



IBM Americas Software Group

## Maintaining IT Resilience and Regulatory Compliance

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## Agenda

- **Tivoli Advanced Catalog Management for z/OS**
- **Tivoli Advanced Audit for DFSMSHsm**
- **Tivoli Advanced Reporting for DFSMSHsm**
- **Tivoli Advanced Backup and Recovery for z/OS**
  - ABARs Manager
  - Critical Data Identification
  - Critical Backup Identification/Tracking



# Recognize Your Risks

	# Data Sets	% of Total	Cumulative %	# Aliases
SYS1.USR2.DEV.CATALOG	683,027	43%	43%	51
SYS1.TST1.DEV.CATALOG	274,644	17%	60%	293
SYS1.TST3.DEV.CATALOG	193,212	12%	72%	222
SYS1.PRD1.DEV.CATALOG	118,877	8%	80%	665
SYS1.DBNT.DEV.CATALOG	84,756	5%	85%	78
SYS1.DBTD.DEV.CATALOG	65,727	4%	89%	206
SYS1.DEV.PXCJ	39,841	3%	92%	11
SYS1.TST2.DEV.CATALOG	35,037	2%	94%	230
SYS1.GRP.DEV.CATALOG	30,174	2%	96%	33
SYS1.ENV.DEV.CATALOG	29,173	2%	98%	15
SYS1.USR4.DEV.CATALOG	10,336	1%	...	2,898
SYS1.USR3.DEV.CATALOG	7,242	1%	...	1,807
SYS1.USR1.DEV.CATALOG	6,484	<1%	...	980
SYS1.DRD.CATALOG	2,099	<1%		23
SYS1.DFHSM.DEV.CATALOG	1,595	<1%		1
SYS1.CADISK1.DEV.CATALOG	355	<1%		3
SYS1.LOGR.DEV.CATALOG	187	<1%		5
SYS1.DEV.CPYCROSS	137	<1%		1
SYS1.PLEX.DEV.CATALOG	48	<1%		2
SYS1.CADISK2.DEV.CATALOG	5	<1%		2

**Number of catalogs:** 20  
**Total data sets:** 1,582,956  
**Avg data sets/catalog:** 79,148  
**Number of aliases:** 7,526

<u>Largest Catalogs</u>	<u>Top 2</u>	<u>Top 5</u>
<b>Total data sets:</b>	<b>957,671</b>	<b>1,354,516</b>
<b>% of total data sets:</b>	<b>60%</b>	<b>85%</b>
<b>Total aliases:</b>	<b>344</b>	<b>1,309</b>

# Tivoli Advanced Catalog Management

- **ISPF Interface**

- Full function and easy to use
- Build JCL for any ACM command with ease
- JCL can be saved to the library of your choice
- Intuitive, with on-screen messages and help
- Display catalog and volume environment
- Issue CAS reporting commands on-screen



# BCS Backup

- **ACM BACKUP BCS**
  - All BCSs written to a single output file
  - Automatically backs up aliases from the master catalog and BCS definition parameters
  - Performs IDCAMS EXAMINE and DIAGNOSE functions, at user request, to provide highest level of integrity
  - EXCP-MODE backup of a damaged BCS – correctly handles spanned records
  - Detailed summary report provides returns codes for all backup and diagnostic functions executed
  - Simulate capability

## BCS Recovery

- **Restoring a BCS from Backup**
  - Restoring a backup copy without considering any updates that may have occurred
  - Only practical if the point-in-time (P.I.T.) backup is accurate and appropriate
  - Most useful when it is desired to rebuild the index and data components to remove CA and CI splits, reduce extents, or change an attribute
  - Support to change attributes
    - New data set name
    - New primary/secondary space allocation for data/index components
    - New data/index CI sizes
    - New CI/CA freespace
    - New VOLSER
    - New SMS classes
  - Automatically remove IMBED and REPLICATE
  - Updates up to 32 Master Catalogs with changes



## BCS Forward Recovery

- **SMF Records Are the Only Practical Way**
  - For BCS forward recovery, SMF record types required:
    - Type 61 – Data set define
    - Type 65 – Data set delete
    - Type 66 – Data set alter
  - For VVDS forward recovery, SMF record type required:
    - Type 60 – VVDS update
  - ACM BACKUP and RECOVER provide error messages if SMF data is not being written



# RECOVER Features

- **BCS Selective Recovery**
  - Include or exclude data sets or volumes by name or masked name
  - Include or exclude specific data set types
    - GDG bases and GDS entries
    - Empty GDG bases
    - Tape data sets
    - Non-VSAM data sets
    - VSAM data sets
    - VOLCAT entries



## VVDS Considerations

- **VVDS Backup and Recovery**
  - IBM utility functions do not support this
  - Therefore, the only recommended option for a failure with a VVDS is volume recovery
  - This can be 'problematic' for critical volumes containing:
    - Multivolume data sets
    - Complex DB2/IMS data bases, spread across many volumes, that must be synchronized at all times

## VSAM Data Set Backup/Recovery

- **BACKUP/RESTORE DSN Command**
  - Supports all VSAM data set types
    - KSDS, ESDS, LDS, RRDS, VRRDS
  - Includes sphere support to back up and recover AIXs and PATHs
  - Can process damaged data sets
    - KSDS with damaged index
    - CIs with out-of-sequence keys
    - CIs with duplicate key records
  - Processes at data component level – bypasses index and unloads in physical sequence
  - Support to change attributes on Restore, automatically remove IMBED/REPLICATE
  - Support for Simulate

## Reorganize While Open

- **REORG Command**

- Works on shared, open, and active BCSs
  - VVDS-mode sharing
  - ECS-mode sharing
- Unloads and reloads 'in-place'
- Allows for attribute change
- IMBED and/or REPLICATE removed automatically
- SIMULATE allows advance testing
- Optionally performs standard ACM BACKUP
- REPAIR corrects for any index or data structural errors found during unload

# Diagnose

- **DIAGNOSE BCS-VVDS and VOLUME-BCS**
  - **BCS-VVDS** compares one or more BCSs to all related VVDSs, looking for cataloged data sets that don't exist
  - **VOLUME-BCS** provides an analysis of the entire volume (VVDS, VTOC, VTOCIX) compared to all BCSs including complete multi-volume data set support
    - Output is an extensive problem description report and a fix file with all necessary IDCAMS and/or ACM commands
    - Review the fix file, modify as needed, then submit
- **DIAGNOSE VVDS-VTOC**
  - **VVDS-VTOC** compares each specified VVDS to its associated VTOC, looking for volume allocation inconsistencies
  - Unlike other DIAGNOSE commands, does not generate a fix file; updates are performed through the use of an AUTOFIX command
  - Run in SIMULATE mode first
- **DIAGNOSE ALIAS Command**
  - Identifies:
    - Missing aliases
    - Aliases that are related differently
    - Aliases that are empty
    - User catalogs without any aliases
    - Approaching full on user catalog connector record in the master catalog

## Additional Features

- **MERGE**CAT: Move all or selected BCS entries between catalogs; split/merge
- **CAT**SCRUB: Sync catalogs to datasets on DASD in DR
- **EXP**LORE: Produce detailed reports of the catalog environment
- **REP**ORT: Format output from EXPLORE
- **MAP**: View VSAM usage patterns and optimize
- **SUPER**CLIP: Rename a volume without moving the datasets
- **GEN**ERATE: Alternative to MCNVTCAT
- **LIST**SMF: Basic SMF reporting facility
- **ALT**ER: Powerful command for correct catalog inconsistencies
- **ZAP**: Bit level catalog update



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# *Tivoli Advanced Auditing for DFSMSHsm*

## Advanced Audit for DFSMSHsm Overview

- **All audits are comprehensive and *fast***
  - Eliminates the need to execute multiple audit commands for a single control data set
- **Automated user-selected fixes**
  - Select fixes from a provided list or create your own
  - Errors and fixes are organized by error type in an ISPF panel
- **Fix JCL and commands are automatically generated**
  - Apply fixes to one, some, or all data sets in a problem class

## Advanced Audit for DFSMSHsm Overview

- **Audits for the MCDS, BCDS and OCDS**
  - Verifies contents
  - Identifies inconsistencies and errors
  - Compares contents to catalogs and tape management inventory
  
- **Quickly verifies the integrity of DFSMSHsm metadata**
  - The ability to recall data
  - The ability to recover data
  - The ability to recycle tapes
  - Identifies out-of-sync conditions with other metadata



# Advanced Audit for DFSMSHsm Primary Option Panel

```
Messages
-----
AKD710  ----- IBM Tivoli Advanced Audit for DFSMSHsm V2R1 ----- 09:00
Option==> _____ scroll ==> CSR

1  MCDS      Created by procs AKDAUDMD, AKDAUDCT, AKDAUDAL
2  BCDS      Created by proc AKDAUDBD
3  OCDS      Created by proc AKDAUDOD
4  HSMTAPE   Created by procs AKDAUDTP, AKDAUDZR, AKDAUDRM, AKDAUDHL
5  MEDCTL    Created by procs AKDAUFD, AKDAUDFL, AKDAUDFT

Enter END to terminate.

4B  :00.1  04/12
```

# Advanced Audit for DFSMShsm Error Summary Panel

- Error Suffix Identifies Type of Error
  - C – Critical
  - W – Warning
  - V – Volume
  - I - Information

```

Messages
-----
AKD720  ----- IBM Tivoli Advanced Audit for DFSMShsm V2R1 Row 1 to 17 of 31
Option==> _____ Scroll ==> CSR

You may Browse (B) Edit (E) Fix (F) Help (H) or Modify (M) Results
S Number Count Message
11D1C 21 MCD ENTRY IS NOT CATALOGED
11V1C 27 MCO VSAM COMPONENT IS NOT CATALOGED
11D2C 9 MCD ENTRY IS CATALOGED ON DIFFERENT VOLUME
11V2C 0 MCO VSAM COMPONENT ON DIFFERENT VOLUME
1103W 0 MCD ENTRY IS MISSING THE MCA ENTRY
1104C 9 MCD LEVEL 1 ENTRY HAS NO VTOC ENTRY ON L1 VOLUME
1105W 1 MCD VSAM BASE NAME IS MISSING IN MCO
1106C 0 MCD IS ON VOLUME WHICH HAS NO MCV ENTRY
1106V 0 SUMMARY OF VOLUMES HAVING NO MCV ENTRY
1107W 439 MCD LEVEL 2 IS ON VOLUME WHICH HAS NO TTOC ENTRY
1107V 4 SUMMARY OF VOLUMES MISSING IN TTOC
1108W 1 MCA ENTRY IS MISSING MCO VSAM COMPONENT ENTRY
1109W 0 MCD ALIAS IS NOT ON TTOC
1109V 0 SUMMARY OF VOLUMES WHERE ALIAS IS NOT IN TTOC
1110W 0 MCD HAS DUPLICATE MCA ENTRY
1111W 233 MCA ENTRY IS MISSING MCD ENTRY
1112W 0 MCO VSAM BASE NAME IS MISSING IN MCD
  
```

# Advanced Audit for DFSMShsm Data Set Error Panel

- Browse list of data sets in error
  - List can be edited

```

Menu  utilities  compilers  Help
-----
BROWSE      SK01.H091619                      Line 00000000 col 001 080
Command ==> _____ scroll ==> CSR
***** Top of Data *****
11D1C CRTSMH.CAT114.MIG.KSDS1                IN-A-SDSP-ON-VOLUME ML1000
11D1C EDP.LAB.MIG2                          HSM.HMIG.T392609.EDP.LAB.J320
11D1C DANR.MQL.OUTPUT                       IN-A-SDSP-ON-VOLUME ML1000
11D1C MH.GTF.TRACE.G0197V00                 HSM.HMIG.U151200.MH.GTF.J7327
11D1C DANRD011.CRTS01.VSAM                 IN-A-SDSP-ON-VOLUME ML1000
11D1C MH.GTF.TRACE.G0199V00                 HSM.HMIG.T461200.MH.GTF.J7326
11D1C MH.GTF.TRACE.G0200V00                 HSM.HMIG.T371200.MH.GTF.J7326
11D1C MH.SRC#P2S.ASM                       HSM.HMIG.T441200.MH.SRC#P2S.J
11D1C DANR.SI52.NOMCDX                     IN-A-SDSP-ON-VOLUME ML1000
11D1C CRTSMH.CAT114.MIG.KSDS3                IN-A-SDSP-ON-VOLUME ML1000
11D1C CRTSMH.CAT114.MIG.NVSM1                IN-A-SDSP-ON-VOLUME ML1000
11D1C CRTSMH.CAT114.MIG.NVSM2                IN-A-SDSP-ON-VOLUME ML1000
11D1C C21272-1.VSAM01                      IN-A-SDSP-ON-VOLUME ML1000
11D1C DCD.TEST.GDG.G0018V00                 HSM.HMIG.T001400.DCD.TEST.J21
11D1C DANRD011.TOBE.ARCIVE                 IN-A-SDSP-ON-VOLUME ML1000
11D1C DCD.TEST.GDG.G0069V00                 HSM.HMIG.T001400.DCD.TEST.J21
11D1C DCD.TEST.GDG.G0142V00                 HSM.HMIG.T001400.DCD.TEST.J21
11D1C CRTSMH.CAT114.MIG.KSDS2                IN-A-SDSP-ON-VOLUME ML1000
11D1C CRTSHSM.VSAM.DATASET                 IN-A-SDSP-ON-VOLUME ML1000
4B                                          :00.1                                04/15

```

## Advanced Audit for DFSMShsm Fix Error Panel

- One or more fixes available for each error

```
Messages
-----
AKD715  ----- IBM Tivoli Advanced Audit for DFSMShsm V2R1   Row 1 to 6 of 6
Option==> _____ Scroll ==> CSR

You may Browse (B) Edit (E) Fix (F) Help (H) or View (V) Results
Command Member Action Title
      F11D1CA      TSO CATALOG A MIGRATED DATASET TO VOLSER MIGRAT
      F11D1CB      TSO HSEND DELETE MIGRATED DSN MISSING CATALOG
      F11D1CC      TSO LISTC FOR DATA SET NOT CATALOGED
      F11D1CD      HSA DISPLAY DUMP OF MCD RECORD
      F11D1CR1     HSM DELETE MCD RECORD WHEN UNABLE TO CATALOG MIGRAT
      F11D1CR3     HSM FIXCDS PATCH ASSIGNED AND NEEDS SCRATCH
***** Bottom of data *****
```

# Advanced Audit for DFSMSHsm Fix Generation

- Fix JCL is automatically generated

```
File Edit Edit_settings Menu utilities Compilers Test Help
EDIT      SK01.H091228      columns 0001 0072
Command ==>                scroll ==> CSR
000012 //STEP1 EXEC PGM=IKJEFT01,
000013 // DYNAMNBR=25,REGION=4096K
000014 /**
000015 //SYSPROC DD DSN=AKD0201X.QABETA.SAKDCLST,DISP=SHR
000016 /**          ****
000017 //SYSOUT DD SYSOUT=*
000018 //SYSTSPRT DD DSN=SK01.FIXAUDIT.F11D1CA,
000019 // DISP=(,CATLG),UNIT=SYSDA,
000020 // SPACE=(CYL,(10,20)),
000021 // DCB=(RECFM=FB,LRECL=133,BLKSIZE=13300)
000022 //SYSTSIN DD *
000023 DEF NVSAM +
000024 (NAME('CRTSMH.CAT114.MIG.KSDS1') +
000025 VOL(MIGRAT) DEVT(SYSALLDA) +
000026 RECATALOG)
000027 DEF NVSAM +
000028 (NAME('EDP.LAB.MIG2') +
000029 VOL(MIGRAT) DEVT(SYSALLDA) +
000030 RECATALOG)
000031 DEF NVSAM +
4B  :00.1 07/02
```

# Advanced Audit for DFSMSHsm MediaControls

## ■ Overview

- Audit tape contents quickly
- Identifies tape corruption before it is too late
- No significant increase in system usage
- No impact to DFSMSHsm request queues
- No hardware tied up for extended periods of time
- Select and prioritize corrective actions

# Advanced Audit for DFSMSHsm MediaControls

## ■ Audit Tape Management Inventory

- Compares tape management contents to catalog environment to insure correctness
  - Finds active DFSMSHsm tapes that are not cataloged
  - Finds file and tape sequence errors
  - Automatically builds corrective action
    - Commands
    - Batch jobs



# Advanced Audit for DFSMSHsm MediaControls Error Summary

```

Messages
-----
AKD720  ----- IBM Tivoli Advanced Audit for DFSMSHsm V2R1 Row 1 to 16 of 16
Option==> _____ Scroll ==> CSR

You may Browse (B) Edit (E) Fix (F) Help (H) or Modify (M) Results
S Number      Count      Message
8000I          0      LIST OF DATA SETS RECORDED IN MCDS/BCDS
8001C          0      NO HSM REFERENCE FOUND FOR REQUESTED TAPE
8C02C          0      NO MCT ENTRY WAS FOUND FOR REQUESTED TAPE
8D02C          0      NO MCV ENTRY WAS FOUND FOR REQUESTED TAPE
8003C          0      NO TTOC EXTENSION 0000 WAS FOUND FOR VOLSER
8004W          0      VOLUME IS IN FAILED CREATE STATUS
8005W          1      VOLUME IS IN FAILED RECYCLE STATUS
8006C          0      TTOC EXTENSION RECORDS ARE OUT OF SEQUENCE
8007C          0      TTOC EXTENSION RECORD IS CONTAMINATED
8008C          0      TTOC EXTENSION RECORDS DO NOT MATCH EXPECTED COUNT
8009W          0      16K BLOCK COUNT DOES NOT MATCH COUNTED BLOCKS
8C10C          0      MCC EXISTS, NOT ON TAPE
8D10C          0      MCD EXISTS, NOT ON TAPE
8C12C          0      MCC MISMATCH FILE BLOCK IDENTIFIER
8D12C          0      MCD MISMATCH FILE BLOCK IDENTIFIER
8020I          302     LIST OF DATA SETS ON TAPE
***** Bottom of data *****

```



# Advanced Audit for DFSMShsm MediaControls Fix Error Panel

- One or more fixes available for each error

```
Messages
-----
AKD715  ----- IBM Tivoli Advanced Audit for DFSMShsm V2R1   Row 1 to 3 of 3
Option==>  _____ Scroll ==> CSR

You may Browse (B) Edit (E) Fix (F) Help (H) or View (V) Results
Command Member Action Title
      F8D10CA      TSO HSEND DEL DATA SET FROM MCDS
      F8D10CB      TSO HSEND RECOVER DATASET FROM BACKUP
      F8D10CC      TSO DISPLAY DATASET FOR BACKUP AND MIGRATION INFO
***** Bottom of data *****
```

# Advanced Audit for DFSMSHsm MediaControls Fix Generation

- Fix JCL is automatically generated

```
File Edit Edit_settings Menu utilities compilers Test Help
EDIT          SK01.H124355          columns 00001 00072
Command ==>          scroll ==> CSR
000012 //STEP1 EXEC PGM=IKJEFT01,
000013 //  DYNAMNBR=25,REGION=4096K
000014 //*
000015 //SYSPROC DD DSN=AKD0201X.QABETA.SAKDCLST,DISP=SHR
000016 //*          ****
000017 //SYSOUT DD SYSOUT=*
000018 //SYSTSPRT DD SYSOUT=*
000019 //SYSTSIN DD *
000020 HSEND FIXCDS D DCD.MIGRAT.DONT.RECALL.G0001V00 +
000021 PATCH(40 X'4000') +
000022 PATCH(64 TSO001) +
000023 ODS('SK01.FIXAUDIT.F8020IA') LOGONLY
000024 HSEND FIXCDS D DCD.MIGRAT.NEVER.RECALL.G0094V00 +
000025 PATCH(40 X'4000') +
000026 PATCH(64 TSO002) +
000027 ODS('SK01.FIXAUDIT.F8020IA') LOGONLY
000028 HSEND FIXCDS D DCD.MIGRAT.NEVER.RECALL.G0095V00 +
000029 PATCH(40 X'4000') +
000030 PATCH(64 TSO001) +
000031 ODS('SK01.FIXAUDIT.F8020IA') LOGONLY
AB :00.1 04/15
```

## Advanced Audit for DFSMSHsm Benefits

- **IBM Tivoli Advanced Audit for DFSMSHsm**
  - Audits DFSMSHsm managed tapes quickly
  - Identifies tape corruption before it is too late
  - No significant increase in system usage
  - No impact to DFSMSHsm request queues
  - No hardware tied up for extended periods of time
  - Select and prioritize corrective actions



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# *Tivoli Advanced Reporting for DFSMSHsm*

## Advanced Reporting for DFSMSHsm

- **Easily collect and display critical DFSMSHsm information**
  - Report on all DFSMSHsm activity
  - Zoom-in on problem areas
  - Provides daily and historical information
  - Take corrective actions for problems detected before they become issues
  - Provides Health Reports that alert the administrator when DFSMSHsm automatic tasks are incomplete

## Advanced Reporting for DFSMSHsm Features

- **ISPF interface**
- **Canned reports for batch**
- **Executes outside of DFSMSHsm**
  - No interference with DFSMSHsm work or requests
  - All reporting is performed using extraction files
  - Extraction files can be refreshed as often as needed



# Advanced Reporting for DFSMSHsm Features

- **Threshold monitoring**
  - Pre-defined reports on Storage Groups
  - Identify DASD free space shortages
- **Tracking and trending reports**
  - Predefined Excel graphs
- **Format and Save**
  - Create custom reports on specific fields
- **Filters and Sort**
  - Filters can be changed/modified on the fly
  - “Wildcard” filtering capabilities
- **Batch reporting**

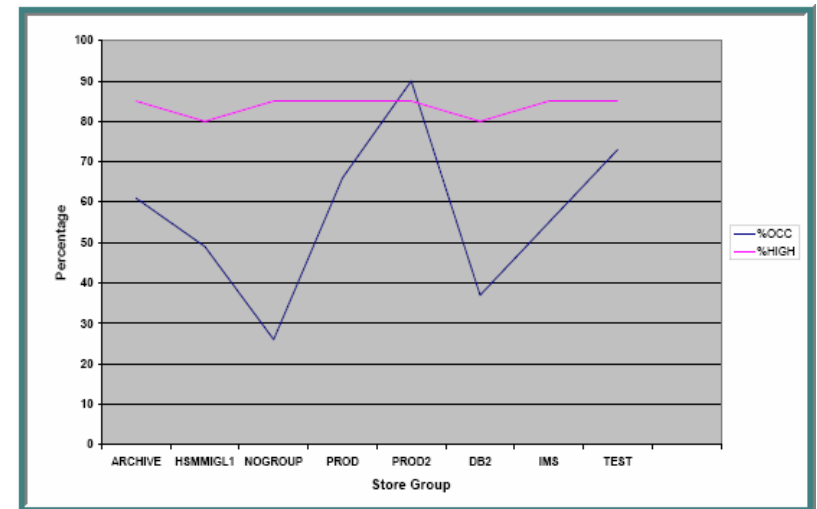
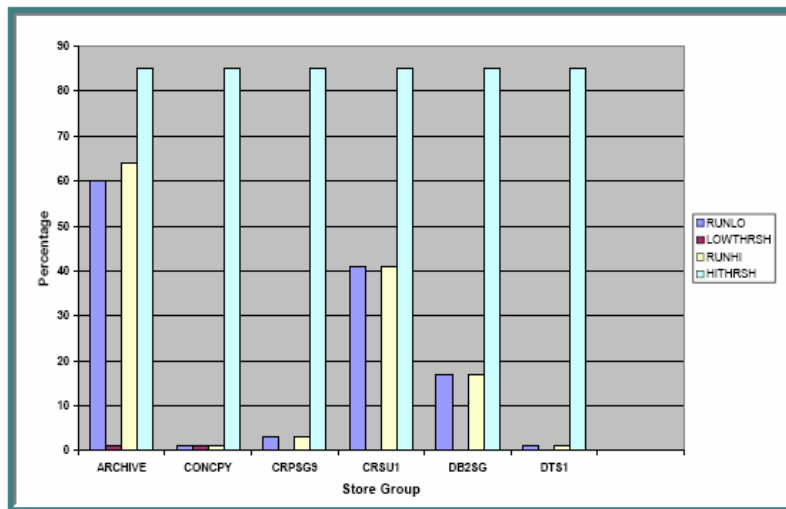
# Advanced Reporting for DFSMSHsm Features

- **DFSMSHsm health reports**
  - Reports status of HSM automatic functions
- **Volume dump reporting**
  - Reports DFSMSHsm Full Volume Dump Information
    - Ability to recover volume or single data set
- **Multi-purpose Query Format Language (MQFL)**
  - SQL based code used for creating trending reports
  - Adhoc custom reports
- **Historical database**
  - Collects data from the DFSMSHsm started task
  - Tracking and trending



# Advanced Reporting for DFSMSHsm Overview

- **Automatic Microsoft Office Excel Charting**
  - Advanced Reporting for DFSMSHsm utilizes the power of Microsoft Office Excel for charting
  - Charts and graphs are predefined
  - Macros are shipped with the product code
  - There are over 80 charts provided

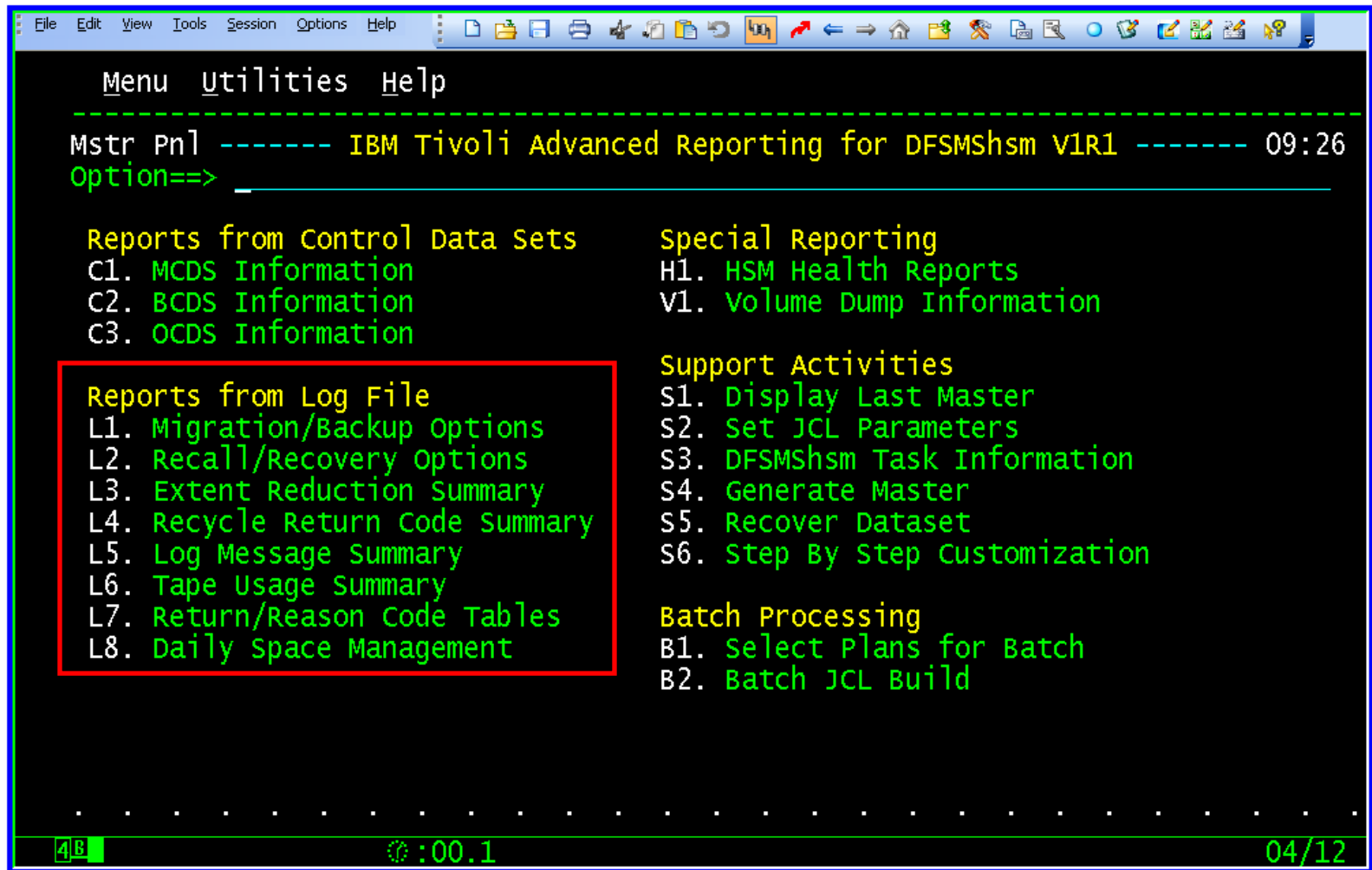


# Advanced Reporting for DFSMSHsm Features

## ■ Corrective Action

- Issue Commands to Correct Error Conditions
  - DFSMSHsm, IDCAMS, other
- Filter Specific Data
  - One or all data matching criteria
- Select Error Corrections
  - Provided customizable library
  - Create and save your own commands
- Process Corrective Commands
  - Interactively
  - Batch job

# Advanced Reporting for DFSMSHsm Main Menu



```
File Edit View Tools Session Options Help
-----
Menu utilities Help
-----
Mstr Pnl ----- IBM Tivoli Advanced Reporting for DFSMSHsm V1R1 ----- 09:26
Option==> _____

Reports from Control Data Sets
C1. MCDS Information
C2. BCDS Information
C3. OCDS Information

Reports from Log File
L1. Migration/Backup Options
L2. Recall/Recovery Options
L3. Extent Reduction Summary
L4. Recycle Return Code Summary
L5. Log Message Summary
L6. Tape Usage Summary
L7. Return/Reason Code Tables
L8. Daily Space Management

Special Reporting
H1. HSM Health Reports
V1. Volume Dump Information

Support Activities
S1. Display Last Master
S2. Set JCL Parameters
S3. DFSMSHsm Task Information
S4. Generate Master
S5. Recover Dataset
S6. Step By Step Customization

Batch Processing
B1. Select Plans for Batch
B2. Batch JCL Build

. . . . .
4B :00.1 04/12
```

# Logfile Summary Reports

```

Menu Utilities Help
-----
MIGRATE ----- Advanced Reporting for DFSMSHsm V1R1 ----- Row 1 to 9 of 9
Option==> _____ scroll ==> PAGE 11:02

                                For ALLVOL

S   Rc   Count  Message
00      193  MIGRATION OK
06         3  DUPLICATE DSN IN MCDS
19      475  DATA SET IN USE
30        22  DATA SET NOT CATALOGED
53         1  EXPIRE ERROR, NEEDS BKUP FIRST
58        18  MIGRATION OR DBA DBU FAILED
68         1  DFDSS ERROR
70        78  SMS DS ERROR
99        82  UNSUPPORTED DS
***** Bottom of data *****

4B  :00.1  05/12

```

# Logfile Summary Reports

## ■ Zoom to Detail

```

Menu  utilities  Help
-----
Mig/Bkup ----- Advanced Reporting for DFSMSHsm V1R1 ----- Row 1 to 13 of 82
Option==> _____ Scroll ==> PAGE 11:04

          ARH SELECTED MIGRATE RETURN CODE
Enter 0 at option for list of options.
Panel 1 of 3. scroll right for more information.
Key S beside entry for return/reason codes
S   Dsn                               Action   Rc  RsnC   Trks   Age
SCPT.SEA.SAVRS.V51B14.LOADLIB         MIGRATE 99 00014   60    16
IMST.VOSSTLT.HALDB002.X00002.DATA     MIGRATE 99 00020    0   803
IMST.VOSSTLT.RESLIB                   MIGRATE 99 00014    0    0
DDOT.DDIT.USERLIB                     MIGRATE 99 00014   30   11
MIX.P.C.P.AUTHLIB                     MIGRATE 99 00014   45    0
IMST.VOSSTLT.HALDB005.X00001.DATA     MIGRATE 99 00020    0   803
SCPT.PROJCL.V261C.LOAD                 MIGRATE 99 00014 1896    7
IMST.VOSSTLT.HALDB003.A00001.DATA     MIGRATE 99 00020    0   438
SCPA.UCC11.V130.CAILIB                MIGRATE 99 00014    0    2
SCPT.STM.V411.LOAD                    MIGRATE 99 00014   30    9
DBMT.OSST.USERLIB                     MIGRATE 99 00014    0   10
SCPT.PUBLIC.FRZFRM.V240.SPFFAUTH       MIGRATE 99 00014    0    9
IMST.VOSSTLT.HALDB006.A00002.DATA     MIGRATE 99 00020    0   438

4B                                     :00.2                                     05/12

```

# Special Reporting

```
File Edit View Tools Session Options Help
-----
Mstr Pnl ----- IBM Tivoli Advanced Reporting for DFSMSHsm V1R1 ----- 09:26
Option==> _____

Reports from Control Data Sets
C1. MCDS Information
C2. BCDS Information
C3. OCDS Information

Reports from Log File
L1. Migration/Backup Options
L2. Recall/Recovery Options
L3. Extent Reduction Summary
L4. Recycle Return Code Summary
L5. Log Message Summary
L6. Tape Usage Summary
L7. Return/Reason Code Tables
L8. Daily Space Management

Special Reporting
H1. HSM Health Reports
V1. Volume Dump Information

Support Activities
S1. Display Last Master
S2. Set JCL Parameters
S3. DFSMSHsm Task Information
S4. Generate Master
S5. Recover Dataset
S6. Step By Step Customization

Batch Processing
B1. Select Plans for Batch
B2. Batch JCL Build

. . . . .
4B :00.1 04/12
```

# HSM Volume Health Report

- Reports on management functions for DASD volumes
  - Migrate, back up, dump, etc.
  - And what failed

```

Menu Utilities Help
-----
Health ----- Advanced Reporting for DFSMShsm V1R1 ----- Row 1 to 9 of 9
Option==> _____ Scroll ==> PAGE 13:06

Enter V to display all detail about volume or B to browse error related detail
S Number Count Message
VOLR000 116 PRIMARY VOLUME IS SMS AND HSM MANAGED.
VOLR001 60 PRIMARY VOLUME IS SMS MANAGED, NOT HSM MANAGED.
VOLR002 8 PRIMARY VOLUME IS HSM MANAGED, NOT SMS MANAGED.
VOLR003 175 MOUNTED VOLUME IS NOT SMS MANAGED, AND NOT HSM MANAGED.
VOLR004 8 MOUNTED VOLUME IS MIGRATION LEVEL 1 VOLUME.
VOLR005 1 MOUNTED VOLUME IS MIGRATION LEVEL 2 VOLUME.
VOLR006 7 MOUNTED VOLUME IS A BACK-UP VOLUME.
VOLR007 3 VOLUME HAS NO ACTIVE VTOC INDEX
VOLR008 0 CACHED VOLUME HAS NO FEATURES ENABLED.
***** Bottom of data *****

```

# HSM Dump Volume Information Report

## ■ HSM Dump Volume Inventory

- View dump classes
- Tape volumes associated with dump
- DSN info in the VTOC if it exists

```

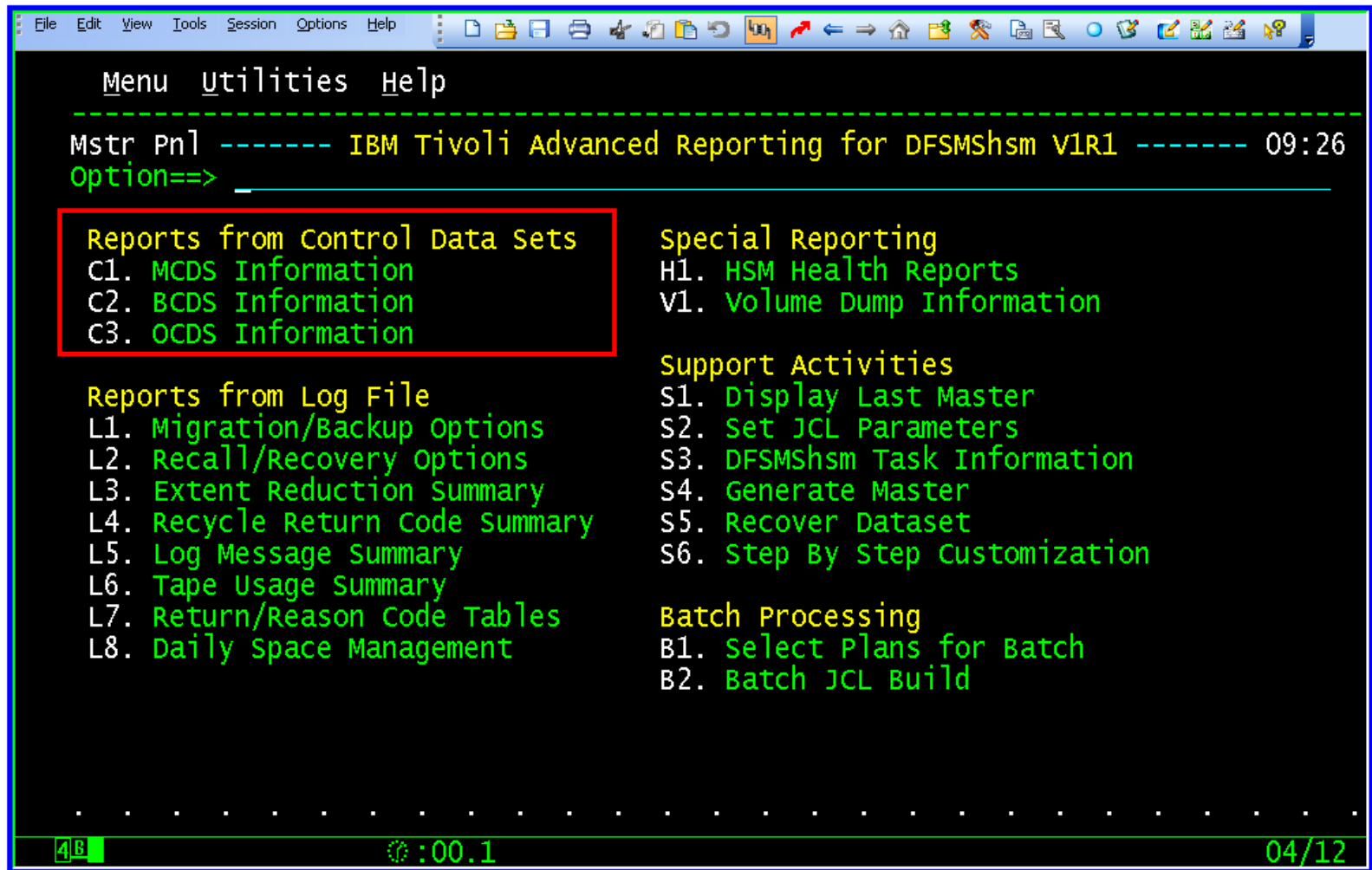
Menu  Utilities  Help
-----
                                Row 1 to 3 of 3
----- Advanced Reporting for DFSMShsm V1R1 ----- 13:59
Option==> _____ Scroll ==> PAGE

          VIEW OF VOLUME DUMPS
Panel 1 of 3.  Scroll right(PF11) for VTOC and Tape dsnames
Enter 0 in option field for options
Select C for dump class detail, D for dsn list, V for list of tapes
  Jul      Greg      Dump  Dump      Tape  CMD or  VTOC CPY
S Date     Date      Time  Volume Class  EXPDT EXPDT  AUTO  Exists
 2007010  01/10/2007  09:30:01  SCD001 DAILY    2007017 1999000 AUTO   YES
 2007009  01/09/2007  09:30:02  SCD001 DAILY    2007016 1999000 AUTO   YES
 2007008  01/08/2007  09:30:02  SCD001 DAILY    2007015 1999000 AUTO   YES
***** Bottom of data *****

```



# Advanced Reporting for DFSMSHsm CDS Reporting



```
File Edit View Tools Session Options Help
-----
Mstr Pnl ----- IBM Tivoli Advanced Reporting for DFSMSHsm V1R1 ----- 09:26
Option==> _____

Reports from Control Data Sets
C1. MCDS Information
C2. BCDS Information
C3. OCDS Information

Reports from Log File
L1. Migration/Backup Options
L2. Recall/Recovery Options
L3. Extent Reduction Summary
L4. Recycle Return Code Summary
L5. Log Message Summary
L6. Tape Usage Summary
L7. Return/Reason Code Tables
L8. Daily Space Management

Special Reporting
H1. HSM Health Reports
V1. Volume Dump Information

Support Activities
S1. Display Last Master
S2. Set JCL Parameters
S3. DFSMSHsm Task Information
S4. Generate Master
S5. Recover Dataset
S6. Step By Step Customization

Batch Processing
B1. Select Plans for Batch
B2. Batch JCL Build

. . . . .
4B :00.1 04/12
```

# Advanced Reporting for DFSMSHsm CDS Reporting

- Migration (MCDS) or Back Up (BCDS) Details
  - By SMS Type and Classes
  - By Migration or Back Up Volume

```

Menu  Utilities  Help
-----
MCDS      ----- Advanced Reporting for DFSMSHsm V1R1      Row 1 to 14 of 448
Option==> _____ Scroll ==> PAGE 14:10

Enter 0 in option field for options
Panel 3 of 4. scroll left or right for more information.

C          Dsname          Mig   T M   N   ML0   Migrated
          Times H L   V   Trks  KB2 Bytes
N037.CTR.TORDSDT5          19 9 2  N   4050   96845
N037.CTR.TORDSDT.LD5       17 9 2  N   2175   59126
N037.CTR.TORDSDT.FORMAT.SORT8 21 9 2  N   1275   34506
N037.CTR.TORDSDT.ERROR8     21 9 2  N    15     1
N037.SDAFLOW.SEQ           5 7 2  N   2985   81493
N037.SDAFLOW.LINK.FORMAT    5 7 2  N   3075   83638
N037.NDAFLOW.LINK.SORT1     5 7 2  N    930   25029
N037.GRDFLOW.LINK.SORT2     5 7 2  N   1065   28934
N037.CTR.TORDSDT.FORMAT6    2 6 2  N   1710   46555
N037.CTR.TORDSDT.FORMAT4    2 6 2  N   1875   51114
N052.BAS.N0520M04.OPLD.EXPRD.G1811V00 2 6 2  N    15     1
N052.BAS.N0520M04.OPLD.EXPRD.G1808V00 2 6 2  N    15     1
N052.BAS.N0520M04.OPLD.EXPRD.G1799V00 2 6 2  N    15     1
N052.BAS.N0520M04.DIALS.EXPRD.G1814V00 2 6 2  N    15     1

4B  :00.1 05/12

```

# Advanced Reporting for DFSMSHsm CDS Reporting

## ■ OCDS Details

- Portions of the OCDS Tape Inventory or ALL of it

```
Menu  Utilities  Help
-----
Tape Inv ----- Advanced Reporting for DFSMSHsm V1R1 ----- 14:15
Option==> _____

select tape inventory options below

1 Migration Level 2 Tapes
2 Spill Tapes
3 Cycle Tapes (Backup)
4 Unassigned Tapes
5 All Tapes in OCDS Inventory

6 Filter Tape Volume Inventory
7 Display Plans for Tape Volume Inventory
8 Display Filtered Flat Files for Tape Inventory
```

# Sort and Filter

- 'O' – Options from most views

```
Menu Utilities Help
-----
Options ----- Advanced Reporting for DFSMSHsm V1R1 ----- 14:21
Option==> _____

Enter Option Number
1 Sort
2 Filter
3 Print
4 Save
F Format and Save
5 Plan
6 Total
7 Tag
8 Untag
9 Run
10 Batch
```

## Sort and Filter

- Data can be sorted on any value listed
  - Ascending or descending
  - Can specify SORT order if multiple fields selected

```

Menu  Utilities  Help
-----
Tape   ----- Advanced Reporting for DFSMSHsm V1R1 ----- 14:27
Option==>
Key N to sort with no duplicates==>
Enter numerical values  A=Ascending  Note: The A or D is required if
For sort order below:  D=Descending  > 1 field is selected.
Vol Type ==> CP=====>
Volser =====> Esoteric=====>
Full =====> Youngest=====>
Dsn(s) =====>
Blks Written=>
Blocks Valid=>
PCT Valid ==> 1      a_
PCT Full ==>
EST CPCTY ==>
Device Type =>
Elig RECYCL =>
Fail RECYCL =>
PRE Vol =====>
SUCC Vol =====>
ALT Vol =====>
Enter REFRESH or R to reset sort to defaults Enter END to cancel sort

4B  :00.2  15/28

```

# Sort and Filter

```

Menu  utilities  Help
-----
Tape ----- Advanced Reporting for DFSMSHsm V1R1 ----- Row 1 to 13 of 97
Option==> _----- 14:29
                                           scroll ==> PAGE

                ARH VIEW OF L2 TAPES
Enter 0 at option for list of options.
Panel 1 of 2. Scroll RIGHT for more information

  Vol  Blocks  Blocks  Pct  Pct  EST  Young-
S  Type Volser Full Dsn(s)  Written  Valid  Valid Full  CPCTY  est Dsn
-----
L2  210081  N      68  163253  0  000  597  27319  1998171
L2  55555  Y       0    0  0  000  000  1149000  0000000
L2  500010  Y       0    0  0  000  000  1149000  0000000
L2  300051  Y       0    0  0  000  000  1149000  0000000
L2  DAND05  Y        5    6  5  001  000   54638  2001285
L2  210060  N     111  7950  6509  001  000  1149000  1998251
L2  210112  N     117  5652  5215  001  000  1149000  1998251
L2  300038  Y     269  2702  298  001  000  1149000  2006271
L2  300028  N        1    1  1  001  000  1149000  2006277
L2  300010  N        2   548  1  001  000  1149000  2006276
L2  300002  N        2    5  5  001  000  1149000  2006275
L2  210156  Y    1483  924614  46051  004  080  1149000  1998218
L2  210137  Y     678  908279  57416  004  079  1149000  1998220

4B  @:00.1 05/12
    
```

## Sort and Filter

- Data can be filtered on any value listed
  - Filter operands are:
    - EQ, NE, LT, GT, NH, NL, NI, LE, LK, NK

```

Menu  Utilities  Help
-----
OCDS  ----- Advanced Reporting for DFSMSHsm V1R1 ----- 14:32
Option==> _____

Filter Option==>      Enter F to perform filter in TSO batch
Label                OPCODE      Argument
Vol Type             =>           =>      Device Type =>           =>
Volser               =>           =>      Elig RECYCL =>          =>
Full                 =>           =>      Fail RECYCL =>         =>
Dsn(s)               =>           =>      PRE Vol      =>         =>
Blks written=>       =>           =>      SUCC Vol     =>         =>
Blocks Valid=>       =>           =>      ALT Vol      =>         =>
PCT Valid            => 1e         => 050  _    Esoteric      =>         =>
PCT Full             =>           =>      CP           =>         =>
EST CPCTY            =>           =>      Youngest     =>         =>
Enter REFRESH or R to reset filter to defaults
  
```

# Sort and Filter

```

Menu Utilities Help
-----
Tape ----- Advanced Reporting for DFSMSHsm V1R1 ----- Row 41 to 52 of 52
Option==> _____ scroll ==> PAGE ----- 14:40

INTERACTIVE FILTERED VIEW OF OCDS TAPES
Enter 0 at option for list of options.
Panel 1 of 2. scroll RIGHT for more information
Vol
S Type Volser Full Dsn(s) Blocks Blocks Pct Pct EST Young-
Written Valid Valid Full CPCTY est Dsn
L2 210103 Y 1501 954678 441781 038 083 1149000 1998243
L2 210122 Y 1304 791533 449099 039 068 1149000 1998196
L2 210111 Y 1093 841195 448972 039 073 1149000 1998243
L2 210142 Y 614 783208 449372 039 068 1149000 1998202
L2 210031 Y 1094 767330 308195 040 100 767330 1998238
L2 210131 Y 549 588463 474961 041 051 1149000 1998208
L2 210130 Y 1371 800055 480010 041 069 1149000 1998195
L2 210029 Y 1348 955466 403113 042 100 955466 1998238
L2 210067 Y 465 741260 497134 043 064 1149000 1998166
L2 210061 Y 957 701664 530208 046 061 1149000 1998131
L2 210014 Y 1631 806615 398186 049 952 27319 1998139
L2 210106 Y 387 733152 569684 049 063 1149000 1998119
***** Bottom of data *****
    
```



## Corrective Actions

- **Example: Migrate Data Sets Now**
  - Enter Option 9 to RUN Command to Migrate

```
Menu Utilities Help
-----
Options ----- Advanced Reporting for DFSMSHsm V1R1 ----- 14:21
Option==> _____

Enter Option Number
1 Sort
2 Filter
3 Print
4 Save
F Format and Save
5 Plan
6 Total
7 Tag
8 Untag
9 Run
10 Batch
```

## Corrective Actions

- **Advanced Reporting for DFSMSHsm Line Command Processor Panel**
  - Press PF05 for a list of Labels for Filter Criteria

```
Menu utilities Help
-----
LineCmds ----- Advanced Reporting for DFSMSHsm V1R1 ----- 15
Option==> _____

                                Line Command Processor
Hit PF04 For format options           Hit PF05 To display labels
Hit PF06 To retrieve a list of commands, Hit PF07 To save this command
Title==> MCDS VIEW BY VOLUME B61004
Format options follow
      FORMAT OPTIONS COMP NOSTRING NODICT TSO NOTOTALS NOTITLES
      /ACTION /DSN
```

# Corrective Actions

- Labels are displayed

```
Menu Utilities Help
-----
Tags Vls ----- Advanced Reporting for DFSMShsm V1R1 ----- 15
Option==> _____

Enter the positional tag you wish to substitute below
Tag==>
SDSN      DATA SET NAME      SMCLSS     MANAGEMENT CLASS
SMG       MIGRATED Y,R,D,P    SSCLSS     STORAGE CLASS
SRCNT     RECALL COUNTS      SDP        SDSP INDICATOR
SCRDT     CREATION DATE      SI         THRASHING INDEX
SRFDT     LAST REF DATE
SMGDT     MIGRATION DATE
SBKDT     BACK-UP DATE
SXPDT     EXPIRATION DATE
SVOL     MIGRATION VOLUME
SL0       PRIMARY VOLUME
SL        MIGRATION LEVEL
SV        VSAM OR NON VSAM
SKB2     KB2 BYTES MIGRATED
STRK     PRIMARY TRACKS
```

## Corrective Actions

- **Advanced Reporting for DFSMShsm Line Command Processor Panel**
  - Key HMIGRATE '/SDSN' in the command line
  - Press 'Enter' and command is sent to HSM

```
Menu Utilities Help
-----
LineCmds ----- Advanced Reporting for DFSMShsm V1R1 ----- 15
Option==> _____

                               Line Command Processor
Hit PF04 For format options           Hit PF05 To display labels
Hit PF06 To retrieve a list of commands, Hit PF07 To save this command
Title==> MCDS VIEW BY VOLUME B61004
Format options follow
FORMAT OPTIONS COMP NOSTRING NODICT TSO NOTOTALS NOTITLES
HMIGRATE '/SDSN' _
```

## Corrective Actions

- **Advanced Reporting for DFSMSHsm Line Command Processor Panel**
  - HSM responds back to your terminal
  - Press 'Enter' when three asterisks are displayed

```
ARC1007I MIGRATE REQUEST 00001257 SENT TO HSM  
***
```

## Advanced Reporting for DFSMSHsm Benefits

- **Gathers Critical Information from DFSMSHsm**
- **Centralizes and Simplifies DFSMSHsm Management**
- **Interactive Display**
- **Provides Daily and Historical Reporting**
- **Powerful Filtering and Masking Support for Reporting**
- **Proactive Analysis Tools**
- **Ability to Identify and Correct Error Conditions**
- **Health Reports**



IBM Americas Software Group

# IBM Business Resiliency Solutions, Features and Functions

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IBM Americas Software Group

# Data Recovery

Quick and Easy



# Data Recovery

- **Review of Objectives**
  - Recover application data from a centralized location with one simple process
    - Recover only the most current copy of every data set
    - Recover at any point in my processing cycle
      - Daily, weekly, monthly, quarterly, annual
  - Easily recover data based on the application's criticality

# Data Recovery

- **Recover Data from a Centralized Location**
  - Inventory all backups including:
    - Application synchronized backups
      - Created by automated process
    - Full volume dumps
      - FlashCopy (PIT) copies dumped to tape
- **Inventory and Recover Support of Backups Needed for Local Recovery**
  - DFSMSdss and FDR backups
  - DFSMShsm automatic backup, ARCINBAK, AUTODUMP, and incremental
  - Backups taken by applications in their batch JCL
    - IDCAMS, IEBGENER, IEBCOPY, etc.
  - CA-FAVER and SORT
  - CR+ catalog backups
  - Database image copies tracked by ABARS

## Data Recovery

- **Group Backups (Logically) by Criticality, Job Groups, Volume, or Data Set Name**
  - Recover based on business needs
  - Recover all data belonging to the application
    - Data on disk and tape
- **Recover Only the Most Current Backup Copy**
  - Some data sets may be backed up more than once
    - We call these redundant backups
  - We provide solutions to reduce the redundancy
    - Reporting on data backed up multiple times
    - Automated incremental backup

# Data Recovery

- **From Incremental Backups**
  - Incrementals reduce the size of the daily backup
    - Automation to skip files that have not changed
    - Does not use the change bit
      - Stores data in its own database
  - Automation to manage processing cycles
    - Daily, weekly, monthly, quarterly, annual
    - Automation to recover the *most current copy* of all data
      - A single RECOVER command is all you need
      - Recover to any point in your processing cycle



IBM Americas Software Group

# Critical Data Identification (CDI) Solution

## Critical Data Identification

- **Automation is Key**

- Automation found in the CDI solution
  - Automation to identify critical application data
  - Automation to populate the list of critical files
  - Automation to track application changes continuously

## Critical Data Identification

- **Automated SMF Record Capture**
  - Started Task
    - Uses the IEFU83 standard SMF exit
    - Identifies all data sets through SMF records
      - Opened and closed
      - Deleted, renamed
      - Allocated; even those dynamically allocated

## Critical Data Identification

- **Automated JCL Capture**
  - Identifies all data sets in the JCL
    - Uses the IEFUJI standard IBM exit
      - Same exit used by JCL validation products
  - Identifies data sets
    - In steps not executed (condition coded, etc.)
    - Not opened by the program
    - Concatenated libraries not opened
  - Explodes the PROCLIBS



## Critical Data Identification

### ■ Real-Time Selection Process (RSP)

- Started task
  - Executes continuously to collect **SMF** and **JCL** data
- Tracks batch and started tasks executions by job name
  - Whenever they execute
  - Each and every time they execute
  - Each cycle
    - Daily, weekly, monthly, quarterly, annually

## Critical Data Identification

- **Automated Creation of the Critical File List**
  - Multiple Formats
    - Selection Data Set
      - DFSMSHsm ABARS format
    - DFDSS format
      - Complete control card format for logical backup execution
    - List format
      - Sequential list

## Critical Data Identification

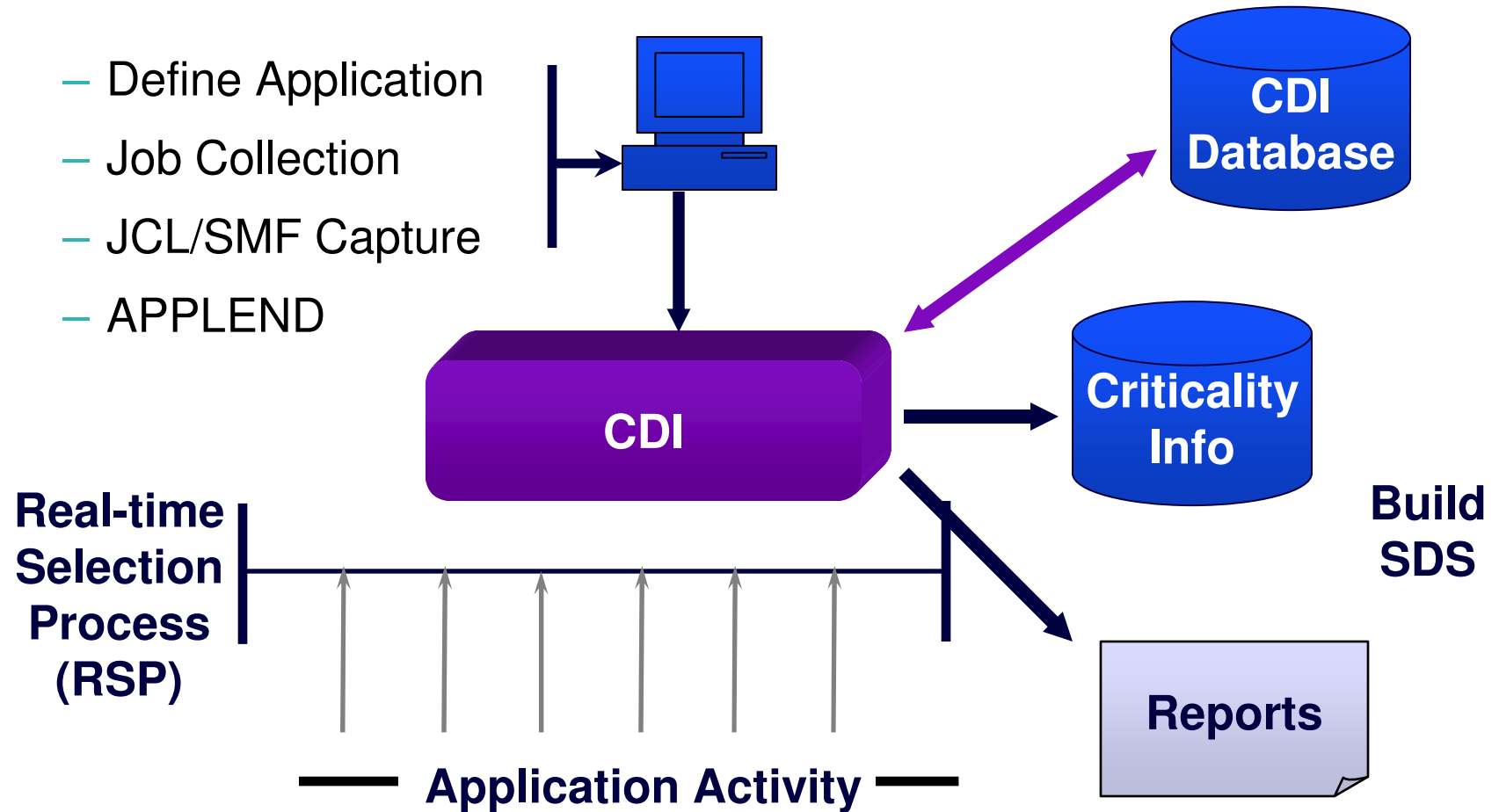
- **Automatic Maintenance of the Critical File List**
  - List of critical files is rebuilt
    - Every time the application executes
      - Finds new files added to the application since the last execution
      - Removes files that have been deleted
      - Finds files from new jobs added to the application since the last execution
  - Eliminates the need to manually update

## Critical Data Identification

- **Application Tracking by Job Name**
  - Application Job Collection Methodologies
    - Interface into scheduling systems
      - Control-M
      - CA-7
      - ESP
      - JobTRAC
      - TWS (OPC)
      - Zeke MVS
    - Job name masks
    - User defined job list



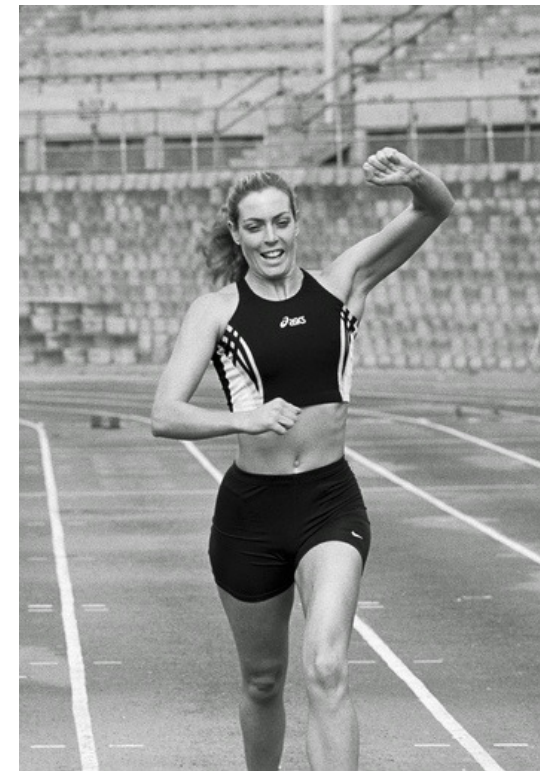
# Critical Data Identification



## Critical Data Identification

### ■ **APPLEND – End of Application**

- Program can be scheduled after the last job in the application
  - End of each application execution
    - Marries the JCL and SMF records
    - Analyzes and processes all filters and/or overrides
    - Builds the selection data set
    - Can trigger the execution of the backup job



# Critical Data Identification

## ■ Filters

- Change criticality decisions
  - Include to exclude
  - Exclude to include
- Include data sets outside the application
  - Toolbox data sets, PDSes, etc.



## Critical Data Identification

- **IBM's Critical Data Identification Solution**
  - Eliminates costs associated with:
    - Manual effort to identify critical data
    - Maintaining the list over time
  - Mitigates risks associated with:
    - Not mirroring critical data
    - Not identifying critical data for backup
  - Assists customers in meeting Sarbanes-Oxley and other government or industry regulations
    - Automation to identify critical data
    - Interfaces into other Mainstar solutions to provide proof that critical data is protected





IBM Americas Software Group

# Critical Backup Identification/Tracking (CBI/T) Solution

## Critical Backup Identification/Tracking (CBI/T) Solution

### ■ Overview of Functionality

#### – Identifies

- All backup copies of data
- Data backed up multiple times
  - Full volume dumps, application backups, etc.
  - Multiple applications backing up the same data set
- Data in the critical file list that has been backed up
  - Proof critical data has a backup
- Data that doesn't have a back up

## Critical Backup Identification/Tracking (CBI/T) Solution

- **Overview of Functionality (continued)**
  - Intercepts backups without JCL changes
  - Provides visibility to all backups taken in the environment
    - Including backups taken with DFSMSHsm
  - Provides recovery support
    - Single or multiple data sets
    - Entire applications
  - Extensive reporting

## Critical Backup Identification/Tracking (CBI/T) Solution

### ■ Data Movers Supported

- DFSMSdss and FDR
  - Physical dumps
  - Logical dumps
- IDCAMS
  - REPRO, EXPORT
- IEBGENER
- ICEGENER
- IEBCOPY
- DFSORT

### ■ Data Movers Supported

- DFSMSHsm Incremental
- DFSMSHsm ARCINBAK
- DFSMSHsm AUTODUMP
- ABARS Manager backups
- Mainstar's CR+
- Tivoli Advanced Catalog Management for z/OS
- Tivoli Advanced Backup & Recovery for z/OS

## Critical Backup Identification/Tracking (CBI/T) Solution

### ■ Backup Tracking

- Backups are tracked by a seamless intercept
  - Triggered by matching job names, step names, and utility program names to a user defined table
- Intercepts backups without JCL changes

## Critical Backup Identification/Tracking (CBI/T) Solution

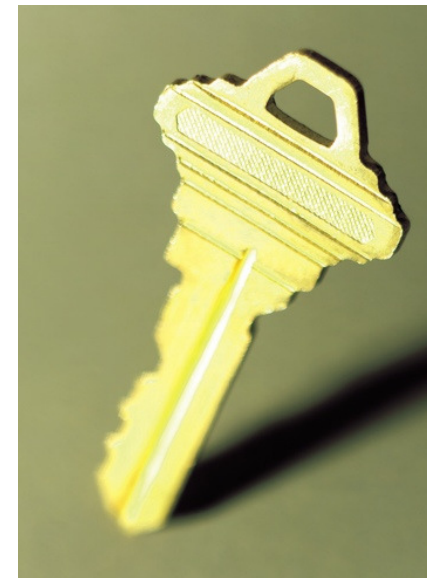
### ■ **Inventory**

- Provides a centralized inventory of backups
  - Full Volume Dumps
  - Application's backups
  - z/OS system support backups
  - Etc.
- Local and off-site disaster recovery support
- Tracks multiple generations of backups

## Critical Backup Identification/Tracking (CBI/T) Solution

### ■ Backup Summary *Key* Information

- Volume names (where applicable)
- Job names
- Job groups
- Output files and VOLSER(s)
- Data set names
- Multiple backups
- Number of data sets
- Size of each data set
- DSCB information



## Critical Backup Identification/Tracking (CBI/T) Solution

### ■ Reports

- What isn't backed up? What am I missing?
- Backup status by full volume dump
- Backup status by job name
- Data set list
- Overlap identification
  - Overlap by data set
  - Overlap by backup





## Critical Backup Identification/Tracking (CBI/T) Solution

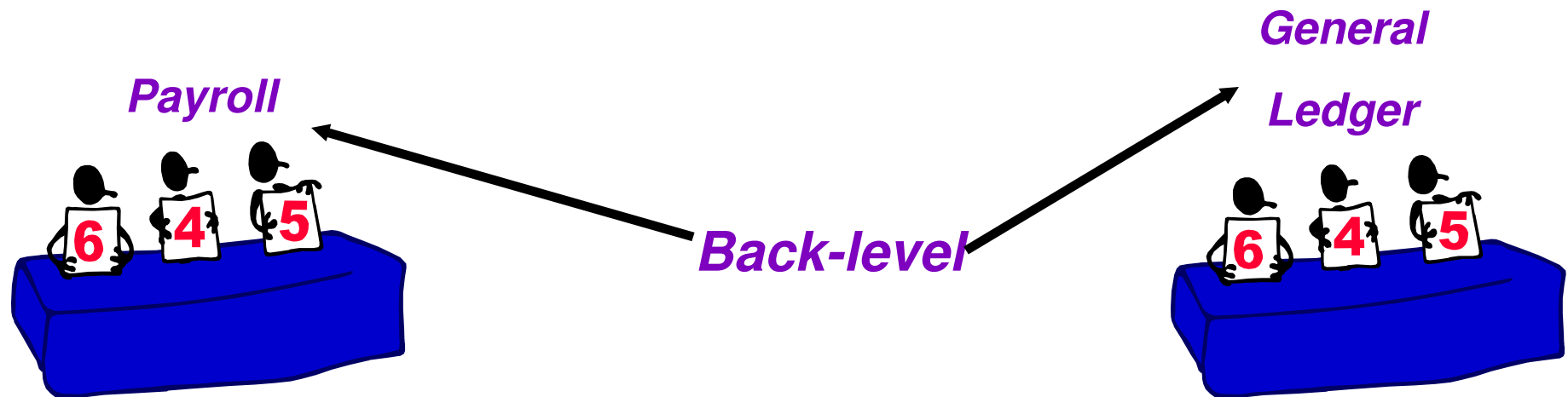
### ■ What Isn't Backed Up Report

- Find out 'what isn't backed up' to ensure you aren't missing critical data sets
- Compares the data sets on volumes, in your ICF user catalogs, by data set names, or all:
  - Towards the Inventory Data Set
  - Optionally against the DFSMSHsm BCDS
- Identifies data sets that are **not recorded in either** and thus, have not been tracked yet, or have not been backed up

# Overlap Reporting

## ■ CBI/T Overlap Reporting

- Supports inventory **overlap** reporting for:
  - Data sets
  - Backups
  - Job groups



## Critical Backup Identification/Tracking (CBI/T) Solution

- **DFSMSHsm Data Set Backup and HRECOVER**
  - Allows Storage Administrators and others to:
    - Find out what DFSMSHsm backups are in the BCDS
    - Select the generation you want
    - Recover data sets without needing to know the DFSMSHsm syntax
    - Perform advanced functions
      - Rename, redirect to non-DFSMS



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