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

Session 10237
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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
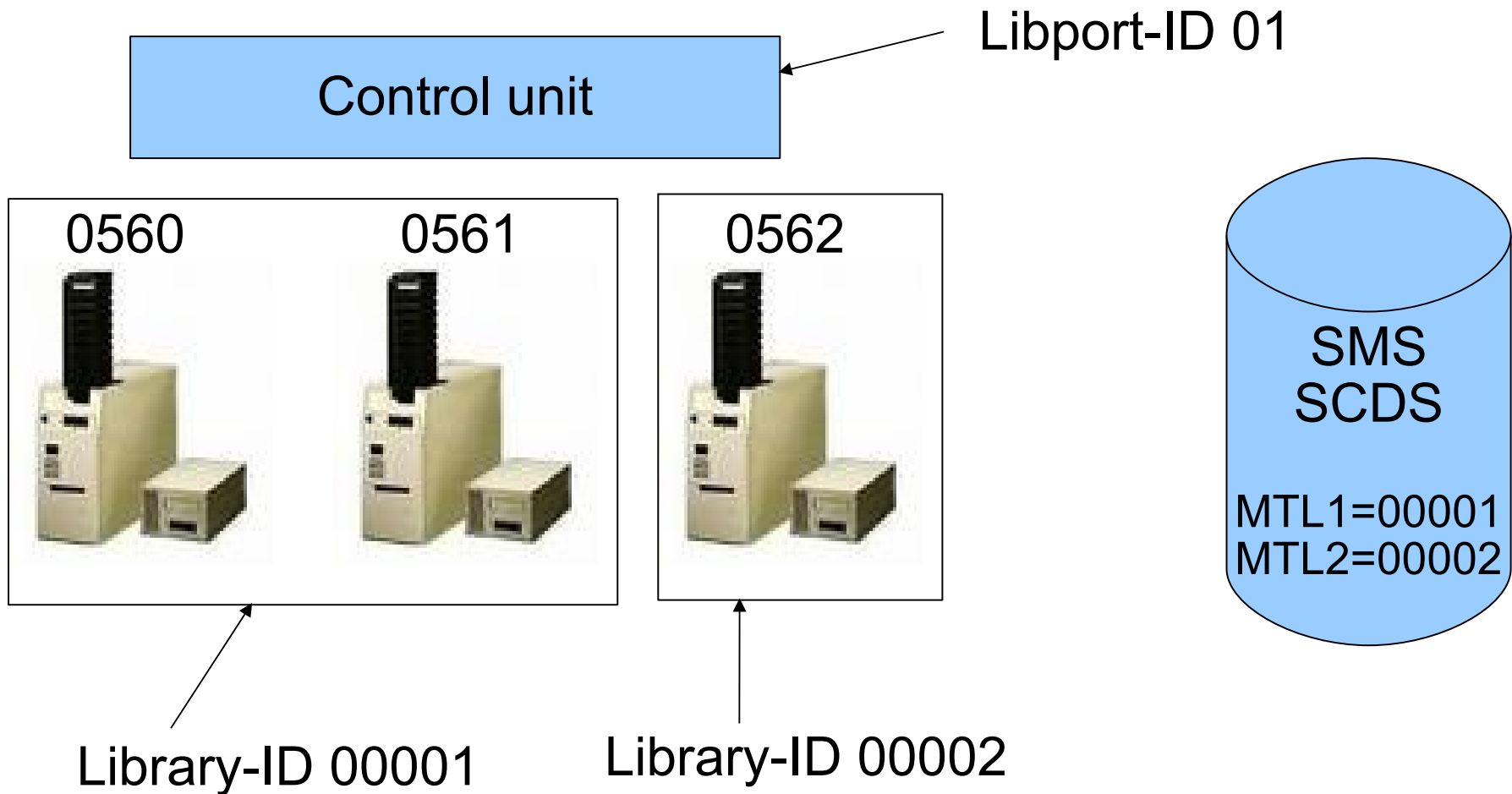
Tape Libraries

- 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

Control unit

Libport-ID 01

0560   0561   0562

SMS
SCDS

MTL1=00001
MTL2=00002

Library-ID 00001   Library-ID 00002

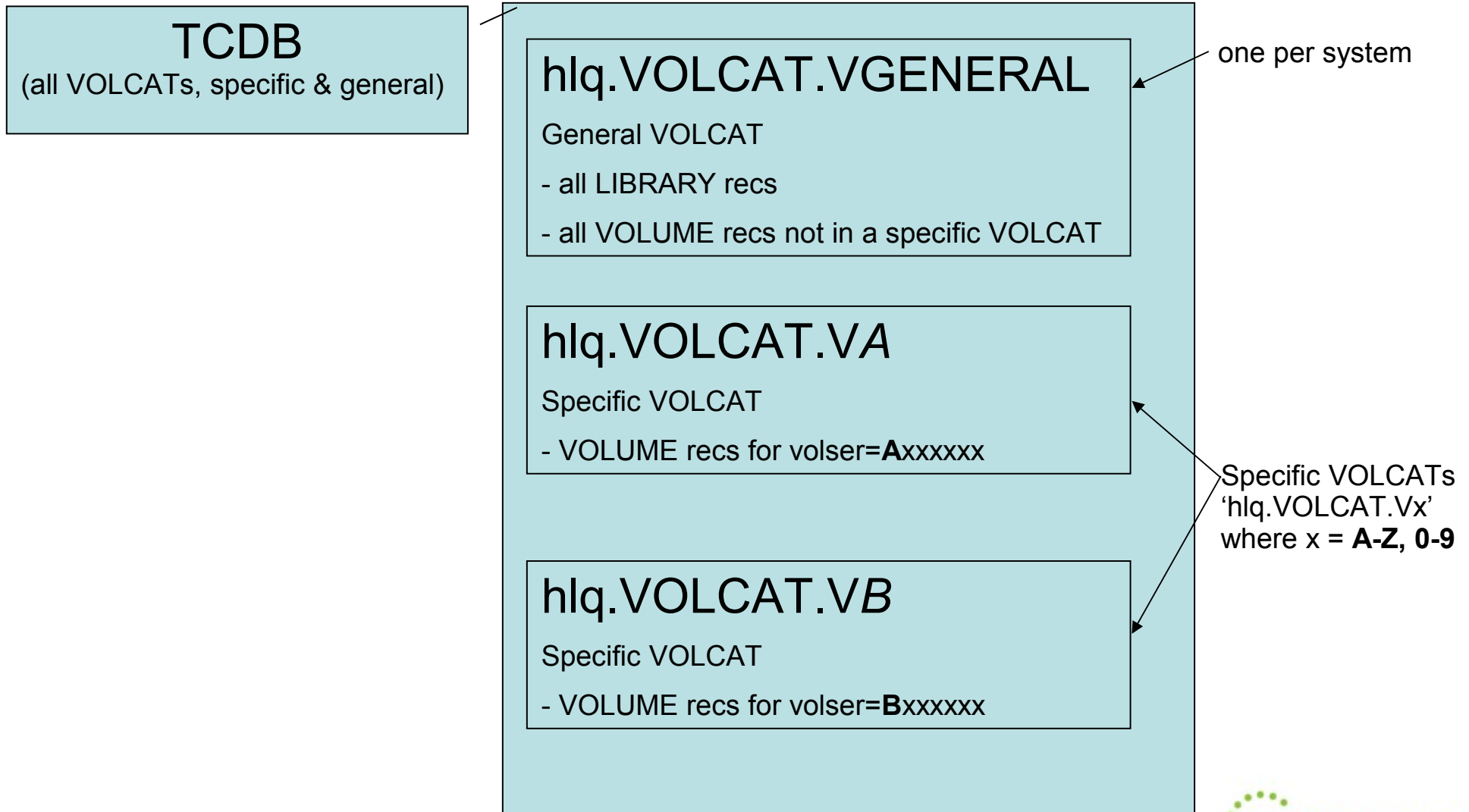Required because MTL's are not self-defining at IPL time

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)

TCDB
(all VOLCATs, specific & general)

hlq.VOLCAT.VGENERAL

General VOLCAT

- all LIBRARY recs

- all VOLUME recs not in a specific VOLCAT

one per system

hlq.VOLCAT.V*A*

Specific VOLCAT

- VOLUME recs for volser=**A**xxxxxx

hlq.VOLCAT.V*B*

Specific VOLCAT

- VOLUME recs for volser=**B**xxxxxx

Specific VOLCATs
'hlq.VOLCAT.Vx'
where x = **A-Z, 0-9**

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(vvvvvv)
CYLINDERS(pri sec) )
```

- Define LIBRARY Entries

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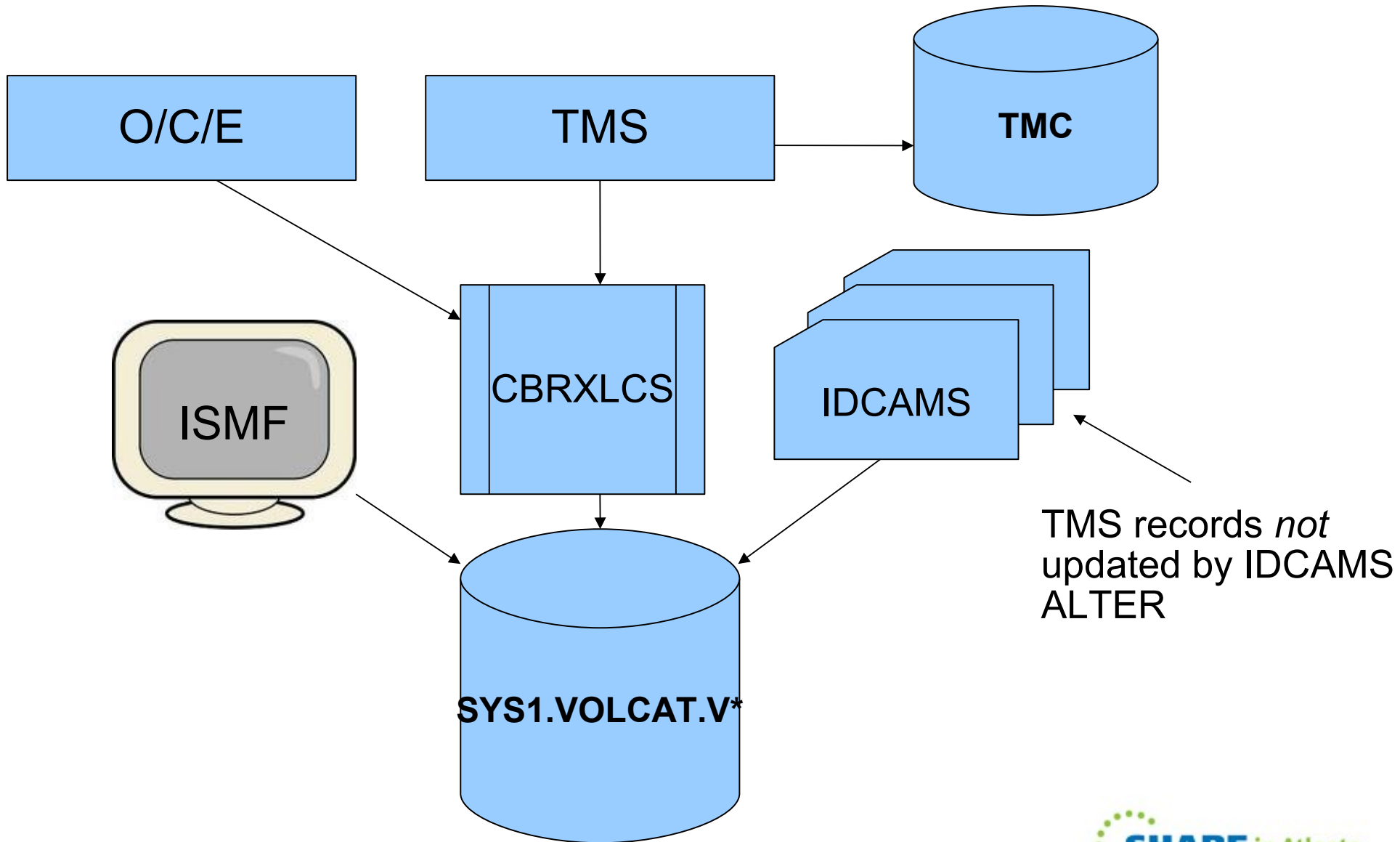
  - Manually via IDCAMS CREATE LIBRARYENTRY

- 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

O/C/E TMS TMC

ISMF CBRXLCS IDCAMS

SYS1.VOLCAT.V*

TMS records *not* updated by IDCAMS ALTER

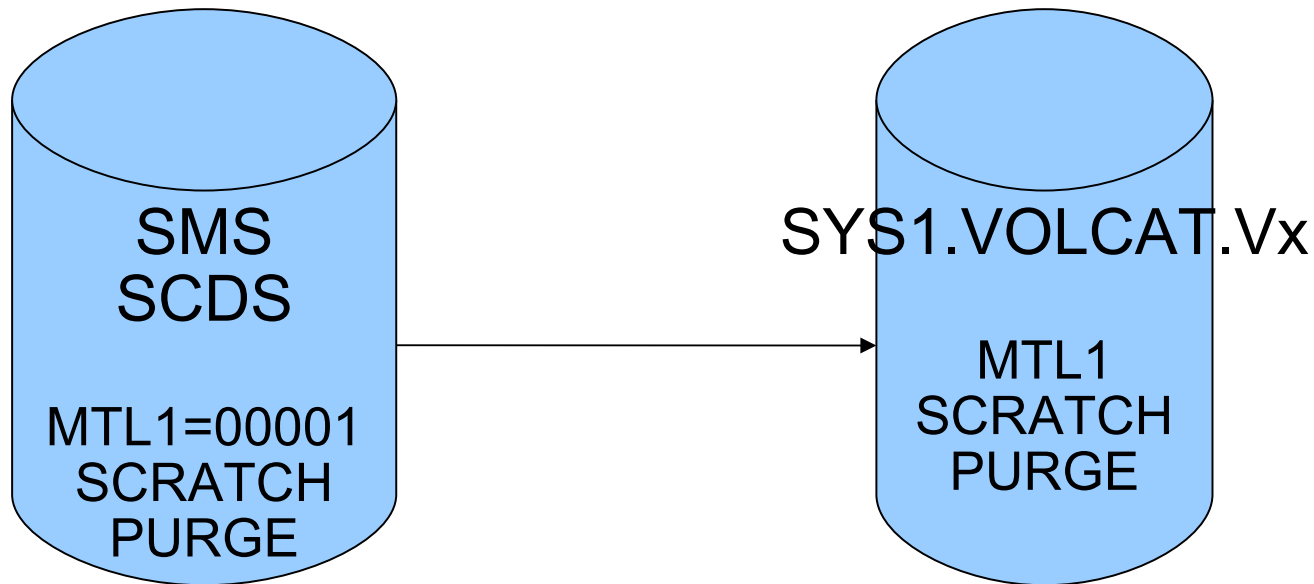# TCDB – Other Tasks

- 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

SMS
SCDS

MTL1=00001
SCRATCH
PURGE

SYS1.VOLCAT.Vx

MTL1
SCRATCH
PURGE

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
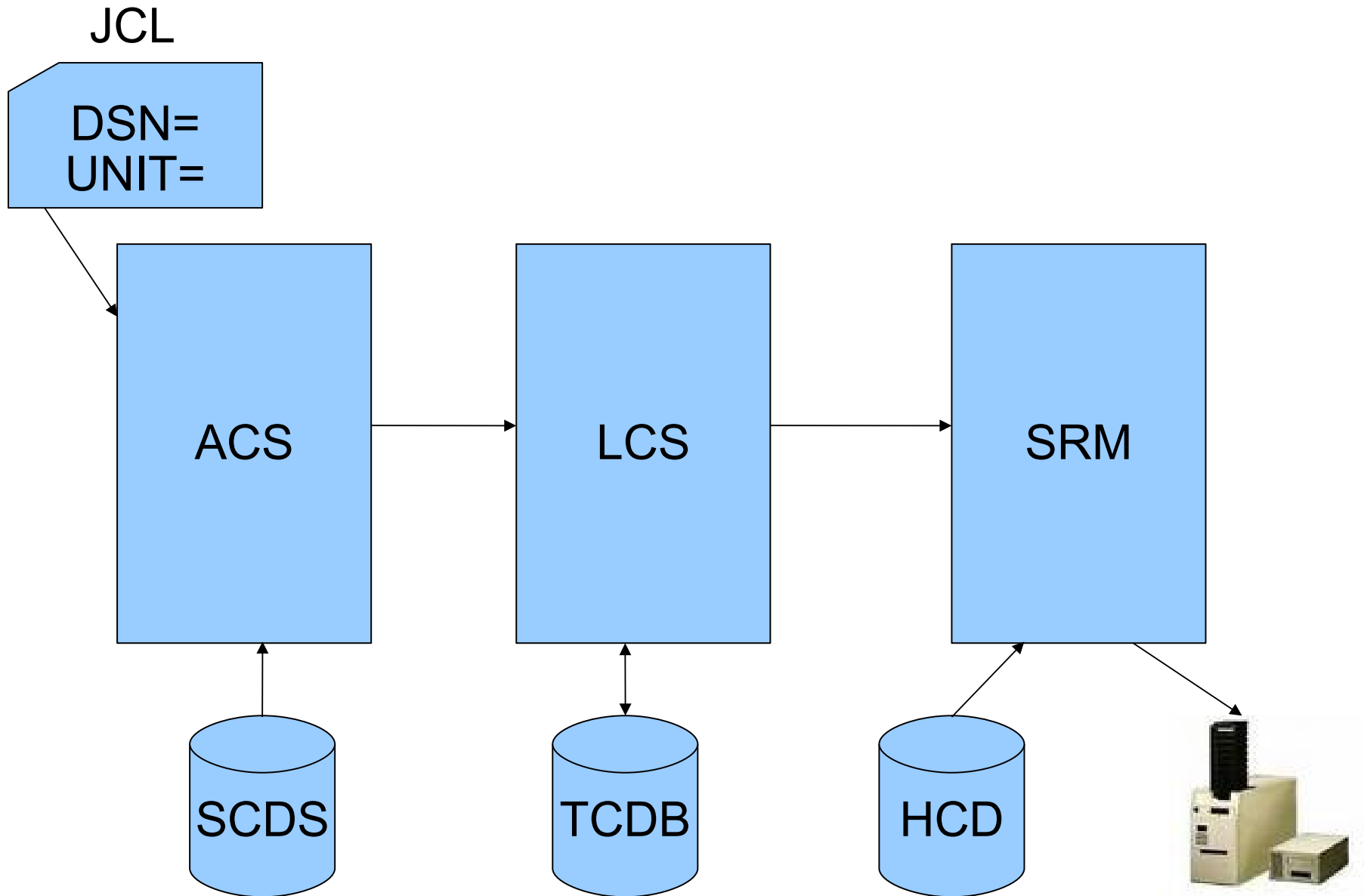
  - SETSMS SCDS(scdsname)

- Start OAM

Enter Volumes into Libraries

- Volumes must be 'entered' into the MTL

- LIBRARY ENTER,volser,library,MEDIAn

  - 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

JCL

DSN=
UNIT=

ACS

LCS

SRM

SCDS

TCDB

HCD

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
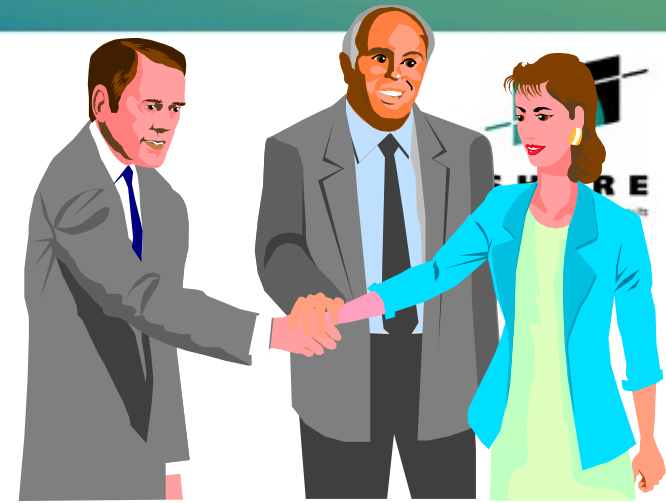
Useful Commands / Documentation

- 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

- SMSHONOR
  - 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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