

Setting Up and Using an SMS-Managed Manual Tape Library (MTL)

Session 09887

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Agenda

- How are tapes managed in SMS?
 - Automated vs. Manual Libraries
 - The OAM Address Space
 - The Tape Control Database
- Setting up an MTL
 - HCD definitions
 - SMS Constructs
 - ACS Routines
- Allocating SMS-Managed tape datasets
- Issues with SMS MTL
- Managing Tapes without SMS

Tape Libraries

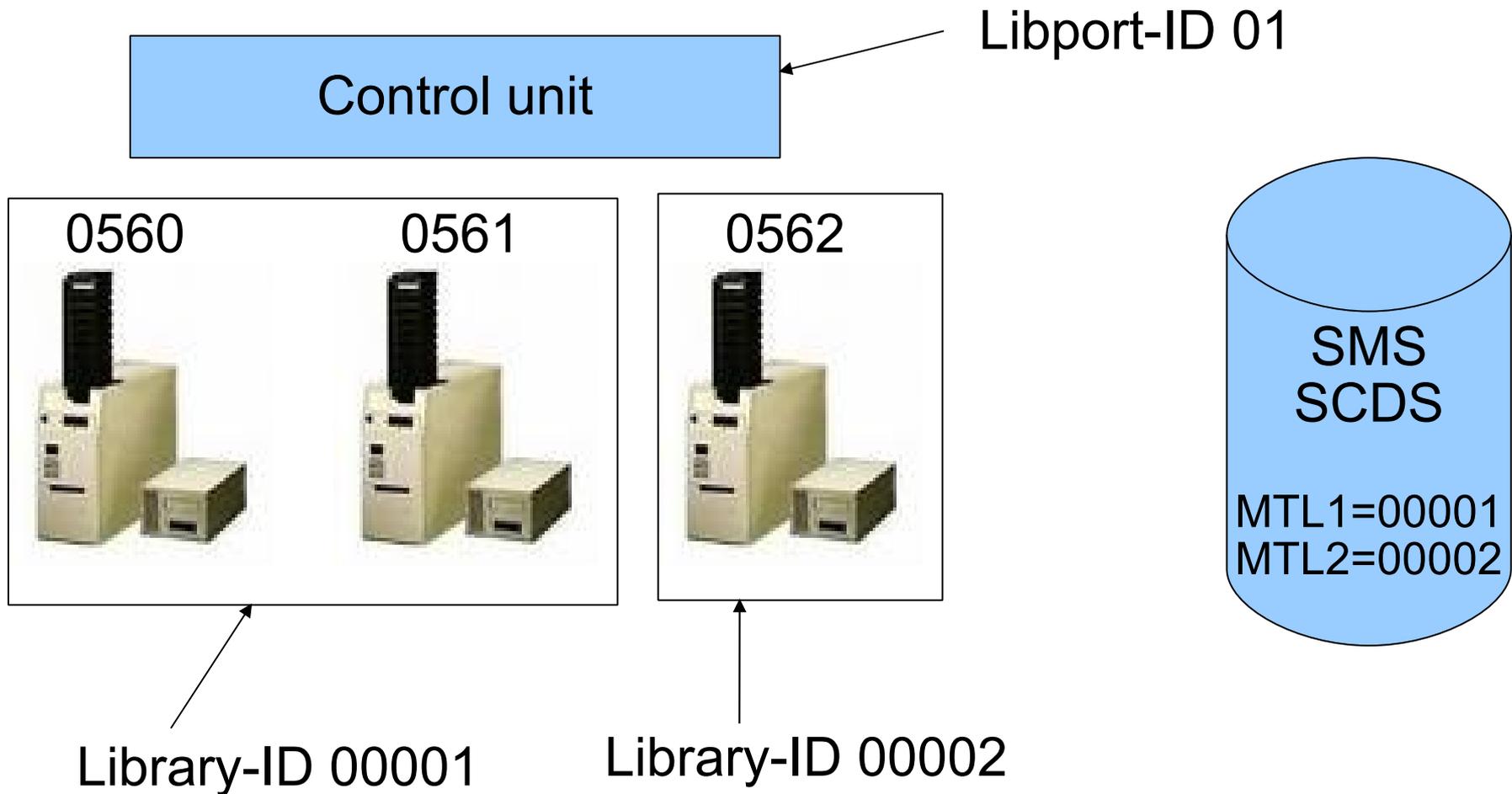
- Automated Libraries
 - Tape robotic systems
 - Managed by vendor software, or SMS and OAM
 - May include outboard policy management

- Manual Libraries
 - Defined in HCD as 'MTL'
 - Standalone (non-robotic) tape drives
 - Tapes manually mounted by operator
 - Virtual tape systems
 - Managed by SMS and OAM; usually no outboard management

Define Libraries in HCD

- Define tape drives as MTL libraries (MTL=YES)
- Define tape library serial number (LIBRARY-ID)
 - Any 5 digit number
 - Must be unique within sysplex
 - *Must match SMS Tape Library Definition*
- Identify control unit for library (LIBPORT-ID)
 - All devices on control unit must have same LIBPORT-ID
 - Devices on control unit can
 - Reside in different libraries (have different LIBRARY-IDs)
 - be non-MTL

Define Libraries in HCD



Required because MTL's are not self-defining at IPL time

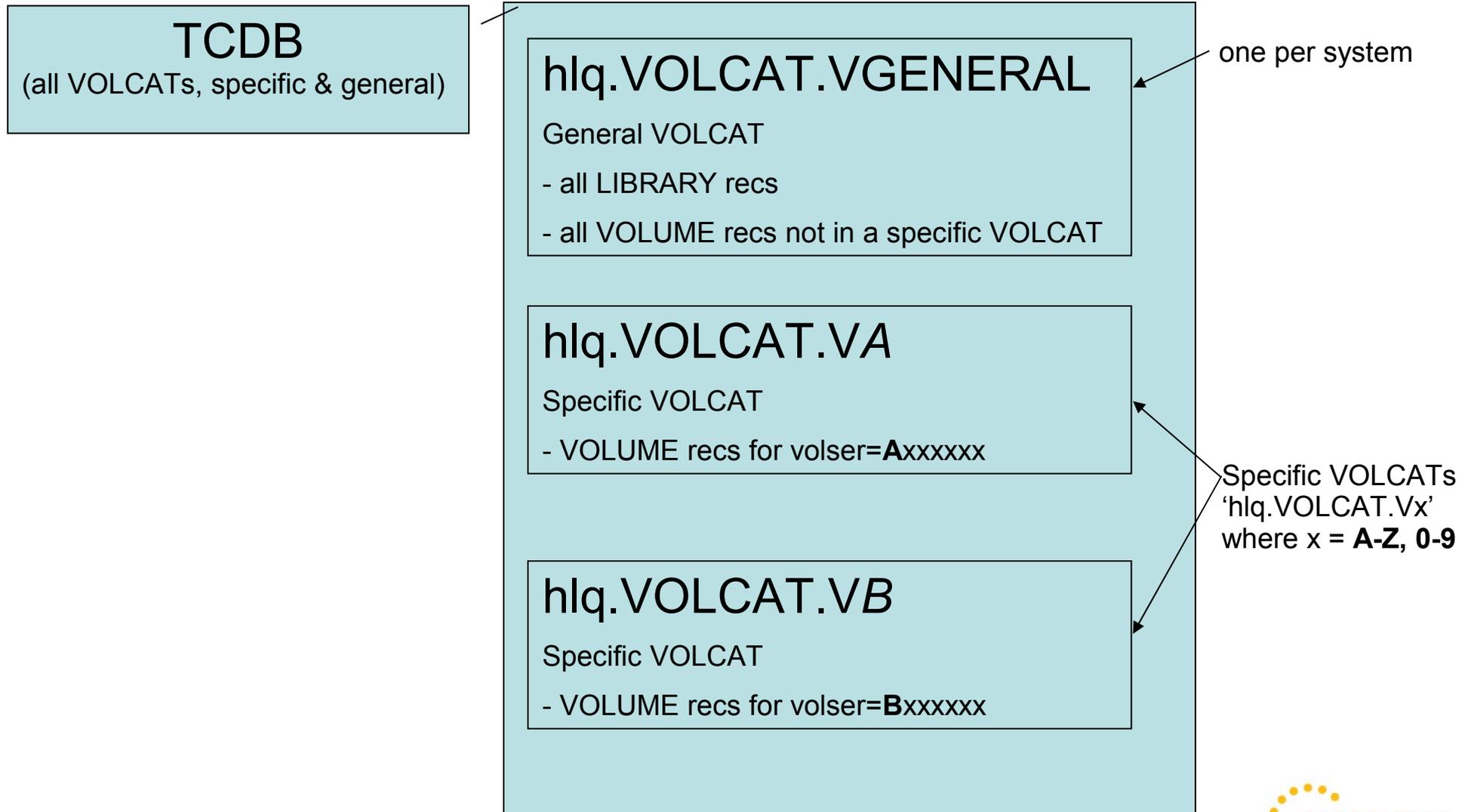
The OAM Address Space

- Library Control System (LCS) provides
 - Cartridge handling (entry/eject, mount/demount, et.al.)
 - Operator commands (DISPLAY, VARY, etc.)
 - TCDB (VOLCAT) updates
- Cartridge Entry / Eject
 - Manually via LIBRARY command or ISMF line command
 - Programatically via CBRXLCS interface

Parmlib / JCL Changes Required for OAM

- PARMLIB Changes
 - IGDSMSxx – OAMPROC procname, task id
 - IEFSSNxx – start OAM subsystem
- OAM Catalogued Procedure
 - SYS1.SAMPLIB(CBRAPROC)

Tape Control Database (VOLCAT)



Library Entry

Library Name

Library ID

--Console Name (to receive msgs)

--Description (1-120 char)

--Hardware Device Type (1-8 char)

--Logical Type (automated/manual)

--Total no. of slots (automated library)

--No. of empty slots (automated library)

--No. of scratch vols (for each MEDIATYPE)

--Scratch threshold (for each MEDIATYPE)

Volume Entry

Volume Serial Number

--Storage Group Name or *SCRTCH*

--Library Name (library name or 'SHELF')

--Location (LIBRARY or SHELF)

--Use attribute (SCRATCH or PRIVATE)

--Shelf name (usually for non-library volumes)

--Owner Info (1-64 char)

--Mediatype (MEDIA1-nn)

--Recording Technique

--Compaction (yes/no/none/IDRC)

--expiration date (highest on vol, blank for scratch tape)

--date last entered / ejected

--date last mounted and opened

--date last written

--readcompatible attribute (yes/no)

--writeprotect attribute (yes/no)

--secure checkpoint volume attribute (yes or no)

Defining the TCDB

- Define Catalog

```
DEFINE UCAT -  
  NAME (SYS1.VOLCAT.VGENERAL) -  
VOLCATALOG  
VOLUME (vvvvvvv)  
CYLINDERS (pri sec) )
```

- Define LIBRARY Entries

- *Automatically when entered in SMS via ISMF*
- Manually via IDCAMS CREATE LIBRARYENTRY

- Alter LIBRARY Entries

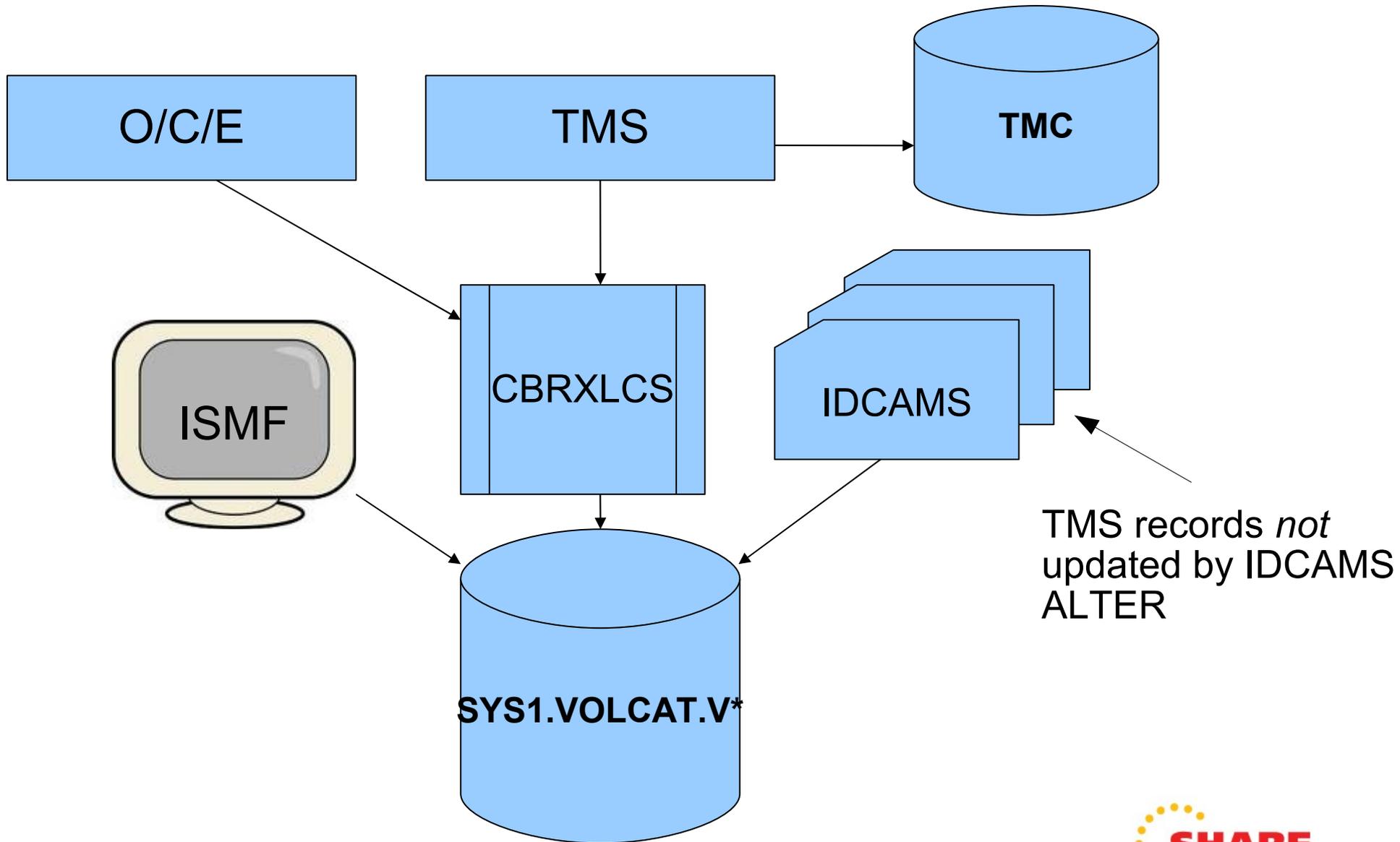
- IDCAMS ALTER LIBRARYENTRY
- ISMF Library Management (option 10.3)

Defining the TCDB

- Define VOLUME Entries
 - *Automatically, as cartridges are entered into library*
 - via LIBRARY ENTER command
 - via CBRXLCS
 - Manually, via IDCAMS CREATE VOLUMEENTRY

- Alter VOLUME Entries
 - Automatically by OPEN/CLOSE/EOV, TMS (CBRXLCS)
 - Manually via
 - IDCAMS ALTER VOLUMEENTRY
 - ISMF Mountable Tape Volume (ISMF option 2.3)

Altering TCDB Records



TCDB – Other Tasks

- Connect the VOLCAT to other systems

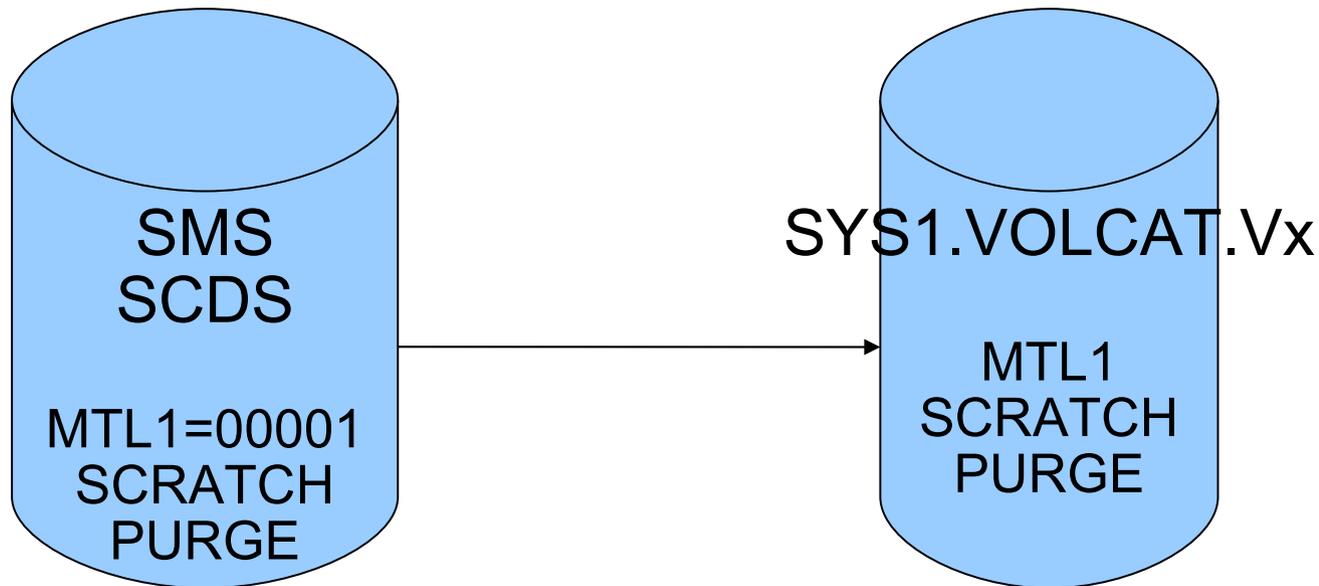
```
IMPORT CONNECT -  
VOLCATALOG -  
OBJECTS ((SYS1.VOLCAT.VGENERAL) operands)
```

- Define and authorize RACF resources (*do this first*)

```
RDEFINE FACILITY STGADMIN.IGG.LIBRARY  
PERMIT STGADMIN.IGG.LIBRARY CLASS (FACILITY) -  
ACCESS (READ) ID (logonID)
```

Define Tape Libraries to SMS

- TCDB Library entry is created when library is defined to ISMF
 - Even if configuration is not activated



Define Tape Libraries to SMS

- Define Library Name
 - LIBRARY-ID identifies libraries and must match HCD
- Define Library Characteristics
 - ENTRY DEFAULT USE ATTRIBUTE
 - (default volume type – scratch or private)
 - EJECT DEFAULT
 - What to do with TCDB volume record on eject – Purge or Keep
 - ENTRY DEFAULT DATA CLASS
 - MEDIA TYPE **Scratch Thresholds**
 - INITIAL ONLINE STATUS (Y/N)

Define Data Classes

- Data Class
 - If assigned, supplies MEDIA TYPE, RECORDING TECHNOLOGY, COMPACTION
 - If not assigned, taken from
 - Tape library definition
 - LIBRARY SETCL command
 - LIBRARY ENTER command
 - all other data class attributes ignored

Define Storage Classes

- Storage Class
 - Must be assigned so that SG routine runs
 - Used in SG routine to select appropriate SG/Library

- Duplicate VOLSER label
 - Storage class DUPT@SMS and DISP=OLD
 - Allows mount outside of library
 - even though volser is in TCDB

Define Tape Storage Groups

- Specifies Library Name
 - Linked to tape drive via Tape Library LIBRARY-ID
- Tape SG may specify multiple libraries (1-8)
 - Scratch allocation will consider all devices in assigned libraries
 - Limited to first 253 tape subsystems (OA21462)

Update ACS Routines

- Data Class name assigned by DC routine
- Storage Class name assigned by SC routine
 - May need to check for UNIT=AFF
- Storage Group name assigned by SG routine
 - to the tape volume, not the dataset
 - TCDB record is updated
 - SG name changed from *SCRTCH* to SG
 - Use attribute changed from S to P
 - Set RECORDING-TECHNOLOGY, EXP DATE, et. al.
 - IGDACSXT may set ACS R/O variables

Activate

- Activate the IODF
 - IPL or ACTIVATE IODF=xx
- SMS Configuration
 - SETSMS SCDS(scdsname)
- Start OAM

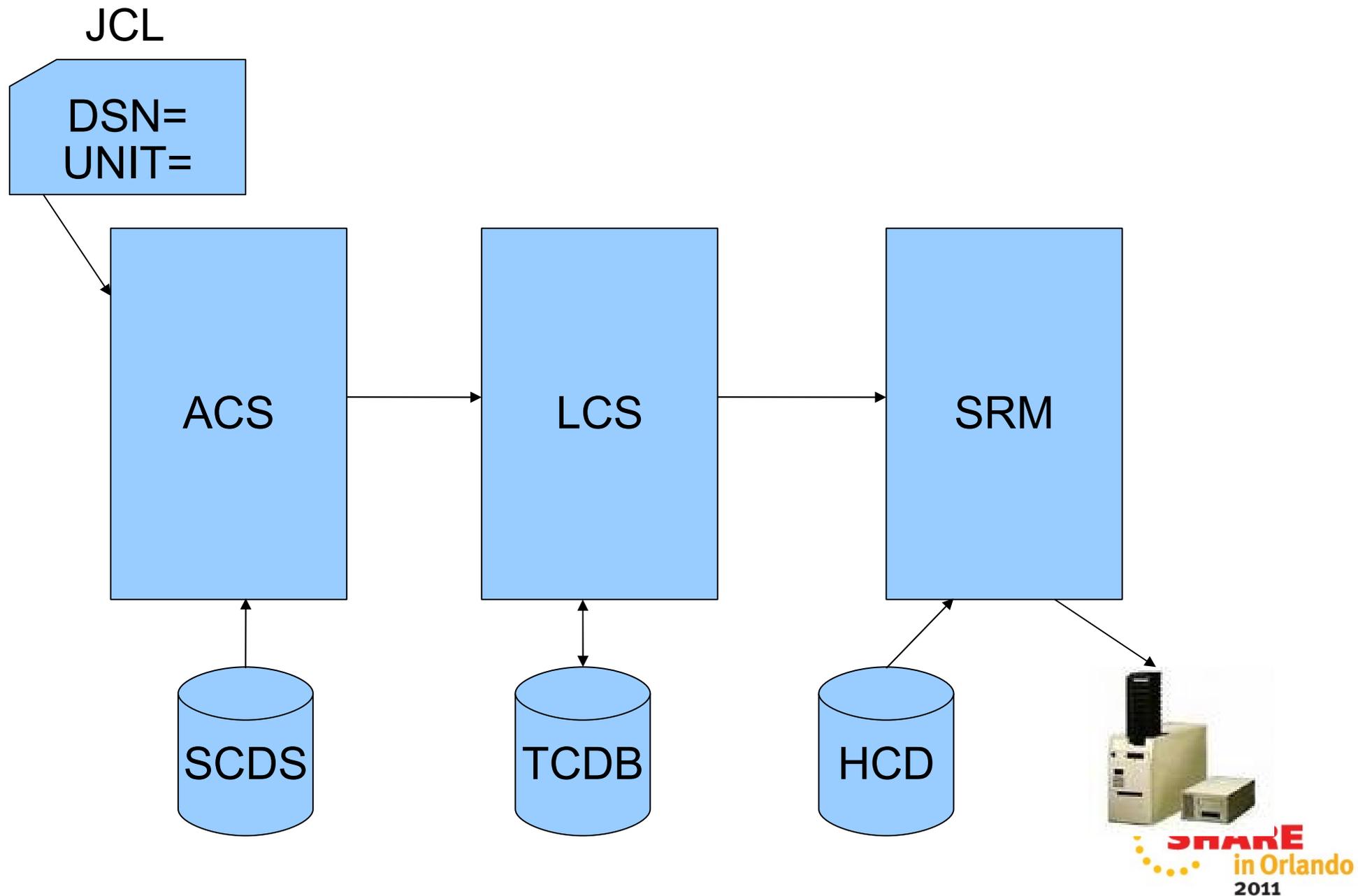
Enter Volumes into Libraries

- Volumes must be 'entered' into the MTL
- LIBRARY ENTER,volser,library,MEDIA n
 - CBRXLCS programming interface
 - DFSMSrmm ADDVOLUME or equivalent
- MEDIATYPE
 - Set from LIBRARY ENTER *or*
 - Default data class *or*
 - LIBRARY SETCL command

Using ISMF Library Lists

- ISMF Mountable Tape Volume List commands
 - ALTER
 - EJECT
- ISMF Tape Library List commands (option 10.3.1)
 - ALTER
 - DELETE
 - LISTVOL – show tape volsers in library
- Console DISPLAY command for Libraries and Volumes

Tape Device Selection



Cautions

- Changing ACS routines / SG Definitions
 - Affects only NEW tape allocations
 - TCDB records must be changed to change SG for existing tapes
 - ISMF ALTER, CBRXLCS (programmatically), IDCAMS
- Alter Tape Library in SMS
 - TCDB is updated immediately
 - Even before SMS configuration is activated
- Hardware type must be supported for MTL
- Operator must mount appropriate tape (mediatype)

Cautions

- Who maintains SMS configuration?
- Is TCDB in sync with TMC?
- Which tape drive is selected?
 - Multiple libraries
 - 'tape-on-disk' systems provide hundreds of drives

Useful Commands / Documentation

- DISPLAY UNIT (MTL devices shown as '349M', etc.)
- DEVSERV QT, QLIB
- DISPLAY SMS,
 - LIBRARY,ALL(DETAIL)
 - VOL(volser) (or ISMF option 2)
- LIBRARY
 - DISPDRV,deviceno
- *DFSMS OAM Planning, Installation, and Storage Administration Guide for Tape Libraries SC35-0427*
- *DFSMS Implementing System-Managed Storage SC26-7407*

Other Tape Allocation Possibilities

- SSMHONOR
 - Allows device selection within UNITs selected by SMS
- Non-SMS Managed Tape
 - By UNIT esoteric or UIM
 - DTS Software ACC/DCC or similar
 - IGGPRE00

Questions?



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Next DTS Webinar – Tuesday, August 23

