



IBM Software Group

New z/VM Systems Management Products from IBM

WAVV Session U4

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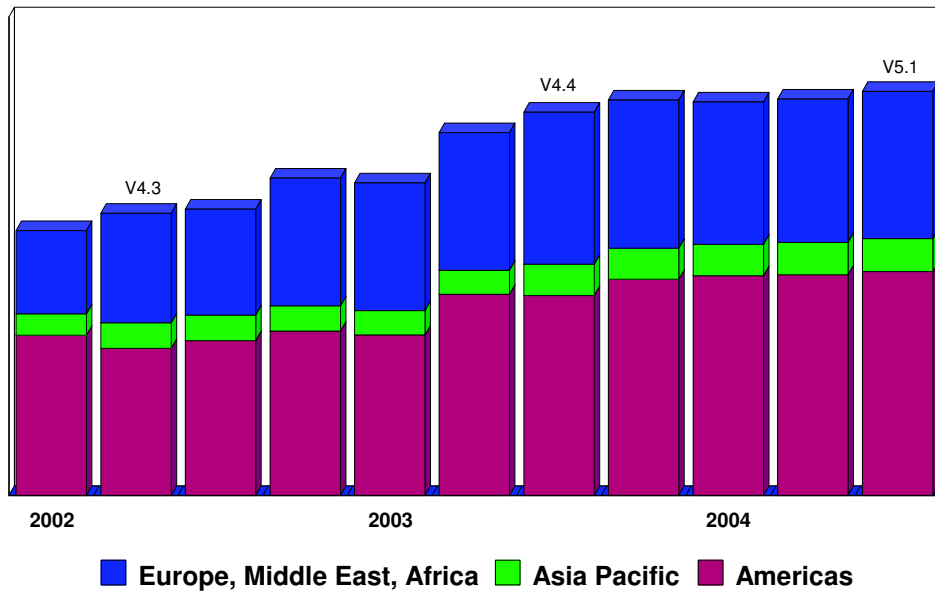
Agenda

- Overview
- Tape Manager
 - Key features
 - Concepts and terms
 - Product architecture
 - Configuration for standalone
 - Configuration with RMM
- Backup and Restore Manager
 - Key features
 - Product architecture
 - Configuration
- Demo of Backup and Restore Manager

New z/VM Systems Management Products from IBM

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z/VM Market - Licenses and Releases/Versions



Overall z/VM Marketplace

- **Traditional z/VM customers**
 - Longtime z/VM (VM/ESA, VM/SP) customers
 - Running business applications on z/VM
 - Also installing and using Linux on zSeries
 - Require full set of systems management solutions for z/VM and the Linux guests
- **Customers using z/VM to host Linux only**
 - New to z/VM
 - Understand the benefits of using z/VM to host Linux guests
 - Prefer Linux-based tools for systems management of Linux guests
 - Also need basic systems management tools for z/VM host
- **Total cost of ownership being scrutinized**
 - Automation
 - Efficiency and productivity
 - Software costs

Tape Manager for z/VM

- **Tape management**
 - Define tapes in a catalog, including:
 - Free or used
 - Internal or external
 - Retention/expiration information
 - ATL or manual mount
 - Group tapes together into pools
 - Ownership and access control
 - Media type
 - Include free and used tapes, with an optional link to a free pool
- **Device management**
 - Define devices
 - Dedicated or assignable
 - Group devices
 - ATL or manual mount
 - Any other grouping you choose (read only vs. write, location, etc.)
- **Product information**
 - Announced February 22, 2005
 - GAed April 29, 2005

Backup and Restore Manager for z/VM

- **Backup**
 - Full or incremental
 - Source data on CMS minidisk, SFS, CKD images
 - Target output to tape, twin tapes, disk
 - Include/exclude minidisks or filepools
 - Mask by filename
- **Restore**
 - Source data on tape or disk
 - Target output to CMS minidisk, SFS, CKD DASD, virtual reader
 - User or administrator requested
 - Selection of data to restore
 - Individual files (with wildcard support), by minidisk, by volume, or by backup instance
- **Catalog**
 - Contains all metadata for backup jobs and files
- **Product information**
 - Announced February 22, 2005
 - GAed April 29, 2005

Tape Manager for z/VM

- Automation
- Efficiency
- Productivity

Key Features

- **Dynamic sharing of existing tape devices between multiple images**
 - Devices must be assignable and not using multiuser attach feature of z/VM
- **Effective management of tapes in ATLS**
 - Granular access control
 - Expiration processing
 - Notification of low threshold for tape resource
 - Utilization information provided per pool
 - Report created and sent to administrator after expiration processing
- **Improved accuracy of manual tape processing**
 - Automatic request and notification of manual mounts
 - Internal label verification at attach/give and detach
- **Optional use of RMM as the tape catalog**
 - Tapes, access control, and retention managed by existing RMM catalog
 - Accessible via commands on z/VM

Concepts and Terms

▪ Tape pool

- Private pool
 - Logical group of physical tapes owned by a CMS userid
 - Free or used
 - Same media type, access control, and defaults
- System free pool
 - One (and only one) list of free tapes which are not in private pools

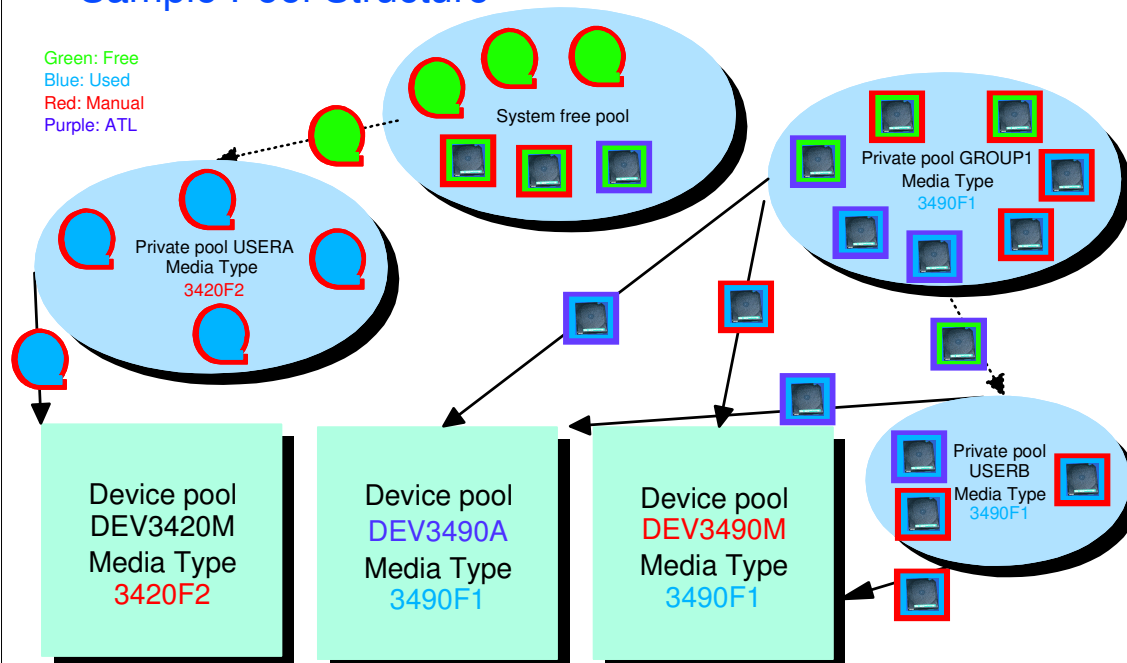
▪ Device pool

- Logical group of physical devices that can handle the same physical media
- Same mount attribute and media type
- Can define one or more
- One device can be in more than one pool
- Admin-specified name

▪ Media type

- Admin defined name that associates devices in device pools with tapes in tape pools
- One media type can be associated with more than one device pool
- Example: 3590 drives on 1st floor vs. 3590 drives on 2nd floor

Sample Pool Structure

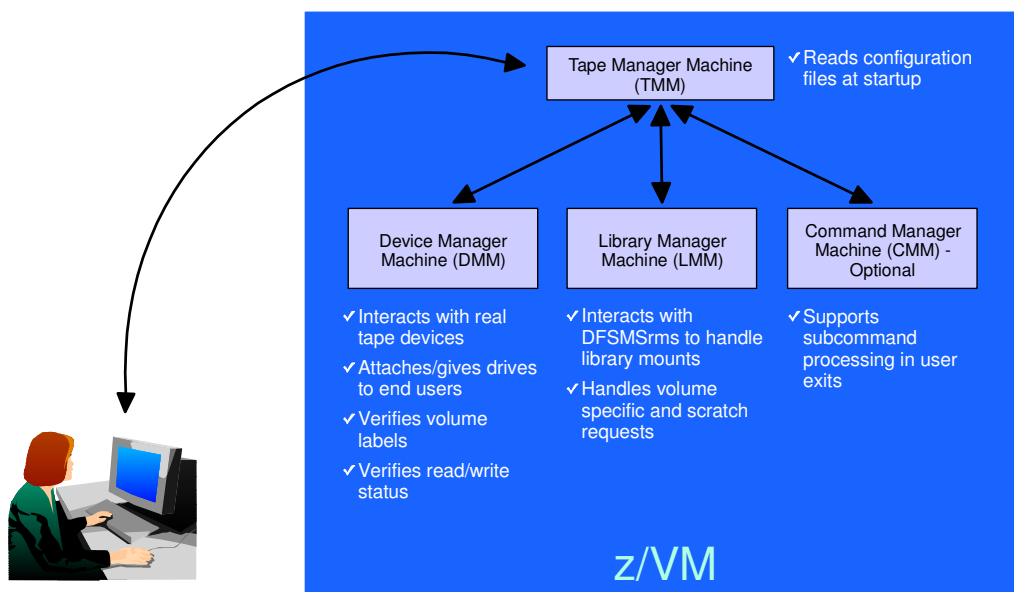


Access Control

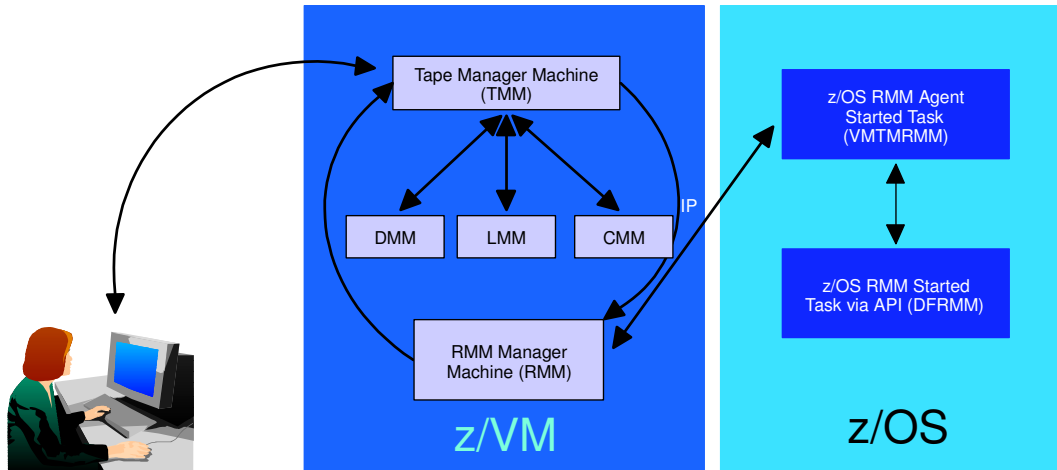
Authority	Modify Pool Attributes and Delete Pool	Modify Tape Attributes	Add/Delete Tapes to the Pool	Modify Tapes	Read Tapes	Tape Attributes Modified Only as a Byproduct of Other Commands	Use Tape Pool as a Free Pool
Sys Admin	✓	✓	✓			✓	
Pool Admin	✓	✓	✓	✓	✓	✓	
Tape			✓	✓	✓	✓	
Write				✓	✓	✓	
Read					✓	✓	
Free							✓
None							

- ▶ Defined using POOL commands
- ▶ Can set defaults for each pool, then add or restrict access via specific user authorization

Tape Manager - Standard Mode



Tape Manager - Integration with RMM



- Communication within z/VM via SMSG/IUCV
 - ▶ IP for TMM to RMM
- Communication between z/VM and z/OS via TCP/IP

Configuration File - Standard Mode

```

/* SAMPLE CONFIG FILE FOR STANDARD IMPLEMENTATIONS          */
/*                                                            */
ADMINS      TMADMN          /* Authorized users          */
/*                                                            */
ATTACH      500             /* Dedicated device list    */
/*                                                            */
/*      Init status Exit ID Xmit ACTN Intervals TO ACTN  SubCmd Secs */
/*      ----- */
CMDEXIT ENABLE      TMCMM  RUN      3      RUN      60
/*                                                            */
/* Non-ATL device pool statement                             */
/*      Name      Devices                                     */
DEVPOOL      3490L  600-601
DEVPOOL      3490M  500-501
/*                                                            */
/* ATL device pool statements showing device list continuation */
DEVPOOL      3590A  ATL NWAATL1 530-531
DEVPOOL      3590A  630-631
/*                                                            */
DEVWAIT      4             /* Max device wait time in minutes */
/*                                                            */
/*      Name      Vaddr Mode                                 */
DISK DB1      0200  U
DISK DB2      0210  V
DISK USER     0191  Z

```

... Configuration File - Standard Mode

```

DMM          TMDMM          /* Userid for the Dev. Mgt. Machine */
/*
EXPSTART     13:30:00       /* Start time for expiration processing */
/*
FREEACC      NONE          /* Allow private pool use of sys scratch */
FREEAUTH     Y              /* Auth required for system scratch use */
/*
FILEOFF      OPERATIONS
/*
LIBRARY      NWAATL1 ONLINE TMLM1 /* Library / Initial status / Server */
/*
LIBTYPPRI    M              /* Primary scratch source MAN/ATL */
LIBTYPSEC    A              /* Secondary scratch source MAN/ATL */
/*
OPERATIONS   OPERATOR
/*
POOLAUTH     Y              /* Auth required to define pools */
POOLDEF      NONE          /* Auth required to define pools */
POOLMAX      1000          /* System default for maximum pool tapes */
POOLWARN     80            /* System default for pool warn percent */
RETNDFLT     100           /* Default retention days */
RETNDMAX     1000          /* Maximum retention days */
/*
SCROWNER     *              /* Default scratch pool owner */
SCRNAME      POOL1         /* Default scratch pool name */
/*
VOLMIN       6              /* Minimum length of volume serial */
VOLMAX       6              /* Maximum length of volume serial <= 16 */
VOLWAIT      10            /* Max retries (1/min) for volume wait */

```

... Configuration File - RMM Mode

```

FILEOFF      OPERATIONS
/*
LIBRARY      NWAATL1 ONLINE TMLM1 /* Library / Initial status / Server */
/*
OPERATIONS   CSHOWA
/*
DISK         TCPIP 0592 Z
/*
/* .- VM RMM service machine name
/* | .- VM TCPIP service machine name
/* | | .- VM RMM service machine IP address
/* | | | or Host Name
/* | | | .- VM service machine port
/* | | | | .- z/OS agent IP address
/* | | | | | or Host Name
/* | | | | | .- z/OS agent port
/* | | | | |
RMM TMRMM TCPIP RS54          9999 RS52          35042
/*
RMMCMDWAIT 3
RMMSCRPOOL ATL ATL1 NWAATL1 SCRATCH0 VOL
RMMSCRPOOL MAN NOATL
/*
RMMSCRFLT   DEVP 3590A
/* RMMSCRFLT   SCRIP ATL1
/* RMMSCRFLT   DEVP 3590A
/* RMMSCRFLT   RDEV 530

```


Tape Manager Summary

- Automate daily tape operations
 - Manage mount requests
 - Control tape access
 - Perform label verification
 - Expire tapes
- Efficiently manage tapes and tape devices
 - Share devices
 - Control access to individual tapes in an ATL
- Improve productivity
 - Notify and interact with operator on behalf of user
 - Support manual and ATL mount requests
 - Perform label verification before and after tape use

Backup and Restore Manager for z/VM

Flexibility

Productivity

Control

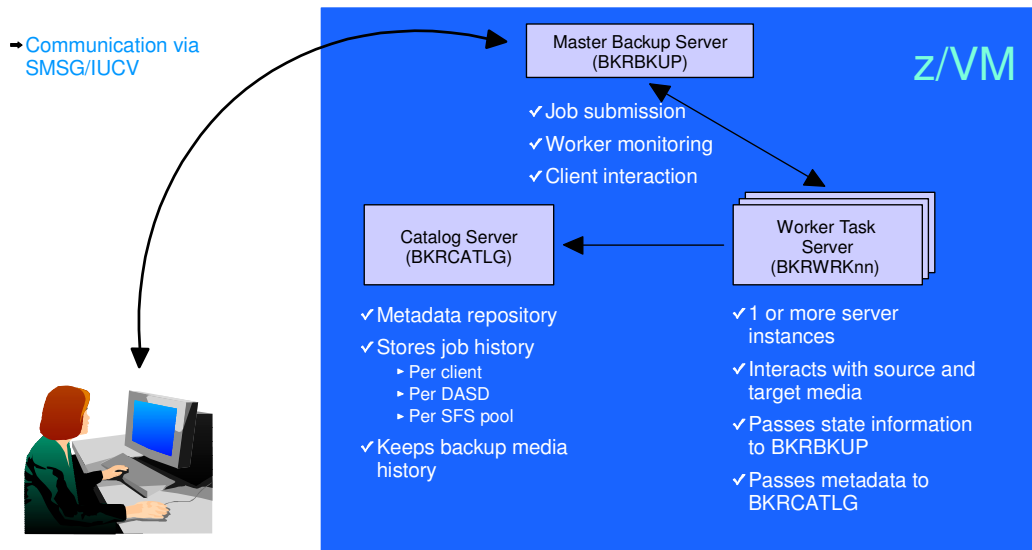
Key Features

- **Modular design with an eye to the future**
 - Data handlers for each data type (minidisk, SFS, CKD, reader)
 - Media drivers for each media type (tape, twin tapes, CMS file)
- **Standard CMS interfaces**
 - Support for new hardware when CMS supports it
 - Backup/restore catalog housed as a hierarchical structure in SFS
- **Documented interfaces to data packaging tools**
- **Review of a defined backup job before submission**
- **Reduced backup window with concurrent processing**
 - Multiple service machines sharing the job
 - Assigned by master server
- **Automatic aging and pruning of the backup catalog**

Access Control

- **Administrators**
 - Review and submit jobs
 - Manipulate contents of backup catalog
 - Backup and restore from anywhere to anywhere
 - Receive all service machine consoles
 - Full screen interface for navigating the catalog and requesting restores
 - By job, then instance, ownerid, resource type, resource (specific filespace or minidisk)
 - By user, then resource, resource type, job name, instance objects
 - By DASD volid, then extent start, extent size, ownerid, minidisk address, job name, instance
 - By DASD volid, then ownerid, minidisk address, extent start, extent size, job name, instance
- **Users**
 - Restore files they own
 - Full screen interface to find files available for restore

Backup and Restore Manager - Architecture



Configuration File

```

Local_Backup_Admin_ID = BKRADMIN
Local_Backup_Master_ID = BKRBKUP
Local_Backup_Catalog_ID = BKRCATLG
*
Worker_Idle_Timeout = +00:15:00

* Temporary staging area info for worker virtual machines
Worker_Stage_Type = VFB-512

* Tunes the number of buffer pages allocated by GETMSDK for VMUDQ (diag 25c)
* reply during INCLUDE/EXCLUDE processing. For every 1MB (256 pages) of
* buffer allocated, GETMSDK can process 17,746 minidisk definitions.
Template_MDISK_Buffer_Pages = 512

BKR_Allow_EDF_Target_Format = 1

* Configuration for tape handling exits (BKRMOUNT, BKRMUNT, BKREOV):
Tape_Exit_Context = BKR
Tape_Operator = OPERATOR
Tape_Request_Method = EXEC TELL
Tape_Delay_Interval = +00:00:60
Tape_Times_To_Poll = 5
TAP1_Virtual_Address = 181
TAP2_Virtual_Address = 182
Tape_Retain_After_EOJ = 0

* Master Backup Catalog configuration:
CatalogPool = ROCKSFS2
CatalogSpace = RVBCATLG
  
```

Job Template

```

CONFIG BKR_OUTPUT_SPEC = IBMTAPE SCRATCH RW 1
*CONFIG BKR_OUTPUT_SPEC = IBMTWIN SCRATCH RW 1 SCRATCH
*CONFIG BKR_OUTPUT_SPEC = CMSFILE DISK POOL X
*
CONFIG BKR_JOB_WORKERS = 3
CONFIG BKR_JOB_NAME     = RS54FULL
*
CONFIG BKR_JOB_CMS_FILEMASK = * * *
CONFIG BKR_JOB_SFS_PATHMASK = *
*
CONFIG BKR_JOB_CATALOG = Y
CONFIG BKR_CATALOG_RETENTION = 30
CONFIG BKR_CATALOG_VERBOSE = N
CONFIG BKR_OUT_EDF_VERBOSE = N
CONFIG BKR_OUT_TAPE_VERBOSE = N
*
CONFIG BKR_EDF_INCR_TOGGLE = N
CONFIG BKR_SFS_INCR_TOGGLE = N
    
```

... Job Template

```

/*****
/* Include/Exclude definitions */
/*****
FUNCTION  MEDIATYPE  OWNER      VDEV VOLUME DEVTYPE      START      END      SIZE  RESERVED
-----|-----|-----|-----|-----|-----|-----|-----|-----|
INCLUDE  MINIDISK   *           = *  *      *      = *      = *      = *      *
EXCLUDE  MINIDISK   FDISK       = *  *      *      = *      = *      = *      *
EXCLUDE  MINIDISK   $ALLOC$     = *  *      *      = *      = *      = *      *
INCLUDE  MINIDISK   MACKO*      = *  *      *      = *      = *      = *      *
EXCLUDE  MINIDISK   MACKO*      = 019* *      *      = *      = *      = *      *
EXCLUDE  MINIDISK   MAINT       = 0123 *      *      = *      = *      = *      *
EXCLUDE  MINIDISK   MAINT       = 0124 *      *      = *      = *      = *      *
EXCLUDE  MINIDISK   ROCKSFS*    = *  *      *      = *      = *      = *      *
INCLUDE  MINIDISK   ROCKSFS*    = 019* *      *      = *      = *      = *      *
EXCLUDE  MINIDISK   VMSERV*     = *  *      *      = *      = *      = *      *
INCLUDE  MINIDISK   VMSERV*     = 019* *      *      = *      = *      = *      *
EXCLUDE  MINIDISK   *           = *  *      *      = *      = *      > 3300 *
EXCLUDE  MINIDISK   *           = *  *      *      = *      = *      = END    *
INCLUDE  MINIDISK   MAINT       = 012* *      *      = *      = *      = *      *

FUNCTION  MEDIATYPE  POOLNAME  OWNER  FS
-----|-----|-----|-----|-----|
INCLUDE  SFS         VMSYSU:   *      SFS
EXCLUDE  SFS         VMSYSU:   DFSMS* *
INCLUDE  SFS         ROCKSFS2: *      *
EXCLUDE  SFS         ROCKSFS2: RVBCATLG *
INCLUDE  SFS         VMDEVU:   *      *
    
```

Backup and Restore Manager Summary

- **Flexibility**
 - Backup only what is needed via include, exclude, and masking statements
 - Mix and match source and target types
- **Productivity**
 - Review of backup job before submission
 - User driven restores with no administrator interaction
- **Control**
 - Each user can only access restore data owned by him/her
 - Automatic aging and pruning of backup catalog
 - Consistent backups using the object directory (not source)

Summary

- **New z/VM tools for systems and storage management**
 - Improved flexibility, productivity, and control of backup and restore operations
 - Automated, efficient, and productive tape management and operations
- **V1.1 available April 29, 2005**
- **Open for additional beta participants**
- **Gathering and prioritizing additional customer requirements**
- **Investigating additional systems and storage management products**
- **Web sites:**
 - <http://www.ibm.com/software/stormgmt/zvm/tape/>
 - <http://www.ibm.com/software/stormgmt/zvm/backup/>