IBM z/VM Management Software

Introduction

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Agenda

- **System management**

  – Operations Manager for z/VM

- **Storage management**

  – Backup and Restore Manager for z/VM

  – Tape Manager for z/VM

  – Archive Manager for z/VM

- **Summary**

Automating Operations
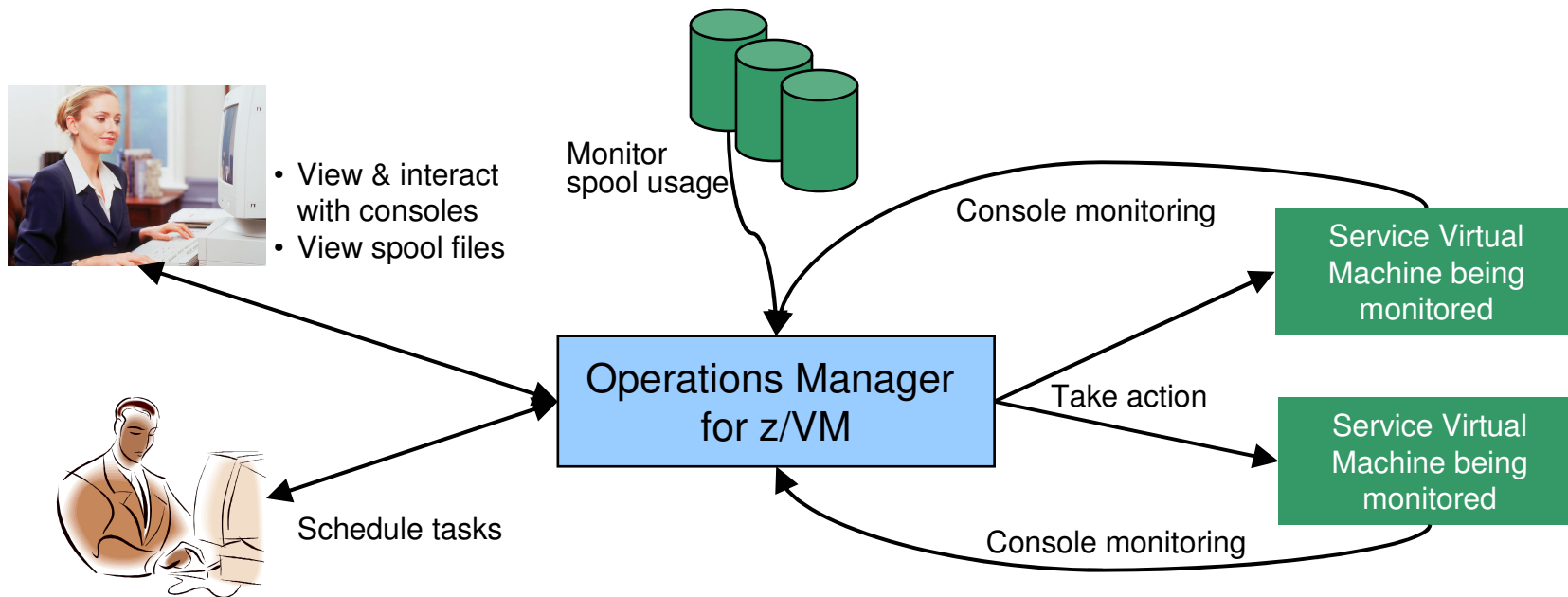## *Operations Manager for z/VM*

Operations Manager for z/VM

Increase productivity
- Authorized users view and interact with monitored virtual machines without logging onto them
- Multiple users view/interact with a virtual machine simultaneously

Improve system availability
- Monitor virtual machines and processes
- Take automated actions based on console messages
- Reduce problems due to operator error

- View & interact with consoles
- View spool files

Monitor spool usage

Console monitoring

Service Virtual Machine being monitored

Operations Manager for z/VM

Take action

Service Virtual Machine being monitored

Schedule tasks

Console monitoring

Automation
- Routine activities done more effectively with minimal operations staff
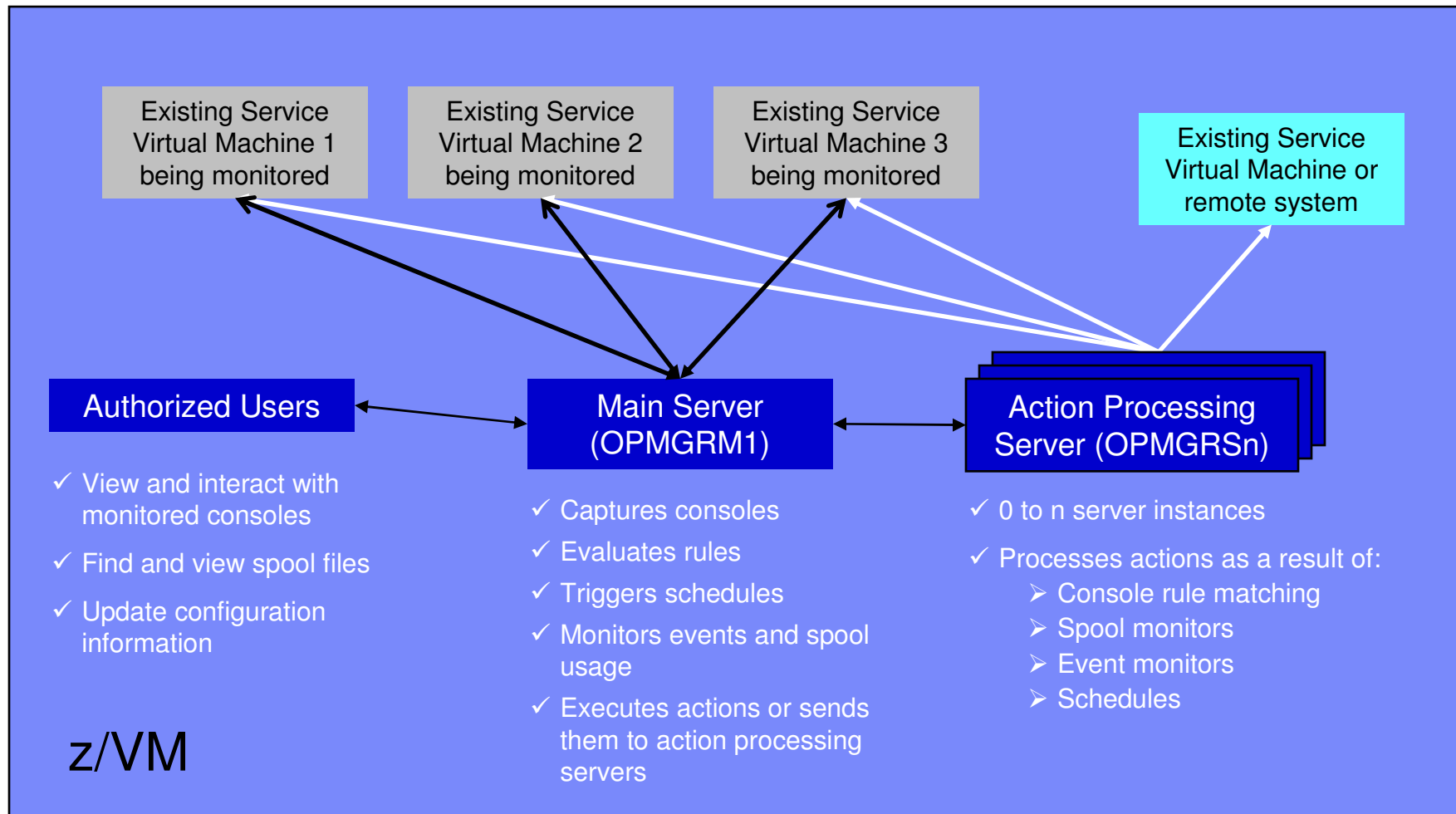- Schedule tasks to occur on a regular basis

Integration
Fulfill take action requests from OMEGAMON XE on z/VM and Linux

Features and Functions

- **Monitor service machine consoles**

- **Monitor spool usage**

- **Monitor system events**

- **View and interact with monitored consoles from authorized user IDs**

- **Find and view spool files**

- **Schedule events/actions**

- **Dynamic configuration**

- **Separation of access control**

Operations Manager

| Existing Service Virtual Machine 1 being monitored | Existing Service Virtual Machine 2 being monitored | Existing Service Virtual Machine 3 being monitored | Existing Service Virtual Machine or remote system |

Authorized Users

Main Server (OPMGRM1)

Action Processing Server (OPMGRSn)

✓ View and interact with monitored consoles

✓ Find and view spool files

✓ Update configuration information

✓ Captures consoles

✓ Evaluates rules

✓ Triggers schedules

✓ Monitors events and spool usage

✓ Executes actions or sends them to action processing servers

✓ 0 to n server instances

✓ Processes actions as a result of:
  ➢ Console rule matching
  ➢ Spool monitors
  ➢ Event monitors
  ➢ Schedules

z/VM

Summary

- **Use Operations Manager to**

  - Automate daily operations

  - Prevent problems rather than react to them

  - Automate reactions to problems when they can't be prevented

  - Improve problem determination procedures

  - Increase programmer and operator productivity

Managing Backup and Recovery
Backup and Restore Manager for z/VM

Product Overview

- **Backup**
  - Requested by administrators
  - Full or incremental
  - Flexible selection of disks and files to back up
  - Review job before submitting for backup
  - Catalog housed in Shared File System

- **Restore**
  - Performed by users for their own data
  - Extending to other users available via exit
  - Performed by administrators for any data
  - Selection of data to restore
    - Full screen interface or commands
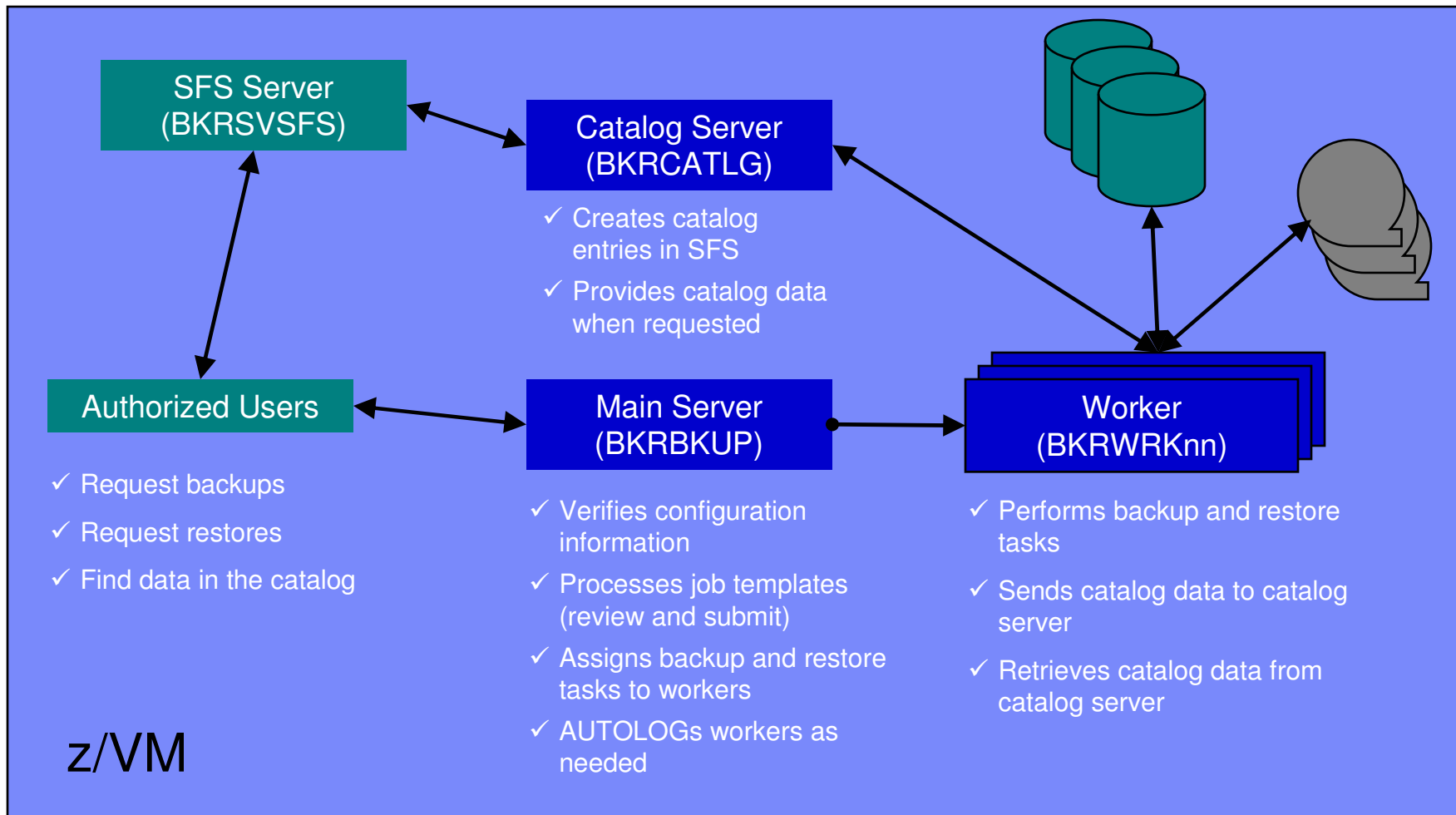
- **Integration with Tape Manager for z/VM**
- **Optional compression of data during backup**
  - **Call your own compression algorithm**
  - **Use IBM provided routine**
- **Encryption exits available**
  - **Call your own routine**
  - **Use vendor-written routine, such as V/Soft Software's Encrypt/Backup for z/VM**

Backup and Restore Manager Service Machines

SFS Server (BKRSVSFS)

Catalog Server (BKRCATLG)

- ✓ Creates catalog entries in SFS
- ✓ Provides catalog data when requested

Authorized Users

- ✓ Request backups
- ✓ Request restores
- ✓ Find data in the catalog

Main Server (BKRBKUP)

- ✓ Verifies configuration information
- ✓ Processes job templates (review and submit)
- ✓ Assigns backup and restore tasks to workers
- ✓ AUTOLOGs workers as needed

Worker (BKRWRKnn)

- ✓ Performs backup and restore tasks
- ✓ Sends catalog data to catalog server
- ✓ Retrieves catalog data from catalog server

z/VM

Summary

- **Use Backup and Restore Manager to**

  – Perform file-level backups of z/VM data

  – Perform image level backups on non-z/VM guest data

  – Perform disaster recovery backups of entire system

  – Easily find and restore data as needed

  – Manage retention of backup data

Managing Tapes and Tape Devices
Tape Manager for z/VM

Product Overview

■ **Manage tapes**

- Define tapes in a catalog, including:
  - Free or used
  - Retention/expiration information
  - ATL/VTS 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.)
- Share devices with other systems

■ **Manage mount requests**

– Volume specific and scratch requests
  - Standard Label
  - Non-Label
  - Bypass Label Processing

Key Benefits

- **Effective management of tapes in ATL or VTS**
  - Granular access control
  - Expiration processing
  - Notification for low threshold for tape resources
  - Interacts with devices through DFSMSRMS on z/VM
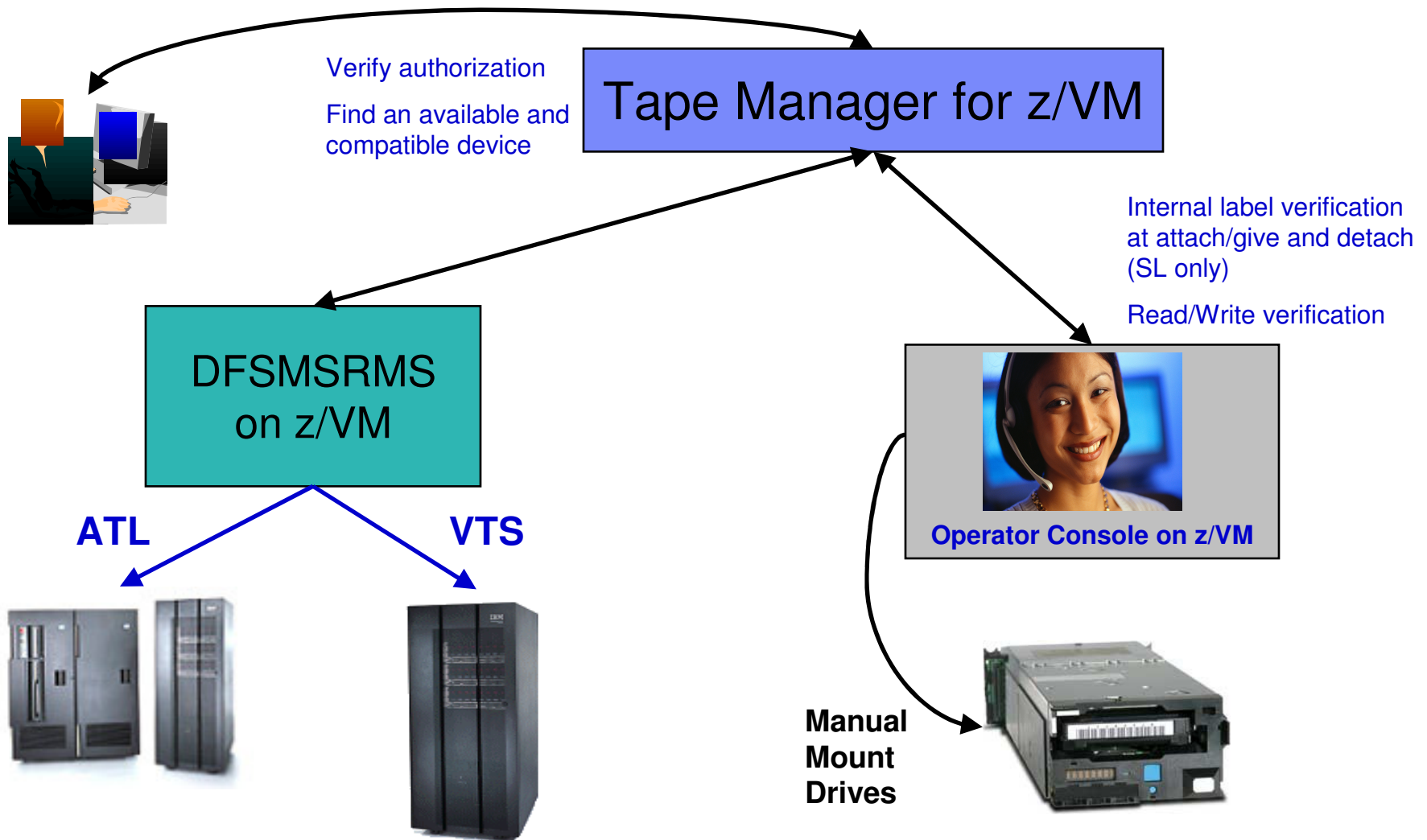
- **Improved accuracy of manual tape processing**
  - Granular access control
  - Automated interface to Operator for manual mounts
  - Internal label verification at attach/give and detach (SL only)
  - Read/Write verification at attach/give

- **Integrated management of z/OS and z/VM tapes using DFSMSrmm on z/OS**
  - Optionally use 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
  - Tapes managed by RMM
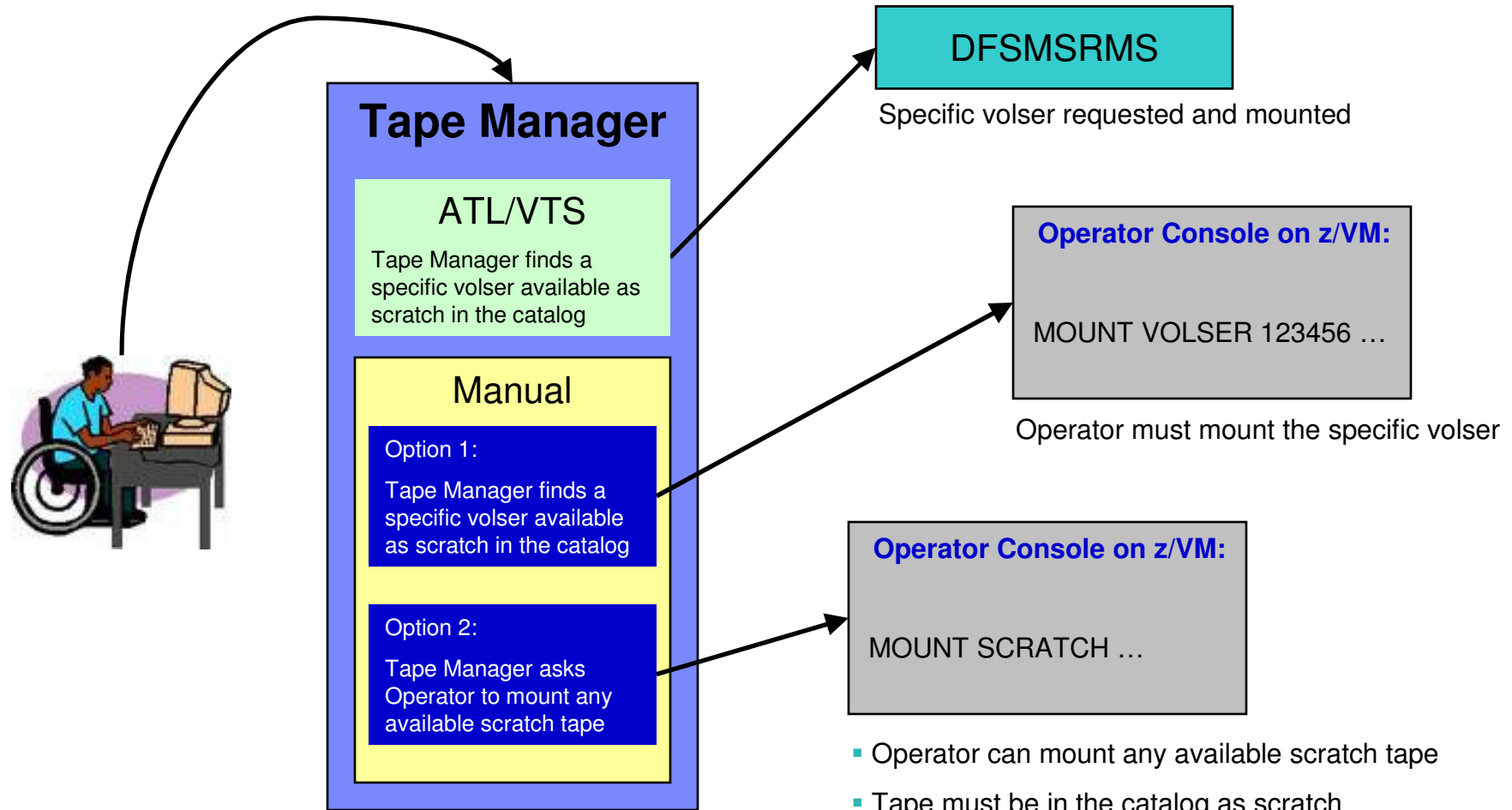 - Devices managed by Tape Manager

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

Tape Mount Support: ATL, VTS, Manual

Verify authorization

Find an available and compatible device

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

Scratch Mount Requests in Standard Mode

DFSMSRMS

Specific volser requested and mounted

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

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
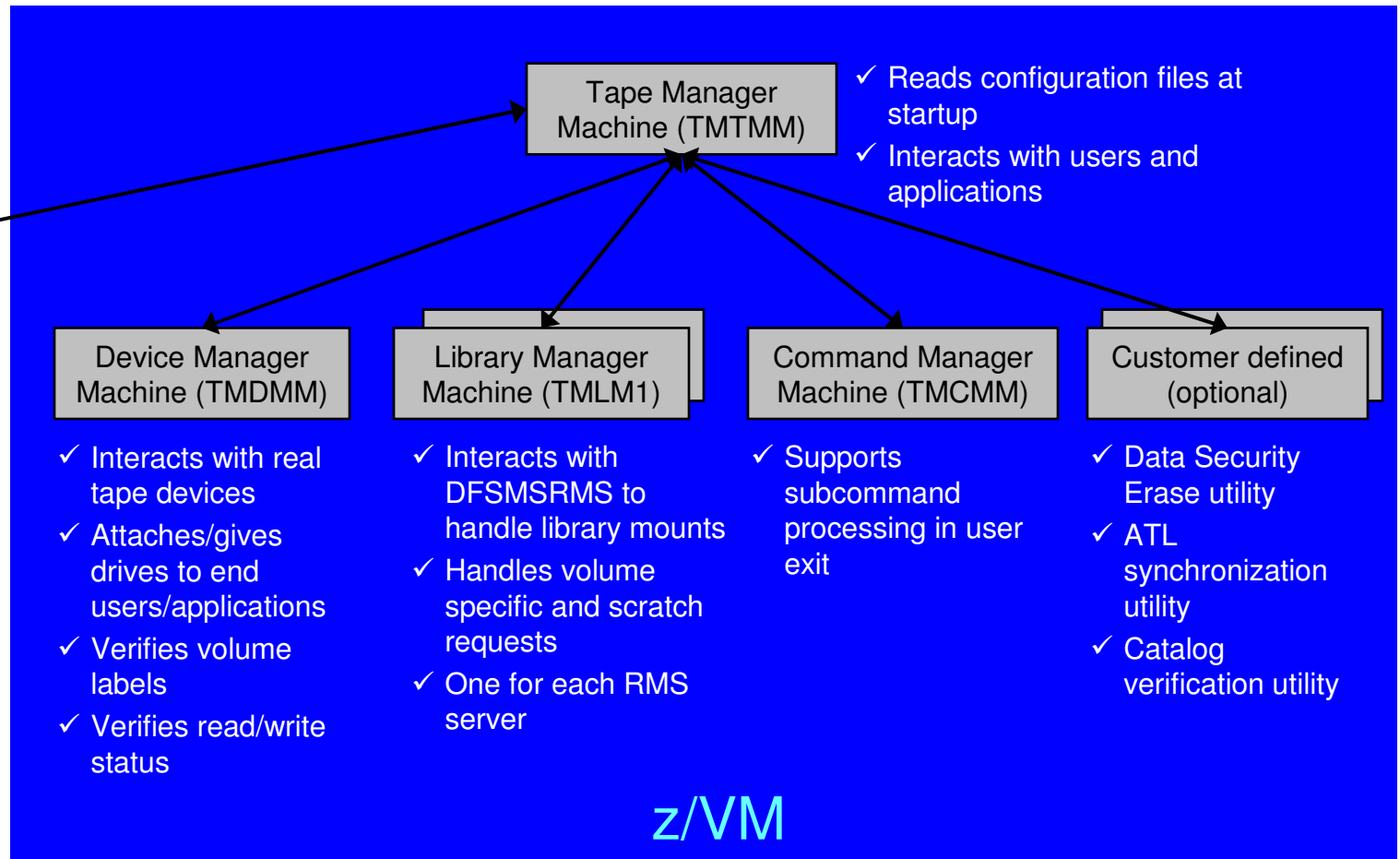- Tape must be in requesting mount pool or free pool

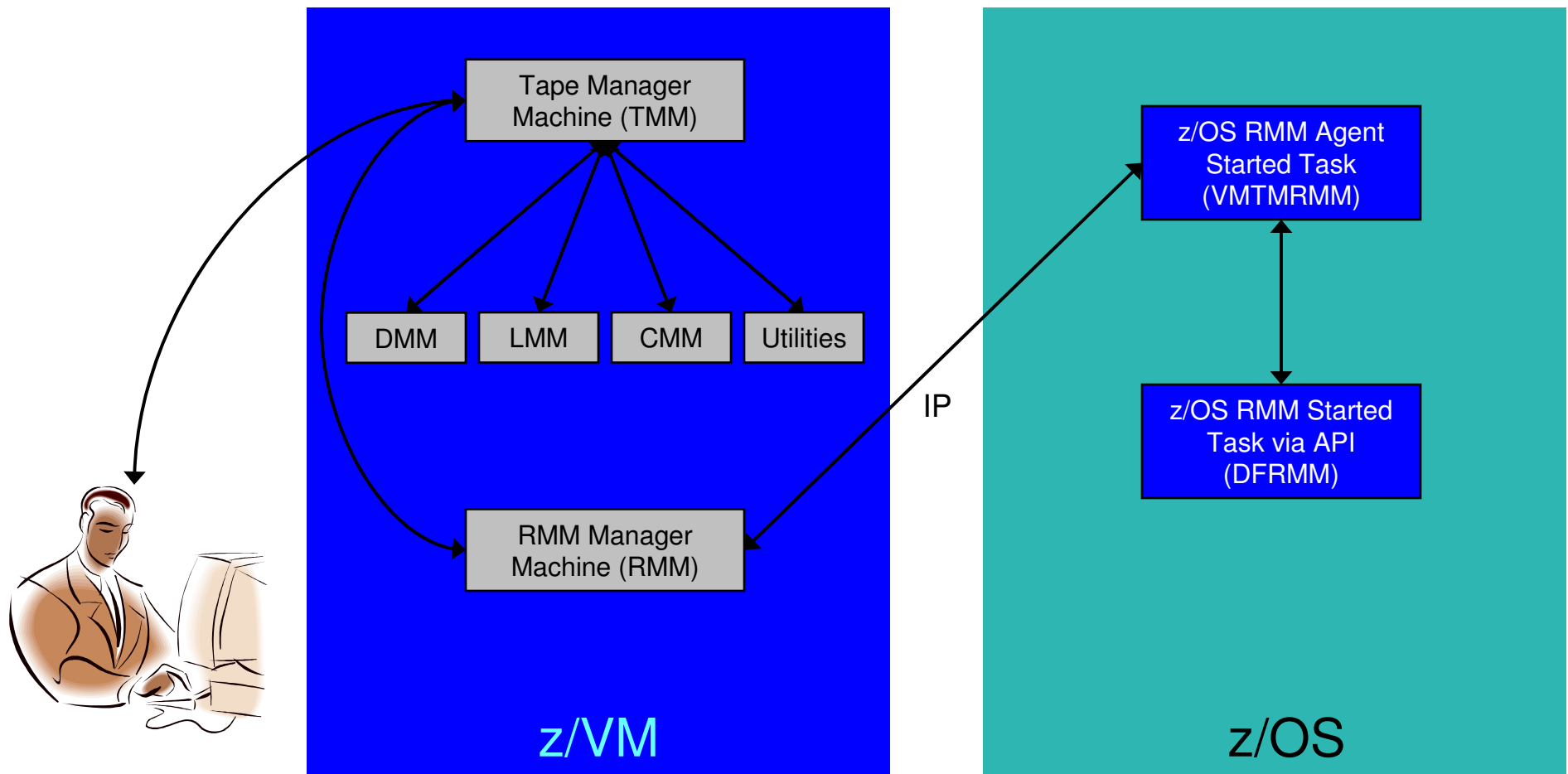Option 1 vs. Option 2 controlled by GENSCRATCH statement in SYS CONFIG

Data Security Erase (DSE)

- **Erase (sensitive) data before tape is reused**

- **Option to enable DSE at tape pool or individual tape level**
  - DSE-enabled flag included in each catalog entry

- **DSE-enabled tapes marked as DSE-ready when freed**

- **Tape Manager DSE utility (TMDSE) executed on a separate user ID**
  - Started manually or automatically with Operations Manager
  - Queries the catalog to find all tapes with DSE-ready flag on
  - Mounts each tape
    - Verifies volume label if possible
      - Configuration option to perform DSE on NL tapes or not
    - Erases tape
    - Turns off DSE-ready flag in catalog
  - Tape is now available for scratch unless its HOLD flag is on
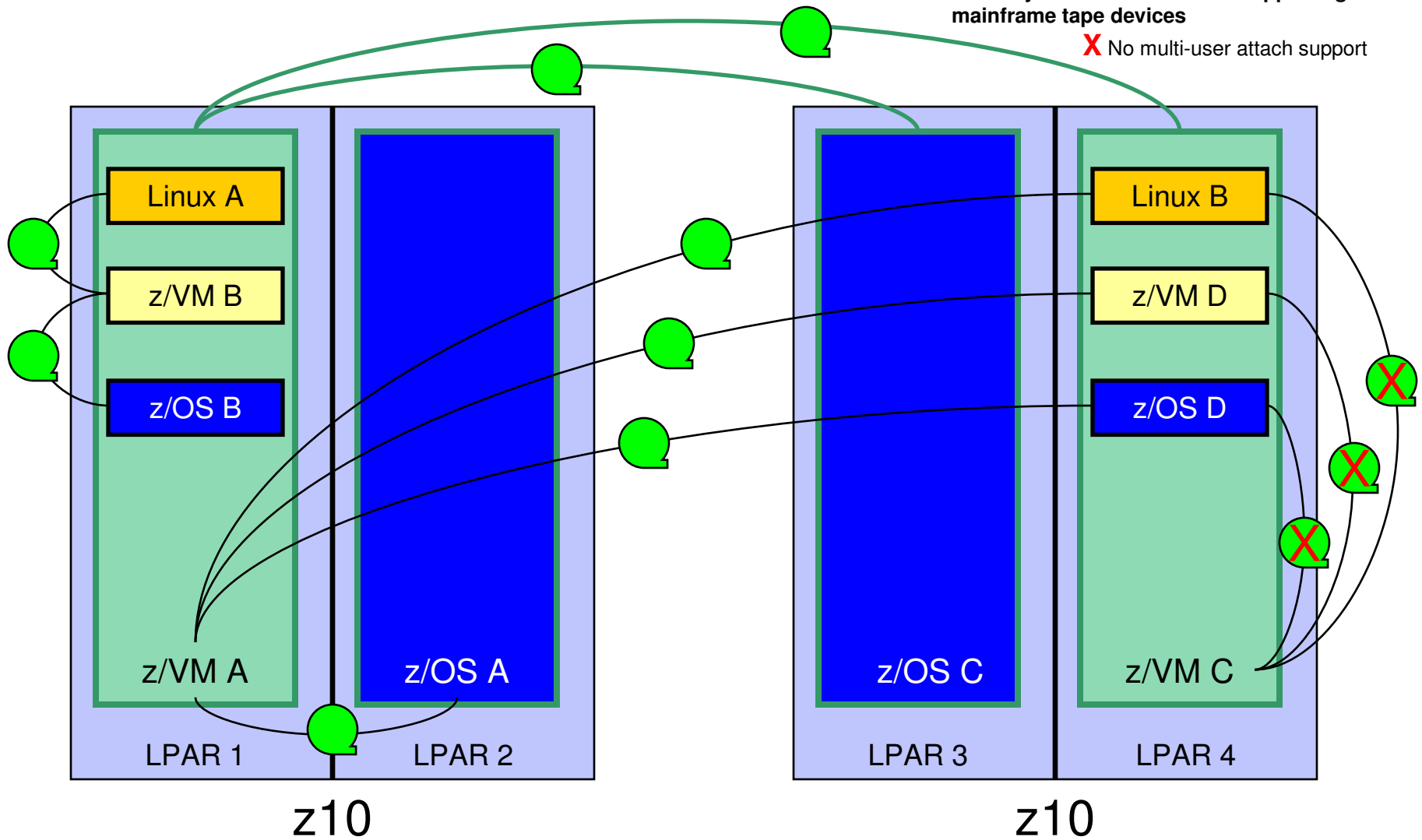
Tape Manager in Standard Mode

Tape Manager Machine (TMTMM)

✓ Reads configuration files at startup
✓ Interacts with users and applications

Device Manager Machine (TMDMM)

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

Library Manager Machine (TMLM1)

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

Command Manager Machine (TMCMM)

✓ Supports subcommand processing in user exit

Customer defined (optional)

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

z/VM

Tape Manager in RMM Mode

z/VM

z/OS

Tape Manager
Machine (TMM)

DMM | LMM | CMM | Utilities

RMM Manager
Machine (RMM)

IP

z/OS RMM Agent
Started Task
(VMTMRMM)

z/OS RMM Started
Task via API
(DFRMM)

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**

X No multi-user attach support

Linux A

z/VM B

z/OS B

z/VM A

z/OS A

Linux B

z/VM D

z/OS D

z/OS C

z/VM C

LPAR 1

LPAR 2

LPAR 3

LPAR 4

z10

z10

Summary

- **Use Tape Manager to**

  – Manage and share devices

  – Manage tape volumes

    • Access control

    • Retention

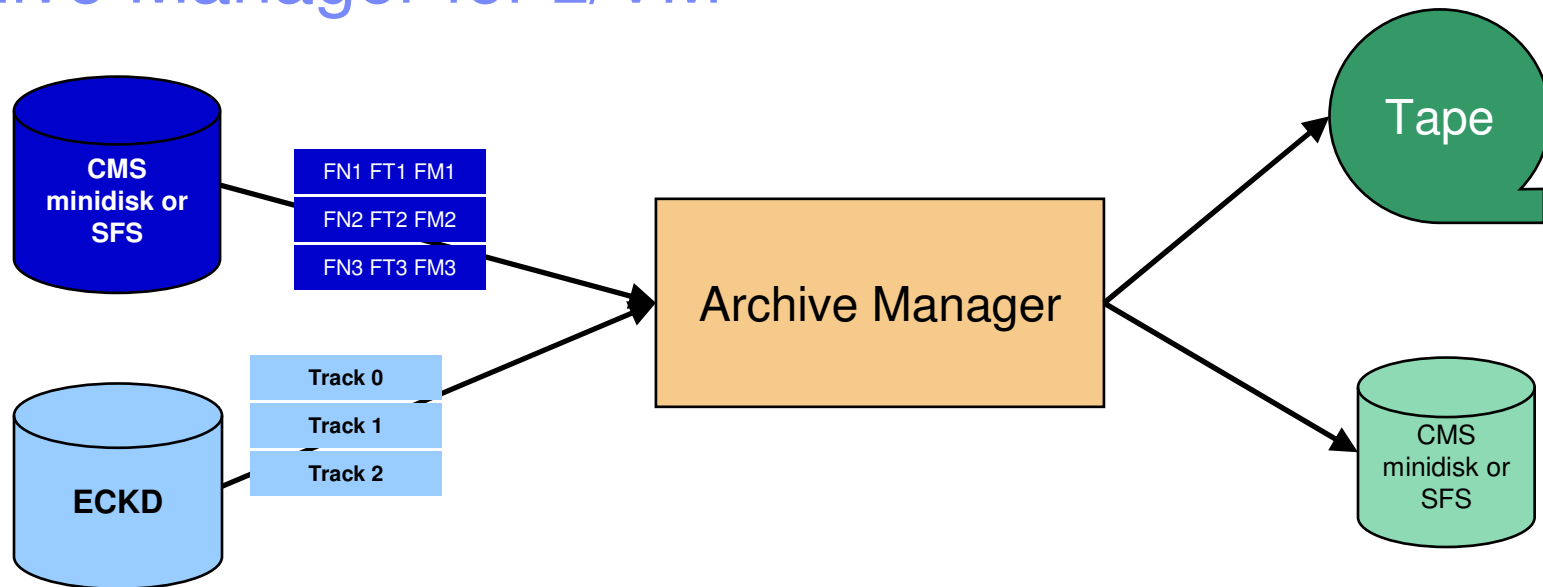   • Data Security

  – Improve accuracy of mount requests

Managing Disk Space
Archive Manager for z/VM

Archive Manager for z/VM

```
CMS
minidisk or          FN1 FT1 FM1
SFS
                     FN2 FT2 FM2

                     FN3 FT3 FM3            Archive Manager        →    Tape


                     Track 0
                     Track 1                                            CMS
ECKD                 Track 2                                            minidisk or
                                                                        SFS
```

- **Improve end user satisfaction and productivity**
  - Users manage their own disk space
  - Move infrequently used files to tape or other disk
  - Archive and recall functions are controlled by the user
    - No administrator intervention required
  - Archived data staged to DASD, then tape if applicable
    - Users don't wait for a tape mount for archive request to complete

- **Reduce DASD space requirements**
  - Archive older files to less expensive storage media
  - Continue to provide users access to the archived data/files

- **Control location, retention, and access to archived data**

- **Integration with Tape Manager for z/VM**

Summary

- **Use Archive Manager to**

  – Improve management of disk space

  – Easily and immediately archive data when a disk is approaching full

  – Manage retention of archived data

Summary

- **Management of z/VM systems with Linux guests requires monitoring and management tools**

- **IBM solutions exist**

  – OMEGAMON XE on z/VM and Linux

  – Operations Manager for z/VM

  – Tape Manager for z/VM

  – Backup and Restore Manager for z/VM

  – Archive Manager for z/VM

- **Demos available**

Reference Information

- **Product Web sites**

  – Start at http://www.ibm.com/software/stormgmt/zvm/index.html

  – Product pages include

    • Publications

    • Pre-requisites

    • Announcements

    • Presentations

    • Support

- **e-mail**

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  – Tracy Dean, tld1@us.ibm.com, Product Manager

धन्यवाद
Hindi

多謝
Traditional Chinese

감사합니다
Korean

Спасибо
Russian

Gracias
Spanish

Thank You
English

شكراً
Arabic

Obrigado
Brazilian Portuguese

Danke
German

Grazie
Italian

多谢
Simplified Chinese

Merci
French

நன்றி
Tamil

ありがとうございました
Japanese

ขอบคุณ
Thai