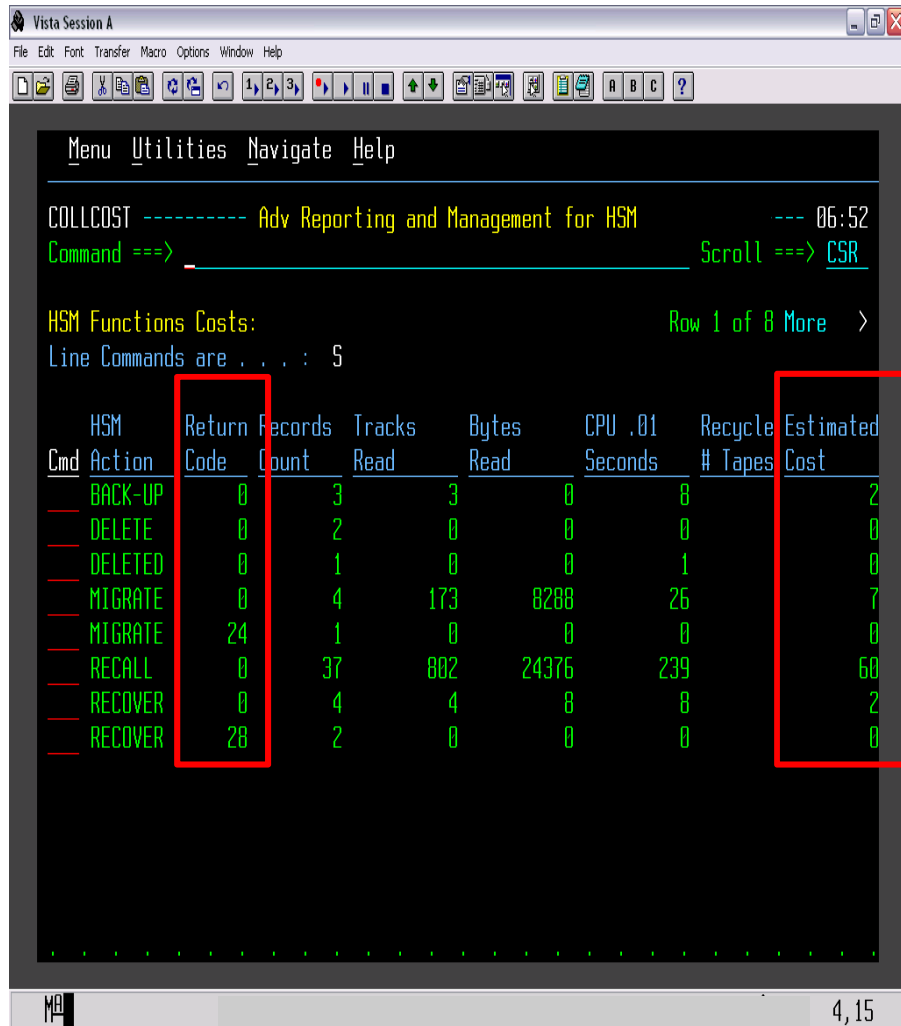


```

Vista Session A
File Edit Font Transfer Macro Options Window Help
Menu Utilities Navigate Help
COLLMENU ----- Adv Reporting and Management for HSM ----- 06:45
Command ==> _____ Scroll ==> CSR
DFSMSHsm Activity Collection Menu: Row 1 of 9
  Report Name      Description
  1 Function Summary      Summary of DFSMSHsm Function Activity
  2 Function Records      View Function Activity Details
  3 Thrashing Report      View Migration/Recall Thrashing
  4 Extent Reductions     View Extent Reduction Activity
  5 Functions Costs       Costs of DFSMSHsm Functions
  6 HSM Activity Collection  Status of HSM Activity Collection
  7 HSM Activity Collection Dsns  Status of HSM Activity Collection Dsns
  
```

- Standards defined years ago do not automatically change with the business and can lead to higher resource consumption by DFSMSHsm.
- Simple tasks like monitoring thrashing data can help point to loopholes in procedures.

Best Practices for – HSM Tuning



Vista Session A
File Edit Font Transfer Macro Options Window Help

Menu Utilities Navigate Help

COLLCOST ----- Adv Reporting and Management for HSM --- 06:52
Command ==> _____ Scroll ==> CSR

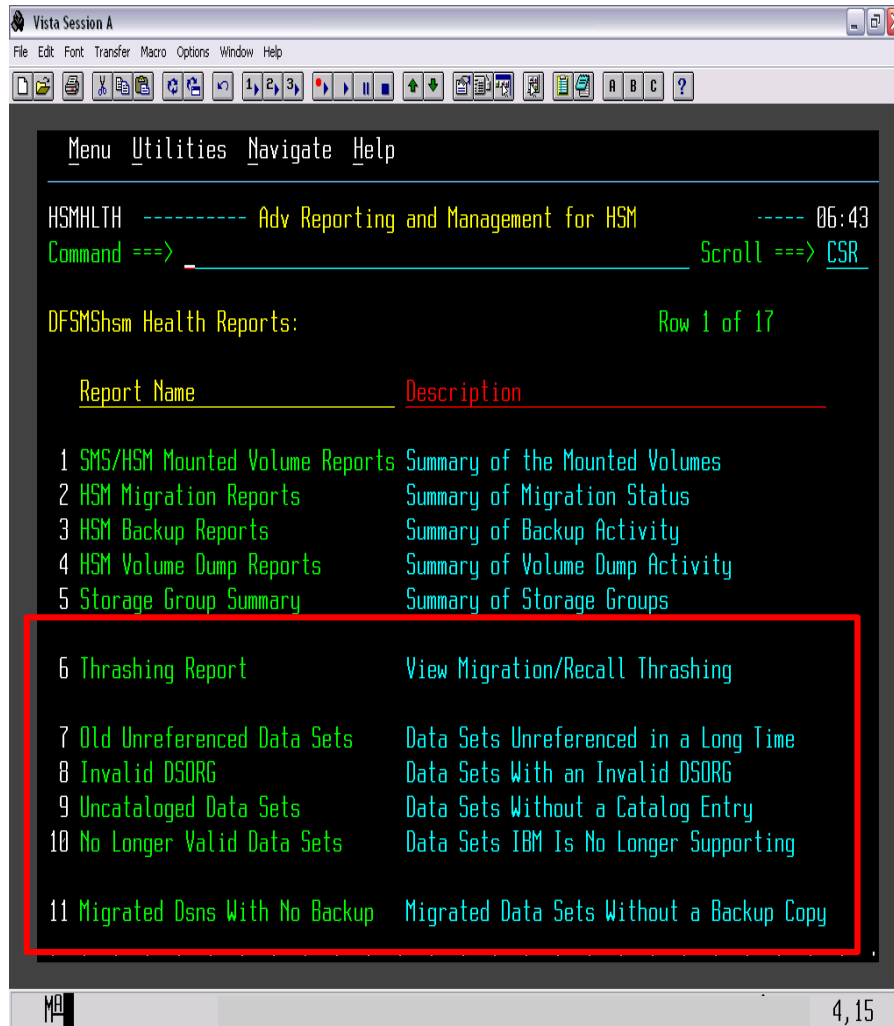
HSM Functions Costs: Row 1 of 8 More >
Line Commands are . . . : S

HSM Cmd	Return Code	Records Count	Tracks Read	Bytes Read	CPU .01 Seconds	Recycle # Tapes	Estimated Cost
BACK-UP	0	3	3	0	0	8	2
DELETE	0	2	0	0	0	0	0
DELETED	0	1	0	0	0	1	0
MIGRATE	0	4	173	8288	26	0	7
MIGRATE	24	1	0	0	0	0	0
RECALL	0	37	802	24376	239	0	60
RECOVER	0	4	4	8	8	0	2
RECOVER	28	2	0	0	0	0	0

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- Knowing an estimated DFSSMShsm cost associated with the data movement can help identify where current procedures need to be reviewed and assist with tuning DFSSMShsm.

Best Practices for – HSM Tuning

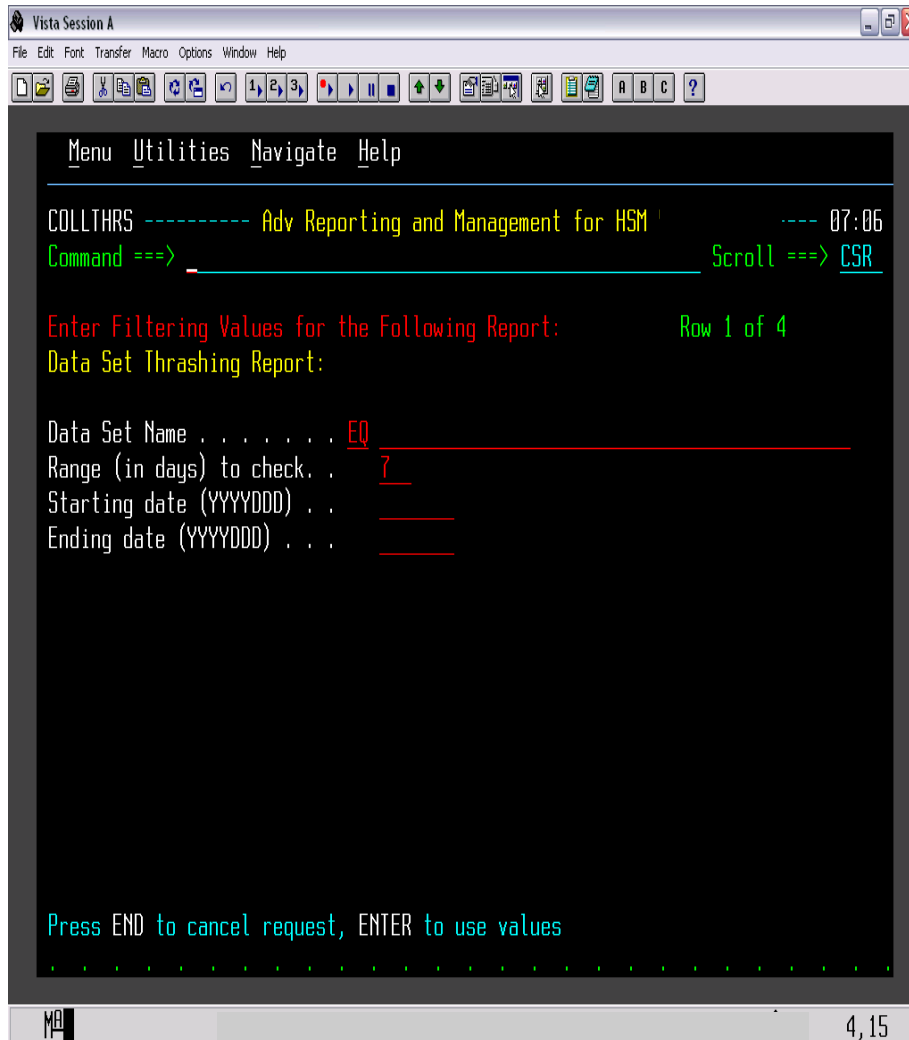


```

Vista Session A
File Edit Font Transfer Macro Options Window Help
Menu Utilities Navigate Help
HSMHLTH ----- Adv Reporting and Management for HSM ----- 06:43
Command ==> _____ Scroll ==> CSR
DFSMSHsm Health Reports: Row 1 of 17
Report Name Description
1 SMS/HSM Mounted Volume Reports Summary of the Mounted Volumes
2 HSM Migration Reports Summary of Migration Status
3 HSM Backup Reports Summary of Backup Activity
4 HSM Volume Dump Reports Summary of Volume Dump Activity
5 Storage Group Summary Summary of Storage Groups
6 Thrashing Report View Migration/Recall Thrashing
7 Old Unreferenced Data Sets Data Sets Unreferenced in a Long Time
8 Invalid DSORG Data Sets With an Invalid DSORG
9 Uncataloged Data Sets Data Sets Without a Catalog Entry
10 No Longer Valid Data Sets Data Sets IBM Is No Longer Supporting
11 Migrated Dsns With No Backup Migrated Data Sets Without a Backup Copy
  
```

- Best practices does not only include data movement.
 - It can also include –
 - HSM Backup
 - Unreferenced data in HSM
 - Data HSM constantly fails on that you may not be aware of, such as:
 - *DSORG*
 - *Uncataloged*
 - *In use*

Best Practices for – HSM Tuning



```
Vista Session A
File Edit Font Transfer Macro Options Window Help
[Toolbar]
Menu Utilities Navigate Help
COLLTHRS ----- Adv Reporting and Management for HSM ----- 07:06
Command ==> _____ Scroll ==> CSR
Enter Filtering Values for the Following Report: Row 1 of 4
Data Set Thrasing Report:
Data Set Name . . . . . EQ _____
Range (in days) to check. . . 7 _____
Starting date (YYYYDDD) . . . _____
Ending date (YYYYDDD) . . . _____
Press END to cancel request, ENTER to use values
4,15
```

- To fully understand where DFSMSHsm Best Practices weaknesses are, you may need to analyze multiple days worth of data.



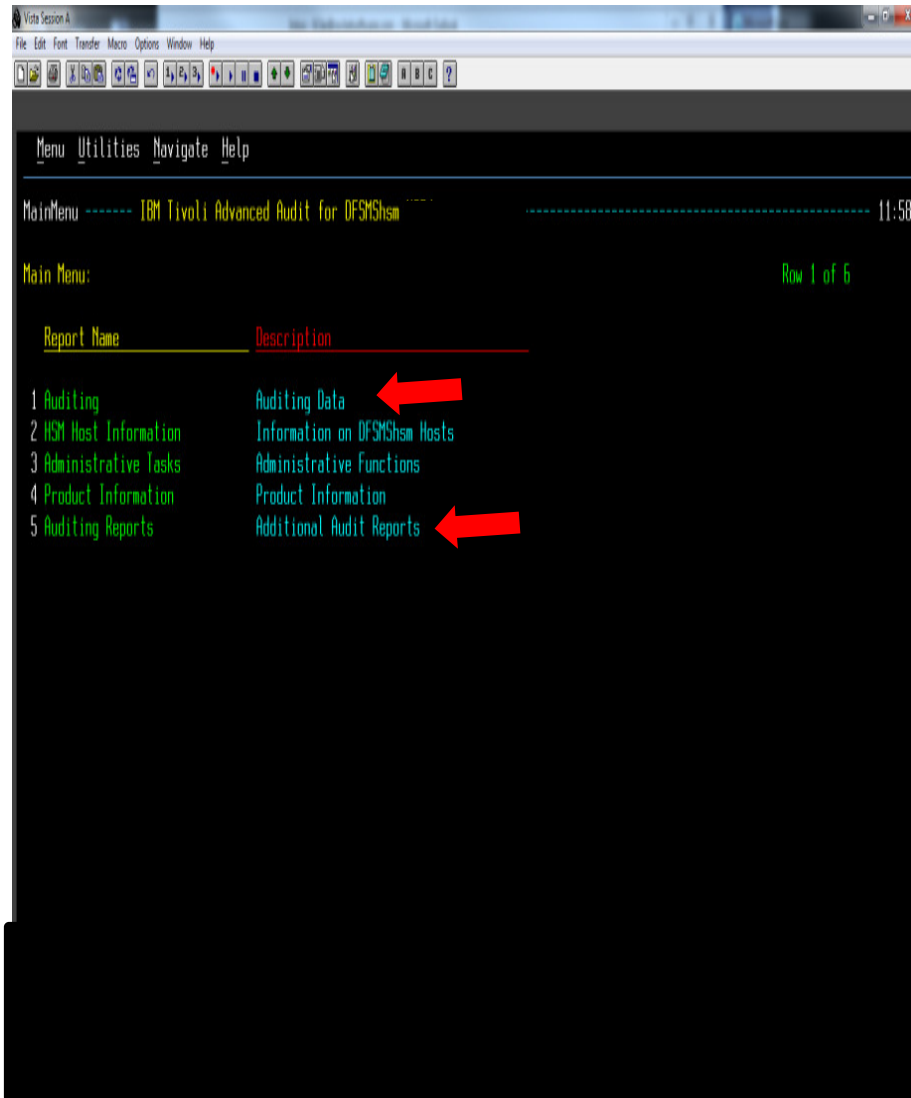
DFSMShsm Best Practices

DFSMS Management Class Auditing

2/13/2014




Best Practices for – Management Class Auditing



- Successful DFSMSHsm Best Practices is not a one-time deal.
 - You should monitor different areas.
 - CDS Health
 - Management Class Activity
 - Note where you are seeing unexplained actions.
 - Note where there may be a high amount of activity.

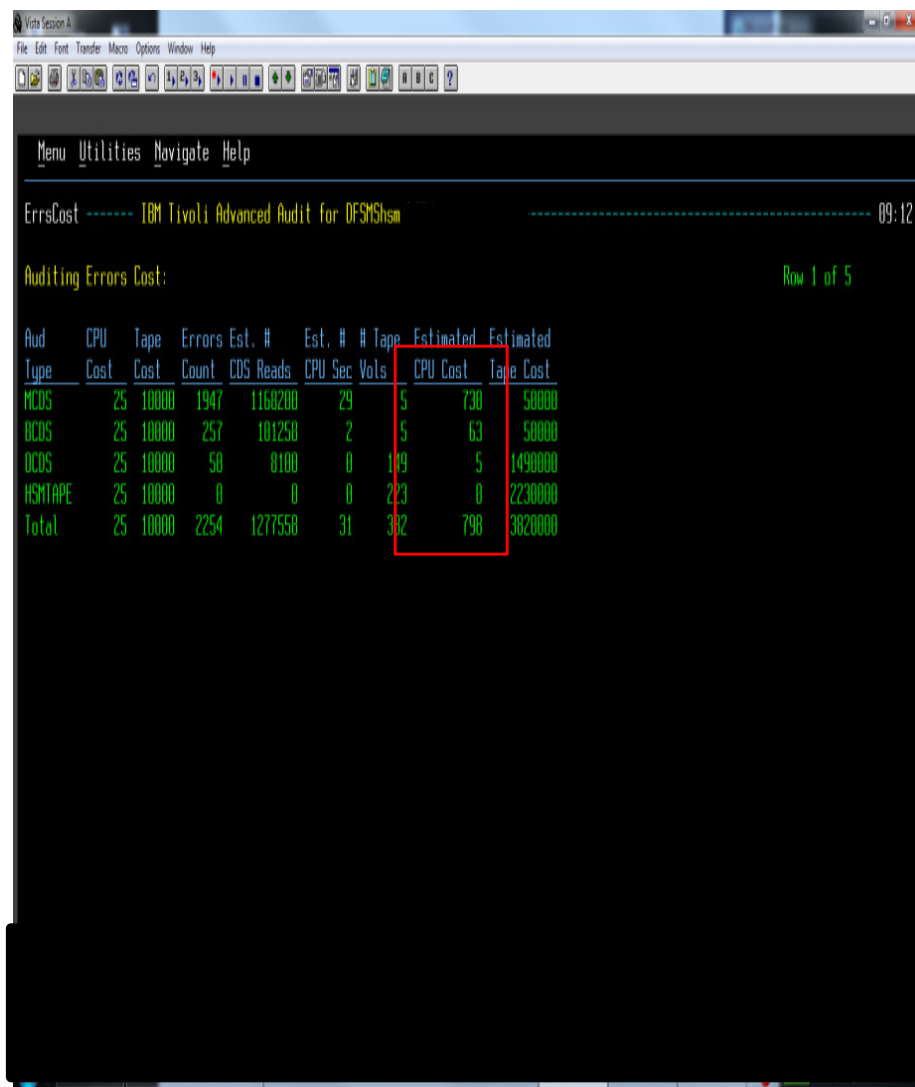
Best Practices for – Management Class Auditing



```
Menu Utilities Navigate Help
AudRMenu ----- IBM Tivoli Advanced Audit for DFSMSHsm ----- 09:12
Auditing Reports: Row 1 of 7
Report Name Description
1 Errors Cost Report Estimated Corruption Costs Report
2 Migration Data Sets Audit Migration Data Sets Thrashing Report
3 SMS Volumes Audit SMS Managed Volumes Threshold Report
4 Storage Groups Audit Storage Groups Threshold Report
5 Migrate Dsns Need Bkup Migrate Dsns Needing a Backup Report
6 VSAM Dsns Need Bkup VSAM Dsns Changed, Not Backed Up Report
```

- Understanding where there may be weaknesses in your Management Class definitions can help –
 - Reduce DFSMSHsm system and resource consumption.
 - Alert you of possible problem areas.
 - Alert you of the possibility of data loss.

Best Practices for – Management Class Auditing



ErrsCost ----- IBM Tivoli Advanced Audit for DFSMSHsm ----- 09:12

Auditing Errors Cost: Row 1 of 5

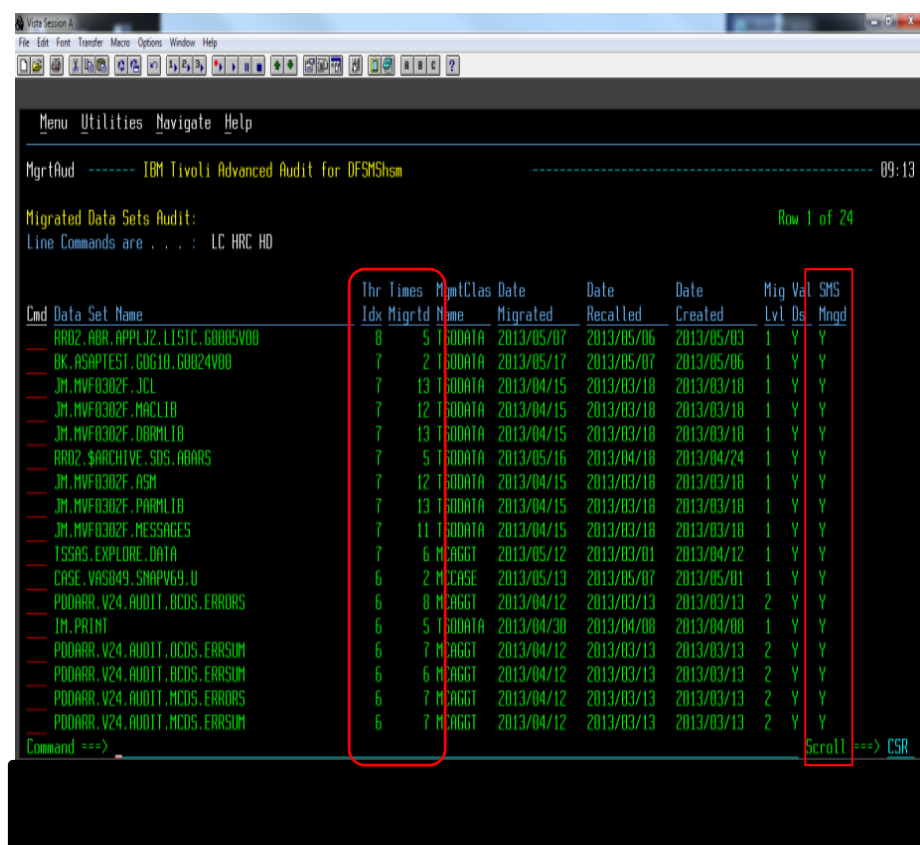
Aud Type	CPU Cost	Tape Cost	Errors Count	Est. # CDS Reads	Est. # CPU Sec	Est. # Tape Vols	Estimated CPU Cost	Estimated Tape Cost
MCDS	25	10000	1947	1168200	29	5	730	50000
BCDS	25	10000	257	101258	2	5	63	50000
OCDS	25	10000	50	8100	0	149	5	1490000
HSMTAPE	25	10000	0	0	0	223	0	2230000
Total	25	10000	2254	1277558	31	302	798	3020000

- Corruption Cost Reporting
 - Provides estimate DFSMSHsm costs wasted in a 24hour period.
 - Waste due to reading corrupted DFSMSHsm CDS records
 - *Resource waste*
 - *Tape waste*
- Good report for –
 - Prioritizing corrective actions
 - Tuning DFSMSHsm

Best Practices for – Management Class Auditing

- Data Set Thrashing Report

- Reports on data meeting predefined Thrashing criteria
 - Thrashing Index of 6+
- Calculations are performed on the total data set life cycle.
 - Create date, number times migrated/recalled
- Good report for DFSMSHsm Tuning
- Alerts you to data that may be in the incorrect Management Class
 - High Migration/Recall
 - Candidate to expire on primary rather than in HSM control
 - Alerts you to users trying to bypass set procedures.



Cmd	Data Set Name	Thr Idx	Times Migrtd	MgmtClas	Date Migrated	Date Recalled	Date Created	Mig Lvl	Val	SMS
RR02	ABR.APPLJ2.L1STC.G0005V00	8	5	TODATA	2013/05/07	2013/05/06	2013/05/03	1	Y	Y
BK	ASAPTEST.G0G10.G0024V00	7	2	TODATA	2013/05/17	2013/05/07	2013/05/06	1	Y	Y
JM	MVF0302F.JCL	7	13	TODATA	2013/04/15	2013/03/18	2013/03/18	1	Y	Y
JM	MVF0302F.MACLIB	7	12	TODATA	2013/04/15	2013/03/18	2013/03/18	1	Y	Y
JM	MVF0302F.DBRMLIB	7	13	TODATA	2013/04/15	2013/03/18	2013/03/18	1	Y	Y
RR02	\$ARCHIVE.SDS.ABARS	7	5	TODATA	2013/05/16	2013/04/18	2013/04/24	1	Y	Y
JM	MVF0302F.ASN	7	12	TODATA	2013/04/15	2013/03/18	2013/03/18	1	Y	Y
JM	MVF0302F.PARAMLIB	7	13	TODATA	2013/04/15	2013/03/18	2013/03/18	1	Y	Y
JM	MVF0302F.MESSAGES	7	11	TODATA	2013/04/15	2013/03/18	2013/03/18	1	Y	Y
TSSAS	EXPLORE.DATA	7	6	MICRAGT	2013/05/12	2013/03/01	2013/04/12	1	Y	Y
CASE	VAS049.SNAPV69.U	6	2	MICRASE	2013/05/13	2013/05/07	2013/05/01	1	Y	Y
PODARR	V24.AUDIT.MCDS.ERRORS	6	8	MICRAGT	2013/04/12	2013/03/13	2013/03/13	2	Y	Y
JM	PRINT	6	5	TODATA	2013/04/30	2013/04/08	2013/04/08	1	Y	Y
PODARR	V24.AUDIT.MCDS.ERRSUM	6	7	MICRAGT	2013/04/12	2013/03/13	2013/03/13	2	Y	Y
PODARR	V24.AUDIT.MCDS.ERRSUM	6	6	MICRAGT	2013/04/12	2013/03/13	2013/03/13	2	Y	Y
PODARR	V24.AUDIT.MCDS.ERRORS	6	7	MICRAGT	2013/04/12	2013/03/13	2013/03/13	2	Y	Y
PODARR	V24.AUDIT.MCDS.ERRSUM	6	7	MICRAGT	2013/04/12	2013/03/13	2013/03/13	2	Y	Y

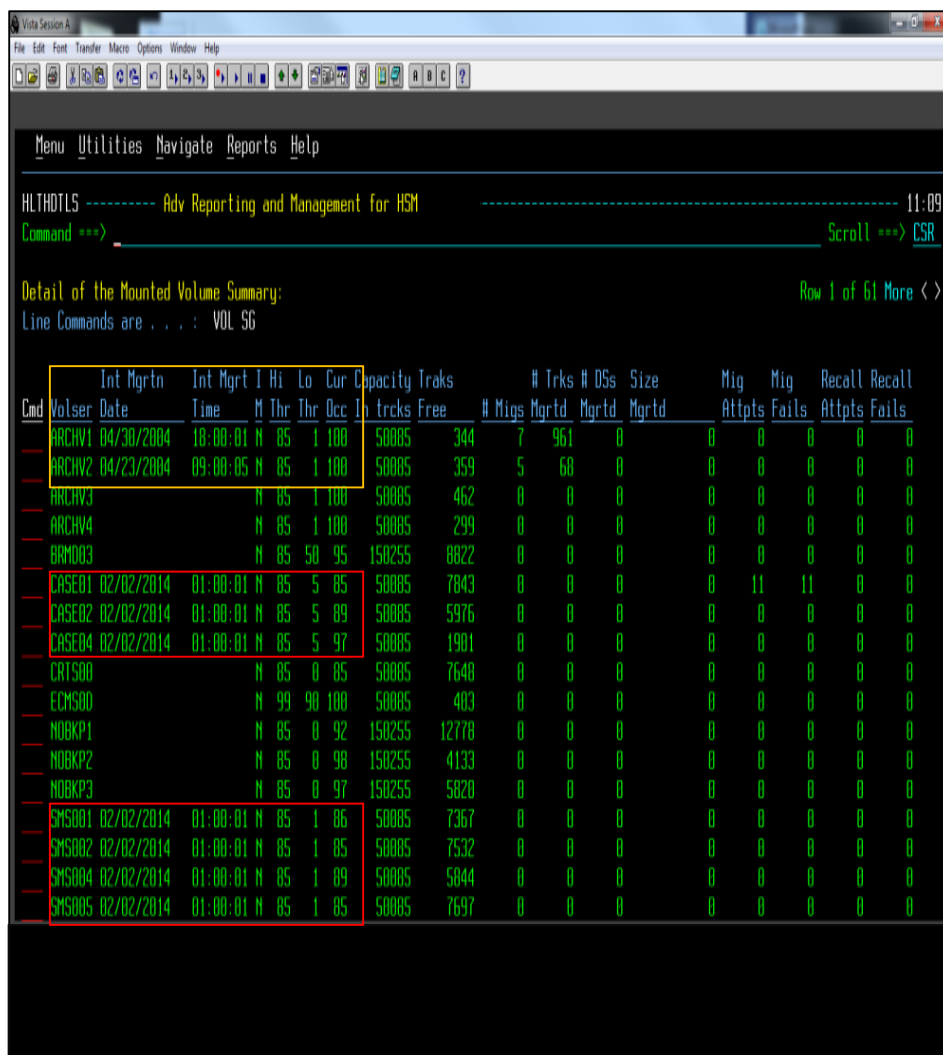
Best Practices for – Storage Group Auditing

- Storage Group Audit Report

- Reviewing Storage Group definitions should be part of your DFSMSHsm Best Practices.

- Good standard for High/Low definition should be 15-20.
- Low threshold defined at 50 or lower could add additional HSM workload if interval migration is turned on.

- DFSMSHsm Tuning



HLTHDTLS ----- Adv Reporting and Management for HSM ----- 11:09
Command ==> _____ Scroll ==> CSR

Detail of the Mounted Volume Summary: Row 1 of 61 More <>
Line Commands are . . . : VOL SO

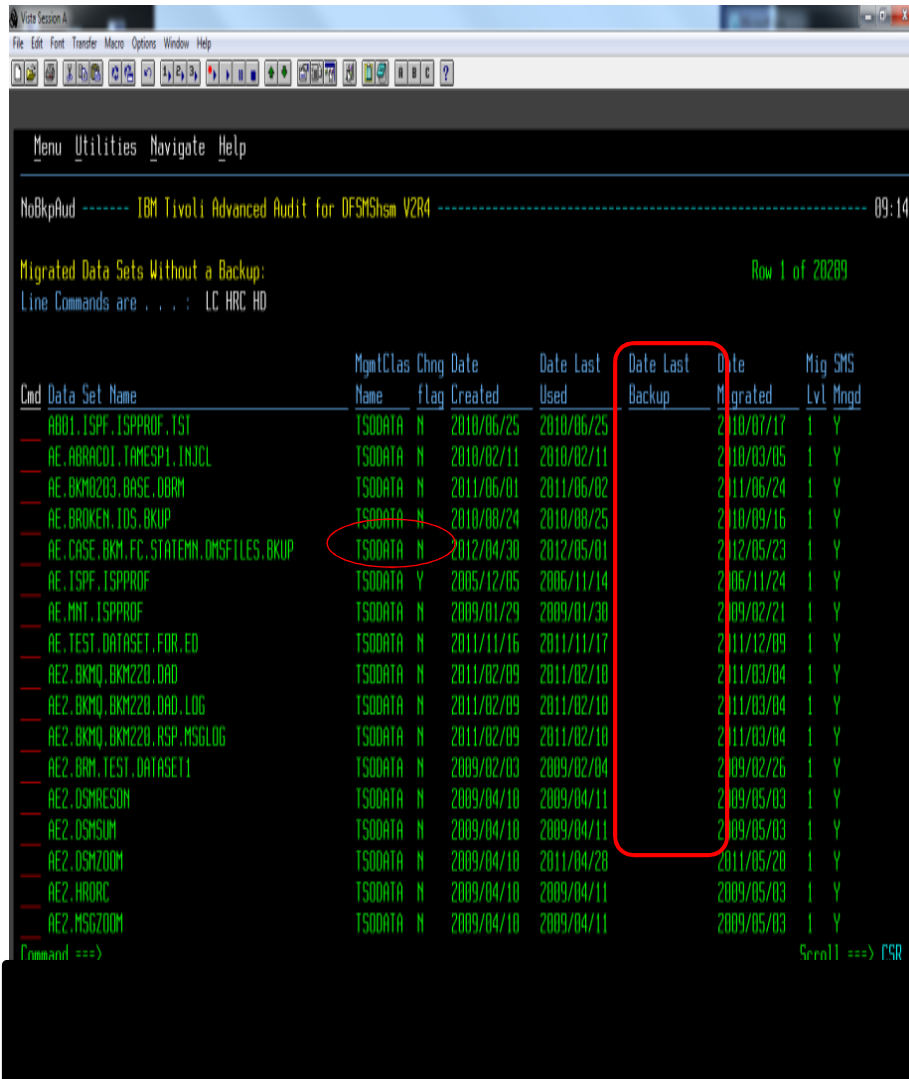
Cmd	Volser	Int Mgrtn Date	Int Mgrt Time	I Hi	Lo	Cur	Capacity	Traks	# Trks	# DSs	Size	Mig	Mig	Recall	Recall		
				M	Thr	Thr	Occ	In	Free	# Migs	Mgrtd	Mgrtd	Mgrtd	Atpts	Fails	Atpts	Fails
	ARCHV1	04/30/2004	18:00:01	N	85	1	100	50085	344	7	961	0	0	0	0	0	0
	ARCHV2	04/23/2004	09:00:05	N	85	1	100	50085	359	5	60	0	0	0	0	0	0
	ARCHV3			N	85	1	100	50085	462	0	0	0	0	0	0	0	0
	ARCHV4			N	85	1	100	50085	299	0	0	0	0	0	0	0	0
	BRM003			N	85	50	95	150255	8822	0	0	0	0	0	0	0	0
	CASE01	02/02/2014	01:00:01	N	85	5	85	50085	7843	0	0	0	11	11	0	0	0
	CASE02	02/02/2014	01:00:01	N	85	5	89	50085	5976	0	0	0	0	0	0	0	0
	CASE04	02/02/2014	01:00:01	N	85	5	97	50085	1901	0	0	0	0	0	0	0	0
	CRT500			N	85	0	85	50085	7648	0	0	0	0	0	0	0	0
	ECHS00			N	99	90	100	50085	403	0	0	0	0	0	0	0	0
	NOBKP1			N	85	0	92	150255	12778	0	0	0	0	0	0	0	0
	NOBKP2			N	85	0	98	150255	4133	0	0	0	0	0	0	0	0
	NOBKP3			N	85	0	97	150255	5820	0	0	0	0	0	0	0	0
	SHS001	02/02/2014	01:00:01	N	85	1	86	50085	7367	0	0	0	0	0	0	0	0
	SHS002	02/02/2014	01:00:01	N	85	1	85	50085	7532	0	0	0	0	0	0	0	0
	SHS004	02/02/2014	01:00:01	N	85	1	89	50085	5844	0	0	0	0	0	0	0	0
	SHS005	02/02/2014	01:00:01	N	85	1	85	50085	7697	0	0	0	0	0	0	0	0

Best Practices for – Management Class Auditing

- Migrated Data Without Backup Audit Report

- Audits and reports on sequential data migrated without a valid backup.
 - Reduces risk of data loss due to not having a valid DFSMSHsm backup.
 - Backup policies may have changed, but data could have been missed.
 - *You know your Data*

- Data Availability Report



Menu Utilities Navigate Help

NoBkpAud ----- IBM Tivoli Advanced Audit for DFSMSHsm V2R4 ----- 09:14

Migrated Data Sets Without a Backup: Row 1 of 20289
Line Commands are . . . : LC HRC HD

Cmd	Data Set Name	MgmtClas Name	Chng Date Flag Created	Date Last Used	Date Last Backup	Date Migrated	Mig SWS Lvl	Mngd
---	AB01.TSPF.TSPPROF.TST	TSODATA	N 2010/06/25	2010/06/25		2010/07/17	1	Y
---	AE.ABRACDI.TAMESP1.INJCL	TSODATA	N 2010/02/11	2010/02/11		2010/03/05	1	Y
---	AE.BKM203.BASE.DDMM	TSODATA	N 2011/06/01	2011/06/02		2011/06/24	1	Y
---	AE.BROKEN.TOS.BKUP	TSODATA	N 2010/08/24	2010/08/25		2010/09/16	1	Y
---	AE.CASE.BKM.FC.STATEMN.DMSFILES.BKUP	TSODATA	N 2012/04/30	2012/05/01		2012/05/23	1	Y
---	AE.TSPF.TSPPROF	TSODATA	Y 2005/12/05	2006/11/14		2006/11/24	1	Y
---	AE.MNT.TSPPROF	TSODATA	N 2009/01/29	2009/01/30		2009/02/21	1	Y
---	AE.TEST.DATASET.FOR.ED	TSODATA	N 2011/11/16	2011/11/17		2011/12/09	1	Y
---	AE2.BKMQ.BKM220.DAD	TSODATA	N 2011/02/09	2011/02/10		2011/03/04	1	Y
---	AE2.BKMQ.BKM220.DAD.LOG	TSODATA	N 2011/02/09	2011/02/10		2011/03/04	1	Y
---	AE2.BKMQ.BKM220.RSP.MSGLOG	TSODATA	N 2011/02/09	2011/02/10		2011/03/04	1	Y
---	AE2.BRM.TEST.DATASET1	TSODATA	N 2009/02/03	2009/02/04		2009/02/26	1	Y
---	AE2.DSMRES0N	TSODATA	N 2009/04/10	2009/04/11		2009/05/03	1	Y
---	AE2.DSMSUM	TSODATA	N 2009/04/10	2009/04/11		2009/05/03	1	Y
---	AE2.DSMZ00M	TSODATA	N 2009/04/10	2011/04/28		2011/05/20	1	Y
---	AE2.HRARC	TSODATA	N 2009/04/10	2009/04/11		2009/05/03	1	Y
---	AE2.MSGZ00M	TSODATA	N 2009/04/10	2009/04/11		2009/05/03	1	Y

Command ==> Scroll ==> CSR

Best Practices for – Management Class Auditing

- VSAM Data Sets Needing Backup
 - Audits and reports on VSAM data changed/updated and not backed up in 2+ days.
 - Reduces risk of data loss due to no valid backup.
 - Reduce the risk of application downtime due to data inaccuracy.
 - *You Know Your Data*
 - Data Availability Report



Menu Utilities Navigate Help

VSAMAud ----- IBM Tivoli Advanced Audit for DFSMSHsm V204 ----- 09:14

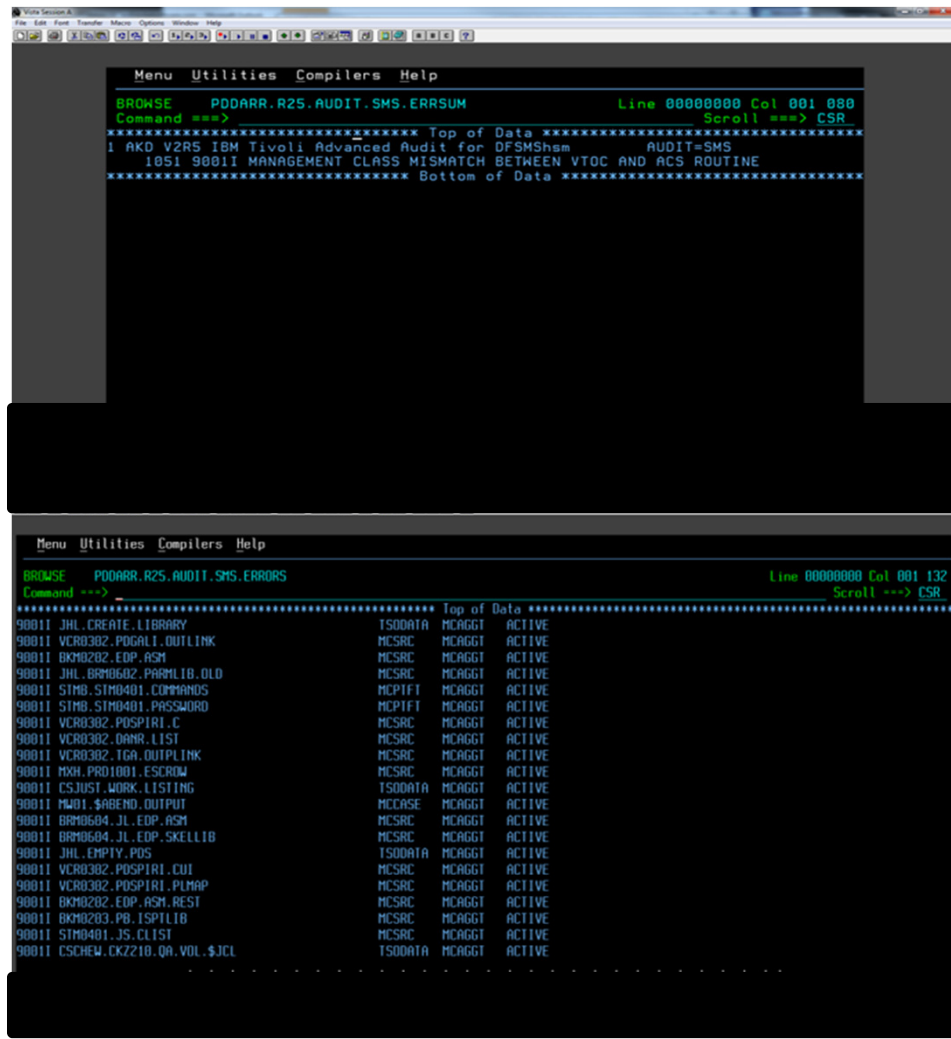
VSAM Data Sets Need A Backup: Row 1 of 387 More >

Line Commands are . . . : LC HRC HD

Cmd	Data Set Name	Date Last Backup	Date Last Updated(VSAM)	MgmtClas	Chng	Flag	Created	Date Last Used	Date Migrated
---	AE2.BKMQ.BKM220.DAD	2011/02/10		TSODATA	N		2011/02/09	2011/02/10	2011/03/04
---	ARH.PROJDEF3.ACCOUNT_OLD	2009/10/06	2010/02/01	MCAGGT	Y		2009/08/12	2010/02/01	2010/09/01
---	ARH.PROJDEF3.ACCOUNT		2009/08/11	MCAGGT	Y		2009/08/11	2010/06/30	2010/09/01
---	ARH.PROJDEF3.AUDIT		2009/08/11	MCAGGT	Y		2009/08/11	2009/08/11	2010/09/01
---	ARH.WRK0203.AUDIT_OLD2		2010/03/25	MCAGGT	Y		2010/02/01	2010/03/25	2010/09/01
---	ARH0202X.QABETA.RCOS2		2009/08/05	MCAGGT	Y		2008/10/13	2009/08/05	2010/09/01
---	ARH0203.DEVPKG.CSI		2010/05/12	MCN0BK	Y		2010/04/23	2010/05/12	2010/09/01
---	BF.OFFLOAD.SOURCE.TEST.VSAM.CLUSTER	2013/01/18		TSODATA	N		2012/12/04	2013/01/22	2013/02/13
---	BF.OFFLOAD.TARGET.TEST.VSAM.CLUSTER			TSODATA	N		2013/02/14	2013/02/15	2013/03/09
---	BK.TEST.CRSU	2008/12/05	2008/12/04	TSODATA	N		2008/04/11	2008/12/04	2008/12/26
---	BK.TESTVSAM.ENTRYSEQ			TSODATA	N		2005/11/17	2005/11/18	2005/11/28
---	BK.TEST01.ASAP08		2002/11/21	TSODATA	Y		2002/03/13	2002/11/20	2003/01/19
---	BK.TEST02.ASAP08			TSODATA	N		2003/11/18	2003/11/19	2004/01/18
---	BK.TEST03.ASAP08			TSODATA	N		2003/11/18	2003/11/19	2004/01/18
---	BK.TEST2.CRSU		2006/05/02	TSODATA	N		2000/04/12	2006/05/02	2006/05/12
---	BKMQ202X.BK.ACD10B		2010/07/21	MCAGGT	Y		2010/07/14	2010/07/21	2010/08/23
---	BKMQ202X.POTAM.ACD10B		2012/03/19	MCAGGT	Y		2010/11/17	2012/03/19	2012/04/18

Command ==> Scroll ==> CSR

Best Practices for – Management Class Auditing



```

Menu Utilities Compilers Help
BROWSE PDDARR.R25.AUDIT.SMS.ERRSUM Line 00000000 Col 001 000
Command ==> Scroll ==> CSR
***** Top of Data *****
1 AKD V2R5 IBM Tivoli Advanced Audit for DFSMSHsm AUDIT=SMS
1051 9001I MANAGEMENT CLASS MISMATCH BETWEEN VTOC AND ACS ROUTINE
***** Bottom of Data *****

Menu Utilities Compilers Help
BROWSE PDDARR.R25.AUDIT.SMS.ERRORS Line 00000000 Col 001 132
Command ==> Scroll ==> CSR
***** Top of Data *****
90011 JHL.CREATE.LIBRARY TS00ATA MCAGGT ACTIVE
90011 VCR0302.PDGRAL1.OUTLINK MCSRC MCAGGT ACTIVE
90011 BK0202.EDP.ASM MCSRC MCAGGT ACTIVE
90011 JHL.BRM0602.PARMLIB.DLD MCSRC MCAGGT ACTIVE
90011 SIMB.SIM0401.COMMANDS MCP1FT MCAGGT ACTIVE
90011 SIMB.SIM0401.PASSWORD MCP1FT MCAGGT ACTIVE
90011 VCR0302.POSP1R1.C MCSRC MCAGGT ACTIVE
90011 VCR0302.DANR.LIST MCSRC MCAGGT ACTIVE
90011 VCR0302.TGA.OUTLINK MCSRC MCAGGT ACTIVE
90011 MXH.PRO1001.ESCR0W MCSRC MCAGGT ACTIVE
90011 CSJUST.WORK.LISTNG TS00ATA MCAGGT ACTIVE
90011 M401.$ABEND.OUTPUT MCCASE MCAGGT ACTIVE
90011 BRM0604.JL.EDP.ASM MCSRC MCAGGT ACTIVE
90011 BRM0604.JL.EDP.SKELLIB MCSRC MCAGGT ACTIVE
90011 JHL.EMPTY.PDS TS00ATA MCAGGT ACTIVE
90011 VCR0302.POSP1R1.CUI MCSRC MCAGGT ACTIVE
90011 VCR0302.POSP1R1.PLMAP MCSRC MCAGGT ACTIVE
90011 BK0202.EDP.ASM.REST MCSRC MCAGGT ACTIVE
90011 BK0203.PB.1SP1LIB MCSRC MCAGGT ACTIVE
90011 SIM0401.JS.CL1ST MCSRC MCAGGT ACTIVE
90011 CSCHEW.CKZ210.QA.VOL.$JCL TS00ATA MCAGGT ACTIVE
  
```

- Audit your data to the active DFSMS ACDS.
 - Know if there is data being managed incorrectly due to wrong Management Class assignment.

- Affects DFSMSHsm
 - Migration
 - Backup
 - Expire
 - More ..

Best Practices for – Management Class Auditing

- DFSMShsm Best Practices is not a one-time task.
 - To have good procedures in place will require that you audit and monitor your current procedures
 - You will want to understand what the data is doing and why it is doing it.
 - Be able to react to and correct quickly weaknesses you may find.
 - Question the unexplainable.
- DFSMShsm Best Practices is no longer just
 - data allocation, backup, archival, etc..
 - It now includes performance, tuning and costs.



Questions?

Session Number 15109

