Session 15549
RMM Exploitation

Speakers

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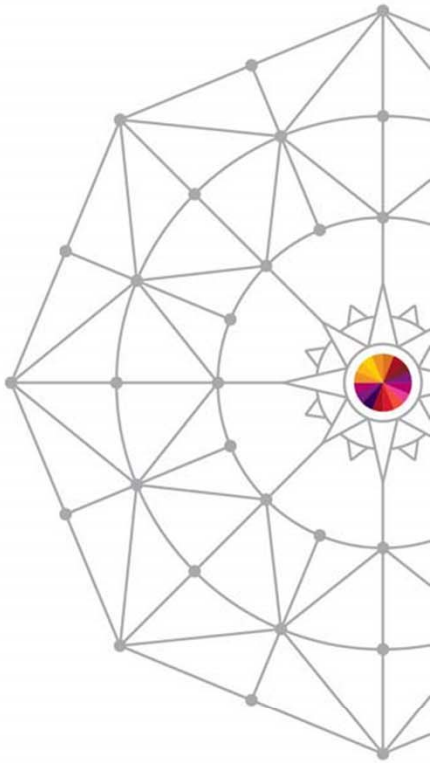
Thursday August 7, 2014

3:00 – 4:00 pm



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SHARE is an independent volunteer-run information technology association that provides **education**, professional **networking** and industry **influence**.

Agenda

- Retentionmethods
  - VRSEL
  - EXPDT
    - Assigning Retentionmethod and Limitations
- Tape Security
  - RMM
  - RACF
  - DEVSUP
- RMM and Virtual Tape
  - Logical vs Physical
  - Export
  - Copy Export

Retentionmethods What are they?

VRSEL Retentionmethod

Policy Driven Retention *(When to Scratch)* *and* *Movement* *(send offsite/vault)*.

User specified EXPDT can be overridden

PGM=EDGHSKP,PARM=VRSEL runs nightly and applies rules to every volume.
VRS Rule changes can change and affect all volume except those excluded

EXPDT Retentionmethod **VRSEL exclude bit is set in dataset record**

Use EXPDT ONLY to Scratch by the supplied or inherited EXPDT

NEVER PROCESSED BY VRSEL Inventory Management EDGHSKP

Since VRSEL also control movement Volumes with RETENTIONMETHOD(EXPDT)
Volumes must be moved manually

Expiration Date or Retention Period is set in the JCL or from the Dataclas RMM
Defaults set in SYS1.PARMLIB(EDGRMM00) OPTION RETPD

Retentionmethods *Vital Record Specifications*

Vital record processing determines RETENTION

Dataset Patterns or ** Default

Type: Days, Cycles, Count, ByDaysCycle, Extradays, LastReferenced

Whilecatalog, UntilExpired

Special conditions OPEN, ABEND, Disp=Delete

Jobname Qualifications

Volumes **Count** ←

Named Chained or Pointed to from EDGUX100 or ACS

VRS definitions can be chained NEXT AND

Named VRS are used for SPECIAL keyword dates

Release Actions On Primary VRS Honor or IGNORE EXPDT

VITAL record processing determines MOVEMENT

Dataset Patterns and volumes

LOCATION(where) STORENUMBER(how long)

Retentionmethods *Vital Record Specifications*

- Mike Wood SHARE Seattle 2010

  Everything you ever wanted to know about VRS'

RETIRED from IBM

Retentionmethods *Volume Creation flow*

1. TAPE is added to the RMM CDS
2. TAPE is initialized and available SCRATCH status
3. TAPE is written to by a JOB
4. Metrics are collected in RMM CDS from the JCL including

   EXPDT special keyword dates

   LABEL=EXPDT=9800n keep until n dates since referenced

   LABEL=EXPDT=99000 keep until DATASET is no longer cataloged

   LABEL=EXPDT=9900n keep until n cycles of dataset exist
5. Dataset is processed by VRS during Housekeeping

   .

   . Apply Policies nightly

Retentionmethods *VRS Example 1*

Example Dataset VICKIE.RMM.TAPE.DATASET,DISP=(,CATLG), LABEL=RETPD=365

VRS For Dataset Pattern
DSN(VICKIE.**) NOGDG
DAYS COUNT(90)
RELEASE(EXPIRYDATEIGNORE)
NEXTVRS(VICKIES)
LOCATION(HOME)
STORENUM(90)

Name(VICKIES)
DAYS COUNT(0) WHILECAT
LOCATION(HOME) STORENUM(0)

Day 1 Retention date set to 2014/308
VRS(VICKIE.**)
Day 2 is it 90 days does VRS still apply
Day 3 is it 90 days does VRS still apply
.

Day 89 is it 90 days does VRS still apply
Day 90 is it 90 days YES VRS no longer applies
ignore Expiration Date
Set VRS to NEXTVRS name(VICKIES)
Day 91 Is it cataloged? Yes
Day 92 Is it cataloged? Yes
day 263 dataset gets uncataloged
Day 263 Is it cataloged? NO
Volume is Returned to SCRATCH

Example is for illustrative purposes ONLY

Retentionmethods *VRS Example 2*

Example Dataset VICKIE.RMM.TAPE.DATASET,DISP=(,CATLG), LABEL=RETPD=365

VRS For Dataset Pattern
DSN(VICKIE.**) NOGDG
DAYS COUNT(90)
RELEASE(EXPIRYDATEIGNORE)
NEXTVRS(VICKIES)
LOCATION(HOME)
STORENUM(90)

Name(VICKIES)
DAYS COUNT(0) WHILECAT
LOCATION(HOME) STORENUM(0)

Day 1 Retention date set to 2014/308
VRS(VICKIE.**)
Day 2 is it 90 days does VRS still apply
Day 3 is it 90 days does VRS still apply
.
day 45 dataset gets uncataloged
Day 89 is it 90 days does VRS still apply
Day 90 is it 90 days YES VRS no longer applies
ignore Expiration Date
Set VRS to NEXTVRS name(VICKIES)
Day 91 Is it cataloged? NO
Volume is Returned to SCRATCH

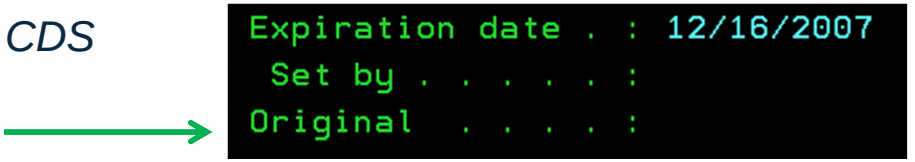
Example is for illustrative purposes ONLY

Retentionmethods

- **Volumes with Retentionmethod(EXPDT)**

Expiration DATE set from JCL or EDGUX100 or ACS routines or RMM Defaults

ORIGINAL date is identified in the RMM CDS



Are processed on a VOLUME Level. Each Volume has a separate EXPDT. The EXPDT may be set by any dataset on the volume. Subsequent datasets can update the EXPDT the VOLUMEs EXPDT..

NOT PROCESSED BY VRSEL

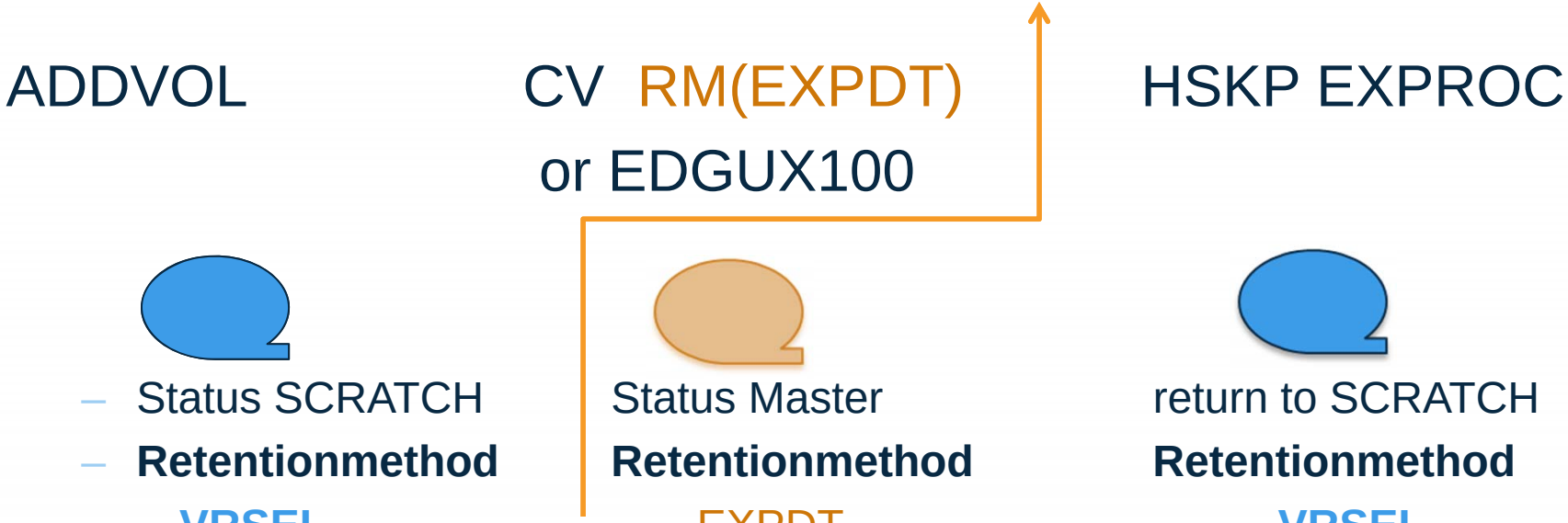
During Housekeeping EXPROC counts the number EXPDT-retained volumes and reports on them. Volumes with RETENTIONMETHOD(EXPDT) are used in the EXPDTDROP Counts.

For Datasets on Tape with RETENTIONMETHOD(EXPDT), no considerations are needed for OPEN or ABEND or go thru DISP=DELETE.

Retentionmethods

Assigning Retentionmethods

- Default Retention Period:
  - SYS1.PARMLIB(EDGRMM00)
    - Option RETENTIONMETHOD(VRSEL | EXPDT)



Retentionmethods

- Default RETENTIONMETHOD is set in
  SYS1.PARMLIB(EDGRMM00) and is set during OPEN and CLOSE

- Set by RMM Command
  RMM CD A.B.C VRSEXCLUDE(YES)*
  RMM CV *volser* RM(EXPDT)

- Override of RETENTIONMETHOD can be made with EDGUX100 UXTABLE

*When VRSEXCLUDE flag is set, the retention date is set to the current date

Retentionmethods

- EDGUX100 and UXTABLE

EDGUX100 has been updated to include a table of vrs excludes. The source can be updated to see the VRSEXCLUDE flag.

```
VXTAB    DS    0F                    START OF VRSELEXCLUDE TABLE
         SPACE 1
         DC    CL8'*'                JOBNAME
         DC    CL44'RMMUSER.VX.*'    DATA SET NAME
         DC    CL8'*'                PROGRAM NAME
         SPACE 1
         DC    CL8'VX END'           END OF VX TABLE MARKER
```

Don’t forget the EXPDT

Retentionmethods

EDGUX100 and UXTABLE limitations

EDGCVRSX is the source for the EDGUX100 Exit routine that loads a table with your definitions to support Special Keyword dates, assignment of a VRS, set the VRSEXCLUDE flag, RETENTIONMETHOD, RETPD, assign a volume to a pooling and more

EDGCVRSG DSN=HSM.H*,RO=YES,VX=YES,RETPD=9999

EDGCVRSG DSN=HSM.H*,RO=YES,RM=EXPDT,RETPD=9999

RetentionOverride=Yes is Required to exit the table

Currently RETPD= is limited to 4- 9's

9999 divided by 365 = 27 years z/OS supports 5- 9s

An RFE has been opened to honor 5- 9s RMM = PERM

Retentionmethods What are they?

- **VRSEL Retentionmethod**

PGM=EDGHSKP,PARM=VRSEL runs nightly and applies rules to every volume.

- **EXPDT Retentionmethod** **VRSEL exclude bit is set in dataset record**

NEVER PROCESSED PGM=EDGHSKP,PARM=VRSEL

MOVEMENT NOT HANDLED FOR VOLUMES WITH RM(EXPDT)

Agenda

- Retentionmethods
  - VRSEL
  - EXPDT
    - Assigning Retentionmethod and Limitations
- Tape Security
  - RMM
  - RACF
  - DEVSUP
- RMM and Virtual Tape
  - Logical vs Physical
  - Export
  - Copy Export

Tape Security

What are you protecting?

- Datasets on Tape
- Tape Metrics in your Tape management system
- What Controls are in place and what do they Protect?
  - RACF
    - TAPEVOL
    - TAPEDSN
    - STGADMIN.EDG.*
    - Erase on scratch
  - RMM
    - EDGRMM00 Options impact RACF Profiles
    - STGADMIN.EDG.* Security Profiles
  - DEVSUP
    - TAPEAUTHDSN*
    - TAPEAUTHF1

RMM provides support for SYS1.PARMLIB (DEVSUP00) TAPEAUTHDSN & TAPEAUTHF1

Tape Security

RACF

Protecting RMM Resources

Tape Metrics in your Tape management system

RACF FACILITY Class

STGADMIN.EDG.*

In the RMM Implementation and Customization Guide, 2 tables exist describing the profile and what it protects or controls

And the Access required for the RMM CDS record

If a profile is missing ‘entity not defined‘ a hierarchy of profiles determines access. Implementation and Customizatoin guide chapter 11 Table 25

z/OS Security Server RACF Security Administrator's Guide,
DFSMSrmm Implementation and Customization Guide, chapter 11

Tape Security

RACF

- DATASET PROFILE *a.b.c* *read update control*
- FACILITY CLASS: No protection
  TAPEVOL class,
  TAPEDSN class
  TAPEVOL & TAPEDSN

TAPEVOL *volser* *A00100** *TVTOC* first dsn on volume

- RDEFINE *volser*
- PERMIT *volser* CLASS(TAPEVOL) ID(user) ACCESS(ALTER)

May be specified in the JCL

*//ddname DD dsn=a.b.c,*PROTECT=YES,disp=old

TAPEDSN

- ADDSD *dsn* TAPE

z/OS Security Server RACF Security Administrator's Guide

Tape Security

RMM Metrics

- EDGRMM00 Options
  - COMMANDAUTH
    - » COMMANDAUTH = OWNER Creating userid = owner
    - » COMMANDAUTH = DSN DASD Dataset Profile

  The commands that are authorized
  RMM RELEASE , CHANGEVOL

- RMM Processing of RACF TAPE PROFILEs
  No protection
  TAPEVOL Class
  TAPEDSN Option
  TAPEVOL and TAPEDSN

- STGADMIN.EDG.* Security Profiles*

Tape Security

RMM resources protected by Security Profiles

STGADMIN.EDG.* Security Profiles

Control functions	table 24 resources protected
Limit updates to the records in the RMM CDS.	Table 25 access required*
Run Utilities	Table 26 scope *role*

Some profiles have no variables while some allow

STGADMIN.EDG.HOUSEKEEP

when authorized the user can run RMM housekeeping functions like VRSEL, EXPROC

STGADMIN.EDG.CV.*status.volser*

When authorized the user can issue an RMM CV for a volume in any status to any volser

STGADMIN.EDG.CV.MASTER.A

When authorized the user can issue an RMM CV for a volume in any MASTER status ONLY to any volser that begins with A

Tape Security

RMM

- RMM Processing of RACF TAPE PROFILEs
  - TPRACF determines how RMM will AUTOMATICALLY update RACF TAPEVOL and TAPEDSN profiles

    - » TPRACF(**N**) Do nothing*
    - » TPRACF(**A**) Automatic define and delete of profiles
      TAPEVOL profile
      DATASET profile DSTYPE(T)
    - » TPRACF(**P**) previously defined - delete on scratch
      updated with RMM ADDVOL CV or DEL,
    - » TPRACF(**C**) Cleanup when volumes RETURN to Scratch

    - ❖ Volume Pool Definitions have a separate setting for RACF

TPRACF (A & P) Automatic and Predefined assume that a discrete profile exists for every Master (nonscratch) tape. If one does not exist, RMM will create one for TPRACF(A).
Generic profiles can be used in place of specific discrete profiles.
During EXPROC *Scratch* processing discrete profiles will be deleted (cleaned up).
TPRACF© Cleanup RMM does NOT create the RACF profiles but does DELETE them when the volume is returned to Scratch.
Volume Owner is added to the Access List when RMM creates the profile.

Tape Security

RMM Processing of RACF TAPE PROFILEs for TPRACF(A /P)

CHAPTER 11… Controlling RACF tape profile processing

Table 34. RACF Processing Performed by DFSMSrmm

Command or Function	TAPEVOL	TAPEDSN	TAPEVOL and TAPEDSN
ADDVOLUME MASTER	For TPRACF(A/P): • Create TAPEVOL profile • Add access list built using the owner, user, and access information	No processing	As for TAPEVOL
ADDVOLUME USER	For TPRACF(A/P): • Create TAPEVOL profile • Add access list built using the owner, user, and access information	No processing	As for TAPEVOL

Table 34 is 3 pages in Installation and customization Guide

Tape Security

DEVSUP00 Open/Close/EOV

- TAPEAUTHDSN*
  How to authorize tape datasets using input from Tape management system
  - » Y RACF Tape Dataset profile DSTYPE=T
  - » N RACF DASD Dataset Profile No DSTYPE=T

    Erase on Scratch is copied from Tape management system

- TAPEAUTHF1*
  If a user has access to File 1 access to all other datasets on the volume are automatically authorized.
  - » TAPEAUTHRC4 Processing when RACF dataset profile is MISSING
    DEFAULT ACTION is FAIL the Request
  - » TAPEAUTHRC8 Processing when RACF dataset profile DENIES Access
    DEFAULT ACTION is FAIL the Request

  - » For TAPEAUTHF1 TAPEDSN is required to be ACTIVE

*Overrides RACF Settings -

Tape Security

Reference Tape Security with DFSMSrmm
SHARE San Diego 2007 Session 3088

EXAMPLE 1
User A is reading a file on a tape, fileseq=5. Dsn=TAPE.FILE

DEVSUP00
TAPEUATHDSN=N
RACF TAPEVOL is ACTIVE
RACF TAPEDSN is NOT ACTIVE
RMM issues SAF call with full 44 char dsn TAPE.FILE,fileseq=5
RACF discrete profile TAPE.FILE DASD Dataset profile is used

TAPEAUTHF1 IGNORED because TAPEAUTHDSN =N and TAPEDSN Class NOT ACTIVE

If TAPEDSN CLASS **is ACTIVE** TAPEAUTHF1 generates a SAF Call for
RMM issues SAF call with full 44 char dsn TAPE.FILE,fileseq=1

EXAMPLE 2
TAPEUATHDSN=Y
RACF TAPEVOL is ACTIVE
RMM issues SAF call with full 44 char dsn TAPE.FILE,fileseq=5
RACF discrete profile TAPE.FILE TAPE Dataset profile is used DSTYPE=T
TAPEUATHDSN=Y AND TAPEAUTHF1=Y
TAPEDSN Must be ACTIVE
RMM issues a second SAF call with full 44 char dsn FILE1,fileseq=1

*Overrides RACF Settings AND DFSMSrmm settings

Tape Security

What are your Settings?

- RACF
  - Is TAPEVOL Class Active
  - Is TAPEDSN Class Active
  - What profiles do you have defined STGADMIN.EDG.*
    Who has access?
- RMM
  - EDGRMM00 Option TPRACF? COMMANDAUTH?
- DEVSUP
  - TAPEAUTHDSN*
  - TAPEAUTHF1

Agenda

- Retentionmethods
  - VRSEL
  - EXPDT
    - Assigning Retentionmethod and Limitations
- Tape Security
  - RMM
  - RACF
  - DEVSUP
- RMM and Virtual Tape
  - Logical vs Physical
  - Export
  - Copy Export

RMM and Virtual Tape

- RMM and Virtual Tape
  - Logical, Physical and Stacked Volumes
  - Import/Export for TS3500 Virtual Tape Server VTS
  - Copy Export TS7700 Virtualization Engine
    TS7720 all cache
    TS7740 cache and back end drives

RMM and Virtual Tape

- RMM and Virtual Tape

  Logical, Physical, Stacked Volumes

  RMM provides support for physical and logical volumes.

  - Logical Volumes reside in a VTS* or on a Stacked volume.
  - Exported Stacked volume.
  - Policies (VRS) are applied to Virtual volumes
  - Policies can APPLY to Stacked volumes when part of a VTS*

  Volumes are added to RMM when entered into the Library*

  Volumes residing in a VTS are defined as TYPE(LOGICAL) and their LOCATION(*libname*)*

  Volumes will be automatically added to RMM depending on the state of your CBRUXENT Exit and any PRTITION statements to ACCEPT or IGNORE ranges of volumes.

  ADDVOL *volser* TYPE(VOLCAT) indicates to get volume information From the TCDB

  Library manager

RMM and Virtual Tape

- RMM PRTITION of tape Libraries

- PRTITION TYPE(NORMM) VOLUME(*) SMT(IGNORE)

Volumes not already known to RMM will not be processed by RMM on this system. No new volumes will be able to be added to RMM unless they are defined to RMM first. No need to disable CBRUXENT exit

- TYPE RMM or NORMM

  THE QUESTION IS: DOES RMM KNOW ABOUT THE VOLSER , is it already in the RMM CDS. NO

- VOLUME PATTERN or RANGE

  THE QUESTION IS: DOES THIS RULE APPLY TO THE VOLUME being processed

- SMT or NOSMT BY LOCATION *OPTIONAL*

  THE QUESTION IS: IS THIS VOLUME SYSTEM MANAGED *YES; it's in a TS7700*

- ACCEPT or IGNORE

  THE QUESTION IS: SHOULD RMM ALLOW THE VOLUME TO BE PROCESSED OR IGNORE

DO NOT Add the VOLUME to the RMM CDS

RMM and Virtual Tape

Volumes have HOME Locations

Shelf
Library
Systems managed Library

For VTS and tape Libraries, once opened the Volumes Location will populate with the Library name

When a Logical Volume is added to RMM for a VTS you should use
RMM ADDVOLUME STATUS(VOLCAT)

DFSMSrmm uses information in the TCDB to update the DFSMSrmm CDS

Volumes added with Status(VOLCAT) not found in the TCDB will be updated with STATUS(ENTRY) until entered into the library.

For Virtual tape, this means adding to the Library manager.

RMM and Virtual Tape

- IMPORT/EXPORT IBM VTS
  - RMM keeps track of logical volumes Exported onto Stacked volumes
  - Stacked Volume support must be enabled.
  - RMM tracks the container volumes and handles
  - movement per the VRS rules for the Logical Volumes

- COPY EXPORT IBM TS7700 Virtualization Engines
  - RMM keeps track of Physical/Stacked volumes when they are Exported
  - movement per the VRS rules for the Physical Volumes

RMM does not allow distributed VTS ONLY consolidated libraries

TS7740 allows a COPY of the logical volume to be removed from the library.
Recovery is not an IMPORT but a modified disaster recovery process.

When ejected message E0006 is intercepted by RMM, the stacked Volume is ADDED to the RMM CDS.
Stacked Volume support must be enabled or the volume is NOT ADDED.

During Inventory management RMM invokes the CBRXLCS QVR interface to determine when an export-hold volume has been ejected.

RMM and Virtual Tape

Export

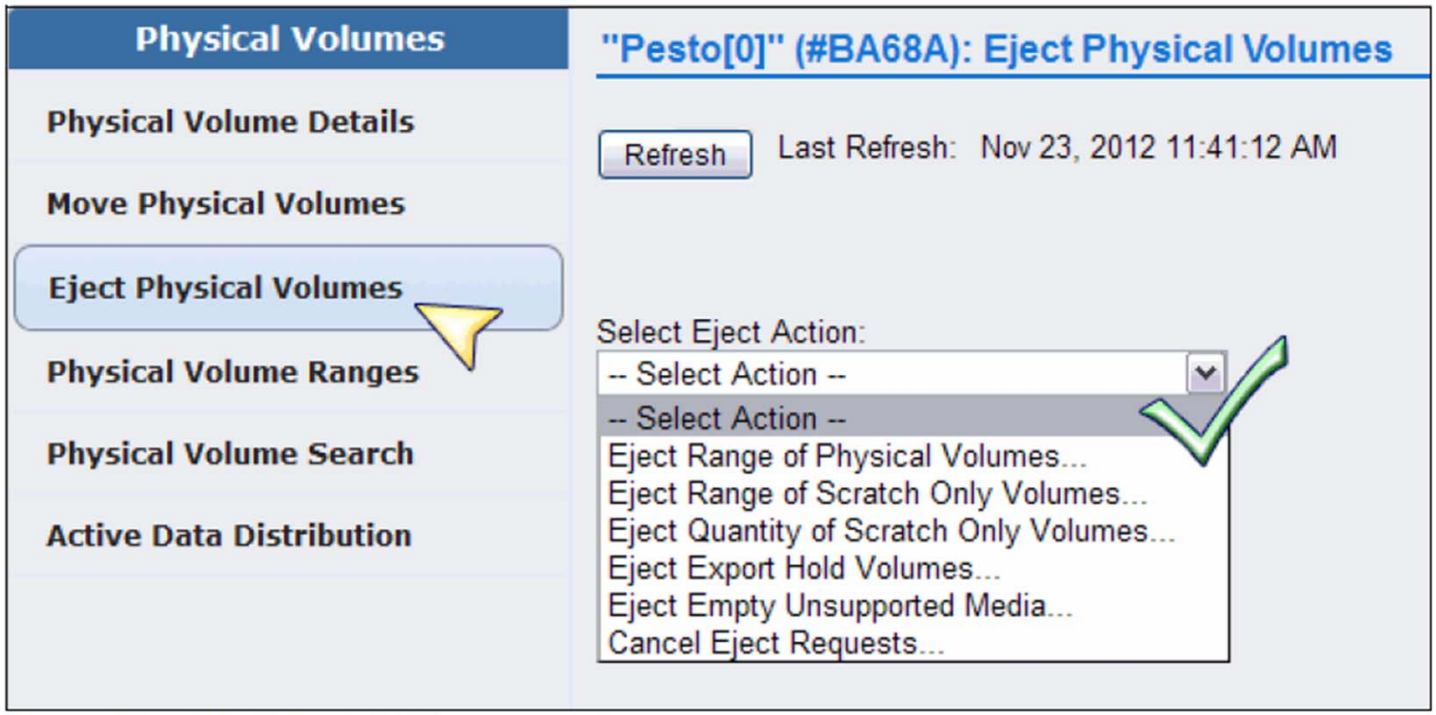


Figure 9-58 Eject Physical Volumes panel

RMM and Virtual Tape

- VRSEL and DSTORE for Stacked volumes

  Stacked Volume support must be enabled.

  During Inventory management VRS rules that apply to the volume for the Copy Exported Volumes will be processed for MOVEMENT

  RMM ADDVRS VOLUME(*stacked –volser pattern*) Count(99999) LOC(exportloc)

  DSTORE will process Stacked Volumes
  Include a Report extract to Produce the Movement report
  confirm movement

- Reclaim per reclaim policies

TS3500 Library

TS7700 Virtualization Engine

RMM and Virtual Tape

- Reclaim per reclaim policies
  (function of TS7700 Virtualization Engine)

  Once the Stacked volume is Empty message
  CBR3750I R0000 RECLAIM SUCCESSFUL FOR EXPORTED STACKED VOLUME volser

  RMM intercepts this message and sets the volumes Home Location to the library. the Copy Exported volume can be inserted back into the TS7740. the next Housekeeping DSTORE will mark the Stacked Volume MANUAL MOVE mode. This ensures that the volume will not move again until once again used for COPY/EXPORT.
  Specify a Report Extract //XREPTEXT for all Housekeeping Steps

Logical volumes on Copy Export Stacked Volumes

RMM does NOT track which Logical Volume resides on a COPY EXPORT

EDGJCEXP can be run to list the Logical Volumes on a Copy Export stacked volume from a TS7700 Virtualization Engine.

SYS1.SAMPLIB(EDGJCEXP) s for a JES2 system. Two steps in a single job. For a JES3 system split into separate jobs

- Input is a Export List
- BVIR Volume Map Logical and Physical Volume relationship
  or Physical Volume Status Pool
- Extended Report extract 'X' records

*a BVIR request for a volume map may run several minutes

Logical volumes on Copy Export Stacked volumes

- BVIR - Volume Map

Stacked Volume Serial Number

Logical Volume Serial Number

```
********************************** Top of Data ****
VTS BULK VOLUME DATA REQUEST
VOLUME MAP
11/03/2009 03:22:06 VERSION 02
S/N: 3484G  LIB ID: 3484A

PHYSICAL  LOGICAL P/B  ORDER    PART          SIZE
A02032    HYD869   B   000001 1 OF 1         0.00 M
A02032    HYD880   B   000002 1 OF 1         0.00 M
A02037    HYD864   B   000001 1 OF 1         0.00 M
A02037    HYD865   B   000002 1 OF 1         0.00 M
A02037    HYD862   B   000003 1 OF 1         0.00 M
A02037    HYD866   B   000004 1 OF 1         0.00 M
A02037    HYD868   B   000005 1 OF 1         2.35 M
A02037    HYD867   B   000006 1 OF 1         0.00 M
A02037    HYD861   B   000007 1 OF 1         0.00 M
A02037    HYD880   B   000002 1 OF 1         1.00 M
A02073    HYD697   P   000001 1 OF 1       237.86 M
A02073    HYD511   P   000002 1 OF 1         0.00 M
A02073    HYD504   P   000003 1 OF 1       313.75 M
A02073    HYD804   P   000004 1 OF 1         0.00 M
A02073    HYD711   P   000005 1 OF 1        24.15 M
A02073    HYD713   P   000006 1 OF 1        24.15 M
A02073    HYD715   P   000007 1 OF 1        24.16 M
```

Logical volumes on Copy Export Stacked volumes

- EDGJCEXP Report – sorted by data set

Copy Exported Data Sets - 1 - 12/08/2009 03:30:21

based on Bulk Volume Information Retrieval data

DATA SET INFORMATION

DATA SET NAME	CREATE DATE	CREATE TIME	REC FM	BLK SIZE	RETENTION DATE	EXPIRATION DATE	PHYSICAL FILE SEQ	V R
BERNDS.EXPIRED.HYD868	2009/338	082750	F	80	2009/353	2009/341	1	Y
BERNDS.EXPIRED.HYD880	2009/337	150732	F	80	2009/352	2009/340	1	Y
BERNDS.MULTI.VOLUME.DS1	2009/338	082524	FB	80	2009/353	2009/341	1	Y
BERNDS.MULTI.VOLUME.DS1	2009/338	082524	FB	80	2009/353	2009/341	1	Y

LOGICAL VOLUME VOLSER	VOLSEQ	INFO REQUIRED LOCATION	EXPIRATION DATE	STACKED VOLUME VOLSER	CURRENT LOCATION	DESTI NATION	IN TRAN	RETENTION DATE	V R	COPY EXPORT EXPORT DATE	INFO EXPORT TIME
HYD868	1	MAZ2	2009/341	A02039	ATL3484F	MAZ1	Y	2020/001	Y	2009/338	083938
HYD880	1	MAZ2	2009/341	A02039	ATL3484F	MAZ1	Y	2020/001	Y	2009/338	083938
HYD862	1	MAZ2	2009/341	A02039	ATL3484F	MAZ1	Y	2020/001	Y	2009/338	083938
HYD861	1	MAZ2	2009/341	A02039	ATL3484F	MAZ1	Y	2020/001	Y	2009/338	083938

Logical volumes on Copy Export Stacked volumes

- EDGJCEXP Report – sorted by logical volume

```
Copy Exported Data Sets By Logical Volume              - 1 -        12/08/2009        03:30:22

based on Bulk Volume Information Retrieval data

Logical Volume Info:  HYD861    1 MAZ2     2009/341

DATA SET INFORMATION

                                                 CREATE      CREATE REC  BLK   RETENTION   EXPIRATION  PHYSICAL V
DATA SET NAME                                    DATE        TIME   FM   SIZE  DATE        DATE        FILE SEQ R
-----------------------------------------------  ----------  ------ ---- ----- ----------  ----------  -------- -
BERNDS.MULTI.VOLUME.DS1                          2009/338    082524 FB     80 2009/353   2009/341       1    Y
BERNDS.SEC14.HYD861                              2009/338    082527 F      80 2009/353   2009/341       2    Y
BERNDS.SEC14.HYD861                              2009/338    082638 F      80 2009/353   2009/341       3    Y
BERNDS.SEC14.HYD861                              2009/338    082749 F      80 2009/353   2009/341       4    Y

STACKED VOLUME   INFO                                          COPY EXPORT INFO
        CURRENT  DESTI    IN   RETENTION  V EXPORT            EXPORT
VOLSER  LOCATION NATION   TRAN DATE       R DATE              TIME
A02039  ATL3484F MAZ1     Y    2020/001   Y 2009/338          083938
A02039  ATL3484F MAZ1     Y    2020/001   Y 2009/338          083938
A02039  ATL3484F MAZ1     Y    2020/001   Y 2009/338          083938
A02039  ATL3484F MAZ1     Y    2020/001   Y 2009/338          083938
```

Logical volumes on Copy Export Stacked volumes

- EDGJCEXP Report – sorted by stacked volume

```
Copy Exported Data Sets By Stacked Volume          - 1 -       12/08/2009       03:30:22

based on Bulk Volume Information Retrieval data

Stacked Volume Info:  A02039 ATL3484F MAZ1     Y 2020/001    Y 2009/338   083938

                 LOGICAL VOLUME INFO
                                 REQUIRED EXPIRATION
                 VOLSER  VOLSEQ LOCATION DATE

                 HYD861      1   MAZ2     2009/341
                 HYD861      1   MAZ2     2009/341
                 HYD861      1   MAZ2     2009/341
                 HYD861      1   MAZ2     2009/341

                 DATA SET INFORMATION
                                                                CREATE     CREATE REC  BLK   RETENTION  EXPIRATION PHYSICAL V
                 DATA SET NAME                                  DATE       TIME   FM   SIZE  DATE       DATE       FILE SEQ R
                 ---------------------------------------------- ---------- ------ ---- ----- ---------- ---------- --------- -
                 BERNDS.MULTI.VOLUME.DS1                        2009/338   082524 FB      80  2009/353   2009/341        1    Y
                 BERNDS.SEC14.HYD861                            2009/338   082527 F       80  2009/353   2009/341        2    Y
                 BERNDS.SEC14.HYD861                            2009/338   082638 F       80  2009/353   2009/341        3    Y
                 BERNDS.SEC14.HYD861                            2009/338   082749 F       80  2009/353   2009/341        4    Y
```

Bulk volume Information Retrieval (BVIR)

Monitoring for Copy Export data

The Bulk Volume Information Retrieval (BVIR) function can also be used to obtain a current list of exported physical volumes for a secondary pool. For each exported physical volume, information is available on the amount of active data that each cartridge contains.

On appropriate TS7740 CLUSTER where Exported Volumes were based on storage group for the grid

BVIR FEATURE MUST BE ENABLED ON THE GRID

Run BVIRRPT TO GET VOLUME MAP

HLQ.IBMTOOLS.CNTL(BVIRVTS) ftp?

```
//jobname JOB
..
//GETVOLS EXEC BVIRVTS,TYPE=VOL,VTSID=CL0,MC=MCVTS0
```

RMM Enabling Stacked Volume support

- Is Stacked volume support enabled?

  RMM LC CNTL Stacked Volumes = Mixed

```
Options:
  Stacked Volumes          = DISABLED
```

- Stacked volume support can be turned on with EDGUTIL,CREATE STACKEDVOLUME(YES)

- Recommendation Define your backend VTS volumes as Stacked.

- You can defined Stacked Volumes to RMM manually but RMM will not manage movement for them.

  RMM ADDVOL volser TYPE(LOGICAL)
  RMM ADDVOL volser TYPE(PHYSICAL)
  RMM ADDVOL *volser* TYPE(STACKED)

  To have RMM Properly identify Logical Volumes on a Stacked Volume:

  Create a list

```
RMM SEARCHVOLUME VOLUME(ST*) OWNER(*) LIMIT(*) -
    CLIST('RMM CHANGEVOLUME ','TYPE(STACKED) LOCATION(vts_name) NORACK')
```

  Run EDGUTIL MEND after ensuring your ranges for container volumes are correct.

```
//Stepname  EXEC PGM=EDGUTIL,PARM=UPDATE
//SYSIN DD
      STACKEDVOLUME(YES)
```

RMM and Virtual Tape

Reference documentation

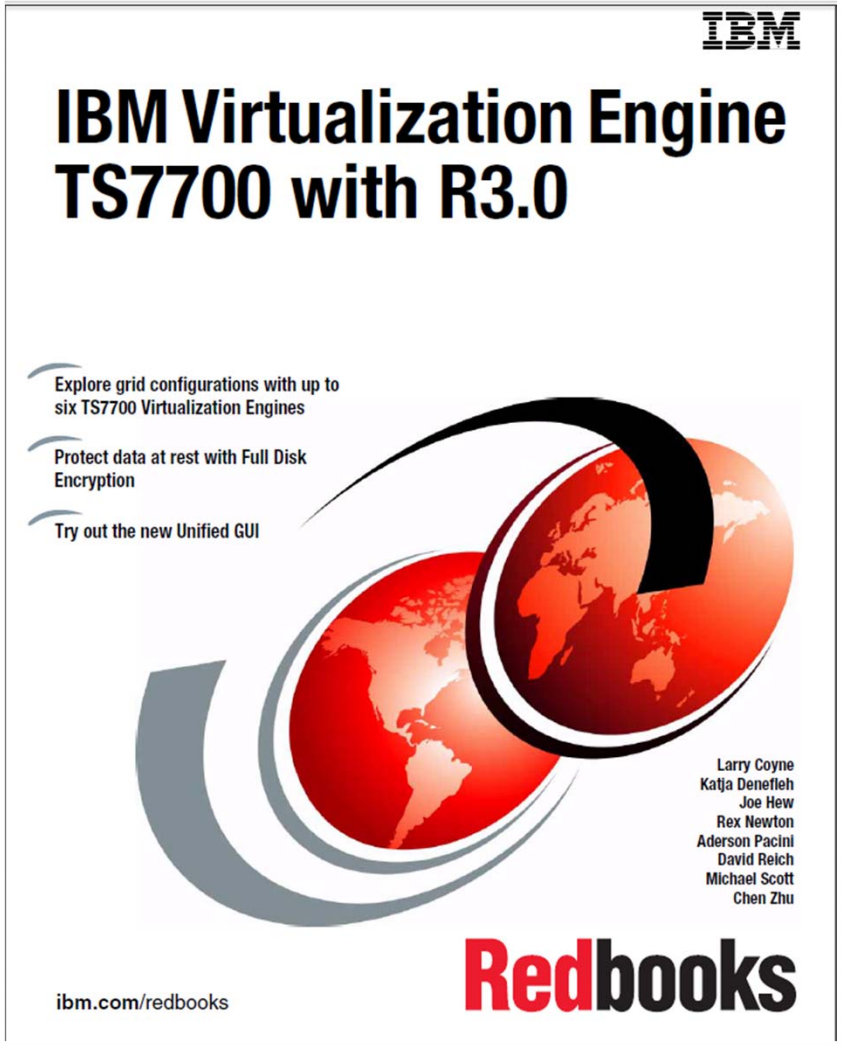
DFSMSrmm Installation and Customization
DFSMSrmm Reporting
DFSMSrmm Managing and using
z/OS DFSMS OAM Planning, Installation and Storage Administration Guide

IBM Redbooks
IBM Virtualization Engine TS7700 with R3.0 SG24-8122-00
Chapter 11 discusses Copy Export
Appendix F BVIR JCL

White Papers
IBM Virtualization Engine TS7700 Series Bulk Volume Information Retrieval Function User's Guide Version 3.1
by Takeshi Nohta

IBM Virtualization Engine TS7700 Series COPY EXPORT Users Guide

RMM and Virtual Tape



Chapter 11 Disaster Recovery 11.5 Copy Export and Reclaim

RMM Exploitation

Thank you!