



IBM Software Group

# IBM's New Operations Manager and Archive Manager for z/VM

Session V67

IBM System z9 and zSeries Technical Conference

21 March 2006

Tracy Dean  
tld1@us.ibm.com

# Agenda

- Overview
- Archive Manager for z/VM
  - Key features
  - Product architecture
  - Configuration
- Operations Manager for z/VM
  - Key features
  - Product architecture
  - Configuration
- Other z/VM Tools (separate session)
  - Tape Manager for z/VM
  - Backup and Restore Manager for z/VM
- **New enhancements in red**

## 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

# Operations Manager for z/VM

- Monitor service machines
- Schedule events/actions
- Automate tasks with Terminal Device Manager
- **V1.2.0**
  - Support for RACF or other External Security Manager
  - Flexible dataspace configuration
  - Define actions for specific action processing server
  - Enhanced viewing of monitored consoles
  - Support for SET OBSERVER
  - New scheduling options
  - New functions for HMF customers
    - Monitor logon status of specified user IDs
    - Limit scheduled actions to specific days of the week or hours of the day
    - Include holidays and dependencies in scheduling
    - Execute actions at specified intervals
  - Announce: 21 February 2006
  - GA: 24 February 2006

## Archive Manager for z/VM

- **Archive** - designed for users and administrators
  - Manage disk space by moving infrequently used or accessed files to tape or other disk
  - Source data on CMS minidisk, SFS, ECKD images
  - Select files by filename filetype filemode
    - Wildcard support for filename filetype, SFS directory (including all subdirectories, or not)
    - Select non-CMS data by virtual device address
  - Target output (a parcel) to tape or disk
    - Always copied to staging disk first
- **Recall**
  - Source data on tape or disk
  - Target output to CMS minidisk, SFS, ECKD DASD, virtual reader
  - User or administrator requested
  - Search for file(s) to recall
    - Wildcard support for filename and filetype
    - Selection by date
    - Can include other files in that archive parcel
- **Product information**
  - Announced 23 August 2005
  - GA 26 August 2005



IBM Software Group

# Operations Manager for z/VM

Monitoring

Scheduling

Task automation

## Key Features

- Monitor service machines
  - Take predefined actions based on message text matching
  - Suppress messages
  - Highlight messages with color, blinking, etc.
- Schedule events/actions
- Automate tasks with Terminal Device Manager
- Supports multiple installations of Operations Manager on one z/VM system
  - Performance (monitoring a large number of consoles)
  - Separation of access control
- Supports your choice for security:
  - Internal security mechanism from V1.1.0
  - RACF for z/VM
  - Other External Security Manager (ESM)

# Monitor Service Machines

- **Monitor logon status of specified user IDs**
  - Take action if logged off to bring it to logged on status
  - Maximum number of retries can be specified
- **Capture console messages**
  - Must SECUSER or **OBSERVER** to Operations Manager GOMMAIN server
    - **Functional differences based on CP support of SECUSER vs OBSERVER**
  - Data spaces used to hold the log of captured messages/consoles
    - Console data passed from data space to the user when view is requested
    - One data space per monitored console
    - **Customizable data space sizes: per monitored console and/or per system**
  - Daily log includes captured message and meta data
    - Text, length, IUCV class, source
- **Define rules to**
  - Scan console messages for text matching
    - Includes wildcard support
  - Take actions based on matches
- **Multiple rules can apply to one message**
  - FINAL option available to indicate no additional rules should be evaluated



# Monitor Service Machines

- Predefined actions
  - Suppress message from dataspace
    - Always sent to the log
  - Highlight message with color, blinking, etc.
  - Hold and change the display attributes of a specific messages when viewing a console and the message moves to the top of the screen
- Customer defined actions
  - CP or CMS command, or EXEC to be executed
  - Run on GOMMAIN, any available action processing server, or a specific action processing server
- View consoles
  - Authorize users to view individual consoles or a set of consoles
    - Message text only
    - Message text with the time stamp
    - Message text with the date and time stamp
  - "Fullscreen mode"
    - Scroll up and down
    - Autoscroll (on or off) as new output is displayed on the console
    - Access a console image before any output is available
    - Issue commands back to the monitored console via CP SEND

# Schedule Events and Actions

## ▪ Define schedules

- At a specific time
  - Hourly at a specified number of minutes past the hour
  - Daily at a specified time
  - Weekly on a specified day of the week and at a specified time
  - Monthly on a specified day of the month and at a specified time
  - Yearly on a specified month and day and at a specified time
  - Once on specified month, day, year, and time
- At regular intervals
  - Every x hours and y minutes
- Within a specified window of time
  - Specify start time
  - Specify conflicting schedules
  - Specify maximum time to defer this schedule, waiting for conflicts/dependencies to complete
  - No execution for this occurrence of the schedule if maximum time is reached
- Within limits
  - Restrict to specific days of the week: Monday through Sunday plus holidays
  - Restrict to certain hours of the day

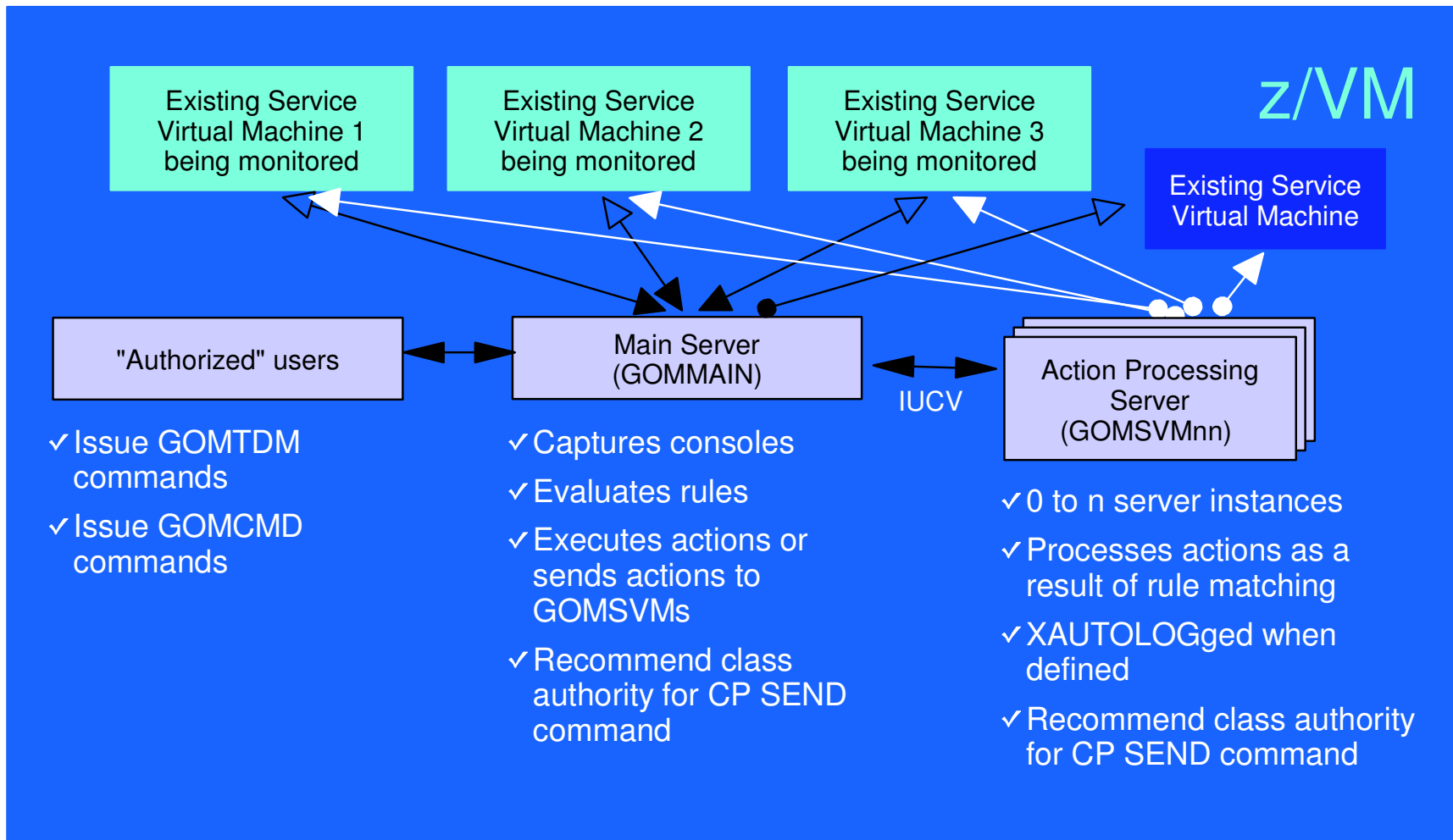
## Schedule Events and Actions

- Time based on local time of system
  - Same as Query TIME
  - Picks up dynamic time zone changes
  - Must be restarted if hardware TOD clock is changed
- Specify the action associated with the timer
  - Actions specified the same as those for console rules
- Only future timers are activated on startup
  - Won't execute a timer scheduled for earlier today **that has reached its maximum deferral**
  - Will execute it at its next occurrence

# Automate Multi-step Tasks

- Using Terminal Device Management (TDM)
  - Create scripts (REXX EXECs) to logon to a user and perform specific actions
  - EXEC contains special calls to Operations Manager GOMTDM functions
    - **OPTION:** set up the environment for this session
      - Suppressing or displaying messages
      - Imbedded delays after input or output displayed on console
      - Maximum wait for console response to a GOMTDM query
      - Stacking returned values LIFO vs. FIFO
      - Coded character set to use
      - Put all console output to a file or not
      - Wait for keyboard input lock to clear or not
    - **INIT:** start a new session at this z/VM system's logon screen and return session id (handle)
    - **INPUT:** enter data from session command line by specifying:
      - Handle
      - Data to enter
      - Cursor position
      - Key to simulate (Enter, Clear, PA1-PA3, PF1-PF24, Forward tab, Backward tab, Up, Down, Left, Right, Newline, Home, EraseEOF)
    - **QUERY:** get information about the session
      - Cursor position
      - Position of next occurrence of a specified string on the screen, based on cursor position
      - Put copy of the screen in a specified file
      - Version of Operations Manager code running
    - **TERM:** end a session specified by a handle
  - Using DIAG '7C' for logical device support

# Operations Manager - Architecture



## Monitoring GOMMAIN using the GOMCMD command

- Issued by users with access to the command
- Executes an Operations Manager command on GOMMAIN
  - User must have authorization to issue the command on GOMMAIN
  - Includes any valid Operations Manager control or configuration command
- Passes output back to user console
  - "Fullscreen mode" for log and console viewing
    - Scrolling up and down
    - Autoscrolling (on or off) as new output is displayed on the console
    - **Hold and change the display attributes when specific messages move to the top of the screen based on message matching rules**
    - Command line available to issue commands back to the monitored console (via CP SEND)
  - "Linemode" for other commands
- Typically used to view a log or query status
  - Can be used to troubleshoot a service machine or user problem
  - Multiple administrators can view a console simultaneously

# Access Control

- Users defined with access to one or more:
  - Control commands
    - Manage the Operations Manager infrastructure
    - Define additional service machines to execute actions
    - Authorize users
    - Display status
    - Issue CP and CMS commands on an Operations Manager service machine
    - Define data space sizes
  - Configuration commands
    - Define rules, timers, actions
    - Define holidays
    - Define user IDs to monitor for logoff status
    - Define groups
  - Consoles
    - Define user access to monitored consoles
- Security
  - Internal to Operations Manager (as in V1.1.0)
  - RACF or other External Security Manager
    - Uses RACROUTE and new Facility classes for Control, Configuration, and Console access
- Additional access based on access to modules
  - GOMCMD: issue commands on GOMMAIN and return output
    - Must be authorized to the commands issued
  - GOMTDM: terminal device management

# Sample Configuration File

```
* Define holidays
*
DEFDATE NAME(LAST2WKS),HOLIDAY(2006/12/18-00:00 2007/01/03-00:01)
DEFDATE NAME(JULY4),HOLIDAY(2006/07/01-00:00 2006/07/05-00:01)
*
* Dataspace sizes
*
DEFDSPS USER(*SFS*),SIZE(2097152)
DEFDSPS USER(*),SIZE(1048576)
*
* Monitor logon status of these user IDs
*
DEFMMON NAME(SFS),USER(BKRSFS),ACTION(LOGONUSR),INTERVAL(5),PARM(BKRSFS),DAYS(*****),RETRY(3)
DEFMMON NAME(TAPEMGR),USER(TMTMM),ACTION(LOGONUSR),INTERVAL(10),PARM(TMTMM),DAYS(*T*TF**H),RETRY(1)
*
* Imbed other configuration information
*
CONFIG FN(MYLOCAL),FT(TIMERS),FM(A)
CONFIG FN(MYLOCAL),FT(CONTROL),FM(A)
*
* Define groups of user IDs
*
DEFGROUP NAME(SFS),USER(*SFS)
DEFGROUP NAME(TAPEMGR),USER(TM%%%)
```



# Sample Configuration File

```
* Define users with control authority to Operations Manager
*
AUTH USER(USER1),CONTROL(Y)
AUTH USER(USER2),CONTROL(Y)
*
* Define users with config authority to Operations Manager
*
AUTH USER(USER1),CONFIG(Y)
AUTH USER(USER3),CONFIG(Y)
*
* Define users and the consoles they can access to Operations Manager
* Must have control authority
*
AUTH USER(USER1),CONSOLE(SFS)
AUTH USER(USER1),CONSOLE(TAPEMGR)
AUTH USER(USER2),CONSOLE(RSCSVM1)
AUTH USER(USER3),CONSOLE(*)
*
* Define servcie machines to Operations Manager
*
DEF SRVM USER(GOM SVM01)
DEF SRVM USER(GOM SVM02)
DEF SRVM USER(GOM SVM03)
DEF SRVM USER(GOM SVM04)
```

# Sample Configuration File

```
* Define rules to Operations Manager
*
DEFRULE NAME (CPREAD),MATCH (*HCP*150A*CP*),ACTION (CPREAD)
DEFRULE NAME (VMREAD),MATCH (*HCP*150A*VM*),ACTION (VMREAD)
DEFRULE NAME (PSWAIT),MATCH (*HCP*450W*),ACTION (PSWAIT)
* Define timers to Operations Manager
*
DEFTIMR NAME (STATS),WHEN (00),ACTION (STATUS)
DEFTIMR NAME (H00),WHEN (00),ACTION (STORMAP)
DEFTIMR NAME (WMON),WHEN (MON-00:00),ACTION (ACCOUNTS),PARM (WEEKLY)
DEFTIMR NAME (FIRSTM),WHEN (01-00:00),ACTION (NEWMONTH),PARM (MONTHLY)
*
* Define actions to Operations Manager
*
DEFACTN NAME (CPREAD),COMMAND (CP SEND &2 BEGIN),
INPUT (LOG,CRE),OUTPUT (LOG),ENV (LVM)
DEFACTN NAME (VMREAD),COMMAND (CP SEND &2 BEGIN),
INPUT (LOG,CRE),OUTPUT (LOG),ENV (LVM)
DEFACTN NAME (PSWAIT),COMMAND (CP SEND &U IPL CMS),
INPUT (LOG,CBL),OUTPUT (LOG),ENV (LVM)
DEFACTN NAME (STATUS),COMMAND (STATUS),OUTPUT (LOG),ENV (GOM)
DEFACTN NAME (STORMAP),COMMAND (STORMAP),OUTPUT (LOG),ENV (LVM)
DEFACTN NAME (ACCOUNTS),COMMAND (EXEC DOACCTS &P),OUTPUT (LOG),ENV (SVM)
DEFACTN NAME (NEWMONTH),COMMAND (EXEC DOACCTS &P),OUTPUT (LOG),ENV (SVM)
```



IBM Software Group

## Archive Manager for z/VM

Efficiency

Productivity

Control

## Key Features

- **Based on design of Backup and Restore Manager**
  - Modular data handlers and media drivers
  - Catalog housed as a hierarchical structure in SFS
  - Standard CMS interfaces
  - Recalls with original date
  - Expiration processing
- **Asynchronous user interface**
  - Immediate (synchronous) notification if no files found to archive
  - User warned not to modify files until archive complete
  - User notified when archive or recall is complete
- **Concurrent processing available when tapes are involved**
  - Multiple service machines available
  - 1 job assigned to 1 service machine
  - Assigned by master server
- **Automatic aging and pruning of the archive catalog and data**
  - Tape consolidation available to remove gaps created by expired archives

# Access Control

## ■ Administrators

- Submit archive and recall requests for any data
- Archive and recall from anywhere to anywhere
- Manipulate contents of archive catalog
- Receive all service machine consoles
- Full screen interface for navigating the catalog and requesting recalls

## ■ Users

- Archive and recall files they own
- Archive to any authorized storage class
- Full screen interface to find files available for recall

## ■ Groups

- Can recall files belonging to any storage group to which they are a member

# Storage Groups and Storage Classes

## AMVSRVR CONFIG

```

Begin_Groups
ALLUSERS
DSKUSERS
End_Groups
Begin_Classes
Define_Class DEFAULT TAPE SIMPLEX 1 365 365 SCRATCH ALLUSERS - N Y Y N N N N
Define_Class ADMINDSK EDF SIMPLEX 1 365 2555 E00 DSKUSERS - Y Y Y Y Y N N
End_Classes
    
```

### DEFAULT Storage Class

- Archives to single tape
- Default retention 365 days
- Min retention 1, max 365 days
- All users on system can archive here
- Users can remove and transfer archives
- Users can not extend expiration, move parcels to another storage class, create image parcels

### ALLUSERS GROUPLST

EVERYONE

### DSKUSERS GROUPLST

ADMINS  
DEPTABC

### EVERYONE ROSTER

\*

### ADMINS ROSTER

OPS\*

### DEPTABC ROSTER

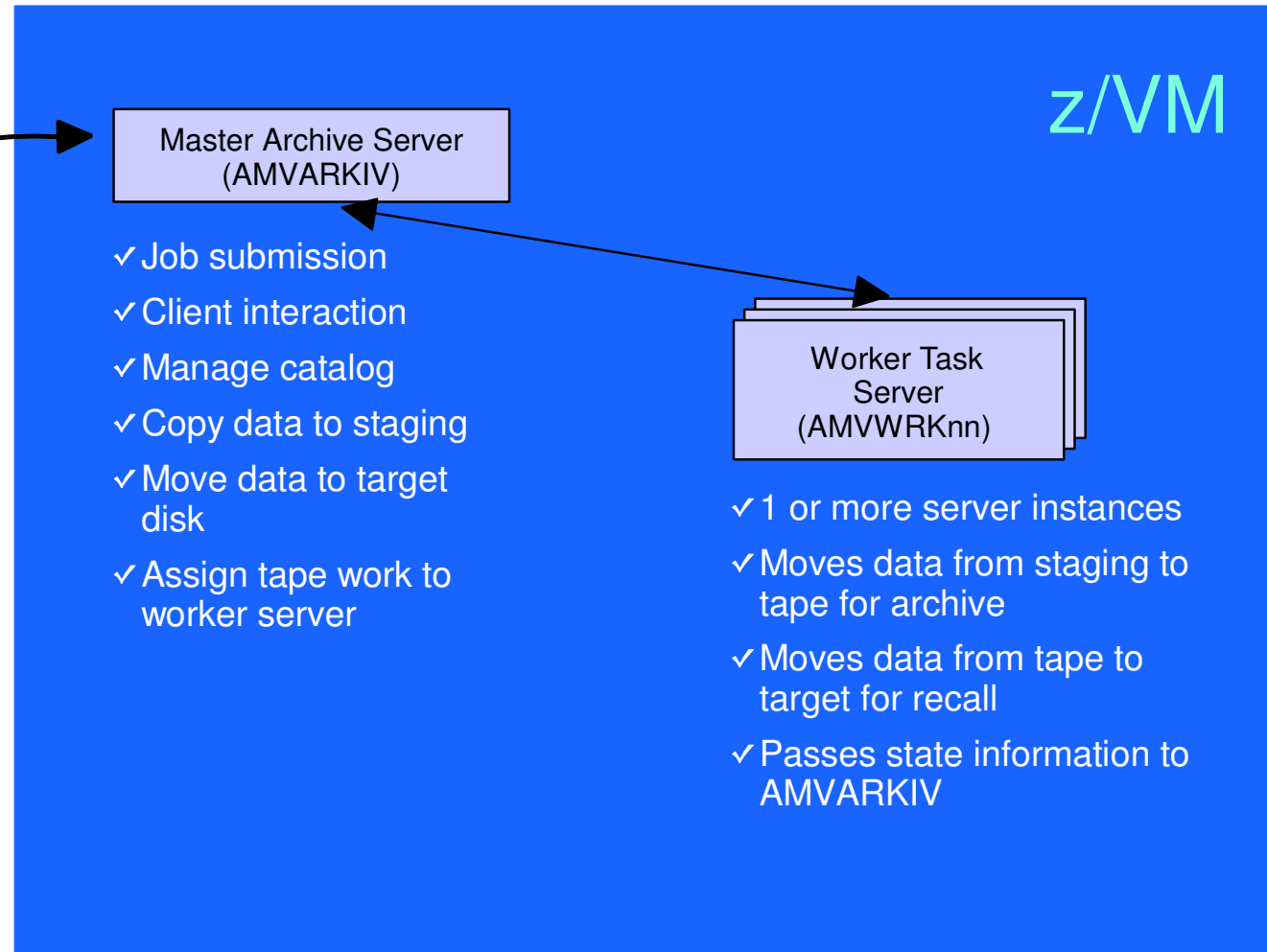
USERA  
USERB  
USERC

### ADMINDSK Storage Class

- Archive to AMVARKIV's E00 mdisk
- Default retention 365 days
- Min retention 1 day, max 7 years
- USERA, USERB, USERC, and OPS\* userids can archive here
- Users can extend expiration, remove and transfer archives, move parcels to another storage class, create image parcels

# Archive Manager - Architecture

→ Communication via  
MSG/IUCV



# System Configuration Information

```
* Identify administrative user and top-level service virtual machines:
*
Local_Archive_Admin_ID   = AMVADMIN
Local_Archive_Server_ID = AMVARKIV
Local_Archive_Catalog_ID = AMVCATLG
*
* Control archivist use of DEFINE MDISK versus LINK for minidisk access
*
* Valid settings are:  "LINK"      - use CP LINK (requires OPTION LKNOPAS)
*                      "DEFMDISK" - use CP DEFINE MDISK (requires OPTION DEVMAINT)
*
* Note:  Use of "DEFMDISK" allows archive processing of T-Disk contents. This
*        feature is unavailable if the "LINK" is specified.
*
* Archive_Minidisk_Via = LINK
Archive_Minidisk_Via   = DEFMDISK
*
* "Drop Dead" idle timer for worker task virtual machines
*
Worker_Idle_Timeout = +00:01:00
*
*
* Temporary staging area info for worker virtual machines
* Worker_Stage_Type = Some valid argument for DEFINE Txxxx -or- DEFINE VFB-512
*                   command.  Supported values are T3380, T3390, or VFB-512.
*
*
Worker_Stage_Type = T3380
```



## 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
  - Improved user management of disk space with archive functions
  - Automated operations
- **29 April 2005**
  - GA Tape Manager for z/VM V1.1
  - GA Backup and Restore Manager for z/VM V1.1
- **24 August 2005**
  - GA Archive Manager for z/VM V1.1
  - GA Operations Manager for z/VM V1.1
- **24 February 2006**
  - GA Tape Manager for z/VM V1.2
  - GA Operations Manager for z/VM V1.2
- **Gathering and prioritizing additional customer requirements**
- **Web site: <http://www.ibm.com/software/stormgmt/zvm/>**