IBM Tape Manager for z/VM

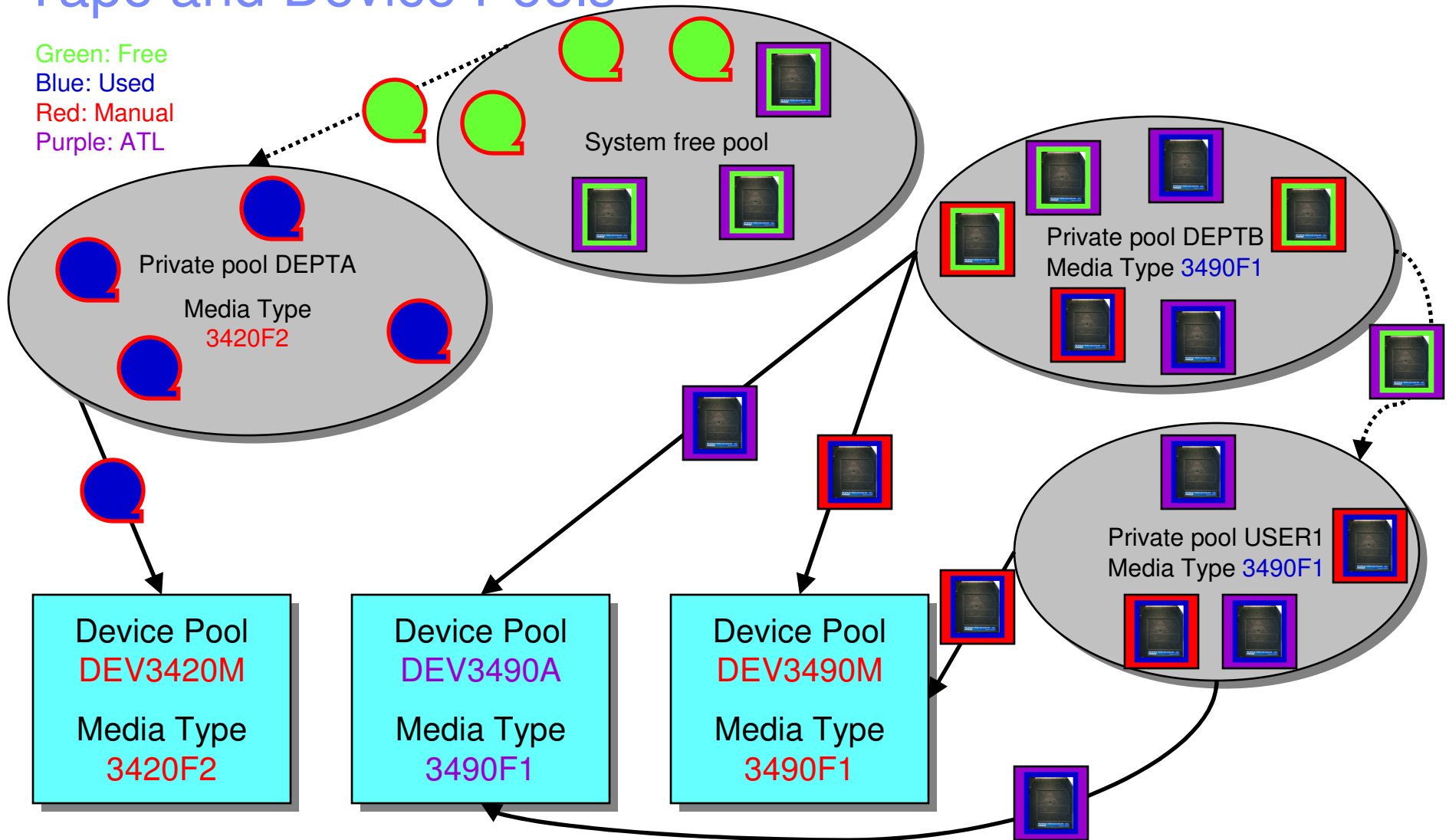Tracy Dean, IBM

September 2006

Agenda

- **Tape Manager for z/VM**

  – Overview

  – Key benefits

  – Features and functions

  – Summary

Product Overview

- **Manage tapes**
  - Define tapes in a catalog, including:
    - Free or used
    - Retention/expiration information
    - ATL or manual mount
    - Data Security Erase
  - Group tapes together into pools
    - Ownership and access control
    - Media type

- **Manage devices**
  - Define available devices
    - Dedicated or assignable
  - Group devices together into device pools
    - ATL/VTS or manual mount
    - Any other grouping you choose (read only vs. write, location, etc.)

- **Manage mount requests**
  - Volume specific and scratch requests
    - Standard Label
    - Non-Label
    - Bypass Label Processing

Tape and Device Pools

Green: Free
Blue: Used
Red: Manual
Purple: ATL

System free pool

Private pool DEPTA

Media Type
3420F2

Private pool DEPTB
Media Type 3490F1

Private pool USER1
Media Type 3490F1

Device Pool
DEV3420M

Media Type
3420F2

Device Pool
DEV3490A

Media Type
3490F1

Device Pool
DEV3490M

Media Type
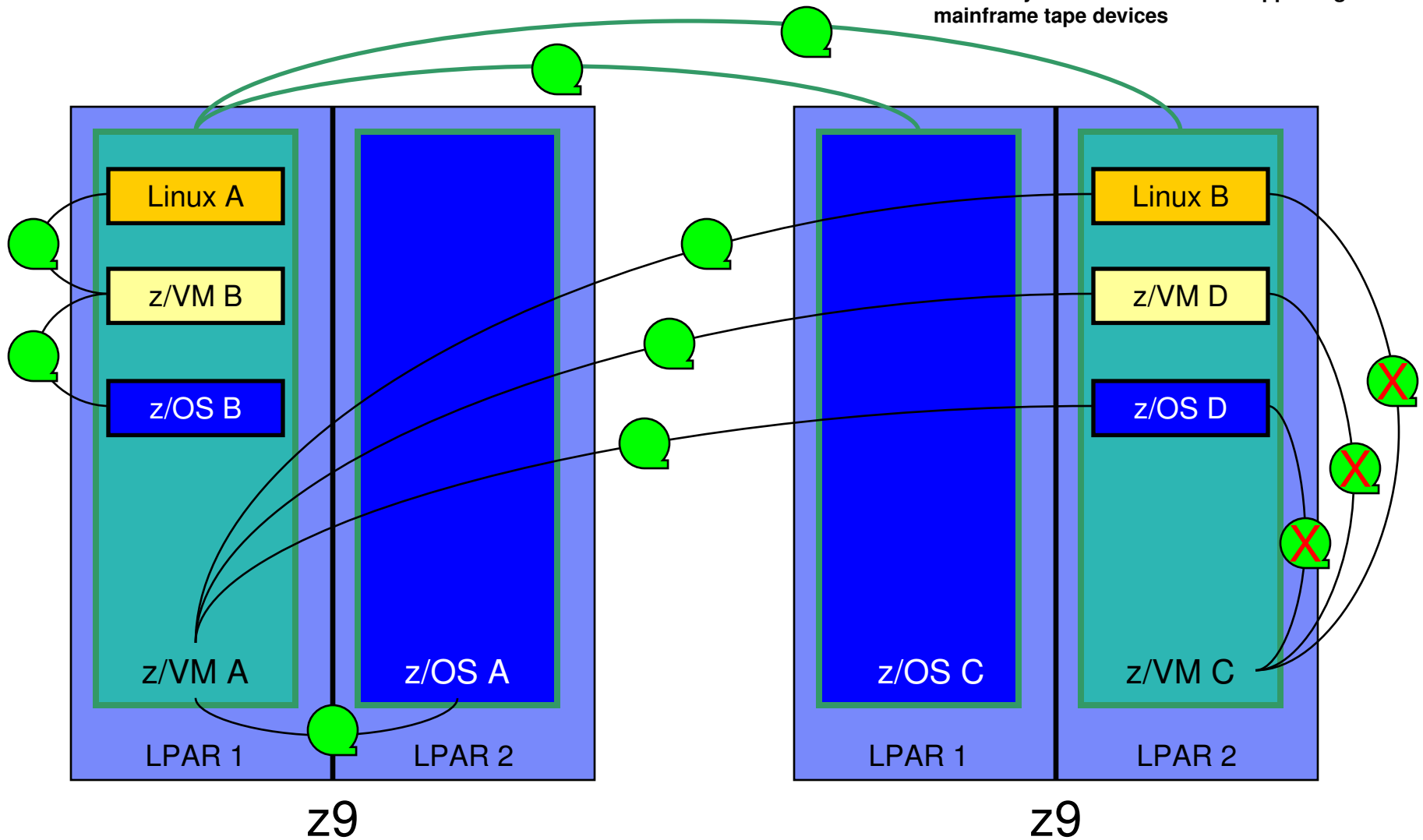3490F1

Access Control

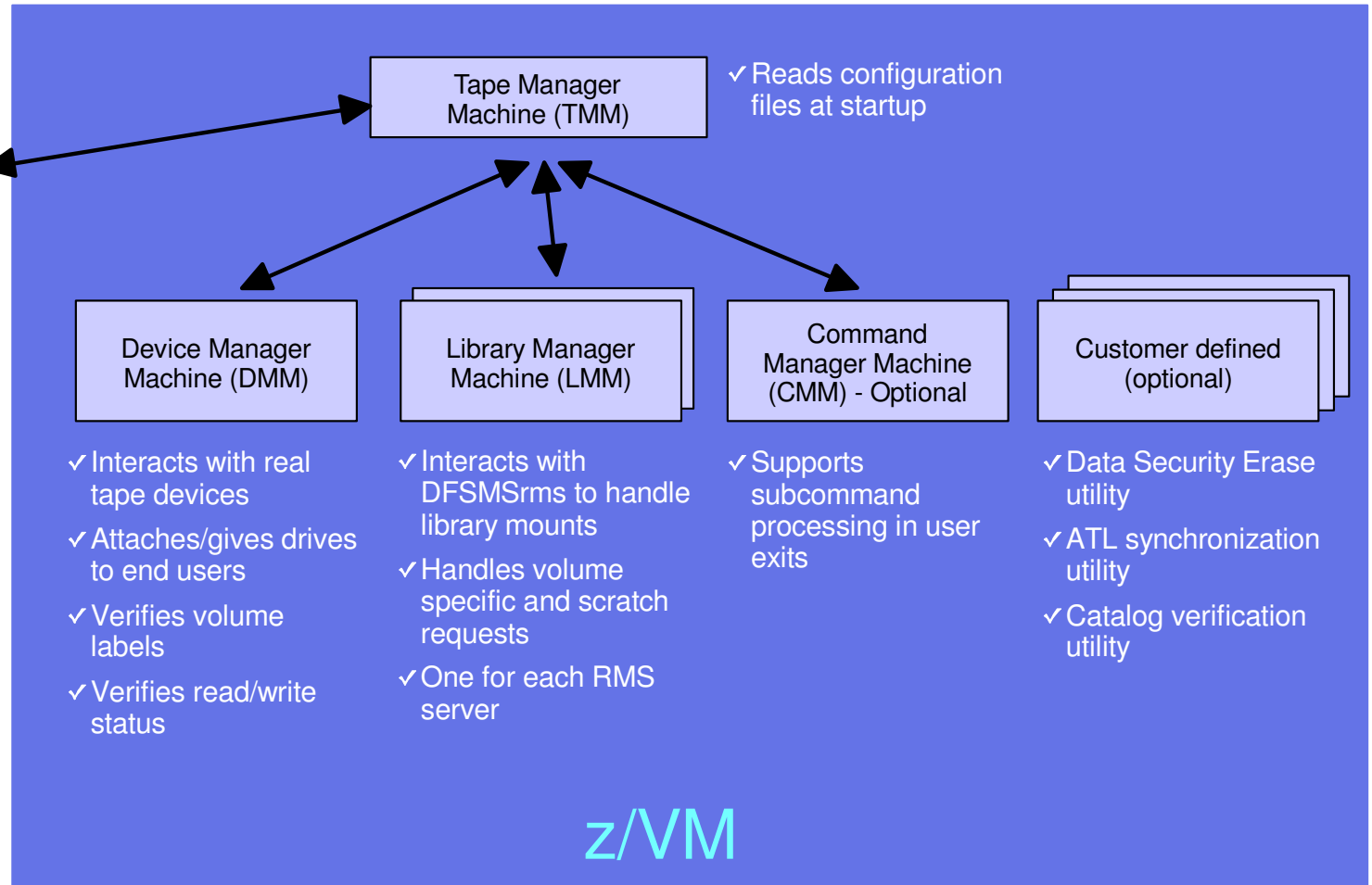| Authority	Modify Pool Attributes and Delete Pool	Modify Tape Attributes	Add Tapes to the System Inventory (System Free Pool or Private Pools)	Delete Tapes from the System Inventory	Transfer Tapes into or out of this Pool; Delete External Tapes from this Private Pool	Modify Tapes	Read Tapes	Tape Attributes Modified Only as a Byproduct of Other Commands	Use Tape Pool as a Free Pool	Receive messages related to this pool
Sys Admin	✓	✓	✓	✓	✓			✓		
Pool Admin	✓	✓			✓	✓	✓	✓		
Tape					✓	✓	✓	✓		
Write						✓	✓	✓		
Read							✓	✓		
None										
Free									✓	
ExceptID										Threshold messages
MntID1 and MntID2										Mount messages, query and cancel mounts

Key Benefits

- **Effective management of tapes in ATLs**
  - Granular access control
  - Expiration processing
  - Notification for low threshold for tape resources
    - Utilization and threshold information provided per pool
    - Immediate notification if threshold is reached
    - Daily pool status report sent to administrator
- **Improved accuracy of manual tape processing**
  - Automated interface to Operator for manual mounts
  - Internal label verification at attach/give and detach (SL only)
  - Read/Write verification
- **Integrated management of z/OS and z/VM tapes using DFSMSrmm on z/OS**
  - Optionally uUse RMM on z/OS as the tape catalog for z/VM and z/OS tapes
  - Tapes, access control, and retention managed by the existing RMM catalog
  - Accessible via Tape Manager on z/VM

Sharing of Tape Devices

➤**z/VM systems with IBM Tape Manager**

➤**z/OS systems with IBM Automated Tape Allocation Manager**

➤**Linux systems with software supporting mainframe tape devices**

z9

z9

Tape Manager in Standard Mode

Tape Manager
Machine (TMM)

✓ Reads configuration
files at startup

Device Manager
Machine (DMM)

Library Manager
Machine (LMM)

Command
Manager Machine
(CMM) - Optional

Customer defined
(optional)

✓ Interacts with real
tape devices
✓ Attaches/gives drives
to end users
✓ Verifies volume
labels
✓ Verifies read/write
status

✓ Interacts with
DFSMSrms to handle
library mounts
✓ Handles volume
specific and scratch
requests
✓ One for each RMS
server

✓ Supports
subcommand
processing in user
exits

✓ Data Security Erase
utility
✓ ATL synchronization
utility
✓ Catalog verification
utility

z/VM
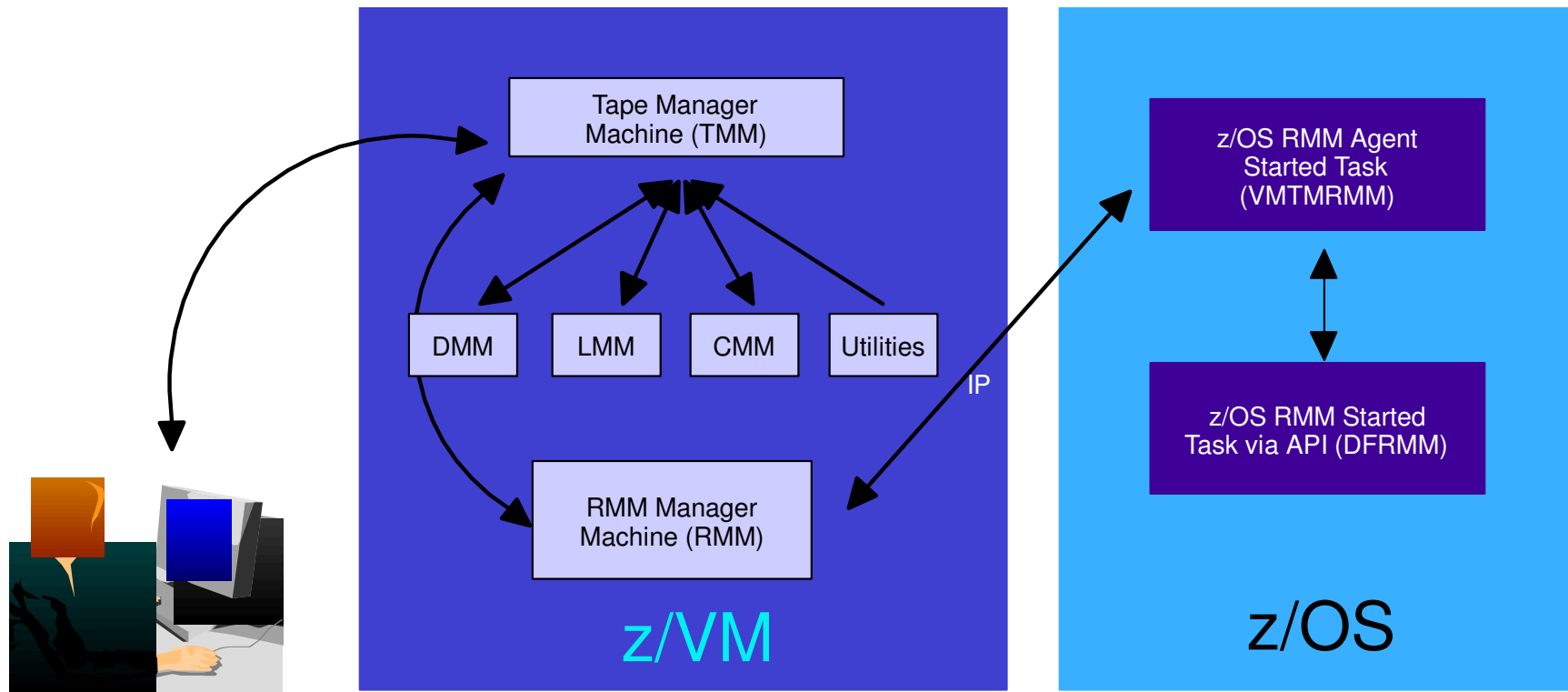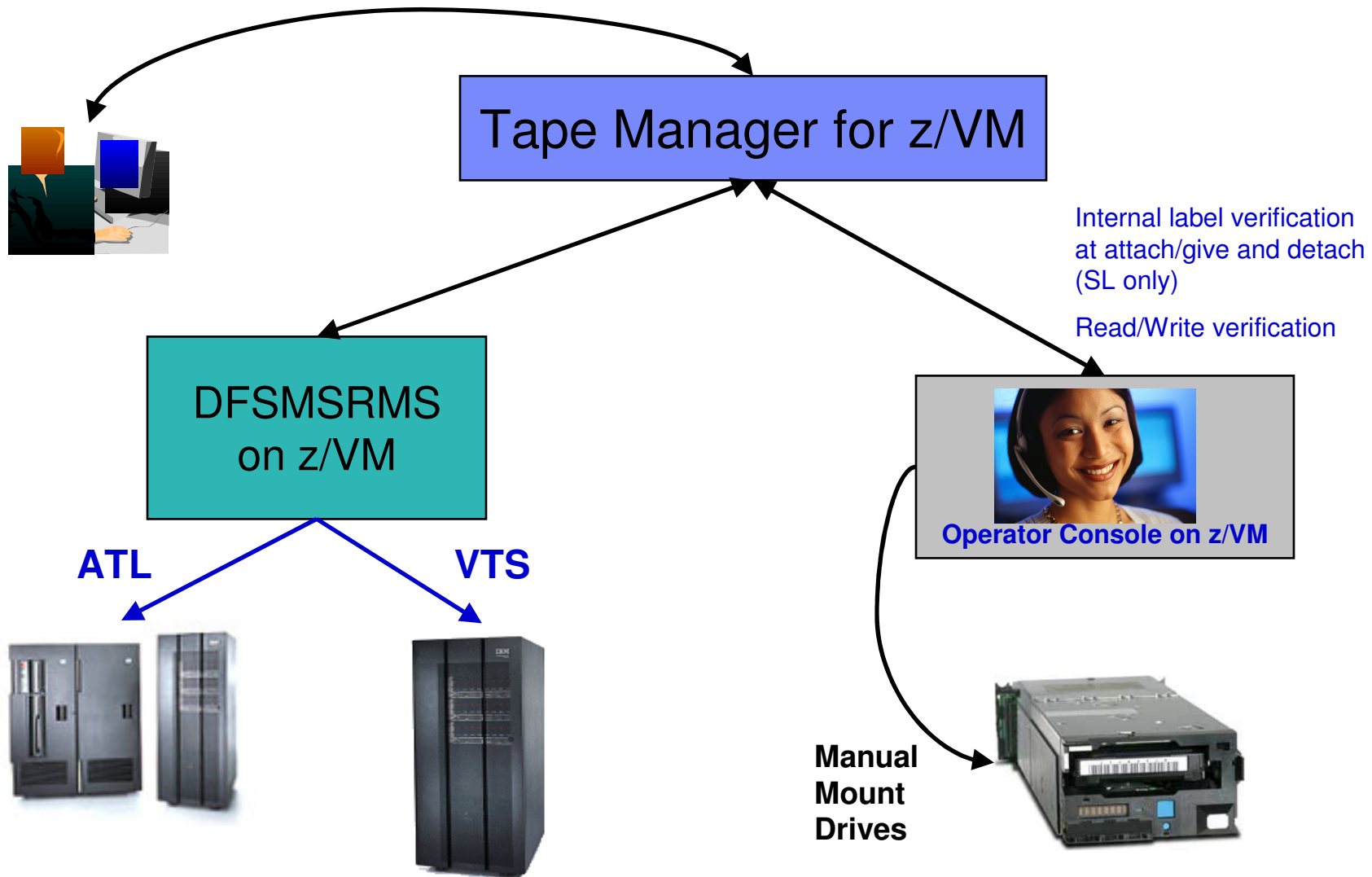
Tape Manager in RMM Mode

Features and Functions

- **Tape mount support**
  - Automated Tape Libraries and Virtual Tape Servers
  - Manual mounts
  - Standard Label
  - Non-Label
  - Bypass Label Processing
- **Scratch mount requests**
  - Volume specific
  - Generic "scratch bin"
- **Data Security Erase**
- **ATL Verification**
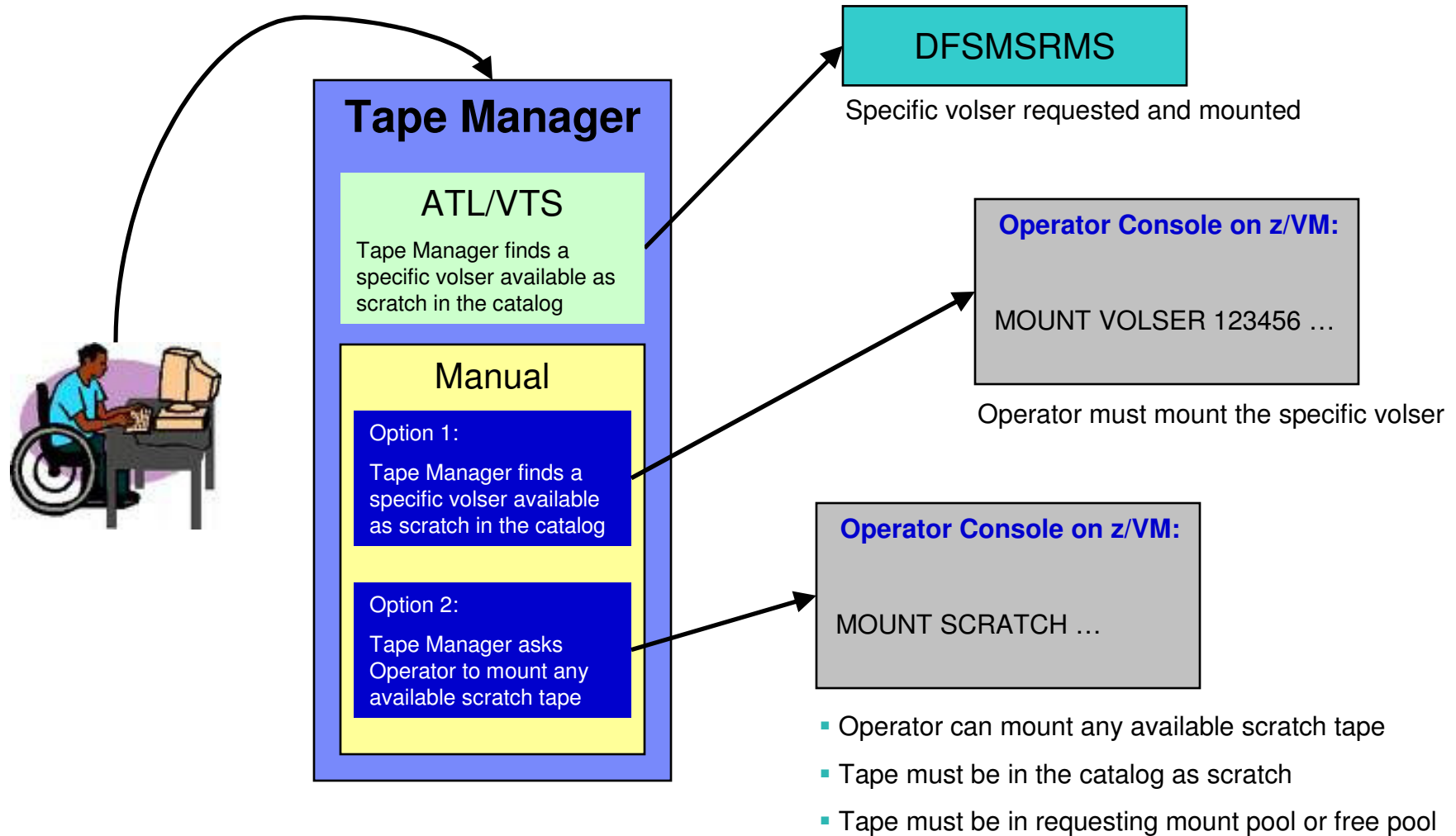- **Catalog data retention**
- **Retry processing**

Tape Mount Support: ATL, VTS, Manual

Tape Manager for z/VM

Internal label verification at attach/give and detach (SL only)

Read/Write verification

DFSMSRMS on z/VM

ATL

VTS

Operator Console on z/VM

Manual Mount Drives

Tape Mount Support

- **Standard Label**
  - Default on mount requests
  - Default authorization

- **NL mounts**
  - NL must be specified on the mount request
  - Tape must be NL
    - Can't mount a Standard Label tape as NL
  - User must be authorized by system default or individually

- **BLP support**
  - BLP must be specified on the mount request
  - Tape can be NL or SL since no checking is done
  - User must be authorized by system default or individually
- **Supported in Standard Mode and RMM Mode**

Scratch Mount Requests in Standard Mode

Tape Manager

ATL/VTS

Tape Manager finds a specific volser available as scratch in the catalog

Manual

Option 1:

Tape Manager finds a specific volser available as scratch in the catalog

Option 2:

Tape Manager asks Operator to mount any available scratch tape

DFSMSRMS

Specific volser requested and mounted

Operator Console on z/VM:

MOUNT VOLSER 123456 …

Operator must mount the specific volser

Operator Console on z/VM:

MOUNT SCRATCH …

- Operator can mount any available scratch tape
- Tape must be in the catalog as scratch
- Tape must be in requesting mount pool or free pool

Data Security Erase (DSE)

- **Option to enable DSE at pool or tape level**
  - DSE flag included in each catalog entry
- **Tape marked as DSE-ready when it is freed**
- **Executed on separate user IDs/service machines**
  - Started manually or as part of Operations Manager schedule
- **Issues query against catalog to find all tapes with DSE-ready flag on**
  - Requires Tape Manager ADMIN authority
- **Mounts each tape**
  - Verifies volume label if possible
  - Erases tape
  - Turns off DSE-ready flag in catalog
  - Tape is now available for scratch unless its HOLD flag is on
- **Configuration options**
  - Maximum number of tapes to process
  - Maximum amount of time to run
  - Continue with the next tape or stop if an error is encountered
  - User ID to receive errors

ATL Verification

- **Executed on separate user IDs/service machines**
  - Started manually or as part of Operations Manager schedule
- **Issues query against catalog to find all tapes in specified ATL(s)**
- **Requires Tape Manager Admin authority and RMS Admin authority**
- **For each tape**
  - Queries DFSMSrms for tape status
  - Takes action based on status and configuration options
- **Configuration options**

```
Max_Runtime = 20
Max_Tapes = 20
Errors_to = ADMIN1 ADMIN2
Error_action = CONTINUE
ATL_Names = IBMATL1 IBMATL2
Action_not_in_library = RESET
Action_inaccessible = IGNORE
Action_ejected = RESET
Action_misplaced = WARN
Action_label_damage = HOLD
```

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  - Takes action based on status and configuration op[...]
- **Configuration options**

Do not start a new tape after this amount of time

Maximum number of tapes to process

User IDs to receive error messages

If error, STOP all tape verification or CONTINUE with next tape

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Names of ATLs to process

Action to take if ATL indicates an error

IGNORE: do nothing

WARN: issue warning message

HOLD: WARN and set HOLD flag for tape

RESET: WARN and set MANUAL flag for tape

Other Features

- ## **Effective maintenance of catalog data**

  - Tape metadata in the catalog not erased when tape is freed or scratched

  - Only erased or rewritten when tape is reused (including DSE)

  - Improves recovery of metadata if tape is accidentally freed

Other Features

- **Retry processing**

  – Automatically retries a mount request when

    • Internal label does not match volser requested

      – Used tapes - applies to manual mounts only

      – Scratch tapes - applies to ATLs and manual mounts, a new scratch volser is requested

    • Mounted tape is NL, but request specified SL (manual mounts only)

    • Mounted tape is SL, but request specified NL (manual mounts only)

    • RMM indicates 'not a scratch volume' or 'volume not found' (ATL only)

  – Operator can request a retry on manual mounts

    • Specific volser for a scratch request is not available

    • Tape Manager finds another scratch and reissues mount request

Tape Manager Summary

- **Automate daily tape operations**
  - Manage mount requests
  - Control tape access
  - Perform label verification
  - Expire tapes

- **Efficiently manage tapes and tape drives**
  - Share devices
  - Control access to individual tapes in an ATL

- **Improve productivity**
  - Support manual and ATL mount requests
  - Notify and interact with Operator on behalf of user for manual mounts
  - Perform label verification before and after tape use
  - Verify read/write attribute on manual mounts