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## Session V69:

# Integrating IBM's Solutions

System and Performance Management of z/VM and Linux on System z

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System z Technical Conference, Dresden  
May 2008

# Agenda

- **Introduction**
- **Architectural overview**
- **Performance management scenarios**
- **System and storage management scenarios**
- **Summary**

# Introduction

- **Products**

- Tivoli OMEGAMON XE on z/VM and Linux
- Operations Manager for z/VM
- Backup and Restore Manager for z/VM
- Tape Manager for z/VM
- Archive Manager for z/VM

- **Scenarios for system and performance management**

- z/VM systems with Linux guests
- z/VM systems without Linux guests

## Monitoring and Management of z/VM and Linux Guests



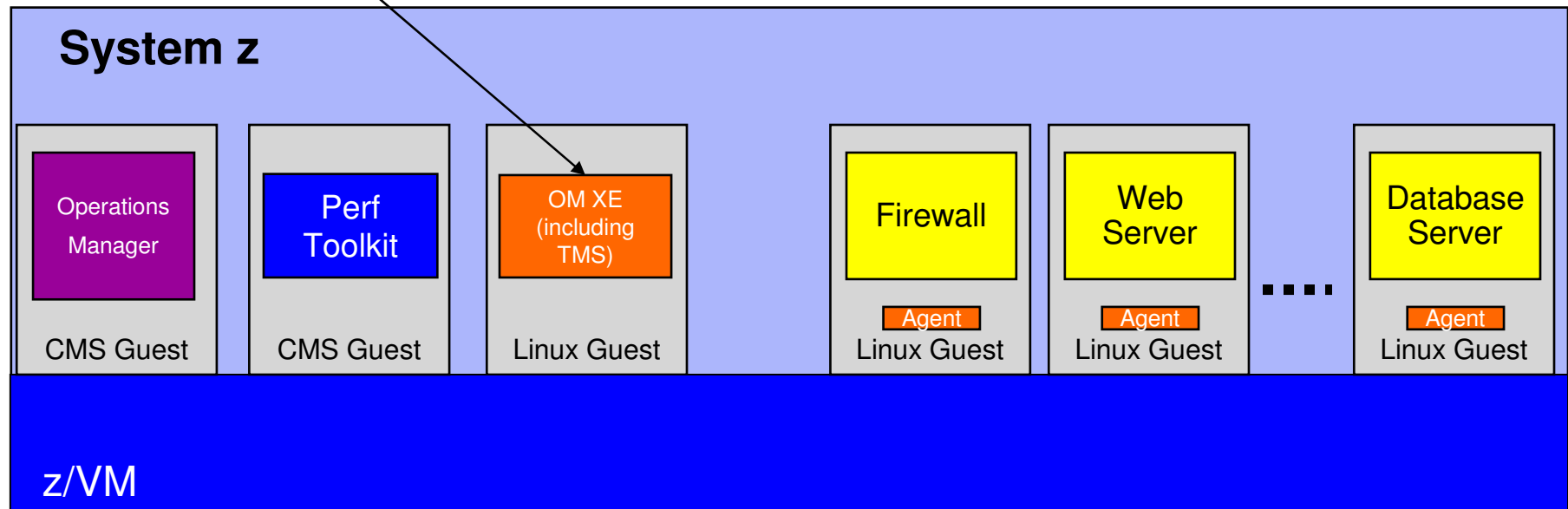
Tivoli Enterprise  
Portal  
(Web browser)

### ➤ OMEGAMON XE on z/VM and Linux

- Performance monitoring for z/VM and Linux guests
- Part of Tivoli Management Services (TMS) infrastructure
- Intuitive browser-based user interface
- Consolidated view of host and guest metrics

### ➤ Operations Manager for z/VM

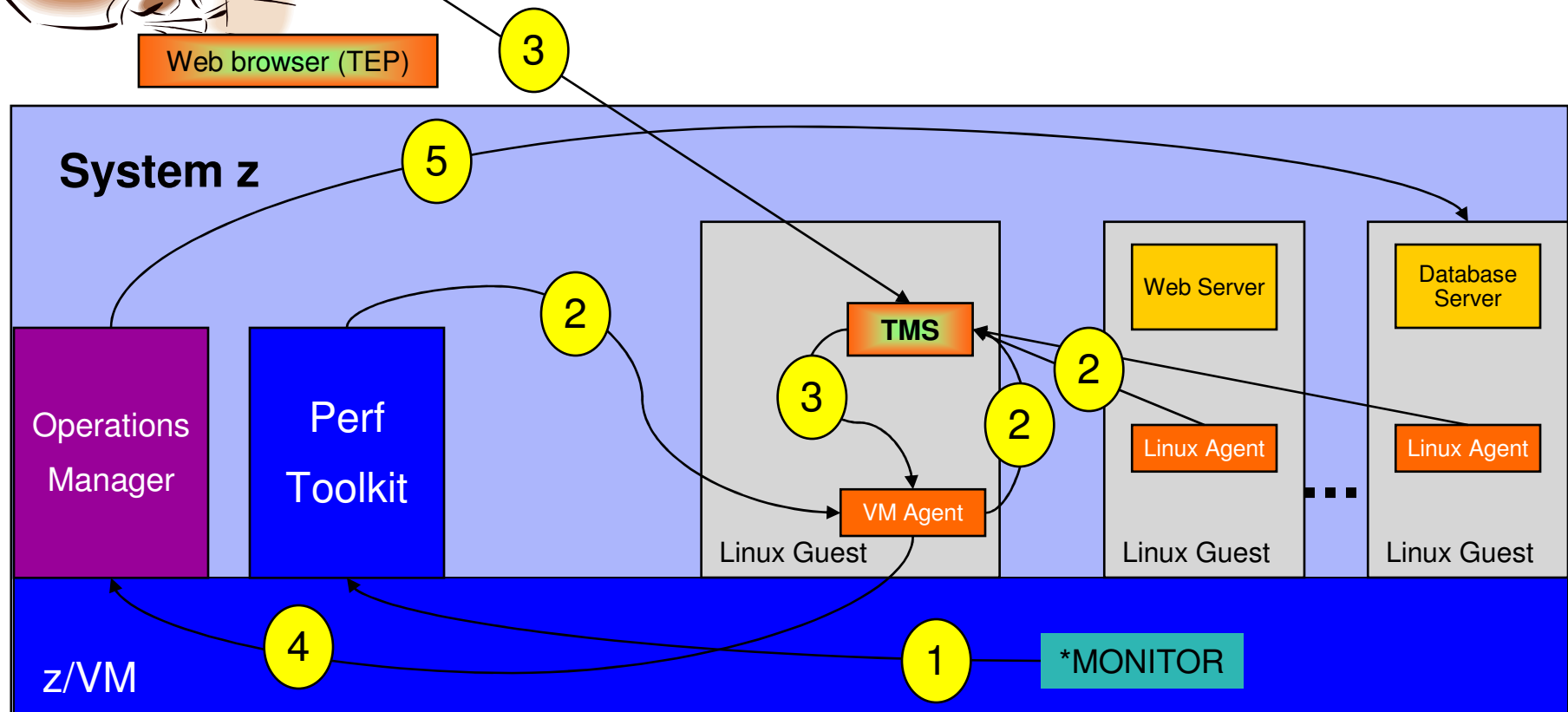
- Monitor consoles of z/VM service machines and guest user IDs
- Take actions based on console messages
  - Respond to “take action” requests from OMEGAMON
- Schedule routine tasks



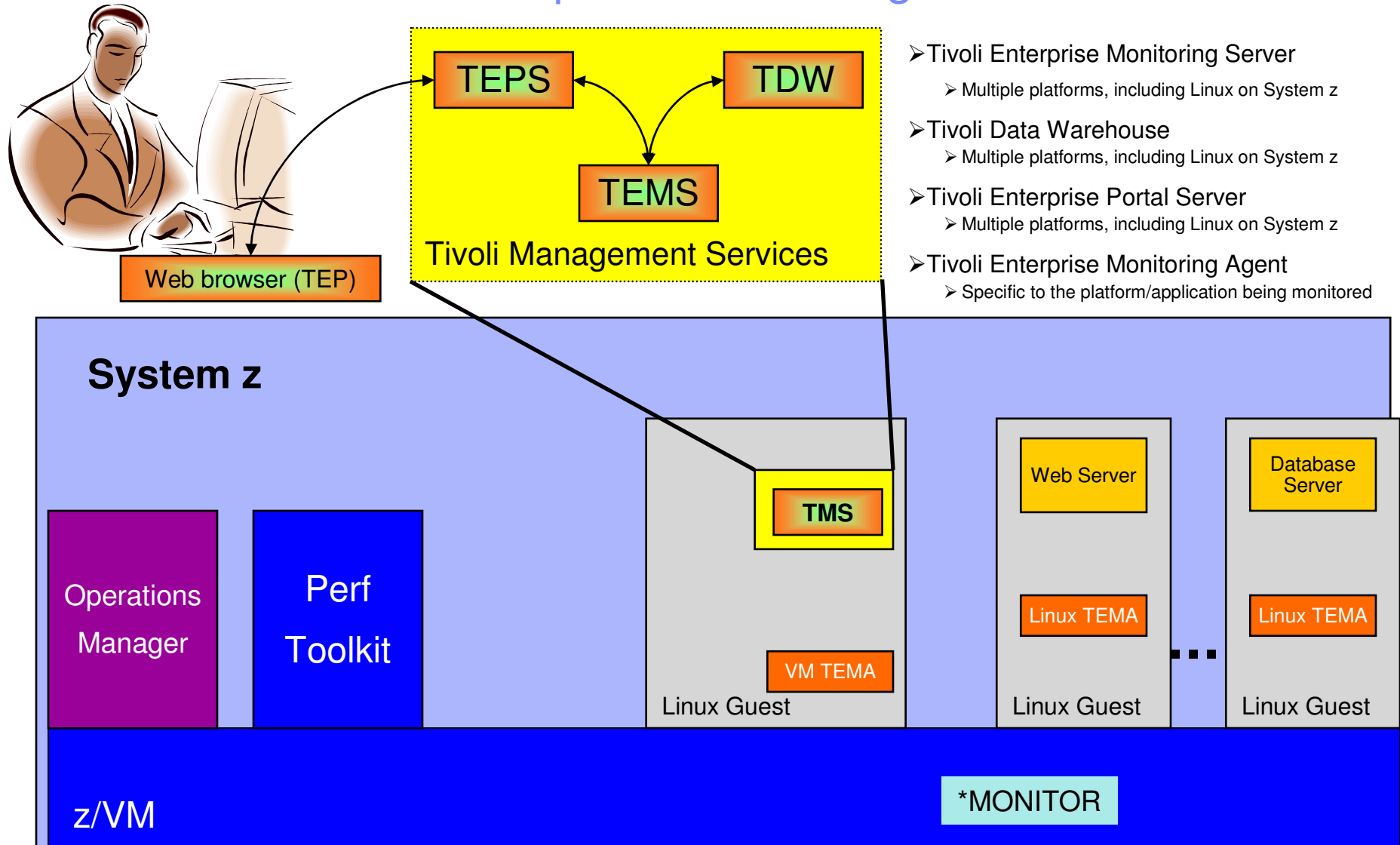
## OMEGAMON XE and Operations Manager for z/VM



## Process Flow



# OMEGAMON XE and Operations Manager for z/VM





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## Demo / Screenshots



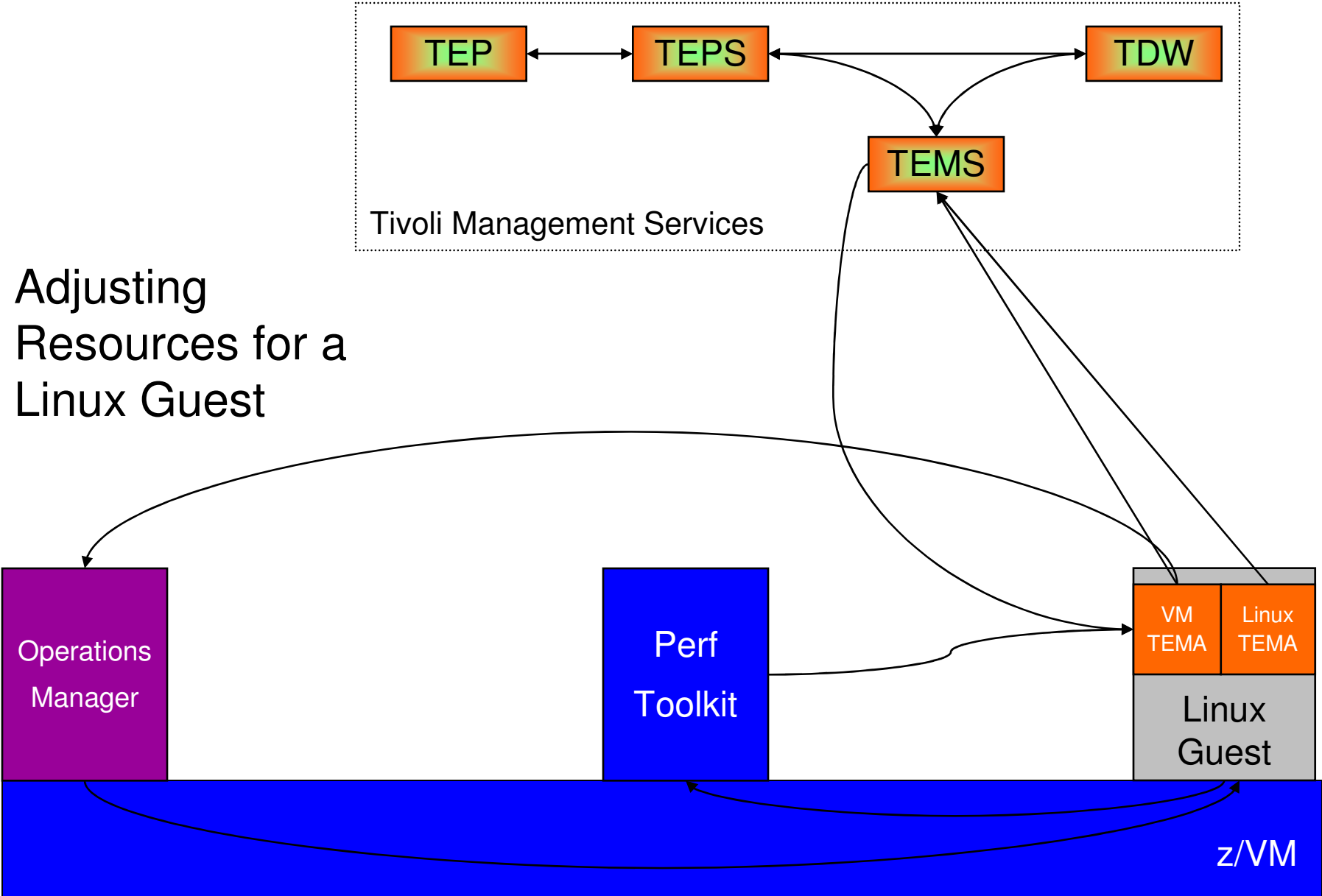
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# OMEGAMON and Operations Manager Performance Management Scenarios



## Adjusting Resources for a Linux Guest

- **Virtual CPU consumption is high for a Linux guest**
- **OMEGAMON XE detects the situation**
  - Sends message to Operations Manager
- **Action is triggered by a rule in Operations Manager**
- **Operations Manager issues CP commands to tune the guest**
  - SET QUICKDSP
  - SET SHARE
- **The triggered policy and action are viewable from TEP**





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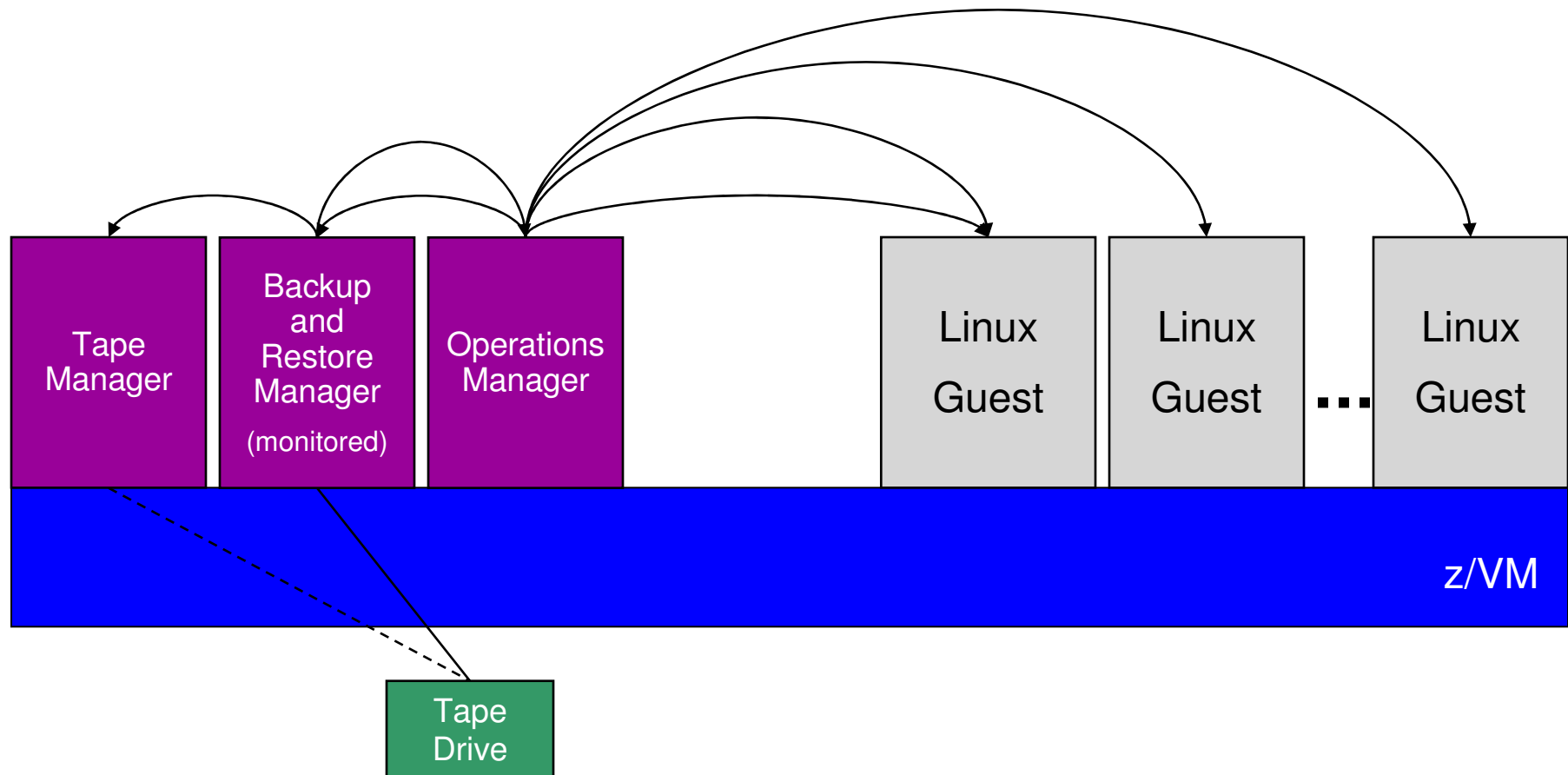
## System and Storage Management Scenarios

## Scheduling Image Backups of Linux Guests

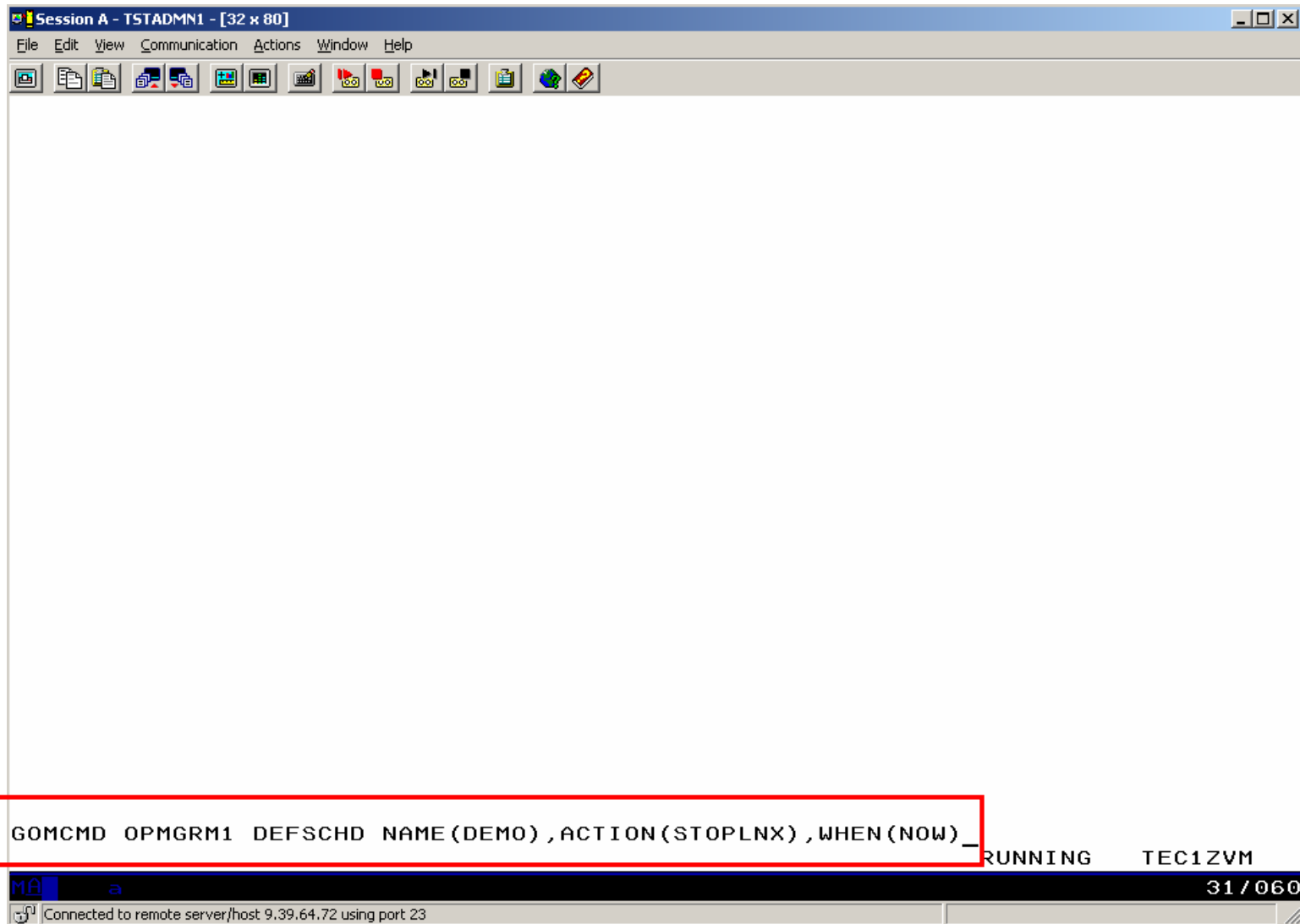
- **Initiated or scheduled by Operations Manager**
  - Schedule defined in Operations Manager to initiate backups at specific times/intervals
    - May include multiple schedules to allow quiescing/backing up one guest at a time
  - Action associated with each schedule
    - Linux guest is quiesced
    - Request sent to Backup and Restore Manager to back up the specific DASD/minidisks requested
    - Operations Manager notified when the action is complete
    - Linux guest is reactivated

# Scheduling Image Backups of Linux Guests

## Scheduled by Operations Manager



## Create a New Schedule to Run Now



## View Operations Manager Log to See Schedule Triggered

```

Session A - TSTADMN1 - [32 x 80]
File Edit View Communication Actions Window Help
03/01/2008 17:52:21 GOMCMD0201L "TSTADMN1DEFSCHD NAME(DEMO),ACTION(STOPLNX),WH
03/01/2008 17:52:22 GOMACT0260I SCHEDULE DEMO ACTION STOPLNX TRIGGERED BY
03/01/2008 17:52:22 GOMACT0262I ACTION STOPLNX BEGIN FOR SCHEDULE SERVER OPMG
03/01/2008 17:52:22 GOMACT0269I COMMAND "RESUME RULE(LNXDOWN)"
03/01/2008 17:52:22 GOMCMD0201L "OPMGRM1 RESUME RULE(LNXDOWN)" VID=OPMGRM1 SR
03/01/2008 17:52:22 GOMACT0267I ACTION STOPLNX END RC=0 SERVER OPMGRM1
03/01/2008 17:52:22 GOMACT0260I SCHEDULE DEMO ACTION STOPLNXA TRIGGERED BY
03/01/2008 17:52:22 GOMACT0262I ACTION STOPLNXA BEGIN FOR SCHEDULE SERVER OPMG
03/01/2008 17:52:22 GOMACT0269I COMMAND "CP SET SECUSER OMEGLNX1 OPMGRM1"
03/01/2008 17:52:22 GOMACT0267I ACTION STOPLNXA END RC=0 SERVER OPMGRM1
03/01/2008 17:52:22 GOMACT0260I SCHEDULE DEMO ACTION STOPLNXB TRIGGERED BY
03/01/2008 17:52:22 GOMACT0262I ACTION STOPLNXB BEGIN FOR SCHEDULE SERVER OPMG
03/01/2008 17:52:22 GOMACT0269I COMMAND "CP SIGNAL SHUTDOWN OMEGLNX1 WITHIN 90
03/01/2008 17:52:22 GOMACT0267I ACTION STOPLNXB END RC=0 SERVER OPMGRM1
03/01/2008 17:52:22 GOMCMD0216L "OMEGLNX1Broadcast message from root (console)
03/01/2008 17:52:22 GOMCMD0216L "OMEGLNX1The system is going down for reboot N
03/01/2008 17:52:22 GOMCMD0216L "OMEGLNX1INIT: Switching to runlevel: 6" VID=*
03/01/2008 17:52:22 GOMCMD0216L "OMEGLNX1INIT: Sending processes the TERM sign
03/01/2008 17:52:26 GOMCMD0201L "TSTADMN1VIEWLOG" VID=TSTADMN1 SRC=MASIUCV CL
03/01/2008 17:52:26 GOMCMD0216L "OMEGLNX1INIT: Sending processes the KILL sign
03/01/2008 17:52:33 GOMCMD0216L "OMEGLNX1Boot logging started on /dev/ttyS0(/d
03/01/2008 17:52:33 GOMCMD0216L "OMEGLNX1Master Resource Control: previous run
03/01/2008 17:52:36 GOMCMD0216L "OMEGLNX1Shutting down CRON daemon" VID=*MSG
03/01/2008 17:52:36 GOMCMD0216L "OMEGLNX1..done" VID=*MSG SRC=MASIUCV CLS
03/01/2008 17:52:38 GOMCMD0216L "OMEGLNX1Shutting down mail service (Postfix).
03/01/2008 17:52:39 GOMCMD0216L "OMEGLNX1Shutting down service kdm" VID=*MSG
03/01/2008 17:52:40 GOMCMD0216L "OMEGLNX1..done" VID=*MSG SRC=MASIUCV CLS
03/01/2008 17:52:41 GOMCMD0216L "OMEGLNX1Shutting down Name Service Cache Daem
03/01/2008 17:52:42 GOMCMD0216L "OMEGLNX1..done" VID=*MSG SRC=MASIUCV CLS
03/01/2008 17:52:43 GOMCMD0216L "OMEGLNX1Shutting down cupsd" VID=*MSG SRC
MASALOG
31/001
Connected to remote server/host 9.39.64.72 using port 23

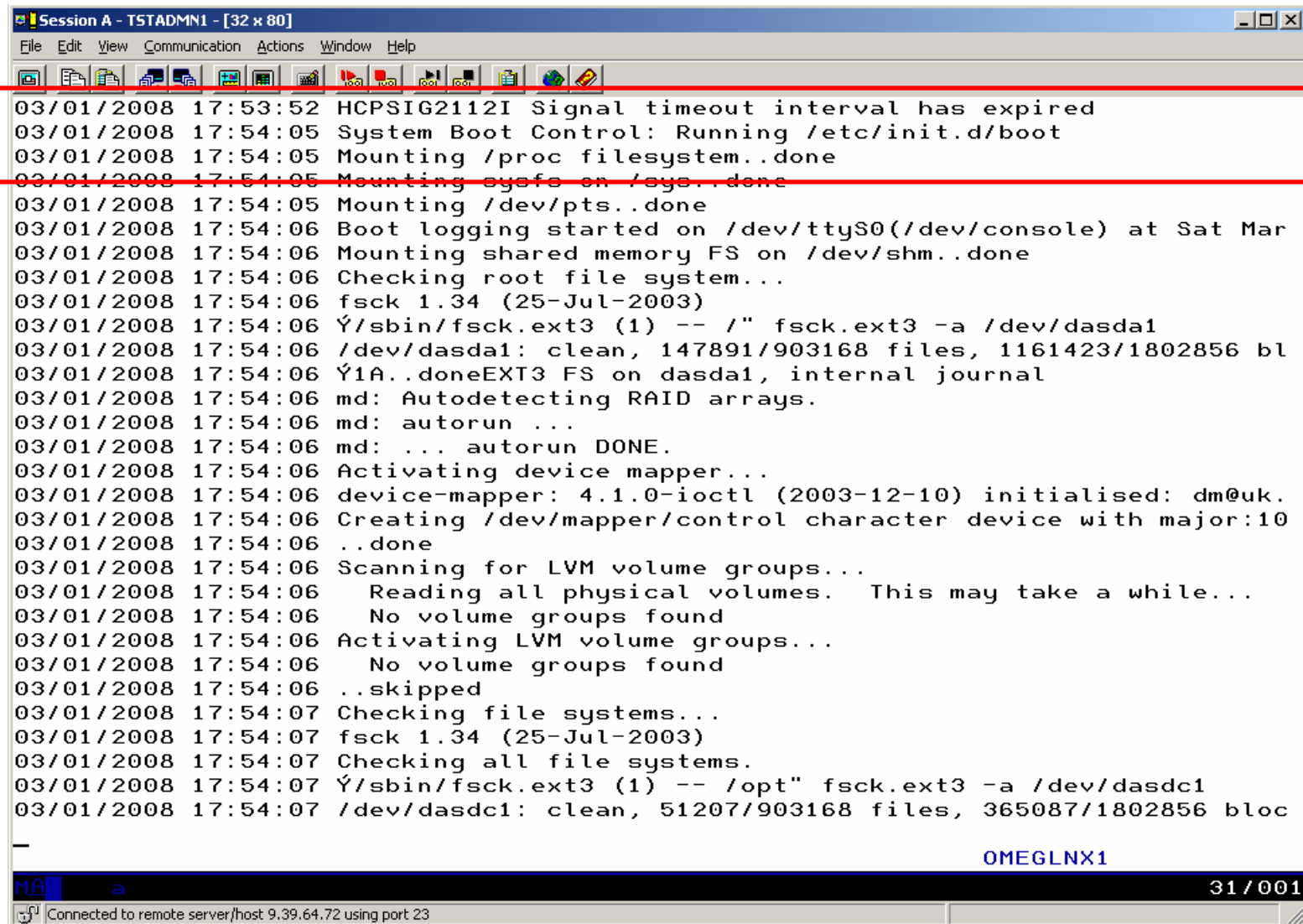
```

## View Linux Guest Console – Observe Shutdown

```
Session A - TSTADMN1 - [32 x 80]
File Edit View Communication Actions Window Help
03/01/2008 17:52:21 Broadcast message from root (console) (Sat Mar  1 11:52:22
03/01/2008 17:52:21 The system is going down for reboot NOW!
03/01/2008 17:52:21 INIT: Switching to runlevel: 6
03/01/2008 17:52:21 INIT: Sending processes the TERM signal
03/01/2008 17:52:26 INIT: Sending processes the KILL signal
03/01/2008 17:52:32 Boot logging started on /dev/ttyS0(/dev/console) at Sat Mar
03/01/2008 17:52:32 Master Resource Control: previous runlevel: 5, switching to
03/01/2008 17:52:35 Shutting down CRON daemon
03/01/2008 17:52:35 ..done
03/01/2008 17:52:37 Shutting down mail service (Postfix)..done
03/01/2008 17:52:38 Shutting down service kdm
03/01/2008 17:52:39 ..done
03/01/2008 17:52:41 Shutting down Name Service Cache Daemon
03/01/2008 17:52:41 ..done
03/01/2008 17:52:42 Shutting down cupsd
03/01/2008 17:52:42 ..done
03/01/2008 17:52:44 Shutting down slpd ..done
03/01/2008 17:52:48 Shutting down sound driver..done
03/01/2008 17:52:48 Shutting down SSH daemon..done
03/01/2008 17:52:50 Remove Net File System (NFS)..unused
03/01/2008 17:52:53 Umount SMB/ CIFS File Systems ..done
03/01/2008 17:52:53 Shutting down resource manager..done
03/01/2008 17:52:53 Shutting down RPC portmap daemon
03/01/2008 17:52:53 ..done
03/01/2008 17:52:55 Shutting down syslog servicesMar  1 11:52:55 sles9 kernel:
03/01/2008 17:52:55 Mar  1 11:52:55 sles9 kernel: Kernel log daemon terminating
03/01/2008 17:52:56 ..done
03/01/2008 17:53:08 Shutting down network interfaces:
03/01/2008 17:53:12      eth0
03/01/2008 17:53:12      eth0      configuration: qeth-bus-ccw-0.0.0600
-
OMEGLN1
31/001
Connected to remote server/host 9.39.64.72 using port 23
```



# Wait for System Down or Time Out Message



```
Session A - TSTADMIN1 - [32 x 80]
File Edit View Communication Actions Window Help

03/01/2008 17:53:52 HCPSIG2112I Signal timeout interval has expired
03/01/2008 17:54:05 System Boot Control: Running /etc/init.d/boot
03/01/2008 17:54:05 Mounting /proc filesystem..done
03/01/2008 17:54:05 Mounting sysfs on /sys..done
03/01/2008 17:54:05 Mounting /dev/pts..done
03/01/2008 17:54:06 Boot logging started on /dev/ttyS0(/dev/console) at Sat Mar
03/01/2008 17:54:06 Mounting shared memory FS on /dev/shm..done
03/01/2008 17:54:06 Checking root file system...
03/01/2008 17:54:06 fsck 1.34 (25-Jul-2003)
03/01/2008 17:54:06 Y/sbin/fsck.ext3 (1) -- /" fsck.ext3 -a /dev/dasda1
03/01/2008 17:54:06 /dev/dasda1: clean, 147891/903168 files, 1161423/1802856 bl
03/01/2008 17:54:06 Y1A..doneEXT3 FS on dasda1, internal journal
03/01/2008 17:54:06 md: Autodetecting RAID arrays.
03/01/2008 17:54:06 md: autorun ...
03/01/2008 17:54:06 md: ... autorun DONE.
03/01/2008 17:54:06 Activating device mapper...
03/01/2008 17:54:06 device-mapper: 4.1.0-ioct1 (2003-12-10) initialised: dm@uk.
03/01/2008 17:54:06 Creating /dev/mapper/control character device with major:10
03/01/2008 17:54:06 ..done
03/01/2008 17:54:06 Scanning for LVM volume groups...
03/01/2008 17:54:06 Reading all physical volumes. This may take a while...
03/01/2008 17:54:06 No volume groups found
03/01/2008 17:54:06 Activating LVM volume groups...
03/01/2008 17:54:06 No volume groups found
03/01/2008 17:54:06 ..skipped
03/01/2008 17:54:07 Checking file systems...
03/01/2008 17:54:07 fsck 1.34 (25-Jul-2003)
03/01/2008 17:54:07 Checking all file systems.
03/01/2008 17:54:07 Y/sbin/fsck.ext3 (1) -- /opt" fsck.ext3 -a /dev/dasdc1
03/01/2008 17:54:07 /dev/dasdc1: clean, 51207/903168 files, 365087/1802856 bloc
-
OMEGLN1X1
MA a 31/001
Connected to remote server/host 9.39.64.72 using port 23
```

# View Backup Manager Console (BKRBKUP)

```

Session A - TSTADMN1 - [32 x 80]
File Edit View Communication Actions Window Help
+++
*MSG OPMGRM1 SUBMIT BKUPLNX1
+++
BKRBK8515I Queued command #1: "*MSG OPMGRM1 SUBMIT BKUPLNX1"
BKRBK8532I Processing SUBMIT BKUPLNX1 command for OPMGRM1 at 03/01/08 17:53:52
AUTO LOGIN *** BKRWRK01 USERS - 23
HCPCLS6056I XAUTOLOG information for BKRWRK01: The IPL command is verified by t
Output line 1 : BKRMK8559I INCLUDE / EXCLUDE processing for job BKUPLNX1 selec
ed 1 objects
Output line 2 : BKRMK8559I for backup processing.
Output line 3 : BKRMK8563I Worker count for job BKUPLNX1 has been set to 1.
Output line 4 : BKRMK8570I Instance number 00000058 has been assigned for job
KUPLNX1.
Output line 5 : BKRMK8568I CMS files will be filtered against file mask "* * *
.
Output line 6 : BKRMK8568I SF3 files will be filtered with path mask "*".
Output line 7 : BKRMK8584I Sending BKUPLNX1 JOB D to worker task BKRWRK01.
Output line 8 : File BKUPLNX1 JOB D1 sent to BKRWRK01 at TEC12VM on 03/01/08 17
53:53
BKRBK8510I 03/01/08 17:53:55 WAKEUP exited on a VMCF interrupt.
BKRBK8512I The stack contains 1 entries. There are 0 lines on the console inpu
BKRBK8513I Program stack entry dump:
+++
*MSG BKRWRK01 WRKRSTAT TURNDON
+++
BKRBK8515I Queued command #1: "*MSG BKRWRK01 WRKRSTAT TURNDON"
BKRBK8519I Processing WRKRSTAT command TURNDON from *MSG BKRWRK01.
BKRBK8510I 03/01/08 17:53:56 WAKEUP exited on a VMCF interrupt.
BKRBK8512I The stack contains 1 entries. There are 0 lines on the console inpu
BKRBK8513I Program stack entry dump:
-
BKRBKUP
31/001
Connected to remote server/host 9.39.64.72 using port 23

```

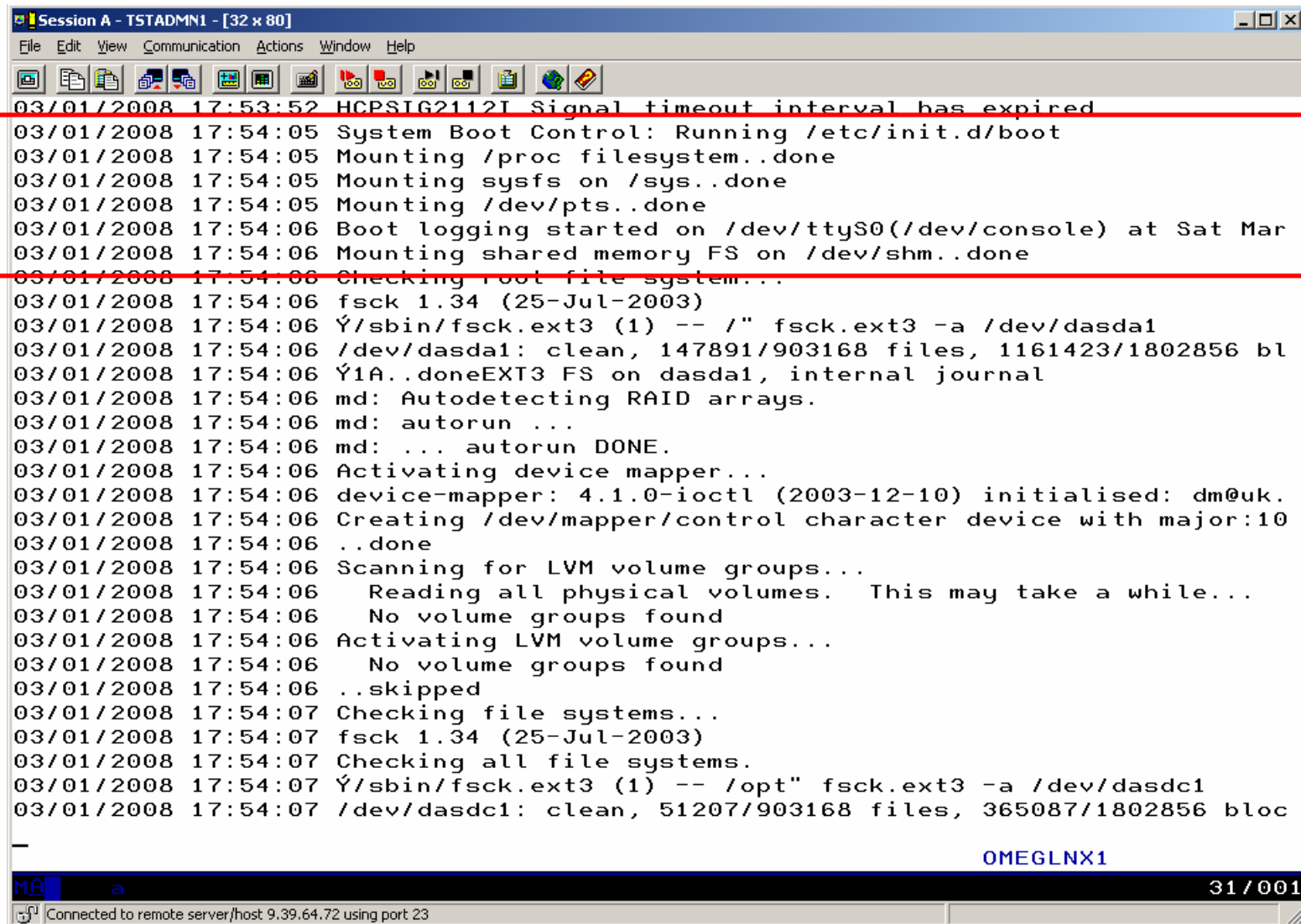
## View Backup Worker Console (BKRWRK01)

```
Session A - TSTADMIN1 - [32 x 80]
File Edit View Communication Actions Window Help
-----
BKRRVB9011I Job name: BKUPLNX1, instance identifier 00000058 starting at 17:53:
BKRRVB9011I Job owner: BKRADMIN
BKRRVB9011I Master backup server: BKRKBUP; worker virtual machine BKRWRK01.
BKRRVB9011I Job token value is 20080301.
BKRRVB9012I Catalog content creation is ENABLED.
BKRRVB9012I Catalog content will be delivered to backup catalog server BKRCATLG
BKRRVB9012I Temporary catalog granule data will be generated in CMS file BKUPLN
-----

BKRRVB9161I Scanning DISKPOOL "LNXBKUP DISKPOOL" for a volume with at least 418
BKRRVB9162I DISKPOOL volume AMVCATLG 333 has 7953 4K blocks free.
BKRRVB9163I Continuing backup with output to AMVCATLG 333.
OM EGLNX1 0191 RR EDF 4096 OX1191 00009000 00003974 00000050 00000050 00000011
-----

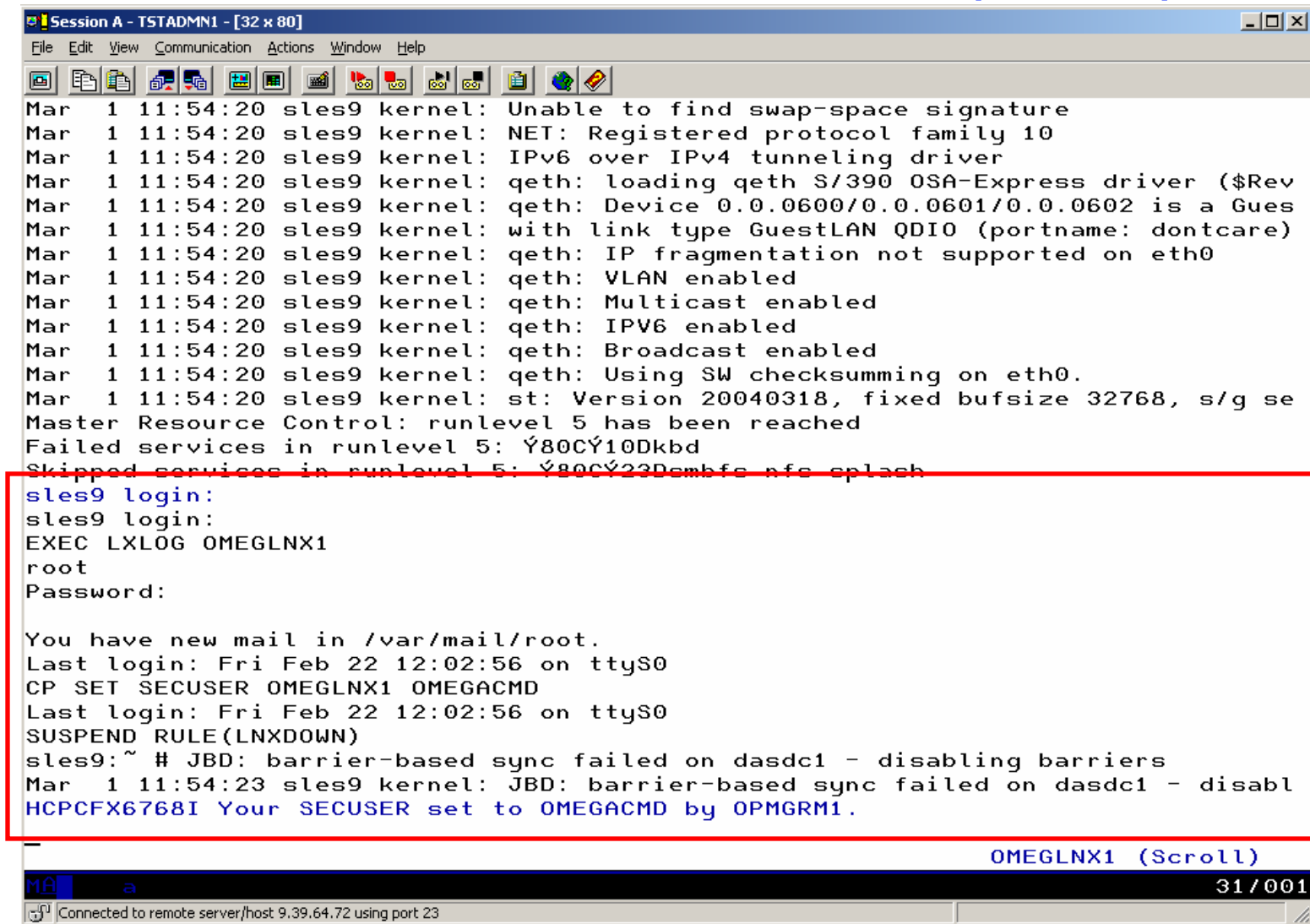
BKRRVB9014I Job completed at 17:54:03 on 03/01/08.
BKRRVB9005I Executing CP command "QUERY TIME"
TIME IS 17:54:03 UTC SATURDAY 03/01/08
CONNECT= 00:00:09 VIRTCPU= 000:00.04 TOTCPU= 000:00.09
BKRRVB9006I CP return code 0
*
* BACKUP COMPLETE - OM EGLNX1 LINUX GUEST
* BACKUP COMPLETE - OM EGLNX1 LINUX GUEST
CP XAUTOLOG OM EGLNX1
-----
BKRWRK01
MA a 31/001
Connected to remote server/host 9.39.64.72 using port 23
```

## View the Linux Guest Console – Guest is Restarting



```
Session A - TSTADMIN1 - [32 x 80]
File Edit View Communication Actions Window Help
03/01/2008 17:53:52 HCPSTG2112I Signal timeout interval has expired
03/01/2008 17:54:05 System Boot Control: Running /etc/init.d/boot
03/01/2008 17:54:05 Mounting /proc filesystem..done
03/01/2008 17:54:05 Mounting sysfs on /sys..done
03/01/2008 17:54:05 Mounting /dev/pts..done
03/01/2008 17:54:06 Boot logging started on /dev/ttyS0(/dev/console) at Sat Mar
03/01/2008 17:54:06 Mounting shared memory FS on /dev/shm..done
03/01/2008 17:54:06 Checking root file system...
03/01/2008 17:54:06 fsck 1.34 (25-Jul-2003)
03/01/2008 17:54:06 Y/sbin/fsck.ext3 (1) -- /" fsck.ext3 -a /dev/dasda1
03/01/2008 17:54:06 /dev/dasda1: clean, 147891/903168 files, 1161423/1802856 bl
03/01/2008 17:54:06 Y1A..doneEXT3 FS on dasda1, internal journal
03/01/2008 17:54:06 md: Autodetecting RAID arrays.
03/01/2008 17:54:06 md: autorun ...
03/01/2008 17:54:06 md: ... autorun DONE.
03/01/2008 17:54:06 Activating device mapper...
03/01/2008 17:54:06 device-mapper: 4.1.0-ioct1 (2003-12-10) initialised: dm@uk.
03/01/2008 17:54:06 Creating /dev/mapper/control character device with major:10
03/01/2008 17:54:06 ..done
03/01/2008 17:54:06 Scanning for LVM volume groups...
03/01/2008 17:54:06 Reading all physical volumes. This may take a while...
03/01/2008 17:54:06 No volume groups found
03/01/2008 17:54:06 Activating LVM volume groups...
03/01/2008 17:54:06 No volume groups found
03/01/2008 17:54:06 ..skipped
03/01/2008 17:54:07 Checking file systems...
03/01/2008 17:54:07 fsck 1.34 (25-Jul-2003)
03/01/2008 17:54:07 Checking all file systems.
03/01/2008 17:54:07 Y/sbin/fsck.ext3 (1) -- /opt" fsck.ext3 -a /dev/dasdc1
03/01/2008 17:54:07 /dev/dasdc1: clean, 51207/903168 files, 365087/1802856 bloc
-
OMEGLN1
ME a 31/001
Connected to remote server/host 9.39.64.72 using port 23
```

## View the Linux Guest Console - Startup Complete



```
Session A - TSTADMIN1 - [32 x 80]
File Edit View Communication Actions Window Help

Mar 1 11:54:20 sles9 kernel: Unable to find swap-space signature
Mar 1 11:54:20 sles9 kernel: NET: Registered protocol family 10
Mar 1 11:54:20 sles9 kernel: IPv6 over IPv4 tunneling driver
Mar 1 11:54:20 sles9 kernel: qeth: loading qeth S/390 OSA-Express driver ($Rev
Mar 1 11:54:20 sles9 kernel: qeth: Device 0.0.0600/0.0.0601/0.0.0602 is a Gues
Mar 1 11:54:20 sles9 kernel: with link type GuestLAN QDIO (portname: dontcare)
Mar 1 11:54:20 sles9 kernel: qeth: IP fragmentation not supported on eth0
Mar 1 11:54:20 sles9 kernel: qeth: VLAN enabled
Mar 1 11:54:20 sles9 kernel: qeth: Multicast enabled
Mar 1 11:54:20 sles9 kernel: qeth: IPV6 enabled
Mar 1 11:54:20 sles9 kernel: qeth: Broadcast enabled
Mar 1 11:54:20 sles9 kernel: qeth: Using SW checksumming on eth0.
Mar 1 11:54:20 sles9 kernel: st: Version 20040318, fixed bufsize 32768, s/g se
Master Resource Control: runlevel 5 has been reached
Failed services in runlevel 5: Y80CY10Dkbd
Skipped services in runlevel 5: Y80CY23Dombfc nfs splash
sles9 login:
sles9 login:
EXEC LXLOG OMEGLNX1
root
Password:

You have new mail in /var/mail/root.
Last login: Fri Feb 22 12:02:56 on ttyS0
CP SET SECUSER OMEGLNX1 OMEGACMD
Last login: Fri Feb 22 12:02:56 on ttyS0
SUSPEND RULE(LNXDOWN)
sles9:~ # JBD: barrier-based sync failed on dasdc1 - disabling barriers
Mar 1 11:54:23 sles9 kernel: JBD: barrier-based sync failed on dasdc1 - disabl
HPCPFX6768I Your SECUSER set to OMEGACMD by OPMGRM1.

OMEGLN1 (Scroll)
31/001
Connected to remote server/host 9.39.64.72 using port 23
```

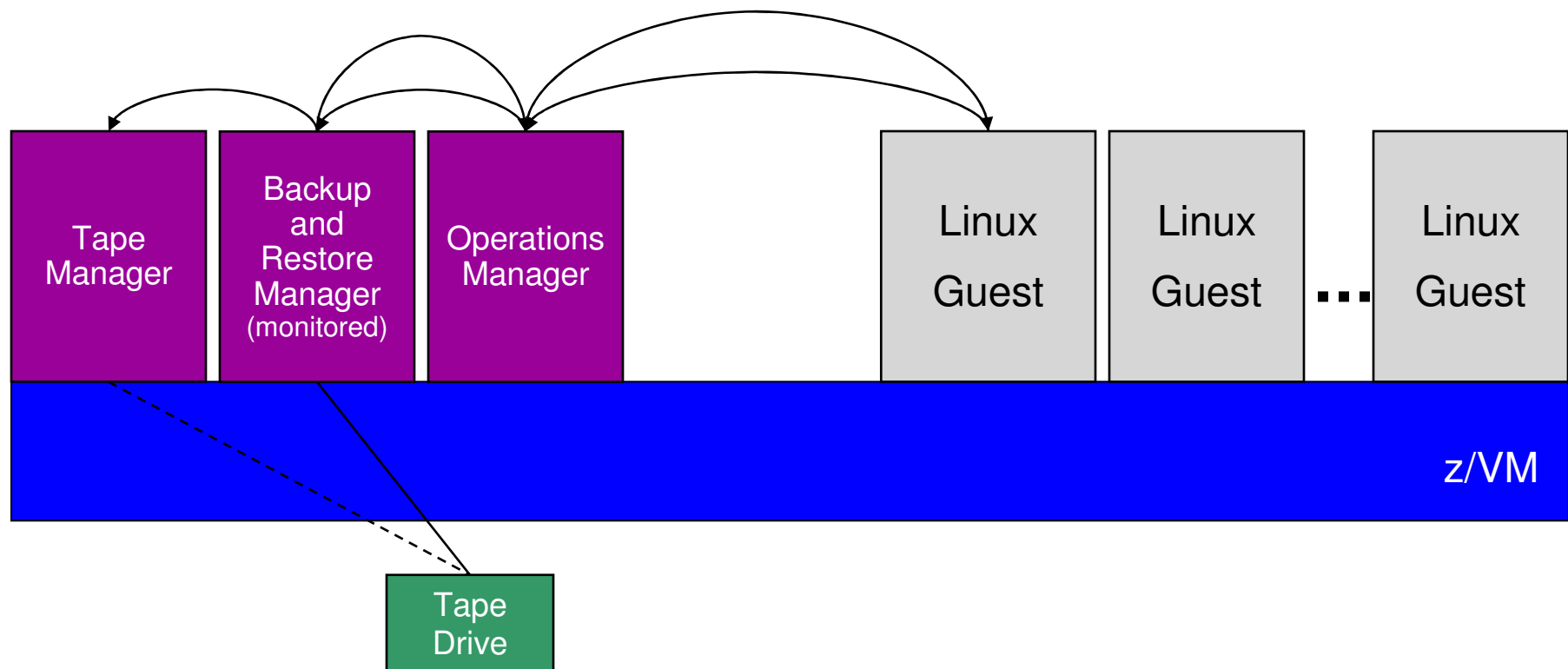
## Performing an Image Backup of a Linux Guest

### ■ Initiated or scheduled by the guest

- Linux guest sends message/request to Operations Manager (or any console being monitored)
- Action is triggered by a rule in Operations Manager
  - Linux guest is quiesced
    - Perhaps quiescing only the application running there
  - Operations Manager sends request to Backup and Restore Manager
    - Back up the specific DASD/minidisks requested
  - Operations Manager monitors the console of the backup server
    - Receives the message when backup is complete
    - Triggers a rule to re-activate the guest and send a message to the Linux guest indicating completion

# Performing an Image Backup of a Linux Guest

## Initiated by the Linux Guest

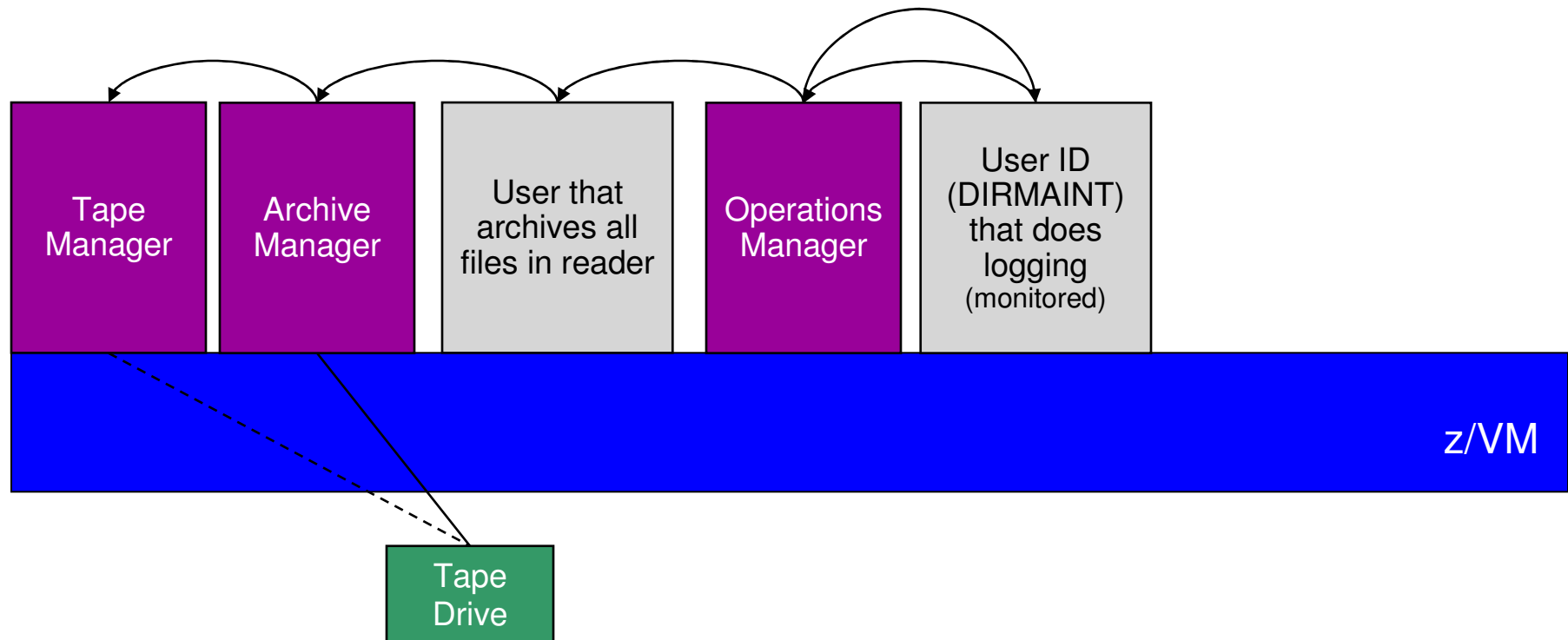


## Detecting Disk Full Conditions of Logging IDs

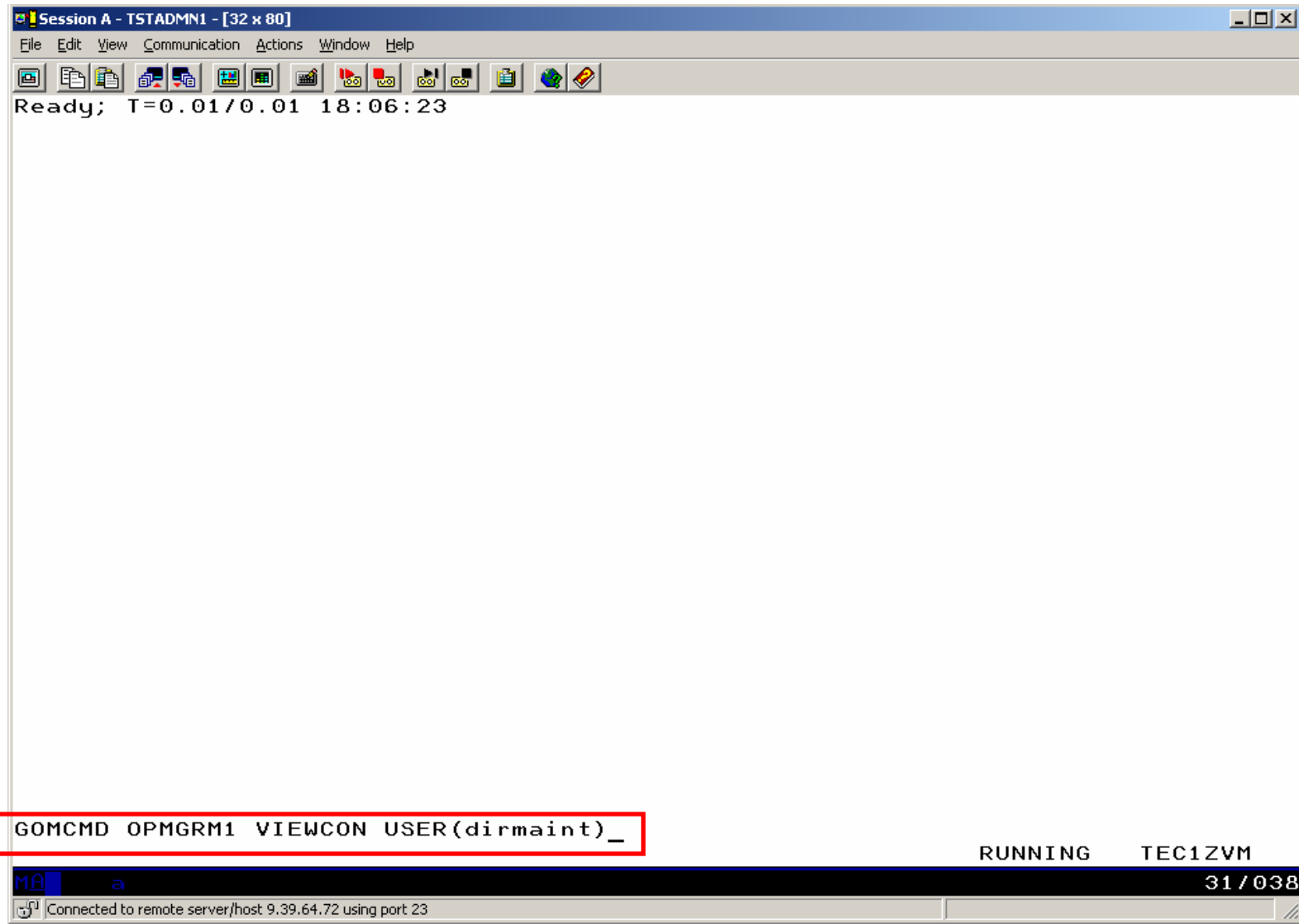
- **Operations Manager monitors the console of a user ID that does logging**
  - DIRMAINT, for example
- **Disk full or early warning message triggers a rule/action in Operations Manager**
  - Shut down the service machine
  - Send the log files to a service machine which automatically archives all files it receives
    - May involve Tape Manager if archiving to tape
  - Erase the log files
  - Restart the service machine



## Detecting Disk Full Conditions of Logging IDs



## View the DIRMAINT Console



## Issue Commands to Look at Disk Status and Copy Files

```

Session A - TSTADMIN1 - [32 x 80]
File Edit View Communication Actions Window Help
DVHWA12140I Waiting for work on 08/03/01 at 18:06:02.
cms acc 333 t
DVHWA12146I Wakeup caused by console attention on 08/03/01 at 18:08:21.
DIRMAINT TEC1ZVM. - 2008/03/01; T=0.01/0.01 18:08:21
DVHREQ2290I Request is: CMS acc 333 t
DVHREQ2288I Your CMS request for DIRMAINT at * has been accepted.
DVHREQ2289I Your CMS request for DIRMAINT at * has completed; with RC
DVHREQ2289I = 0.
DIRMAINT TEC1ZVM. - 2008/03/01; T=0.02/0.02 18:08:22
DVHWA12140I Waiting for work on 08/03/01 at 18:08:22.
cms q disk
DVHWA12146I Wakeup caused by console attention on 08/03/01 at 18:08:31.
DIRMAINT TEC1ZVM. - 2008/03/01; T=0.01/0.01 18:08:31
DVHREQ2290I Request is: CMS q disk
DVHREQ2288I Your CMS request for DIRMAINT at * has been accepted.

```

LABEL	VDEV	M	STAT	CYL	TYPE	BLKSZ	FILES	BLKS USED-(%)	BLKS LEFT	BLK TOTA
DIR155	155	A	R/W	9	3390	4096	11	78-05	1542	162
DRM491	191	C	R/W	15	3390	4096	250	1311-49	1389	270
DRM11F	11F	D	R/W	8	3390	4096	47	568-39	872	144
DIR1DF	1DF	E	R/W	9	3390	4096	122	259-16	1361	162
DIR1DB	1DB	G	R/W	9	3390	4096	10	140-09	1480	162
DIR1AA	1AA	H	R/W	9	3390	4096	8	172-11	1448	162
MNT190	190	S	R/O	100	3390	4096	887	14513-81	3487	1800
DIR333	333	T	R/W	5	3390	4096	2	505-56	395	90
MNT19E	19E	Y/S	R/O	250	3390	4096	1100	28061-62	16939	4500
DIR1FA	1FA	Z	R/W	9	3390	4096	0	7-00	1613	162

```

DVHREQ2289I Your CMS request for DIRMAINT at * has completed; with RC
DVHREQ2289I = 0.
DIRMAINT TEC1ZVM. - 2008/03/01; T=0.02/0.02 18:08:32
DVHWA12140I Waiting for work on 08/03/01 at 18:08:32.
CMS COPYFILE DIRMAINT TLOG0914 T = TLOG0912 H_
DIRMAINT (Scroll)
31/046
Connected to remote server/host 9.39.64.72 using port 23

```

# Trigger Hourly Disk Check

```

Session A - TSTADMIN1 - [32 x 80]
File Edit View Communication Actions Window Help

cms q disk
DVHWA12146I Wakeup caused by console attention on 08/03/01 at 18:11:20.
DIRMAINT TEC1ZVM. - 2008/03/01; T=0.01/0.01 18:11:20
DVHREQ2290I Request is: CMS q disk
DVHREQ2288I Your CMS request for DIRMAINT at * has been accepted.

```

LABEL	VDEV	M	STAT	CYL	TYPE	BLKSZ	FILES	BLKS USED-(%)	BLKS LEFT	BLK TOTA
DIR155	155	A	R/W	9	3390	4096	11	78-05	1542	162
DRM491	191	C	R/W	15	3390	4096	250	1311-49	1389	270
DRM11F	11F	D	R/W	8	3390	4096	47	568-39	872	144
DIR1DF	1DF	E	R/W	9	3390	4096	122	259-16	1361	162
DIR1DB	1DB	G	R/W	9	3390	4096	10	140-09	1480	162
DIR1AA	1AA	H	R/W	9	3390	4096	11	1367-84	253	162
MNT190	190	S	R/O	100	3390	4096	687	14513-81	3487	1800
DIR333	333	T	R/W	5	3390	4096	2	505-56	395	90
MNT19E	19E	Y/S	R/O	250	3390	4096	1100	28061-62	16939	4500
DIR1FA	1FA	Z	R/W	9	3390	4096	0	7-00	1613	162

```

DVHREQ2289I Your CMS request for DIRMAINT at * has completed; with RC
DVHREQ2289I = 0.
DIRMAINT TEC1ZVM. - 2008/03/01; T=0.02/0.03 18:11:21
DVHWA12140I Waiting for work on 08/03/01 at 18:11:21.

cms exec dvhourly
DVHWA12146I Wakeup caused by console attention on 08/03/01 at 18:14:09.
DIRMAINT TEC1ZVM. - 2008/03/01; T=0.01/0.01 18:14:09
DVHREQ2290I Request is: CMS exec dvhourly
DVHREQ2288I Your CMS request for DIRMAINT at * has been accepted.
DVHRLY3895W Disk 01AA is 84% full, exceeding its
DVHRLY3895W Disk 01AA is 84% full, exceeding its
EXEC DIRM1AA DIRMAINT
DIRM1AA - DIRMAINT log archive started ....
DIRM1AA - Issuing DIRM SHUTDOWN ....

DIRMAINT
MA a 31/001
Connected to remote server/host 9.39.64.72 using port 23

```

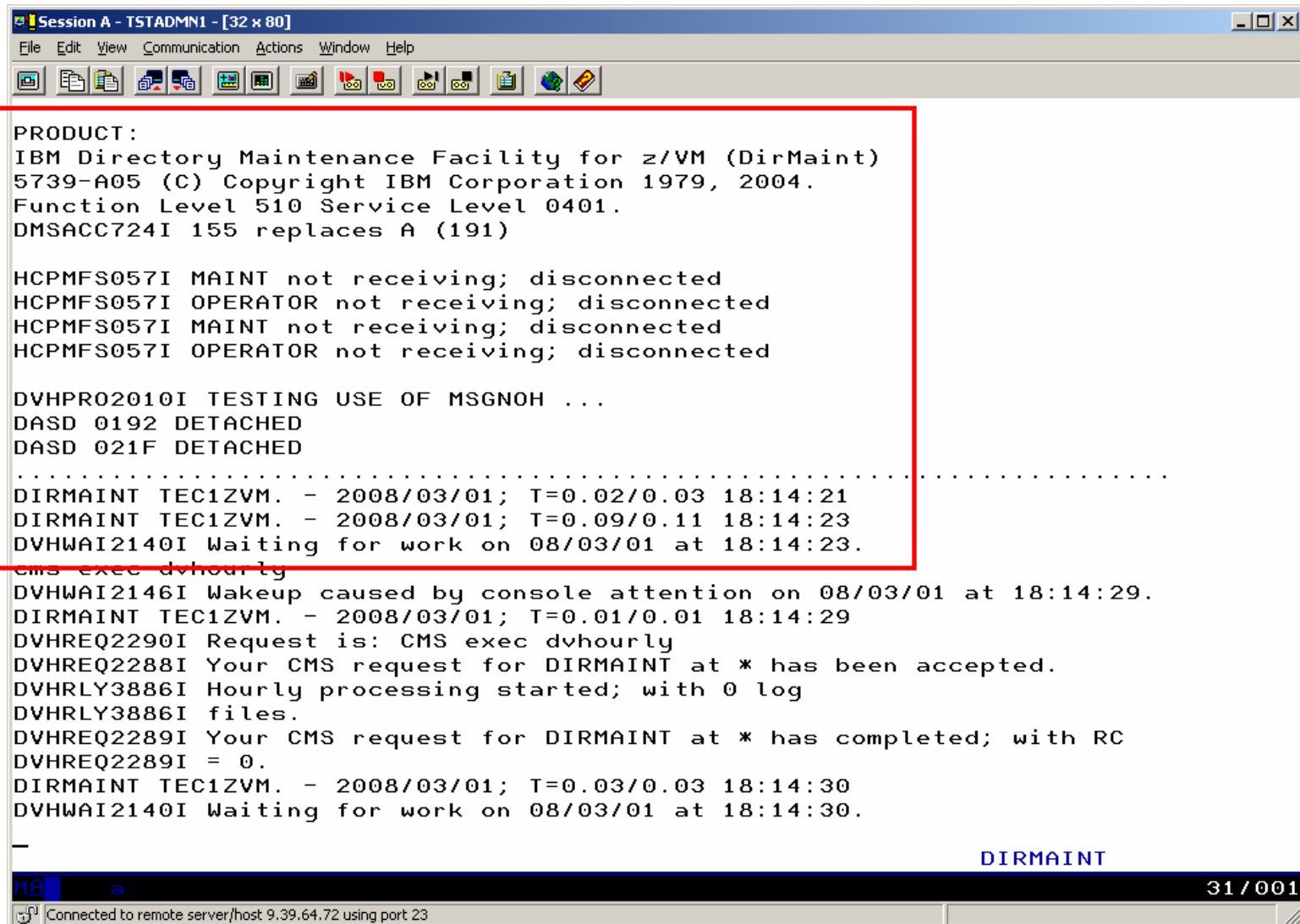
## Files Sent to Archiving Server (ARCHLOGS)

```

Session A - TSTADMIN1 - [32 x 80]
File Edit View Communication Actions Window Help
File DIRMAINT TLOG0801 Z1 sent to ARCHLOGS at TEC1ZVM on 03/01/08 18:14:14
ARCHLOGS: File DIRMAINT TLOG0801 D1 created from DIRMAINT TLOG0801 Z1 received
ARCHLOGS: File DIRMAINT TLOG0801 (spoolid 71) from OPMGRM1 successfully received
ARCHLOGS: ng disk.
ARCHLOGS: Calling Archive for DIRMAINT TLOG0801.
ARCHLOGS: AMVARC8031I *** Archive transaction has been submitted for processing
ARCHLOGS: AMVARC8031I ***
ARCHLOGS: AMVARC8031I *** IMPORTANT: Do not alter or delete objects selected for
ARCHLOGS: AMVARC8031I *** archive until you receive confirmation that
ARCHLOGS: AMVARC8031I *** the archive transaction has been successfully
ARCHLOGS: AMVARC8031I *** processed.
ARCHLOGS: RDR FILE 0073 SENT FROM OPMGRM1 PUN WAS 0007 RECS 6925 CPY 001 A NO
File DIRMAINT TLOG0802 Z1 sent to ARCHLOGS at TEC1ZVM on 03/01/08 18:14:14
ARCHLOGS: DMSCYW2245I *MSG AMVARKIV 03/01/08 18:14:16 Archive staging operation
ARCHLOGS: File DIRMAINT TLOG0801 successfully archived.
ARCHLOGS: DMSCYW2245I *MSG AMVARKIV 03/01/08 18:14:16 Your information is in pa
ARCHLOGS: RDR FILE 0074 SENT FROM OPMGRM1 PUN WAS 0008 RECS 020K CPY 001 A NO
File DIRMAINT TLOG0910 Z1 sent to ARCHLOGS at TEC1ZVM on 03/01/08 18:14:14
ARCHLOGS: File DIRMAINT TLOG0802 D1 created from DIRMAINT TLOG0802 Z1 received
ARCHLOGS: File DIRMAINT TLOG0802 (spoolid 73) from OPMGRM1 successfully received
ARCHLOGS: ng disk.
ARCHLOGS: Calling Archive for DIRMAINT TLOG0802.
ARCHLOGS: AMVARC8031I *** Archive transaction has been submitted for processing
ARCHLOGS: AMVARC8031I ***
ARCHLOGS: AMVARC8031I *** IMPORTANT: Do not alter or delete objects selected for
ARCHLOGS: AMVARC8031I *** archive until you receive confirmation that
ARCHLOGS: AMVARC8031I *** the archive transaction has been successfully
ARCHLOGS: AMVARC8031I *** processed.
ARCHLOGS: DMSCYW2245I *MSG AMVARKIV 03/01/08 18:14:18 Archive staging operation
ARCHLOGS: DMSCYW2245I *MSG AMVARKIV 03/01/08 18:14:18 Your information is in pa
-
DIRMAINT
MA a 31/001
Connected to remote server/host 9.39.64.72 using port 23

```

# Observe DIRMAINT Restarting



```
Session A - TSTADMN1 - [32 x 80]
File Edit View Communication Actions Window Help

PRODUCT:
IBM Directory Maintenance Facility for z/VM (DirMaint)
5739-A05 (C) Copyright IBM Corporation 1979, 2004.
Function Level 510 Service Level 0401.
DMSACC724I 155 replaces A (191)

HCPMFS057I MAINT not receiving; disconnected
HCPMFS057I OPERATOR not receiving; disconnected
HCPMFS057I MAINT not receiving; disconnected
HCPMFS057I OPERATOR not receiving; disconnected

DVHPR02010I TESTING USE OF MSGNOH ...
DASD 0192 DETACHED
DASD 021F DETACHED
.....
DIRMAINT TEC1ZVM. - 2008/03/01; T=0.02/0.03 18:14:21
DIRMAINT TEC1ZVM. - 2008/03/01; T=0.09/0.11 18:14:23
DVHWAI2140I Waiting for work on 08/03/01 at 18:14:23.
cms exec dvhourly
DVHWAI2146I Wakeup caused by console attention on 08/03/01 at 18:14:29.
DIRMAINT TEC1ZVM. - 2008/03/01; T=0.01/0.01 18:14:29
DVHREQ2290I Request is: CMS exec dvhourly
DVHREQ2288I Your CMS request for DIRMAINT at * has been accepted.
DVHRLY3886I Hourly processing started; with 0 log
DVHRLY3886I files.
DVHREQ2289I Your CMS request for DIRMAINT at * has completed; with RC
DVHREQ2289I = 0.
DIRMAINT TEC1ZVM. - 2008/03/01; T=0.03/0.03 18:14:30
DVHWAI2140I Waiting for work on 08/03/01 at 18:14:30.

-
DIRMAINT
MA a 31/001
Connected to remote server/host 9.39.64.72 using port 23
```

# Verify Logging Disk is No Longer Full

```

Session A - TSTADMIN1 - [32 x 80]
File Edit View Communication Actions Window Help
cms exec dvhourly
DVHWAI2146I Wakeup caused by console attention on 08/03/01 at 18:14:29.
DIRMAINT TEC1ZVM. - 2008/03/01; T=0.01/0.01 18:14:29
DVHREQ2290I Request is: CMS exec dvhourly
DVHREQ2288I Your CMS request for DIRMAINT at * has been accepted.
DVHRLY3886I Hourly processing started; with 0 log
DVHRLY3886I files.
DVHREQ2289I Your CMS request for DIRMAINT at * has completed; with RC
DVHREQ2289I = 0.
DIRMAINT TEC1ZVM. - 2008/03/01; T=0.03/0.03 18:14:30
DVHWAI2140I Waiting for work on 08/03/01 at 18:14:30
cms q disk
DVHWAI2146I Wakeup caused by console attention on 08/03/01 at 18:19:21.
DIRMAINT TEC1ZVM. - 2008/03/01; T=0.01/0.01 18:19:21
DVHREQ2290I Request is: CMS q disk
DVHREQ2288I Your CMS request for DIRMAINT at * has been accepted.

```

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DRM11F	11F	D	R/W	8	3390	4096	47	568-39	872	144
DIR1DF	1DF	E	R/W	9	3390	4096	122	259-16	1361	162
DIR1DB	1DB	G	R/W	9	3390	4096	10	140-09	1480	162
DIR1AA	1AA	H	R/W	9	3390	4096	7	14-01	1606	162
MNT190	190	S	R/O	100	3390	4096	687	14513-81	3487	1800
MNT19E	19E	Y/S	R/O	250	3390	4096	1100	28061-62	16939	4500
DIR1FA	1FA	Z	R/W	9	3390	4096	0	7-00	1613	162

```

DVHREQ2289I Your CMS request for DIRMAINT at * has completed, with RC
DVHREQ2289I = 0.
DIRMAINT TEC1ZVM. - 2008/03/01; T=0.02/0.03 18:19:22
DVHWAI2140I Waiting for work on 08/03/01 at 18:19:22.
-
DIRMAINT (Scroll)
MA a 31/001
Connected to remote server/host 9.39.64.72 using port 23

```

# View DIRMANT Logs in Archive Manager

Session A - TSTADMIN1 - [32 x 80]

File Edit View Communication Actions Window Help

Files for owner(s): \*

Selection: Name: \* Type: \* Mode: \* 36 of 36 shown

Current filters: Name: \* Type: \* Mode: \* Owner: \*

Owner	Filename	Filetype	Fm	Date	Time	Device or Path
ARCHLOGS	DIRMAINT	TRANSLOG	1	08/03/01	18:14:12	192
ARCHLOGS	DIRMAINT	TLOG0910	1	08/03/01	18:11:14	192
ARCHLOGS	DIRMAINT	TLOG0911	1	08/03/01	18:10:55	192
ARCHLOGS	DIRMAINT	TLOG0912	1	08/03/01	18:10:50	192
ARCHLOGS	DIRMAINT	TLOG0802	1	08/03/01	00:01:06	192
ARCHLOGS	DIRMAINT	TLOG0801	1	08/02/23	00:01:07	192
ARCHLOGS	DIRMAINT	TRANSLOG	1	08/02/22	17:55:55	192
ARCHLOGS	DIRMAINT	TLOG0913	1	08/02/22	17:54:52	192
ARCHLOGS	DIRMAINT	TLOG0912	1	08/02/22	17:54:46	192
ARCHLOGS	DIRMAINT	TLOG0801	1	08/02/01	00:01:06	192
ARCHLOGS	DIRMAINT	TLOG0712	1	08/01/31	00:01:06	192
ARCHLOGS	DIRMAINT	TRANSLOG	1	08/01/30	17:46:06	192
ARCHLOGS	DIRMAINT	TLOG0914	1	08/01/30	17:45:24	192
ARCHLOGS	DIRMAINT	TLOG0913	1	08/01/30	17:45:18	192
ARCHLOGS	DIRMAINT	TLOG0912	1	08/01/30	17:45:12	192
ARCHLOGS	DIRMAINT	TLOG0712	1	08/01/26	00:01:06	192
ARCHLOGS	DIRMAINT	TRANSLOG	1	08/01/25	21:08:07	192
ARCHLOGS	DIRMAINT	TLOG0911	1	08/01/25	21:07:29	192
ARCHLOGS	DIRMAINT	TLOG0913	1	08/01/25	21:07:06	192
ARCHLOGS	DIRMAINT	TLOG0912	1	08/01/25	21:06:55	192
ARCHLOGS	DIRMAINT	TLOG0712	1	08/01/06	00:01:08	192
ARCHLOGS	DIRMAINT	TLOG0712	1	08/01/06	00:01:08	192
ARCHLOGS	DIRMAINT	TLOG0911	1	07/05/17	00:07:55	192

1= Help 3= Quit 4= Return 5= Sort Up  
6= Sort Down 7= Backward 8= Forward 10= Recall 11= Details

MA a 09/033

Connected to remote server/host 9.39.64.72 using port 23



## Summary

- **IBM solutions exist for customers running z/VM and Linux guests**
  - 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
- **Integrating these solutions can help**
  - Automate daily tasks
  - Deal with predictable situations automatically
  - Schedule events