Using Unicenter VM:Operator To Manage Linux Servers

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Session 9146

Abstract

For some sites, moving to Linux on the zSeries means adding VM to your enterprise. For others, it just means a new use for an existing platform. Through the use of your existing CA VM management tools, this session will discuss how you can leverage your existing VM:Operator product to assist you in administering and managing your Linux environment.

Agenda

- VM:Operator Function Review
- Implementing Common Functions For Linux Servers
- Useful VM:Operator Macros
- Summary

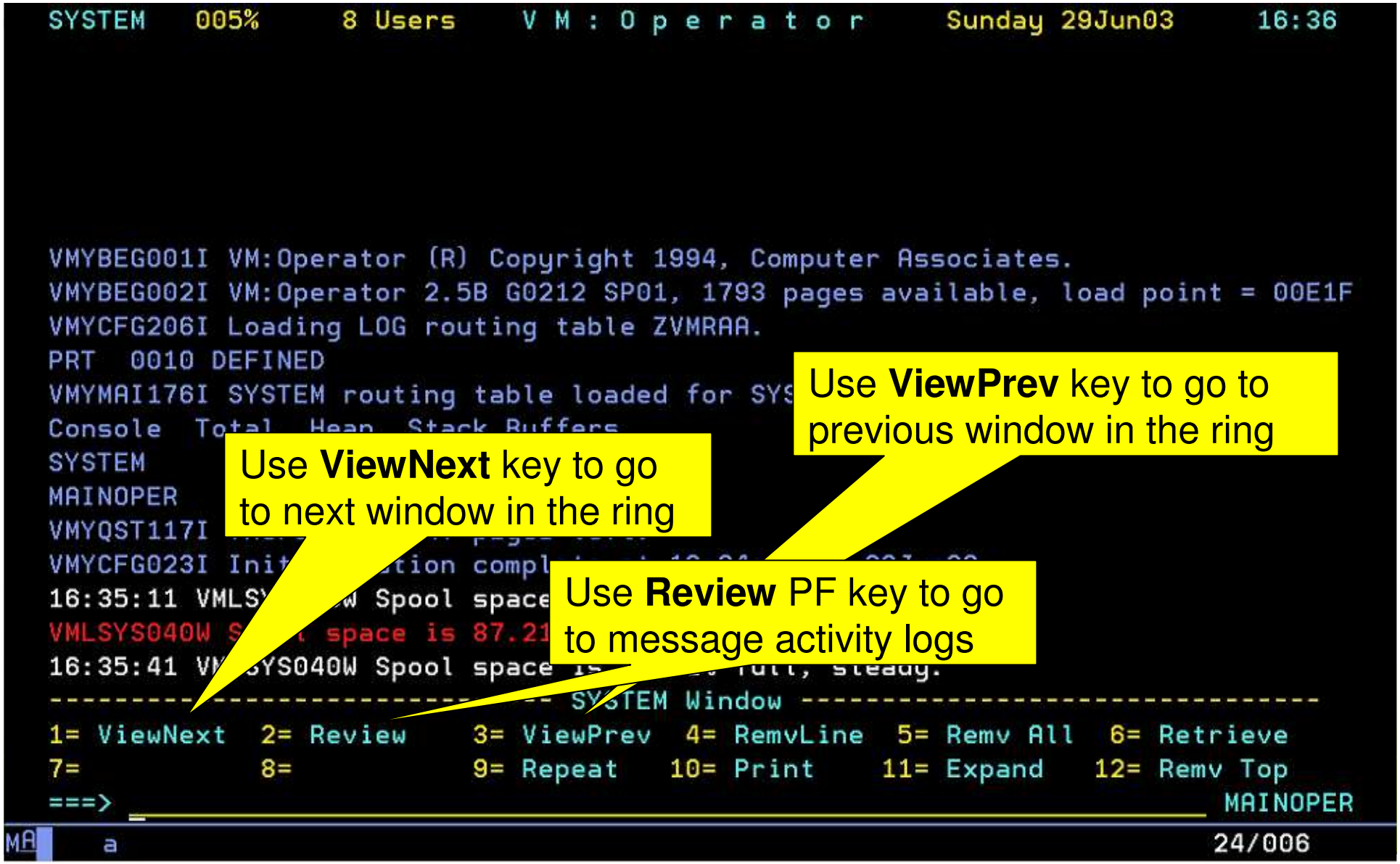
Unicenter VM:Operator

- Automates VM console management
  - Allows a secondary operations console to work and function like an z/OS console
  - Automated message routing and filtering manager
  - Execution of action routines when specific messages received
- Consolidates system activity logs
  - Historical review of current and previous day activities
- Provides windows into VM service virtual machines
  - Window manager for all virtual Linux servers

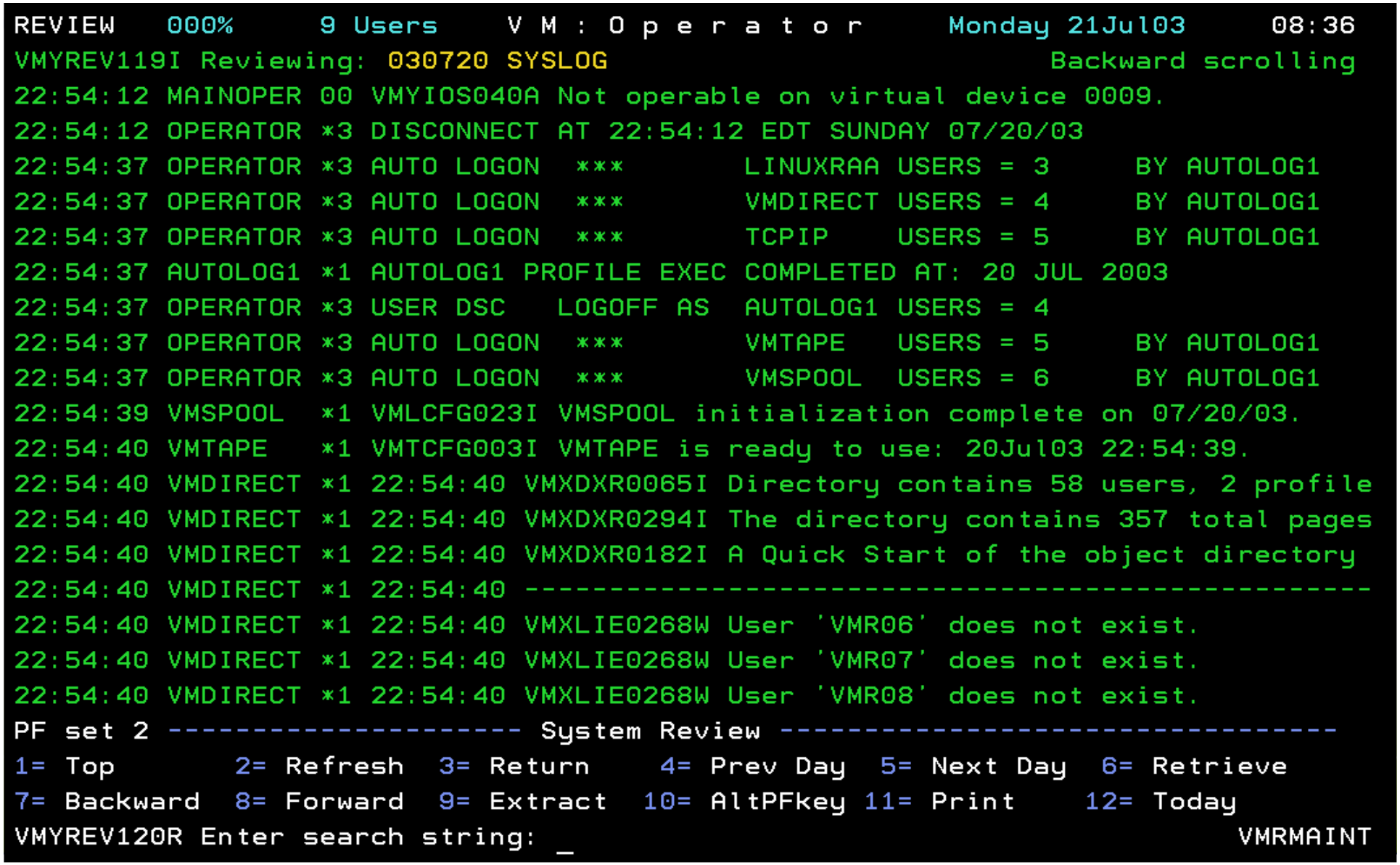
Unicenter VM:Operator

- Windows into other processes arranged in a ‘ring’
  - Use pre-assigned PF keys or VIEW command to move from one window to another
- Supports remote access for system programmers
  - Share the operator console with authorized users
  - Separate message routing and action tables based upon system programmer needs
  - Invoked with the VMYIAMOP Utility

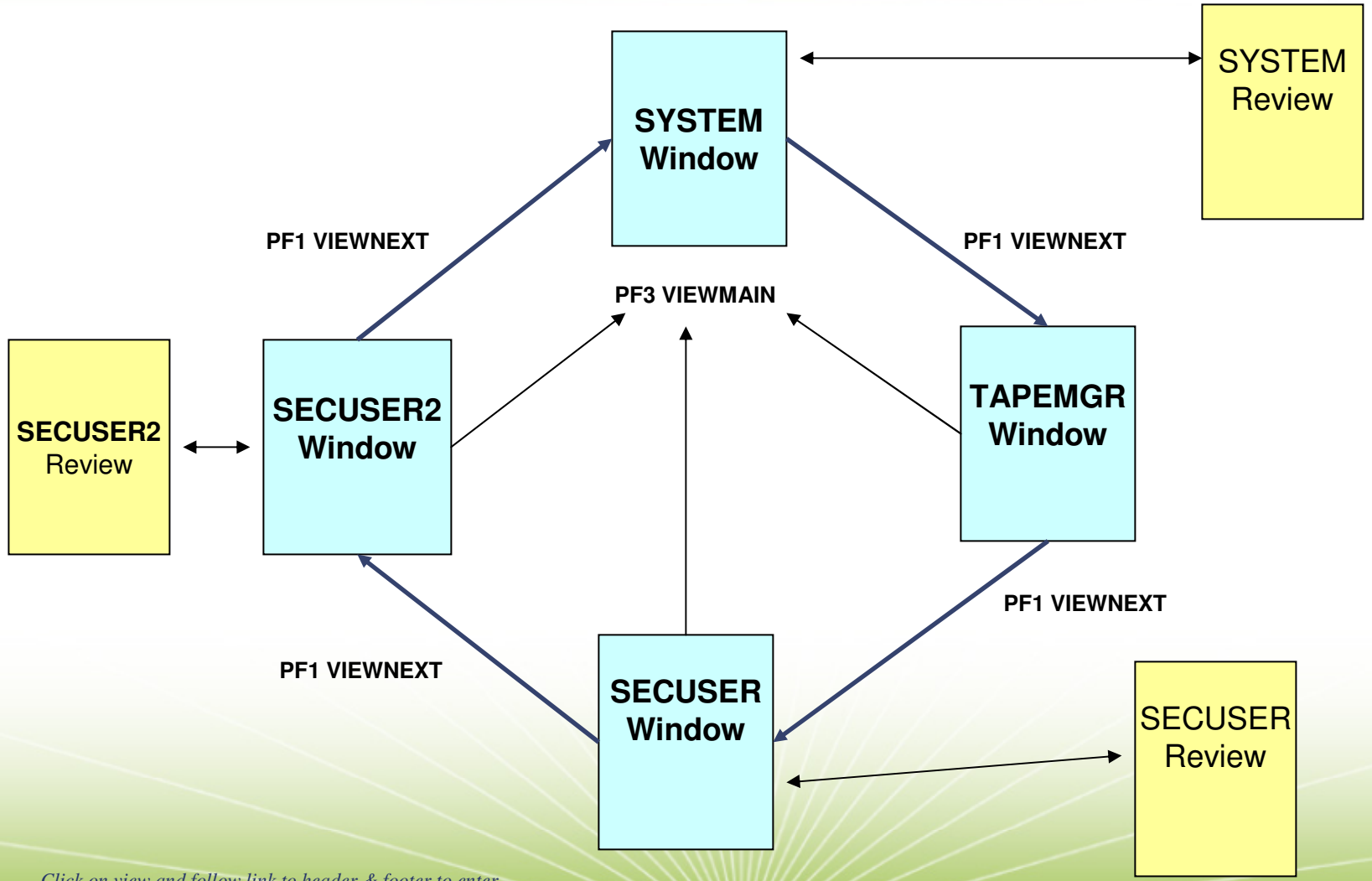
Primary Operations Console



Activity Review Window



The “Ring”

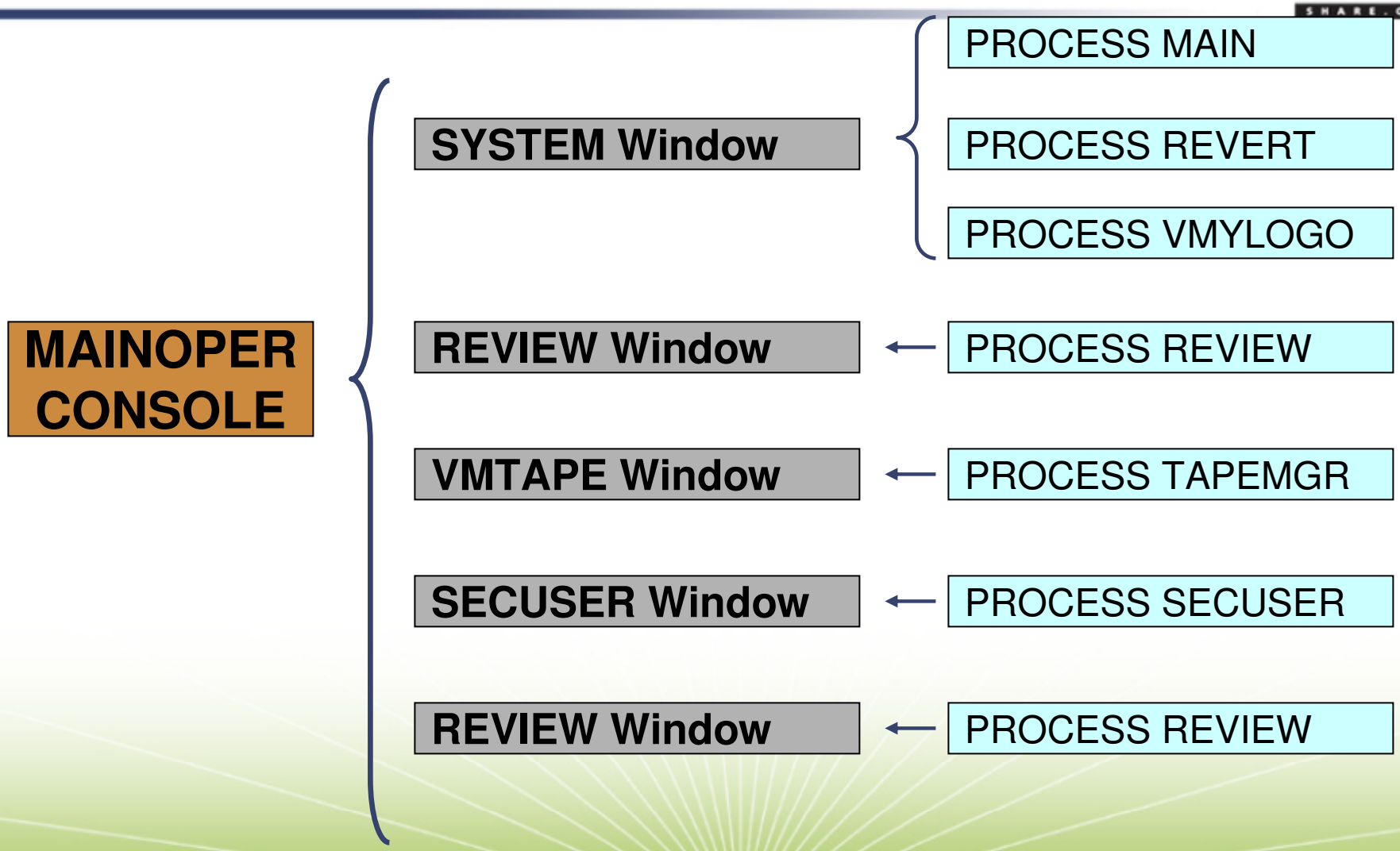

SYSTEM Window
SYSTEM Review
PF1 VIEWNEXT
PF1 VIEWNEXT
PF3 VIEWMAIN
SECUSER2 Review
SECUSER2 Window
TAPEMGR Window
PF1 VIEWNEXT
PF1 VIEWNEXT
SECUSER Window
SECUSER Review

VM:Operator Control Files

Unicenter VM:Operator control files identify the general attributes of the VM:Operator system and define how it is configured. The VM:Operator control files are:

- VMOPER CONFIG
-  CONSOLE files
-  USERID files
-  INCLUDE files
-  Routing tables (LOGTABLE, SYSTABLE, and SECTABLE)
- User exits
- HOLDMSG files
- Session files

Sample Console Definitions



VM:Operator CONSOLE Files

- CONSOLE files are CMS files that reside on a minidisk accessed by VM:Operator
  - The installation process provides you with an initial CONSOLE file called MAINOPER CONSOLE. It can be modified or other CONSOLE files created
- Every console identified in your VM:Operator configuration file or attached to the userid running VM:Operator requires its own CONSOLE file specifying
  - Which windows are to run on the console
  - Which sessions are to run on the console
  - The virtual address and spooling parameters of the optional printer to be used by the console

VM:Operator INCLUDE Files

- INCLUDE files specify Unicenter VM:Operator window characteristics including
  - Processes (what is the purpose of the window)
  - Program function key settings
  - Color settings
  - Reserved window text lines

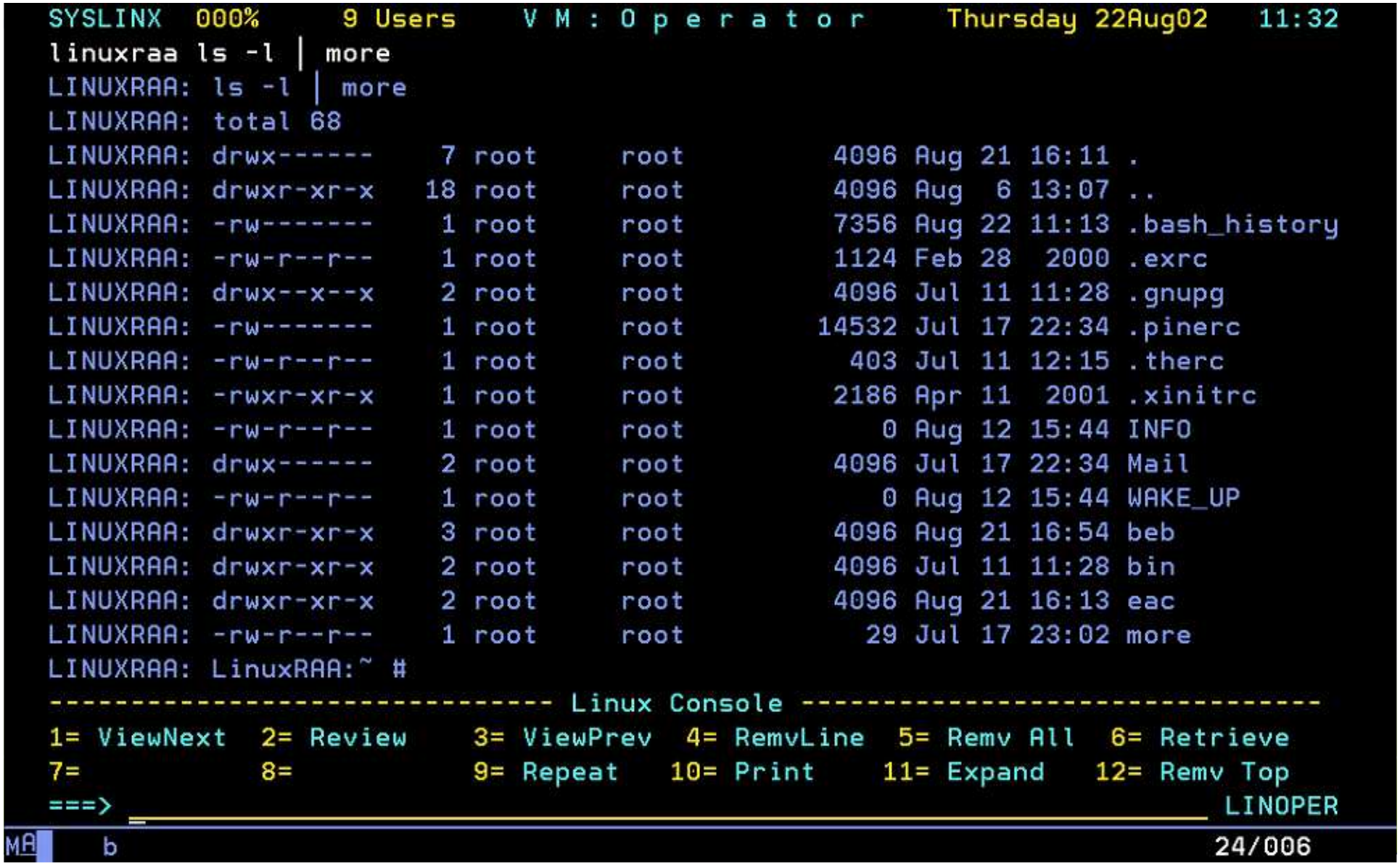
VM:Operator Routing Tables

- Routing tables are lists of entries that map message templates with actions.
- Three types of Unicenter VM:Operator routing tables
  - The LOGTABLE routing table is a front-end routing table defined in the Unicenter VM:Operator configuration file
  - The SYSTABLE routing table provide you with the tools to customize SYSTEM window message displays
  - The SECUSER routing table provide you with the tools to customize SECUSER window message displays

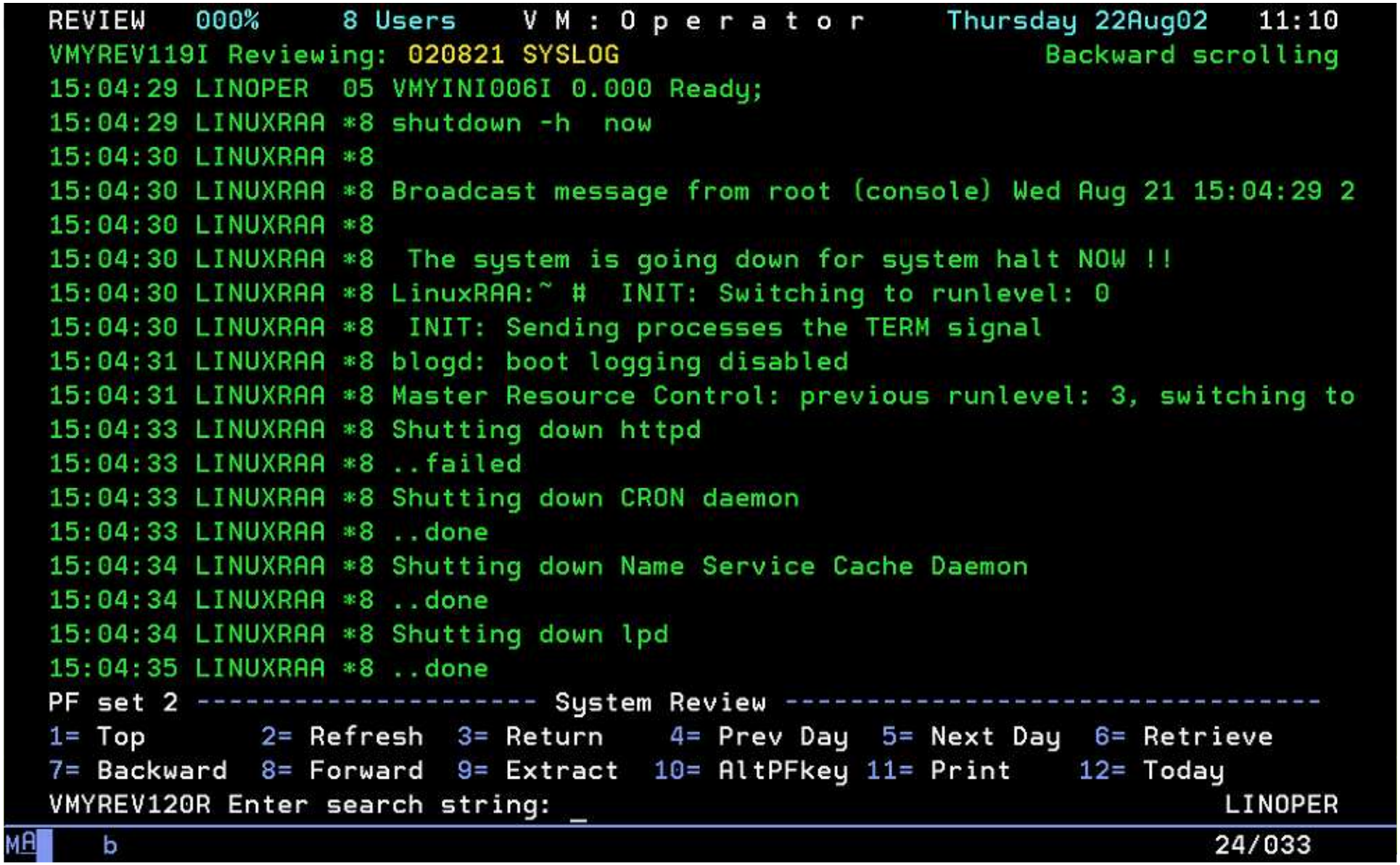
Benefits for Linux Servers

- Centralized Linux console management
  - Make use of existing windowing capabilities for all Linux virtual machines
  - Alleviates need to Telnet into Linux virtual server for simple administrative tasks
- Real-time and historical review of VM Linux userid message traffic
  - Includes all initialization and shutdown messages
- Automate Linux administration and provisioning processes
  - Automate initialization and shutdown of virtual Linux servers
  - Automate update of network configuration information

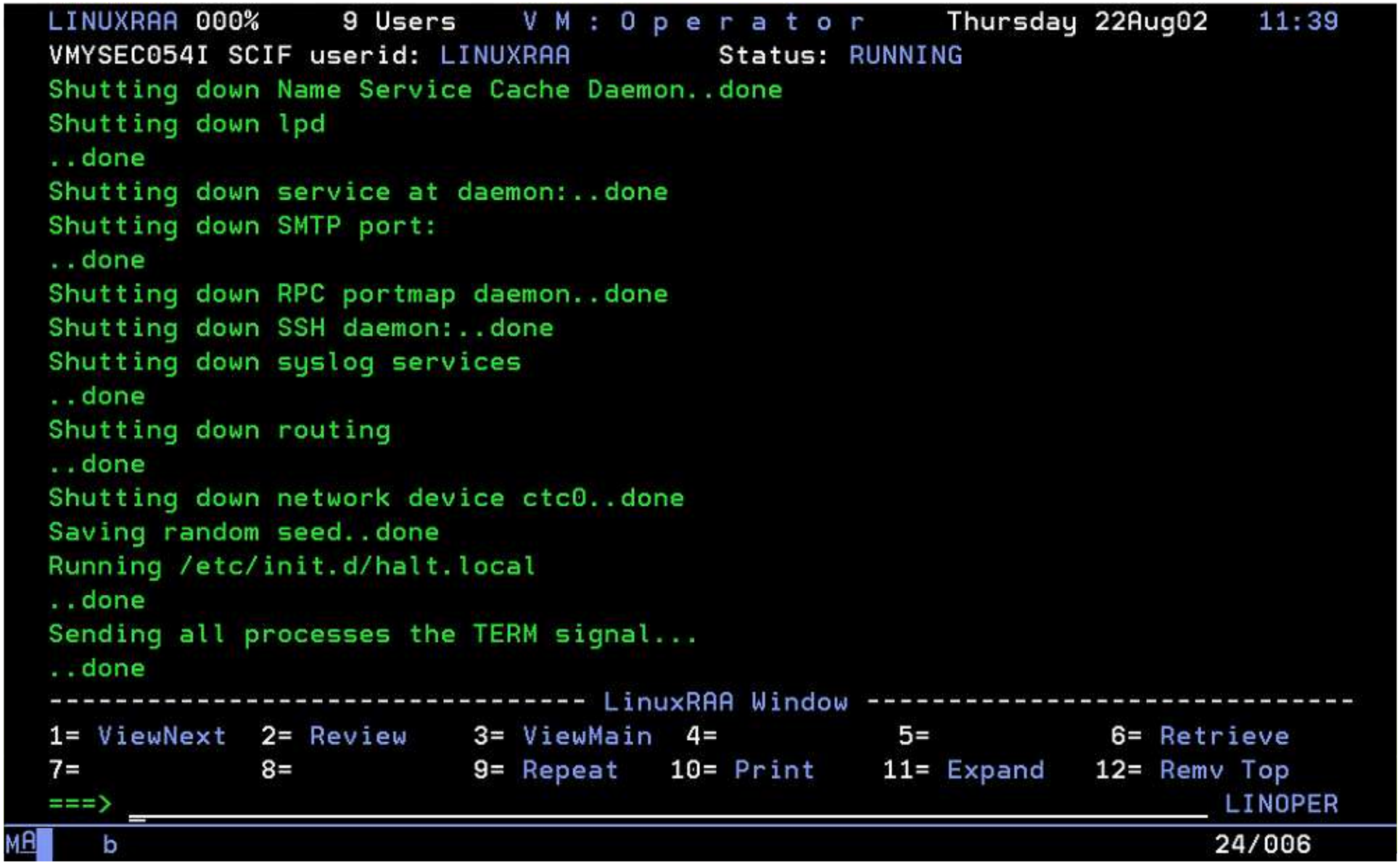
Consolidated Linux Console



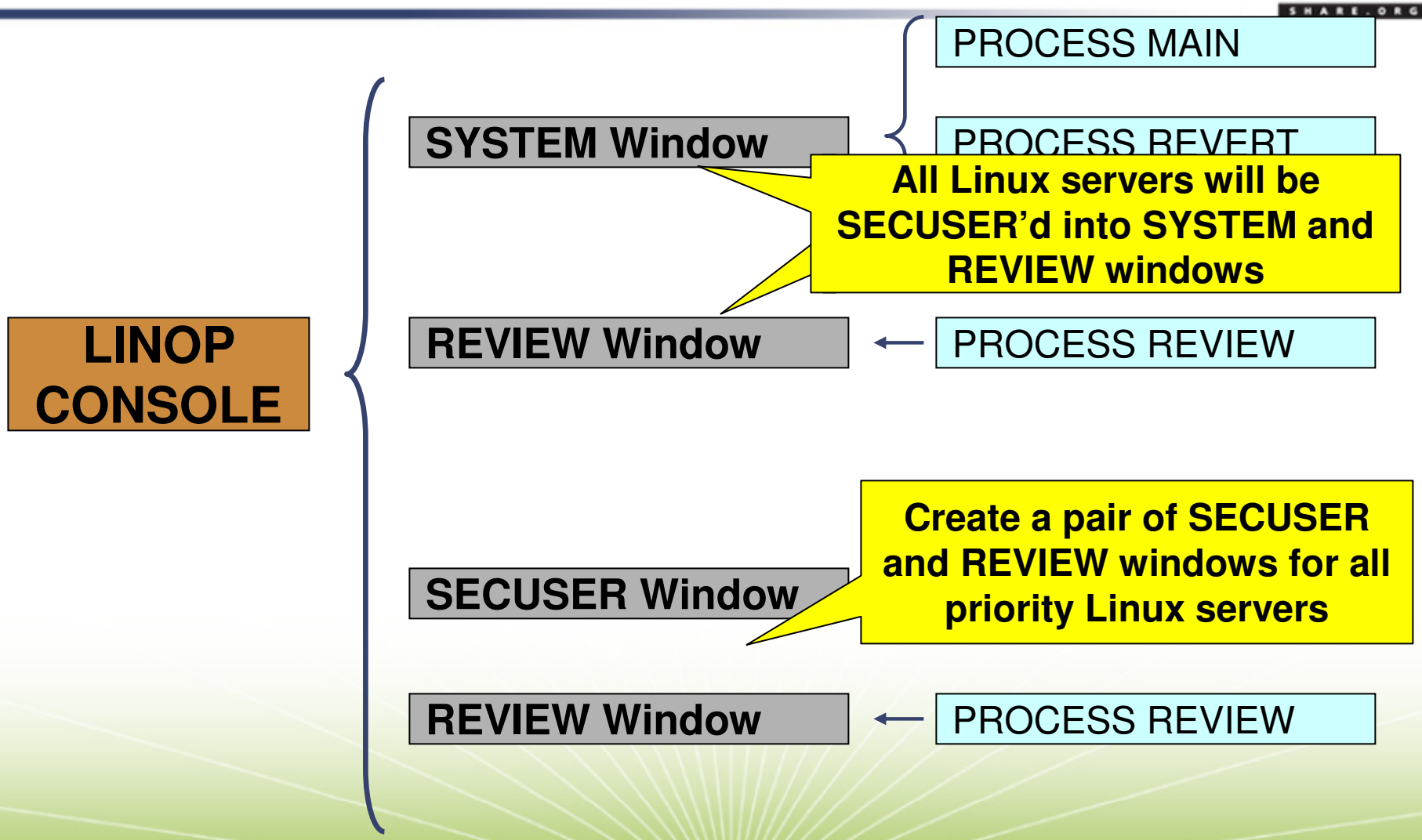
Reviewing Linux Activity



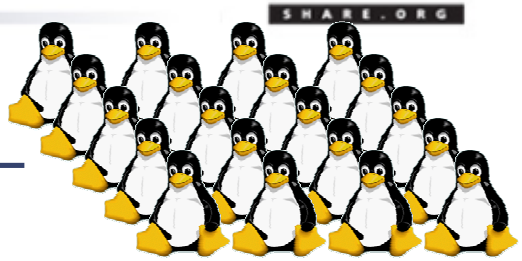
Linux Server Window



Linux Console Definitions



Transforming The “Ring”



SECUSER’d Linux Servers Without Windows

SYSTEM Review

SYSTEM Window

PF1 VIEWNEXT

PF3 VIEWMAIN

LWEB010 Review

LWEB010 SECUSER Window

LAPC045 SECUSER Window

PF1 VIEWNEXT

LAPC045 Review

PF1 VIEWNEXT

LDB2023 SECUSER Window

LDB2023 Review

Transform a Colony Into A Ring

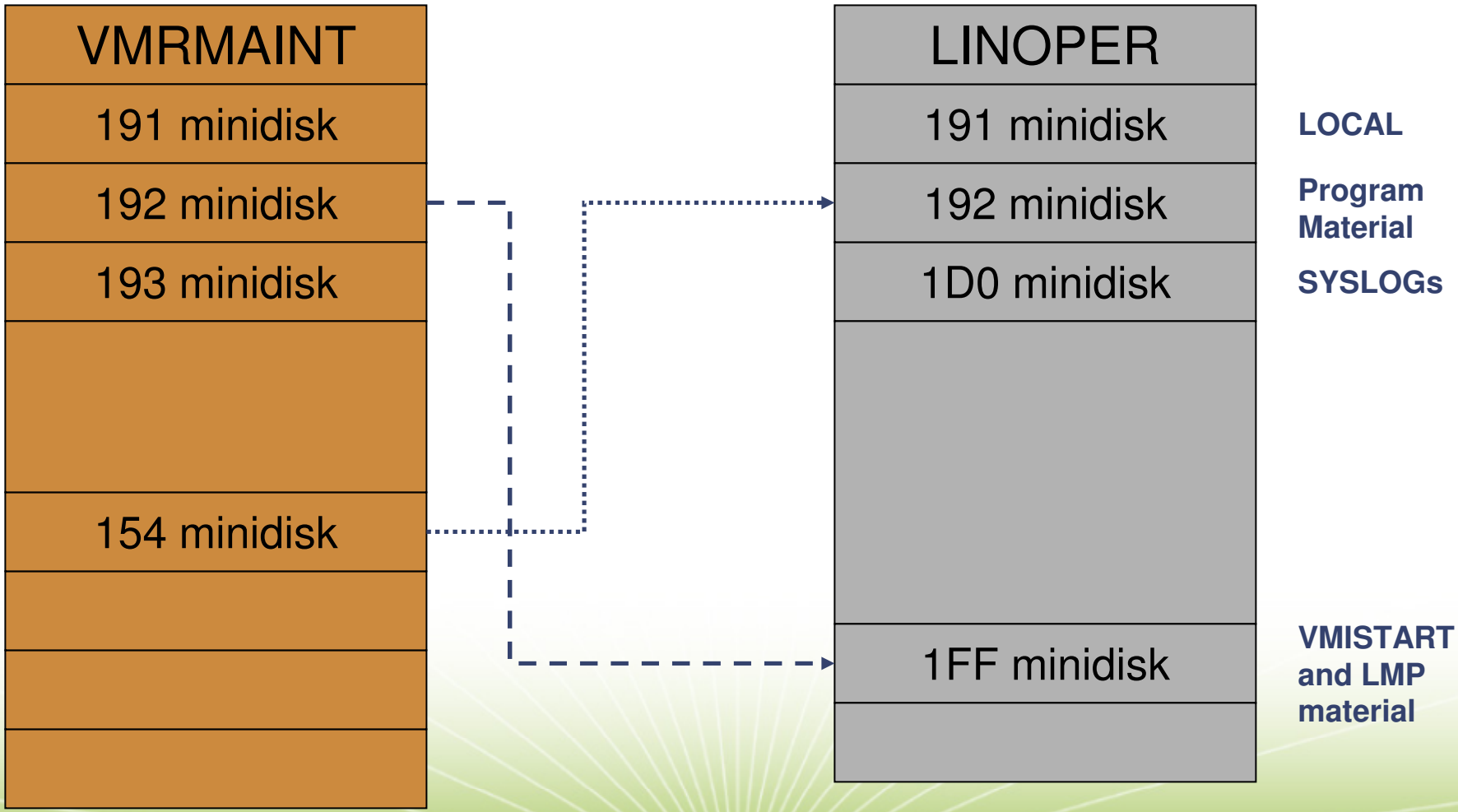
1. Install a second VM:Operator machine
2. Modify traditional SYSTEM window into a consolidated Linux server window
3. Specify REVIEW window for all Linux server activity
4. Create individual windows for choice Linux servers

Don't forget to create your own VMYIAMOP USERID files for the new VM:Operator system

Installation Steps

1. Create VM userid that mirrors system operator userid
   - Typically use LINOPER as userid
   - Specify link to VMRMAINT 154 minidisk
   - Allocate a new 1D0 minidisk to serve as SYSLOG minidisk
2. Update VMRMAINT CONFIG to reference new VM:Operator instance
3. Create new LINOPER MDISKS file on VMRMAINT 192 minidisk
4. Ensure PROFILE EXEC invokes VMISTART routine

LINOPER Architecture



LINOPER Directory Entry

```
USER LINOPER LINOPER 32M 32M ABEG 64
ACCOUNT 99999999 GENERAL
*AC= 99999999
 MACHINE ESA
 IPL CMS PARM AUTOCR
 IUCV ANY MSGLIMIT 255
 IUCV ALLOW
 OPTION MAXCONN 512 MAINTCCW
 CONSOLE 0009 3215
 SPOOL 00C 2540 READER *
 SPOOL 00D 2540 PUNCH A
 SPOOL 00E 1403 A
 LINK MAINT 190 190 RR
 LINK MAINT 19E 19E RR
 LINK VMRMAINT 154 192 RR
 LINK VMRMAINT 192 1FF RR
 MDISK 191 3390 211 5 SPACE MR
 MDISK 1D0 3390 216 5 SPACE MR
```

VM:Operator Program Material

VM:Operator LOCAL minidisk

VM:Operator SYSLOG minidisk

VMRMAINT CONFIG

```
PRODUCT   VM:ACCOUNT     VMACCT      0212
PRODUCT   VM:SPOOL       VMSPOOL     0212
PRODUCT   VM:BACKUP      VMBACKUP    0212
PRODUCT   VM:OPERATOR    VMOPER      0212
PRODUCT   VM:OPERATOR    LINOPER     0212
```

Specify new userid here as 3rd token

Copy release designator as 4th token

LINOPER MDISKS

```
*-------------------------------------------------------
* This file identifies the minidisks associated with
* the VM:Operator Service Virtual Machine named LINOPER.
*-------------------------------------------------------
* The record format is:
*
* KEYWORD     OWNERID   VADDR  RPASS    WPASS    MPASS

  LOCAL       LINOPER   191    VMRPASS  VMRPASS
  VMSI        VMRMAINT  154    VMRPASS  VMRPASS
  SYSLOG      LINOPER   1D0    VMRPASS  VMRPASS
```

LINOP CONSOLE

* Following are windows organized in a ring. You pass
* to the next window by pressing the PF1 key.
  INCLUDE SYSLIN
  INCLUDE LAPC045
  INCLUDE LDB2023
  INCLUDE LWEB010
  PF1 VIEWMAIN

*-Following are "review" windows NOT chained in a ring.

  INCLUDE REVIEW
  INCLUDE RLAPC045
  INCLUDE RLDB2023
  INCLUDE RLWEB010

Sample SECUSER INCLUDE

```
*This file defines a Linux DB2 SECUSER window. It references
*a REVIEW window defined in Ruserid INCLUDE and uses the
*Luserid SECTABLE routing table.

WINDOW LDB2023
  PROCESS SECUSER LDB2023 NOTIME HILIGHT SECTABLE LDB2023

  COLOR TITLE BLUE WHITE
  COLOR FIXED WHITE BLUE
  COLOR BKGROUND GREEN
  COLOR HILIGHT WHITE
  COLOR PREHOLD RED HOLDING RED BLINK
  COLOR INPUT UNDERLINE GREEN WHITE

  PF1 VIEWNEXT
  PF2 VIEW RLDB2023 REFRESH TODAY
.
.
```

Routing Table Hints

- LOGTABLE
  - Do not suppress display of *8 IUCV messages
  - Add SPAWN records for new Linux macros
- SYSTABLE
  - IGNORE all IUCV Class 1-7 messages so that only SECUSER messages (IUCV class *8) display
  - VM:Operator process messages will still display
- SECTABLE
  - Specify NOTIME parameter so that you don't have to account for time stamps when matching messages

Sample LOGTABLE Entries

.

.

.

SPAWN LINLOGOF MSG * *8 1 HCPGSP2630I

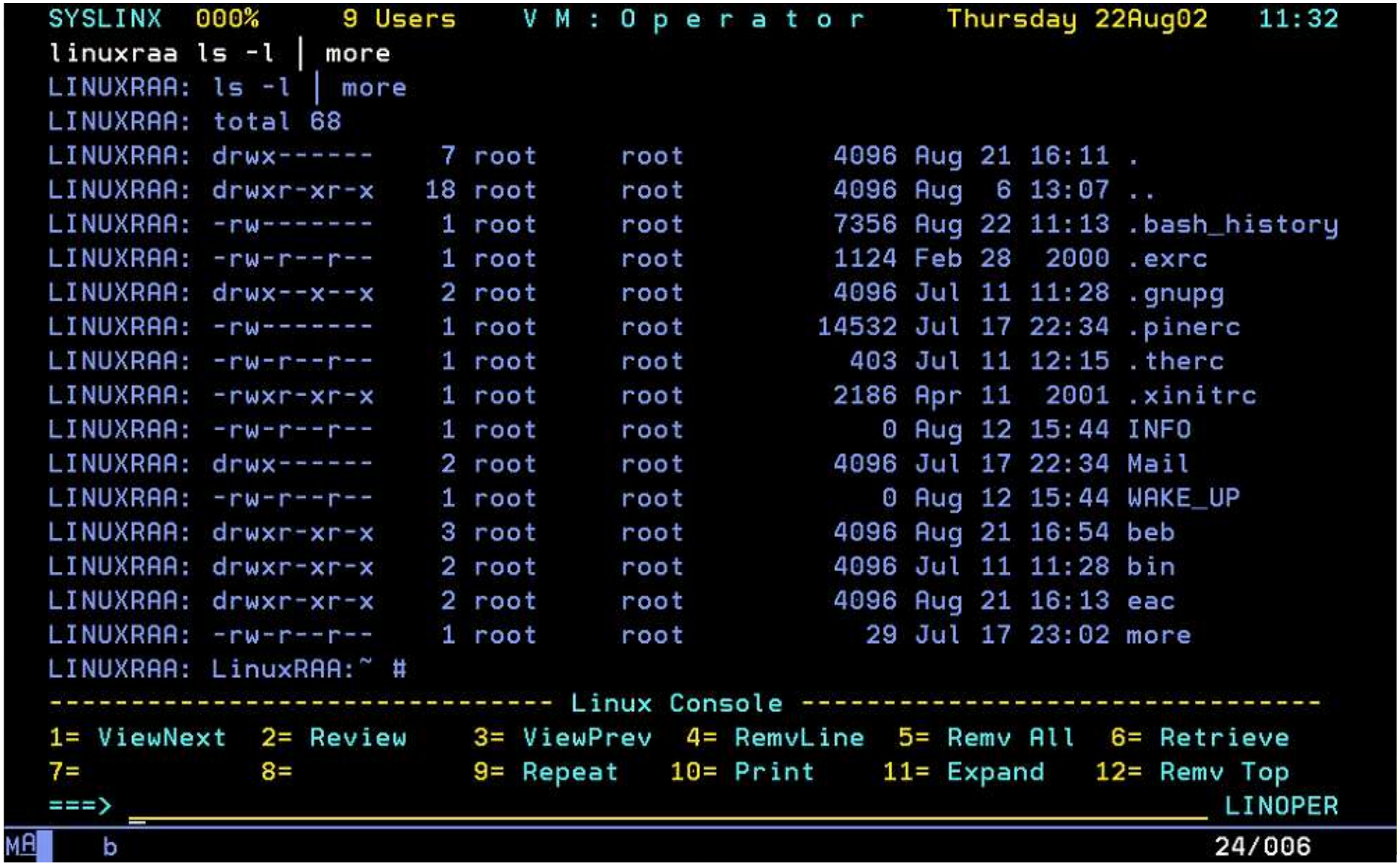
SPAWN LINLOGON MSG * *8 1 We are running under VM

SPAWN UPNETLIN MSG * *1 1 UPNETLIN

MSG * *8

*IGNORE MSG * *8

Consolidated Linux Console



Communicating With Servers

- Choice 1
  - Create a VM:Operator macro for each Linux server
  - Macro name must match each Linux server

    ldb2023 shutdown –h now
- Choice 2
  - Create a single VM:Operator macro that requires you to specify Linux userid as part of command

    linux ldb2023 shutdown –h now

One Userid – One Macro Example

```
 LDB2023  VMOPER   G1  F 80  Trunc=80 Size=8 Line=0 Col=1 Alt=0
====>

* * * Top of File * * *
/*-----------------------------------------------------------------
VM:Operator dialog to communicate with the specified Linux guest
machine via SCIF
-----------------------------------------------------------------*/
parse arg command
parse source with . linuxServer .
foo = diag(8, 'SEND' linuxServer command)
exit 0
* * * End of File * * *
```

Linux Management Routines

- STARTLIN/SHUTLIN VMOPER macros
  - Used to startup or shutdown one or more virtual Linux servers
- GETLDATA EXEC
  - Used to read ULINUX DATA file for server information
- CLONELIN EXEC
  - Used to interface with VM:Director to create new Linux servers based upon template directory definitions and to interface with VM:Backup HiDRO to restore Linux master file systems to the new userid
- UPNETLIN VMOPER macro
  - Used to update network configuration information after new Linux userid has been defined and files (DASD) restored

Note: These routines are not included as part of the product – contact the speaker for copies

ULINUX DATA File

```
LDB2023  linux    Susetb01 maint tcaratac test
LDB2023  comm     CTCA 3002 3003 TCPIP
LDB2023  disk     LI9M01.191.60 LI9M01.200.3200 LI9M01.201.3337
                  LI9M01.0202.3339
LDB2023  tcpip    limaintb.int.east.com 167.68.141.1 255.255.255.255
                  167.68.40.1
```

STARTLIN/SHUTLIN Macros

- Macros used to start up or shutdown Linux server farms
  - Uses configuration data in ULINUX DATA file on LINUX record
- STARTLIN starts up 8 servers at a time
- SHUTLIN shuts down all servers
  - Logs off server after shutdown is complete
- Both macros allow you to start up or shutdown:
  - Specific servers
  - Test servers
  - Production servers

CLONELIN Macro

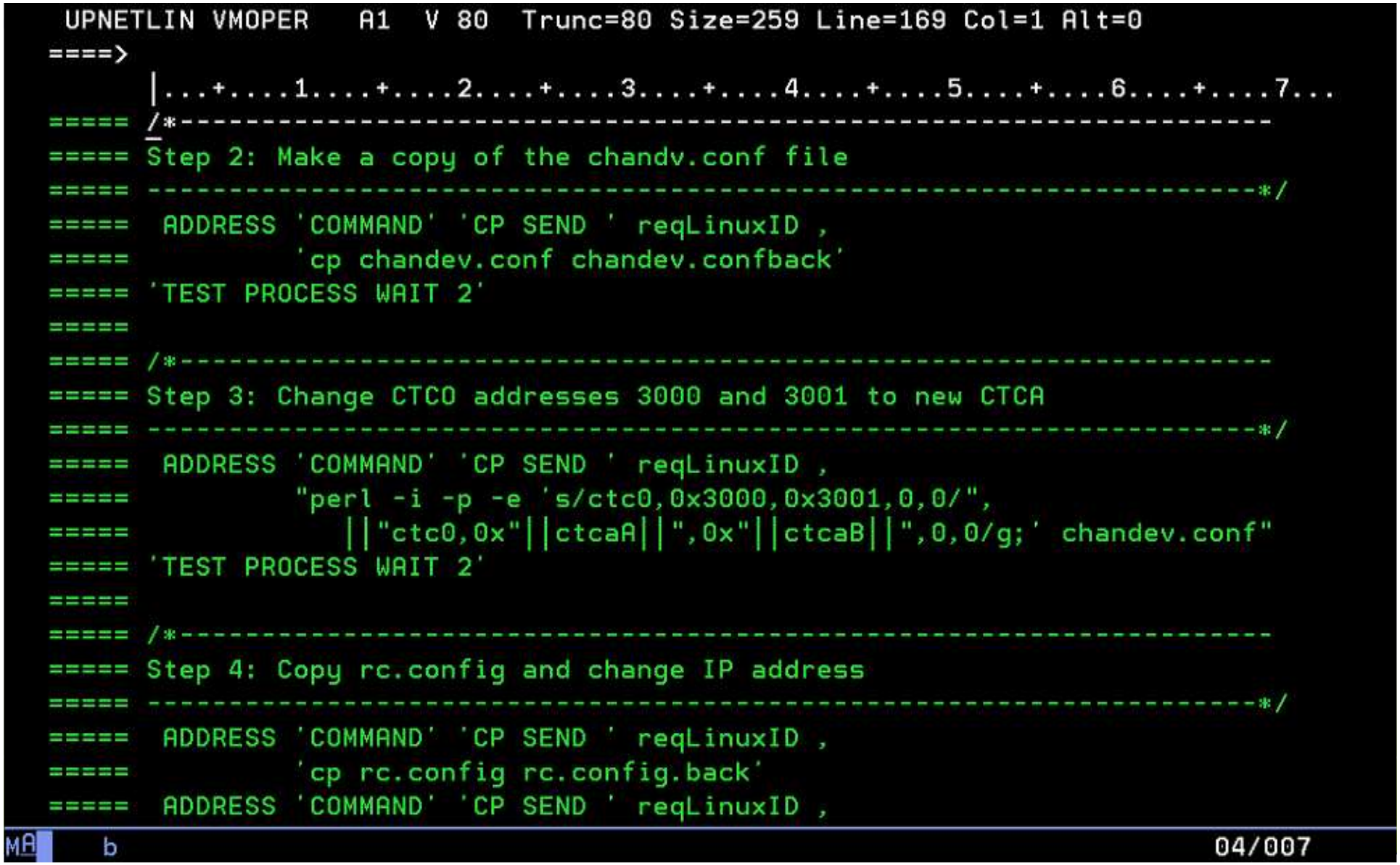
- Create master Linux images
  - VM directory images [VM:Director]
  - DASD backups for Linux file systems [VM:Backup]

1. Clones new image from base directory entry
   - Use VM:Director ADDENTRY and ADDMDISK commands
   - Restore file systems from DASD backups
2. Use VM:Backup restore templates to restore data to new server
3. Automate networking configuration to specify new TCPIP settings with VM:Operator via UPNETLIN macro

UPNETLIN Macro

- Automates process of modifying network configuration information
- Reads ULINUX DATA file to obtain
  - TCPIP data
  - Hostname
  - IP address
  - Mask value
  - Gateway IP address
- Uses Perl to update configuration files
  - Easier than using VM:Operator DIALOG commands to modify files

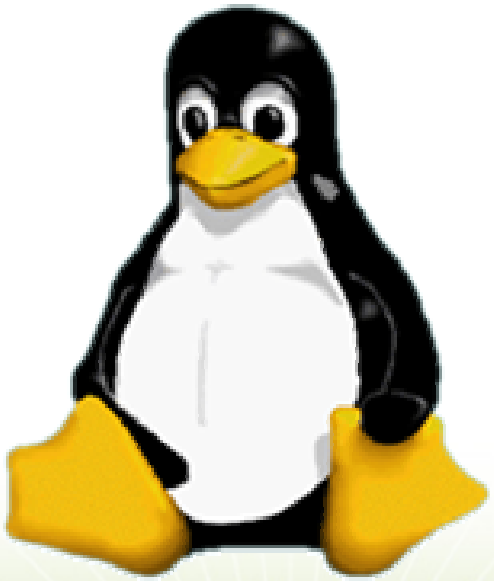
Automate Linux Configuration



Summary

- Current VM:Operator features can be used to manage new Linux server farm
- Consolidated Linux SYSTEM window provides single management point
- Use SECUSER windows only for critical Linux servers
- Using VM:Operator macros can ease administrative tasks

Questions



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