Backup Strategies for z/VM and Linux on z Systems

SHARE, Session #16468

Tracy Dean, tld1@us.ibm.com
IBM
March 2015

IBM

Notices and Disclaimers

- Copyright © 2015 by International Business Machines Corporation (IBM). No part of this document may be reproduced or transmitted in any form without written permission from IBM.
- U.S. Government Users Restricted Rights - Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM.
- Information in these presentations (including information relating to products that have not yet been announced by IBM) has been reviewed for accuracy as of the date of initial publication and could include unintentional technical or typographical errors. IBM shall have no responsibility to update this information. THIS document is distributed "AS IS" without any warranty, either express or implied. In no event shall IBM be liable for any damage arising from the use of this information, including but not limited to, loss of data, business interruption, loss of profit or loss of opportunity. IBM products and services are warranted according to the terms and conditions of the agreements under which they are provided.
- Any statements regarding IBM's future direction, intent or product plans are subject to change or withdrawal without notice.
- Performance data contained herein was generally obtained in a controlled, isolated environments. Customer examples are presented as illustrations of how those customers have used IBM products and the results they may have achieved. Actual performance, cost, savings or other results in other operating environments may vary.
- References in this document to IBM products, programs, or services does not imply that IBM intends to make such products, programs or services available in all countries in which IBM operates or does business.
- Workshops, sessions and associated materials may have been prepared by independent session speakers, and do not necessarily reflect the views of IBM. All materials and discussions are provided for informational purposes only, and are neither intended to, nor shall constitute legal or other guidance or advice to any individual participant or their specific situation.
- It is the customer's responsibility to insure its own compliance with legal requirements and to obtain advice of competent legal counsel as to the identification and interpretation of any relevant laws and regulatory requirements that may affect the customer's business and any actions the customer may need to take to comply with such laws. IBM does not provide legal advice or represent or warrant that its services or products will ensure that the customer is in compliance with any law.

Notices and Disclaimers (con't)

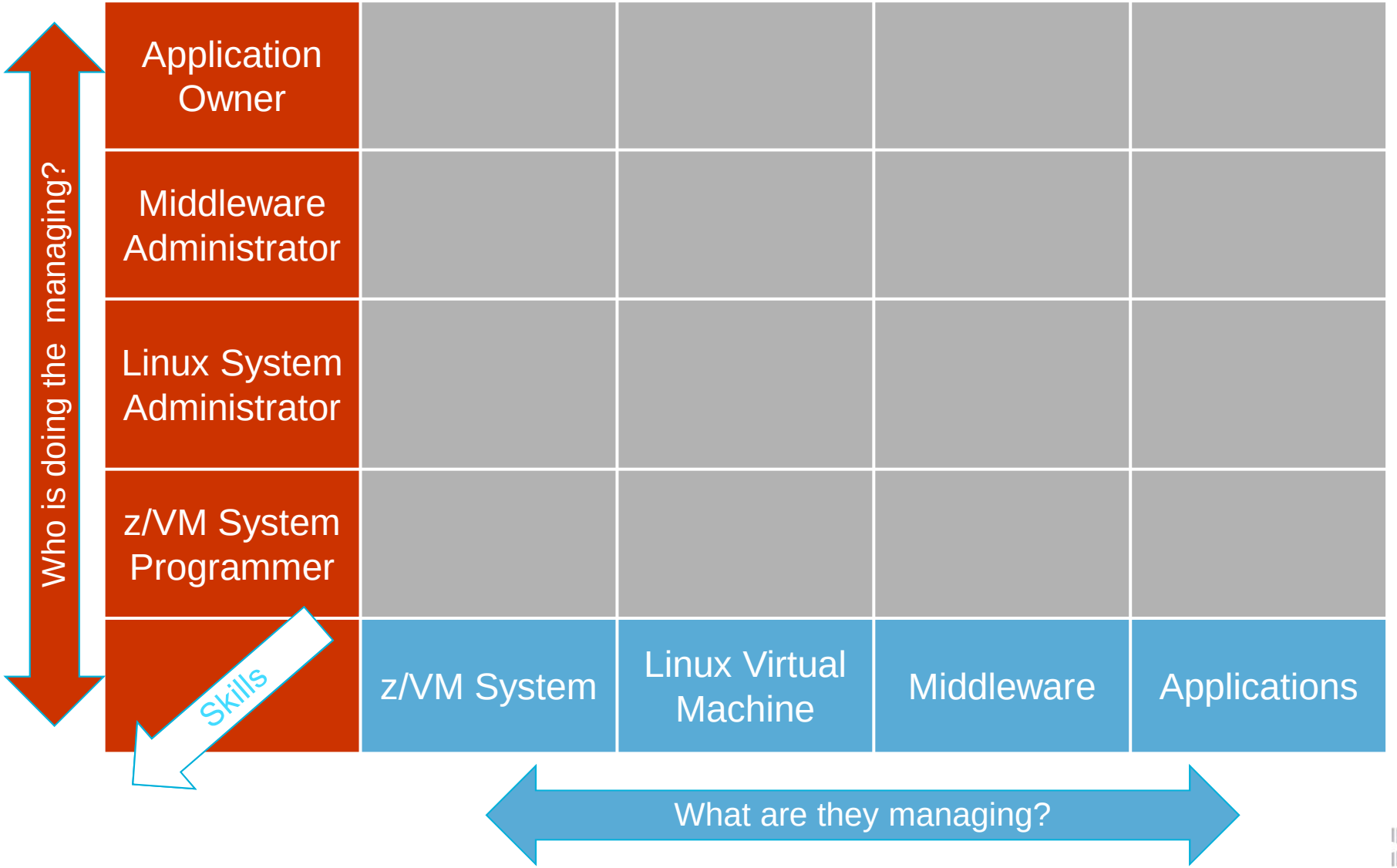
- Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products in connection with this publication and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products. IBM does not warrant the quality of any third-party products, or the ability of any such third-party products to interoperate with IBM's products. IBM expressly disclaims all warranties, expressed or implied, including but not limited to, the implied warranties of merchantability and fitness for a particular purpose.
- The provision of the information contained herein is not intended to, and does not, grant any right or license under any IBM patents, copyrights, trademarks or other intellectual property right.
- IBM, the IBM logo, ibm.com, Bluemix, Blueworks Live, CICS, Clearcase, DOORS®, Enterprise Document Management System™, Global Business Services ®, Global Technology Services ®, Information on Demand, ILOG, Maximo®, MQIntegrator®, MQSeries®, Netcool®, OMEGAMON, OpenPower, PureAnalytics™, PureApplication®, pureCluster™, PureCoverage®, PureData®, PureExperience®, PureFlex®, pureQuery®, pureScale®, PureSystems®, QRadar®, Rational®, Rhapsody®, SoDA, SPSS, StoredIQ, Tivoli®, Trusteer®, urban{code}®, Watson, WebSphere®, Worklight®, X-Force® and System z® Z/OS, are trademarks of International Business Machines Corporation, registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on the Web at "Copyright and trademark information" at: www.ibm.com/legal/copytrade.shtml.

Agenda

- Positioning
- Recommended practices and available options
  - Backing up and restoring z/VM
  - Backing up and restoring Linux on z Systems
- Backing up and restoring data in a z/VM SSI cluster
- Overview of IBM products
  - Backup and Restore Manager for z/VM
  - Tape Manager for z/VM
- Backup scenarios
  - Live demos
  - Configuration options and sample code
- Summary and reference information
- Hands-on lab - all products in IBM Infrastructure Suite for z/VM and Linux
  - Wednesday, 4:30pm-5:30pm
  - Location: Redwood (Level 2)

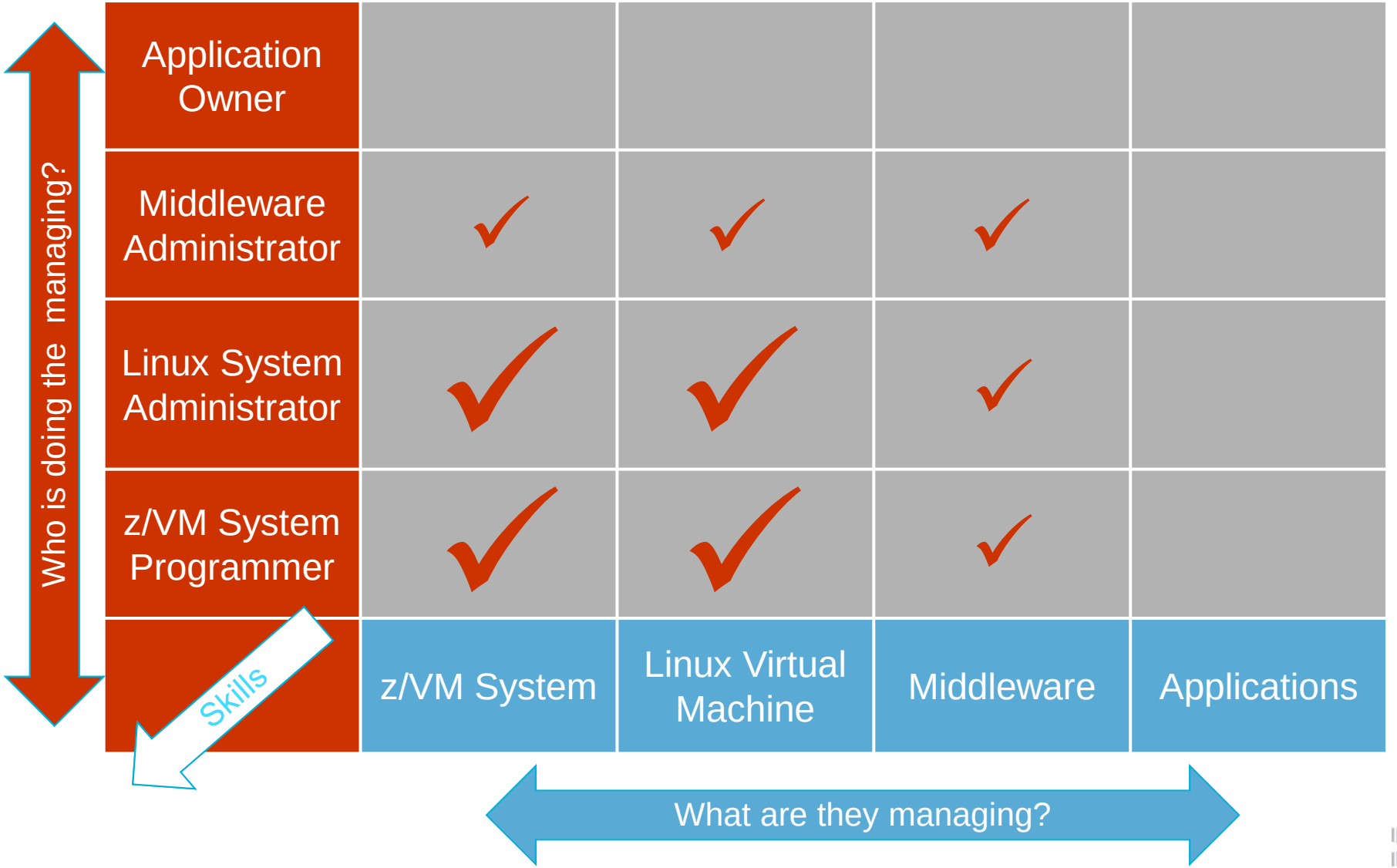
© 2013, 2015 IBM Corporation

Three Dimensions of Systems Management



© 2013, 2015 IBM Corporation

Three Dimensions of Systems Management



© 2013, 2015 IBM Corporation

IBM z/VM Management Solutions

- Security
  - RACF and zSecure Manager for z/VM
- Performance monitoring
  - OMEGAMON XE on z/VM and Linux
  - Performance Toolkit for z/VM
- Backup and recovery
  - Backup and Restore Manager for z/VM
    - New release (V1.3) announced February 24, 2015
  - Tape Manager for z/VM
  - Tivoli Storage Manager
- Automation and operational monitoring
  - Operations Manager for z/VM
    - Including integration with existing monitoring and alert systems
- Interactive provisioning and system resource management
  - IBM Wave for z/VM

© 2013, 2015 IBM Corporation

IBM Infrastructure Suite for z/VM and Linux

- New IBM bundle/suite
- Announced and available September 2014
- Tools needed to manage the z/VM and Linux on z Systems infrastructure
  - Wave for z/VM
  - OMEGAMON XE on z/VM and Linux
  - Operations Manager for z/VM
  - Backup and Restore Manager for z/VM
    - Order Tape Manager for z/VM separately if plan to back up to tape
  - Tivoli Storage Manager Extended Edition
- Discounted price as a bundle
- Website:
  - http://www.ibm.com/software/products/en/ibm-infrastructure-suite-for-zvm-and-linux
- DeveloperWorks Wiki
  - https://www.ibm.com/developerworks/community/wikis/home?lang=en#!/wiki/W9b511b099ded_4e32_abfb_ed8ce4da5b17

© 2013, 2015 IBM Corporation

Recommended Practices and Available Options

Recommended Practices – Backup and Recovery

Image level backup of z/VM
- Operating system

File level backup of z/VM data
- Directory information
- Configuration files
- Log files
- Tools – REXX EXECs, automation scripts, etc.

Image level backup of (some?) Linux guests
- Operating system
- Applications
- Application data (maybe)

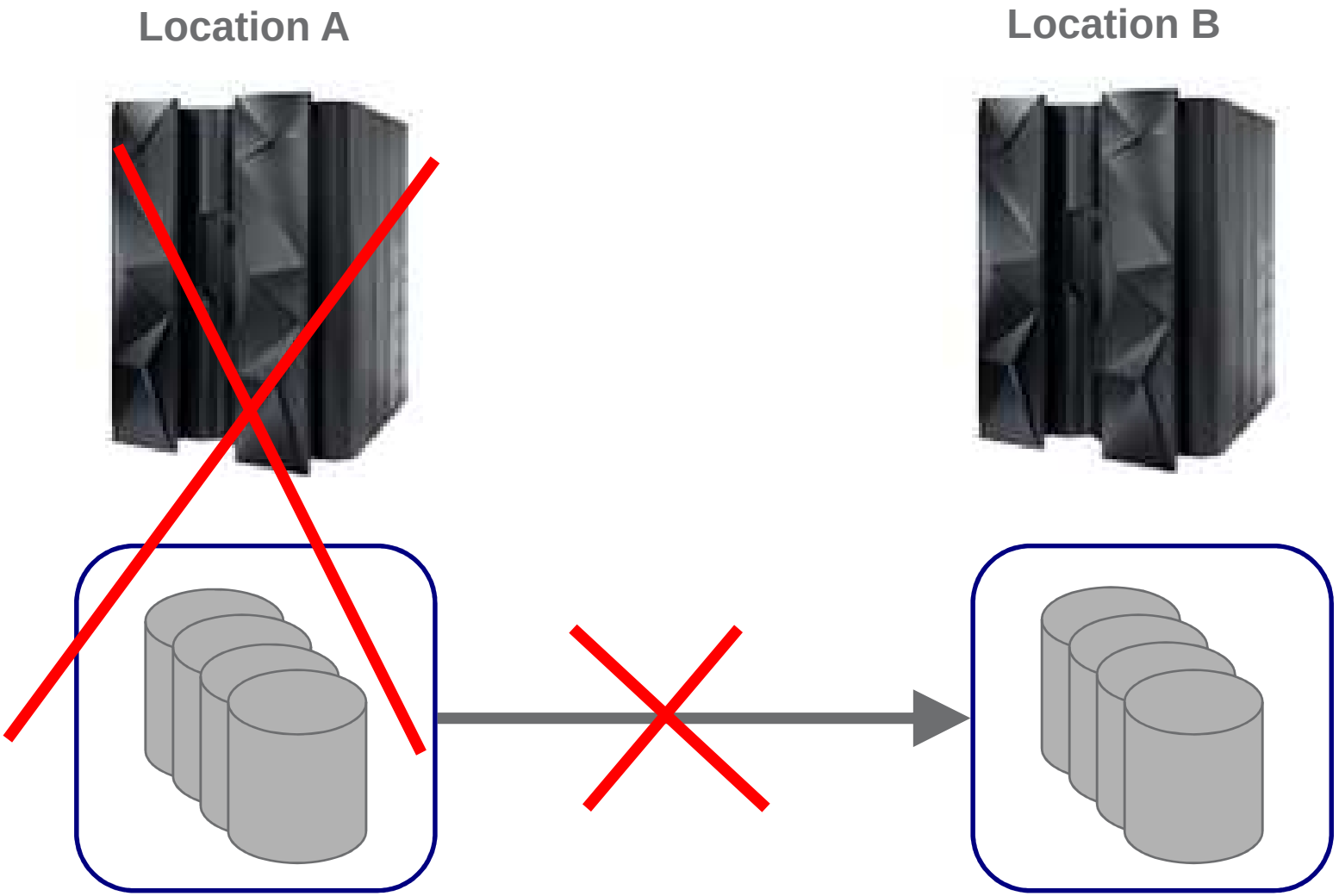
File level backup of Linux guests
- Configuration files
- Log files
- Tools

Recovery of z/VM system, including Linux guests
- Dependence on z/OS

versus
- Independent recovery

© 2013, 2015 IBM Corporation

High Availability



© 2013, 2015 IBM Corporation

High Availability and Backup/Recovery are NOT the Same

Location A

Location B

Does not address operational recovery needs

Recommended Practices – Backup and Recovery

Image level backup of z/VM
- Operating system

File level backup of z/VM data
- Directory information
- Configuration files
- Log files
- Tools – REXX EXECs, automation scripts, etc.

Image level backup of (some?) Linux guests
- Operating system
- Applications
- Application data (maybe)

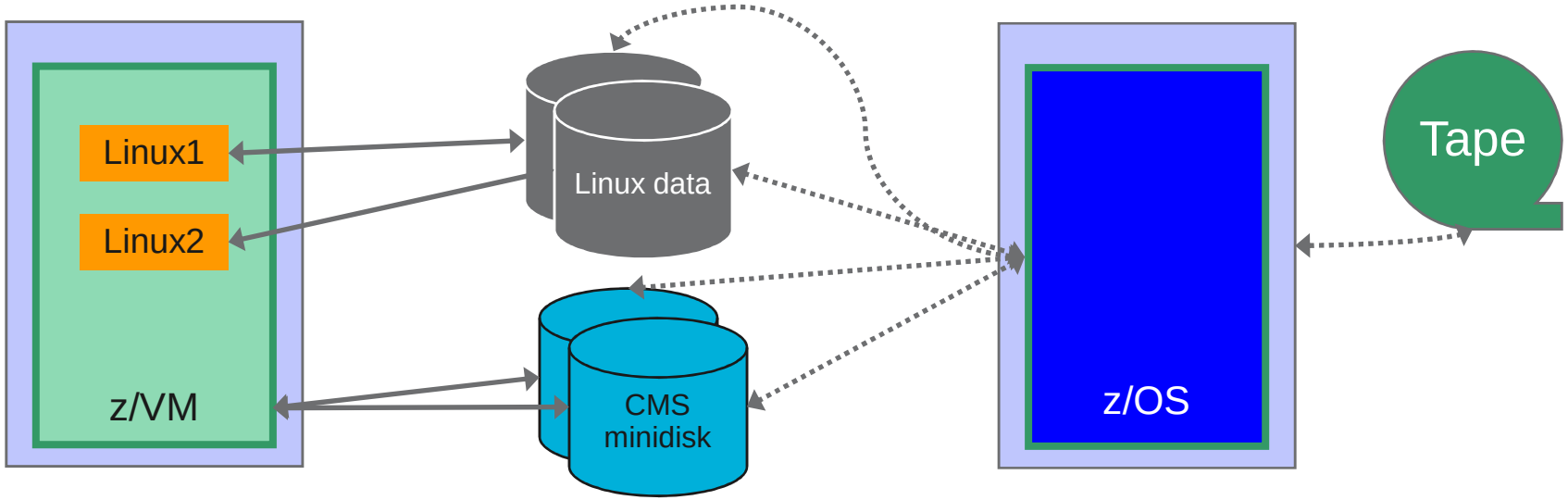
File level backup of Linux guests
- Configuration files
- Log files
- Tools

Recovery of z/VM system, including Linux guests
- Dependence on z/OS

versus
- Independent recovery

© 2013, 2015 IBM Corporation

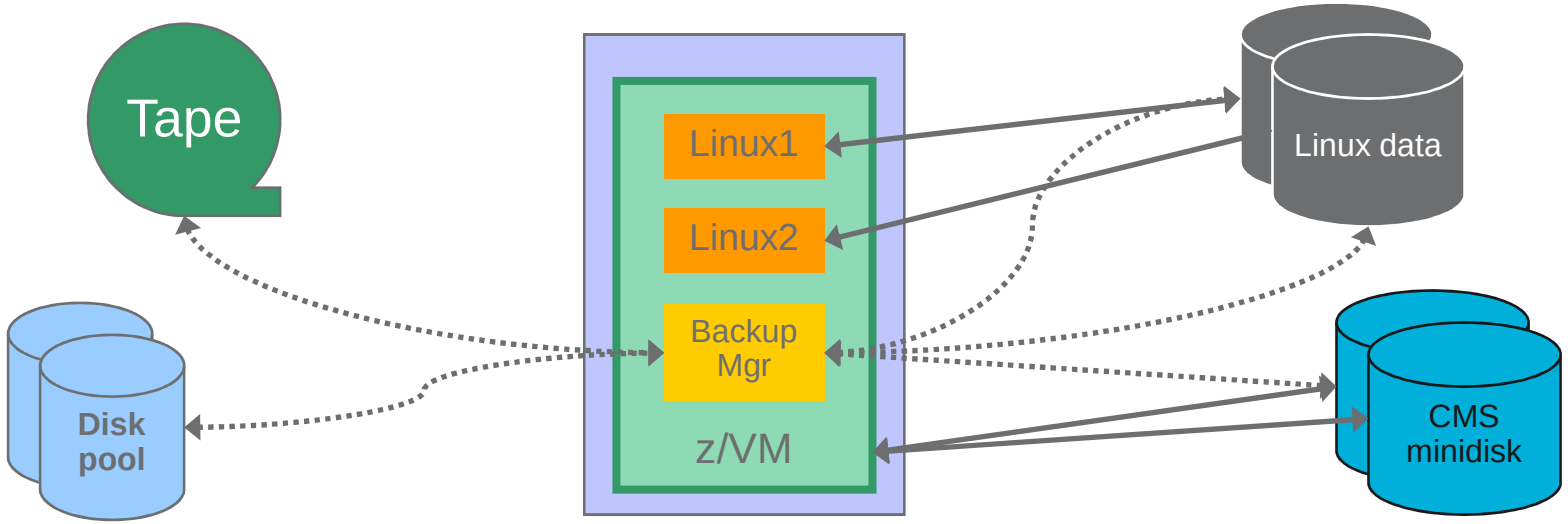
Image Level Backup/Recovery of z/VM and Linux Guests from z/OS



- Image level backup and recovery of DASD volumes from z/OS
  - **Existing z/OS procedures and tools in place**
  - **Use existing tape devices**
  - **Fast**
  - **Doesn't include FCP-attached DASD**
  - **Linux should be down**
    - **Flashcopy can minimize downtime**
  - **Dependent on z/OS for recovery and DR**
    - **Is Linux workload critical – recovery required in parallel with z/OS in event of disaster?**
  - **Using z/OS cycles (on general purpose processors) to back up z/VM and Linux**

© 2013, 2015 IBM Corporation

Image Level Backup/Recovery of z/VM and Linux Guests from z/VM



- Image level backup and recovery of DASD volumes from z/VM
  - **Low risk if z/VM is running – but not zero risk**
  - **Includes FCP-attached DASD (defined to z/VM as EDEVICEs)**
    - **Volumes can not be DEDICATEd to guest**
  - **Linux should be down**
    - **Flashcopy can minimize downtime**
  - **Recovery of z/VM and Linux independent from recovery of z/OS**
    - **Critical Linux workload recovered in parallel with z/OS in event of disaster**
    - **Faster recovery of z/VM and Linux overall**
  - **Backup software required on z/VM**
    - **Use z/VM cycles on IFL processors to back up z/VM and Linux**
  - **Requires mainframe attached tape devices**
    - **Share tape devices with z/OS – does not require both systems to be up**

© 2013, 2015 IBM Corporation

What About DDR?

- DDR - DASD Dump Restore utility in z/VM
- Basic ability to copy data from one location to another
  - Command driven
  - Specify a source location
  - Specify a target location (disk or tape)
- Useful when copying/cloning minidisks or volumes
  - No ability to do file level backup/recovery
  - Be aware of “changing data” on active disks or volumes
- Very limited in terms of production level backup and recovery
- Advantages of Backup and Restore Manager for z/VM over DDR
  - File level backup and recovery
  - Incremental backups of z/VM (CMS and SFS) files
  - Cataloging of what has been backed up
    - Including full screen interfaces for finding backup data and restoring it
  - Automated expiration processing of catalog data and backup data on disk or tape
  - Flexibility to define a job once using wildcarding – future invocations of that job will back up any new data that meets the criteria
  - Invoke multiple service machines to share the backup task – completing the backup sooner
  - Integration with a tape management system – no need to manage tapes and tape mounts manually

© 2013, 2015 IBM Corporation

Do I Need to Back Up Every Linux Guest ?

- It depends …
- Is each guest image unique?
  - Are logs or other output stored within each guest?
  - Is configuration of each guest automated?
- Can a new guest be recreated from a golden image more easily than restoring it?

Is backing up just the “golden images” sufficient?

© 2013, 2015 IBM Corporation

Recommended Practices – Backup and Recovery

Image level backup of z/VM
- Operating system

File level backup of z/VM data
- Directory information
- Configuration files
- Log files
- Tools – REXX EXECs, automation scripts, etc.

Image level backup of (some?) Linux guests
- Operating system
- Applications
- Application data (maybe)

File level backup of Linux guests
- Configuration files
- Log files
- Tools

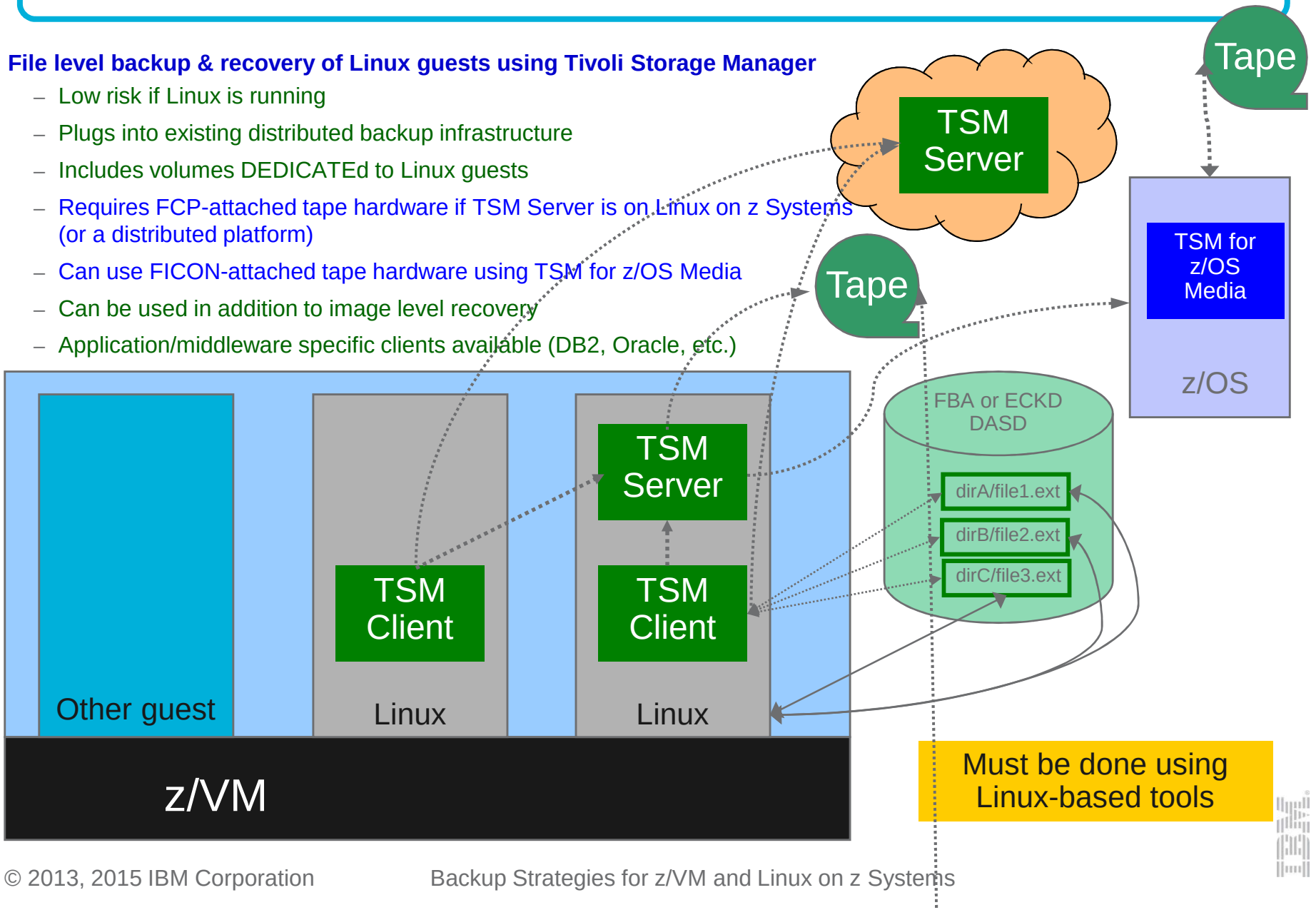
Recovery of z/VM system, including Linux guests
- Dependence on z/OS

versus
- Independent recovery

© 2013, 2015 IBM Corporation

File Level Backup and Recovery of Linux Guests

- **File level backup & recovery of Linux guests using Tivoli Storage Manager**
  - Low risk if Linux is running
  - Plugs into existing distributed backup infrastructure
  - Includes volumes DEDICATEd to Linux guests
  - Requires FCP-attached tape hardware if TSM Server is on Linux on z Systems (or a distributed platform)
  - Can use FICON-attached tape hardware using TSM for z/OS Media
  - Can be used in addition to image level recovery
  - Application/middleware specific clients available (DB2, Oracle, etc.)



© 2013, 2015 IBM Corporation

Recommended Practices – Backup and Recovery

Image level backup of z/VM
- Operating system

File level backup of z/VM data
- Directory information
- Configuration files
- Log files
- Tools – REXX EXECs, automation scripts, etc.

Image level backup of (some?) Linux guests
- Operating system
- Applications
- Application data (maybe)

File level backup of Linux guests
- Configuration files
- Log files
- Tools

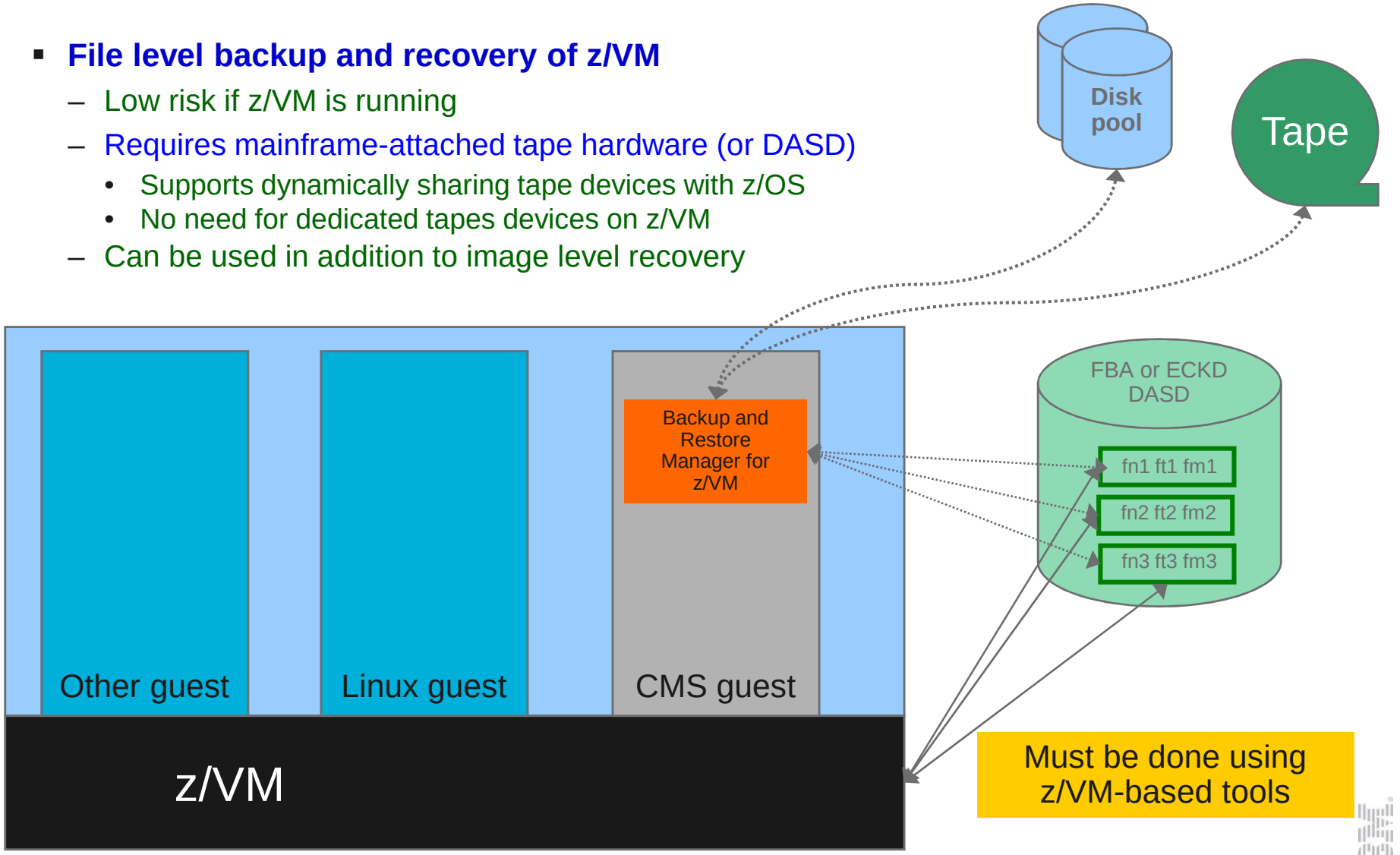
Recovery of z/VM system, including Linux guests
- Dependence on z/OS

versus
- Independent recovery

© 2013, 2015 IBM Corporation

File Level Backup and Recovery of z/VM

- **File level backup and recovery of z/VM**
  - Low risk if z/VM is running
  - Requires mainframe-attached tape hardware (or DASD)
    - Supports dynamically sharing tape devices with z/OS
    - No need for dedicated tapes devices on z/VM
  - Can be used in addition to image level recovery



© 2013, 2015 IBM Corporation

Where and How to Back Up z/VM and Linux Guests

- Using z/OS to back up and restore z/VM and Linux
  - Useful during Linux on z Systems POC or early stages of Linux roll-out
    - Easy and fast to implement for existing z/OS customers
    - Provides disaster/volume level recovery (not file level recovery)
  - Concerns or issues long term as Linux workload grows or becomes critical
    - Doesn't support FCP-attached DASD
    - File level recovery of z/VM or Linux data is time consuming and manual
      - Backups only contain volume images
    - In disaster situation, z/VM and Linux must wait for z/OS recovery before beginning their recovery
    - Increased use of z/OS CPU cycles to support z/VM and Linux

- Using native z/VM and Linux solutions for backup and recovery
  - Supports operational errors and disaster situations
    - File level backup and recovery of both z/VM and Linux
    - Image level backup and recovery of FCP and FICON-attached DASD (z/VM and Linux)
  - Independent of z/OS
    - Backups run on (less expensive) IFLs
    - Recovery in parallel with z/OS
    - Dynamically sharing of tape devices with z/OS is still possible
      - Does not require both systems to be up

© 2013, 2015 IBM Corporation

Backing Up Linux – Should the Guest Be Up or Down?

- Linux keeps pending I/O's in memory when possible
  - Designed for distributed platforms where I/O is assumed to be slow
- Backup solutions that read Linux DASD volumes but run outside Linux don't have a view of these pending I/Os
  - Data on DASD may be in inconsistent state due to pending I/Os
  - Restoring data that has been backed up while Linux is running may not yield usable results
  - SYNC command exists to force all I/Os to be processed
    - Linux will immediately start caching new I/Os
  - Dependent on type of application running on Linux
    - Similar to pulling the plug on a distributed Linux server, then restarting it
      - But worse – backup occurs over a period of time

© 2013, 2015 IBM Corporation

Backing Up Linux – Should the Guest Be Up or Down?

- Reduce risk by
  - "Right-sizing" Linux guests – don't give more memory than needed
    - Recommended for performance reasons anyway
  - Using Flashcopy to flash the disks and back up the flashed copy
- For guaranteed recovery, shut down or suspend the guest before backing it up from z/VM or z/OS
    - Your experience may (will) vary
    - Evaluate the risk based on the application
    - Use Flashcopy to reduce the downtime
- Additional notes
  - For DASD volumes DEDICATEd to Linux guests
    - Backups can not be done while guest is running
      - Volume is attached to guest
    - Backups can be done while guest is down
      - Requires attaching volume to SYSTEM before backup begins

© 2013, 2015 IBM Corporation

Using Suspend Before Backing Up Linux Guests …

- SUSPEND/RESUME functions available in Linux on z Systems distributions
- Similar to hibernate function in Windows
  - Suspend
    - Completes all pending I/Os
    - Writes memory to disk
  - Resume
    - Detects suspend state
    - Reads memory from disk to restore previous state of the guest
- Requires setup and planning
  - Verify the effort is worth it for each type of guest
  - Otherwise, use shutdown instead of suspend

© 2013, 2015 IBM Corporation

… Using Suspend Before Backing Up Linux Guests

- Setup
  - Specify swap disk in zipl.conf
    - Example: resume=/dev/disk/by-path/ccw-0.0.010f-part1
  - In list of swap disks
    - Specify this one with lowest priority
    - Use real disk (not VDISK)
    - Needs to have enough room for all memory of Linux guest + swap space
- Issue suspend via one of the following:
  - echo disk > /sys/power/state
  - CP SIGNAL SHUTDOWN
    - Must update config file on Linux to specify suspend rather than kill in response to signal shutdown
- Reference:
  - White paper – “Methods to pause a z/VM guest: Optimize the resource utilization of idling servers”
    - http://www.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/WP101981

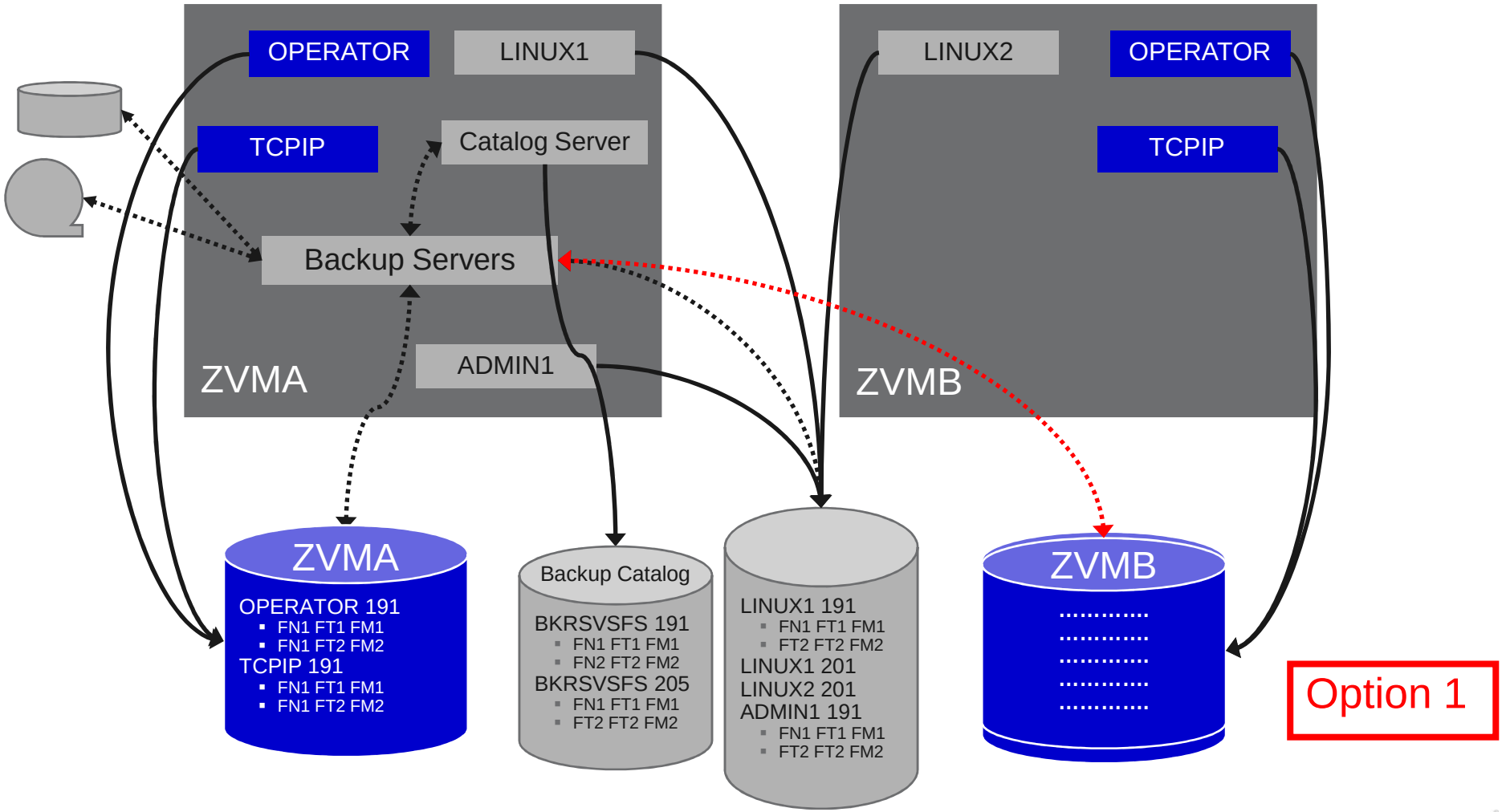
© 2013, 2015 IBM Corporation

Backing up and Restoring Data in a z/VM SSI Cluster

SSI Considerations for Backup and Restore

Single Config Users and MDisks

Multiconfig / IDENTITY Users and MDisks

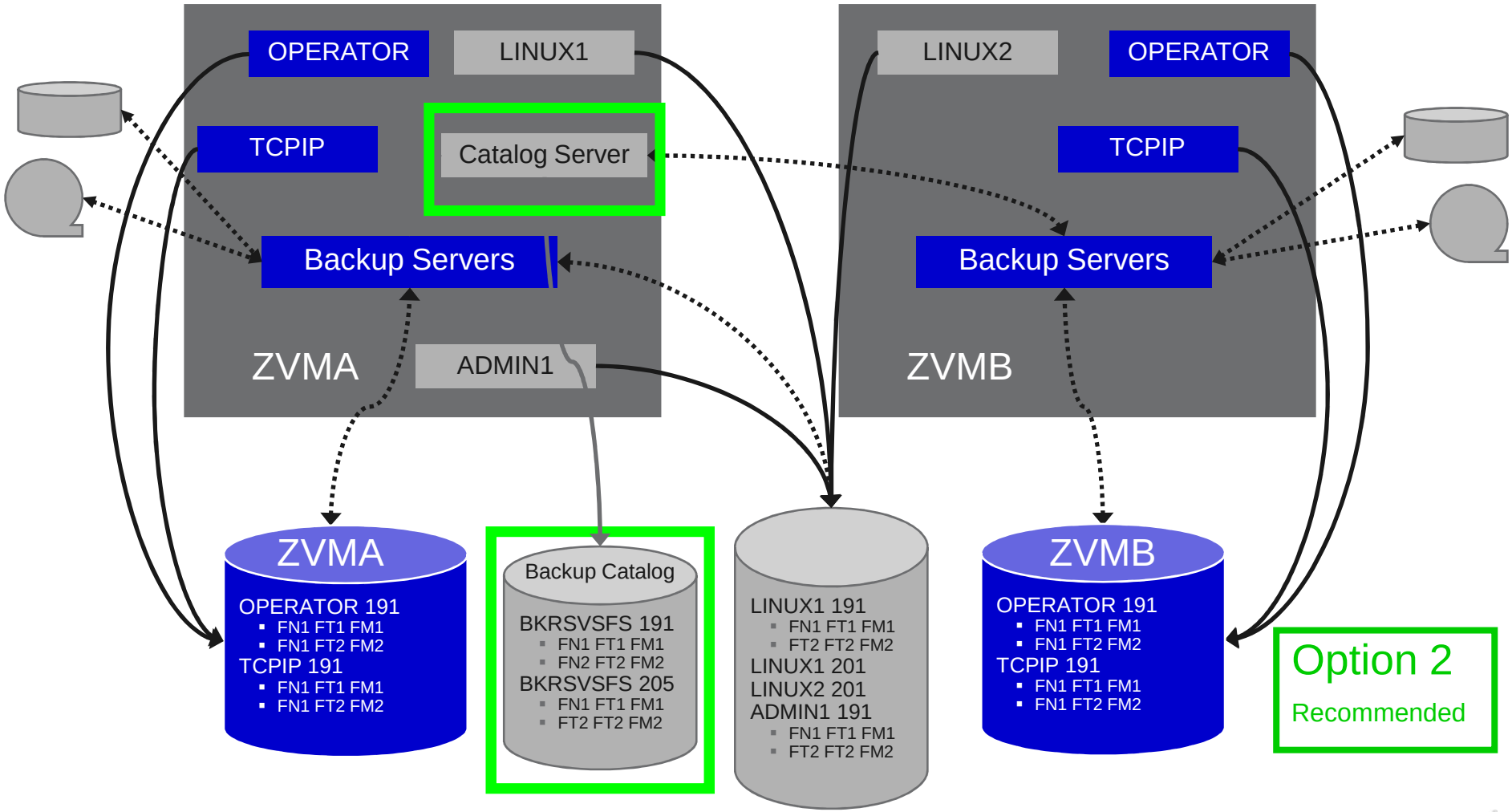


© 2013, 2015 IBM Corporation

SSI Considerations for Backup and Restore

Single Config Users and MDisks

Multiconfig / IDENTITY Users and MDisks



© 2013, 2015 IBM Corporation

SSI Considerations for Backup and Restore

- Backup service machines on any member can see all minidisks of single configuration users
- Backup service machines on any member can see all minidisks of local multiconfiguration (IDENTITY) users
  - Can **not** see minidisks of IDENTITY users on other members
  - Can **only** see DASD volumes (if shared/available) of IDENTITY users on other members
- Recommendation
  - Create Backup service machines as IDENTITY users on each member
    - For IBM Backup and Restore Manager: BKRBKUP, BKRCATLG, BKRWRKnn
  - If backup catalog is in SFS, create one single configuration user for SFS server/filepool
    - Configure as SSI (or REMOTE) in DMSPARMS file
    - Allows single configuration users to restore their own data when logged onto any member
  - Create multiple backup jobs
    - Separate job(s) for single configuration users – only run them from one member
    - For multiconfiguration (IDENTITY) users
      - One job per member
      - Use a unique job name on each member
      - Run the member specific job on that member's backup server

© 2013, 2015 IBM Corporation

Backup and Recovery

IBM Backup and Restore Manager for z/VM

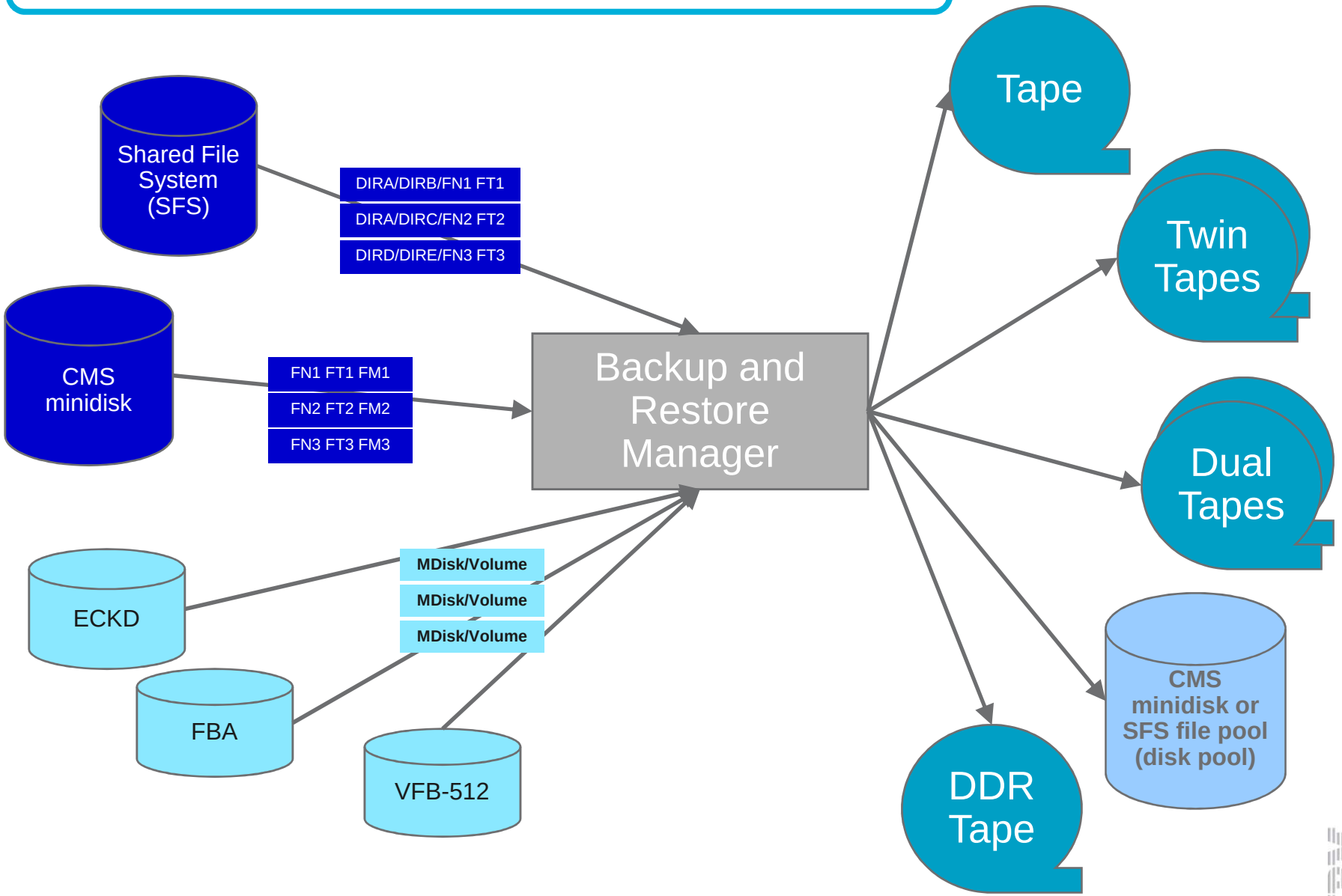
Product Overview

- Backup
  - Requested by administrators
  - Full or incremental
  - Flexible selection of disks and files to back up
  - Review job before submitting for backup
- Restore
  - Restore data via full screen interface or commands
  - Performed by users for their own data
    - Extended to other users available via exit
  - Performed by administrators for any data

Catalog in Shared File System (SFS) – presentation on web site for installation and setup

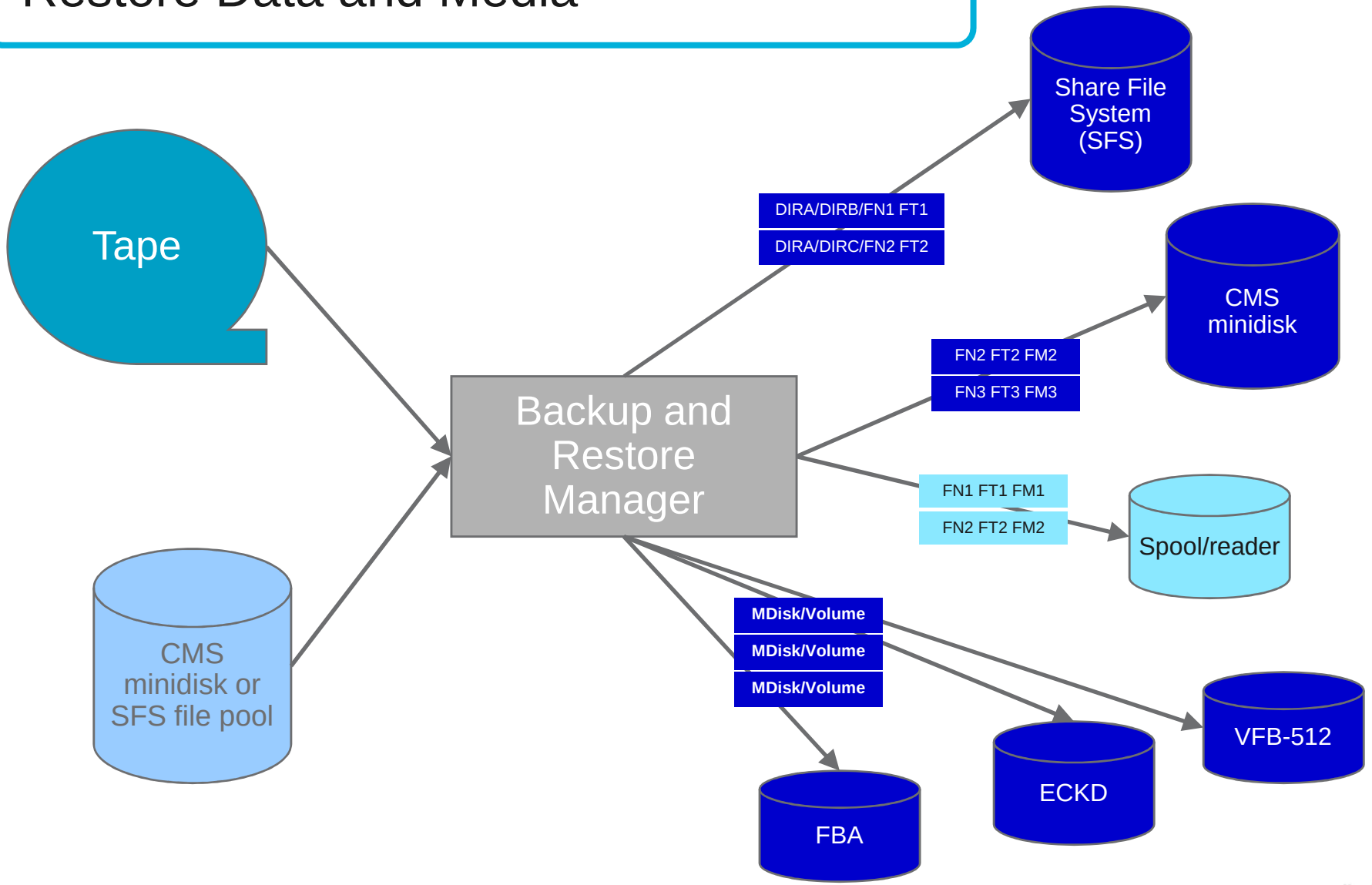
- **Integration with Tape Manager for z/VM**
- **Optional compression of data during backup via exits**
  - Call your own compression algorithm
  - Use IBM provided routine
- **Encryption available via exits**
  - Call your own routine
  - Use vendor-written routine, such as V/Soft Software's Encrypt/Backup for z/VM
  - Use encryption capable tape devices

Backup Data and Media



© 2013, 2015 IBM Corporation

Restore Data and Media

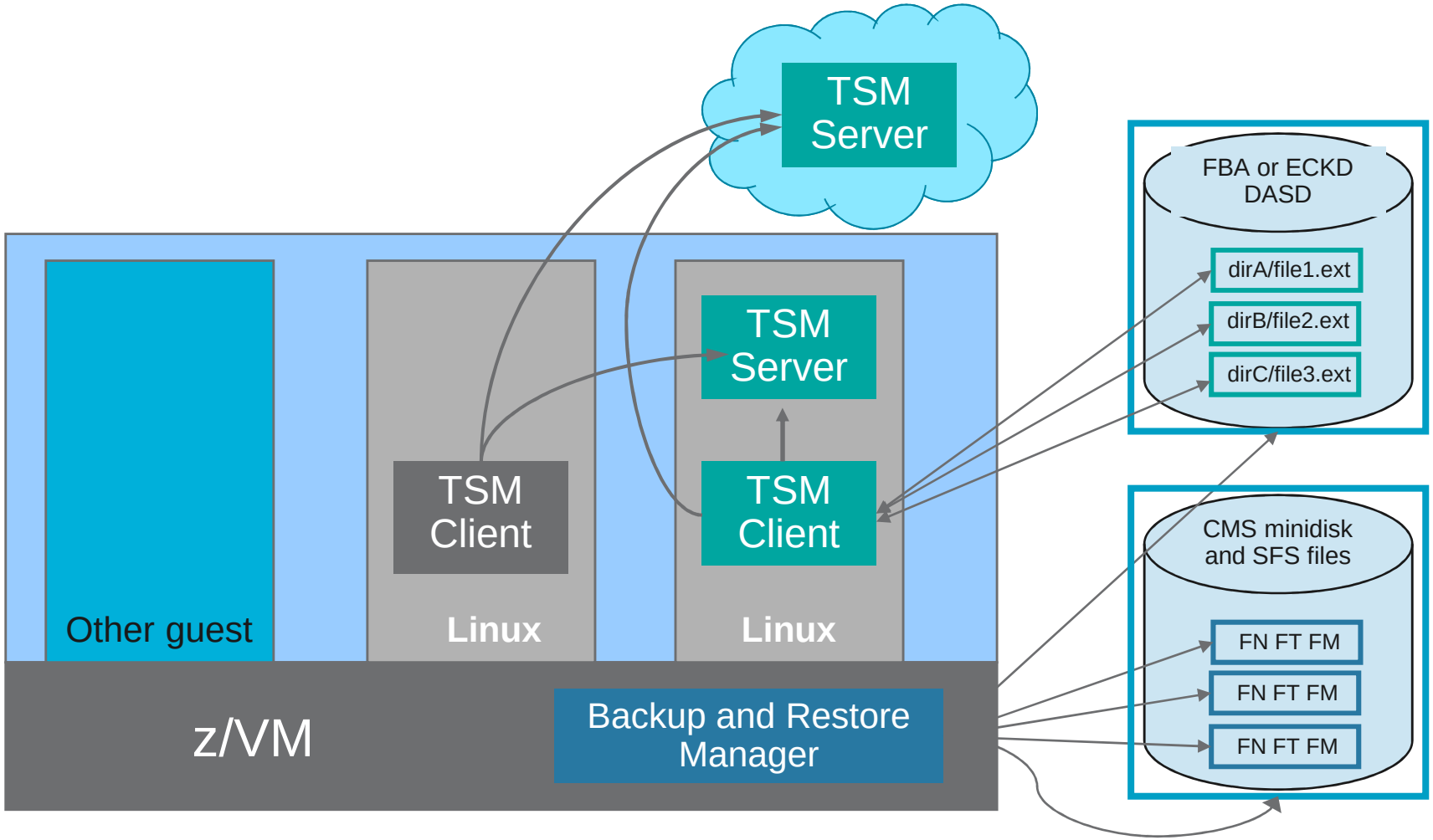


© 2013, 2015 IBM Corporation

Backup and Restore Manager and Linux Guests

Using Backup and Restore Manager with Tivoli Storage Manager

Choose the solution that meets your needs – or combine for file recovery and DR



© 2013, 2015 IBM Corporation

Key Benefits

- System backups available for Disaster Recovery
  - Option to restore using DDR or Backup and Restore Manager
  - Manage retention of DR backups
  - Retrieve a list of tapes associated with a specific backup
    - Pull list for movement to off-site storage
- Guest backups available for restoring to a previous state or level
- Backups of user data available for
  - Restoring to a previous state or level
  - Replacing files accidentally erased or corrupted
- Users restore their own data
  - No administrator interaction required

© 2013, 2015 IBM Corporation

Key Benefits Cont…

- Flexible selection of data to back up
  - Include/exclude
    - Minidisks, SFS directories
    - Real device addresses or volsers
    - Extents
  - Mask by filename, filetype, or SFS path
  - Review a defined backup job before submission
- Management of backup data
  - Retention set as part of the backup job
  - Automatic aging and pruning of the backup catalog
    - Including associated tapes and disk pools (if backed up to disk)
  - View/query the list of expired backups
- Reduced backup window with concurrent processing
  - Multiple worker service machines sharing the job
  - Suggest one worker service machine for each available tape drive
    - Or minidisk in disk pool

© 2013, 2015 IBM Corporation

Defining a Backup Job

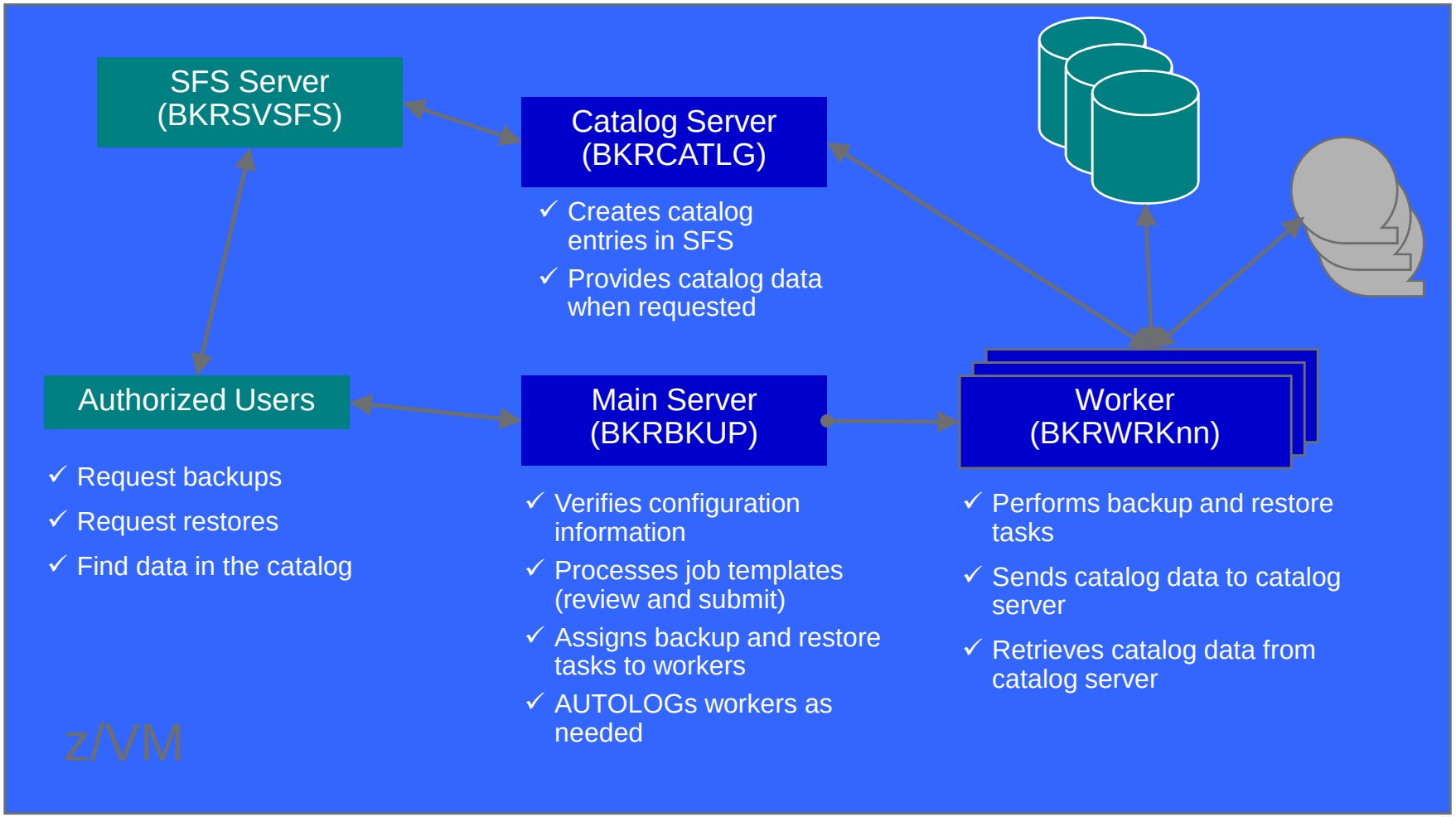
```
/* Include/Exclude definitions                                        */
/**********************************************************************/
  FUNCTION  MEDIATYPE   OWNER      VDEV VOLUME DEVTYPE       START          END          SIZE
|----------|----------|--------|--|----|------|--------|--|----------|--|----------|--|-------|
 INCLUDE    MINIDISK   *        =  *    *      *        =  *          =  *          =  *
 EXCLUDE    MINIDISK   *LNX*    =  *    *      *        =  *          =  *          =  *
 EXCLUDE    MINIDISK   MAINT    =  0123 *      *        =  *          =  *          =  *
 EXCLUDE    MINIDISK   MAINT    =  0124 *      *        =  *          =  *          =  *
 EXCLUDE    MINIDISK   *        =  *    *      *        =  *          =  END        =  *
 EXCLUDE    MINIDISK   *        =  *    *      *        =  *          =  *          >  3300
 INCLUDE    MINIDISK   MAINT    =  012* *      *        =  *          =  *          =  *

  FUNCTION  MEDIATYPE  ADDRESS
|----------|----------|---------|
 INCLUDE    RDEVICE    900-90F
 EXCLUDE    RDEVICE    *B

  FUNCTION  MEDIATYPE  VOLSER
|----------|----------|------|
 INCLUDE    RDEVVOL    630*

  FUNCTION  MEDIATYPE  POOLNAME  OWNER   FS
|----------|----------|--------|--------|---|
 INCLUDE    SFS        VMSYSU:  *        SFS
 EXCLUDE    SFS        VMSYSU:  VMSERVU  SFS
```

Backup and Restore Manager Architecture – non-SSI

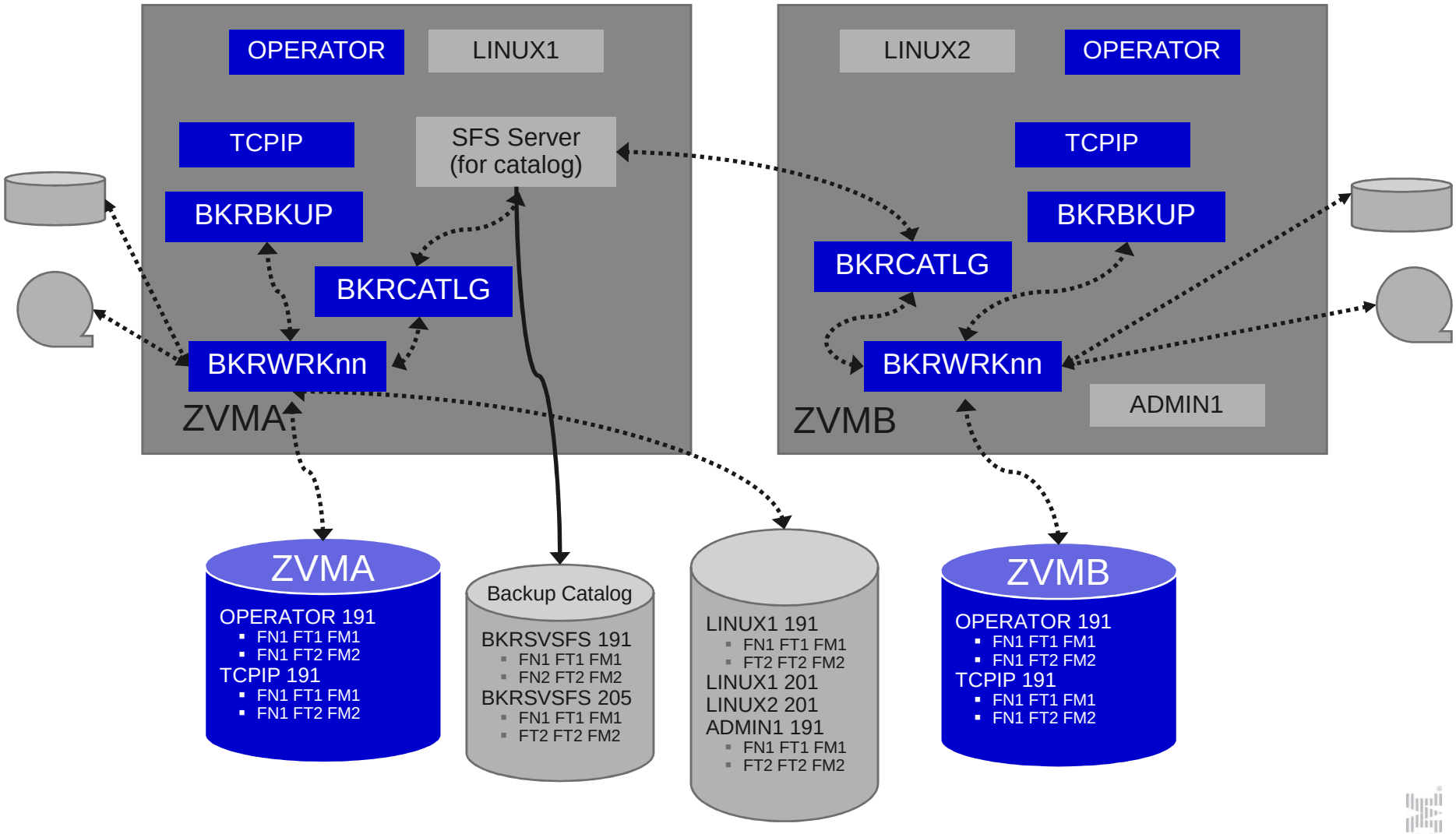


© 2013, 2015 IBM Corporation

Backup and Restore Manager Architecture – SSI

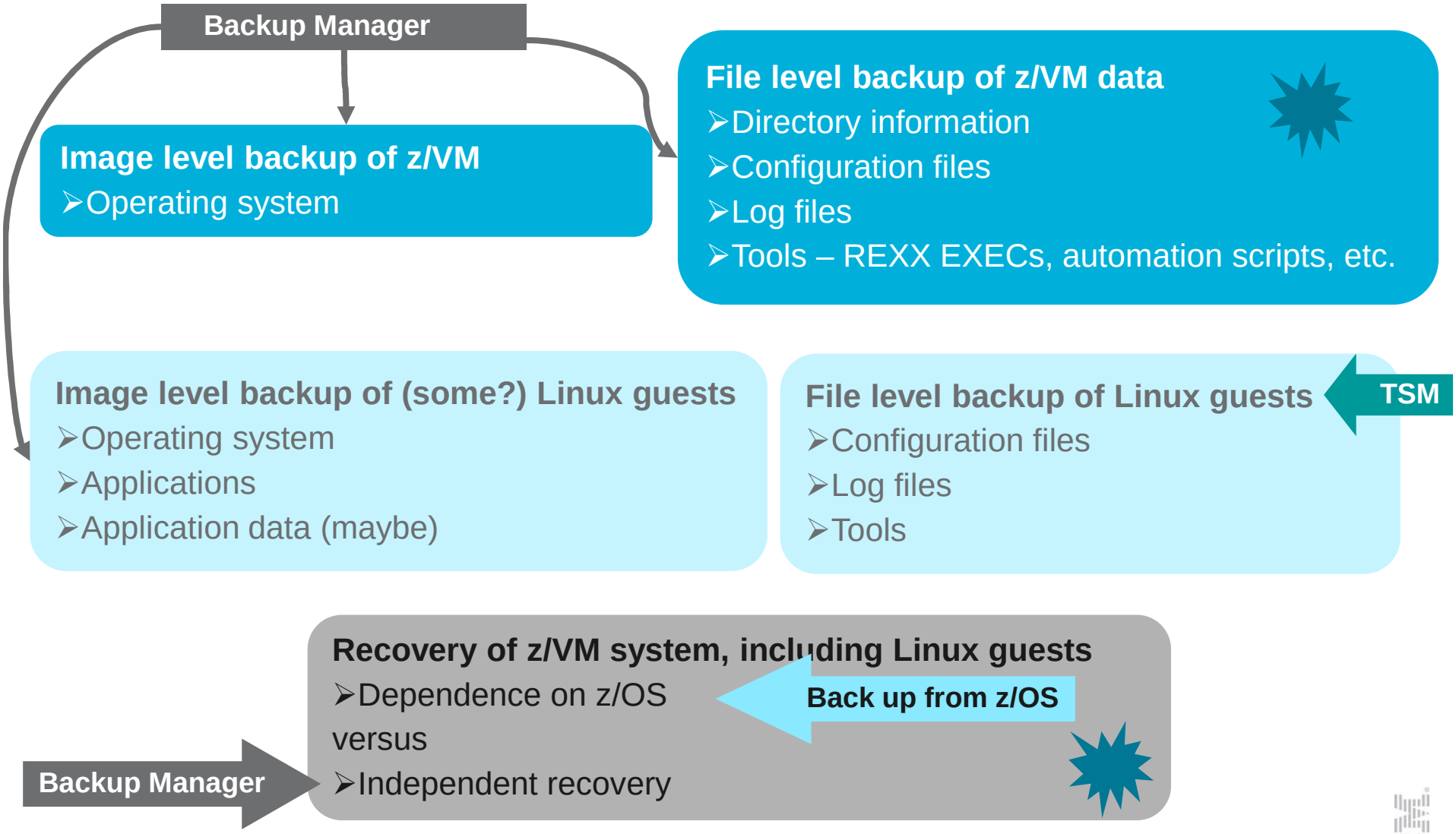
Single Config Users & MDisks

Multiconfig / IDENTITY
Users & MDisks



© 2013, 2015 IBM Corporation

Recommended Practices – Backup and Recovery



© 2013, 2015 IBM Corporation

Summary

- Use Backup and Restore Manager to
  - Perform file-level backups of z/VM data
  - Perform image level backups of non-z/VM guest data
    - Use Tivoli Storage Manager for file level backups of Linux
  - Perform disaster recovery backups of entire system
  - Easily find and restore data as needed
  - Automatically manage retention of backup data
  - Carefully plan for SSI configurations

© 2013, 2015 IBM Corporation

Managing Tapes and Tape Devices

Tape Manager for z/VM

Product Overview

- Manage tapes
  - Define tapes in a catalog
    - 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

© 2013, 2015 IBM Corporation

Key Benefits

- Effective management of tapes in ATL or VTS
  - Granular access control
  - Expiration processing
  - Notification for low threshold for tape resources
  - IBM libraries supported through DFSMSRMS on z/VM
  - STK libraries supported through STK Host Software Component for VM, or STK VM Client
  - EMC libraries supported through standard CCW interface
- 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 – sharing devices with z/OS is discussed later
  - Not available for STK libraries

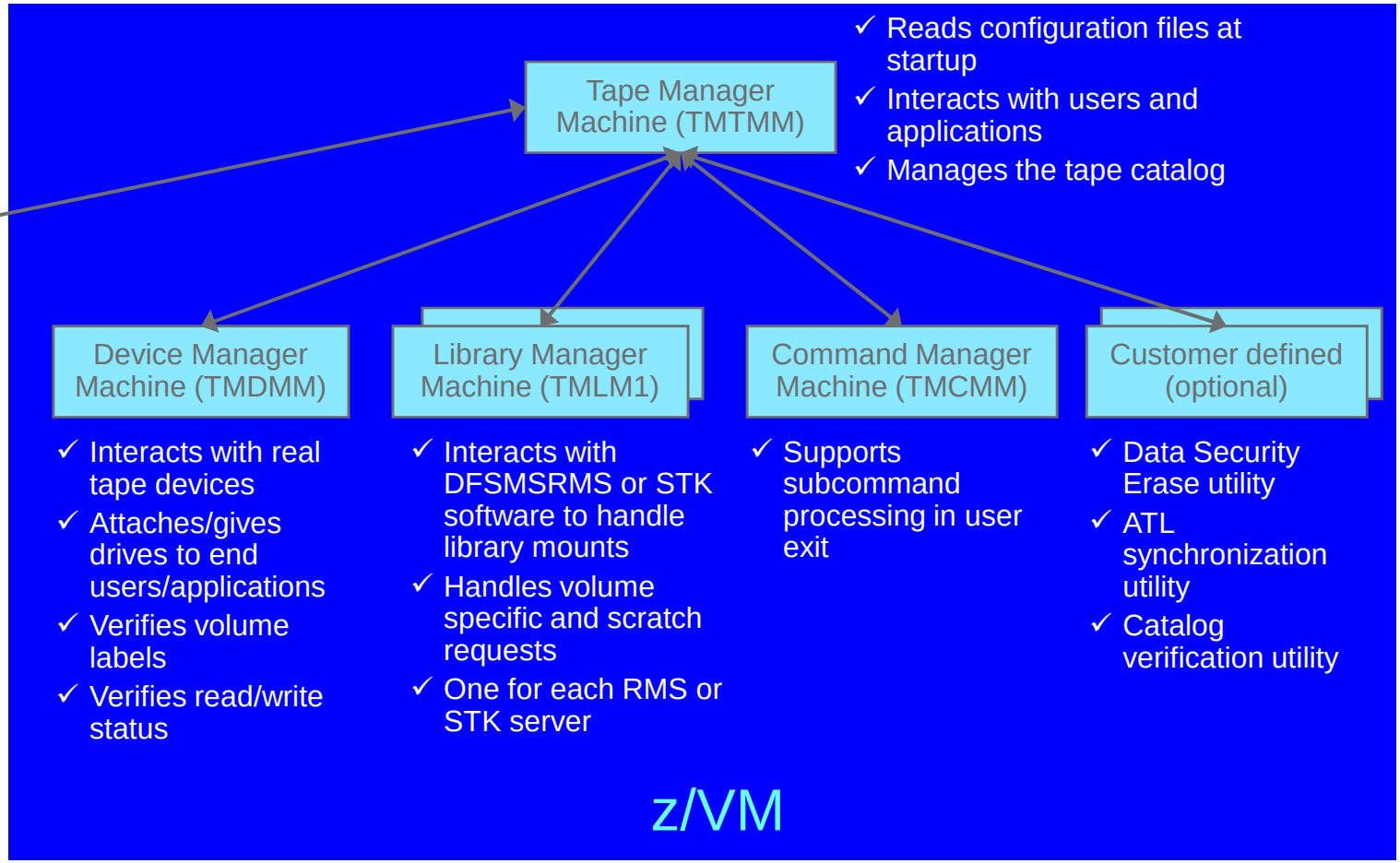
© 2013, 2015 IBM Corporation

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

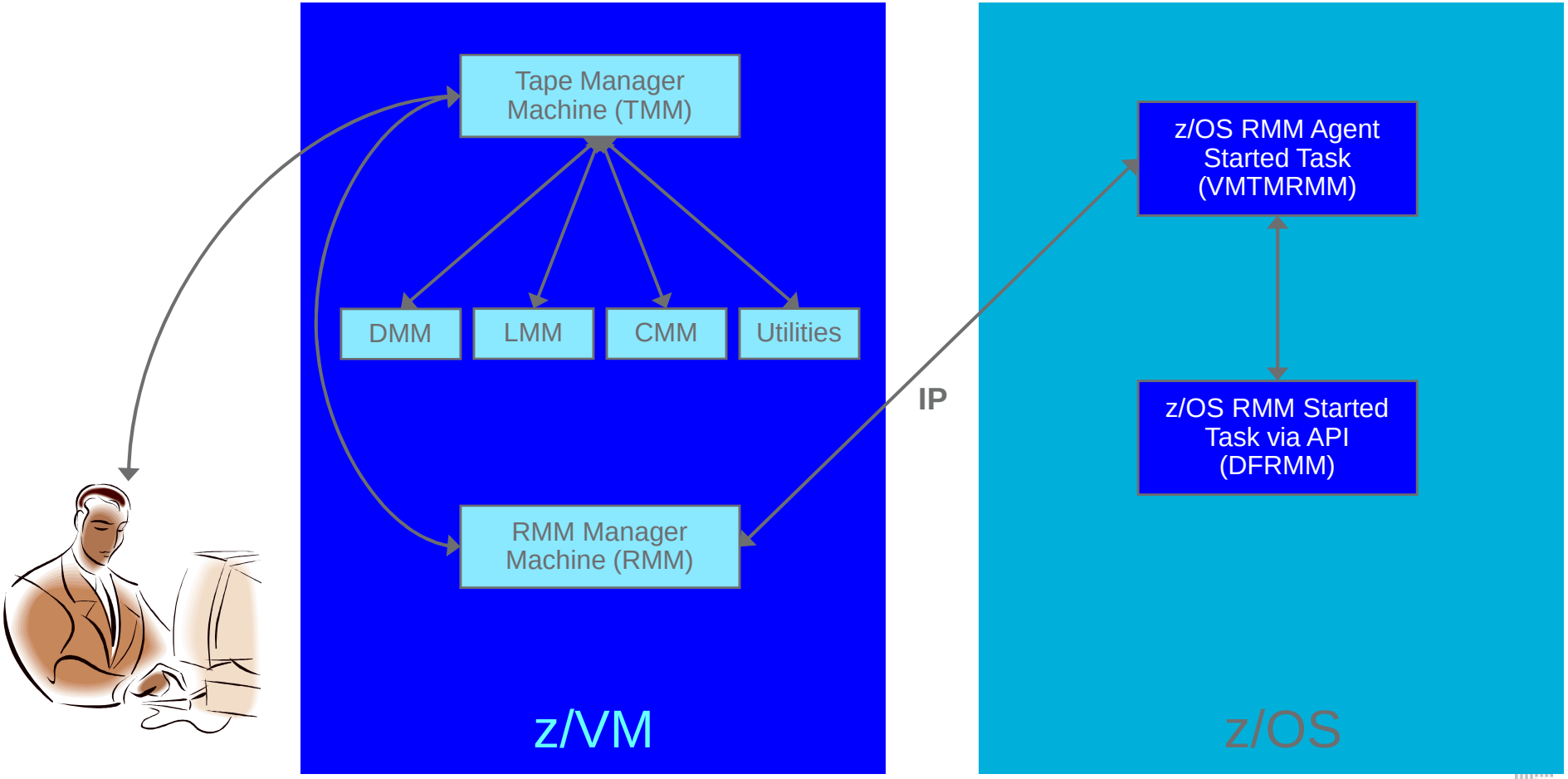
© 2013, 2015 IBM Corporation

Tape Manager in Standard Mode



© 2013, 2015 IBM Corporation

Tape Manager in RMM Mode



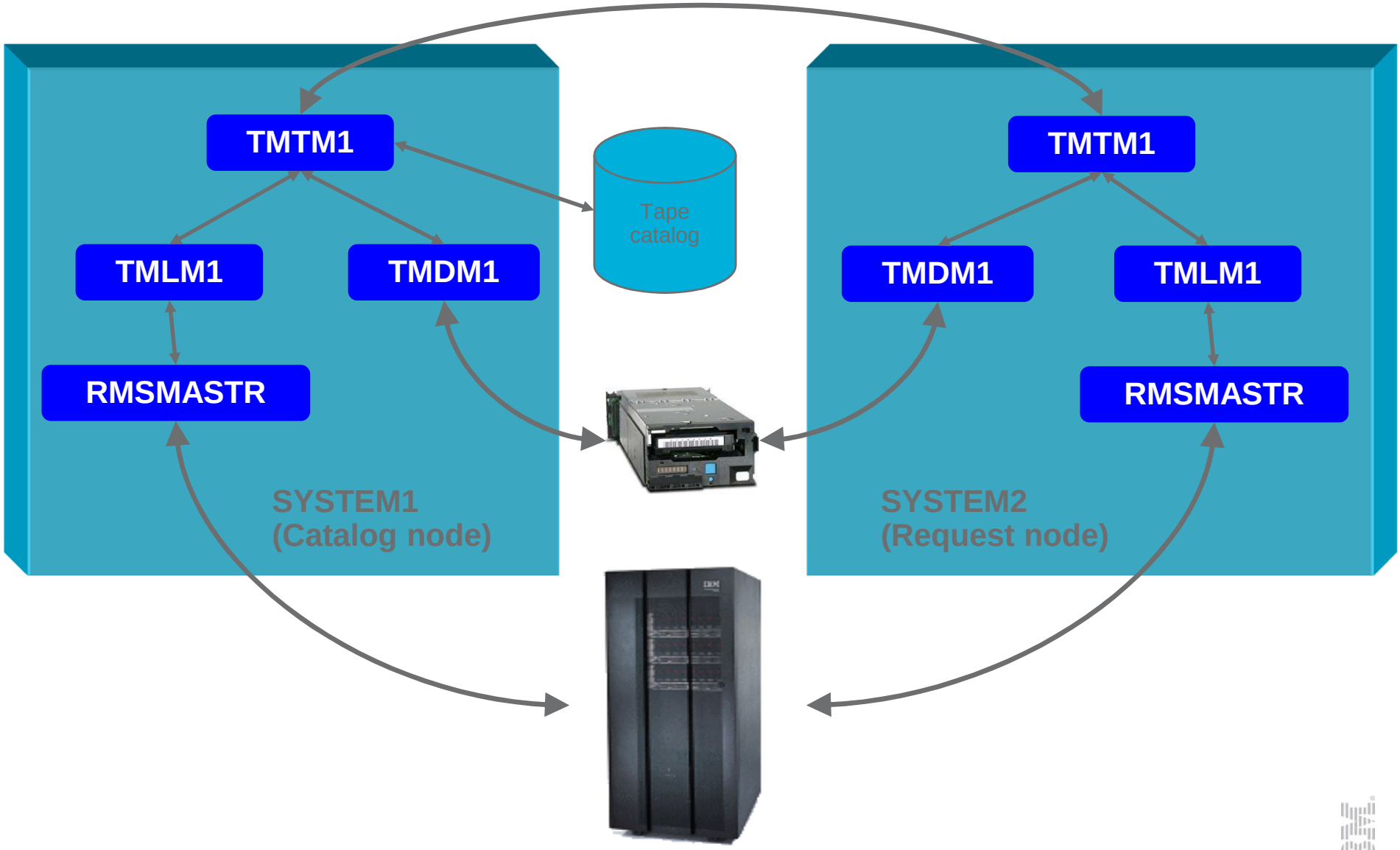
© 2013, 2015 IBM Corporation

Support for One Tape Catalog Across Multiple z/VM Systems

- One “catalog node”
  - Responsible for the tape catalog contents
- Multiple “request nodes”
  - Manage requests on the local system
  - Communicate with catalog node to read or update catalog data
- One catalog used by multiple z/VM systems
  - No longer need to create a catalog on each z/VM system, each with its own range of volsers
  - All z/VM systems share one catalog
- IP used for communication between systems

© 2013, 2015 IBM Corporation

Communication Between Service Machines and Systems

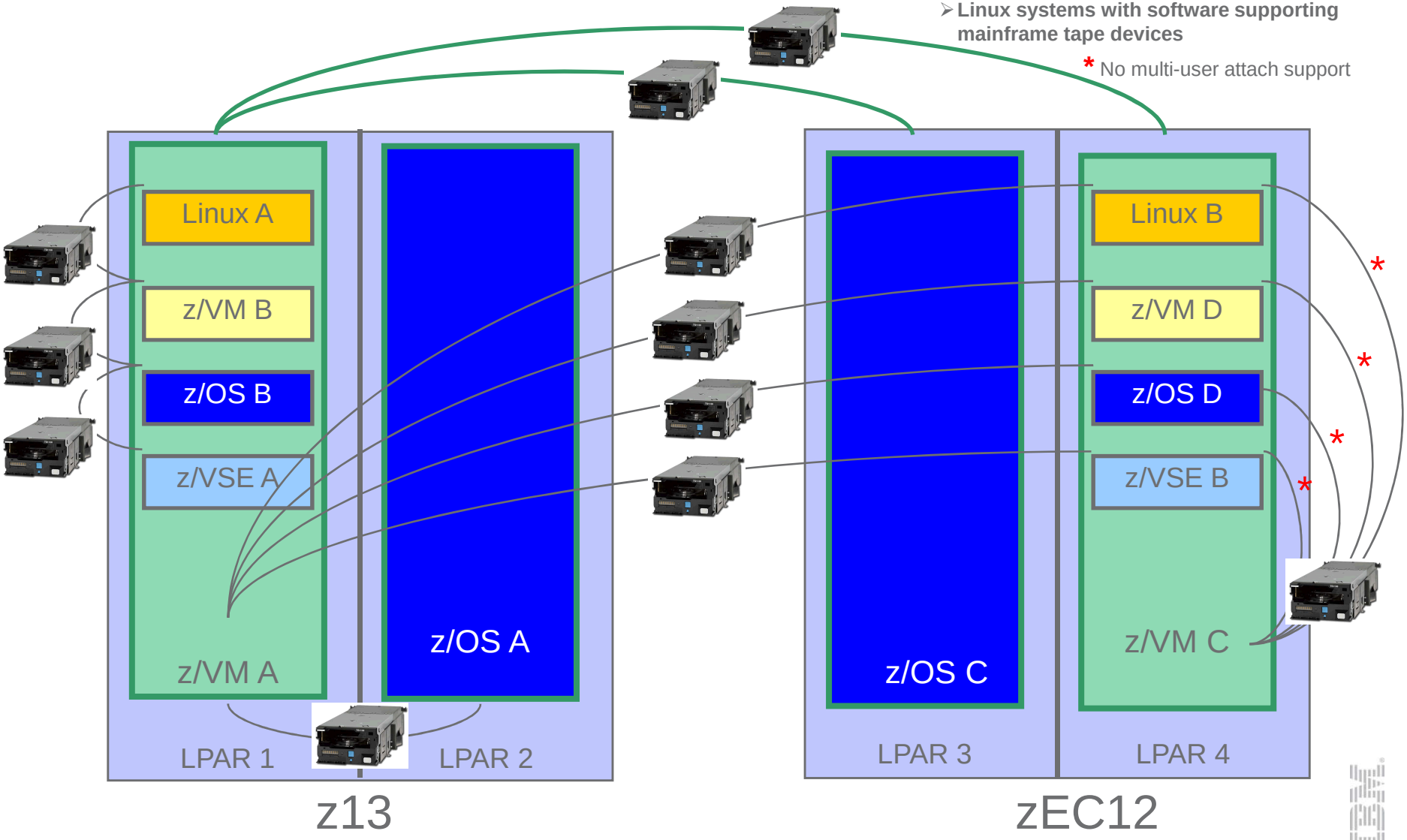


© 2013, 2015 IBM Corporation

Dynamically Share Real Tape Devices

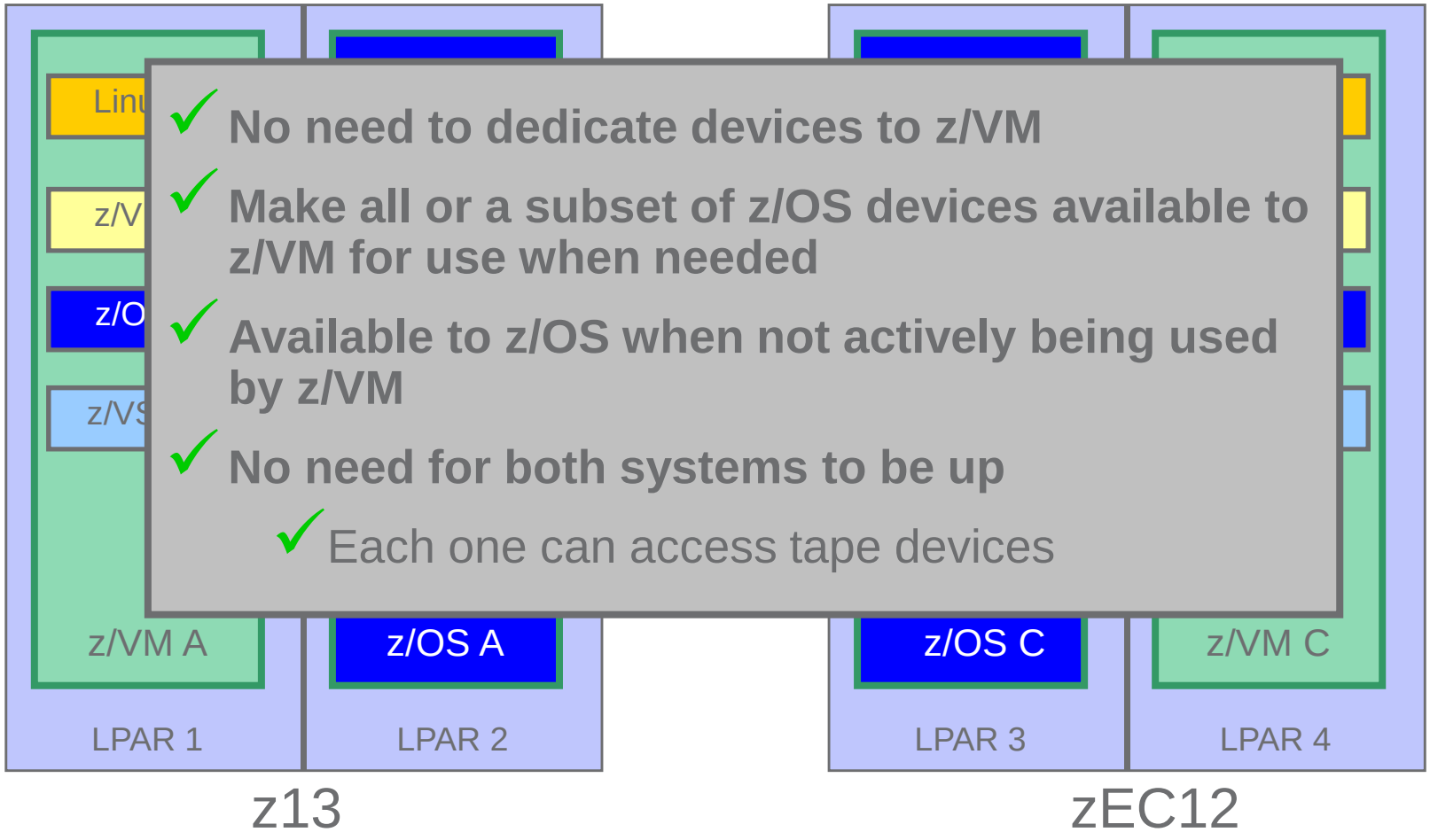
- z/VM systems with IBM Tape Manager
- z/OS systems with IBM Automated Tape Allocation Manager
- Linux systems with software supporting mainframe tape devices

* No multi-user attach support



© 2013, 2015 IBM Corporation

Dynamically Share Tape Devices



© 2013, 2015 IBM Corporation

Tape Manager for z/VM - Summary

- Use Tape Manager to
  - Manage and share devices
  - Manage tape volumes
    - Access control
    - Retention
    - Data Security
  - Improve accuracy of mount requests

Summary

- Management of z/VM systems with Linux guests requires monitoring and management tools
- IBM solutions exist
  - OMEGAMON XE on z/VM and Linux
  - zSecure Manager for z/VM
  - Operations Manager for z/VM
  - Wave for z/VM
  - Tape Manager for z/VM
  - Backup and Restore Manager for z/VM
  - Archive Manager for z/VM
- Demos are available

© 2013, 2015 IBM Corporation

Reference Information

- Product Web site
  - Start at http://www.ibm.com/software/products/en/backup-restore-manager-for-zvm
  - Start at http://www.ibm.com/software/products/en/tape-manager-for-zvm
  - Product pages include
    - Publications
    - Pre-requisites
    - Presentations
    - White papers
    - Support
- e-mail
  - Mike Sine, sine@us.ibm.com, Technical Marketing
  - Tracy Dean, tld1@us.ibm.com, Product Manager
- White papers and presentations on Backup and Restore Manager and Tape Manager websites (Resources tab)
  - Getting Started with Installation, including SFS server creation and installation of Backup Mgr
    - z/VM V6.2 and later
    - z/VM V5.4
  - Backing up z/VM and Linux on System z – Tivoli Storage Manager vs Backup Manager
  - Pausing (including SUSPENDing) a Linux Guest
  - Enabling the FACILITY Class for Use by RACF for z/VM

© 2013, 2015 IBM Corporation

Demonstration Scenarios

With Screenshots

Backup and Recovery – Demos Available

A. Performing an incremental backup

B. Restoring files from backup

C. Back up and restore single and multiconfiguration users in an SSI environment

D. Scheduling image backups of Linux guests

E. Suspend and resume a guest as part of backup

F. Reviewing a disaster recovery backup

G. Reviewing data in the backup catalog for recovery

© 2013, 2015 IBM Corporation

Scenario A: Performing an Incremental Backup

- Administrator previously performed a full backup
- Incremental job defined, using last full backup as its base
- Change a file on user's A-disk
- Submit incremental job for review
- Submit incremental job for backup processing
- Use Operations Manager to monitor backup servers

© 2013, 2015 IBM Corporation

Scenario A: Detailed Steps

- From a z/VM user ID, change a file

```
xedit b b a
```

- From an authorized z/VM user ID, submit a backup job for review

```
smsg bkrbkup review increm01
```

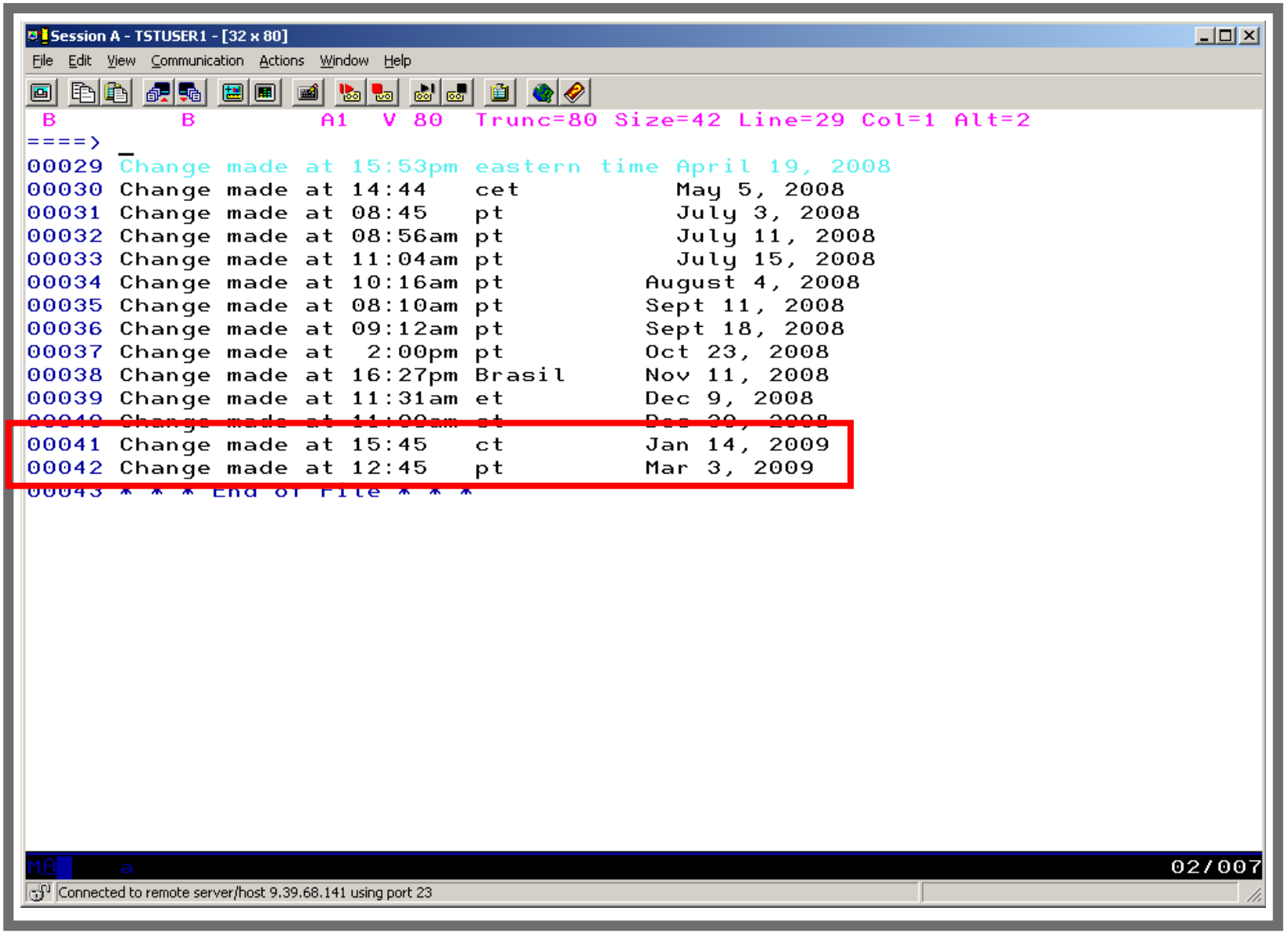
- Review the resulting files in the reader (LINKFAIL and JOB files)
- From an authorized z/VM user ID, submit a backup job for backup processing

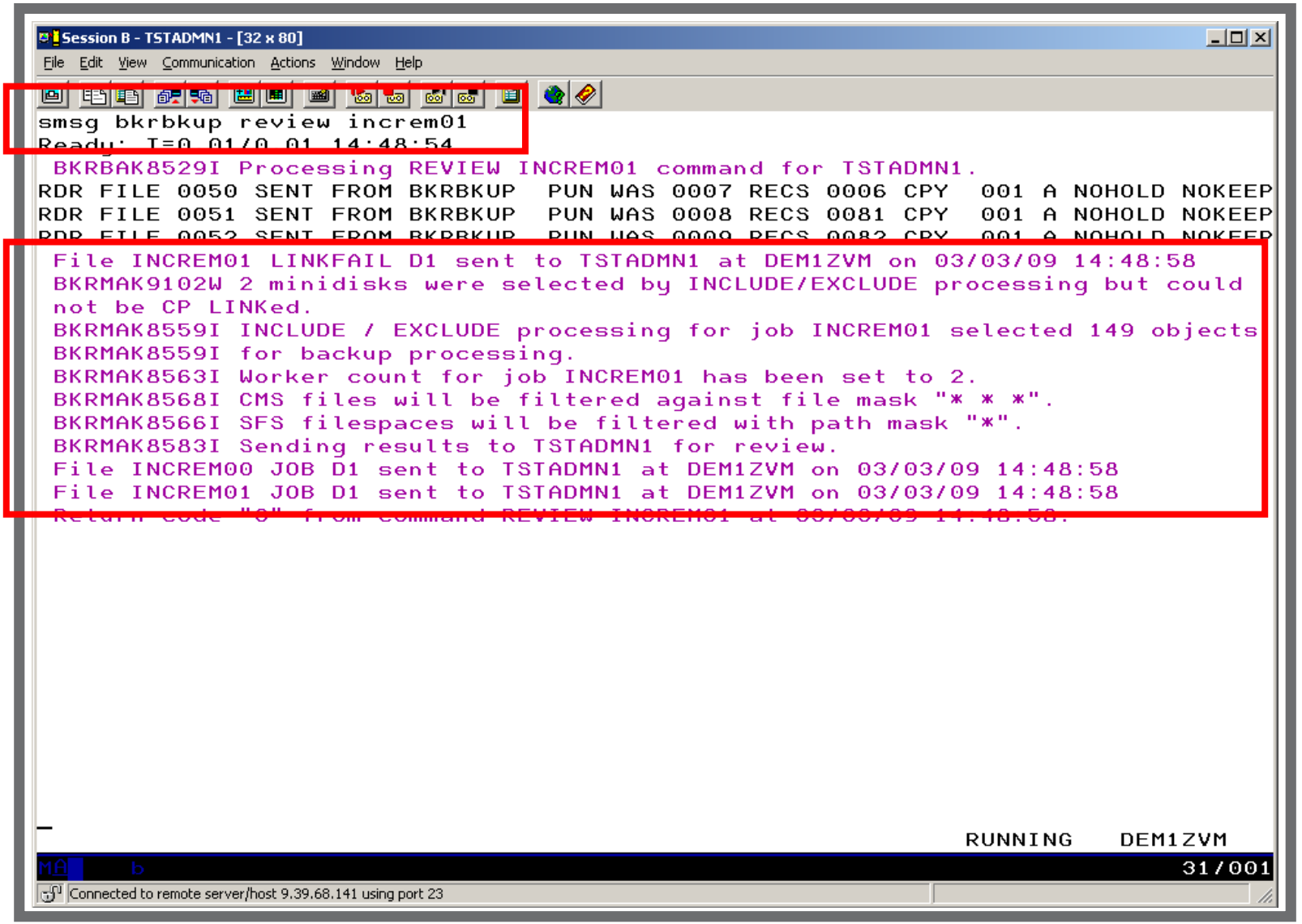
```
smsg bkrbkup submit increm01
```

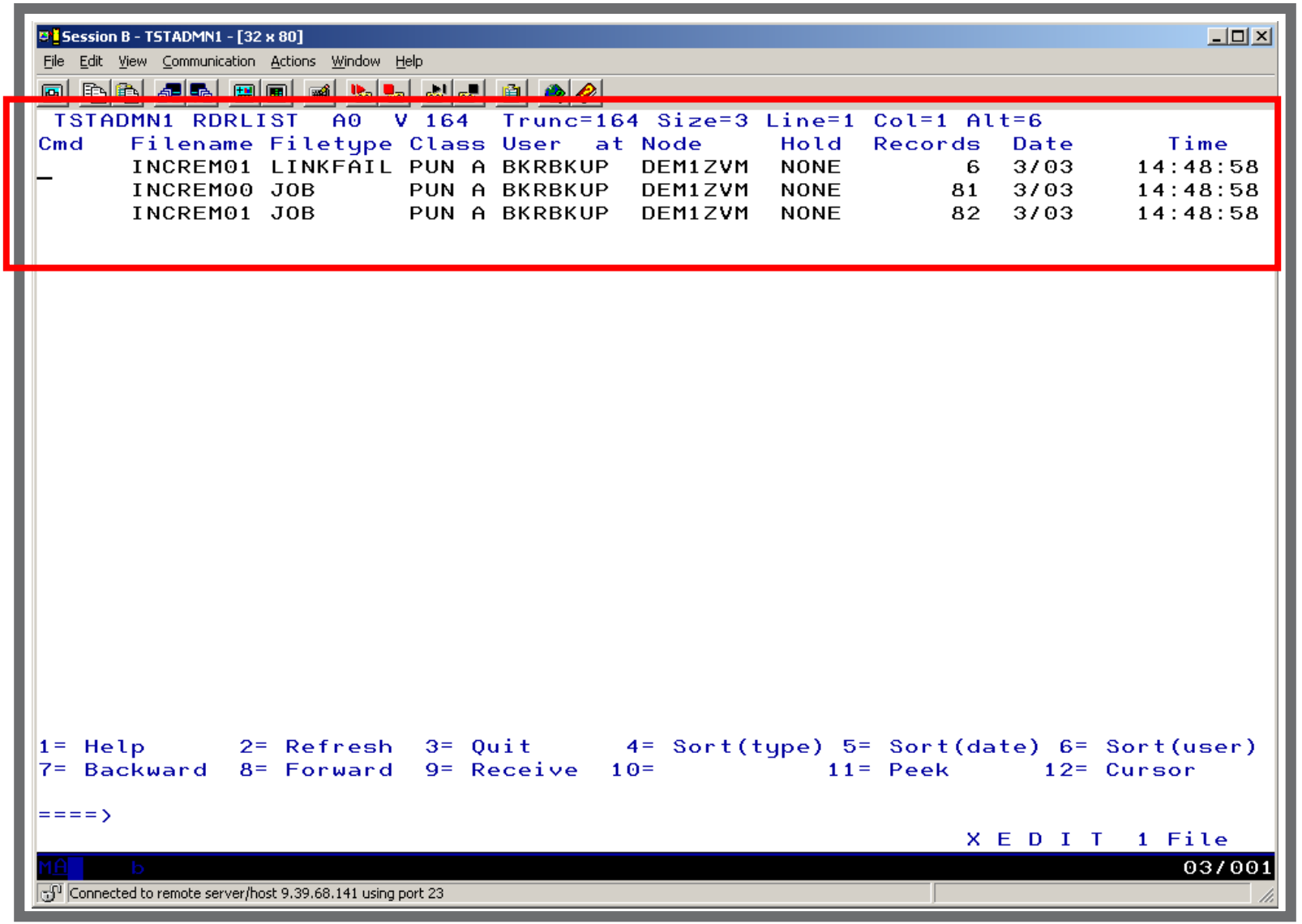
- View the console of the backup servers to see the processing

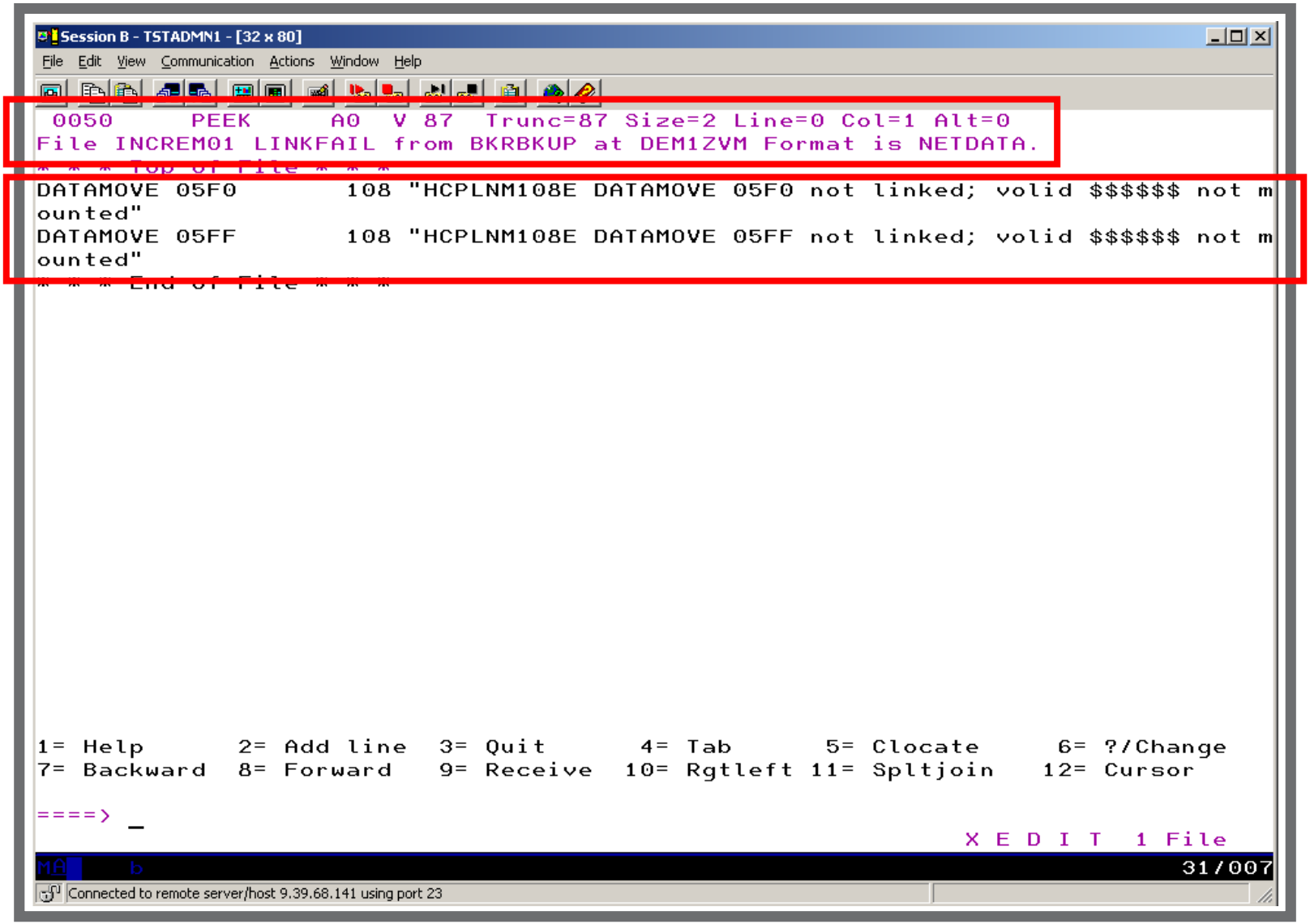
```
gomcmd opmgrm1 viewcon user(backup)
```

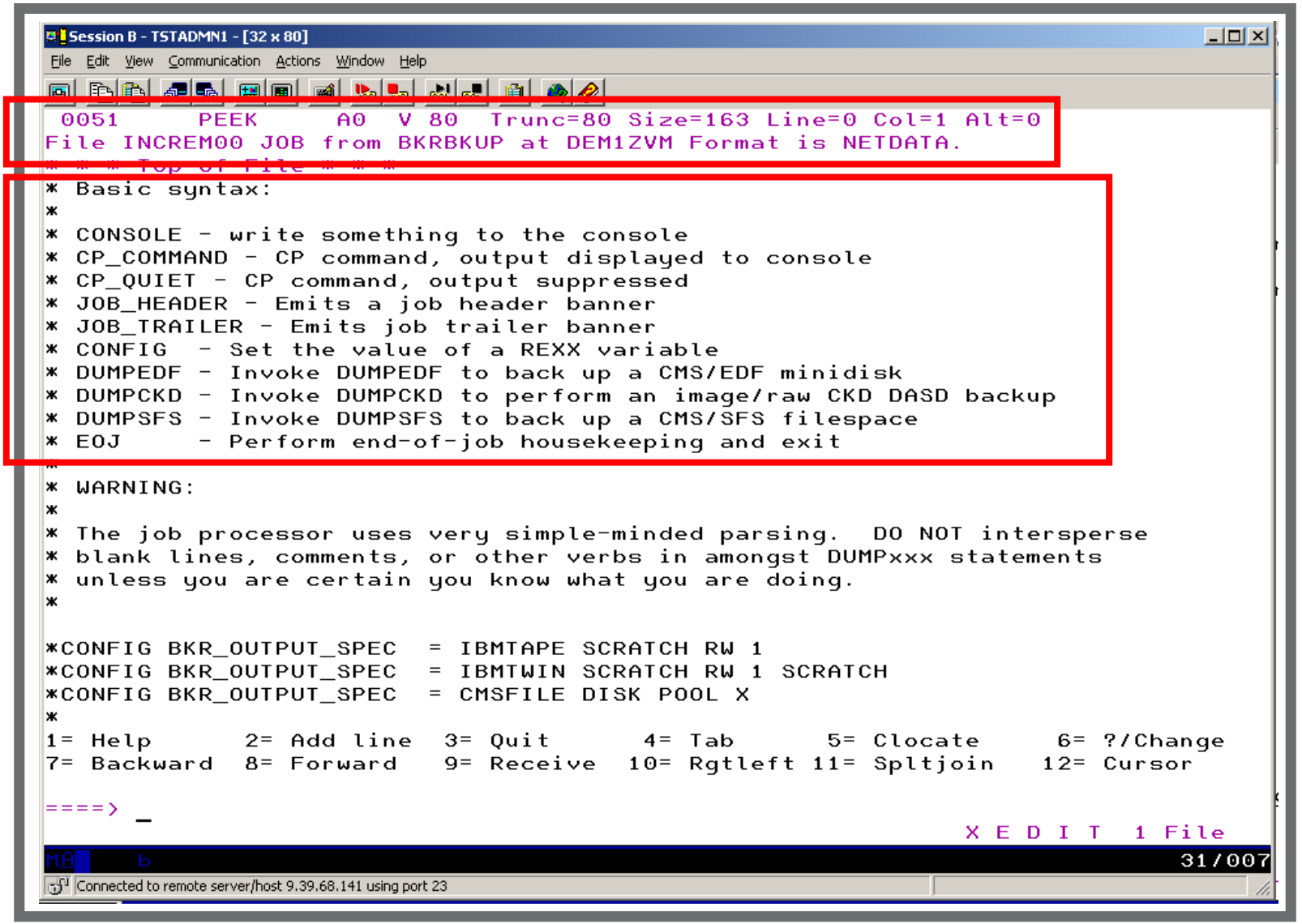
© 2013, 2015 IBM Corporation

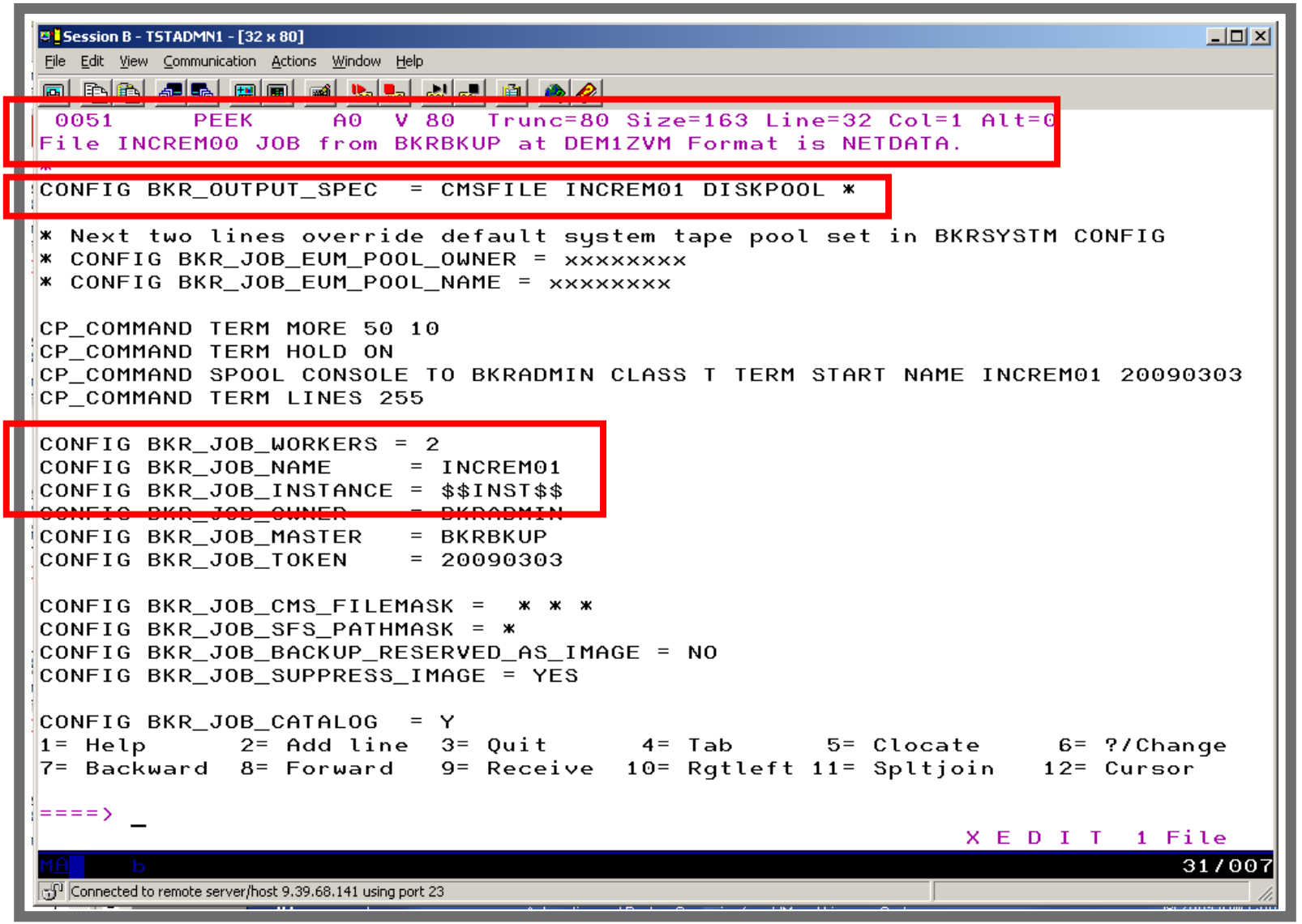

Session A - TSTUSER1 - [32 x 80]
File Edit View Communication Actions Window Help
B B A1 V 80 Trunc=80 Size=42 Line=29 Col=1 Alt=2
====>
00029 Change made at 15:53pm eastern time April 19, 2008
00030 Change made at 14:44 cet May 5, 2008
00031 Change made at 08:45 pt July 3, 2008
00032 Change made at 08:56am pt July 11, 2008
00033 Change made at 11:04am pt July 15, 2008
00034 Change made at 10:16am pt August 4, 2008
00035 Change made at 08:10am pt Sept 11, 2008
00036 Change made at 09:12am pt Sept 18, 2008
00037 Change made at 2:00pm pt Oct 23, 2008
00038 Change made at 16:27pm Brasil Nov 11, 2008
00039 Change made at 11:31am et Dec 9, 2008
00041 Change made at 15:45 ct Jan 14, 2009
00042 Change made at 12:45 pt Mar 3, 2009
00043 * * * End of File * * *
MA a
02/007
Connected to remote server/host 9.39.68.141 using port 23

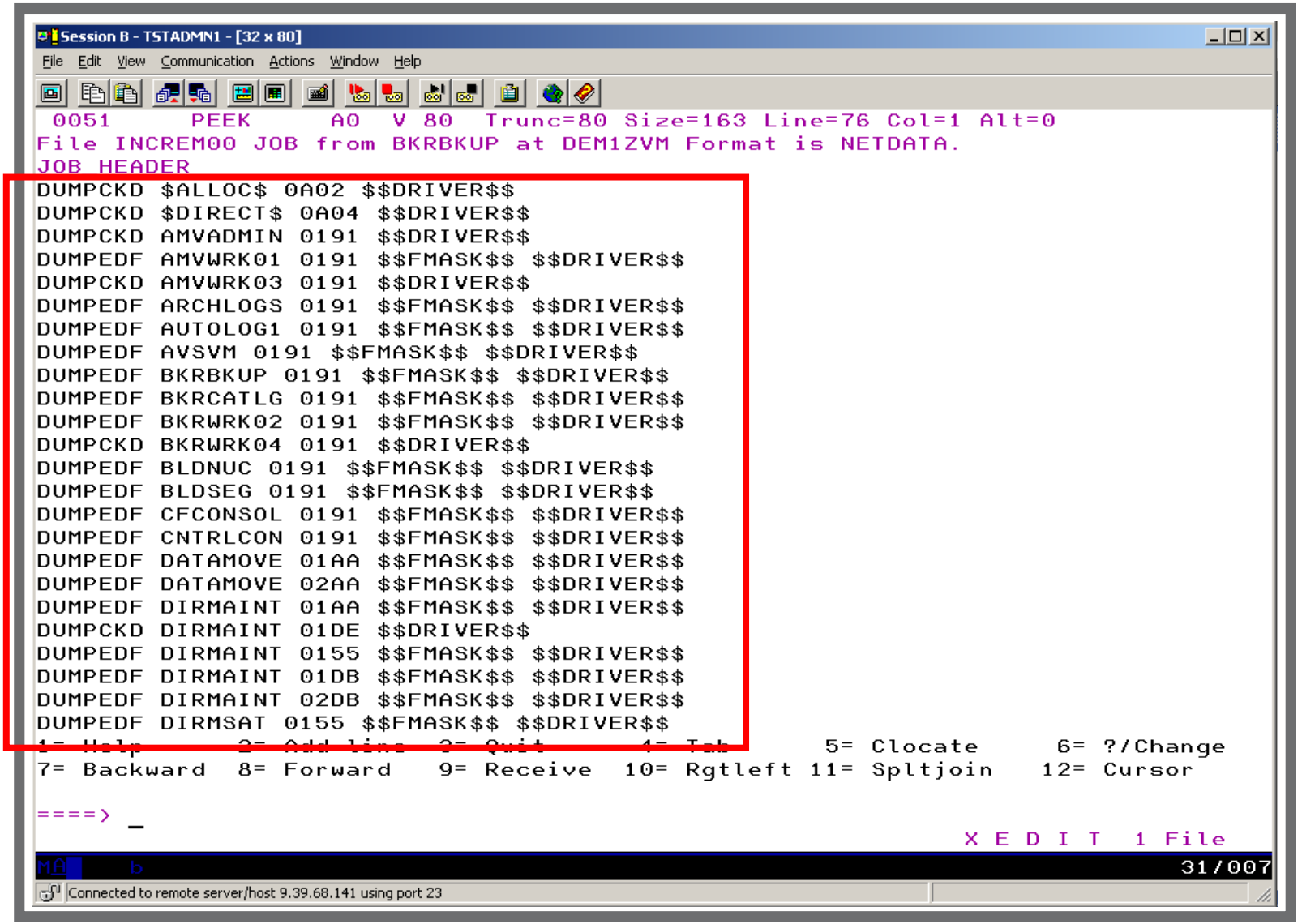

Session B - TSTADMN1 - [32 x 80]
File Edit View Communication Actions Window Help
smsg bkrbkup review increm01
Ready; T=0.01/0.01 14:48:54
BKRBAK8529I Processing REVIEW INCREM01 command for TSTADMN1.
RDR FILE 0050 SENT FROM BKRBKUP PUN WAS 0007 RECS 0006 CPY 001 A NOHOLD NOKEEP
RDR FILE 0051 SENT FROM BKRBKUP PUN WAS 0008 RECS 0081 CPY 001 A NOHOLD NOKEEP
File INCREM01 LINKFAIL D1 sent to TSTADMN1 at DEM1ZVM on 03/03/09 14:48:58
BKRMAK9102W 2 minidisks were selected by INCLUDE/EXCLUDE processing but could not be CP LINKed.
BKRMAK8559I INCLUDE / EXCLUDE processing for job INCREM01 selected 149 objects
BKRMAK8559I for backup processing.
BKRMAK8563I Worker count for job INCREM01 has been set to 2.
BKRMAK8568I CMS files will be filtered against file mask "* * *".
BKRMAK8566I SFS filespaces will be filtered with path mask "*".
BKRMAK8583I Sending results to TSTADMN1 for review.
File INCREM00 JOB D1 sent to TSTADMN1 at DEM1ZVM on 03/03/09 14:48:58
File INCREM01 JOB D1 sent to TSTADMN1 at DEM1ZVM on 03/03/09 14:48:58
RUNNING DEM1ZVM
31/001
Connected to remote server/host 9.39.68.141 using port 23

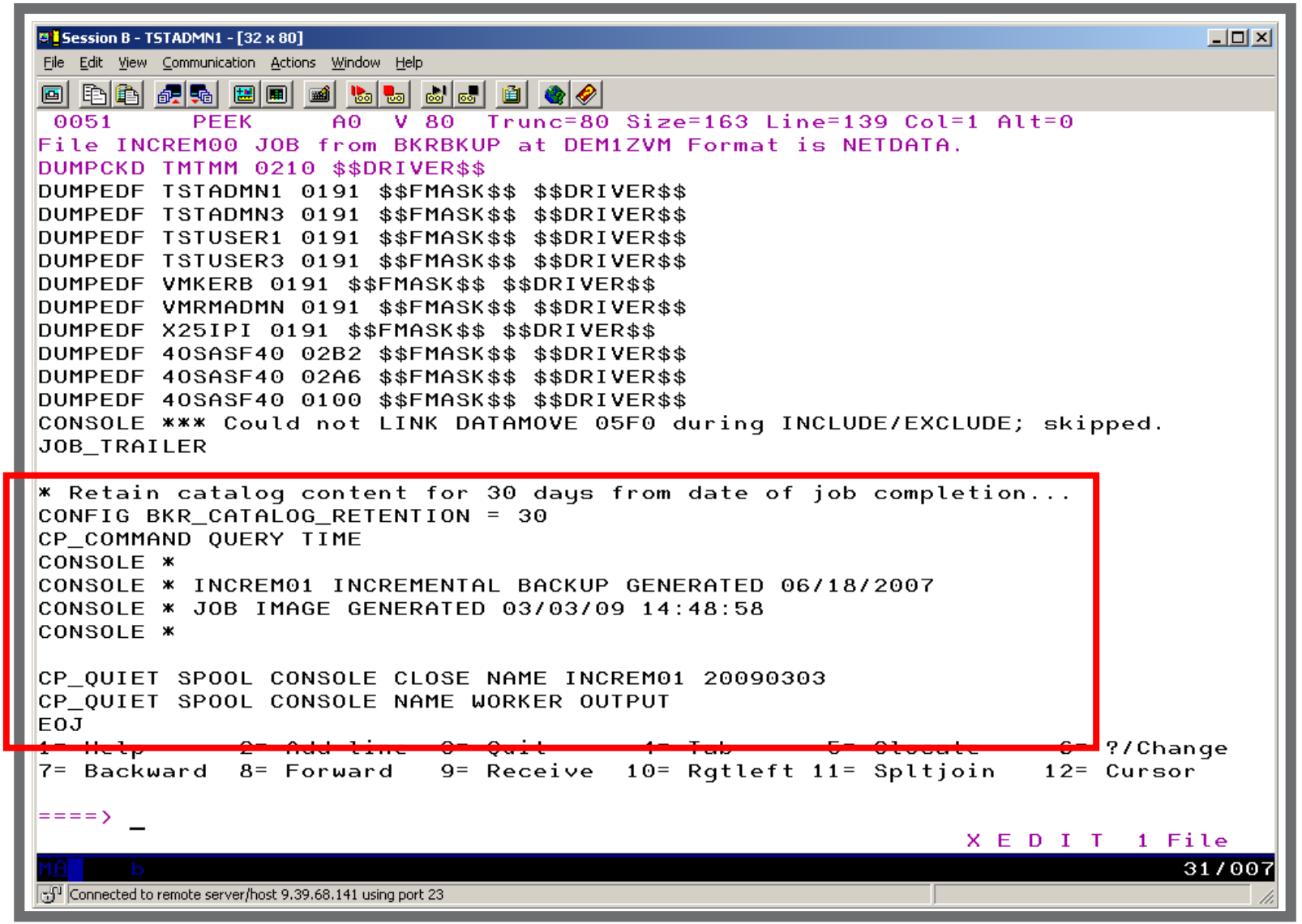

Session B - TSTADMN1 - [32 x 80]
File Edit View Communication Actions Window Help
TSTADMN1 RDRLIST A0 V 164 Trunc=164 Size=3 Line=1 Col=1 Alt=6
Cmd Filename Filetype Class User at Node Hold Records Date Time
INCREM01 LINKFAIL PUN A BKRBKUP DEM1ZVM NONE 6 3/03 14:48:58
INCREM00 JOB PUN A BKRBKUP DEM1ZVM NONE 81 3/03 14:48:58
INCREM01 JOB PUN A BKRBKUP DEM1ZVM NONE 82 3/03 14:48:58
1= Help 2= Refresh 3= Quit 4= Sort(type) 5= Sort(date) 6= Sort(user)
7= Backward 8= Forward 9= Receive 10= 11= Peek 12= Cursor
====>
X E D I T 1 File
03/001
Connected to remote server/host 9.39.68.141 using port 23

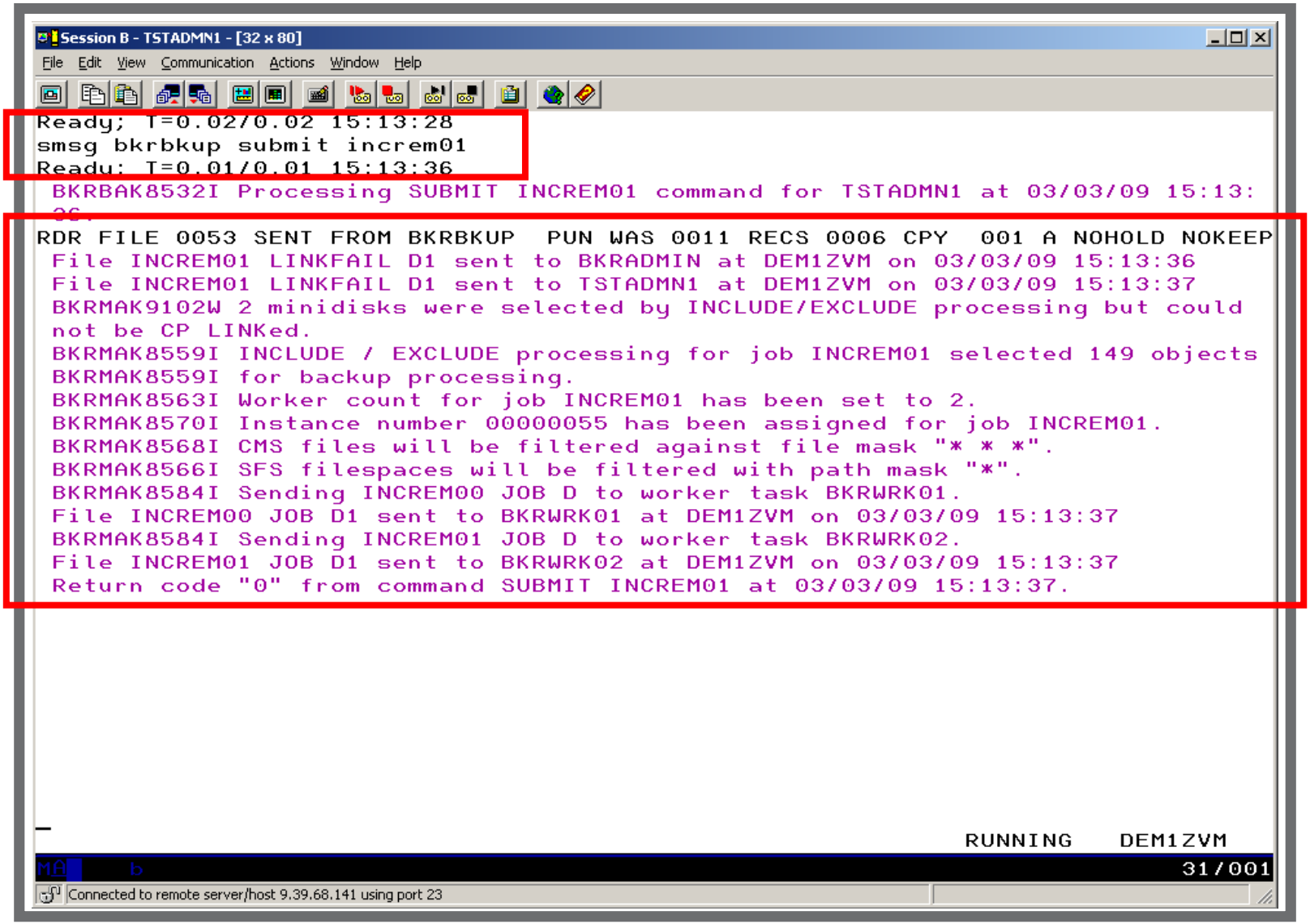

Session B - TSTADMN1 - [32 x 80]
File Edit View Communication Actions Window Help
0050 PEEK A0 V 87 Trunc=87 Size=2 Line=0 Col=1 Alt=0
File INCREM01 LINKFAIL from BKRBKUP at DEM1ZVM Format is NETDATA.
* * * Top of File * * *
DATAMOVE 05F0 108 "HCPLNM108E DATAMOVE 05F0 not linked; volid $$$$$$ not m
ounted"
DATAMOVE 05FF 108 "HCPLNM108E DATAMOVE 05FF not linked; volid $$$$$$ not m
ounted"
* * * End of File * * *
1= Help 2= Add line 3= Quit 4= Tab 5= Clocate 6= ?/Change
7= Backward 8= Forward 9= Receive 10= Rgtleft 11= Spltjoin 12= Cursor
====> _
X E D I T 1 File
MA b 31/007
Connected to remote server/host 9.39.68.141 using port 23

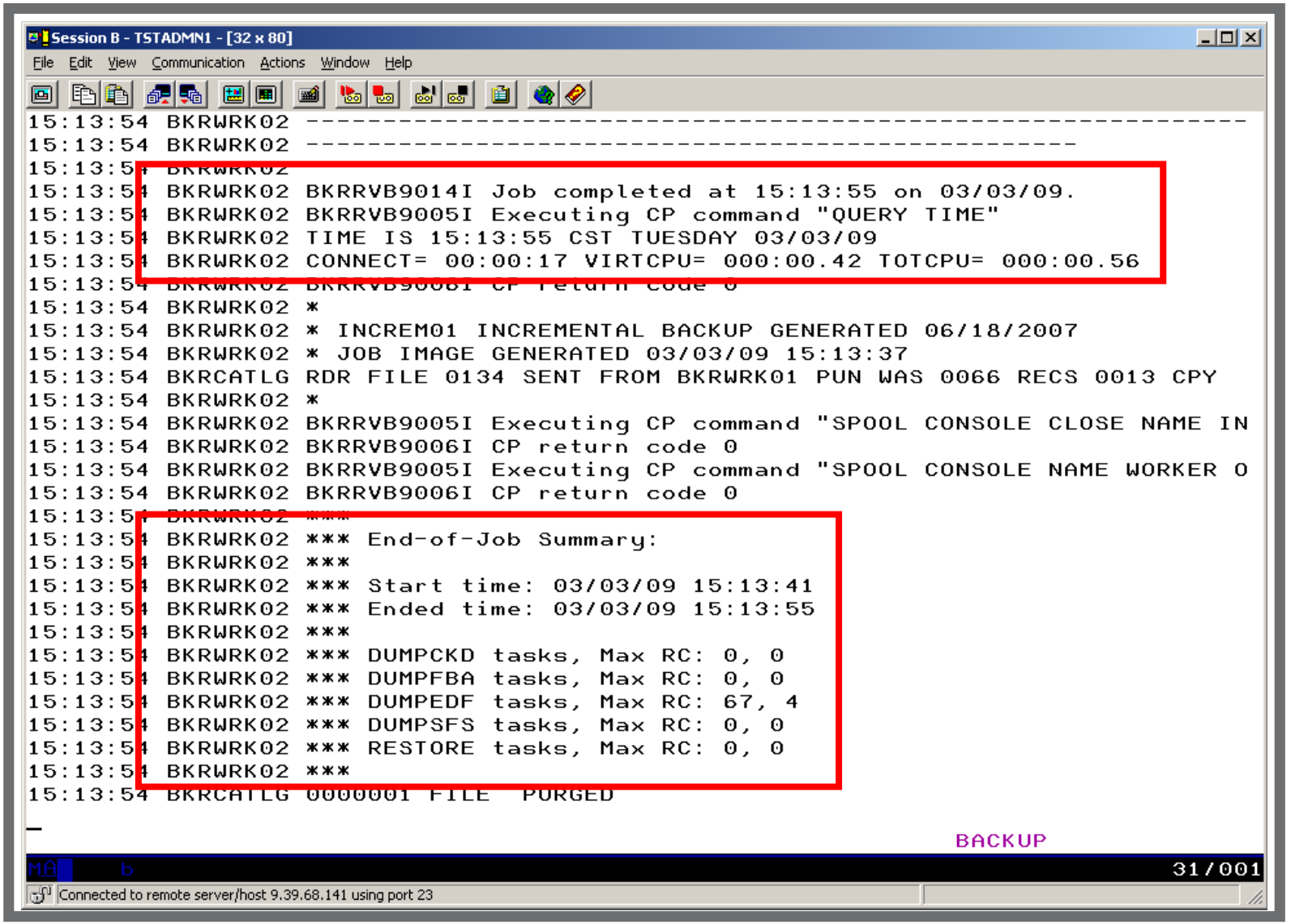

Session B - TSTADMN1 - [32 x 80]
File Edit View Communication Actions Window Help
0051 PEEK A0 V 80 Trunc=80 Size=163 Line=0 Col=1 Alt=0
File INCREM00 JOB from BKRBKUP at DEM1ZVM Format is NETDATA.
* * * Top of File * * *
* Basic syntax:
*
* CONSOLE - write something to the console
* CP_COMMAND - CP command, output displayed to console
* CP_QUIET - CP command, output suppressed
* JOB_HEADER - Emits a job header banner
* JOB_TRAILER - Emits job trailer banner
* CONFIG - Set the value of a REXX variable
* DUMPEDF - Invoke DUMPEDF to back up a CMS/EDF minidisk
* DUMPCKD - Invoke DUMPCKD to perform an image/raw CKD DASD backup
* DUMPSFS - Invoke DUMPSFS to back up a CMS/SFS filespace
* EOJ - Perform end-of-job housekeeping and exit
*
* WARNING:
*
* The job processor uses very simple-minded parsing. DO NOT intersperse
* blank lines, comments, or other verbs in amongst DUMPxxx statements
* unless you are certain you know what you are doing.
*
*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
*
1= Help 2= Add line 3= Quit 4= Tab 5= Clocate 6= ?/Change
7= Backward 8= Forward 9= Receive 10= Rgtleft 11= Spltjoin 12= Cursor
====>
X E D I T 1 File
MA b
31/007
Connected to remote server/host 9.39.68.141 using port 23


Session B - TSTADMN1 - [32 x 80]
File Edit View Communication Actions Window Help
0051 PEEK A0 V 80 Trunc=80 Size=163 Line=32 Col=1 Alt=0
File INCREM00 JOB from BKRBKUP at DEM1ZVM Format is NETDATA.
*
CONFIG BKR_OUTPUT_SPEC = CMSFILE INCREM01 DISKPOOL *
* Next two lines override default system tape pool set in BKRSYSTM CONFIG
* CONFIG BKR_JOB_EUM_POOL_OWNER = xxxxxxxx
* CONFIG BKR_JOB_EUM_POOL_NAME = xxxxxxxx
CP_COMMAND TERM MORE 50 10
CP_COMMAND TERM HOLD ON
CP_COMMAND SPOOL CONSOLE TO BKRADMIN CLASS T TERM START NAME INCREM01 20090303
CP_COMMAND TERM LINES 255
CONFIG BKR_JOB_WORKERS = 2
CONFIG BKR_JOB_NAME = INCREM01
CONFIG BKR_JOB_INSTANCE = $$INST$$
CONFIG BKR_JOB_OWNER = BKRADMIN
CONFIG BKR_JOB_MASTER = BKRBKUP
CONFIG BKR_JOB_TOKEN = 20090303
CONFIG BKR_JOB_CMS_FILEMASK = * * *
CONFIG BKR_JOB_SFS_PATHMASK = *
CONFIG BKR_JOB_BACKUP_RESERVED_AS_IMAGE = NO
CONFIG BKR_JOB_SUPPRESS_IMAGE = YES
CONFIG BKR_JOB_CATALOG = Y
1= Help 2= Add line 3= Quit 4= Tab 5= Clocate 6= ?/Change
7= Backward 8= Forward 9= Receive 10= Rgtleft 11= Spltjoin 12= Cursor
====> _
X E D I T 1 File
MA b 31/007
Connected to remote server/host 9.39.68.141 using port 23


Session B - TSTADMN1 - [32 x 80]
File Edit View Communication Actions Window Help
0051 PEEK A0 V 80 Trunc=80 Size=163 Line=76 Col=1 Alt=0
File INCREM00 JOB from BKRBKUP at DEM1ZVM Format is NETDATA.
JOB HEADER
DUMPCKD $ALLOC$ 0A02 $$DRIVER$$
DUMPCKD $DIRECT$ 0A04 $$DRIVER$$
DUMPCKD AMVADMIN 0191 $$DRIVER$$
DUMPEDF AMVWRK01 0191 $$FMASK$$ $$DRIVER$$
DUMPCKD AMVWRK03 0191 $$DRIVER$$
DUMPEDF ARCHLOGS 0191 $$FMASK$$ $$DRIVER$$
DUMPEDF AUTOLOG1 0191 $$FMASK$$ $$DRIVER$$
DUMPEDF AVSVM 0191 $$FMASK$$ $$DRIVER$$
DUMPEDF BKRBKUP 0191 $$FMASK$$ $$DRIVER$$
DUMPEDF BKRCATLG 0191 $$FMASK$$ $$DRIVER$$
DUMPEDF BKRWRK02 0191 $$FMASK$$ $$DRIVER$$
DUMPCKD BKRWRK04 0191 $$DRIVER$$
DUMPEDF BLDNUC 0191 $$FMASK$$ $$DRIVER$$
DUMPEDF BLDSEG 0191 $$FMASK$$ $$DRIVER$$
DUMPEDF CFCONSOL 0191 $$FMASK$$ $$DRIVER$$
DUMPEDF CNTRLCON 0191 $$FMASK$$ $$DRIVER$$
DUMPEDF DATAMOVE 01AA $$FMASK$$ $$DRIVER$$
DUMPEDF DATAMOVE 02AA $$FMASK$$ $$DRIVER$$
DUMPEDF DIRMAINT 01AA $$FMASK$$ $$DRIVER$$
DUMPCKD DIRMAINT 01DE $$DRIVER$$
DUMPEDF DIRMAINT 0155 $$FMASK$$ $$DRIVER$$
DUMPEDF DIRMAINT 01DB $$FMASK$$ $$DRIVER$$
DUMPEDF DIRMAINT 02DB $$FMASK$$ $$DRIVER$$
DUMPEDF DIRMSAT 0155 $$FMASK$$ $$DRIVER$$
1= Help 2= Add line 3= Quit 4= Tab 5= Clocate 6= ?/Change
7= Backward 8= Forward 9= Receive 10= Rgtleft 11= Spltjoin 12= Cursor
====>
XEDIT 1 File
MA b 31/007
Connected to remote server/host 9.39.68.141 using port 23


Session B - TSTADMN1 - [32 x 80]
File Edit View Communication Actions Window Help
0051 PEEK A0 V 80 Trunc=80 Size=163 Line=139 Col=1 Alt=0
File INCREM00 JOB from BKRBKUP at DEM1ZVM Format is NETDATA.
DUMPCKD TMTMM 0210 $$DRIVER$$
DUMPEDF TSTADMN1 0191 $$FMASK$$ $$DRIVER$$
DUMPEDF TSTADMN3 0191 $$FMASK$$ $$DRIVER$$
DUMPEDF TSTUSER1 0191 $$FMASK$$ $$DRIVER$$
DUMPEDF TSTUSER3 0191 $$FMASK$$ $$DRIVER$$
DUMPEDF VMKERB 0191 $$FMASK$$ $$DRIVER$$
DUMPEDF VMRMADMN 0191 $$FMASK$$ $$DRIVER$$
DUMPEDF X25IPI 0191 $$FMASK$$ $$DRIVER$$
DUMPEDF 4OSASF40 02B2 $$FMASK$$ $$DRIVER$$
DUMPEDF 4OSASF40 02A6 $$FMASK$$ $$DRIVER$$
DUMPEDF 4OSASF40 0100 $$FMASK$$ $$DRIVER$$
CONSOLE *** Could not LINK DATAMOVE 05F0 during INCLUDE/EXCLUDE; skipped.
JOB_TRAILER
* Retain catalog content for 30 days from date of job completion...
CONFIG BKR_CATALOG_RETENTION = 30
CP_COMMAND QUERY TIME
CONSOLE *
CONSOLE * INCREM01 INCREMENTAL BACKUP GENERATED 06/18/2007
CONSOLE * JOB IMAGE GENERATED 03/03/09 14:48:58
CONSOLE *
CP_QUIET SPOOL CONSOLE CLOSE NAME INCREM01 20090303
CP_QUIET SPOOL CONSOLE NAME WORKER OUTPUT
EOJ
7= Backward 8= Forward 9= Receive 10= Rgtleft 11= Spltjoin 12= Cursor
====>
X E D I T 1 File
31/007
Connected to remote server/host 9.39.68.141 using port 23


Session B - TSTADMN1 - [32 x 80]
File Edit View Communication Actions Window Help
Ready; T=0.02/0.02 15:13:28
smsg bkrbkup submit increm01
Ready; T=0.01/0.01 15:13:36
BKRBAK8532I Processing SUBMIT INCREM01 command for TSTADMN1 at 03/03/09 15:13:
36.
RDR FILE 0053 SENT FROM BKRBKUP PUN WAS 0011 RECS 0006 CPY 001 A NOHOLD NOKEEP
File INCREM01 LINKFAIL D1 sent to BKRADMIN at DEM1ZVM on 03/03/09 15:13:36
File INCREM01 LINKFAIL D1 sent to TSTADMN1 at DEM1ZVM on 03/03/09 15:13:37
BKRMAK9102W 2 minidisks were selected by INCLUDE/EXCLUDE processing but could
not be CP LINKed.
BKRMAK8559I INCLUDE / EXCLUDE processing for job INCREM01 selected 149 objects
BKRMAK8559I for backup processing.
BKRMAK8563I Worker count for job INCREM01 has been set to 2.
BKRMAK8570I Instance number 00000055 has been assigned for job INCREM01.
BKRMAK8568I CMS files will be filtered against file mask "* * *".
BKRMAK8566I SFS filespaces will be filtered with path mask "*".
BKRMAK8584I Sending INCREM00 JOB D to worker task BKRWRK01.
File INCREM00 JOB D1 sent to BKRWRK01 at DEM1ZVM on 03/03/09 15:13:37
BKRMAK8584I Sending INCREM01 JOB D to worker task BKRWRK02.
File INCREM01 JOB D1 sent to BKRWRK02 at DEM1ZVM on 03/03/09 15:13:37
Return code "0" from command SUBMIT INCREM01 at 03/03/09 15:13:37.
RUNNING DEM1ZVM
MA b 31/001
Connected to remote server/host 9.39.68.141 using port 23


Session B - TSTADMN1 - [32 x 80]
File Edit View Communication Actions Window Help
15:13:54 BKRWRK02 ----------
15:13:54 BKRWRK02 ----------
15:13:54 BKRWRK02 BKRRVB9014I Job completed at 15:13:55 on 03/03/09.
15:13:54 BKRWRK02 BKRRVB9005I Executing CP command "QUERY TIME"
15:13:54 BKRWRK02 TIME IS 15:13:55 CST TUESDAY 03/03/09
15:13:54 BKRWRK02 CONNECT= 00:00:17 VIRTCPU= 000:00.42 TOTCPU= 000:00.56
15:13:54 BKRWRK02 *
15:13:54 BKRWRK02 * INCREM01 INCREMENTAL BACKUP GENERATED 06/18/2007
15:13:54 BKRWRK02 * JOB IMAGE GENERATED 03/03/09 15:13:37
15:13:54 BKRCATLG RDR FILE 0134 SENT FROM BKRWRK01 PUN WAS 0066 RECS 0013 CPY
15:13:54 BKRWRK02 *
15:13:54 BKRWRK02 BKRRVB9005I Executing CP command "SPOOL CONSOLE CLOSE NAME IN
15:13:54 BKRWRK02 BKRRVB9006I CP return code 0
15:13:54 BKRWRK02 BKRRVB9005I Executing CP command "SPOOL CONSOLE NAME WORKER O
15:13:54 BKRWRK02 BKRRVB9006I CP return code 0
15:13:54 BKRWRK02 ***
15:13:54 BKRWRK02 *** End-of-Job Summary:
15:13:54 BKRWRK02 ***
15:13:54 BKRWRK02 *** Start time: 03/03/09 15:13:41
15:13:54 BKRWRK02 *** Ended time: 03/03/09 15:13:55
15:13:54 BKRWRK02 ***
15:13:54 BKRWRK02 *** DUMPCKD tasks, Max RC: 0, 0
15:13:54 BKRWRK02 *** DUMPFBA tasks, Max RC: 0, 0
15:13:54 BKRWRK02 *** DUMPEDF tasks, Max RC: 67, 4
15:13:54 BKRWRK02 *** DUMPSFS tasks, Max RC: 0, 0
15:13:54 BKRWRK02 *** RESTORE tasks, Max RC: 0, 0
15:13:54 BKRWRK02 ***
15:13:54 BKRCATLG 0000001 FILE PURGED
BACKUP
MA b
31/001
Connected to remote server/host 9.39.68.141 using port 23

Scenario B: Restoring Files from Backup

- Full and incremental backups performed previously
- User accidentally erases or corrupts a file
- User restores the file from backup
  - Full screen interface to see all files available in backup
    - Including multiple “versions” of the same file
  - Filters and sorting available to easily find the needed file
  - Request restore directly to disk or to reader
- No administrator intervention required

© 2013, 2015 IBM Corporation

Scenario B: Detailed Steps

- From a z/VM user ID, view all catalog data you own

```
bkrlist
```

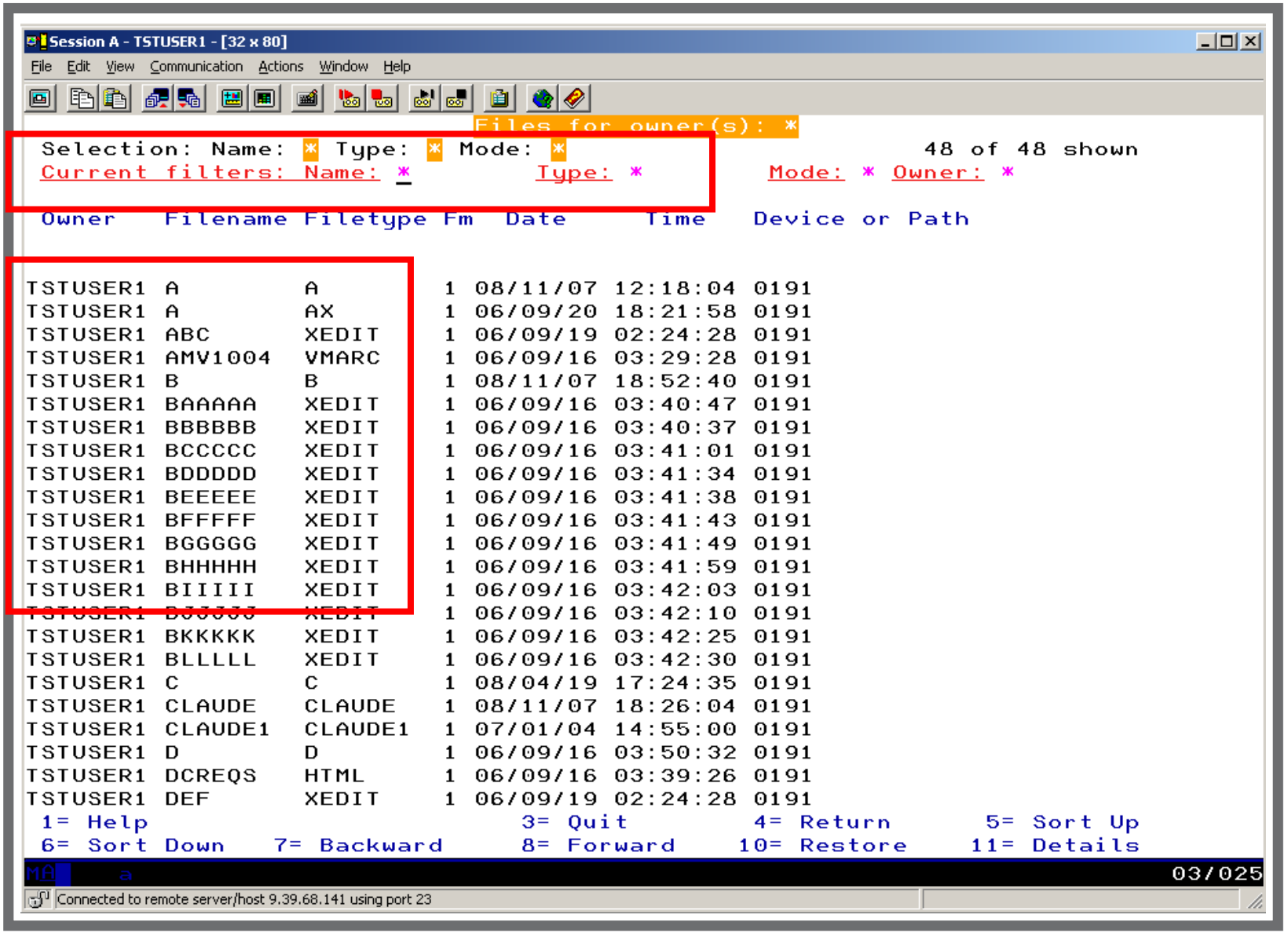
- Use the filters to find the file you want to restore
- Put the cursor on the file and hit F10
- Specify the user ID to whom the file should be sent and hit F10
- Look at the reader of that user ID to see the restored file and a copy of the console during the restore processing

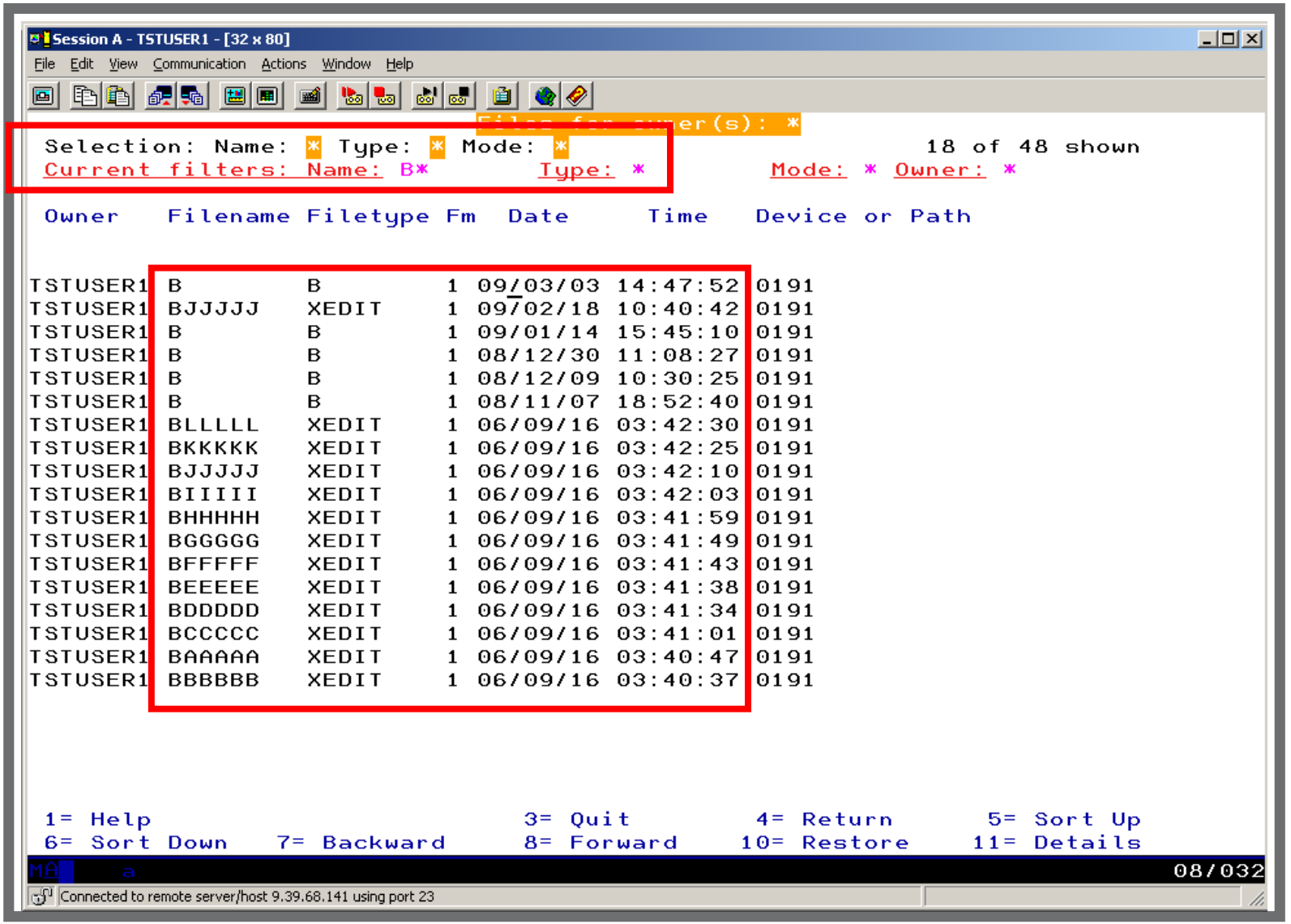
```
rdrlist
```

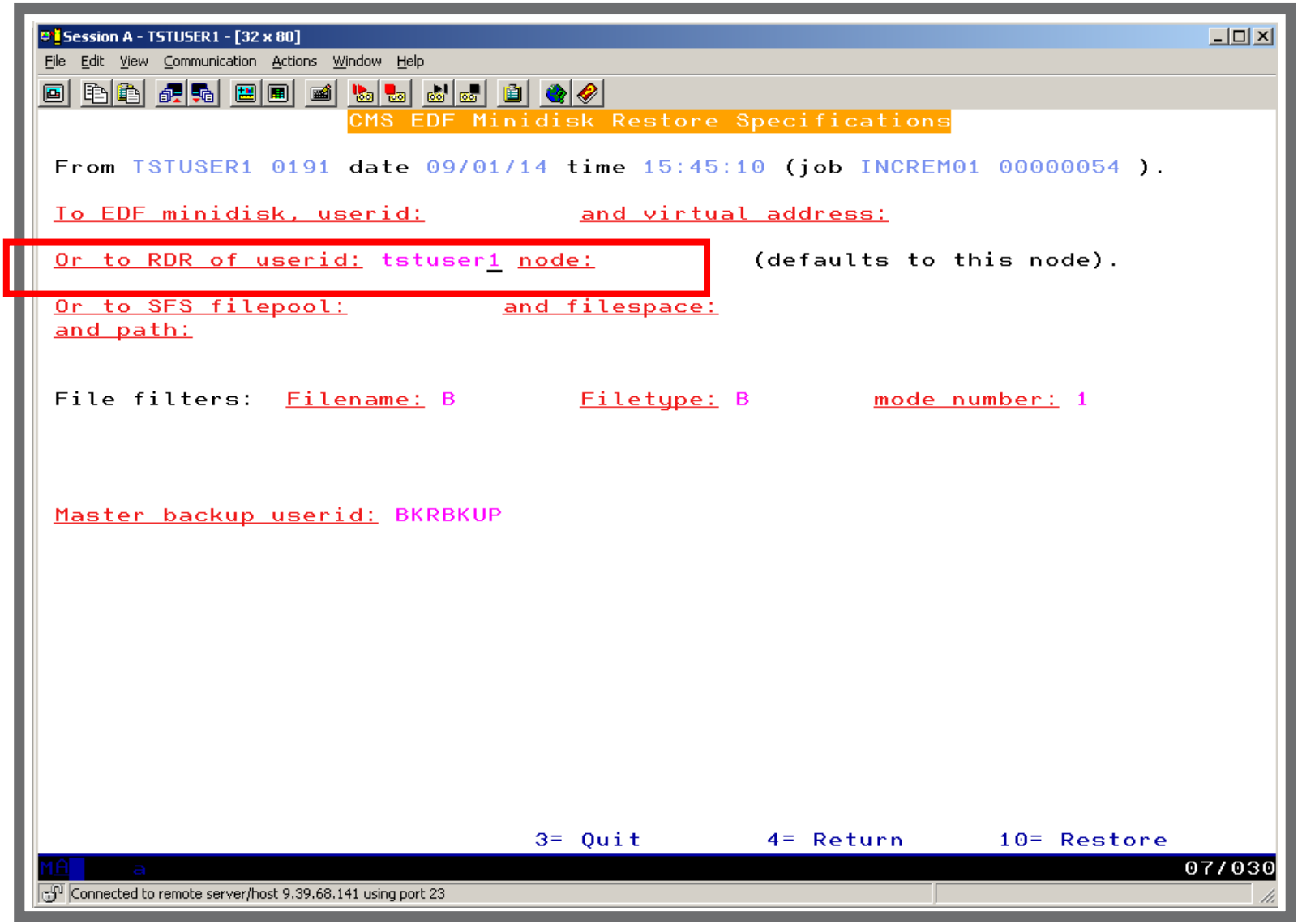
- View the contents of the file to verify it's the correct version

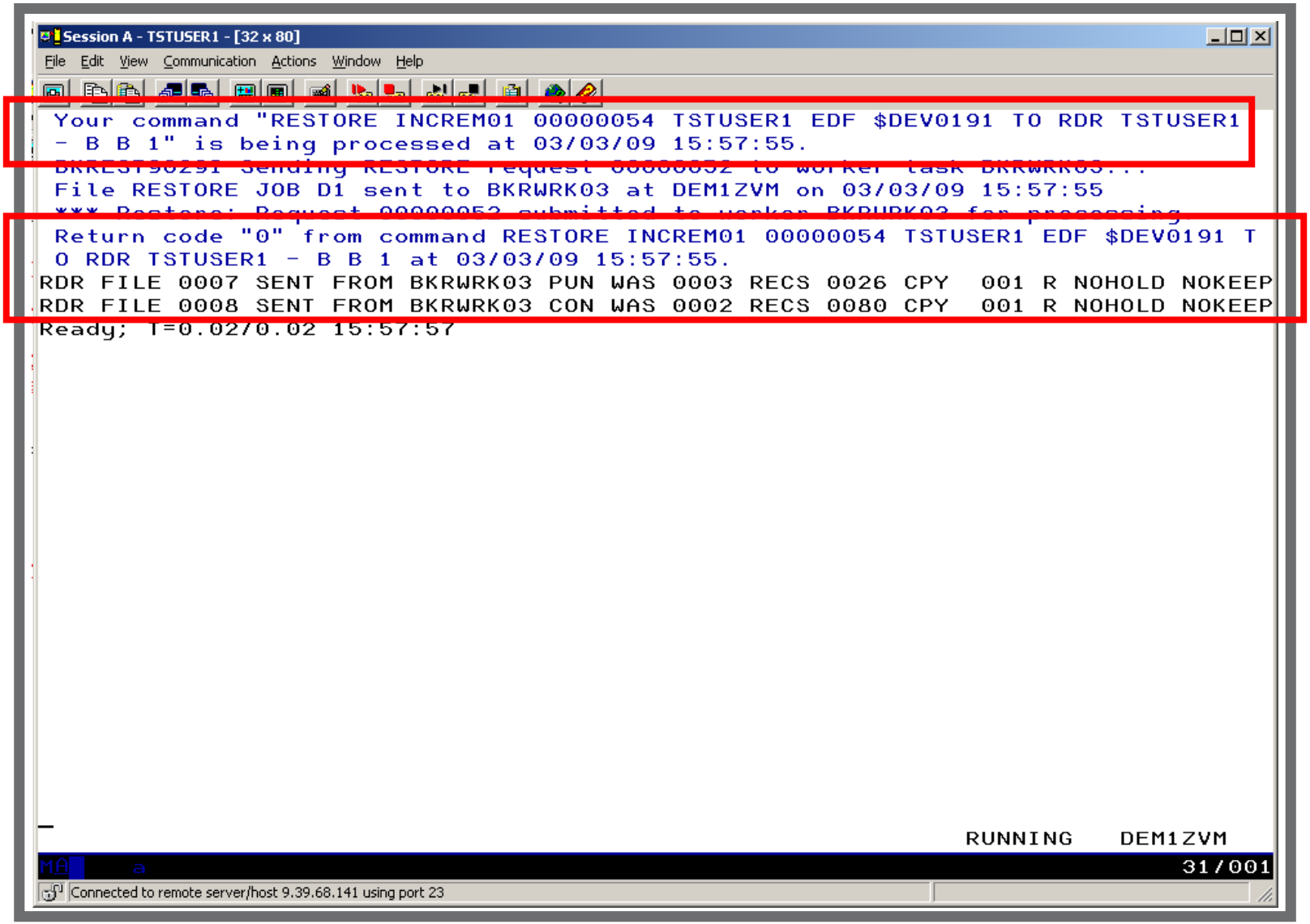
```
peek
```

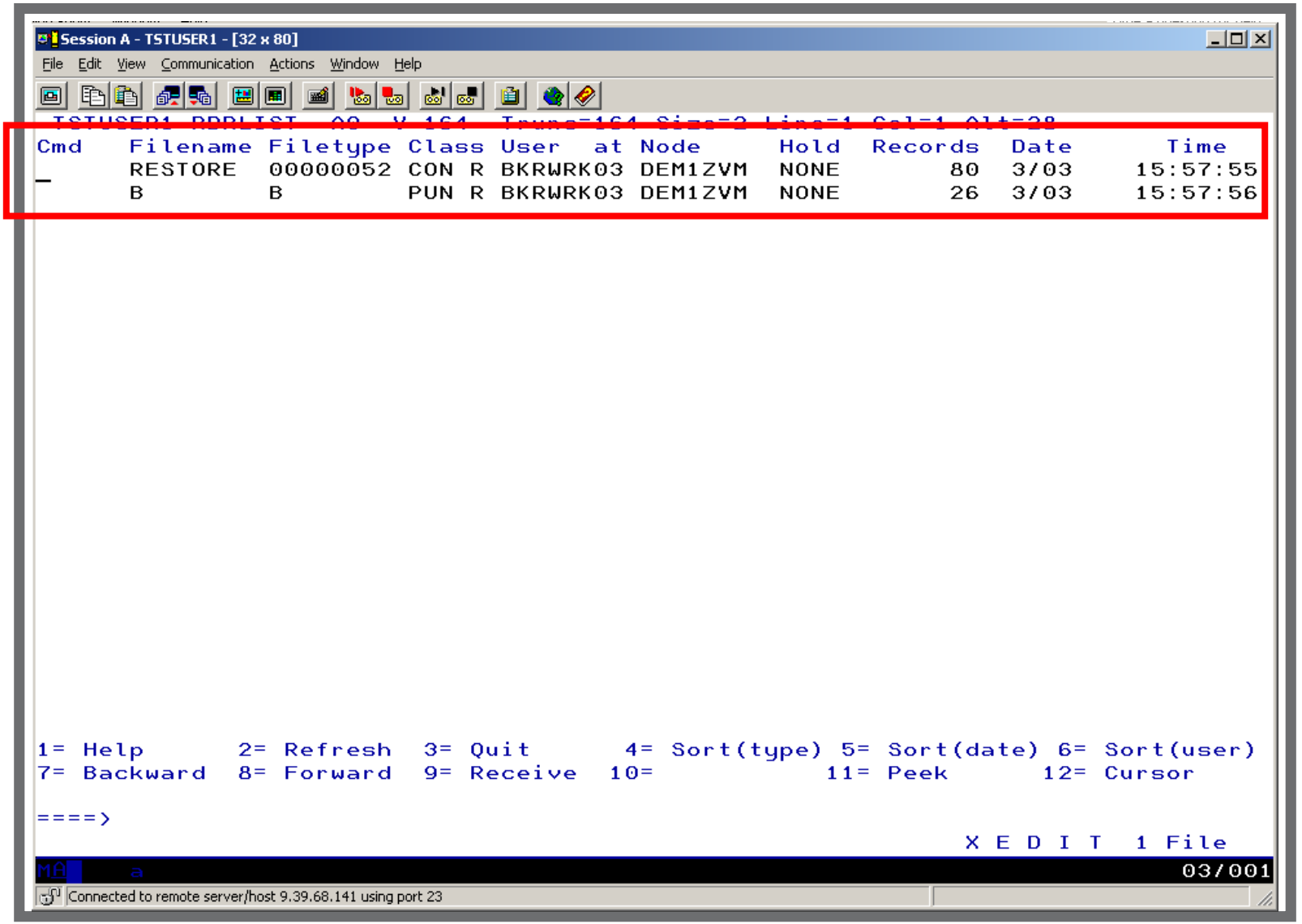
© 2013, 2015 IBM Corporation

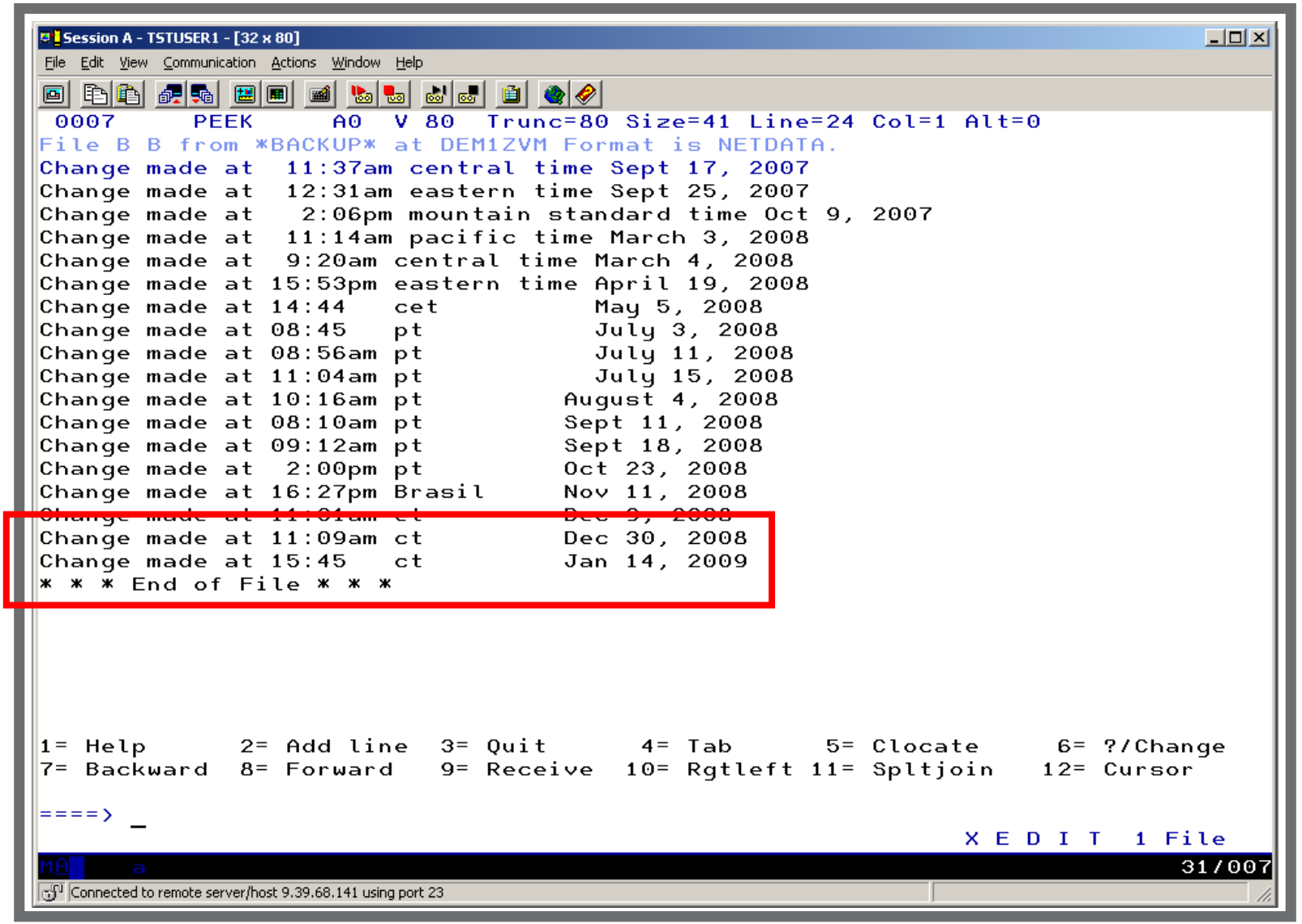

Session A - TSTUSER1 - [32 x 80]
File Edit View Communication Actions Window Help
Files for owner(s): *
Selection: Name: * Type: * Mode: * 48 of 48 shown
Current filters: Name: * Type: * Mode: * Owner: *
Owner Filename Filetype Fm Date Time Device or Path
TSTUSER1 A A 1 08/11/07 12:18:04 0191
TSTUSER1 A AX 1 06/09/20 18:21:58 0191
TSTUSER1 ABC XEDIT 1 06/09/19 02:24:28 0191
TSTUSER1 AMV1004 VMARC 1 06/09/16 03:29:28 0191
TSTUSER1 B B 1 08/11/07 18:52:40 0191
TSTUSER1 BAAAAA XEDIT 1 06/09/16 03:40:47 0191
TSTUSER1 BBBBBB XEDIT 1 06/09/16 03:40:37 0191
TSTUSER1 BCCCCC XEDIT 1 06/09/16 03:41:01 0191
TSTUSER1 BDDDDD XEDIT 1 06/09/16 03:41:34 0191
TSTUSER1 BEEEEE XEDIT 1 06/09/16 03:41:38 0191
TSTUSER1 BFFFFF XEDIT 1 06/09/16 03:41:43 0191
TSTUSER1 BGGGGG XEDIT 1 06/09/16 03:41:49 0191
TSTUSER1 BHHHHH XEDIT 1 06/09/16 03:41:59 0191
TSTUSER1 BIIIII XEDIT 1 06/09/16 03:42:03 0191
TSTUSER1 BJJJJJ XEDIT 1 06/09/16 03:42:10 0191
TSTUSER1 BKKKKK XEDIT 1 06/09/16 03:42:25 0191
TSTUSER1 BLLLLL XEDIT 1 06/09/16 03:42:30 0191
TSTUSER1 C C 1 08/04/19 17:24:35 0191
TSTUSER1 CLAUDE CLAUDE 1 08/11/07 18:26:04 0191
TSTUSER1 CLAUDE1 CLAUDE1 1 07/01/04 14:55:00 0191
TSTUSER1 D D 1 06/09/16 03:50:32 0191
TSTUSER1 DCREQS HTML 1 06/09/16 03:39:26 0191
TSTUSER1 DEF XEDIT 1 06/09/19 02:24:28 0191
1= Help 3= Quit 4= Return 5= Sort Up
6= Sort Down 7= Backward 8= Forward 10= Restore 11= Details
MA a 03/025
Connected to remote server/host 9.39.68.141 using port 23


Session A - TSTUSER1 - [32 x 80]
File Edit View Communication Actions Window Help
Files for owner(s): *
Selection: Name: * Type: * Mode: * 18 of 48 shown
Current filters: Name: B* Type: * Mode: * Owner: *
Owner Filename Filetype Fm Date Time Device or Path
TSTUSER1 B B 1 09/03/03 14:47:52 0191
TSTUSER1 BJJJJJ XEDIT 1 09/02/18 10:40:42 0191
TSTUSER1 B B 1 09/01/14 15:45:10 0191
TSTUSER1 B B 1 08/12/30 11:08:27 0191
TSTUSER1 B B 1 08/12/09 10:30:25 0191
TSTUSER1 B B 1 08/11/07 18:52:40 0191
TSTUSER1 BLLLLL XEDIT 1 06/09/16 03:42:30 0191
TSTUSER1 BKKKKK XEDIT 1 06/09/16 03:42:25 0191
TSTUSER1 BJJJJJ XEDIT 1 06/09/16 03:42:10 0191
TSTUSER1 BIIIII XEDIT 1 06/09/16 03:42:03 0191
TSTUSER1 BHHHHH XEDIT 1 06/09/16 03:41:59 0191
TSTUSER1 BGGGGG XEDIT 1 06/09/16 03:41:49 0191
TSTUSER1 BFFFFF XEDIT 1 06/09/16 03:41:43 0191
TSTUSER1 BEEEEE XEDIT 1 06/09/16 03:41:38 0191
TSTUSER1 BDDDDD XEDIT 1 06/09/16 03:41:34 0191
TSTUSER1 BCCCCC XEDIT 1 06/09/16 03:41:01 0191
TSTUSER1 BAAAAA XEDIT 1 06/09/16 03:40:47 0191
TSTUSER1 BBBBBB XEDIT 1 06/09/16 03:40:37 0191
1= Help 3= Quit 4= Return 5= Sort Up
6= Sort Down 7= Backward 8= Forward 10= Restore 11= Details
MA a 08/032
Connected to remote server/host 9.39.68.141 using port 23


Session A - TSTUSER1 - [32 x 80]
File Edit View Communication Actions Window Help
CMS EDF Minidisk Restore Specifications
From TSTUSER1 0191 date 09/01/14 time 15:45:10 (job INCREM01 00000054).
To EDF minidisk, userid:
and virtual address:
Or to RDR of userid: tstuser1 node:
(defaults to this node).
Or to SFS filepool:
and filespace:
and path:
File filters: Filename: B
Filetype: B
mode number: 1
Master backup userid: BKRBKUP
3= Quit
4= Return
10= Restore
07/030
Connected to remote server/host 9.39.68.141 using port 23


Session A - TSTUSER1 - [32 x 80]
File Edit View Communication Actions Window Help
Your command "RESTORE INCREM01 00000054 TSTUSER1 EDF $DEV0191 TO RDR TSTUSER1
- B B 1" is being processed at 03/03/09 15:57:55.
File RESTORE JOB D1 sent to BKRWRK03 at DEM1ZVM on 03/03/09 15:57:55
Return code "0" from command RESTORE INCREM01 00000054 TSTUSER1 EDF $DEV0191 T
O RDR TSTUSER1 - B B 1 at 03/03/09 15:57:55.
RDR FILE 0007 SENT FROM BKRWRK03 PUN WAS 0003 RECS 0026 CPY 001 R NOHOLD NOKEEP
RDR FILE 0008 SENT FROM BKRWRK03 CON WAS 0002 RECS 0080 CPY 001 R NOHOLD NOKEEP
Ready; T=0.02/0.02 15:57:57
RUNNING DEM1ZVM
31/001
Connected to remote server/host 9.39.68.141 using port 23


Session A - T5TUSER1 - [32 x 80]
File Edit View Communication Actions Window Help
T5TUSER1 RDRLIST 00 V 164 Trunc=164 Size=2 Line=1 Col=1 Alt=28
Cmd Filename Filetype Class User at Node Hold Records Date Time
RESTORE 00000052 CON R BKRWRK03 DEM1ZVM NONE 80 3/03 15:57:55
B B PUN R BKRWRK03 DEM1ZVM NONE 26 3/03 15:57:56
1= Help 2= Refresh 3= Quit 4= Sort(type) 5= Sort(date) 6= Sort(user)
7= Backward 8= Forward 9= Receive 10= 11= Peek 12= Cursor
====>
X E D I T 1 File
MA a 03/001
Connected to remote server/host 9.39.68.141 using port 23


Session A - TSTUSER1 - [32 x 80]
File Edit View Communication Actions Window Help
0007 PEEK A0 V 80 Trunc=80 Size=41 Line=24 Col=1 Alt=0
File B B from *BACKUP* at DEM1ZVM Format is NETDATA.
Change made at 11:37am central time Sept 17, 2007
Change made at 12:31am eastern time Sept 25, 2007
Change made at 2:06pm mountain standard time Oct 9, 2007
Change made at 11:14am pacific time March 3, 2008
Change made at 9:20am central time March 4, 2008
Change made at 15:53pm eastern time April 19, 2008
Change made at 14:44 cet May 5, 2008
Change made at 08:45 pt July 3, 2008
Change made at 08:56am pt July 11, 2008
Change made at 11:04am pt July 15, 2008
Change made at 10:16am pt August 4, 2008
Change made at 08:10am pt Sept 11, 2008
Change made at 09:12am pt Sept 18, 2008
Change made at 2:00pm pt Oct 23, 2008
Change made at 16:27pm Brasil Nov 11, 2008
Change made at 11:09am ct Dec 30, 2008
Change made at 15:45 ct Jan 14, 2009
* * * End of File * * *
1= Help 2= Add line 3= Quit 4= Tab 5= Clocate 6= ?/Change
7= Backward 8= Forward 9= Receive 10= Rgtleft 11= Spltjoin 12= Cursor
====>
X E D I T 1 File
31/007
Connected to remote server/host 9.39.68.141 using port 23

Scenario C: Back up and Restore Single and Multiconfiguration Users in SSI

- Two member SSI cluster
  - TEST7SSI, TESTCSSI
- Three backup jobs for full backups
  - USERFULL – all single configuration users across the SSI cluster
    - Always run from TEST7SSI (required (for now))
  - IDSSI7FL – all multiconfiguration (IDENTITY) users on TEST7SSI
    - Always run from TEST7SSI (required)
  - IDSSICFL - all multiconfiguration (IDENTITY) users on TESTCSSI
    - Always run from TESTCSSI (required)
- Three similar jobs for incremental
- Restore files in multiple ways
  - Single configuration users
    - Restore to disk or reader from any member of the cluster
  - Multiconfiguration users
    - Restore to disk from the local member
    - Restore CMS files to reader from any member

© 2013, 2015 IBM Corporation

Scenario C: Detailed Steps

- From a Backup Manager admin ID (DEMOADMN) on TEST7SSI, view all catalog data for multiconfiguration user OP1

```
bkruser
```

- Use the filters to find all files for OP1's 191 disk
  - Note files exist from both TEST7SSI and TESTCSSI
- F4 to return and then find all files for single configuration user DEMOADMN
  - Note files only exist in the USERxxxx jobs – not member specific
- Update a file on OP1 191 disk

```
link op1 191 333 mr
acc 333 z
x test op1 z
```

- Add a new line to the file

```
file
rel z (det
```

- Similarly update a file on DEMOADMN 191 disk

```
x test demoadmn a
```

- Perform a review of the incremental backup for multiconfiguration users on TEST7SSI

```
smsg bkrbkup review idssi7in
```

© 2013, 2015 IBM Corporation

Scenario C: Detailed Steps

- Perform a backup for multiconfiguration users on TEST7SSI

```
smsg bkrbkup submit idssi7in
```

- View the console of the worker(s) assigned

```
gomcmd opmgrm1 viewcon user(bkrwrkxx)
```

- Perform a backup for single configuration users in the TEST7SSI and TESTCSSI cluster

```
smsg bkrbkup submit userincr
```

- When jobs are complete find the updated test files for OP1 and DEMOADMN in the catalog

```
bkrlist
```

- Once a file is chosen, use F10 to restore the file to the reader
- View the files in the reader

```
rdrlist
```

- Logoff DEMOADMN (do not disconnect – must logoff)

```
logoff
```

© 2013, 2015 IBM Corporation

Scenario C: Detailed Steps

- Logon DEMOADMN on the other member of the cluster TESTCSSI
- Find the test files for DEMOADMN in the catalog

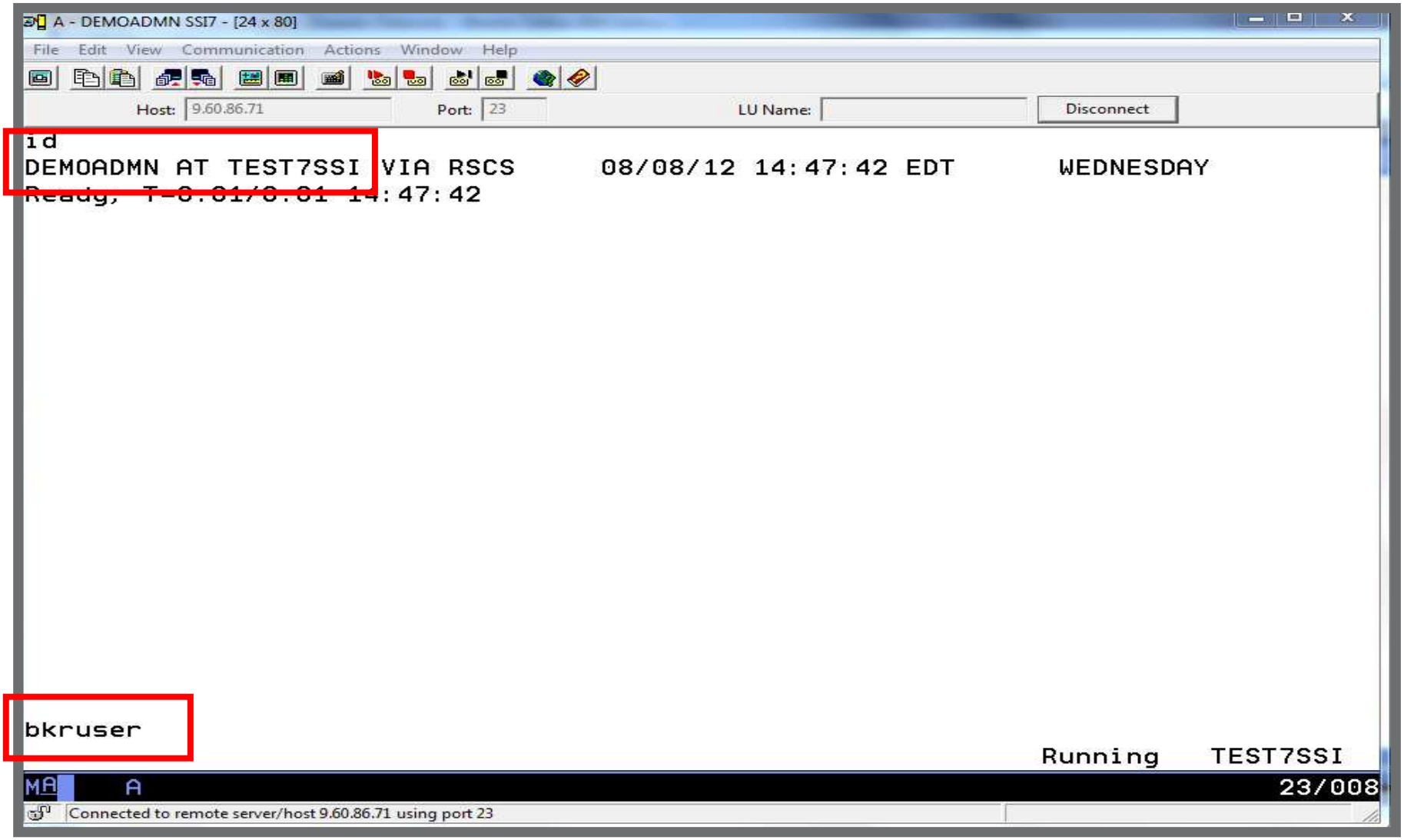
```
bkrlist
```

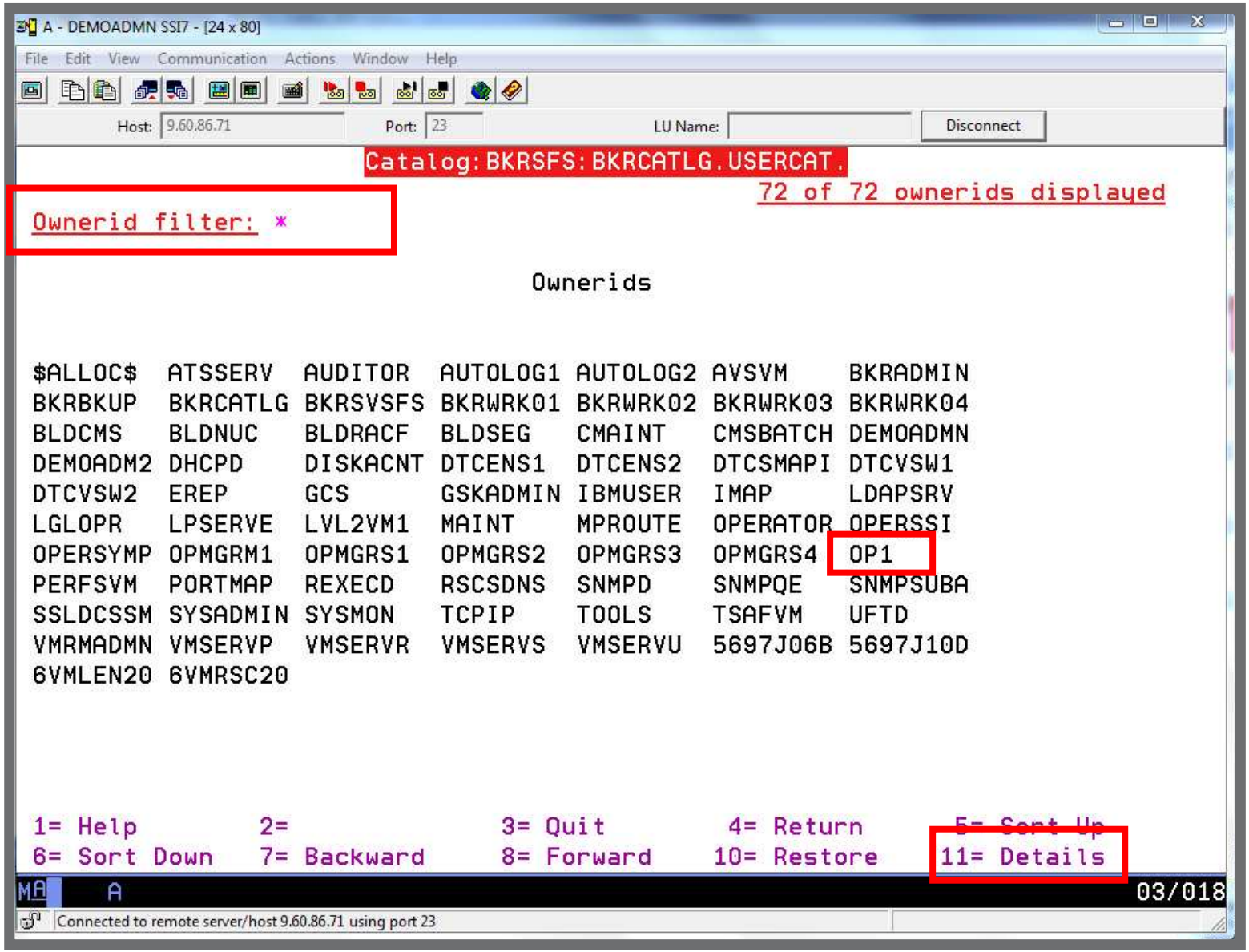
- Once a file is chosen, use F10 to restore the file to the reader
- View the files in the reader

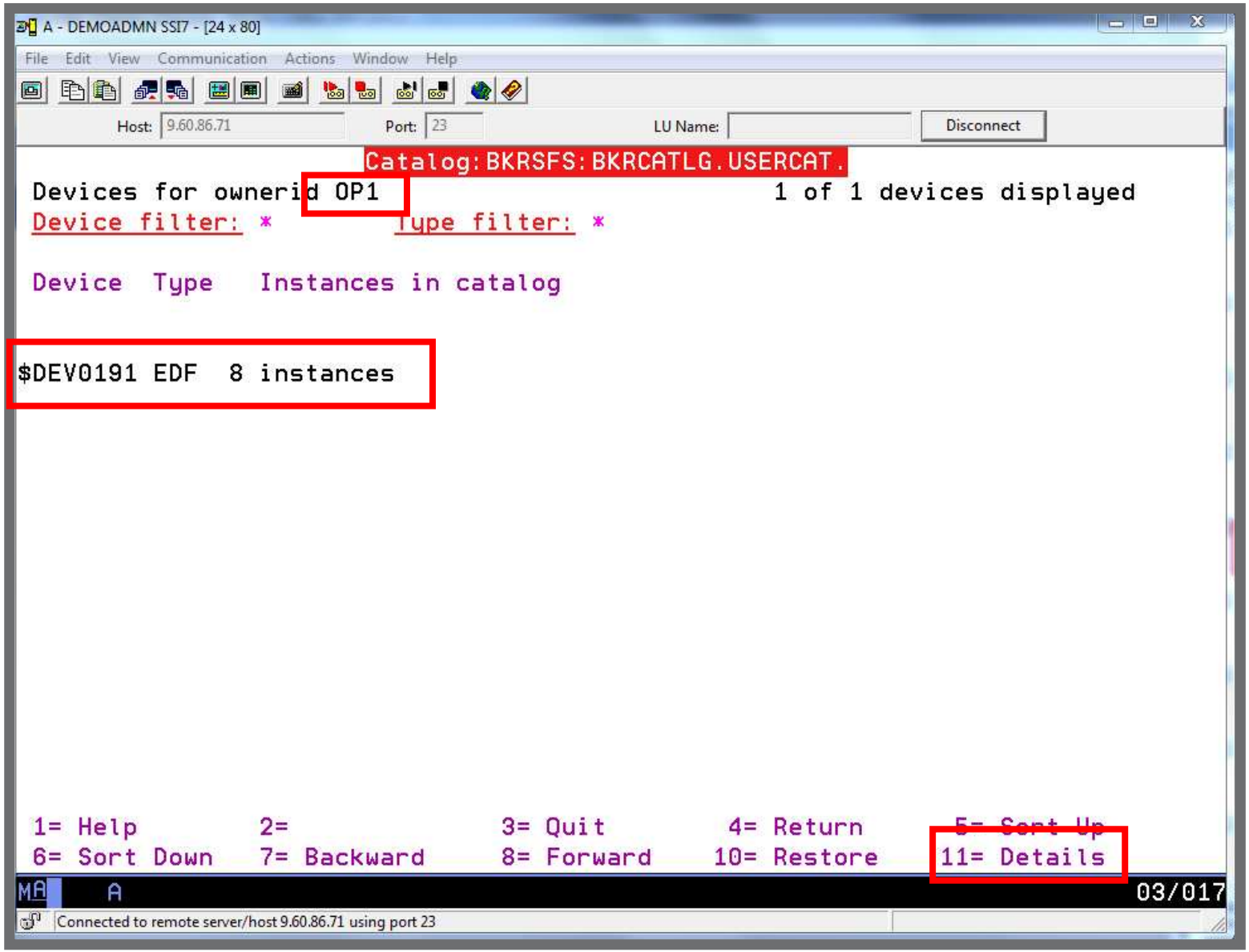
```
rdrlist
```

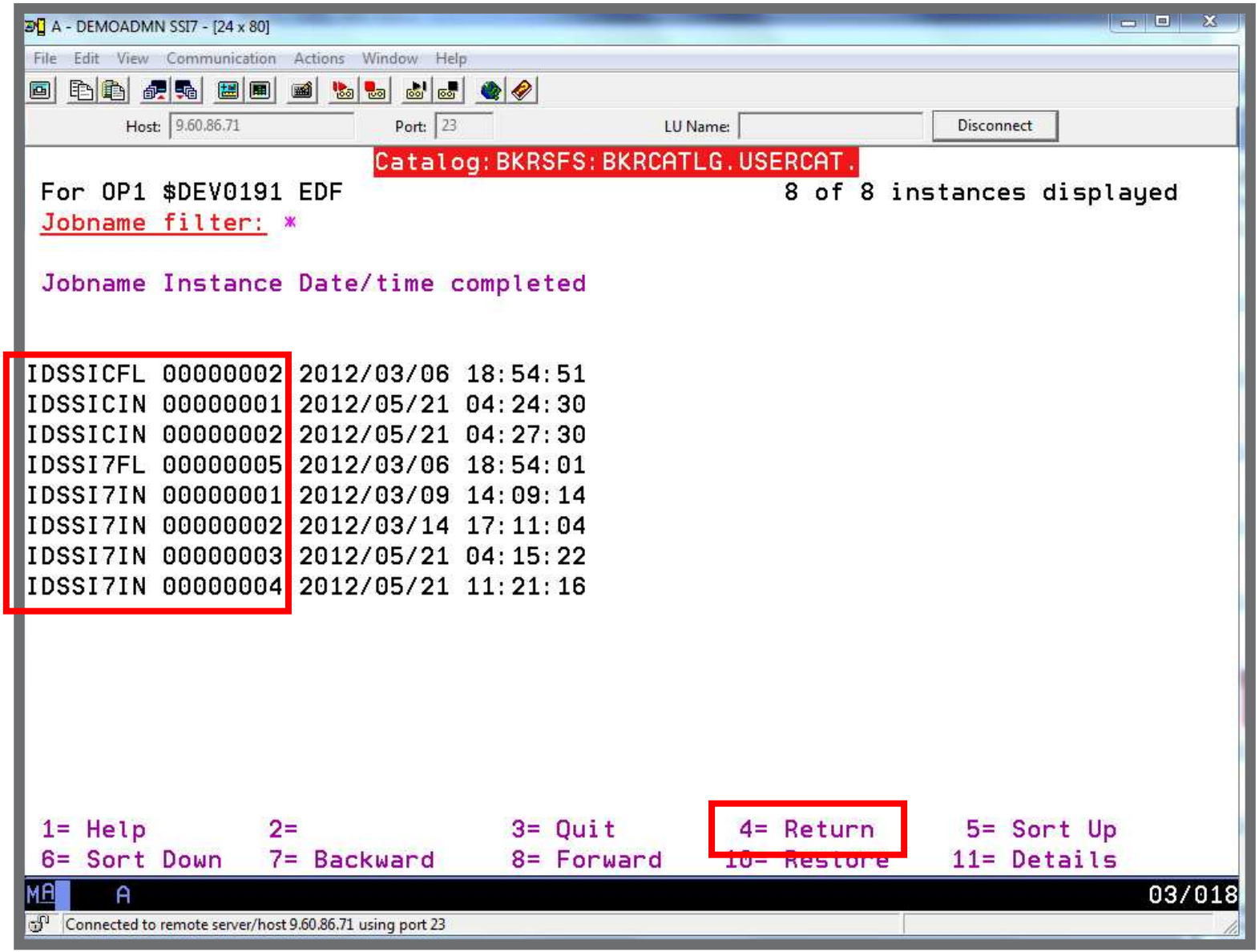
- Notice you can restore files for DEMOADMN from either member of the cluster

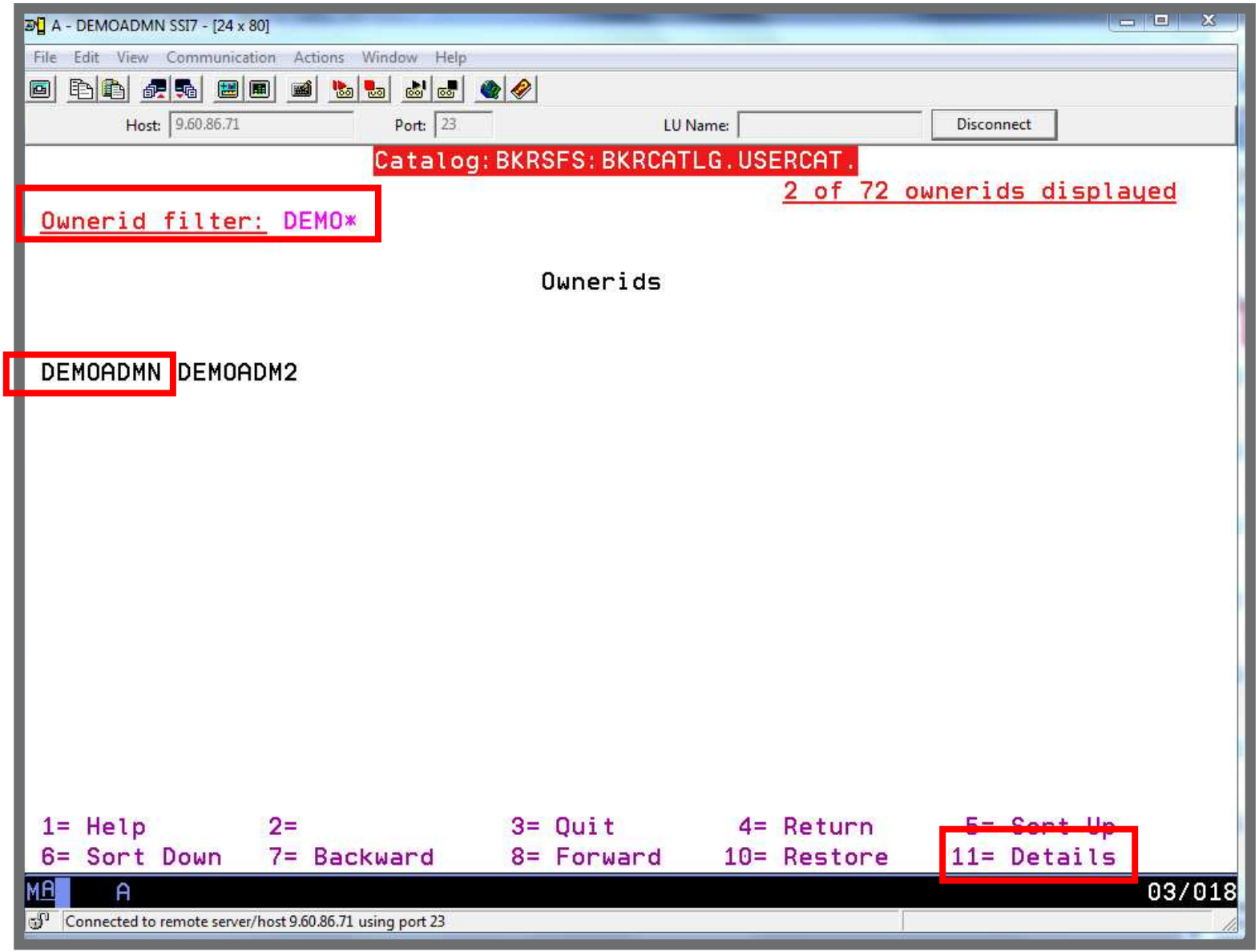
© 2013, 2015 IBM Corporation

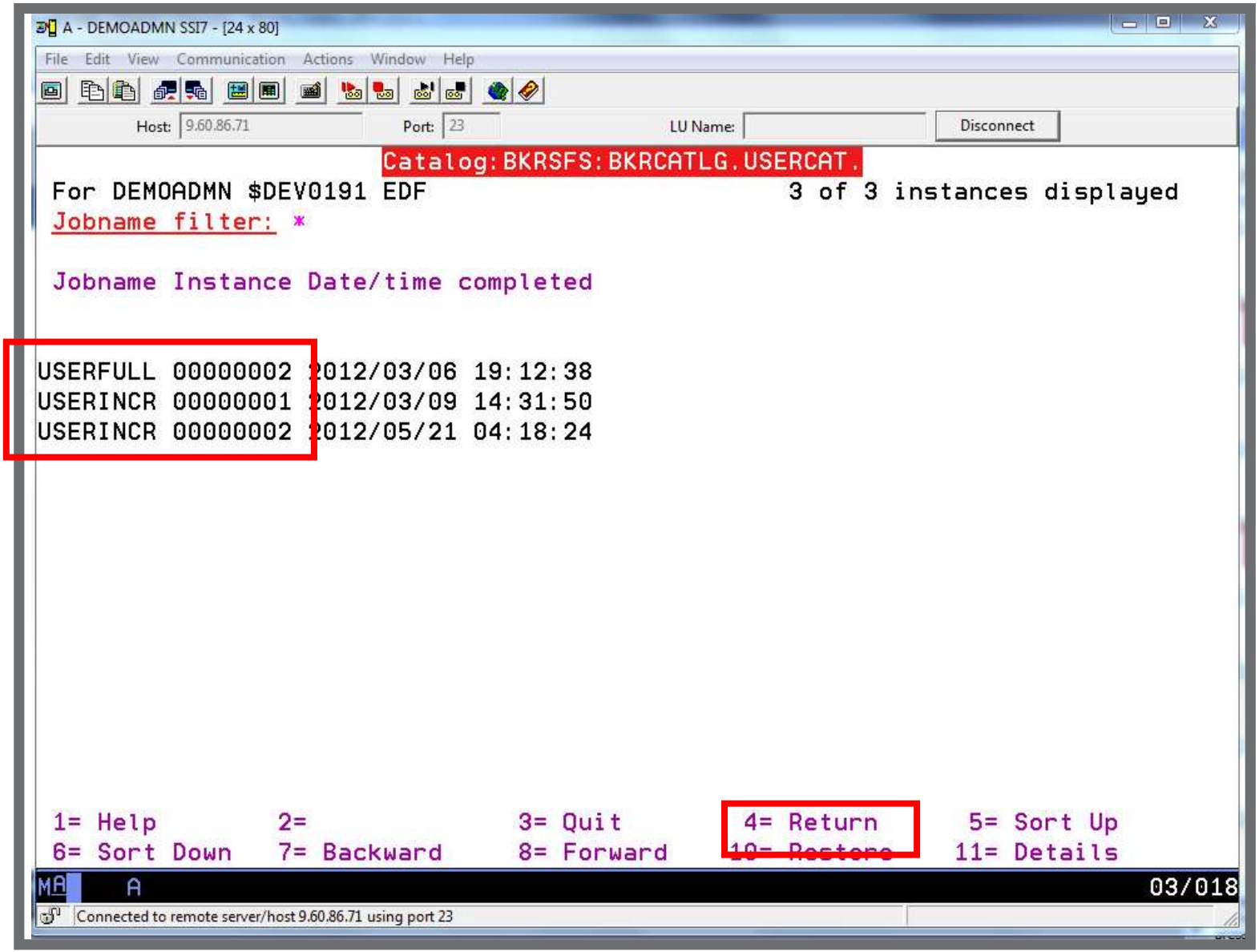

A - DEMOADMN SSI7 - [24 x 80]
File Edit View Communication Actions Window Help
Host: 9.60.86.71
Port: 23
LU Name:
Disconnect
id
DEMOADMN AT TEST7SSI VIA RSCS 08/08/12 14:47:42 EDT WEDNESDAY
Ready; T=0.01/0.01 14:47:42
bkruser
Running TEST7SSI
MA A
23/008
Connected to remote server/host 9.60.86.71 using port 23

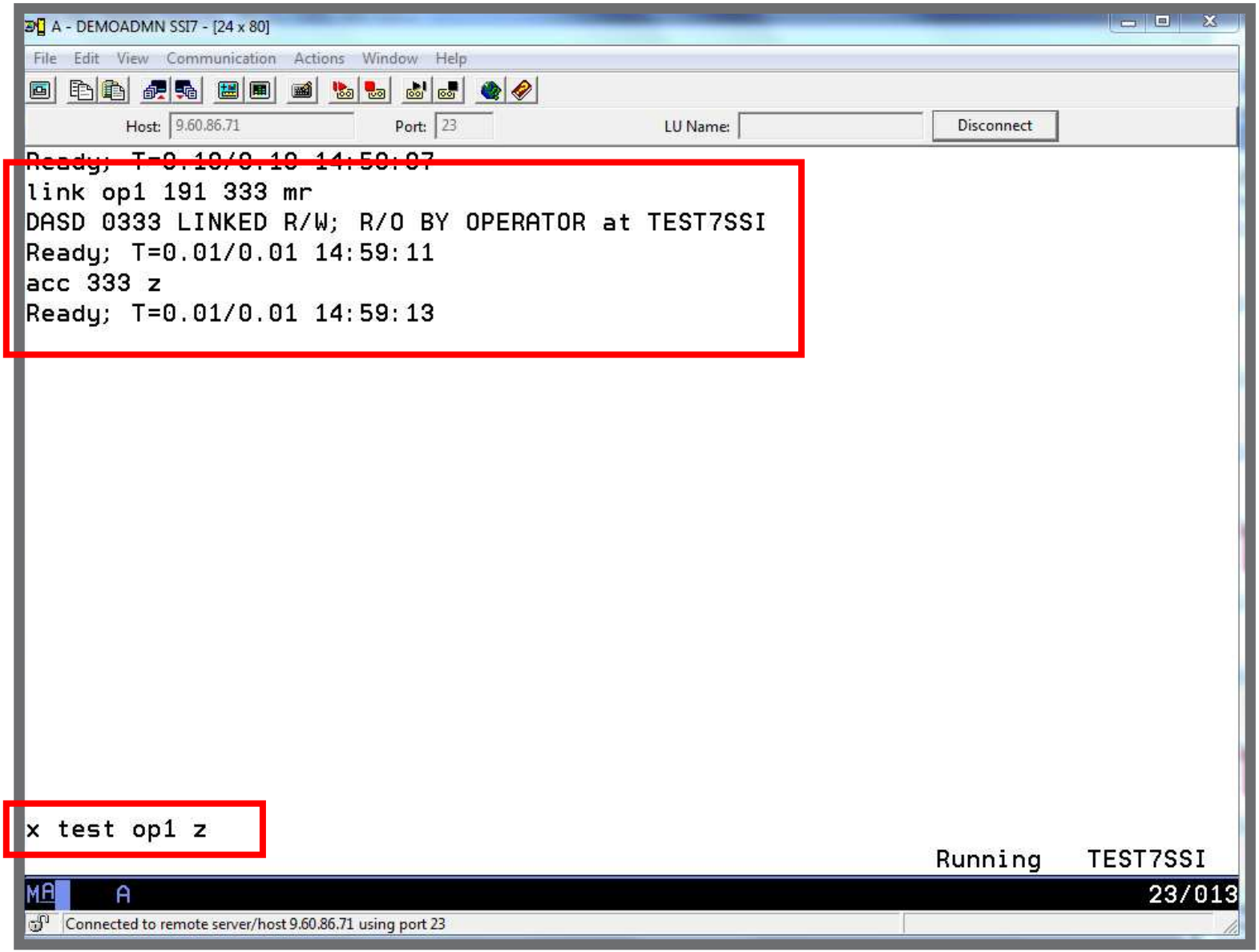

A - DEMOADMN SSI7 - [24 x 80]
File Edit View Communication Actions Window Help
Host: 9.60.86.71
Port: 23
LU Name:
Disconnect
Catalog:BKRSFS:BKRCATLG.USERCAT.
72 of 72 ownerids displayed
Ownerid filter: *
Ownerids
$ALLOC$ ATSSERV AUDITOR AUTOLOG1 AUTOLOG2 AVSVM BKRADMIN
BKRBKUP BKRCATLG BKRSVSFS BKRWRK01 BKRWRK02 BKRWRK03 BKRWRK04
BLDCMS BLDNUC BLDRACF BLDSEG CMAINT CMSBATCH DEMOADMN
DEMOADM2 DHCPD DISKACNT DTCENS1 DTCENS2 DTCSMAPI DTCVSW1
DTCVSW2 EREP GCS GSKADMIN IBMUSER IMAP LDAPSRV
LGLOPR LPSERVE LVL2VM1 MAINT MPROUTE OPERATOR OPERSSI
OPERSYMP OPMGRM1 OPMGRS1 OPMGRS2 OPMGRS3 OPMGRS4 OP1
PERFSVM PORTMAP REXECD RSCSDNS SNMPD SNMPQE SNMPSUBA
SSLDCSSM SYSADMIN SYSMON TCPIP TOOLS TSAFVM UFTD
VMRMADMN VMSERVP VMSERVR VMSERVS VMSERVU 5697J06B 5697J10D
6VMLEN20 6VMRSC20
1= Help 2= 3= Quit 4= Return 5= Sort Up
6= Sort Down 7= Backward 8= Forward 10= Restore 11= Details
MA A 03/018
Connected to remote server/host 9.60.86.71 using port 23

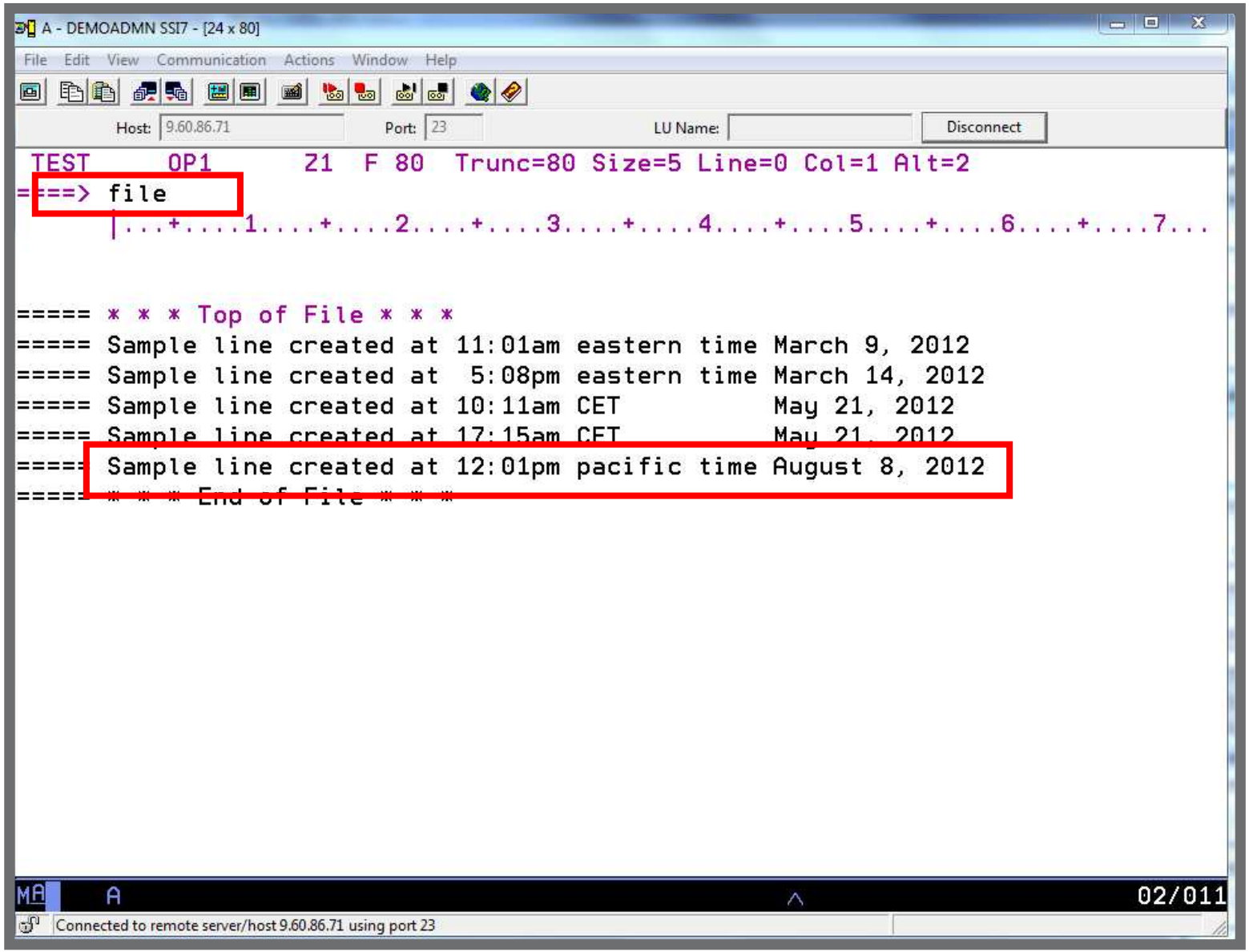

A - DEMOADMN SSI7 - [24 x 80]
File Edit View Communication Actions Window Help
Host: 9.60.86.71
Port: 23
LU Name:
Disconnect
Catalog:BKRSFS:BKRCATLG.USERCAT.
Devices for ownerid OP1
1 of 1 devices displayed
Device filter: *
Type filter: *
Device Type Instances in catalog
$DEV0191 EDF 8 instances
1= Help
2=
3= Quit
4= Return
5= Sort Up
6= Sort Down
7= Backward
8= Forward
10= Restore
11= Details
MA A
03/017
Connected to remote server/host 9.60.86.71 using port 23

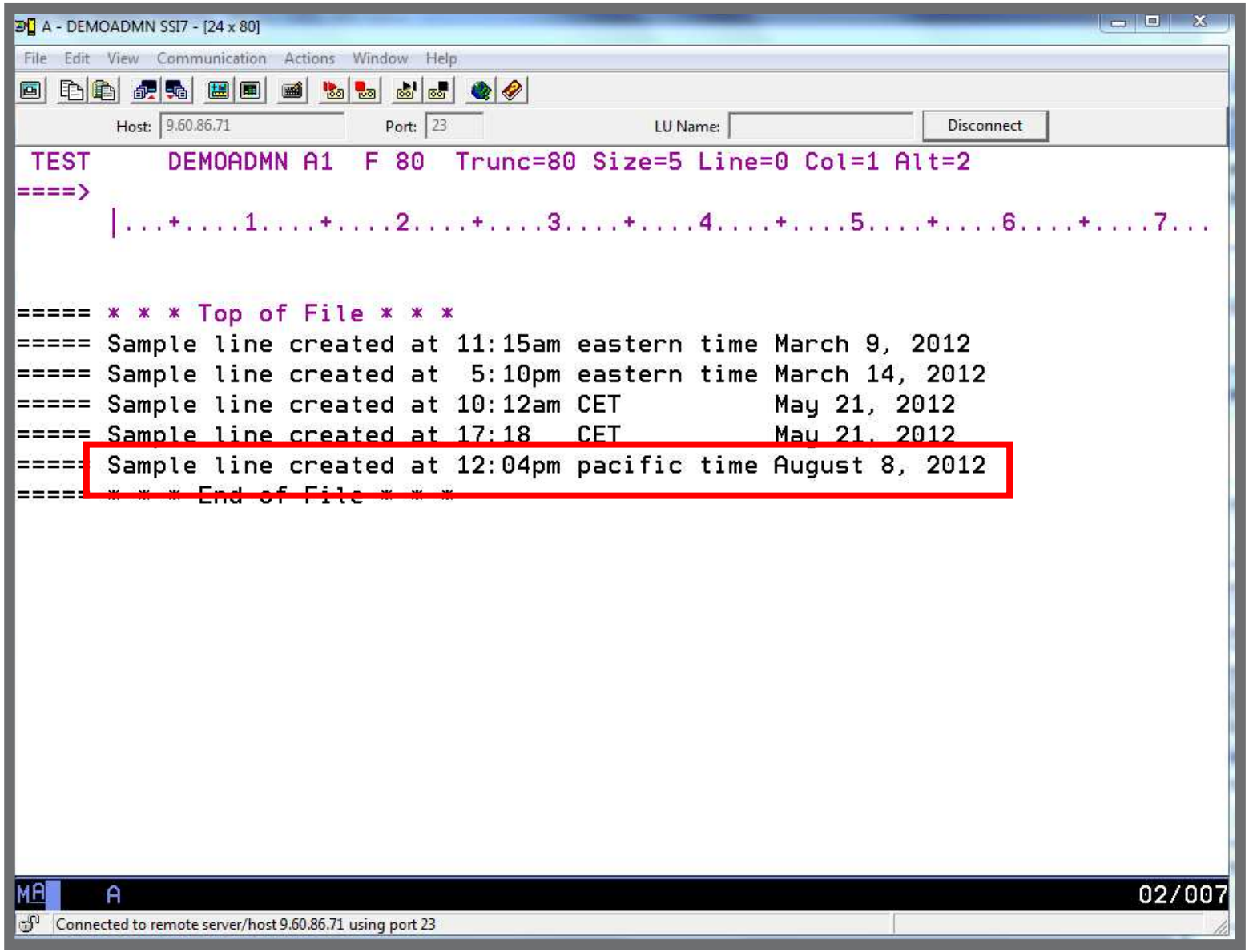

A - DEMOADMN SSI7 - [24 x 80]
File Edit View Communication Actions Window Help
Host: 9.60.86.71
Port: 23
LU Name:
Disconnect
Catalog:BKRSFS:BKRCATLG.USERCAT.
For OP1 $DEV0191 EDF
8 of 8 instances displayed
Jobname filter: *
Jobname Instance Date/time completed
IDSSICFL 00000002 2012/03/06 18:54:51
IDSSICIN 00000001 2012/05/21 04:24:30
IDSSICIN 00000002 2012/05/21 04:27:30
IDSSI7FL 00000005 2012/03/06 18:54:01
IDSSI7IN 00000001 2012/03/09 14:09:14
IDSSI7IN 00000002 2012/03/14 17:11:04
IDSSI7IN 00000003 2012/05/21 04:15:22
IDSSI7IN 00000004 2012/05/21 11:21:16
1= Help
2=
3= Quit
4= Return
5= Sort Up
6= Sort Down
7= Backward
8= Forward
10= Restore
11= Details
MA A
03/018
Connected to remote server/host 9.60.86.71 using port 23

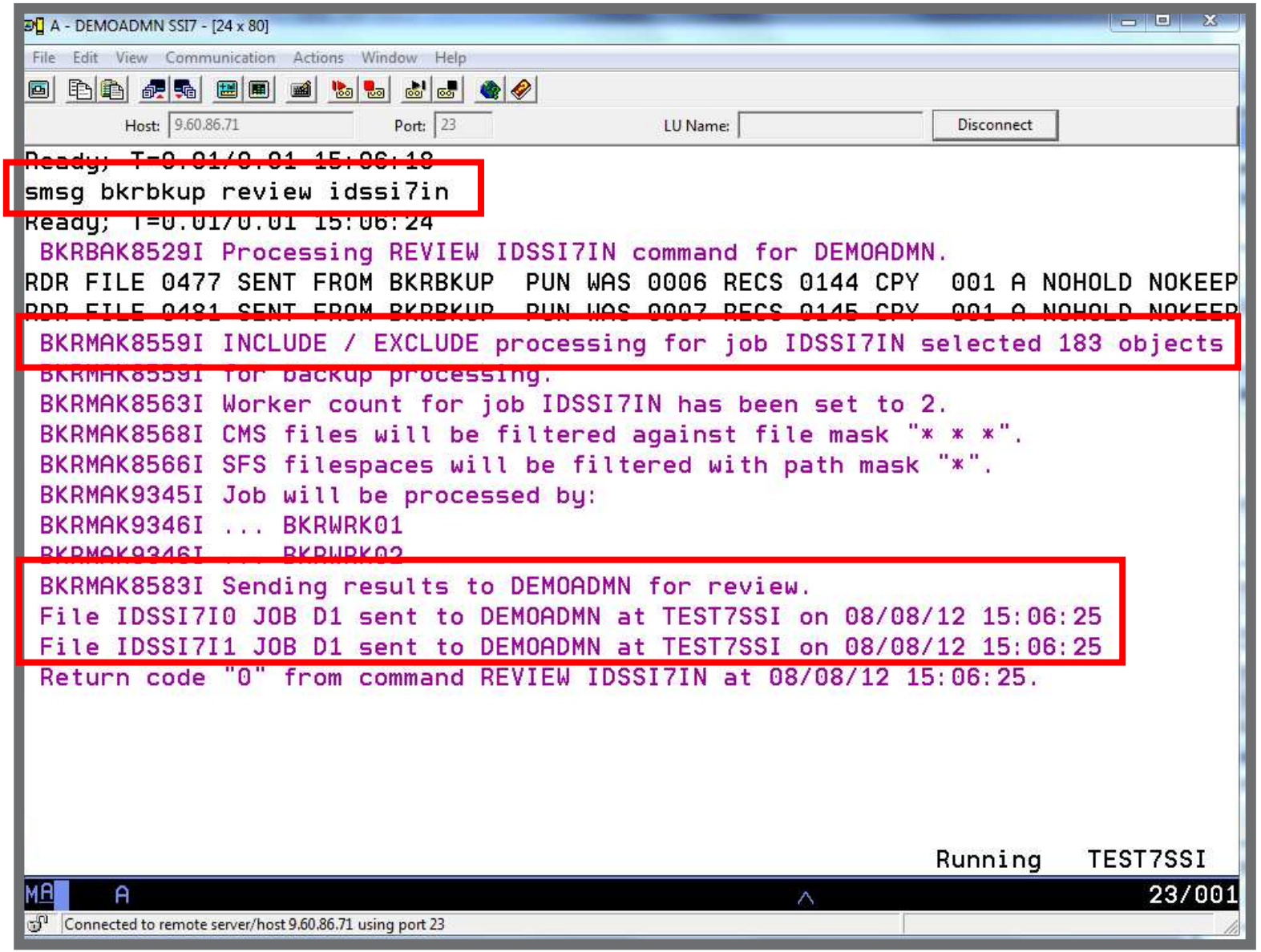

A - DEMOADMN SSI7 - [24 x 80]
File Edit View Communication Actions Window Help
Host: 9.60.86.71
Port: 23
LU Name:
Disconnect
Catalog:BKRSFS:BKRCATLG.USERCAT.
2 of 72 ownerids displayed
Ownerid filter: DEMO*
Ownerids
DEMOADMN DEMOADM2
1= Help 2= 3= Quit 4= Return 5= Sort Up
6= Sort Down 7= Backward 8= Forward 10= Restore 11= Details
MA A 03/018
Connected to remote server/host 9.60.86.71 using port 23

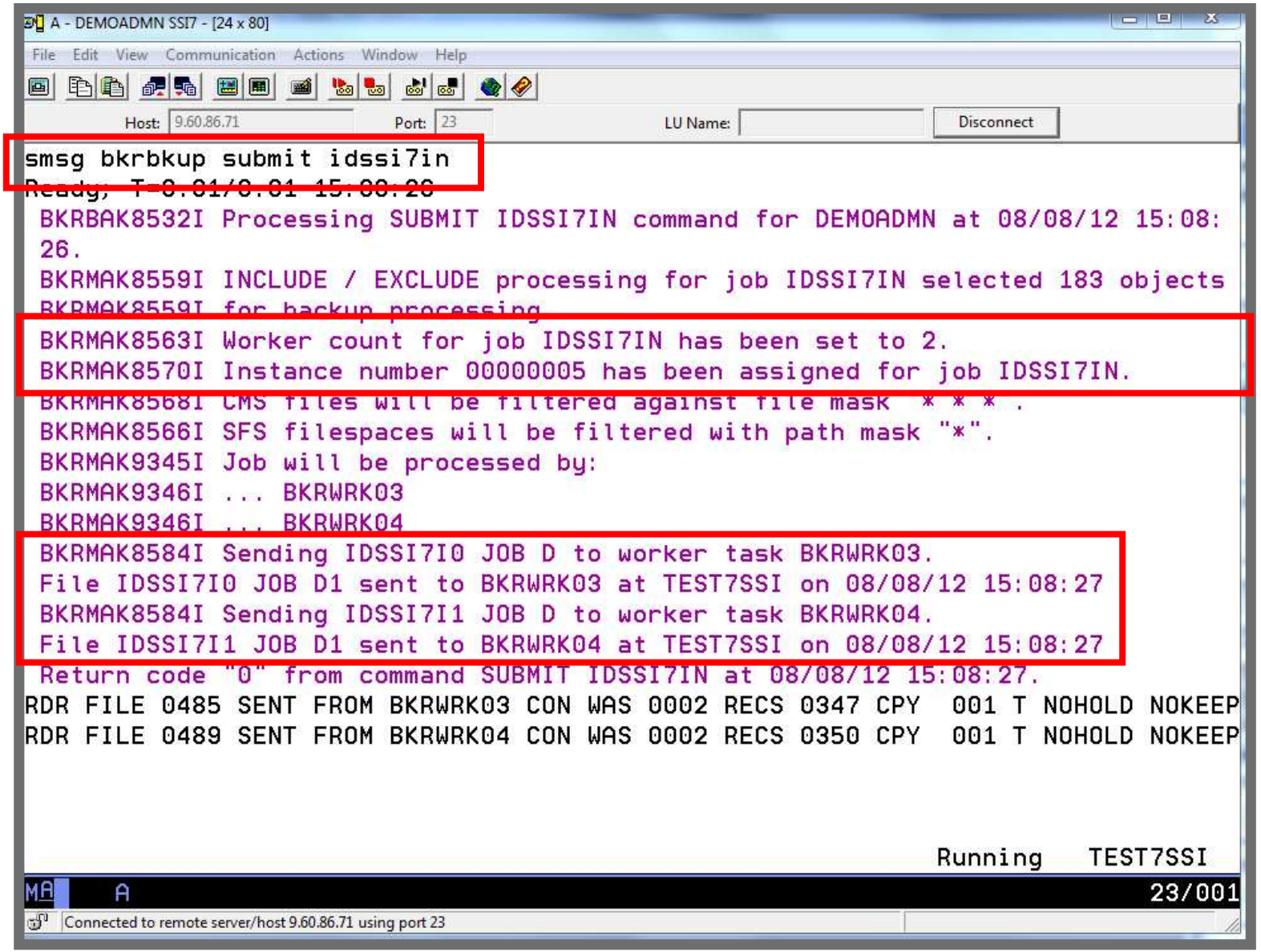

A - DEMOADMN SSI7 - [24 x 80]
File Edit View Communication Actions Window Help
Host: 9.60.86.71 Port: 23 LU Name: Disconnect
Catalog:BKRSFS:BKRCATLG.USERCAT.
For DEMOADMN $DEV0191 EDF 3 of 3 instances displayed
Jobname filter: *
Jobname Instance Date/time completed
USERFULL 00000002 2012/03/06 19:12:38
USERINCR 00000001 2012/03/09 14:31:50
USERINCR 00000002 2012/05/21 04:18:24
1= Help 2= 3= Quit 4= Return 5= Sort Up
6= Sort Down 7= Backward 8= Forward 10= Restore 11= Details
MA A 03/018
Connected to remote server/host 9.60.86.71 using port 23

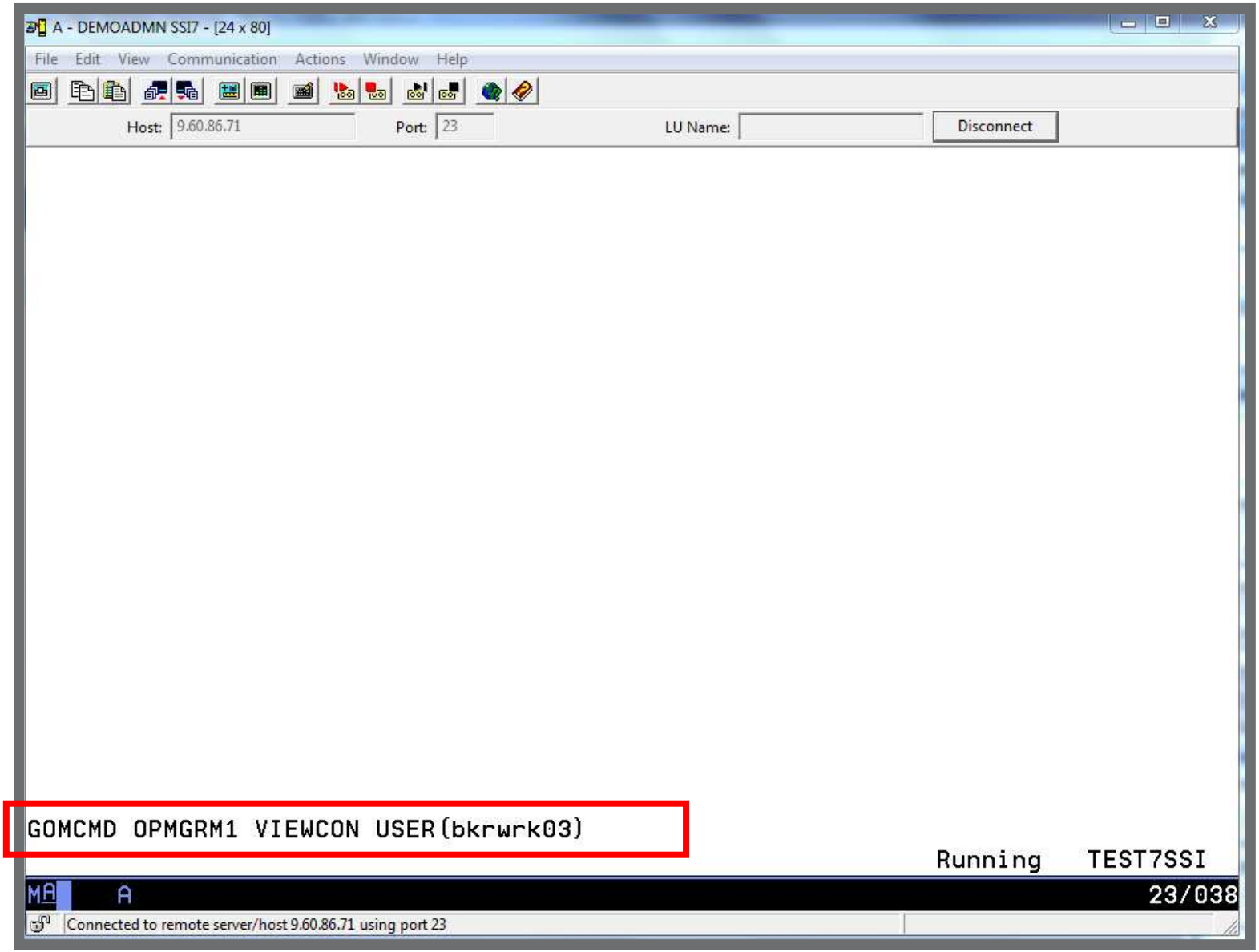

A - DEMOADMN SSI7 - [24 x 80]
File Edit View Communication Actions Window Help
Host: 9.60.86.71
Port: 23
LU Name:
Disconnect
Ready; T=0.10/0.10 14:58:07
link op1 191 333 mr
DASD 0333 LINKED R/W; R/O BY OPERATOR at TEST7SSI
Ready; T=0.01/0.01 14:59:11
acc 333 z
Ready; T=0.01/0.01 14:59:13
x test op1 z
Running TEST7SSI
MA A
23/013
Connected to remote server/host 9.60.86.71 using port 23

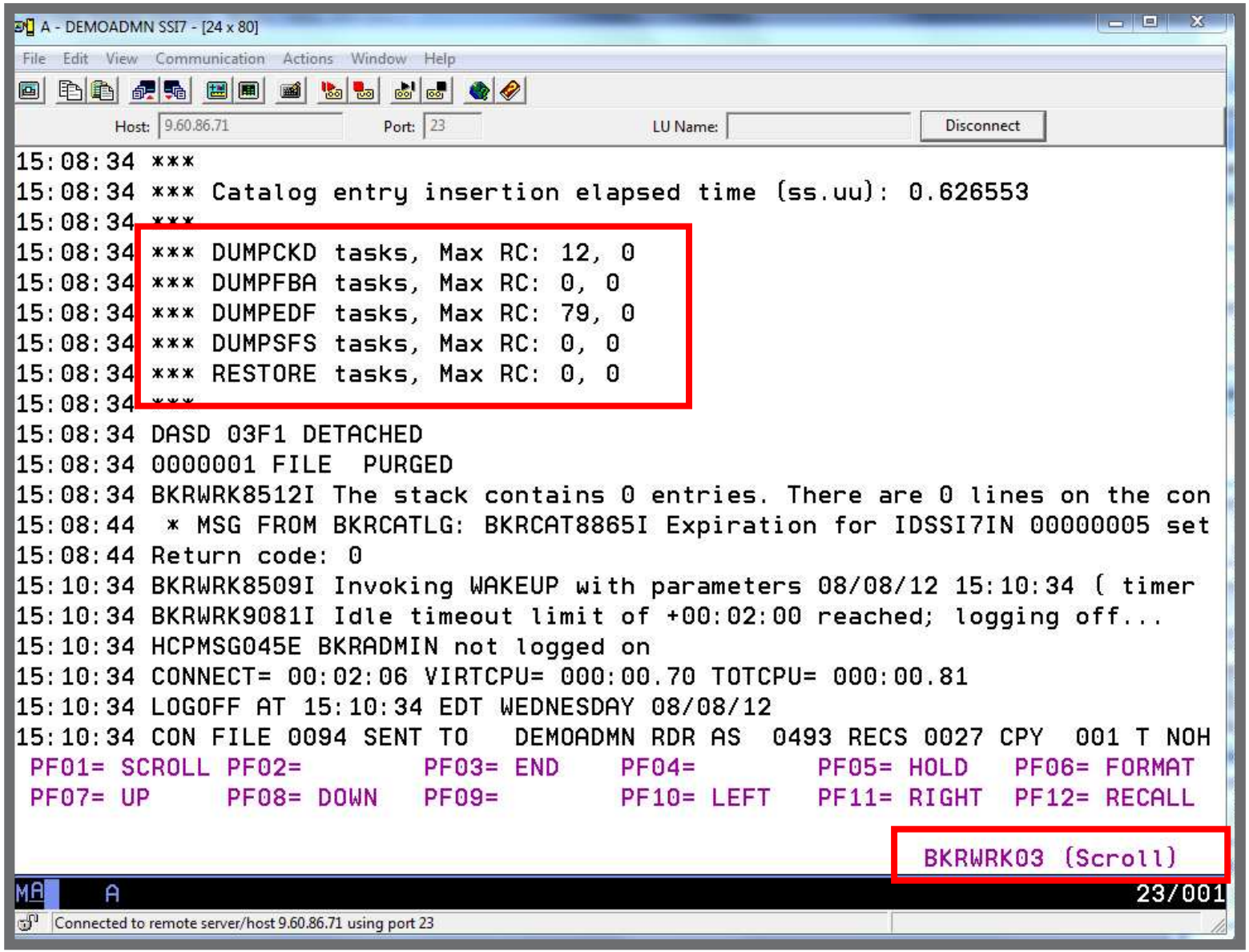

A - DEMOADMN SSI7 - [24 x 80]
File Edit View Communication Actions Window Help
Host: 9.60.86.71
Port: 23
LU Name:
Disconnect
TEST OP1 Z1 F 80 Trunc=80 Size=5 Line=0 Col=1 Alt=2
====> file
|...+....1....+....2....+....3....+....4....+....5....+....6....+....7...
***** * * * Top of File * * *
***** Sample line created at 11:01am eastern time March 9, 2012
***** Sample line created at 5:08pm eastern time March 14, 2012
***** Sample line created at 10:11am CET May 21, 2012
***** Sample line created at 17:15am CET May 21, 2012
***** Sample line created at 12:01pm pacific time August 8, 2012
***** * * * End of File * * *
MA A 02/011
Connected to remote server/host 9.60.86.71 using port 23

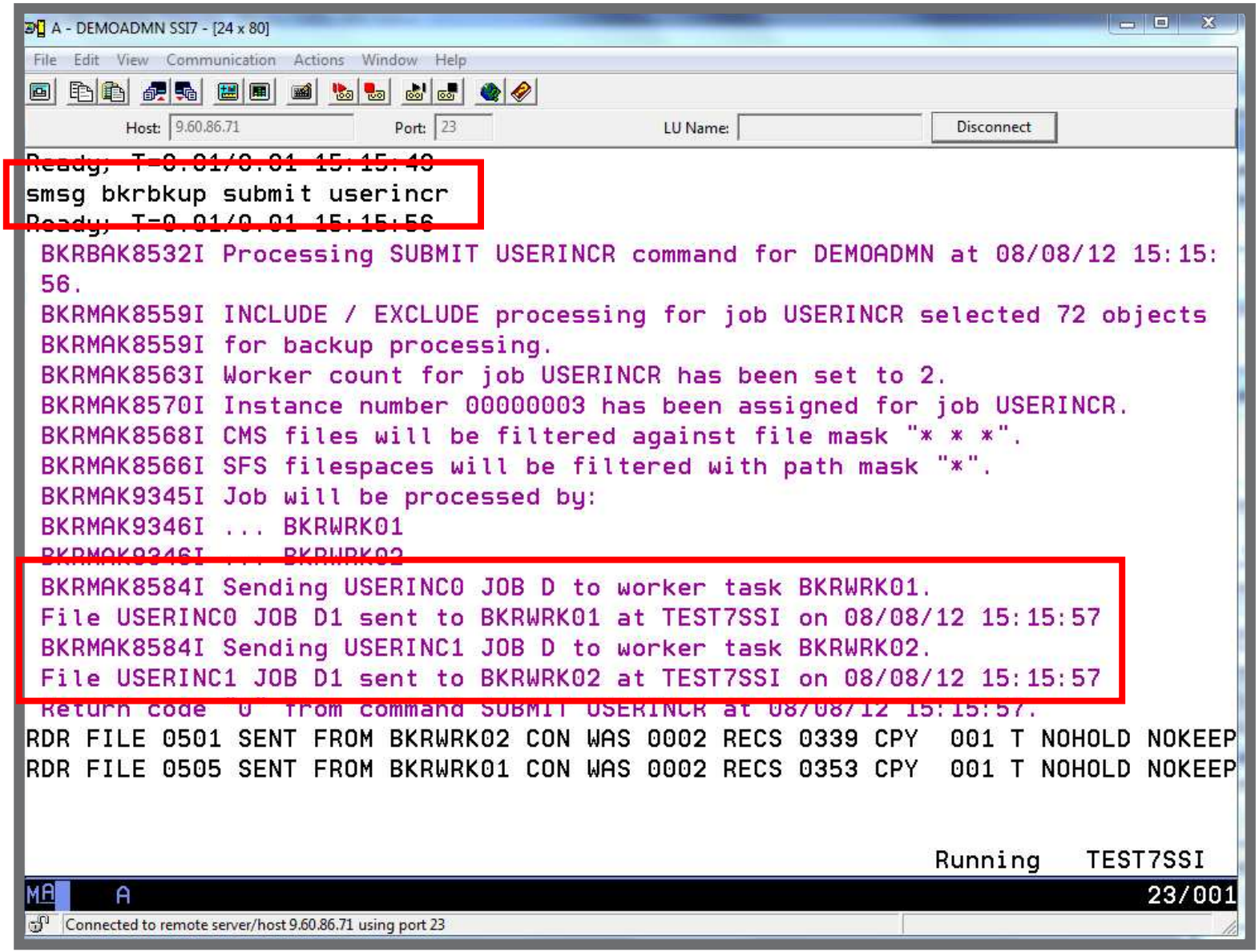

A - DEMOADMN SSI7 - [24 x 80]
File Edit View Communication Actions Window Help
Host: 9.60.86.71
Port: 23
LU Name:
Disconnect
TEST DEMOADMN A1 F 80 Trunc=80 Size=5 Line=0 Col=1 Alt=2
====>
|...+....1....+....2....+....3....+....4....+....5....+....6....+....7...
===== * * * Top of File * * *
===== Sample line created at 11:15am eastern time March 9, 2012
===== Sample line created at 5:10pm eastern time March 14, 2012
===== Sample line created at 10:12am CET May 21, 2012
===== Sample line created at 17:18 CET May 21, 2012
===== Sample line created at 12:04pm pacific time August 8, 2012
===== * * * End of File * * *
MA A 02/007
Connected to remote server/host 9.60.86.71 using port 23

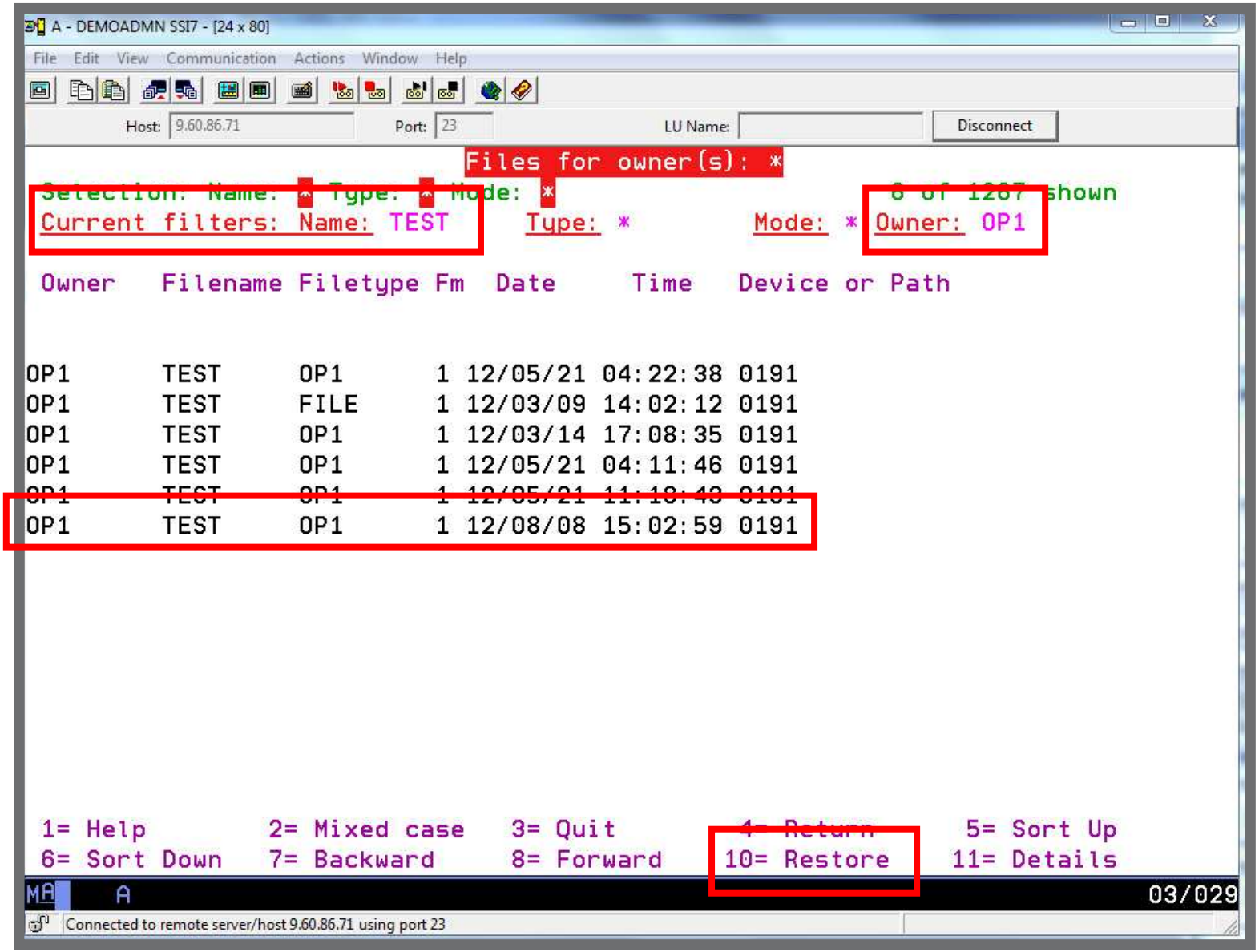

A - DEMOADMN SSI7 - [24 x 80]
File Edit View Communication Actions Window Help
Host: 9.60.86.71 Port: 23 LU Name: Disconnect
smsg bkrbkup review idssi7in
Ready; T=0.01/0.01 15:06:24
BKRBAK8529I Processing REVIEW IDSSI7IN command for DEMOADMN.
RDR FILE 0477 SENT FROM BKRBKUP PUN WAS 0006 RECS 0144 CPY 001 A NOHOLD NOKEEP
BKRMAK8559I INCLUDE / EXCLUDE processing for job IDSSI7IN selected 183 objects
BKRMAK8563I Worker count for job IDSSI7IN has been set to 2.
BKRMAK8568I CMS files will be filtered against file mask "* * *".
BKRMAK8566I SFS filespaces will be filtered with path mask "*".
BKRMAK9345I Job will be processed by:
BKRMAK9346I ... BKRWRK01
BKRMAK8583I Sending results to DEMOADMN for review.
File IDSSI7I0 JOB D1 sent to DEMOADMN at TEST7SSI on 08/08/12 15:06:25
File IDSSI7I1 JOB D1 sent to DEMOADMN at TEST7SSI on 08/08/12 15:06:25
Return code "0" from command REVIEW IDSSI7IN at 08/08/12 15:06:25.
Running TEST7SSI
MA A 23/001
Connected to remote server/host 9.60.86.71 using port 23

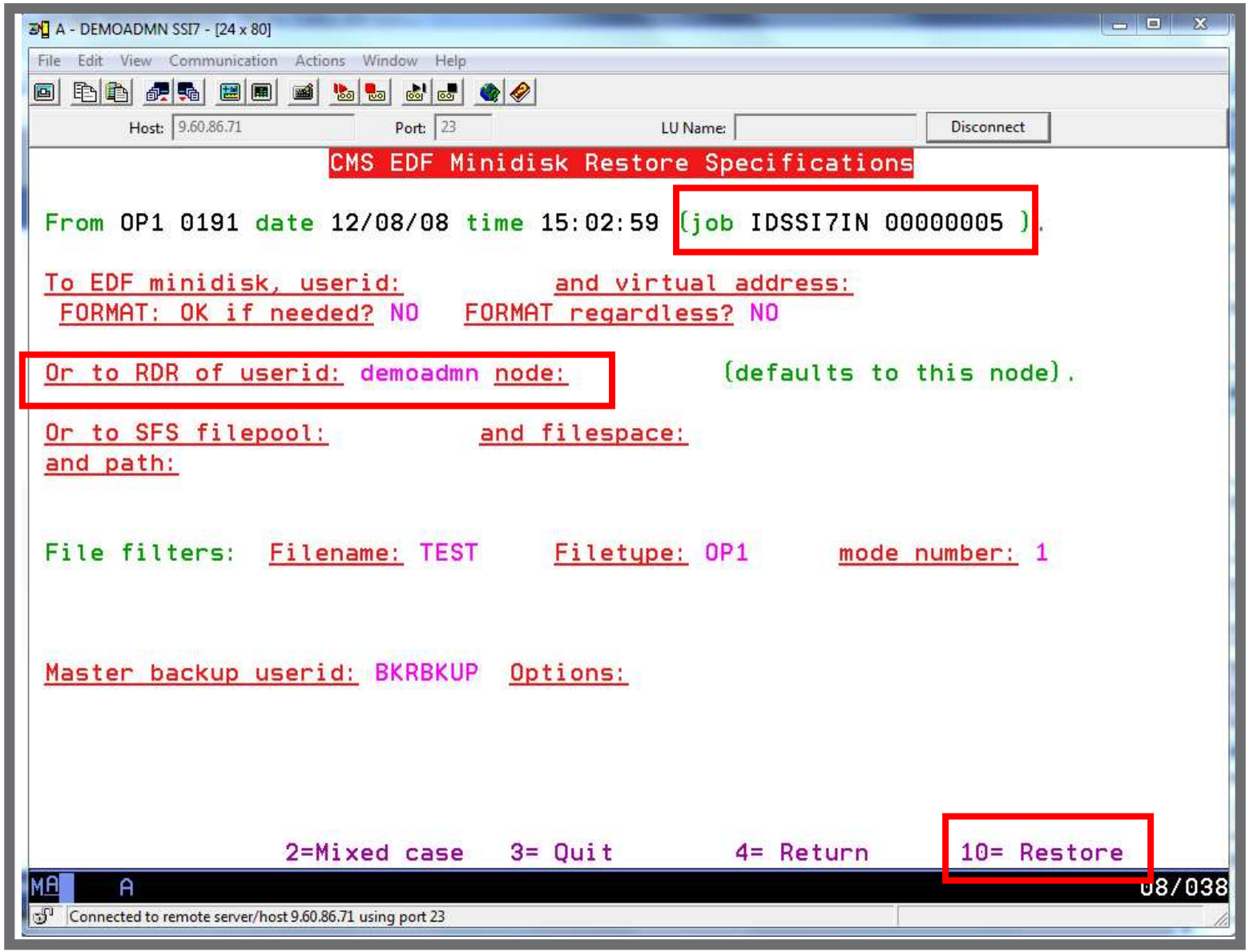

A - DEMOADMN SSI7 - [24 x 80]
File Edit View Communication Actions Window Help
Host: 9.60.86.71 Port: 23 LU Name: Disconnect
smsg bkrbkup submit idssi7in
Ready; T=0.01/0.01 15:08:26
BKRBAK8532I Processing SUBMIT IDSSI7IN command for DEMOADMN at 08/08/12 15:08:26.
BKRMAK8559I INCLUDE / EXCLUDE processing for job IDSSI7IN selected 183 objects
BKRMAK8559I for backup processing.
BKRMAK8563I Worker count for job IDSSI7IN has been set to 2.
BKRMAK8570I Instance number 00000005 has been assigned for job IDSSI7IN.
BKRMAK8568I CMS files will be filtered against file mask * * * .
BKRMAK8566I SFS filespaces will be filtered with path mask "*".
BKRMAK9345I Job will be processed by:
BKRMAK9346I ... BKRWRK03
BKRMAK9346I ... BKRWRK04
BKRMAK8584I Sending IDSSI7I0 JOB D to worker task BKRWRK03.
File IDSSI7I0 JOB D1 sent to BKRWRK03 at TEST7SSI on 08/08/12 15:08:27
BKRMAK8584I Sending IDSSI7I1 JOB D to worker task BKRWRK04.
File IDSSI7I1 JOB D1 sent to BKRWRK04 at TEST7SSI on 08/08/12 15:08:27
Return code "0" from command SUBMIT IDSSI7IN at 08/08/12 15:08:27.
RDR FILE 0485 SENT FROM BKRWRK03 CON WAS 0002 RECS 0347 CPY 001 T NOHOLD NOKEEP
RDR FILE 0489 SENT FROM BKRWRK04 CON WAS 0002 RECS 0350 CPY 001 T NOHOLD NOKEEP
Running TEST7SSI
MA A 23/001
Connected to remote server/host 9.60.86.71 using port 23

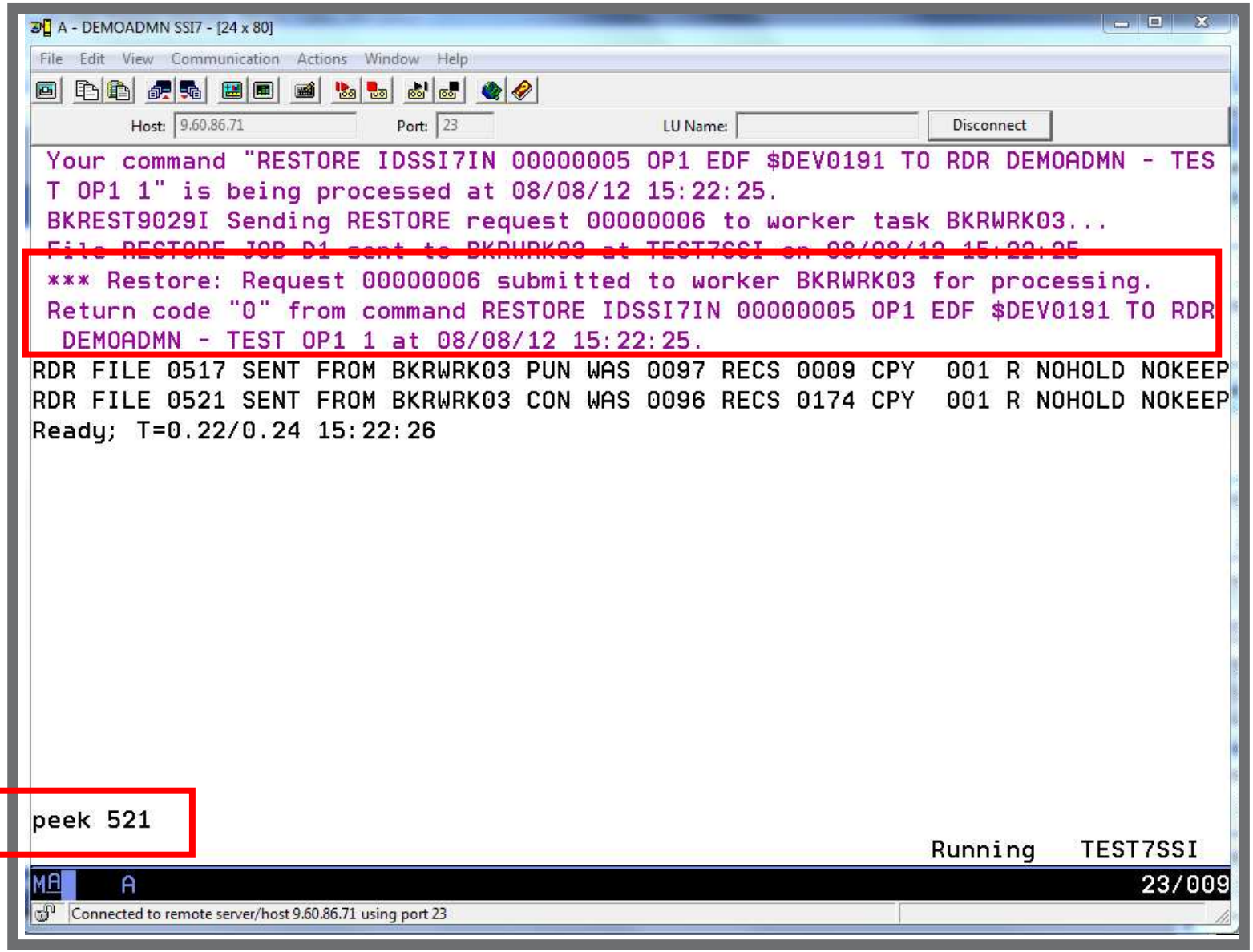

A - DEMOADMN SSI7 - [24 x 80]
File Edit View Communication Actions Window Help
Host: 9.60.86.71
Port: 23
LU Name:
Disconnect
GOMCMD OPMGRM1 VIEWCON USER(bkrwrk03)
Running TEST7SSI
MA A
23/038
Connected to remote server/host 9.60.86.71 using port 23

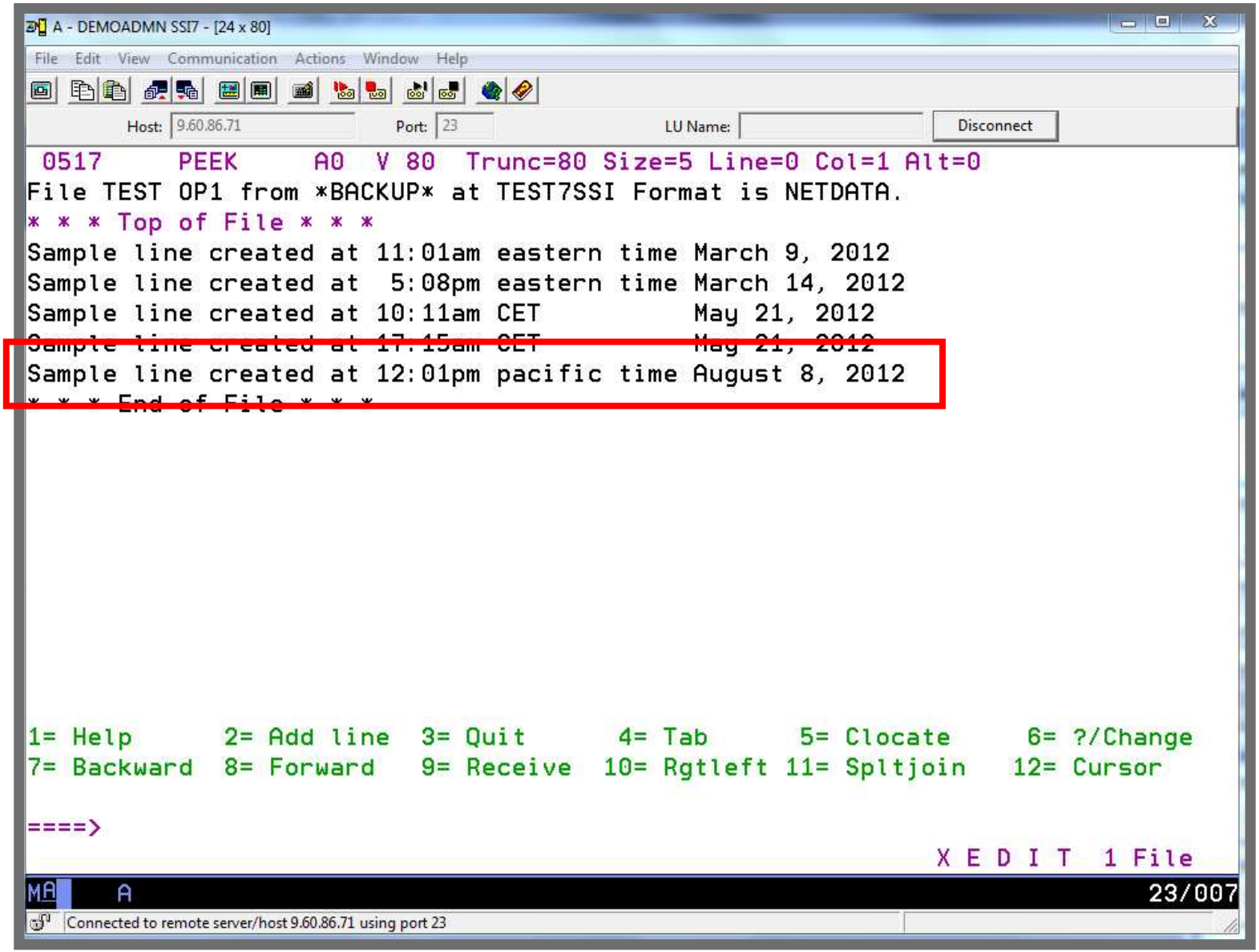

A - DEMOADMN SSI7 - [24 x 80]
File Edit View Communication Actions Window Help
Host: 9.60.86.71 Port: 23 LU Name: Disconnect
15:08:34 ***
15:08:34 *** Catalog entry insertion elapsed time (ss.uu): 0.626553
15:08:34 ***
15:08:34 *** DUMPCKD tasks, Max RC: 12, 0
15:08:34 *** DUMPFBA tasks, Max RC: 0, 0
15:08:34 *** DUMPEDF tasks, Max RC: 79, 0
15:08:34 *** DUMPSFS tasks, Max RC: 0, 0
15:08:34 *** RESTORE tasks, Max RC: 0, 0
15:08:34 ***
15:08:34 DASD 03F1 DETACHED
15:08:34 0000001 FILE PURGED
15:08:34 BKRWRK8512I The stack contains 0 entries. There are 0 lines on the con
15:08:44 * MSG FROM BKRCATLG: BKRCAT8865I Expiration for IDSSI7IN 00000005 set
15:08:44 Return code: 0
15:10:34 BKRWRK8509I Invoking WAKEUP with parameters 08/08/12 15:10:34 (timer
15:10:34 BKRWRK9081I Idle timeout limit of +00:02:00 reached; logging off...
15:10:34 HCPMSG045E BKRADMIN not logged on
15:10:34 CONNECT= 00:02:06 VIRTCPU= 000:00.70 TOTCPU= 000:00.81
15:10:34 LOGOFF AT 15:10:34 EDT WEDNESDAY 08/08/12
15:10:34 CON FILE 0094 SENT TO DEMOADMN RDR AS 0493 RECS 0027 CPY 001 T NOH
PF01= SCROLL PF02= PF03= END PF04= PF05= HOLD PF06= FORMAT
PF07= UP PF08= DOWN PF09= PF10= LEFT PF11= RIGHT PF12= RECALL
BKRWRK03 (Scroll)
MA A 23/001
Connected to remote server/host 9.60.86.71 using port 23

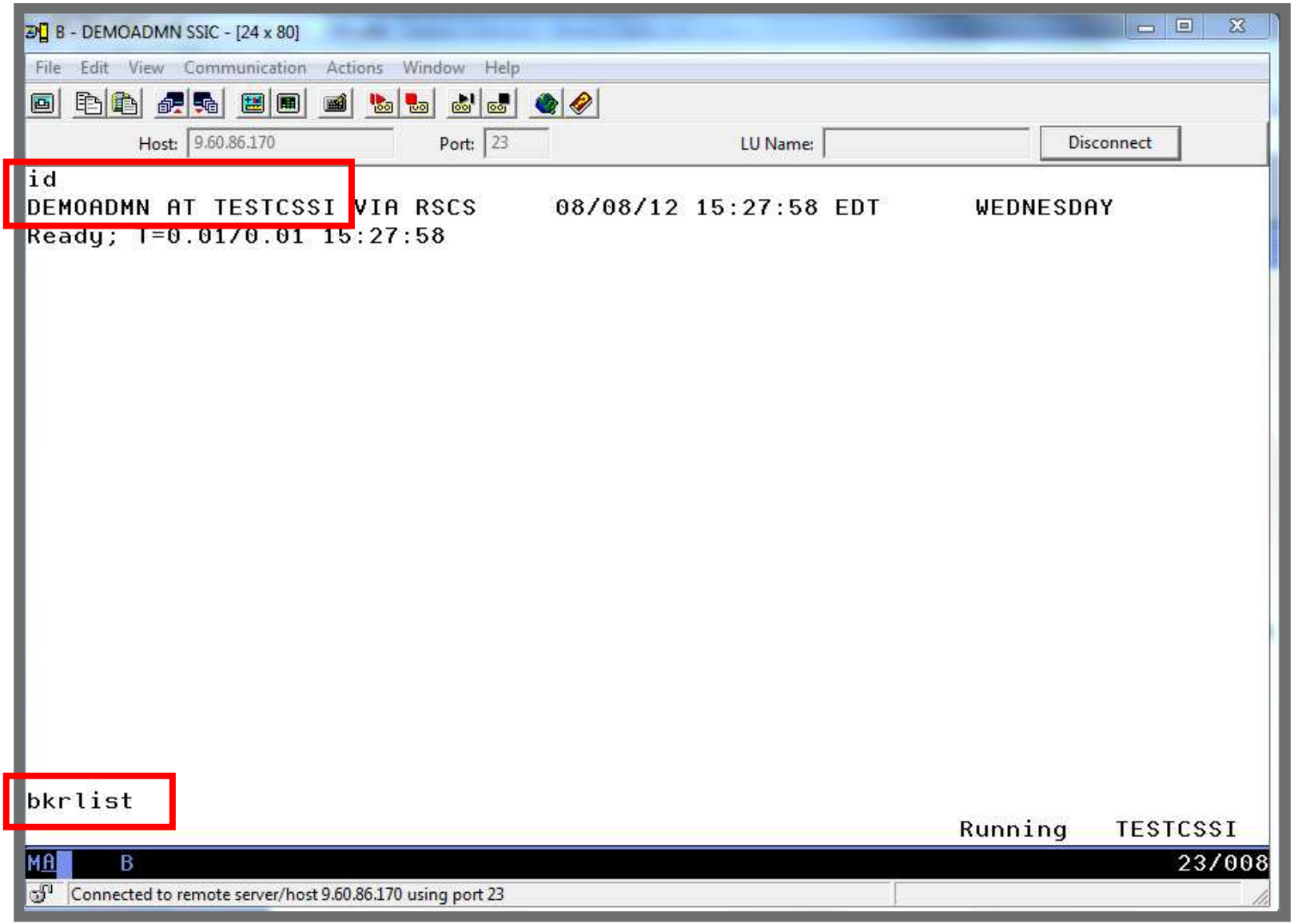

A - DEMOADMN SSI7 - [24 x 80]
File Edit View Communication Actions Window Help
Host: 9.60.86.71 Port: 23 LU Name: Disconnect
smsg bkrbkup submit userincr
BKRBAK8532I Processing SUBMIT USERINCR command for DEMOADMN at 08/08/12 15:15:56.
BKRMAK8559I INCLUDE / EXCLUDE processing for job USERINCR selected 72 objects
BKRMAK8559I for backup processing.
BKRMAK8563I Worker count for job USERINCR has been set to 2.
BKRMAK8570I Instance number 00000003 has been assigned for job USERINCR.
BKRMAK8568I CMS files will be filtered against file mask "* * *".
BKRMAK8566I SFS filespaces will be filtered with path mask "*".
BKRMAK9345I Job will be processed by:
BKRMAK9346I ... BKRWRK01
BKRMAK8584I Sending USERINC0 JOB D to worker task BKRWRK01.
File USERINC0 JOB D1 sent to BKRWRK01 at TEST7SSI on 08/08/12 15:15:57
BKRMAK8584I Sending USERINC1 JOB D to worker task BKRWRK02.
File USERINC1 JOB D1 sent to BKRWRK02 at TEST7SSI on 08/08/12 15:15:57
RDR FILE 0501 SENT FROM BKRWRK02 CON WAS 0002 RECS 0339 CPY 001 T NOHOLD NOKEEP
RDR FILE 0505 SENT FROM BKRWRK01 CON WAS 0002 RECS 0353 CPY 001 T NOHOLD NOKEEP
Running TEST7SSI
MA A 23/001
Connected to remote server/host 9.60.86.71 using port 23

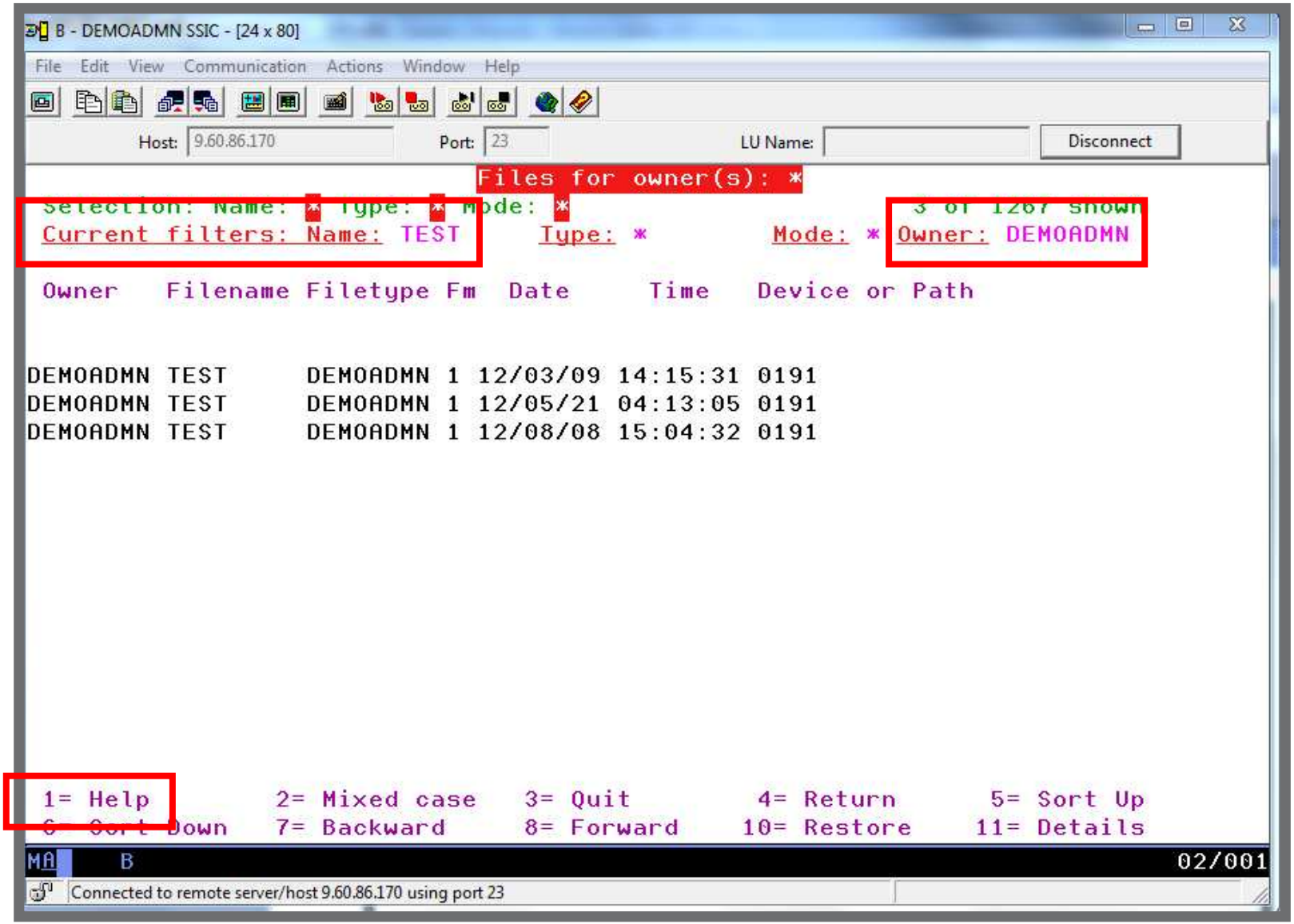

A - DEMOADMN SSI7 - [24 x 80]
File Edit View Communication Actions Window Help
Host: 9.60.86.71
Port: 23
LU Name:
Disconnect
Files for owner(s): *
Selection: Name: * Type: * Mode: *
6 of 1287 shown
Current filters: Name: TEST Type: * Mode: * Owner: OP1
Owner Filename Filetype Fm Date Time Device or Path
OP1 TEST OP1 1 12/05/21 04:22:38 0191
OP1 TEST FILE 1 12/03/09 14:02:12 0191
OP1 TEST OP1 1 12/03/14 17:08:35 0191
OP1 TEST OP1 1 12/05/21 04:11:46 0191
OP1 TEST OP1 1 12/08/08 15:02:59 0191
1= Help 2= Mixed case 3= Quit 4= Return 5= Sort Up
6= Sort Down 7= Backward 8= Forward 10= Restore 11= Details
MA A
03/029
Connected to remote server/host 9.60.86.71 using port 23


A - DEMOADMN SSI7 - [24 x 80]
File Edit View Communication Actions Window Help
Host: 9.60.86.71
Port: 23
LU Name:
Disconnect
CMS EDF Minidisk Restore Specifications
From OP1 0191 date 12/08/08 time 15:02:59 (job IDSSI7IN 00000005).
To EDF minidisk, userid:
and virtual address:
FORMAT: OK if needed? NO
FORMAT regardless? NO
Or to RDR of userid: demoadmn node:
(defaults to this node).
Or to SFS filepool:
and filespace:
and path:
File filters:
Filename: TEST
Filetype: OP1
mode number: 1
Master backup userid: BKRBKUP
Options:
2=Mixed case
3= Quit
4= Return
10= Restore
MA
A
08/038
Connected to remote server/host 9.60.86.71 using port 23


A - DEMOADMN SSI7 - [24 x 80]
File Edit View Communication Actions Window Help
Host: 9.60.86.71 Port: 23 LU Name: Disconnect
Your command "RESTORE IDSSI7IN 00000005 OP1 EDF $DEV0191 TO RDR DEMOADMN - TES
T OP1 1" is being processed at 08/08/12 15:22:25.
BKREST9029I Sending RESTORE request 00000006 to worker task BKRWRK03...
*** Restore: Request 00000006 submitted to worker BKRWRK03 for processing.
Return code "0" from command RESTORE IDSSI7IN 00000005 OP1 EDF $DEV0191 TO RDR
DEMOADMN - TEST OP1 1 at 08/08/12 15:22:25.
RDR FILE 0517 SENT FROM BKRWRK03 PUN WAS 0097 RECS 0009 CPY 001 R NOHOLD NOKEEP
RDR FILE 0521 SENT FROM BKRWRK03 CON WAS 0096 RECS 0174 CPY 001 R NOHOLD NOKEEP
Ready; T=0.22/0.24 15:22:26
peek 521
Running TEST7SSI
MA A 23/009
Connected to remote server/host 9.60.86.71 using port 23


A - DEMOADMN SSI7 - [24 x 80]
File Edit View Communication Actions Window Help
Host: 9.60.86.71 Port: 23 LU Name: Disconnect
0517 PEEK A0 V 80 Trunc=80 Size=5 Line=0 Col=1 Alt=0
File TEST OP1 from *BACKUP* at TEST7SSI Format is NETDATA.
* * * Top of File * * *
Sample line created at 11:01am eastern time March 9, 2012
Sample line created at 5:08pm eastern time March 14, 2012
Sample line created at 10:11am CET May 21, 2012
Sample line created at 12:01pm pacific time August 8, 2012
1= Help 2= Add line 3= Quit 4= Tab 5= Clocate 6= ?/Change
7= Backward 8= Forward 9= Receive 10= Rgtleft 11= Spltjoin 12= Cursor
====>
X E D I T 1 File
MA A 23/007
Connected to remote server/host 9.60.86.71 using port 23


B - DEMOADMN SSIC - [24 x 80]
File Edit View Communication Actions Window Help
Host: 9.60.86.170
Port: 23
LU Name:
Disconnect
id
DEMOADMN AT TESTCSSI VIA RSCS 08/08/12 15:27:58 EDT WEDNESDAY
Ready; T=0.01/0.01 15:27:58
bkrlist
Running TESTCSSI
MA B 23/008
Connected to remote server/host 9.60.86.170 using port 23


B - DEMOADMN SSIC - [24 x 80]
File Edit View Communication Actions Window Help
Host: 9.60.86.170
Port: 23
LU Name:
Disconnect
Files for owner(s): *
Selection: Name: * Type: * Mode: *
3 of 1267 shown
Current filters: Name: TEST Type: * Mode: * Owner: DEMOADMN
Owner Filename Filetype Fm Date Time Device or Path
DEMOADMN TEST DEMOADMN 1 12/03/09 14:15:31 0191
DEMOADMN TEST DEMOADMN 1 12/05/21 04:13:05 0191
DEMOADMN TEST DEMOADMN 1 12/08/08 15:04:32 0191
1= Help 2= Mixed case 3= Quit 4= Return 5= Sort Up
6= Sort Down 7= Backward 8= Forward 10= Restore 11= Details
MA B 02/001
Connected to remote server/host 9.60.86.170 using port 23

Scenario D: Scheduling Image Backups of Linux Guests

- Initiated or scheduled by Operations Manager
  - Schedule defined in Operations Manager to initiate backups at specific times/intervals
  - Action associated with each schedule
    - Linux guest is shut down
    - Operations Manager watches for shutdown complete
    - Sends request to Backup and Restore Manager to back up the specific DASD/minidisks associated with the guest
      - Alternatively use FLASHCOPY to copy DASD, restart guest, then perform backup of copy of DASD.
    - Operations Manager watches for backup complete message
    - Restarts Linux guest
  - Guest is down for minimum time required for backup

© 2013, 2015 IBM Corporation

Scenario D: Detailed Steps

- Define a schedule to start the automated backup process

```
gomcmd opmgrm1 defschd name(demo),action(stoplnx),when(now)
```

- View the Operations Manager log to see the schedule trigger

```
gomcmd opmgrm1 viewlog
```

- View the console of the Linux guest to see it shut down

```
gomcmd opmgrm1 viewcon user(omeglnx1)
```

- View the console of the backup server to see the backup start

```
gomcmd opmgrm1 viewcon user(bkrbkup)
```

- Find the worker that has been assigned and view its console

```
gomcmd opmgrm1 viewcon user(bkrwrkxx)
```

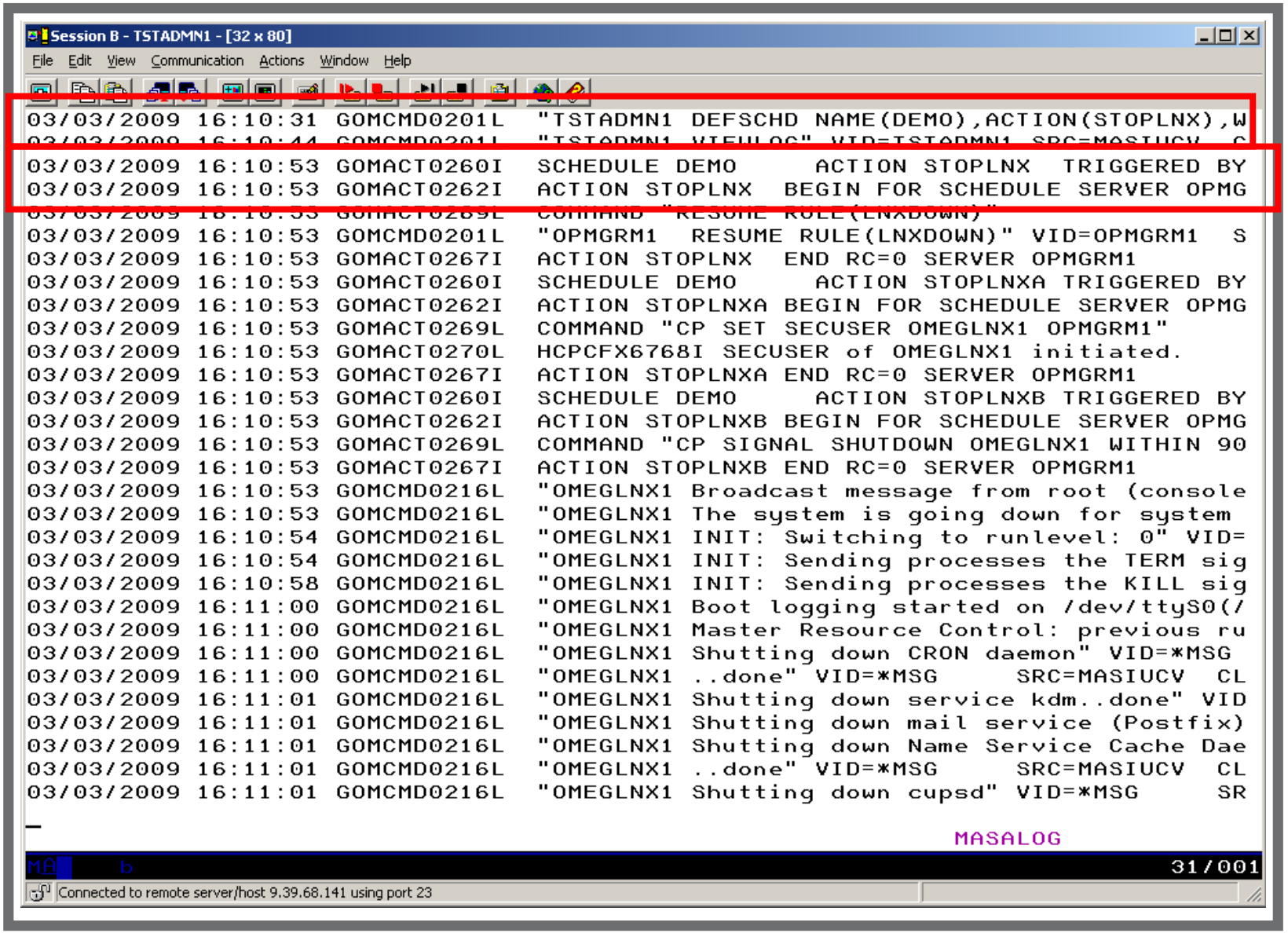
- View the console of the Linux guest to see it restart

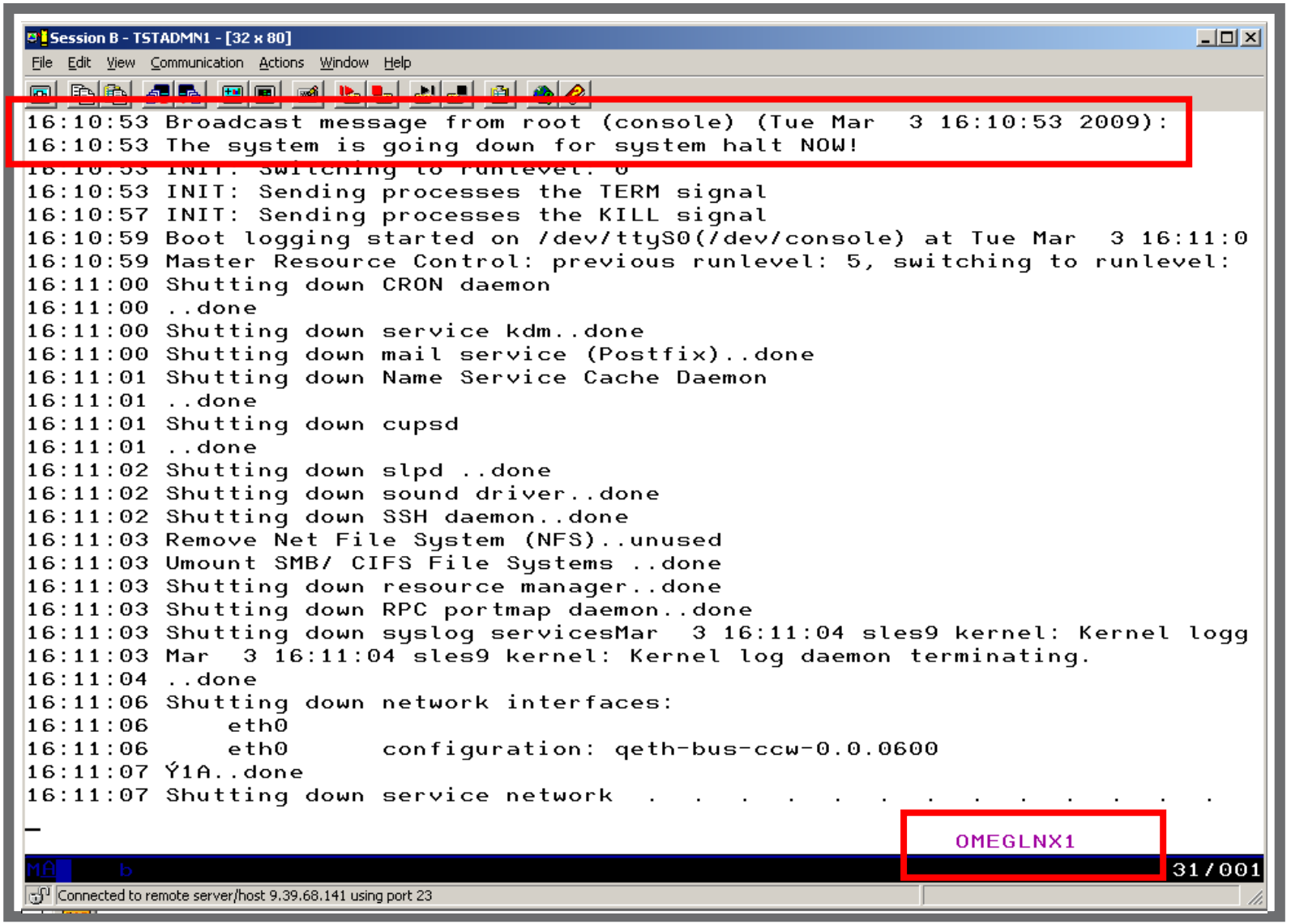
```
gomcmd opmgrm1 viewcon user(omeglnx1)
```

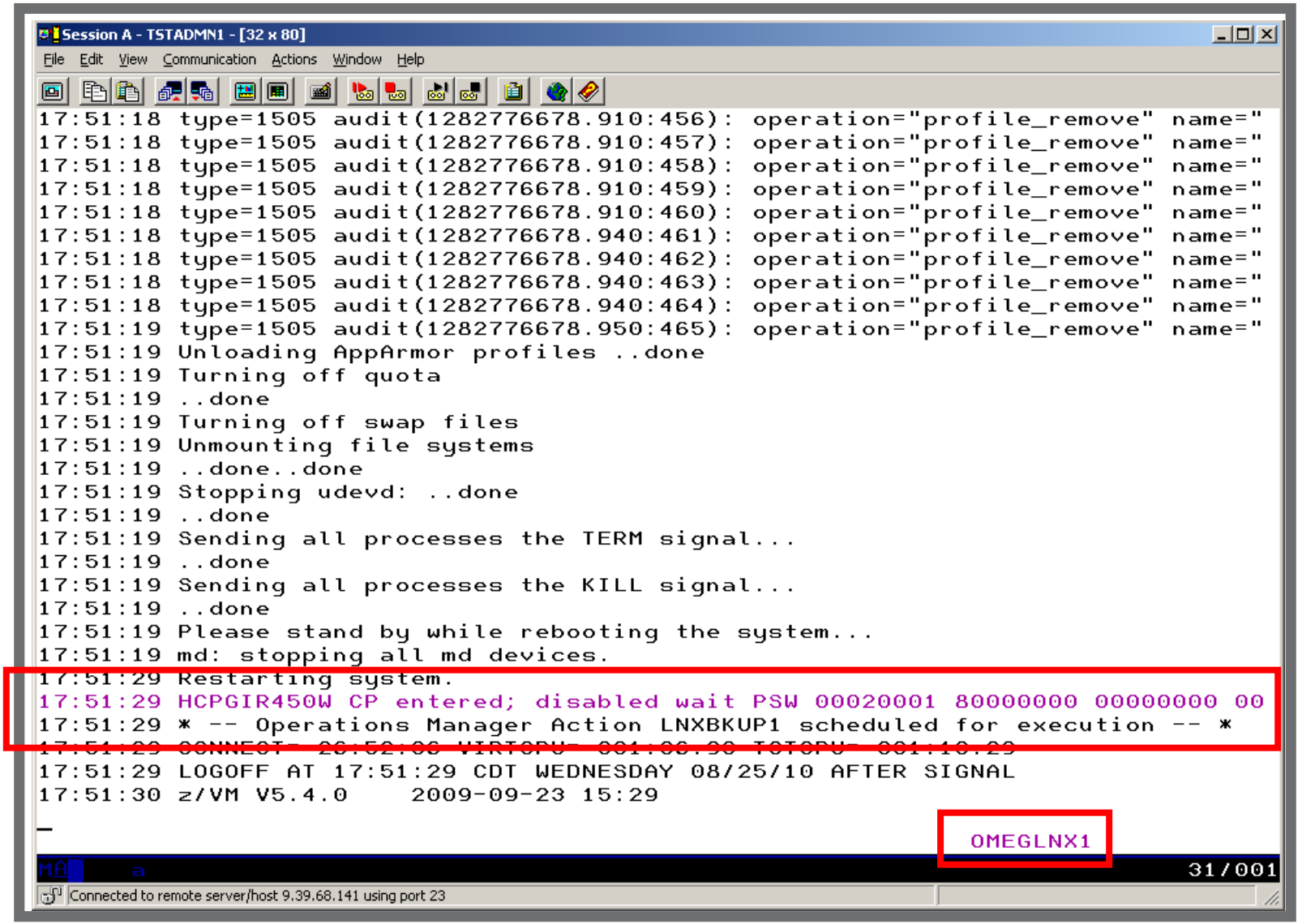
- View the backup catalog to see the completed job

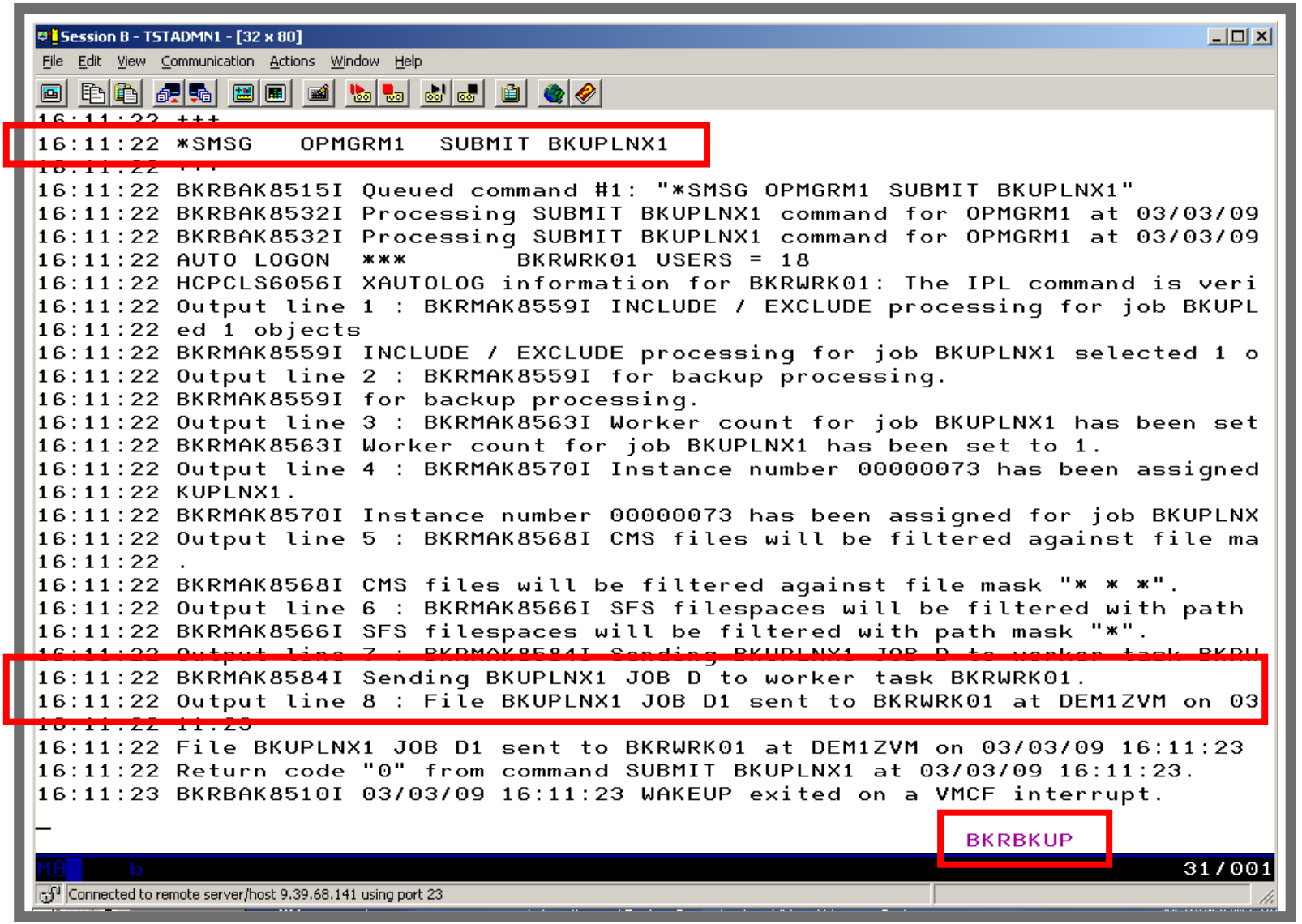
```
bkrjob
```

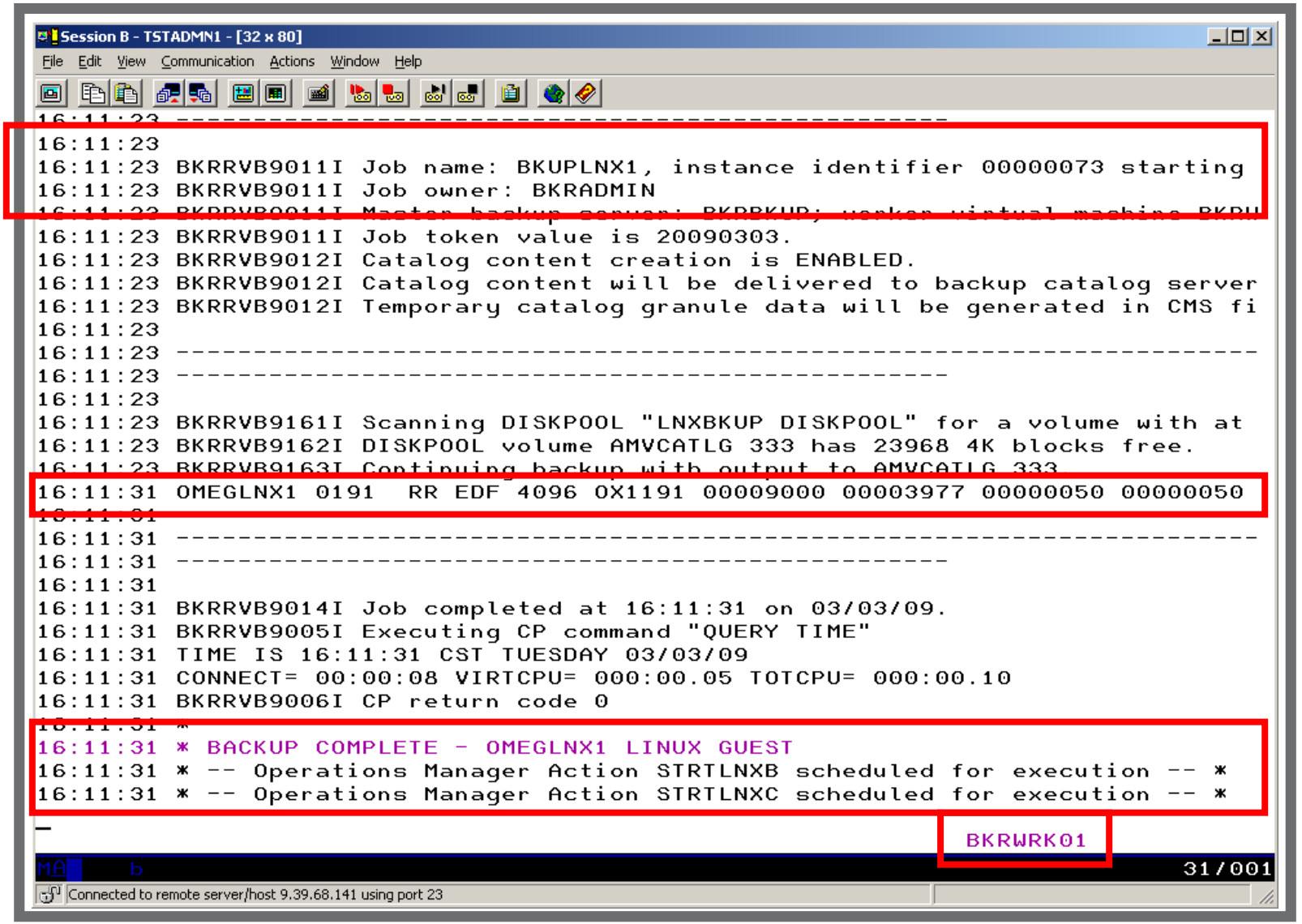
© 2013, 2015 IBM Corporation

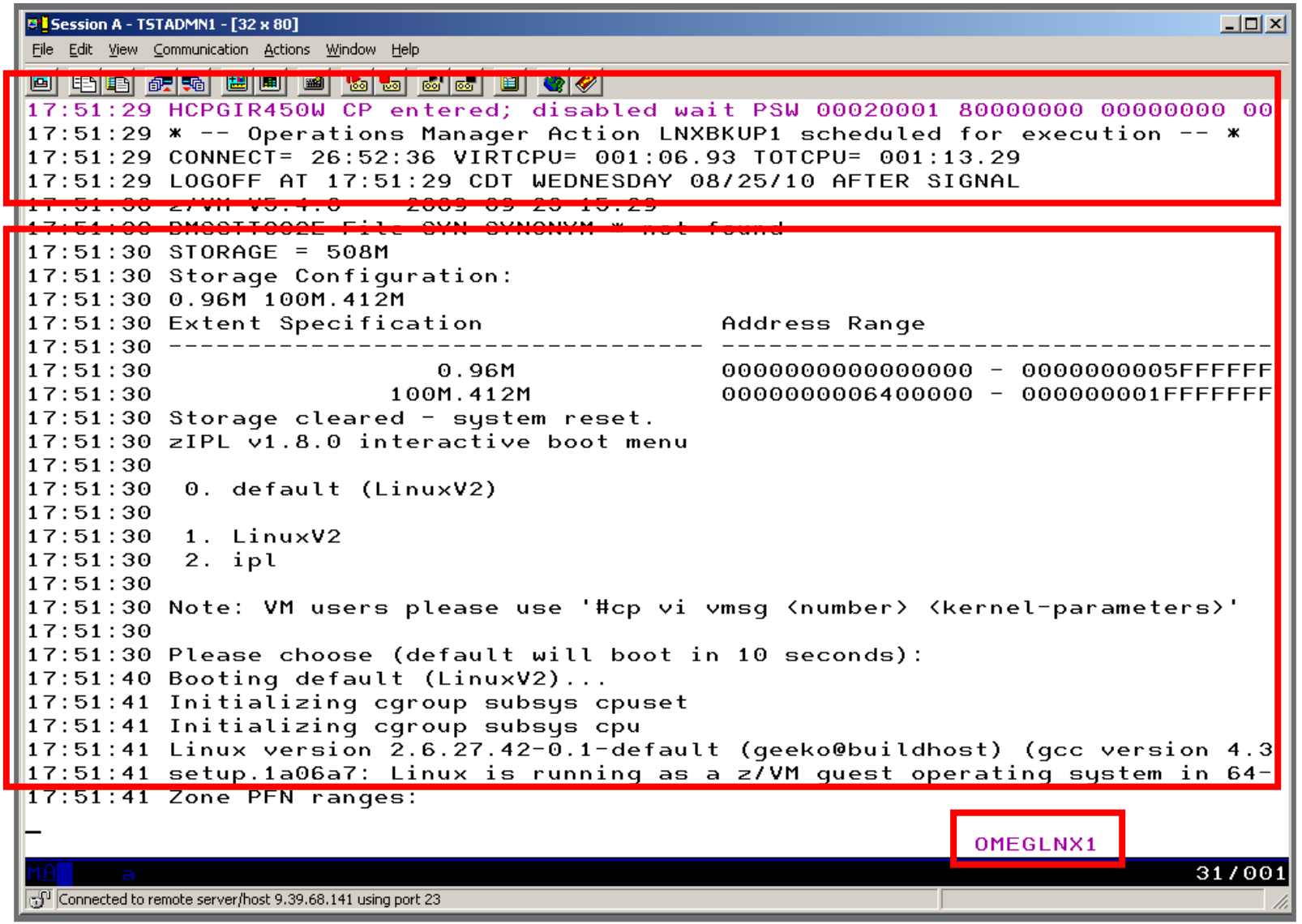

Session B - TSTADMN1 - [32 x 80]
File Edit View Communication Actions Window Help
03/03/2009 16:10:31 GOMCMD0201L "TSTADMN1 DEFSCHD NAME(DEMO),ACTION(STOPLNX),W
03/03/2009 16:10:53 GOMACT0260I SCHEDULE DEMO ACTION STOPLNX TRIGGERED BY
03/03/2009 16:10:53 GOMACT0262I ACTION STOPLNX BEGIN FOR SCHEDULE SERVER OPMG
03/03/2009 16:10:53 GOMCMD0201L "OPMGRM1 RESUME RULE(LNXDOWN)" VID=OPMGRM1 S
03/03/2009 16:10:53 GOMACT0267I ACTION STOPLNX END RC=0 SERVER OPMGRM1
03/03/2009 16:10:53 GOMACT0260I SCHEDULE DEMO ACTION STOPLNXA TRIGGERED BY
03/03/2009 16:10:53 GOMACT0262I ACTION STOPLNXA BEGIN FOR SCHEDULE SERVER OPMG
03/03/2009 16:10:53 GOMACT0269L COMMAND "CP SET SECUSER OMEGLNX1 OPMGRM1"
03/03/2009 16:10:53 GOMACT0270L HCPCFX6768I SECUSER of OMEGLNX1 initiated.
03/03/2009 16:10:53 GOMACT0267I ACTION STOPLNXA END RC=0 SERVER OPMGRM1
03/03/2009 16:10:53 GOMACT0260I SCHEDULE DEMO ACTION STOPLNXB TRIGGERED BY
03/03/2009 16:10:53 GOMACT0262I ACTION STOPLNXB BEGIN FOR SCHEDULE SERVER OPMG
03/03/2009 16:10:53 GOMACT0269L COMMAND "CP SIGNAL SHUTDOWN OMEGLNX1 WITHIN 90
03/03/2009 16:10:53 GOMACT0267I ACTION STOPLNXB END RC=0 SERVER OPMGRM1
03/03/2009 16:10:53 GOMCMD0216L "OMEGLNX1 Broadcast message from root (console
03/03/2009 16:10:53 GOMCMD0216L "OMEGLNX1 The system is going down for system
03/03/2009 16:10:54 GOMCMD0216L "OMEGLNX1 INIT: Switching to runlevel: 0" VID=
03/03/2009 16:10:54 GOMCMD0216L "OMEGLNX1 INIT: Sending processes the TERM sig
03/03/2009 16:10:58 GOMCMD0216L "OMEGLNX1 INIT: Sending processes the KILL sig
03/03/2009 16:11:00 GOMCMD0216L "OMEGLNX1 Boot logging started on /dev/ttyS0(/
03/03/2009 16:11:00 GOMCMD0216L "OMEGLNX1 Master Resource Control: previous ru
03/03/2009 16:11:00 GOMCMD0216L "OMEGLNX1 Shutting down CRON daemon" VID=*MSG
03/03/2009 16:11:00 GOMCMD0216L "OMEGLNX1 ..done" VID=*MSG SRC=MASIUCV CL
03/03/2009 16:11:01 GOMCMD0216L "OMEGLNX1 Shutting down service kdm..done" VID
03/03/2009 16:11:01 GOMCMD0216L "OMEGLNX1 Shutting down mail service (Postfix)
03/03/2009 16:11:01 GOMCMD0216L "OMEGLNX1 Shutting down Name Service Cache Dae
03/03/2009 16:11:01 GOMCMD0216L "OMEGLNX1 ..done" VID=*MSG SRC=MASIUCV CL
03/03/2009 16:11:01 GOMCMD0216L "OMEGLNX1 Shutting down cupsd" VID=*MSG SR
MASALOG
31/001
Connected to remote server/host 9.39.68.141 using port 23

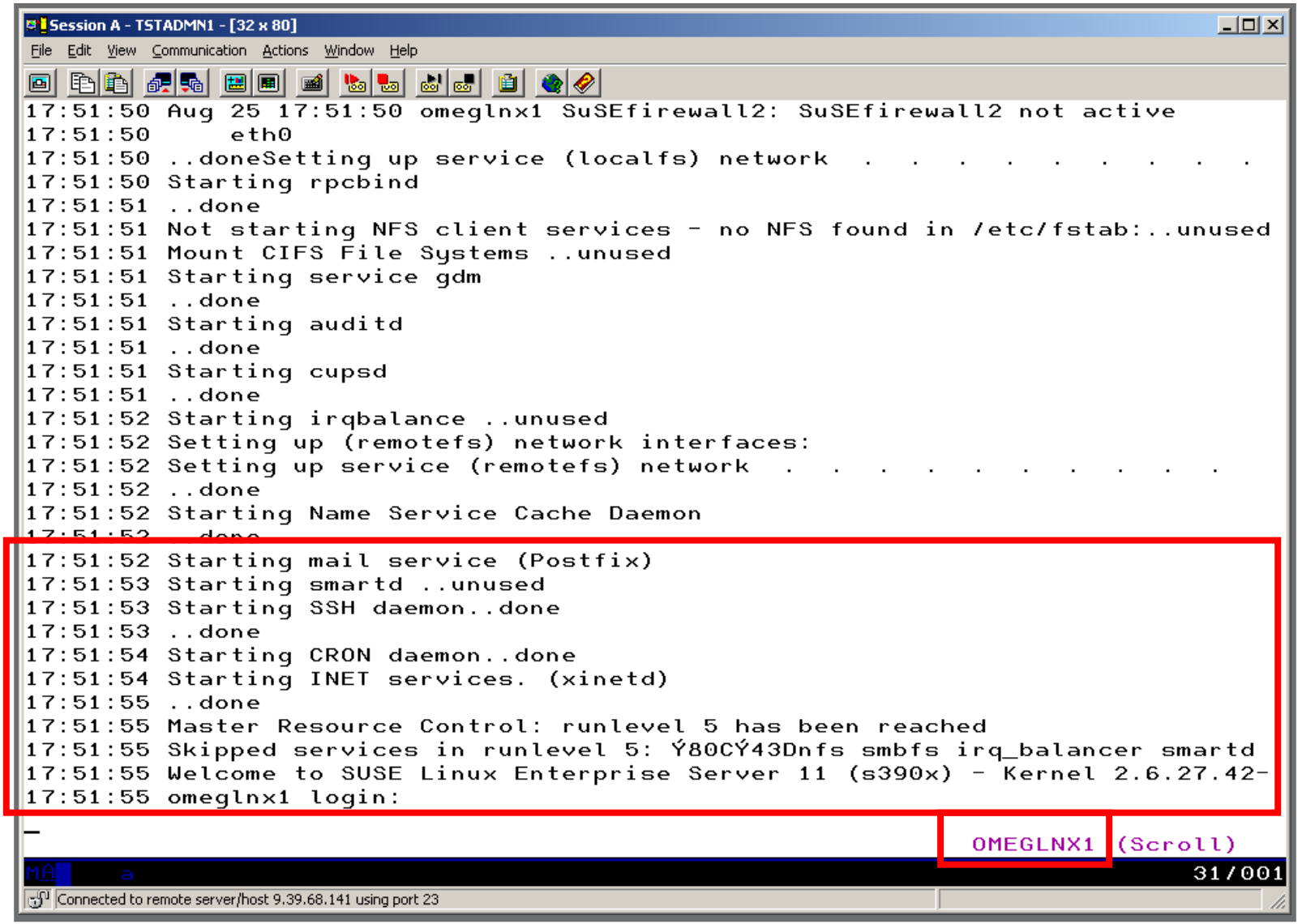

Session B - TSTADMN1 - [32 x 80]
File Edit View Communication Actions Window Help
16:10:53 Broadcast message from root (console) (Tue Mar 3 16:10:53 2009):
16:10:53 The system is going down for system halt NOW!
16:10:53 INIT: Switching to runlevel: 0
16:10:53 INIT: Sending processes the TERM signal
16:10:57 INIT: Sending processes the KILL signal
16:10:59 Boot logging started on /dev/ttyS0(/dev/console) at Tue Mar 3 16:11:0
16:10:59 Master Resource Control: previous runlevel: 5, switching to runlevel:
16:11:00 Shutting down CRON daemon
16:11:00 ..done
16:11:00 Shutting down service kdm..done
16:11:00 Shutting down mail service (Postfix)..done
16:11:01 Shutting down Name Service Cache Daemon
16:11:01 ..done
16:11:01 Shutting down cupsd
16:11:01 ..done
16:11:02 Shutting down slpd ..done
16:11:02 Shutting down sound driver..done
16:11:02 Shutting down SSH daemon..done
16:11:03 Remove Net File System (NFS)..unused
16:11:03 Umount SMB/ CIFS File Systems ..done
16:11:03 Shutting down resource manager..done
16:11:03 Shutting down RPC portmap daemon..done
16:11:03 Shutting down syslog servicesMar 3 16:11:04 sles9 kernel: Kernel logg
16:11:03 Mar 3 16:11:04 sles9 kernel: Kernel log daemon terminating.
16:11:04 ..done
16:11:06 Shutting down network interfaces:
16:11:06 eth0
16:11:06 eth0 configuration: qeth-bus-ccw-0.0.0600
16:11:07 Ý1A..done
16:11:07 Shutting down service network . . . . . .
OMEGLNX1
MA b
31/001
Connected to remote server/host 9.39.68.141 using port 23


Session A - TSTADMN1 - [32 x 80]
File Edit View Communication Actions Window Help
17:51:18 type=1505 audit(1282776678.910:456): operation="profile_remove" name="
17:51:18 type=1505 audit(1282776678.910:457): operation="profile_remove" name="
17:51:18 type=1505 audit(1282776678.910:458): operation="profile_remove" name="
17:51:18 type=1505 audit(1282776678.910:459): operation="profile_remove" name="
17:51:18 type=1505 audit(1282776678.910:460): operation="profile_remove" name="
17:51:18 type=1505 audit(1282776678.940:461): operation="profile_remove" name="
17:51:18 type=1505 audit(1282776678.940:462): operation="profile_remove" name="
17:51:18 type=1505 audit(1282776678.940:463): operation="profile_remove" name="
17:51:18 type=1505 audit(1282776678.940:464): operation="profile_remove" name="
17:51:19 type=1505 audit(1282776678.950:465): operation="profile_remove" name="
17:51:19 Unloading AppArmor profiles ..done
17:51:19 Turning off quota
17:51:19 ..done
17:51:19 Turning off swap files
17:51:19 Unmounting file systems
17:51:19 ..done..done
17:51:19 Stopping udevd: ..done
17:51:19 ..done
17:51:19 Sending all processes the TERM signal...
17:51:19 ..done
17:51:19 Sending all processes the KILL signal...
17:51:19 ..done
17:51:19 Please stand by while rebooting the system...
17:51:19 md: stopping all md devices.
17:51:29 Restarting system.
17:51:29 HCPGIR450W CP entered; disabled wait PSW 00020001 80000000 00000000 00
17:51:29 * -- Operations Manager Action LNXBKUP1 scheduled for execution -- *
17:51:29 LOGOFF AT 17:51:29 CDT WEDNESDAY 08/25/10 AFTER SIGNAL
17:51:30 z/VM V5.4.0 2009-09-23 15:29
OMEGLNX1
MA a
31/001
Connected to remote server/host 9.39.68.141 using port 23


Session B - TSTADMN1 - [32 x 80]
File Edit View Communication Actions Window Help
16:11:22 *SMSG OPMGRM1 SUBMIT BKUPLNX1
16:11:22 BKRBAK8515I Queued command #1: "*SMSG OPMGRM1 SUBMIT BKUPLNX1"
16:11:22 BKRBAK8532I Processing SUBMIT BKUPLNX1 command for OPMGRM1 at 03/03/09
16:11:22 BKRBAK8532I Processing SUBMIT BKUPLNX1 command for OPMGRM1 at 03/03/09
16:11:22 AUTO LOGON *** BKRWRK01 USERS = 18
16:11:22 HCPCLS6056I XAUTOLOG information for BKRWRK01: The IPL command is veri
16:11:22 Output line 1 : BKRMAK8559I INCLUDE / EXCLUDE processing for job BKUPL
16:11:22 ed 1 objects
16:11:22 BKRMAK8559I INCLUDE / EXCLUDE processing for job BKUPLNX1 selected 1 o
16:11:22 Output line 2 : BKRMAK8559I for backup processing.
16:11:22 BKRMAK8559I for backup processing.
16:11:22 Output line 3 : BKRMAK8563I Worker count for job BKUPLNX1 has been set
16:11:22 BKRMAK8563I Worker count for job BKUPLNX1 has been set to 1.
16:11:22 Output line 4 : BKRMAK8570I Instance number 00000073 has been assigned
16:11:22 KUPLNX1.
16:11:22 BKRMAK8570I Instance number 00000073 has been assigned for job BKUPLNX
16:11:22 Output line 5 : BKRMAK8568I CMS files will be filtered against file ma
16:11:22 .
16:11:22 BKRMAK8568I CMS files will be filtered against file mask "* * *".
16:11:22 Output line 6 : BKRMAK8566I SFS filespaces will be filtered with path
16:11:22 BKRMAK8566I SFS filespaces will be filtered with path mask "*".
16:11:22 BKRMAK8584I Sending BKUPLNX1 JOB D to worker task BKRWRK01.
16:11:22 Output line 8 : File BKUPLNX1 JOB D1 sent to BKRWRK01 at DEM1ZVM on 03
16:11:22 File BKUPLNX1 JOB D1 sent to BKRWRK01 at DEM1ZVM on 03/03/09 16:11:23
16:11:22 Return code "0" from command SUBMIT BKUPLNX1 at 03/03/09 16:11:23.
16:11:23 BKRBAK8510I 03/03/09 16:11:23 WAKEUP exited on a VMCF interrupt.
BKRBKUP
31/001
Connected to remote server/host 9.39.68.141 using port 23


Session B - TSTADMN1 - [32 x 80]
File Edit View Communication Actions Window Help
16:11:23
16:11:23 BKRRVB9011I Job name: BKUPLNX1, instance identifier 00000073 starting
16:11:23 BKRRVB9011I Job owner: BKRADMIN
16:11:23 BKRRVB9011I Master backup server: BKRBKUP; worker virtual machine BKRU
16:11:23 BKRRVB9011I Job token value is 20090303.
16:11:23 BKRRVB9012I Catalog content creation is ENABLED.
16:11:23 BKRRVB9012I Catalog content will be delivered to backup catalog server
16:11:23 BKRRVB9012I Temporary catalog granule data will be generated in CMS fi
16:11:23
16:11:23 BKRRVB9161I Scanning DISKPOOL "LNXBKUP DISKPOOL" for a volume with at
16:11:23 BKRRVB9162I DISKPOOL volume AMVCATLG 333 has 23968 4K blocks free.
16:11:23 BKRRVB9163I Continuing backup with output to AMVCATLG 333
16:11:31 OMEGLNX1 0191 RR EDF 4096 0X1191 00009000 00003977 00000050 00000050
16:11:31 BKRRVB9014I Job completed at 16:11:31 on 03/03/09.
16:11:31 BKRRVB9005I Executing CP command "QUERY TIME"
16:11:31 TIME IS 16:11:31 CST TUESDAY 03/03/09
16:11:31 CONNECT= 00:00:08 VIRTCPU= 000:00.05 TOTCPU= 000:00.10
16:11:31 BKRRVB9006I CP return code 0
16:11:31 * BACKUP COMPLETE - OMEGLNX1 LINUX GUEST
16:11:31 * -- Operations Manager Action STRTLNXB scheduled for execution -- *
16:11:31 * -- Operations Manager Action STRTLNXC scheduled for execution -- *
BKRWRK01
31/001
Connected to remote server/host 9.39.68.141 using port 23


Session A - TSTADMN1 - [32 x 80]
File Edit View Communication Actions Window Help
17:51:29 HCPGIR450W CP entered; disabled wait PSW 00020001 80000000 00000000 00
17:51:29 * -- Operations Manager Action LNXBKUP1 scheduled for execution -- *
17:51:29 CONNECT= 26:52:36 VIRTCPU= 001:06.93 TOTCPU= 001:13.29
17:51:29 LOGOFF AT 17:51:29 CDT WEDNESDAY 08/25/10 AFTER SIGNAL
17:51:30 STORAGE = 508M
17:51:30 Storage Configuration:
17:51:30 0.96M 100M.412M
17:51:30 Extent Specification Address Range
17:51:30 0.96M 0000000000000000 - 0000000005FFFFFF
17:51:30 100M.412M 0000000006400000 - 000000001FFFFFFF
17:51:30 Storage cleared - system reset.
17:51:30 zIPL v1.8.0 interactive boot menu
17:51:30 0. default (LinuxV2)
17:51:30 1. LinuxV2
17:51:30 2. ipl
17:51:30 Note: VM users please use '#cp vi vmsg <number> <kernel-parameters>'
17:51:30 Please choose (default will boot in 10 seconds):
17:51:40 Booting default (LinuxV2)...
17:51:41 Initializing cgroup subsys cpuset
17:51:41 Initializing cgroup subsys cpu
17:51:41 Linux version 2.6.27.42-0.1-default (geeko@buildhost) (gcc version 4.3
17:51:41 setup.1a06a7: Linux is running as a z/VM guest operating system in 64-
17:51:41 Zone PFN ranges:
OMEGLNX1
31/001
Connected to remote server/host 9.39.68.141 using port 23


Session A - T5TADMN1 - [32 x 80]
File Edit View Communication Actions Window Help
17:51:50 Aug 25 17:51:50 omeglnx1 SuSEfirewall2: SuSEfirewall2 not active
17:51:50 eth0
17:51:50 ..doneSetting up service (localfs) network . . . . . .
17:51:50 Starting rpcbind
17:51:51 ..done
17:51:51 Not starting NFS client services - no NFS found in /etc/fstab:..unused
17:51:51 Mount CIFS File Systems ..unused
17:51:51 Starting service gdm
17:51:51 ..done
17:51:51 Starting auditd
17:51:51 ..done
17:51:51 Starting cupsd
17:51:51 ..done
17:51:52 Starting irqbalance ..unused
17:51:52 Setting up (remotefs) network interfaces:
17:51:52 Setting up service (remotefs) network . . . . . .
17:51:52 ..done
17:51:52 Starting Name Service Cache Daemon
17:51:52 Starting mail service (Postfix)
17:51:53 Starting smartd ..unused
17:51:53 Starting SSH daemon..done
17:51:53 ..done
17:51:54 Starting CRON daemon..done
17:51:54 Starting INET services. (xinetd)
17:51:55 ..done
17:51:55 Master Resource Control: runlevel 5 has been reached
17:51:55 Skipped services in runlevel 5: Ý80CÝ43Dnfs smbfs irq_balancer smartd
17:51:55 Welcome to SUSE Linux Enterprise Server 11 (s390x) - Kernel 2.6.27.42-
17:51:55 omeglnx1 login:
OMEGLNX1 (Scroll)
MA a
31/001
Connected to remote server/host 9.39.68.141 using port 23

Scenario D: How Do You Do That?

Console rule in Operations Manager:

```
*
* Watch for shutdown complete message on Linux guest
DEFRULE NAME(LNXDOWN),+
  MATCH(*HCPGIR450%*),+
  USER(OMEGLNX1),+
  ACTION(LNXBKUP)
* Turn off the rule in general
SUSPEND RULE(LNXDOWN)
```

© 2013, 2015 IBM Corporation

Scenario D: How Do You Do That?

Chain of actions in Operations Manager, triggered by schedule

```
*
* Start of guest backup scenario, resume rule for guest shutdown msg
DEFACTN NAME(STOPLNX),+
  COMMAND('RESUME RULE(LNXDOWN)'),+
  ENV(GOM),+
  NEXTACTN(STOPLNXA)
*
* Change SECUSER to Operations Manager before shutting it down
DEFACTN NAME(STOPLNXA),+
  COMMAND(CP SET SECUSER OMEGLNX1 OPMGRM1),+
  ENV(LVM),+
  NEXTACTN(STOPLNXB)
*
* Action to shut down Linux guest in prep for backup
DEFACTN NAME(STOPLNXB),+
  COMMAND(CP SIGNAL SHUTDOWN OMEGLNX1 WITHIN 90),+
  ENV(LVM)
```

© 2013, 2015 IBM Corporation

Scenario D: How Do You Do That?

Chain of actions and rules in Operations Manager:

```
* Highlight message and submit backup job for a specific Linux guest
DEFACTN NAME(LNXBKUP),+
  INPUT(AHI),+
  NEXTACTN(LNXBKUPB)
*
DEFACTN NAME(LNXBKUPB),+
  COMMAND(CP SMSG BKRBKUP SUBMIT BKUPLNX1),+
  ENV(LVM)
*
* Define all Backup Manager workers as a group
DEFGROUP NAME(BKRWRKRS),+
  USER(BKRWRK0*)
*
* Restart Linux guest when Backup is complete
DEFRULE NAME(BKUPDONE),+
  MATCH(*BACKUP COMPLETE - OMEGLNX1*),+
  GROUP(BKRWRKRS),+
  ACTION(STRTLNX)
```

© 2013, 2015 IBM Corporation

Scenario D: How Do You Do That?

Suspend rule in Operations Manager (don't back up the guest every time it is shut down)

```
* Suspend rule for backing up Linux guest
DEFACTN NAME(DELBKUP),+
  COMMAND(SUSPEND RULE(LNXDOWN)),+
  ENV(GOM)
```

© 2013, 2015 IBM Corporation

Scenario E: Suspend and Resume a Linux Guest

- From DEMOADMN, view the console of the Linux guest

```
gomcmd opmgrm1 viewcon user(rhel6d)
```

- From MAINT, suspend a Linux guest using CP SIGNAL SHUTDOWN

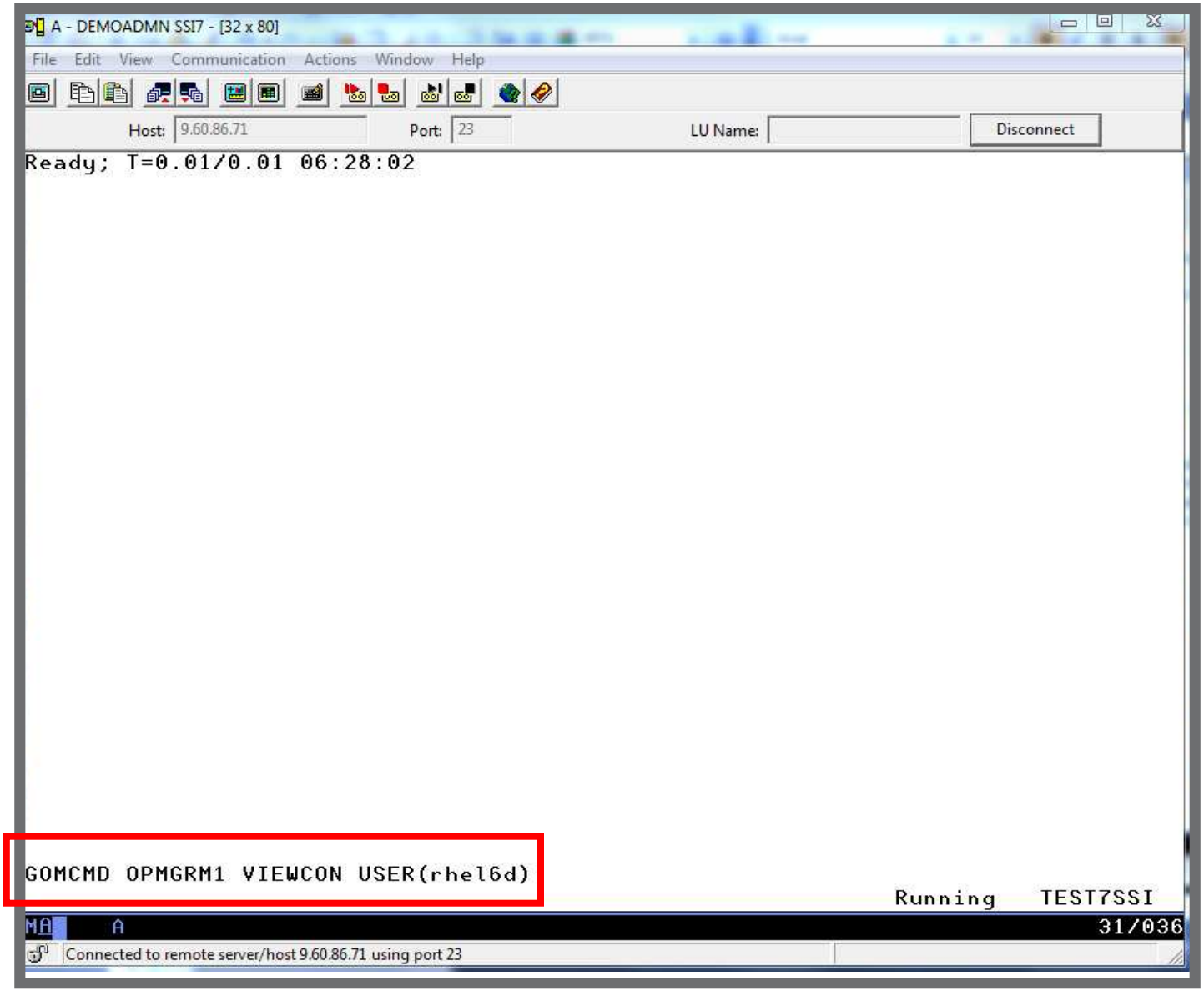
```
cp signal shutdown rhel6d within 90
```

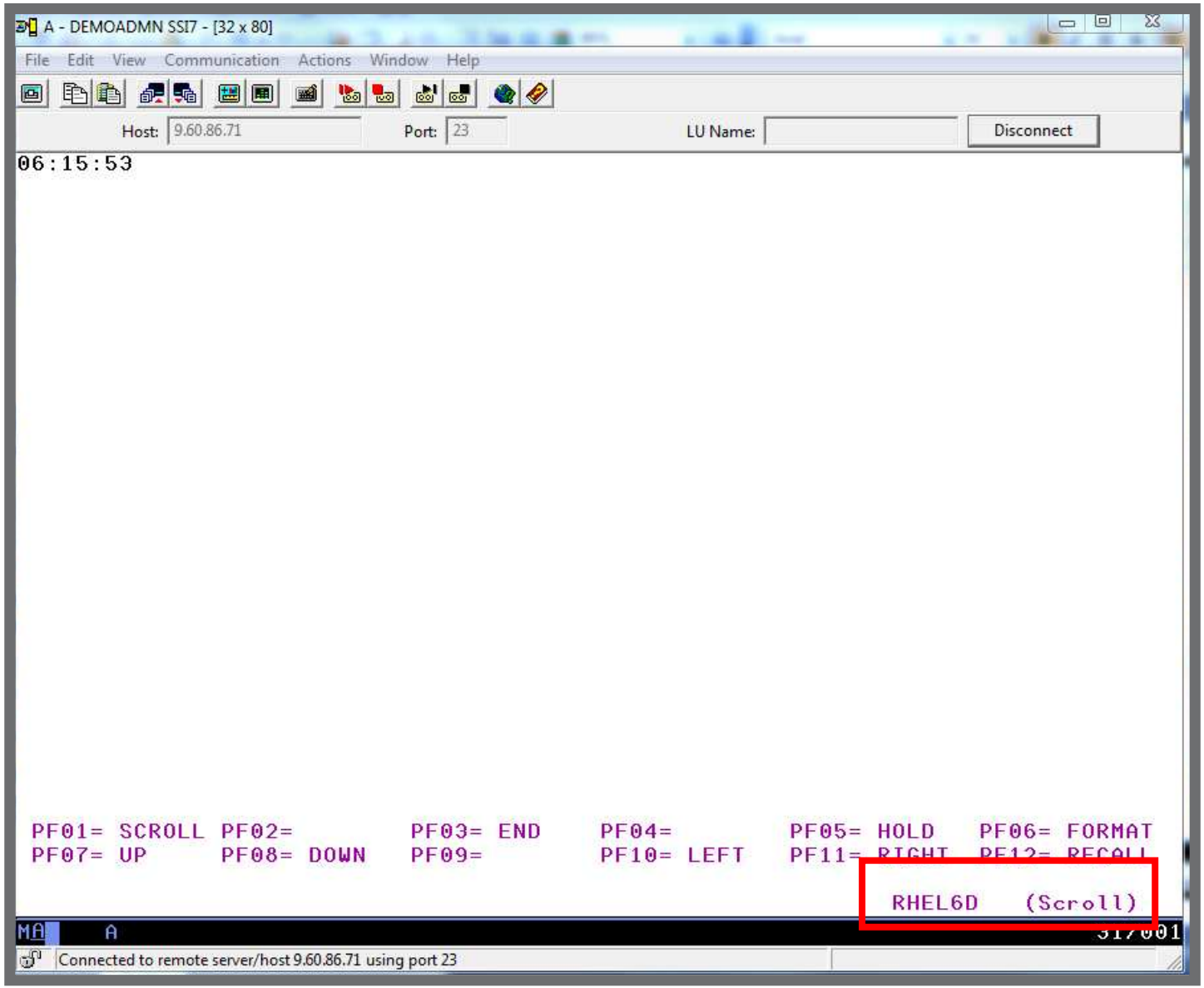
- On DEMOADMN, note the guest suspending and logging off
- From MAINT, resume a Linux guest

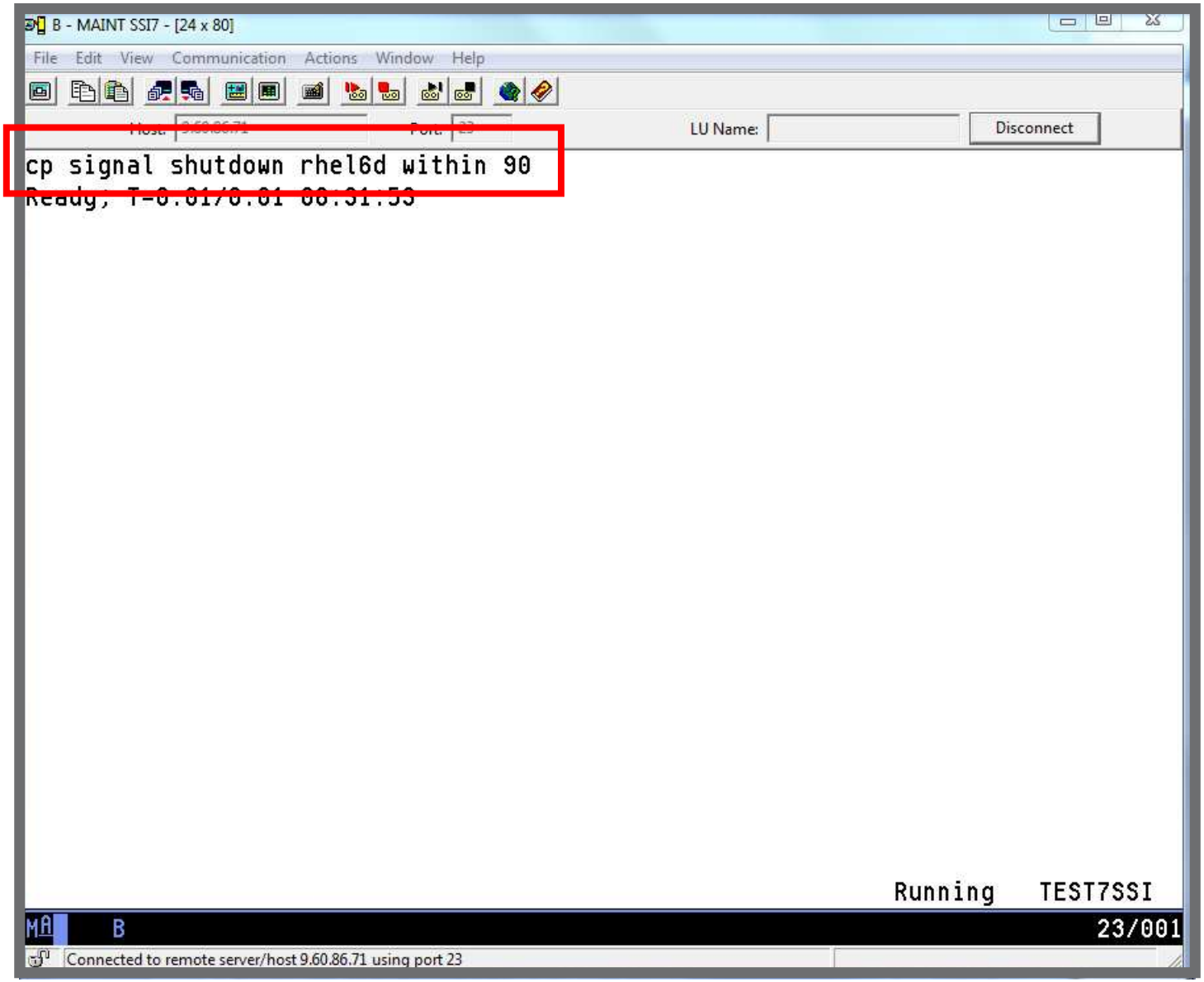
```
cp xautolog rhel6d
```

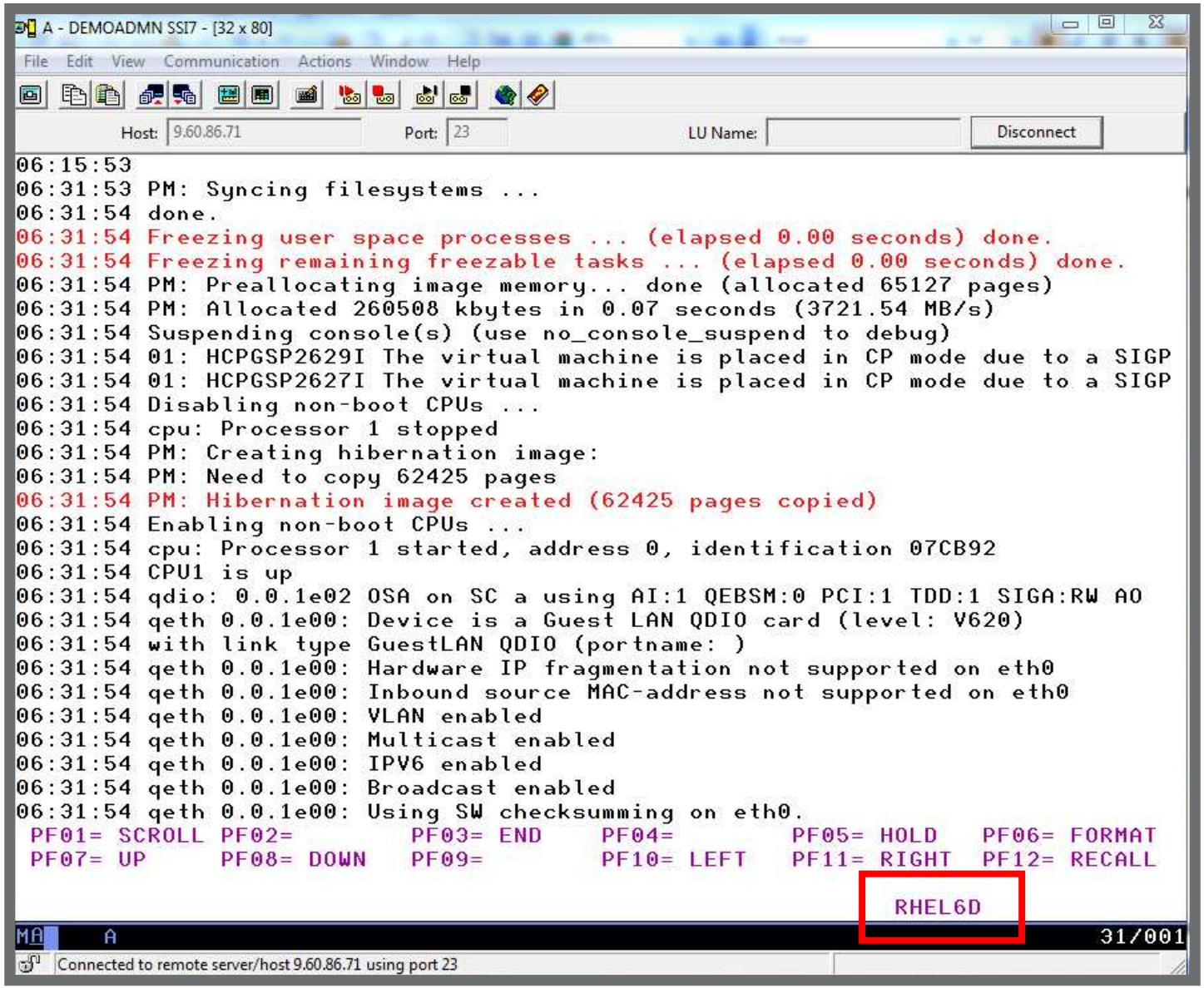
- On DEMOADMN, note the guest resuming

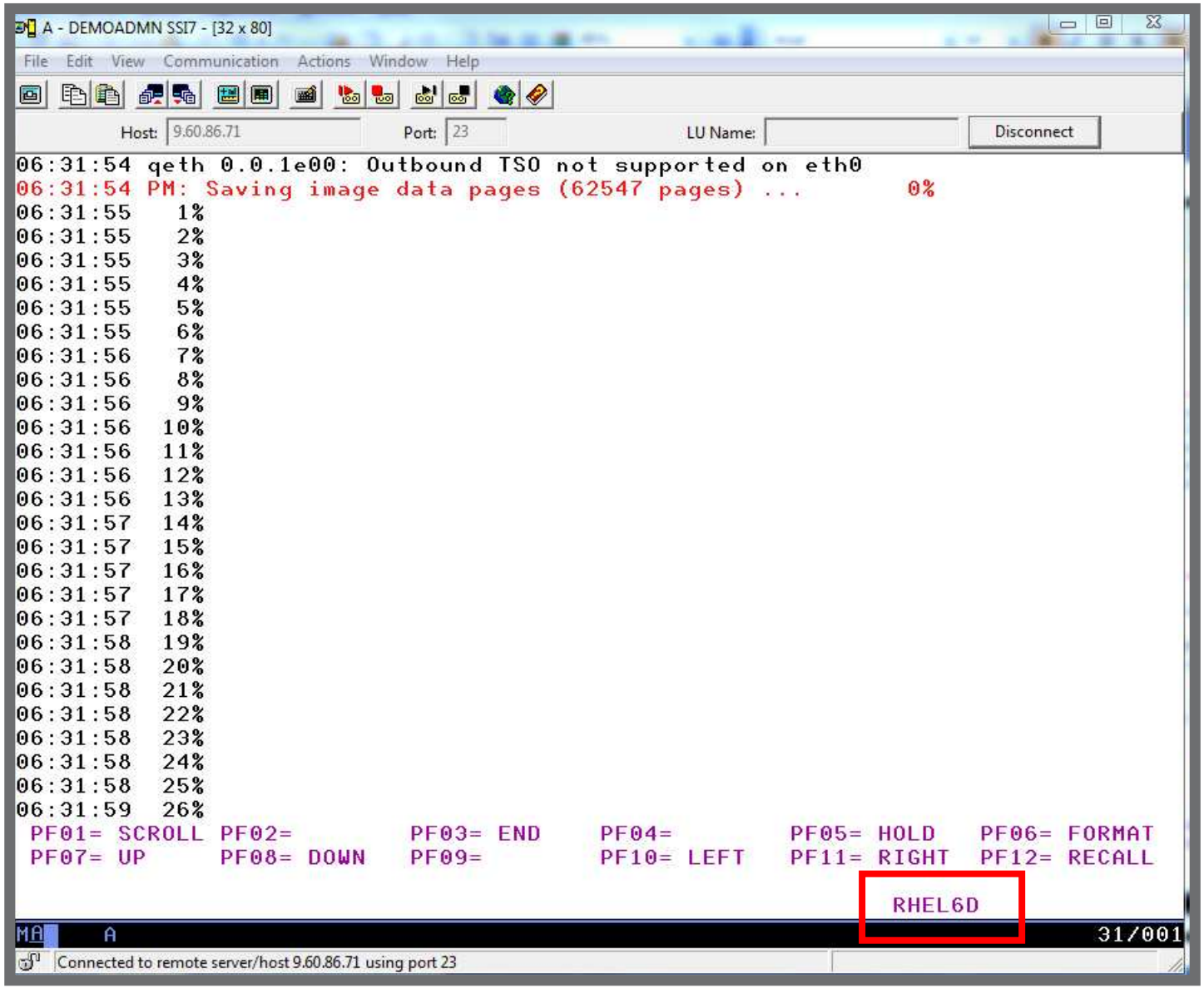
© 2013, 2015 IBM Corporation

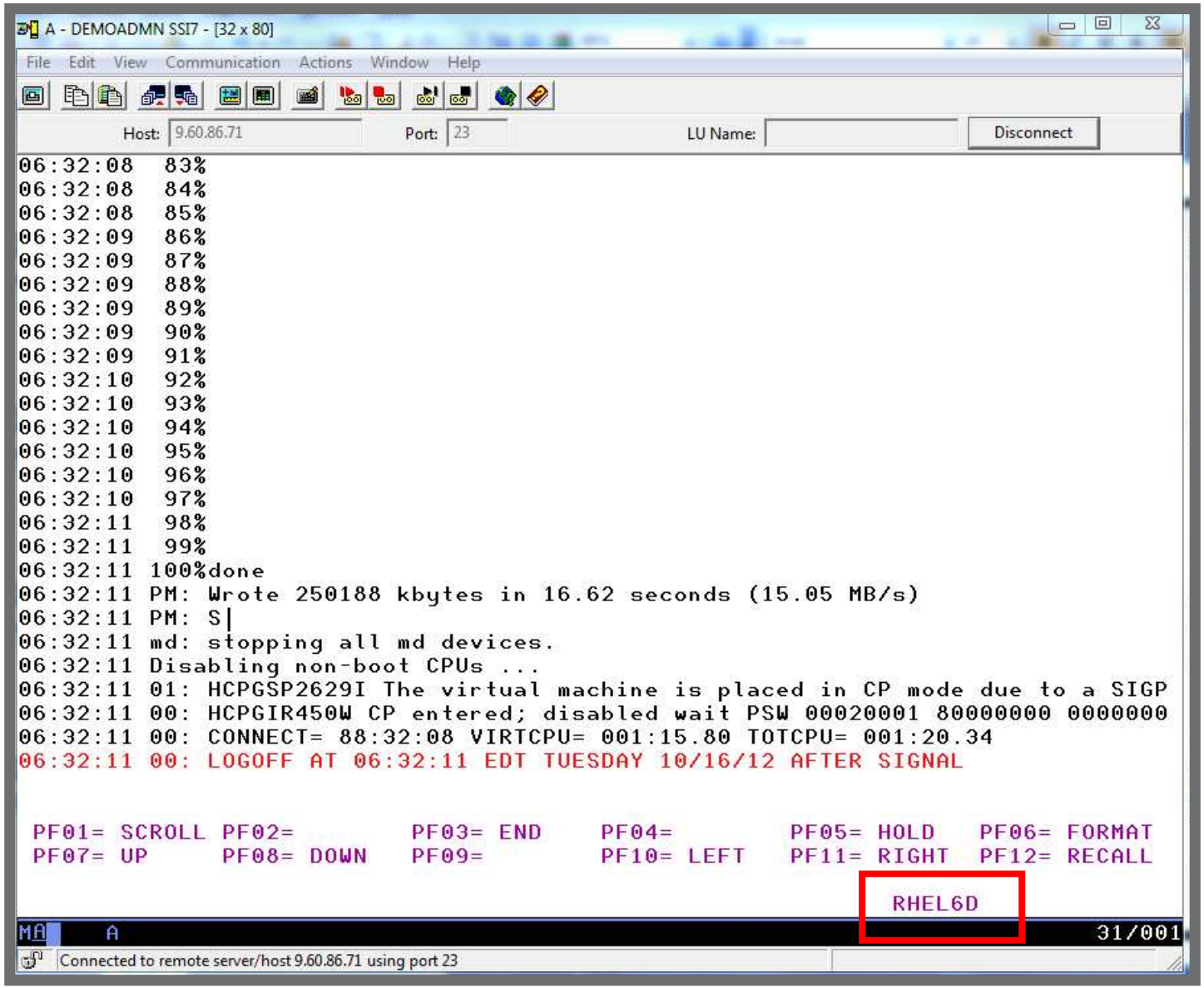

A - DEMOADMN SSI7 - [32 x 80]
File Edit View Communication Actions Window Help
Host: 9.60.86.71
Port: 23
LU Name:
Disconnect
Ready; T=0.01/0.01 06:28:02
GOMCMD OPMGRM1 VIEWCON USER(rhel6d)
Running TEST7SSI
MA A
31/036
Connected to remote server/host 9.60.86.71 using port 23

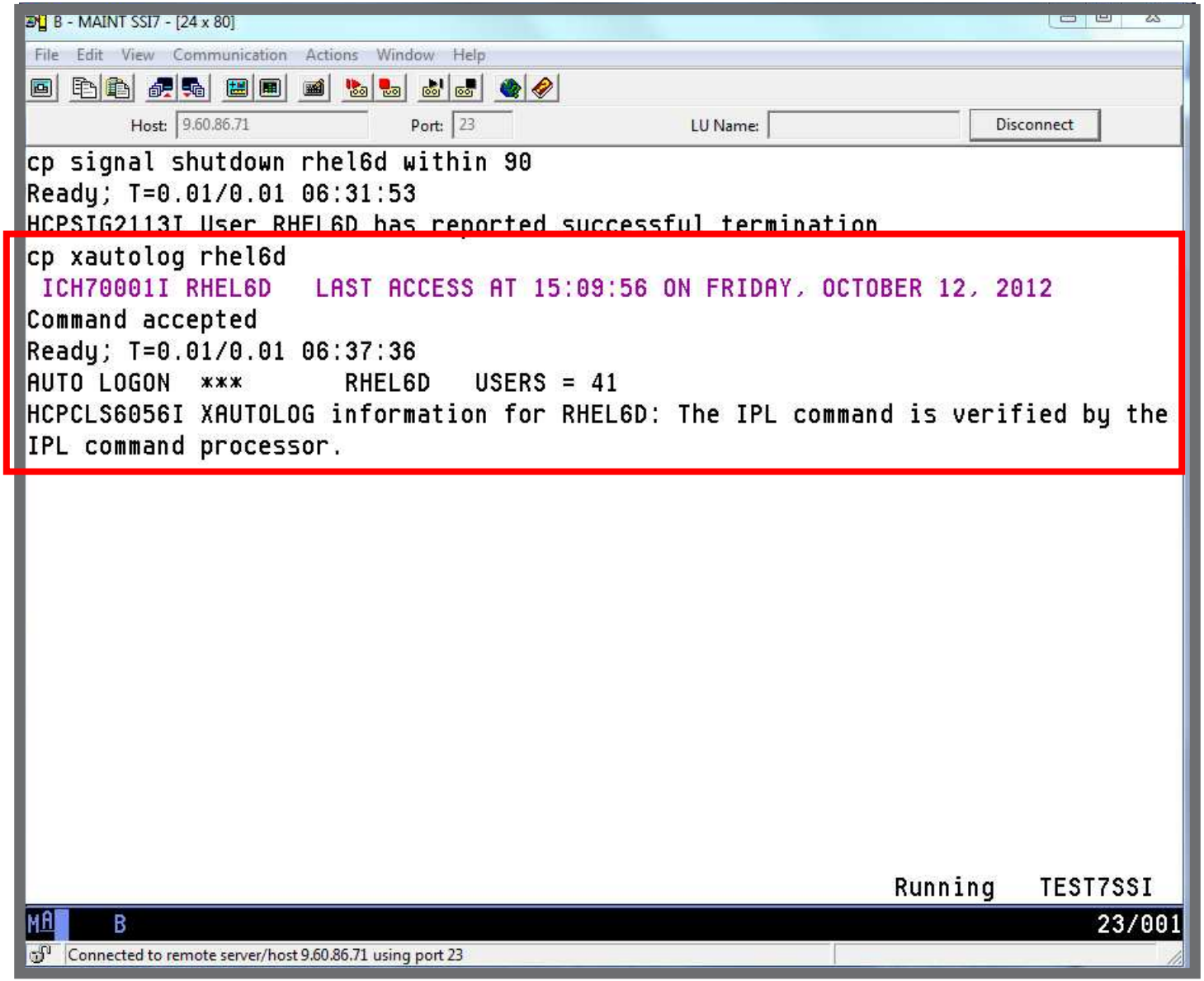

A - DEMOADMN SSI7 - [32 x 80]
File Edit View Communication Actions Window Help
Host: 9.60.86.71
Port: 23
LU Name:
Disconnect
06:15:53
PF01= SCROLL PF02= PF03= END PF04= PF05= HOLD PF06= FORMAT
PF07= UP PF08= DOWN PF09= PF10= LEFT PF11= RIGHT PF12= RECALL
RHEL6D (Scroll)
MA A
317/001
Connected to remote server/host 9.60.86.71 using port 23

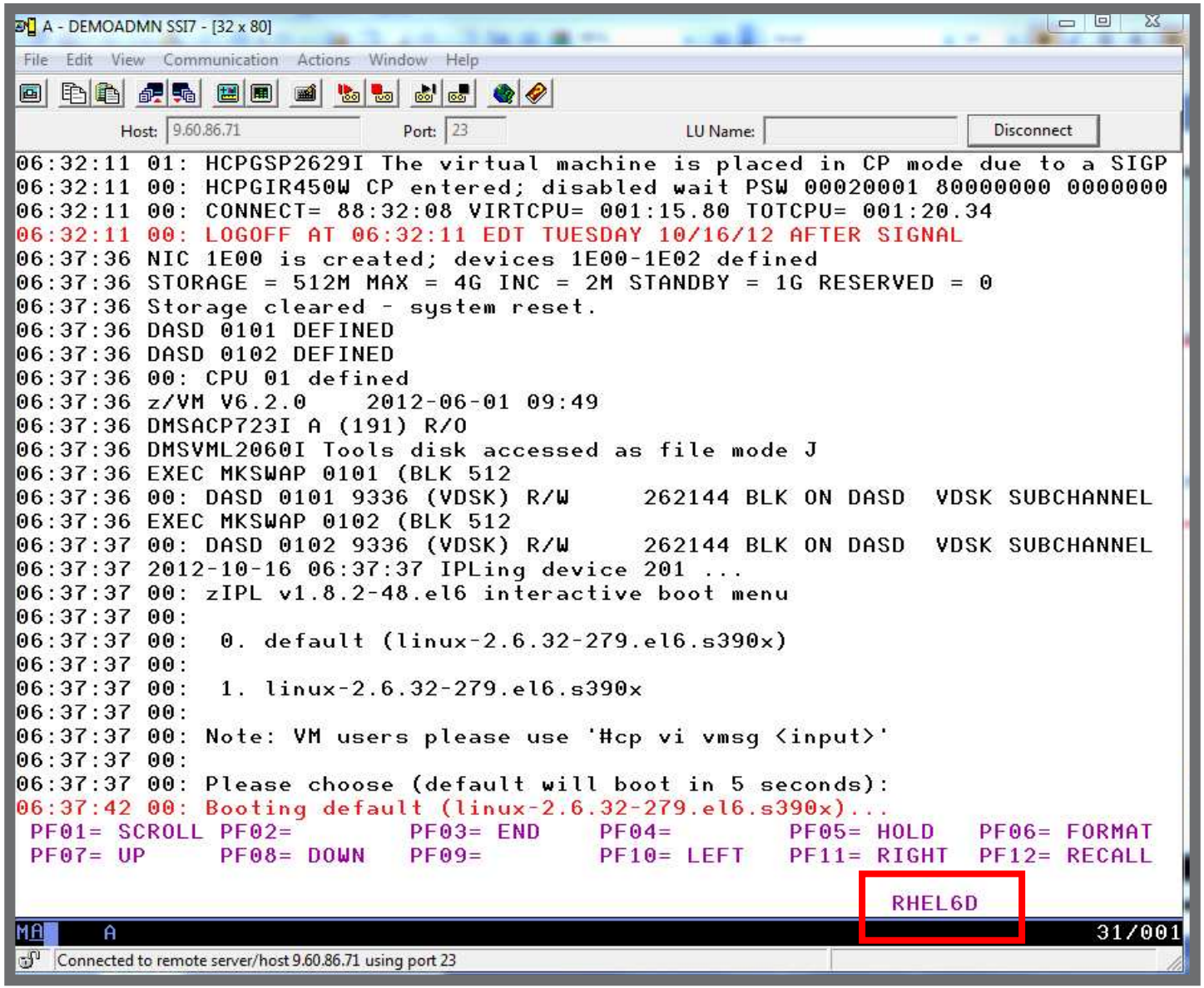

B - MAINT SSI7 - [24 x 80]
File Edit View Communication Actions Window Help
LU Name:
Disconnect
cp signal shutdown rhel6d within 90
Ready; T=0.01/0.01 08:31:53
Running TEST7SSI
MA B 23/001
Connected to remote server/host 9.60.86.71 using port 23

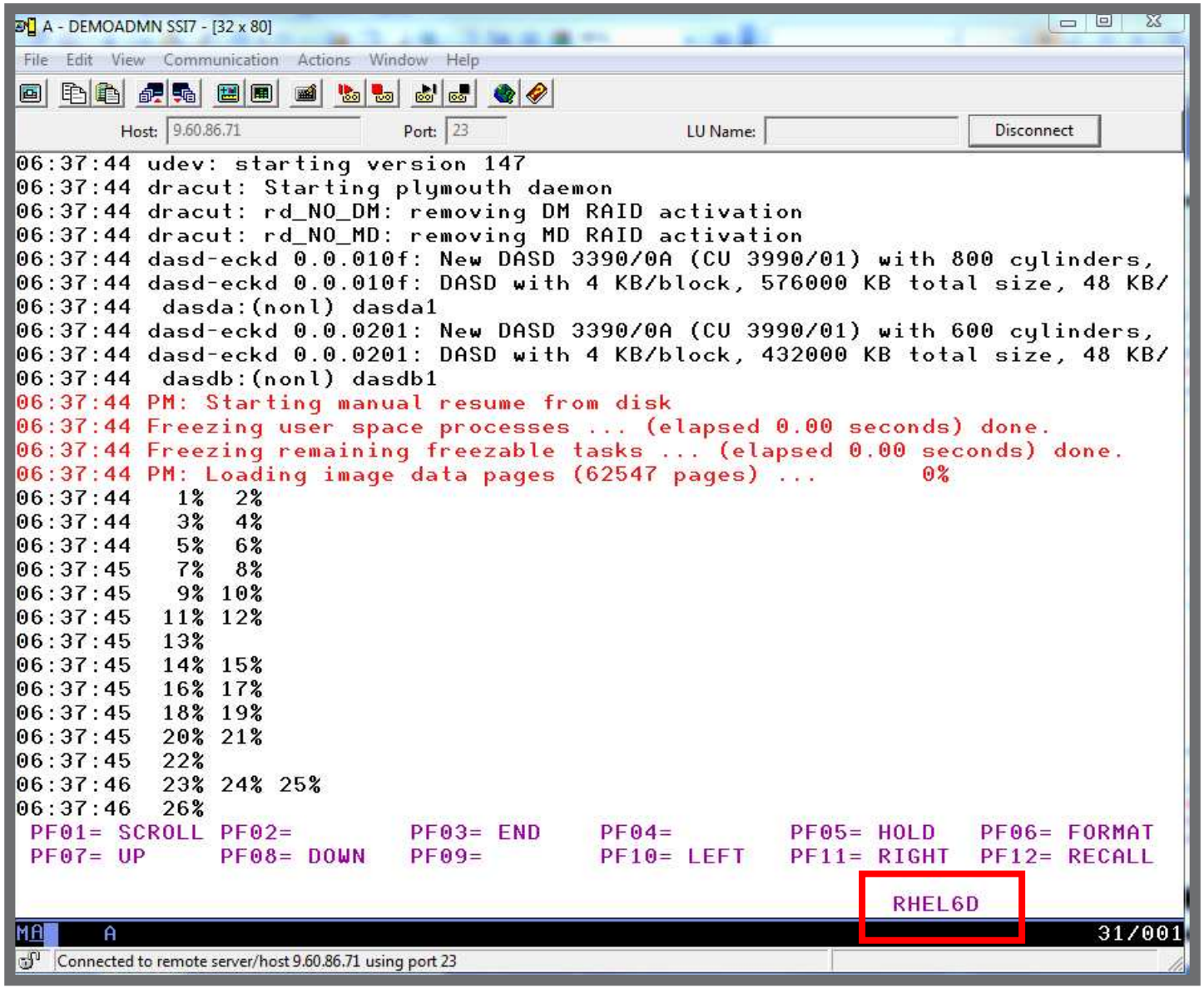

A - DEMOADMN SSI7 - [32 x 80]
File Edit View Communication Actions Window Help
Host: 9.60.86.71 Port: 23 LU Name: Disconnect
06:15:53
06:31:53 PM: Syncing filesystems ...
06:31:54 done.
06:31:54 Freezing user space processes ... (elapsed 0.00 seconds) done.
06:31:54 Freezing remaining freezable tasks ... (elapsed 0.00 seconds) done.
06:31:54 PM: Preallocating image memory... done (allocated 65127 pages)
06:31:54 PM: Allocated 260508 kbytes in 0.07 seconds (3721.54 MB/s)
06:31:54 Suspending console(s) (use no_console_suspend to debug)
06:31:54 01: HCPGSP2629I The virtual machine is placed in CP mode due to a SIGP
06:31:54 01: HCPGSP2627I The virtual machine is placed in CP mode due to a SIGP
06:31:54 Disabling non-boot CPUs ...
06:31:54 cpu: Processor 1 stopped
06:31:54 PM: Creating hibernation image:
06:31:54 PM: Need to copy 62425 pages
06:31:54 PM: Hibernation image created (62425 pages copied)
06:31:54 Enabling non-boot CPUs ...
06:31:54 cpu: Processor 1 started, address 0, identification 07CB92
06:31:54 CPU1 is up
06:31:54 qdio: 0.0.1e02 OSA on SC a using AI:1 QEBSM:0 PCI:1 TDD:1 SIGA:RW AO
06:31:54 qeth 0.0.1e00: Device is a Guest LAN QDIO card (level: V620)
06:31:54 with link type GuestLAN QDIO (portname:)
06:31:54 qeth 0.0.1e00: Hardware IP fragmentation not supported on eth0
06:31:54 qeth 0.0.1e00: Inbound source MAC-address not supported on eth0
06:31:54 qeth 0.0.1e00: VLAN enabled
06:31:54 qeth 0.0.1e00: Multicast enabled
06:31:54 qeth 0.0.1e00: IPV6 enabled
06:31:54 qeth 0.0.1e00: Broadcast enabled
06:31:54 qeth 0.0.1e00: Using SW checksumming on eth0.
PF01= SCROLL PF02= PF03= END PF04= PF05= HOLD PF06= FORMAT
PF07= UP PF08= DOWN PF09= PF10= LEFT PF11= RIGHT PF12= RECALL
RHEL6D
MA A 31/001
Connected to remote server/host 9.60.86.71 using port 23

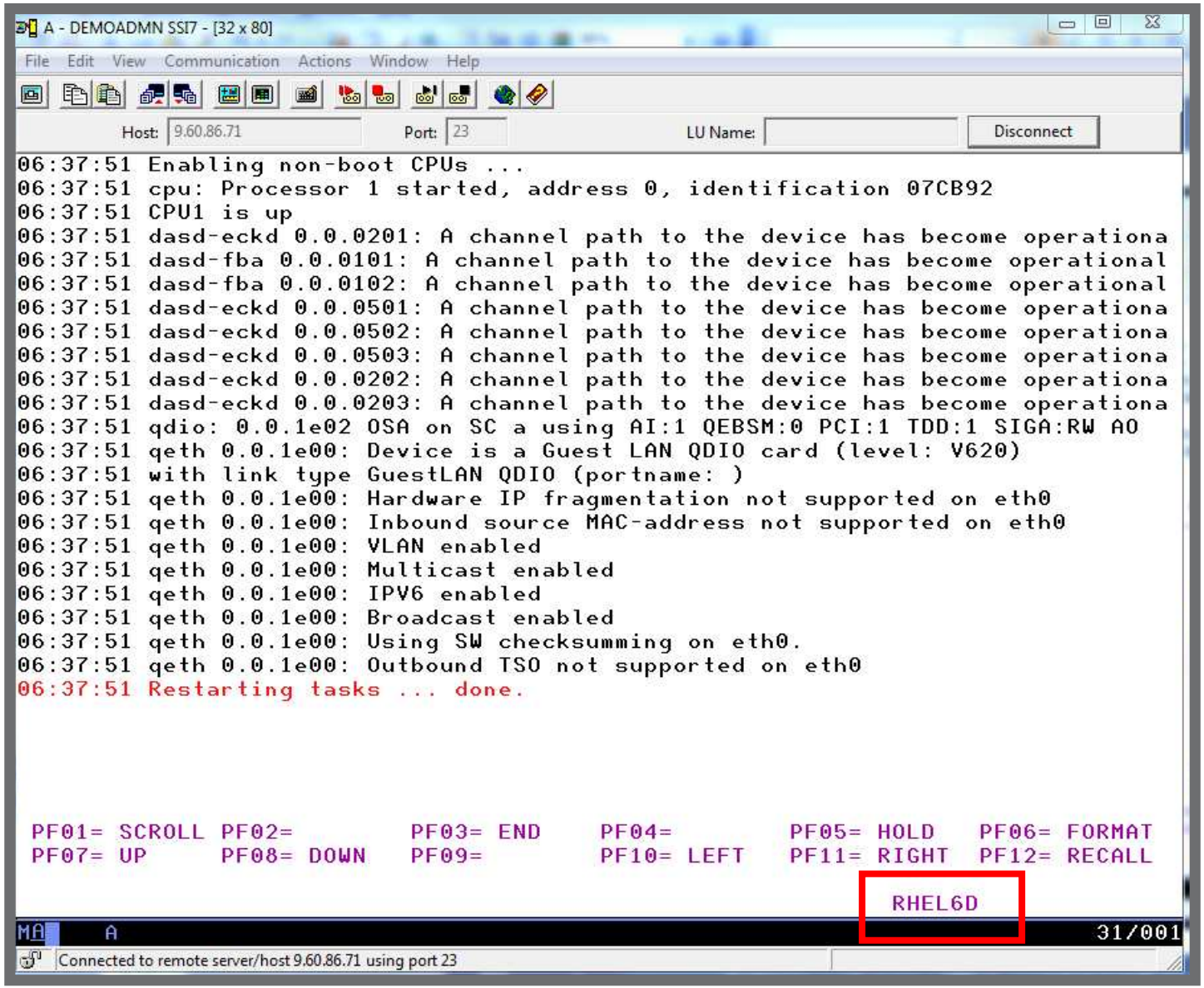

A - DEMOADMN SSI7 - [32 x 80]
File Edit View Communication Actions Window Help
Host: 9.60.86.71 Port: 23 LU Name: Disconnect
06:31:54 qeth 0.0.1e00: Outbound TSO not supported on eth0
06:31:54 PM: Saving image data pages (62547 pages) ... 0%
06:31:55 1%
06:31:55 2%
06:31:55 3%
06:31:55 4%
06:31:55 5%
06:31:55 6%
06:31:56 7%
06:31:56 8%
06:31:56 9%
06:31:56 10%
06:31:56 11%
06:31:56 12%
06:31:56 13%
06:31:57 14%
06:31:57 15%
06:31:57 16%
06:31:57 17%
06:31:57 18%
06:31:58 19%
06:31:58 20%
06:31:58 21%
06:31:58 22%
06:31:58 23%
06:31:58 24%
06:31:58 25%
06:31:59 26%
PF01= SCROLL PF02= PF03= END PF04= PF05= HOLD PF06= FORMAT
PF07= UP PF08= DOWN PF09= PF10= LEFT PF11= RIGHT PF12= RECALL
RHEL6D
MA A 31/001
Connected to remote server/host 9.60.86.71 using port 23


A - DEMOADMN SSI7 - [32 x 80]
File Edit View Communication Actions Window Help
Host: 9.60.86.71
Port: 23
LU Name:
Disconnect
06:32:08 83%
06:32:08 84%
06:32:08 85%
06:32:09 86%
06:32:09 87%
06:32:09 88%
06:32:09 89%
06:32:09 90%
06:32:09 91%
06:32:10 92%
06:32:10 93%
06:32:10 94%
06:32:10 95%
06:32:10 96%
06:32:10 97%
06:32:11 98%
06:32:11 99%
06:32:11 100%done
06:32:11 PM: Wrote 250188 kbytes in 16.62 seconds (15.05 MB/s)
06:32:11 PM: S
06:32:11 md: stopping all md devices.
06:32:11 Disabling non-boot CPUs ...
06:32:11 01: HCPGSP2629I The virtual machine is placed in CP mode due to a SIGP
06:32:11 00: HCPGIR450W CP entered; disabled wait PSW 00020001 80000000 0000000
06:32:11 00: CONNECT= 88:32:08 VIRTCPU= 001:15.80 TOTCPU= 001:20.34
06:32:11 00: LOGOFF AT 06:32:11 EDT TUESDAY 10/16/12 AFTER SIGNAL
PF01= SCROLL PF02= PF03= END PF04= PF05= HOLD PF06= FORMAT
PF07= UP PF08= DOWN PF09= PF10= LEFT PF11= RIGHT PF12= RECALL
RHEL6D
MA A 31/001
Connected to remote server/host 9.60.86.71 using port 23


B - MAINT SSI7 - [24 x 80]
File Edit View Communication Actions Window Help
Host: 9.60.86.71
Port: 23
LU Name:
Disconnect
cp signal shutdown rhel6d within 90
Ready; T=0.01/0.01 06:31:53
HCPSIG2113I User RHEL6D has reported successful termination
cp xautolog rhel6d
ICH70001I RHEL6D LAST ACCESS AT 15:09:56 ON FRIDAY, OCTOBER 12, 2012
Command accepted
Ready; T=0.01/0.01 06:37:36
AUTO LOGON *** RHEL6D USERS = 41
HCPCLS6056I XAUTOLOG information for RHEL6D: The IPL command is verified by the
IPL command processor.
Running TEST7SSI
MA B 23/001
Connected to remote server/host 9.60.86.71 using port 23


A - DEMOADMN SSI7 - [32 x 80]
File Edit View Communication Actions Window Help
Host: 9.60.86.71 Port: 23 LU Name: Disconnect
06:32:11 01: HCPGSP2629I The virtual machine is placed in CP mode due to a SIGP
06:32:11 00: HCPGIR450W CP entered; disabled wait PSW 00020001 80000000 0000000
06:32:11 00: CONNECT= 88:32:08 VIRTCPU= 001:15.80 TOTCPU= 001:20.34
06:32:11 00: LOGOFF AT 06:32:11 EDT TUESDAY 10/16/12 AFTER SIGNAL
06:37:36 NIC 1E00 is created; devices 1E00-1E02 defined
06:37:36 STORAGE = 512M MAX = 4G INC = 2M STANDBY = 1G RESERVED = 0
06:37:36 Storage cleared - system reset.
06:37:36 DASD 0101 DEFINED
06:37:36 DASD 0102 DEFINED
06:37:36 00: CPU 01 defined
06:37:36 z/VM V6.2.0 2012-06-01 09:49
06:37:36 DMSACP723I A (191) R/O
06:37:36 DMSVML2060I Tools disk accessed as file mode J
06:37:36 EXEC MKSWAP 0101 (BLK 512
06:37:36 00: DASD 0101 9336 (VDSK) R/W 262144 BLK ON DASD VDSK SUBCHANNEL
06:37:36 EXEC MKSWAP 0102 (BLK 512
06:37:37 00: DASD 0102 9336 (VDSK) R/W 262144 BLK ON DASD VDSK SUBCHANNEL
06:37:37 2012-10-16 06:37:37 IPLing device 201 ...
06:37:37 00: zIPL v1.8.2-48.el6 interactive boot menu
06:37:37 00:
06:37:37 00: 0. default (linux-2.6.32-279.el6.s390x)
06:37:37 00:
06:37:37 00: 1. linux-2.6.32-279.el6.s390x
06:37:37 00:
06:37:37 00: Note: VM users please use '#cp vi vmsg <input>'
06:37:37 00:
06:37:37 00: Please choose (default will boot in 5 seconds):
06:37:42 00: Booting default (linux-2.6.32-279.el6.s390x)...
PF01= SCROLL PF02= PF03= END PF04= PF05= HOLD PF06= FORMAT
PF07= UP PF08= DOWN PF09= PF10= LEFT PF11= RIGHT PF12= RECALL
RHEL6D
MA A 31/001
Connected to remote server/host 9.60.86.71 using port 23


A - DEMOADMN SSI7 - [32 x 80]
File Edit View Communication Actions Window Help
Host: 9.60.86.71 Port: 23 LU Name: Disconnect
06:37:44 udev: starting version 147
06:37:44 dracut: Starting plymouth daemon
06:37:44 dracut: rd_NO_DM: removing DM RAID activation
06:37:44 dracut: rd_NO_MD: removing MD RAID activation
06:37:44 dasd-eckd 0.0.010f: New DASD 3390/0A (CU 3990/01) with 800 cylinders,
06:37:44 dasd-eckd 0.0.010f: DASD with 4 KB/block, 576000 KB total size, 48 KB/
06:37:44 dasda:(nonl) dasda1
06:37:44 dasd-eckd 0.0.0201: New DASD 3390/0A (CU 3990/01) with 600 cylinders,
06:37:44 dasd-eckd 0.0.0201: DASD with 4 KB/block, 432000 KB total size, 48 KB/
06:37:44 dasdb:(nonl) dasdb1
06:37:44 PM: Starting manual resume from disk
06:37:44 Freezing user space processes ... (elapsed 0.00 seconds) done.
06:37:44 Freezing remaining freezable tasks ... (elapsed 0.00 seconds) done.
06:37:44 PM: Loading image data pages (62547 pages) ... 0%
06:37:44 1% 2%
06:37:44 3% 4%
06:37:44 5% 6%
06:37:45 7% 8%
06:37:45 9% 10%
06:37:45 11% 12%
06:37:45 13%
06:37:45 14% 15%
06:37:45 16% 17%
06:37:45 18% 19%
06:37:45 20% 21%
06:37:45 22%
06:37:46 23% 24% 25%
06:37:46 26%
PF01= SCROLL PF02= PF03= END PF04= PF05= HOLD PF06= FORMAT
PF07= UP PF08= DOWN PF09= PF10= LEFT PF11= RIGHT PF12= RECALL
RHEL6D
MA A 31/001
Connected to remote server/host 9.60.86.71 using port 23


A - DEMOADMN SSI7 - [32 x 80]
File Edit View Communication Actions Window Help
Host: 9.60.86.71
Port: 23
LU Name:
Disconnect
06:37:51 Enabling non-boot CPUs ...
06:37:51 cpu: Processor 1 started, address 0, identification 07CB92
06:37:51 CPU1 is up
06:37:51 dasd-eckd 0.0.0201: A channel path to the device has become operationa
06:37:51 dasd-fba 0.0.0101: A channel path to the device has become operational
06:37:51 dasd-fba 0.0.0102: A channel path to the device has become operational
06:37:51 dasd-eckd 0.0.0501: A channel path to the device has become operationa
06:37:51 dasd-eckd 0.0.0502: A channel path to the device has become operationa
06:37:51 dasd-eckd 0.0.0503: A channel path to the device has become operationa
06:37:51 dasd-eckd 0.0.0202: A channel path to the device has become operationa
06:37:51 dasd-eckd 0.0.0203: A channel path to the device has become operationa
06:37:51 qdio: 0.0.1e02 OSA on SC a using AI:1 QEBSM:0 PCI:1 TDD:1 SIGA:RW A0
06:37:51 qeth 0.0.1e00: Device is a Guest LAN QDIO card (level: V620)
06:37:51 with link type GuestLAN QDIO (portname:)
06:37:51 qeth 0.0.1e00: Hardware IP fragmentation not supported on eth0
06:37:51 qeth 0.0.1e00: Inbound source MAC-address not supported on eth0
06:37:51 qeth 0.0.1e00: VLAN enabled
06:37:51 qeth 0.0.1e00: Multicast enabled
06:37:51 qeth 0.0.1e00: IPV6 enabled
06:37:51 qeth 0.0.1e00: Broadcast enabled
06:37:51 qeth 0.0.1e00: Using SW checksumming on eth0.
06:37:51 qeth 0.0.1e00: Outbound TSO not supported on eth0
06:37:51 Restarting tasks ... done.
PF01= SCROLL PF02= PF03= END PF04= PF05= HOLD PF06= FORMAT
PF07= UP PF08= DOWN PF09= PF10= LEFT PF11= RIGHT PF12= RECALL
RHEL6D
MA A 31/001
Connected to remote server/host 9.60.86.71 using port 23

Scenario E: How Do You Do That?

- Define swap space in /etc/fstab

```
/dev/disk/by-path/ccw-0.0.010f-part1 swap
```

- Enable suspend/resume and define swap space to use for it in zipl.conf

```
resume=/dev/disk/by-path/ccw-0.0.010f-part1
```

- Define suspend as response to signal shutdown (via control-alt-delete.conf)

```
script
/bin/echo disk > /sys/power/state || /sbin/shutdown -h -t 4 now
end script
```

© 2013, 2015 IBM Corporation

Scenario F: Reviewing a Disaster Recovery Backup

- Create a backup job based on sample provided
- Perform image backup of DASD volumes for Disaster Recovery (DR) purposes
  - Can include z/VM and Linux guests
- Output of backup is a DDR tape
  - Compatible with DDR for restore at recovery site
- Submit DR job for review
- Review output of review processing

© 2013, 2015 IBM Corporation

Scenario F: Detailed Steps

- From an authorized z/VM user ID, copy the sample DDR template from the sample disk to a new backup job
- Edit the new job and make necessary changes

```
xedit ddrdemo template c
```

- If not using SFS for templates disk, tell Backup Manager to reaccess the disk

```
smsg bkrbkup cms acc 199 e/e
```

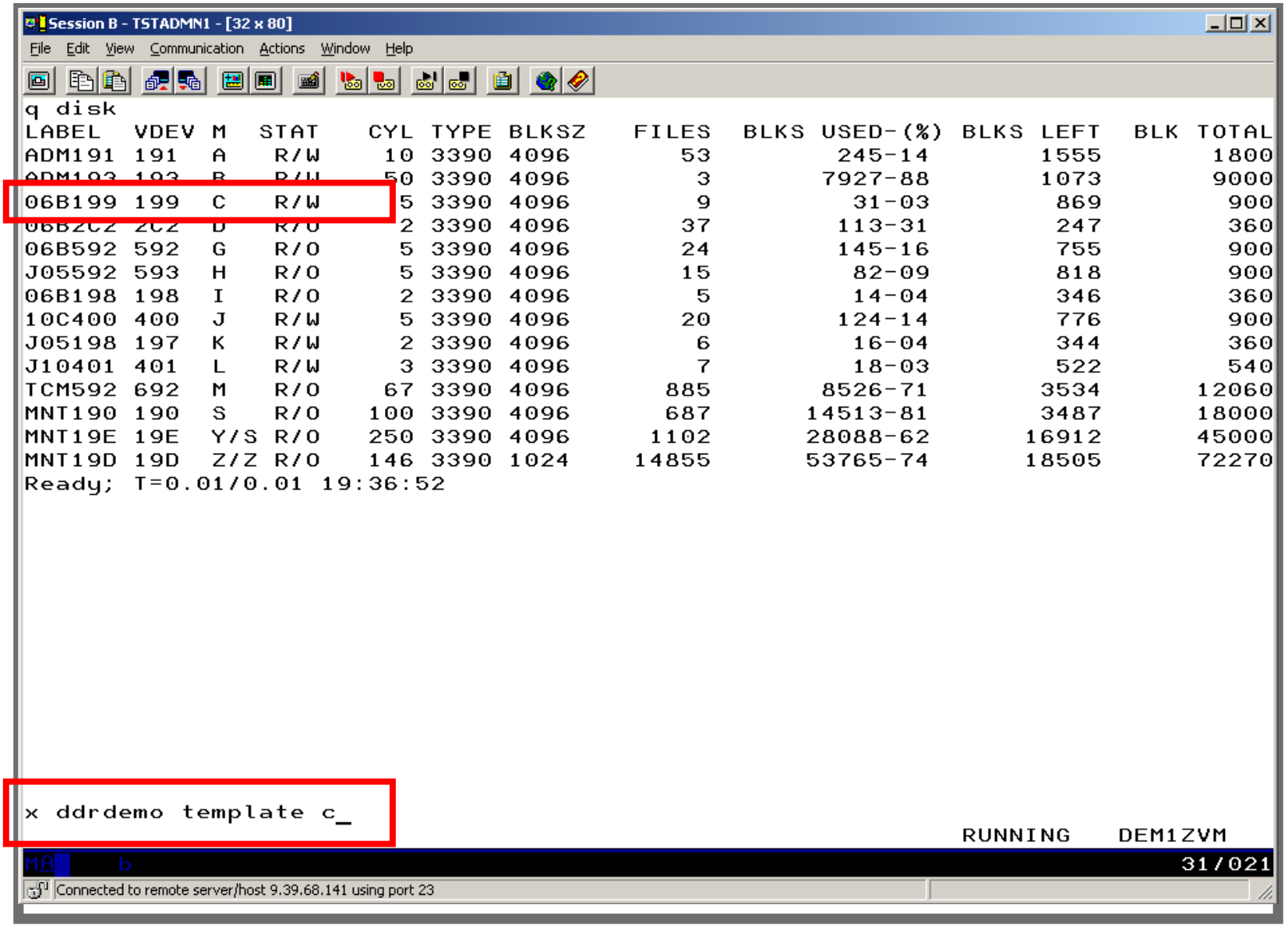
- From an authorized z/VM user ID, submit the backup job for review processing

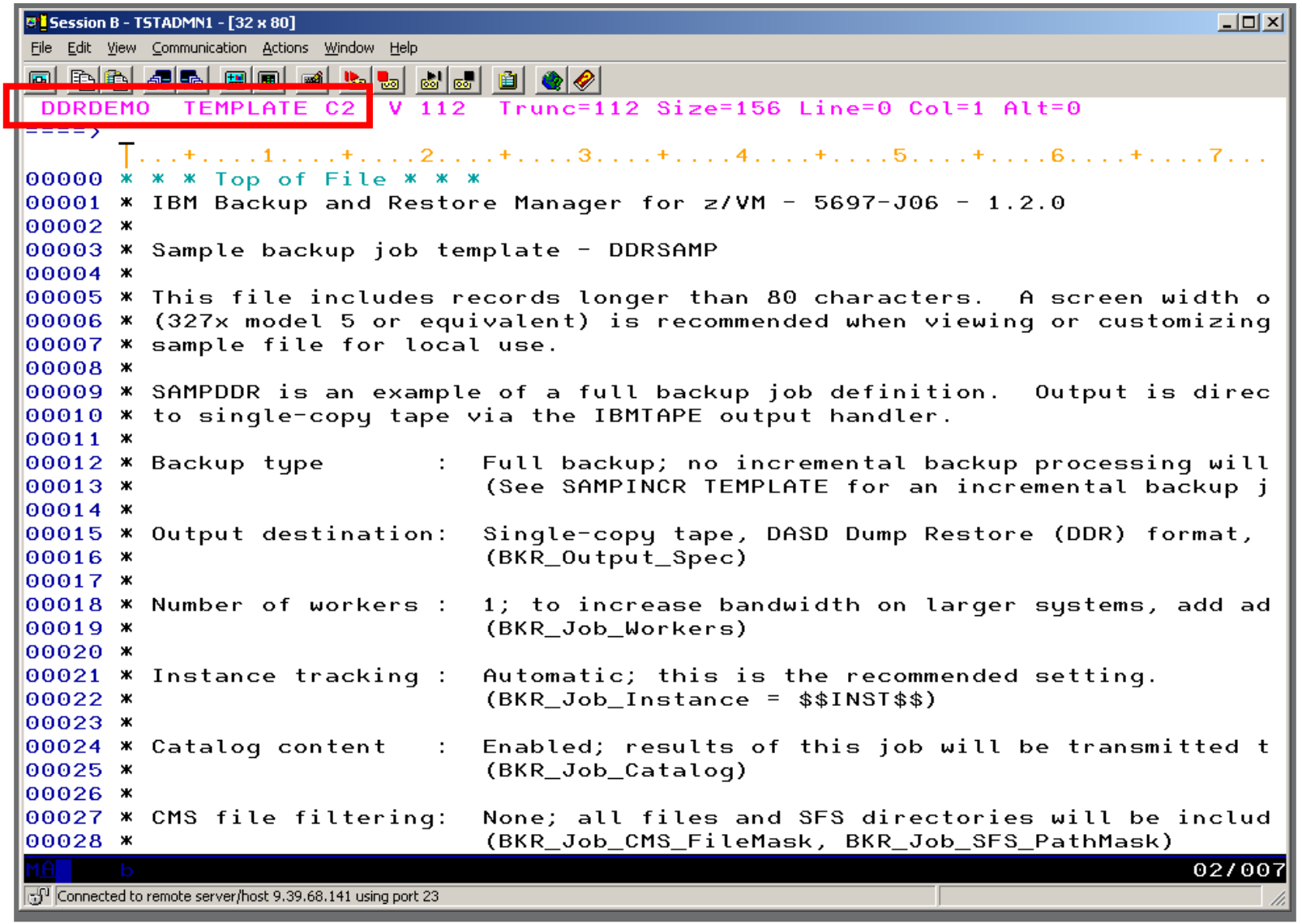
```
smsg bkrbkup review ddrdemo
```

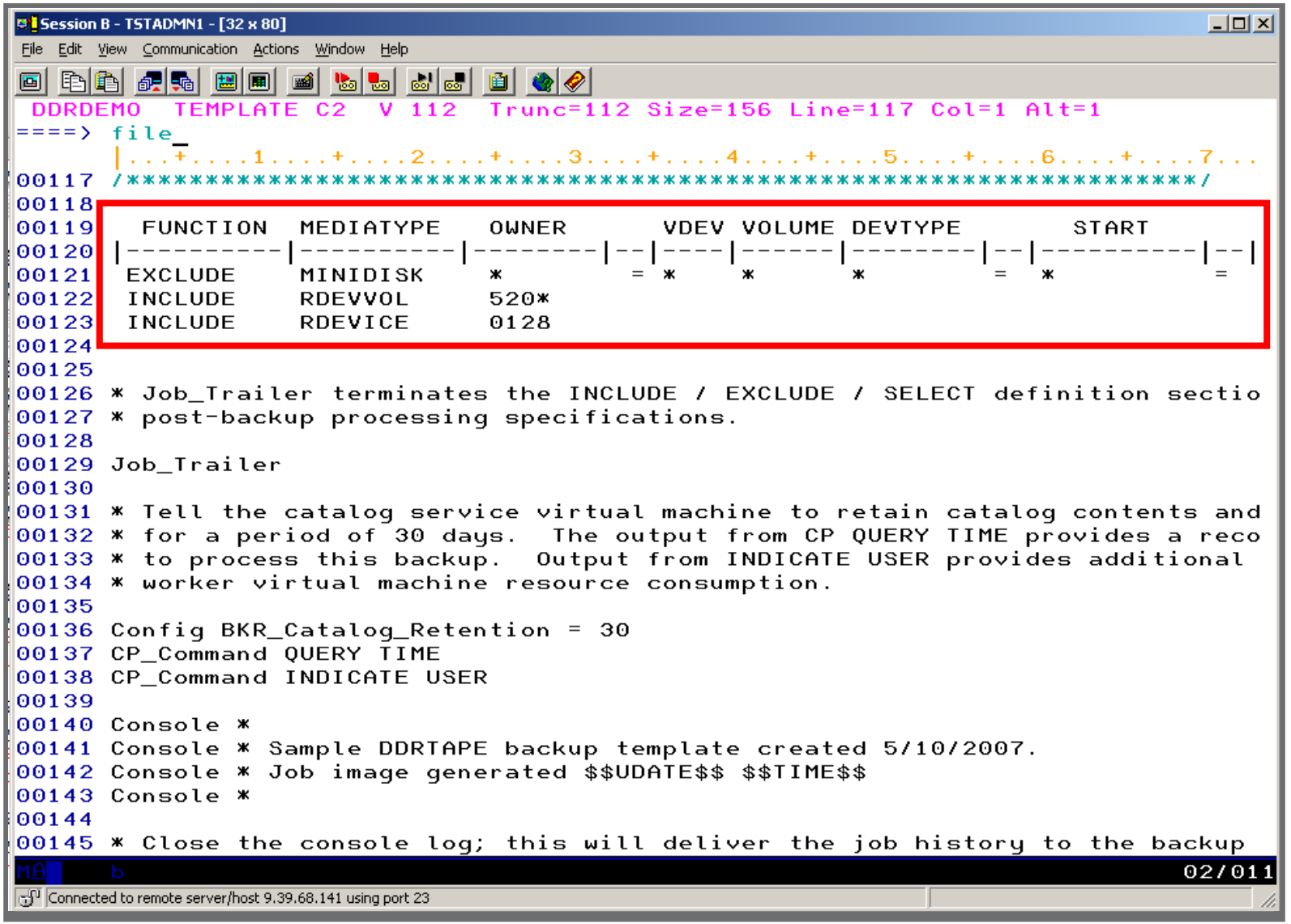
- View the file(s) returned to you by Backup Manager

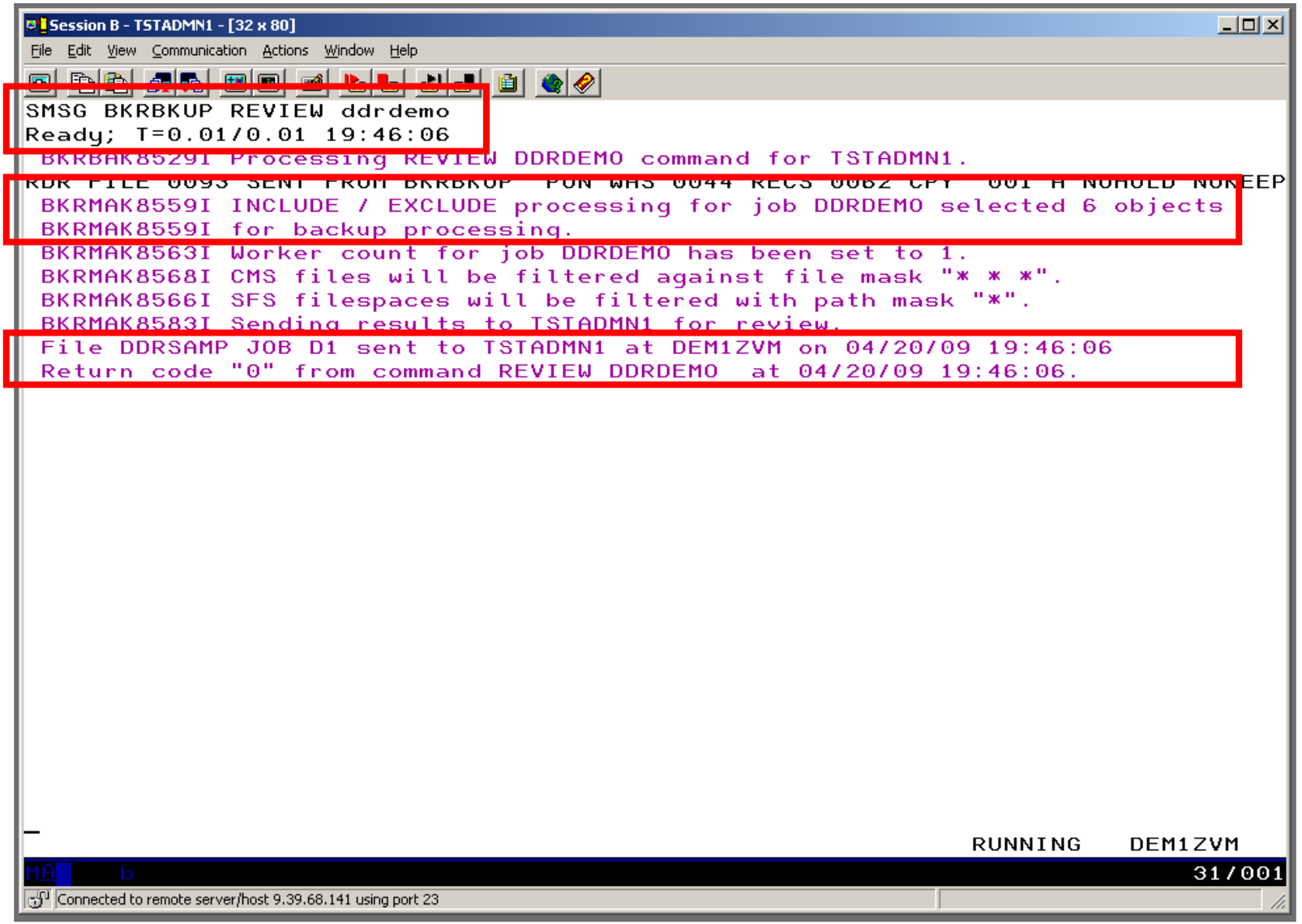
```
peek <rdrfile>
```

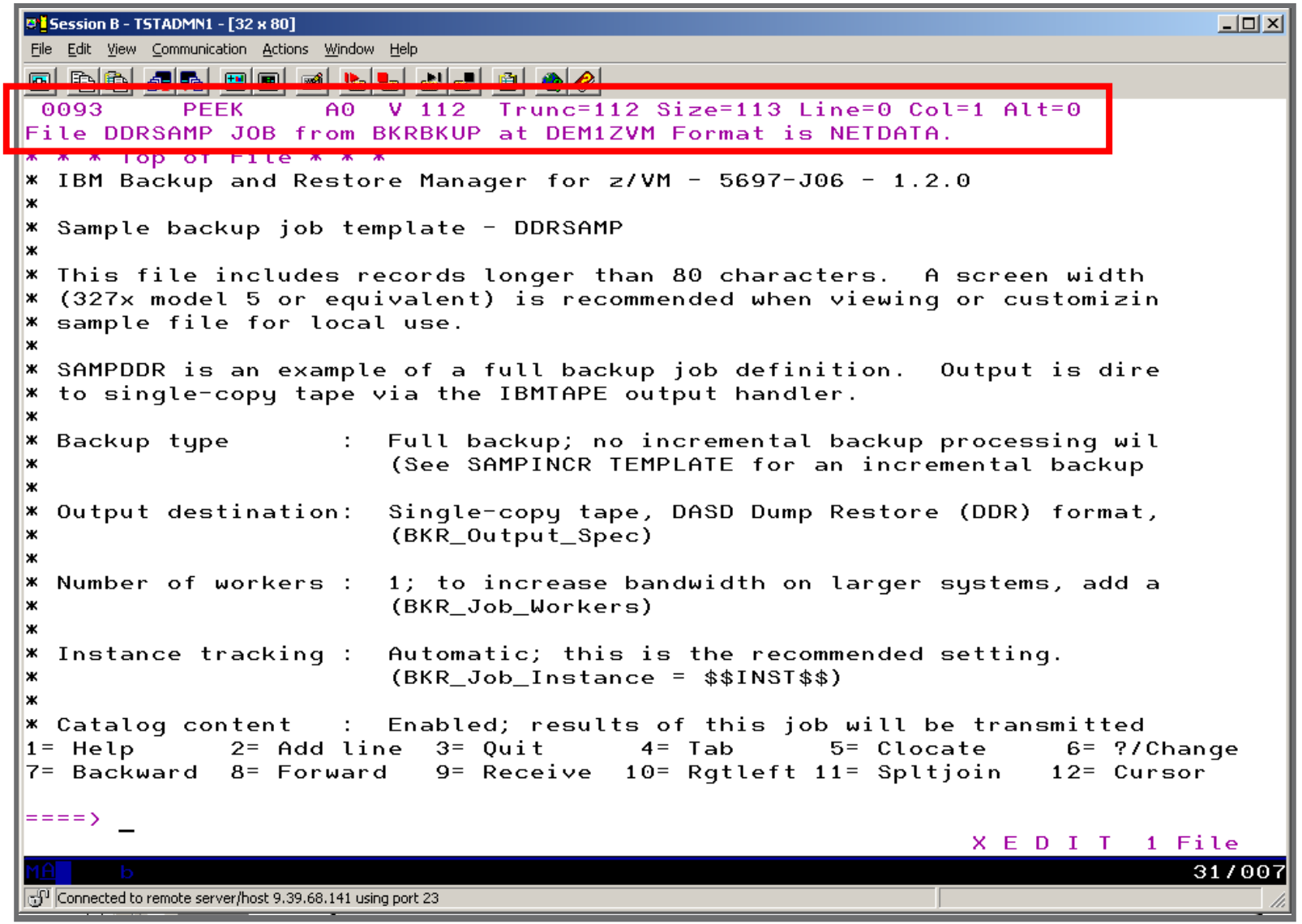
© 2013, 2015 IBM Corporation

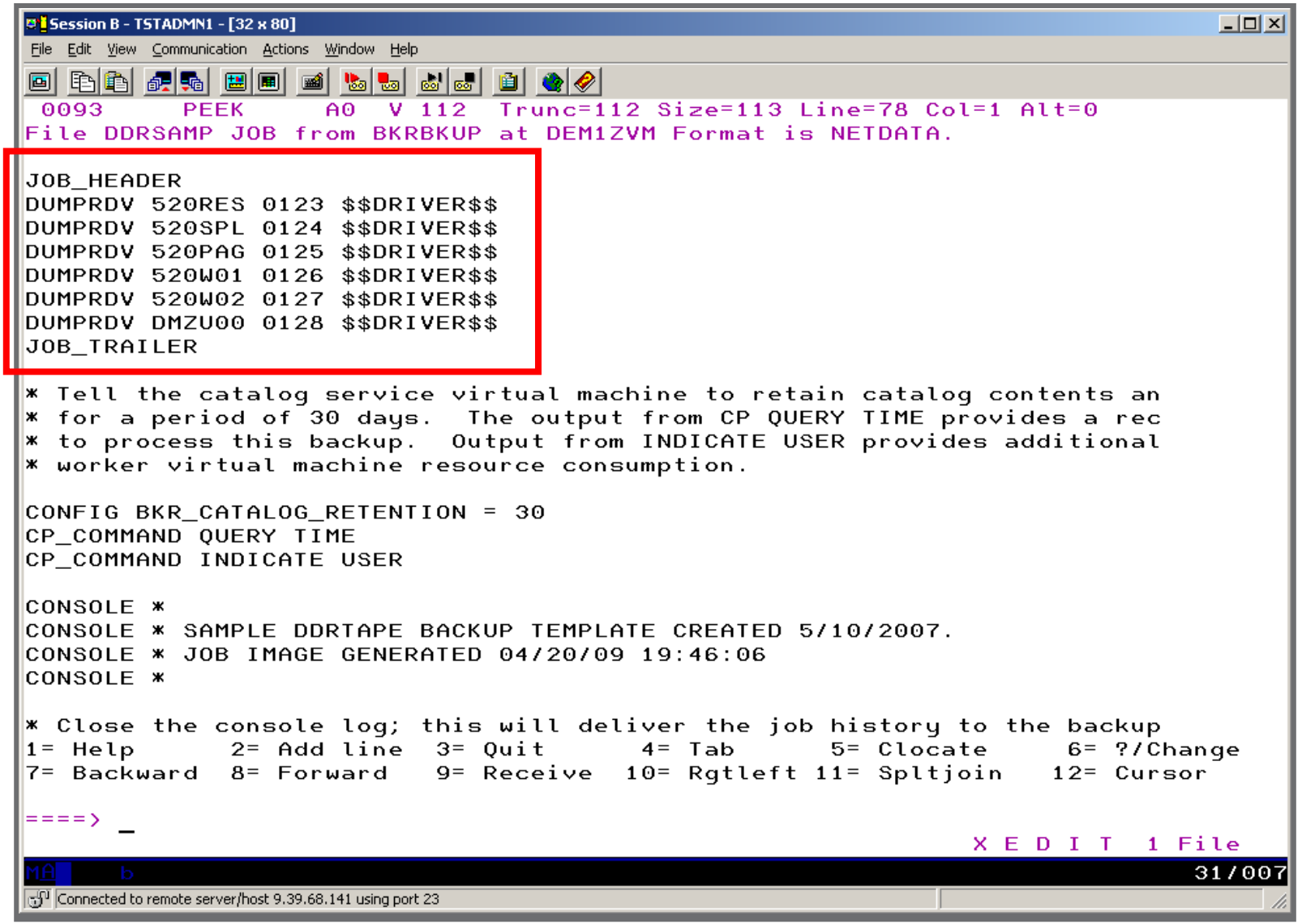

Session B - TSTADMN1 - [32 x 80]
File Edit View Communication Actions Window Help
q disk
LABEL VDEV M STAT CYL TYPE BLKSZ FILES BLKS USED-(%) BLKS LEFT BLK TOTAL
ADM191 191 A R/W 10 3390 4096 53 245-14 1555 1800
ADM193 193 B R/W 50 3390 4096 3 7927-88 1073 9000
06B199 199 C R/W 5 3390 4096 9 31-03 869 900
06B2C2 2C2 D R/O 2 3390 4096 37 113-31 247 360
06B592 592 G R/O 5 3390 4096 24 145-16 755 900
J05592 593 H R/O 5 3390 4096 15 82-09 818 900
06B198 198 I R/O 2 3390 4096 5 14-04 346 360
10C400 400 J R/W 5 3390 4096 20 124-14 776 900
J05198 197 K R/W 2 3390 4096 6 16-04 344 360
J10401 401 L R/W 3 3390 4096 7 18-03 522 540
TCM592 692 M R/O 67 3390 4096 885 8526-71 3534 12060
MNT190 190 S R/O 100 3390 4096 687 14513-81 3487 18000
MNT19E 19E Y/S R/O 250 3390 4096 1102 28088-62 16912 45000
MNT19D 19D Z/Z R/O 146 3390 1024 14855 53765-74 18505 72270
Ready; T=0.01/0.01 19:36:52
x ddrdemo template c_
RUNNING DEM1ZVM
MA b 31/021
Connected to remote server/host 9.39.68.141 using port 23


Session B - TSTADMN1 - [32 x 80]
File Edit View Communication Actions Window Help
DDRDEMO TEMPLATE C2 V 112 Trunc=112 Size=156 Line=0 Col=1 Alt=0
00000 * * * Top of File * * *
00001 * IBM Backup and Restore Manager for z/VM - 5697-J06 - 1.2.0
00002 *
00003 * Sample backup job template - DDRSAMP
00004 *
00005 * This file includes records longer than 80 characters. A screen width o
00006 * (327x model 5 or equivalent) is recommended when viewing or customizing
00007 * sample file for local use.
00008 *
00009 * SAMPDDR is an example of a full backup job definition. Output is direc
00010 * to single-copy tape via the IBMTAPE output handler.
00011 *
00012 * Backup type : Full backup; no incremental backup processing will
00013 * (See SAMPINCR TEMPLATE for an incremental backup j
00014 *
00015 * Output destination: Single-copy tape, DASD Dump Restore (DDR) format,
00016 * (BKR_Output_Spec)
00017 *
00018 * Number of workers : 1; to increase bandwidth on larger systems, add ad
00019 * (BKR_Job_Workers)
00020 *
00021 * Instance tracking : Automatic; this is the recommended setting.
00022 * (BKR_Job_Instance = $$INST$$)
00023 *
00024 * Catalog content : Enabled; results of this job will be transmitted t
00025 * (BKR_Job_Catalog)
00026 *
00027 * CMS file filtering: None; all files and SFS directories will be includ
00028 * (BKR_Job_CMS_FileMask, BKR_Job_SFS_PathMask)
02/007
Connected to remote server/host 9.39.68.141 using port 23


Session B - TSTADMN1 - [32 x 80]
File Edit View Communication Actions Window Help
DDRDEMO TEMPLATE C2 V 112 Trunc=112 Size=156 Line=117 Col=1 Alt=1
====> file
00117 /***/
00118
00119 FUNCTION MEDIATYPE OWNER VDEV VOLUME DEVTYPE START
00120 |----------|----------|--------|--|----|------|--------|--|----------|--|
00121 EXCLUDE MINIDISK * = * * * = * =
00122 INCLUDE RDEVVOL 520*
00123 INCLUDE RDEVICE 0128
00124
00125
00126 * Job_Trailer terminates the INCLUDE / EXCLUDE / SELECT definition sectio
00127 * post-backup processing specifications.
00128
00129 Job_Trailer
00130
00131 * Tell the catalog service virtual machine to retain catalog contents and
00132 * for a period of 30 days. The output from CP QUERY TIME provides a reco
00133 * to process this backup. Output from INDICATE USER provides additional
00134 * worker virtual machine resource consumption.
00135
00136 Config BKR_Catalog_Retention = 30
00137 CP_Command QUERY TIME
00138 CP_Command INDICATE USER
00139
00140 Console *
00141 Console * Sample DDRTAPE backup template created 5/10/2007.
00142 Console * Job image generated $$UDATE$$ $$TIME$$
00143 Console *
00144
00145 * Close the console log; this will deliver the job history to the backup
MA b 02/011
Connected to remote server/host 9.39.68.141 using port 23


Session B - TSTADMN1 - [32 x 80]
File Edit View Communication Actions Window Help
SMSG BKRBKUP REVIEW ddrdemo
Ready; T=0.01/0.01 19:46:06
BKRBAK8529I Processing REVIEW DDRDEMO command for TSTADMN1.
RDR FILE 0093 SENT FROM BKRBKUP PUN WAS 0044 RECS 0062 CPY 001 A NOHOLD NOKEEP
BKRMAK8559I INCLUDE / EXCLUDE processing for job DDRDEMO selected 6 objects
BKRMAK8559I for backup processing.
BKRMAK8563I Worker count for job DDRDEMO has been set to 1.
BKRMAK8568I CMS files will be filtered against file mask "* * *".
BKRMAK8566I SFS filespaces will be filtered with path mask "*".
BKRMAK8583I Sending results to TSTADMN1 for review.
File DDRSAMP JOB D1 sent to TSTADMN1 at DEM1ZVM on 04/20/09 19:46:06
Return code "0" from command REVIEW DDRDEMO at 04/20/09 19:46:06.
RUNNING DEM1ZVM
MA b 31/001
Connected to remote server/host 9.39.68.141 using port 23


Session B - TSTADMN1 - [32 x 80]
File Edit View Communication Actions Window Help
0093 PEEK A0 V 112 Trunc=112 Size=113 Line=0 Col=1 Alt=0
File DDRSAMP JOB from BKRBKUP at DEM1ZVM Format is NETDATA.
* * * Top of File * * *
* IBM Backup and Restore Manager for z/VM - 5697-J06 - 1.2.0
*
* Sample backup job template - DDRSAMP
*
* This file includes records longer than 80 characters. A screen width
* (327x model 5 or equivalent) is recommended when viewing or customizin
* sample file for local use.
*
* SAMPDDR is an example of a full backup job definition. Output is dire
* to single-copy tape via the IBMTAPE output handler.
*
* Backup type : Full backup; no incremental backup processing wil
* (See SAMPINCR TEMPLATE for an incremental backup
*
* Output destination: Single-copy tape, DASD Dump Restore (DDR) format,
* (BKR_Output_Spec)
*
* Number of workers : 1; to increase bandwidth on larger systems, add a
* (BKR_Job_Workers)
*
* Instance tracking : Automatic; this is the recommended setting.
* (BKR_Job_Instance = $$INST$$)
*
* Catalog content : Enabled; results of this job will be transmitted
1= Help 2= Add line 3= Quit 4= Tab 5= Clocate 6= ?/Change
7= Backward 8= Forward 9= Receive 10= Rgtleft 11= Spltjoin 12= Cursor
====>
XEDIT 1 File
MA b
31/007
Connected to remote server/host 9.39.68.141 using port 23


Session B - TSTADMN1 - [32 x 80]
File Edit View Communication Actions Window Help
0093 PEEK A0 V 112 Trunc=112 Size=113 Line=78 Col=1 Alt=0
File DDRSAMP JOB from BKRBKUP at DEM1ZVM Format is NETDATA.
JOB_HEADER
DUMPRDV 520RES 0123 $$DRIVER$$
DUMPRDV 520SPL 0124 $$DRIVER$$
DUMPRDV 520PAG 0125 $$DRIVER$$
DUMPRDV 520W01 0126 $$DRIVER$$
DUMPRDV 520W02 0127 $$DRIVER$$
DUMPRDV DMZU00 0128 $$DRIVER$$
JOB_TRAILER
* Tell the catalog service virtual machine to retain catalog contents an
* for a period of 30 days. The output from CP QUERY TIME provides a rec
* to process this backup. Output from INDICATE USER provides additional
* worker virtual machine resource consumption.
CONFIG BKR_CATALOG_RETENTION = 30
CP_COMMAND QUERY TIME
CP_COMMAND INDICATE USER
CONSOLE *
CONSOLE * SAMPLE DDRTAPE BACKUP TEMPLATE CREATED 5/10/2007.
CONSOLE * JOB IMAGE GENERATED 04/20/09 19:46:06
CONSOLE *
* Close the console log; this will deliver the job history to the backup
1= Help 2= Add line 3= Quit 4= Tab 5= Clocate 6= ?/Change
7= Backward 8= Forward 9= Receive 10= Rgtleft 11= Spltjoin 12= Cursor
====> _
X E D I T 1 File
MA b 31/007
Connected to remote server/host 9.39.68.141 using port 23

Scenario G: Reviewing data in the Backup catalog for recovery

- Various backup jobs have previously been submitted and completed
- Full screen interfaces available for searching the backup catalog and finding data available for recovery
  - BKRLIST
    - Useful when looking for a specific file or set of files owned by a specific user ID
    - Users with ADMIN authority beware of size
      - Use parameters to narrow the search
  - BKRUSER
    - Useful when looking for backup jobs associated with a specific user ID
  - BKRJOB
    - Useful when looking for backup jobs by job name
  - BKRVOL
    - Useful when looking for backup jobs associated with a specific DASD volume

© 2013, 2015 IBM Corporation

Scenario G: Detailed Steps

- From an authorized z/VM user ID, issue one of the following commands to browse the catalog

```
bkrlist
bkruser
bkrjob
bkrvol
```

- Use F11 to drill down through details
- Use F10 to restore data

© 2013, 2015 IBM Corporation

धन्यवाद

Hindi

多謝

Traditional Chinese

감사합니다

Korean

Спасибо

Russian

Gracias

Spanish

Thank You

English

شكراً

Arabic

Obrigado

Brazilian Portuguese

Danke

German

多谢

Simplified Chinese

Grazie

Italian

Merci

French

நன்றி

Tamil

ありがとうございました

Japanese

ขอบคุณ

Thai

© 2013, 2015 IBM Corporation