

VIOS for IBM i Administrators – Setup and Configuration

Session ID: VT 445-3

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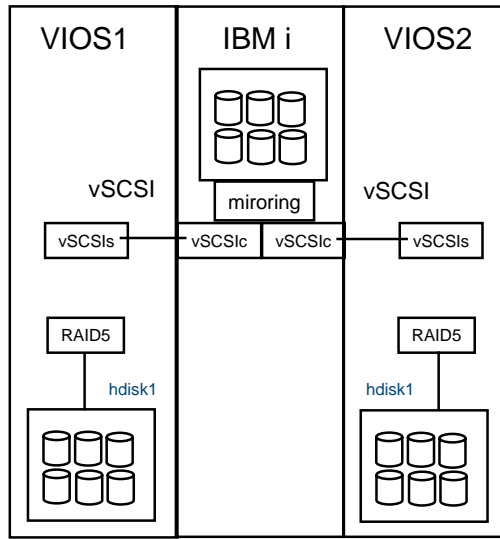
Power AIX for Business Linux

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References

- PowerVM Virtualization on IBM System p: Introduction and Configuration Fourth Edition - SG24-7940
 - <http://www.redbooks.ibm.com/abstracts/sg247940.html?Open>
- PowerVM Virtualization on IBM System p: Managing and Monitoring - SG24-7590
 - <http://www.redbooks.ibm.com/abstracts/sg247590.html?Open>
- IBM System p Advanced POWER Virtualization (PowerVM) Best Practices - redp4194
 - <http://www.redbooks.ibm.com/abstracts/redp4194.html?Open>
- Power Systems: Virtual I/O Server and Integrated Virtualization Manager commands (iphcg.pdf)
 - <http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/iphcg/iphcg.pdf>

IBM i as a client to VIOS and Internal Disk

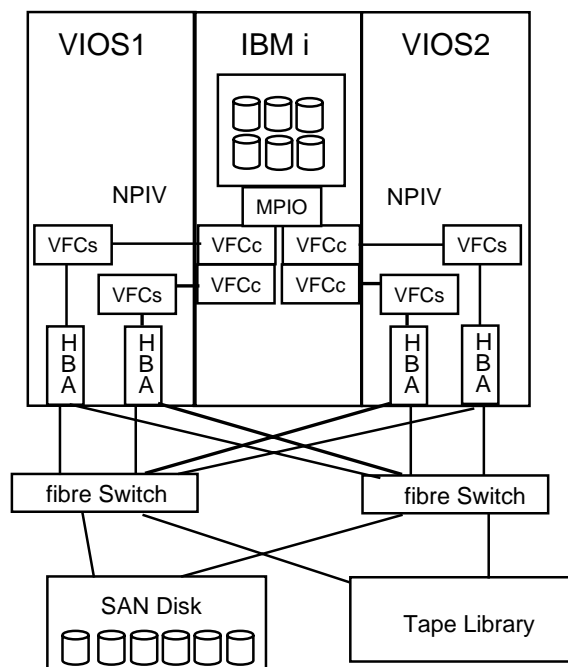


Hosting by two VIOS LPARS provides the most resilient environment

Not required but recommended

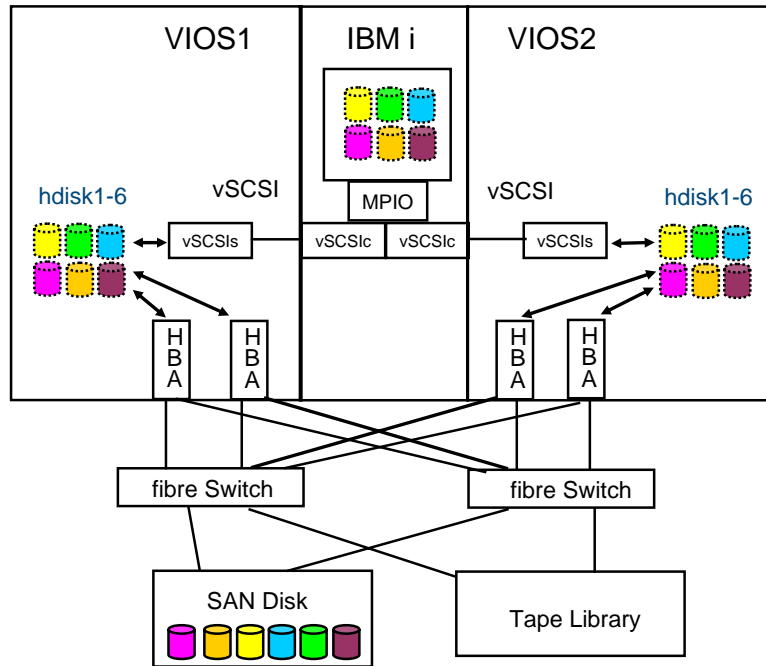
3 Power is performance redefined

IBM i as a client to VIOS with NPIV



4 Power is performance redefined

IBM i as a client to VIOS with vSCSI SAN drives



Overview of the Virtual I/O Server

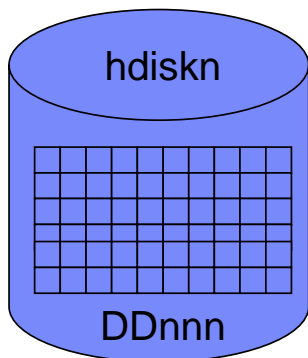
Components needed to host a server

- Storage
 - Internal or External disk
 - Types of virtual storage devices
 - Logical volume backed devices
 - File backed devices
 - Device backed devices
 - NPIV attached devices
 - Virtual Optical devices
- Network connectivity
 - Shared Ethernet Adapter (SEA)
 - Integrated Virtual Ethernet (IVE) / Host Ethernet Adapter (HEA)
- Memory
 - Active Memory Sharing

Storage Terms and Options

VIOS Terms

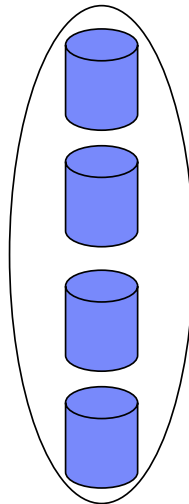
Physical Volumes



IBM i Terms

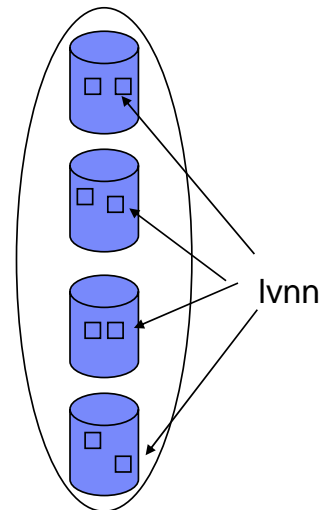
Devices

Volumes Groups



Auxiliary Storage Pool (ASP)

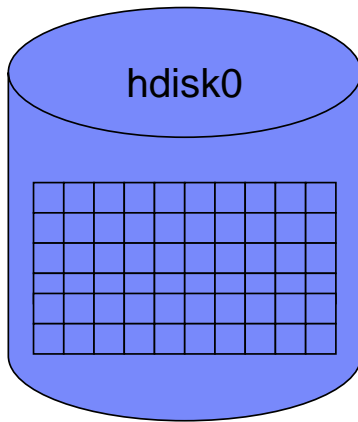
Logical Volumes or File Backed



Network Server Storage Space (NWSSTG)

Storage: Logical Volume Management

Physical Volumes

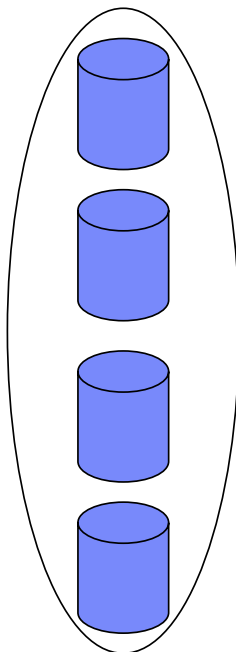


Physical Volumes may be managed using the Virtual Disk tab in the HMC GUI

- Disks autodetected at boot or by `cfgdev` (or `cfgmgr` in aix)
- Naming
 - `hdisk-n`
- Granularity
 - Physical Partition (PP)
 - Size: Assigns at VG creation
- Limitations
 - Sizing: Max PP/disk
 - 1016 PP/disk
 - All disks in VG have same PP
 - Belongs to only 1 VG
- Commands
 - `lspv`
 - `lspv hdisk0`
 - `lspv -l hdisk0`
- May represent a disk array
- May be internal or external (SAN) storage

Storage: Logical Volume Management

Volumes Groups

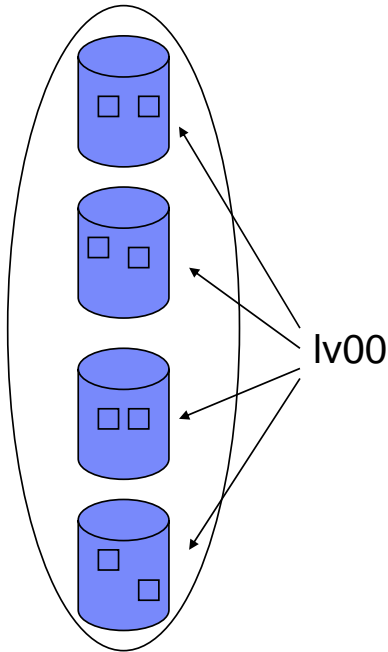


- Naming
 - `rootvg` – VIOS system (Like system ASP)
 - Otherwise user defined (Like User ASP)
- Limitations
 - 128 Disks/VG
 - LV's, filesystems, mirrors can not span VG's
- Commands -
 - `lsvg`
 - `lsvg rootvg`
 - `lsvg -map rootvg`
 - `lsvg -lv rootvg`
- Guideline
 - Reserve `rootvg` for VIOS and application
 - Put data in user defined VG

Volume groups may be managed using the Storage Pools tab in the HMC GUI

Storage: Logical Volume Management

Logical Volumes

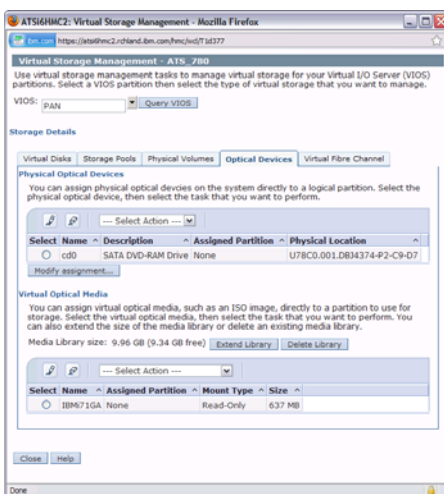


- Purpose
 - Raw Partition or format as filesystem
 - Provides striping, Raid 0, 1, 0+1
 - Used to split a volume group into smaller space to be given to other LPARS
- Naming
 - System specified – lv00
 - User Specified
- Limitations
 - 512 LVs/VG
 - Minimum size = 1PP
 - LV's can not span VG's
- Commands -
 - `lslv -map lvname`
 - `lslv -pv lvname`
- File Backed Devices are very similar to Logical Volumes

Logical Volumes may be managed using the Virtual Disk tab in the HMC GUI

Storage: Virtual Optical Devices

Virtual Media Repository



- Purpose
 - Store CD / DVD images
 - Act as a CD/DVD device to client LPARs
- Limitations
 - 1 Media Repository per VG
- Commands -
 - `mkrep` → create the virtual media repository
 - `mkvopt` → add an iso to the repository
 - `rmvopt` → remove a file from the repository
 - `mkvdev -fbo` → connect to client lpar
 - `lsrep` → list images in the repository
 - `loadopt` → load an image for the client
 - `unloadopt` → unliad an image for a client

Virtual Media Repository may be managed using the Optical Devices tab in the HMC GUI

Steps to Implement using the VIO Server

- Plan the environment
- Activate the VIO features on the hardware
- Build the logical partition for the VIO Server(s)
- Use the Diagnostics CD to reformat disk and build raid array(s) if needed
- Install the VIO server(s)
- Build the logical partition for the hosted server
- Create the disk volumes for the guest system
- Build the links to between the volumes and the guest server
- Activate the guest partition from the HMC
- Install client OS

Check the System Properties for VIOS Support

The screenshot shows the Hardware Management Console (HMC) interface. On the left, the 'Systems Management' tree is visible, with 'DALI6_570' selected. The main window displays the 'Properties' for 'DALI6_570', with the 'Capabilities' tab active. A table lists various capabilities and their values. A callout box points to the 'Virtual I/O Server Capable' entry, which is currently set to 'False'.

Capability	Value
i5/OS Capable	True
5250 Application Capable	False
CoD Capable	True
Processor Capable	True
Memory Capable	True
Micro-partitioning Capable	True
Virtual I/O Server Capable	False
Logical Host Channel Adapter Capability	True
Logical Host Ethernet Adapter Capability	True
Huge Page Capable	True
Barrier Synchronization Capable	True
Service Processor Failover Capable	True
Shared Ethernet Adapter Failover Capable	True
Redundant Error Path Reporting Capable	True
GX Plus Capable	True
Hardware Discovery Capable	True
Active Partition Mobility Capable	False
Inactive Partition Mobility Capable	False
Partition processor compatibility mode capable	True
Partition Availability Priority Capable	True

Virtual I/O Server Capable must be set to True

Virtual I/O Server Overview

- **Virtual I/O (VIO) Server provides**
 - Virtual storage for LPARS without physical disks
 - Shared Ethernet Adapter (SEA) Capability

- **Virtual I/O Server is a special ‘appliance’ partition**
 - Multiple VIO server partitions allowed on same box

- **Installed in separate partition from mksysb image**
 - CD Install
 - NIMOL installation from HMC
 - NIM from AIX

Virtual I/O Server Overview (Continued)

- **Virtual I/O is client server based**
 - VIO server owns physical resources
 - VIO client accesses resources through ‘virtual’ devices
 - Virtual SCSI
 - Virtual Ethernet
 - NPIV - N_Port ID Virtualization
 - Communications is through PHYP (POWER hypervisor)

- **VIO Server is accessed through *restricted korn shell***
 - Configuration on VIO server done by user *padmin*
 - Command line interface for configuration
 - Special command set provided for VIO Server configuration
 - Access to root user functions through *oem_setup_env* cmd.

- **Multiple LPARs can use same physical resource**
 - Physical Disk subsystem
 - Physical Ethernet Adapter

Virtual I/O Server Overview (Continued)

- **VIO Server supports multiple OS clients**
 - **AIX 5.3**
 - **SUSE Linux Enterprise Server**
 - **Red Enterprise Linux AS for POWER**
 - **POWER6 and IBM i 6.1**
 - **Not supported**
 - **Pre AIX 5.3 not supported as client**
 - **i5/OS V5R4 and / or POWER5 partitions not supported as clients**

- **VIO Server can be on Dedicated or Shared Processor LPAR**

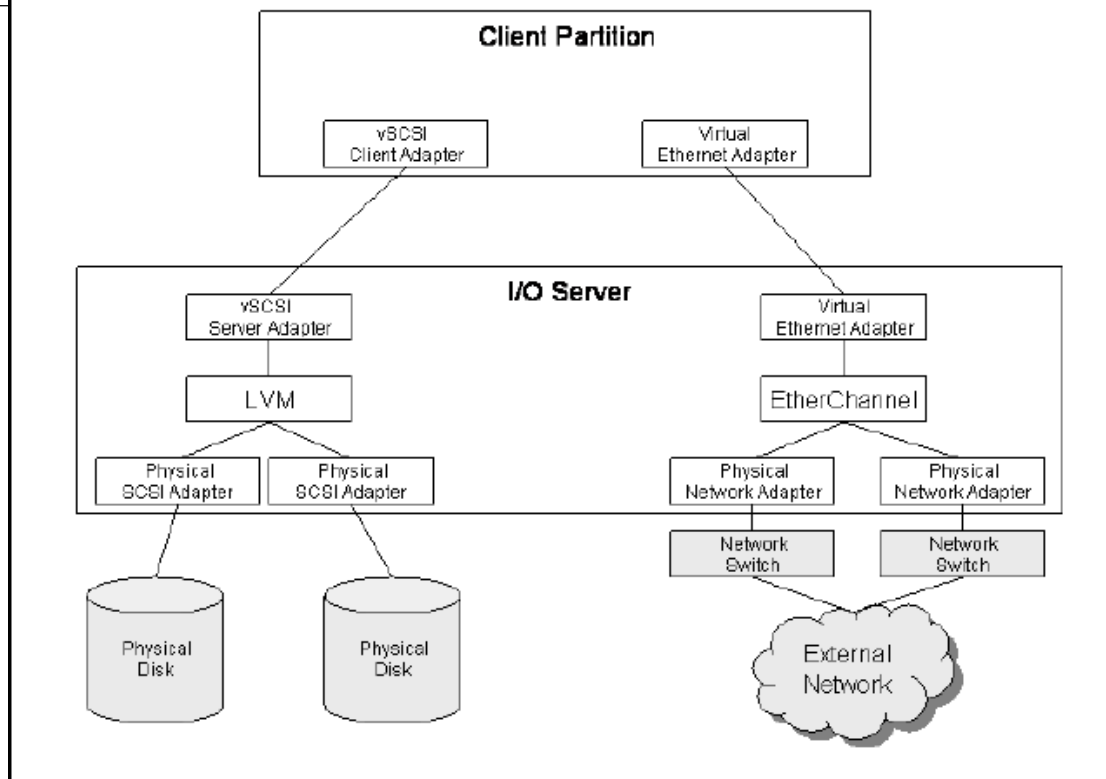
- **VIO Server **should not** be used to run customer applications**
 - **Treat as an appliance**

Why use a Virtual I/O Server?

- **Allows a large number of partitions in a micro-partitioning environment**
 - ✓ **Systems may support more partitions than I/O slots available**
 - ✓ **Allow partitions to be created without physical slot restrictions**
 - ✓ **Removes slot requirement of 1 NIC and 1 storage adapter per LPAR**

- **Optimized utilization of resources**
 - ✓ **Add partitions without adding any additional hardware resources**
 - ✓ **Efficient utilization of physical resources through sharing on the VIO server**
 - ✓ **Facilitates server consolidation**

- **The two main reason to use the Virtual I/O Server on an iSeries system are:**
 - ✓ **Your system has non i5 disk that you want to share across multiple partitions**
 - ✓ **You want to use the Shared ethernet adapter function for networking rather than using functions in i5/OS to provide network connectivity to guest LPARS**



Managing Virtual I/O Server?

- VIO server provides restricted scriptable command line interface (CLI)
- All aspects of VIO server administration can be done through the CLI
 - ✓ Device management (physical, virtual, LVM)
 - ✓ Network configuration
 - ✓ Software installation and update
 - ✓ Security
 - ✓ User management
 - ✓ Installation of OEM software
 - ✓ Maintenance tasks
- First login will present 'padmin' user and force new password
- Type 'help' to list commands supported
 - Most supported through 'ioscli'
- See: Virtual I/O Server and PLM Commands Reference
 - In infocenter

Virtual SCSI Overview

- **VIO Server owns physical disk resources**
 - LVM based storage on VIO Server
 - Physical Storage can be most types supported by AIX
 - Local SCSI
 - Remote storage (e.g. ESS, DS8K, EMC)

- **VIO Client LPAR sees disks as vscsi (Virtual SCSI) devices**
 - Virtual SCSI devices added to partition via HMC
 - LUNs on VIO Server accessed as vscsi on client
 - Partitions maintain client/server relationship
 - VIO Server must be active for client to boot

- **Multiple LPARs can use same or different physical disk**
 - Configure as logical volume on VIO Server
 - Appear as hdisk on the client
 - Can assign entire hdisk to a single client
 - May be created as a “File Backed” device

Step one Install VIOS

This example is using internal disk

- Build the LPAR for VIOS
- Setup Disk environment
- Install VIOS

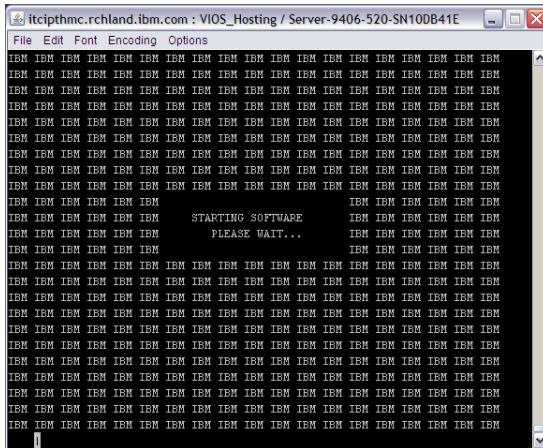
Build the VIOS LPAR

- To build the VIOS partition
 - Follow the steps in the chapter 3 (section 3.3) of the redbook PowerVM Virtualization on IBM System p: Introduction and Configuration Fourth Edition
<http://www.redbooks.ibm.com/abstracts/sg247940.html?Open>
 - Sizing should be considered
 - Workload estimator may be used for sizing
 - Consider availability configurations
 - 2 VIOS LPARS with mirroring in IBM i for internal storage
 - 2 VIOS LPARS with MPIO functions for external storage
 - Build a root volume group (rootvg) – think of it as load source
 - rootvg may be mirrored in VIOS for disk protection (mirrorios)
 - Build a volume group(s) for hosted disk
 - For internal disk, RAID protection is the only supported option
 - For SAN attach storage there are many options available

Overview of Disk environment

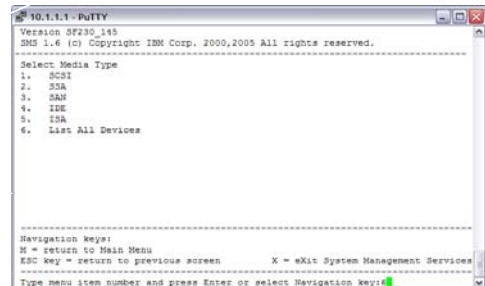
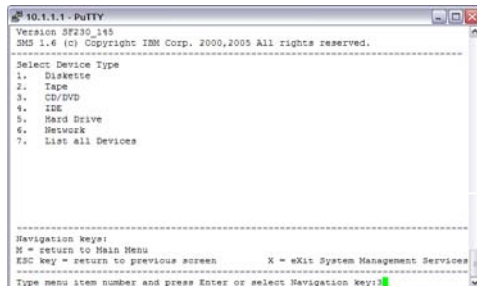
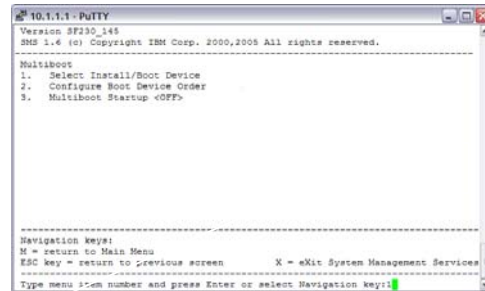
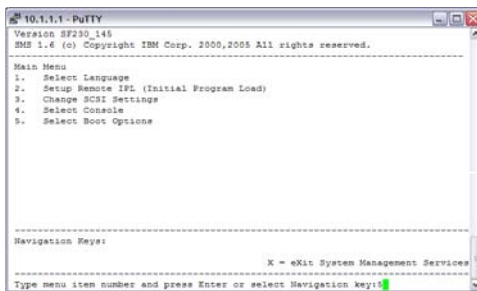
- This example starts with Internal disk that were previously used in a RAID array with an IBM i partition
- Many options available with SAN
 - Consider access via NPIV support if available (not covered here)
- Steps to make them usable by VIOS (or AIX)
 - Format to JBOD format (512) to remove from existing RAID array
 - Set up a RootVG volume group (Load Source)
 - Build a RAID array to hold the data volumes for the hosted clients
- This is equivalent to Using DST or SST or create or add disk to an ASP

Boot Diagnostic Utilities CD

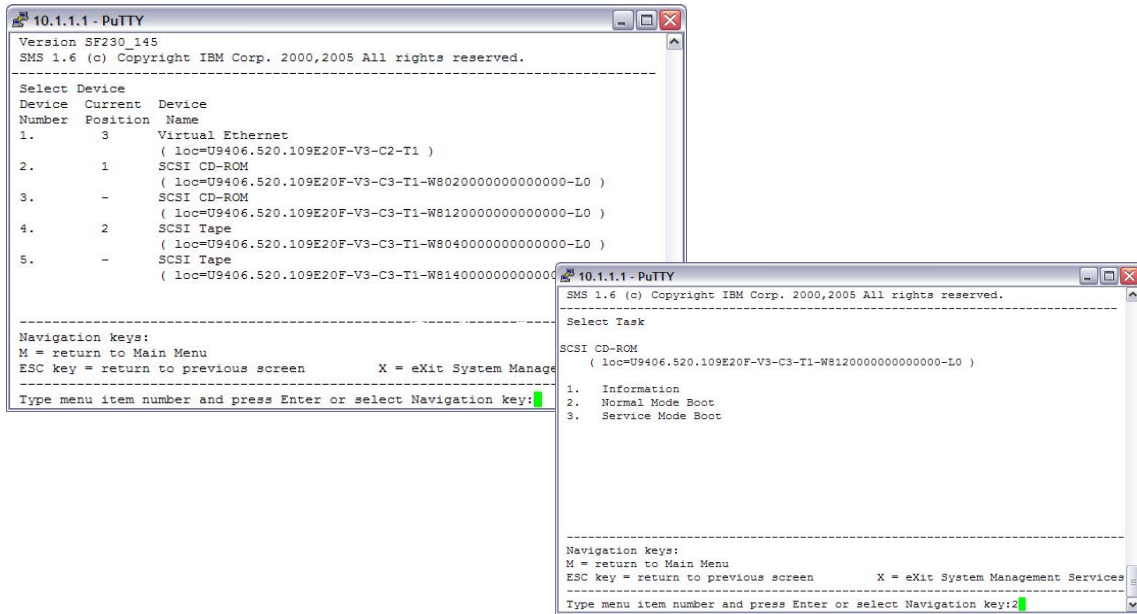


- Connect a console session
 - Use the HMC function
 - Use putty to ssh to HMC signon hscroot and then use the command **vtmenu**
 - use **~.** (tilde dot) to exit back to the LPAR selection menu
- Insert Diag CD into CD/DVD drive and boot
 - <http://www14.software.ibm.com/webapp/set2/sas/f/diags/download/home.html>
- Activate the VIOS LPAR into SMS

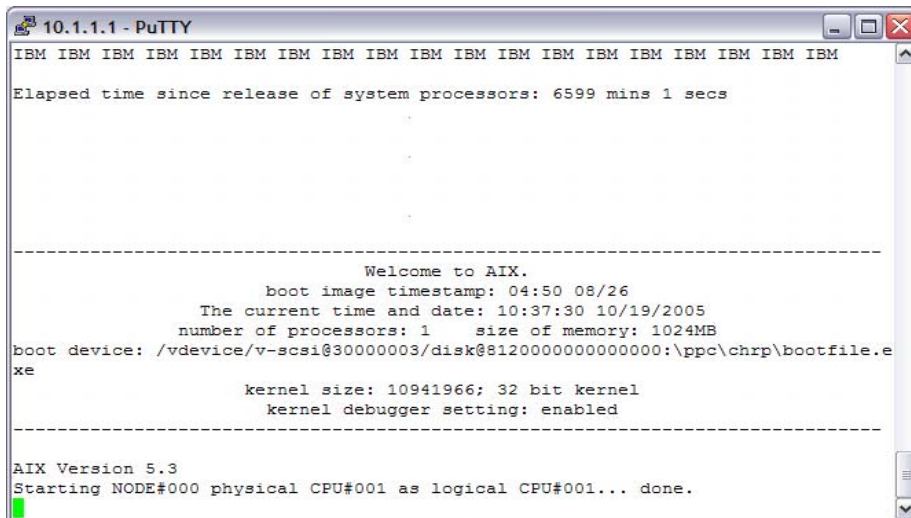
Select the boot device



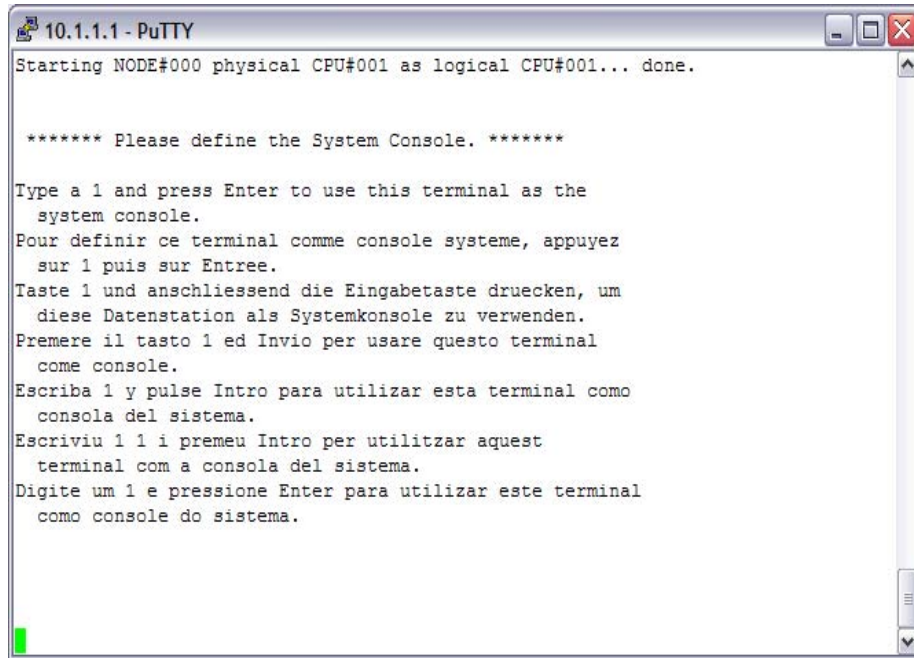
Select the boot device



Start of Install



Install continues



```
10.1.1.1 - PuTTY
Starting NODE#000 physical CPU#001 as logical CPU#001... done.

***** Please define the System Console. *****

Type a 1 and press Enter to use this terminal as the
system console.
Pour definir ce terminal comme console systeme, appuyez
sur 1 puis sur Entree.
Taste 1 und anschliessend die Eingabetaste druecken, um
diese Datenstation als Systemkonsole zu verwenden.
Premere il tasto 1 ed Invio per usare questo terminal
come console.
Escriba 1 y pulse Intro para utilizar esta terminal como
consola del sistema.
Escriviu 1 i premeu Intro per utilitzar aquest
terminal com a consola del sistema.
Digite um 1 e pressione Enter para utilizar este terminal
como console do sistema.
```

DIAGNOSTIC OPERATING INSTRUCTIONS VERSION 6.1.1.2

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These programs contain diagnostics, service aids, and tasks for the system. These procedures should be used whenever problems with the system occur which have not been corrected by any software application procedures available.

In general, the procedures will run automatically. However, sometimes you will be required to select options, inform the system when to continue, and do simple tasks.

Several keys are used to control the procedures:

- The Enter key continues the procedure or performs an action.
- The Backspace key allows keying errors to be corrected.
- The cursor keys are used to select an option.

To continue, press Enter.

Select vt320 as terminal type

DEFINE TERMINAL

The terminal is not properly initialized.
The following are some of the terminal types that are supported.

ibm3101	tvi912	vt330
ibm3151	tvi925	vt340
ibm3161	tvi920	wyse30
ibm3162	tvi950	wyse50
ibm3163	vs100	wyse60
ibm3164	vt100	wyse100
ibmpc	vt320	wyse350
lft	sun	

NOTE: If you are using a Graphics Display, such as a 5081 or 6091 display, enter 'lft' as the terminal type.

If the next screen is unreadable, press <CTRL> C.

Please enter a terminal type, or press Enter to return.

vt320

Select 3

FUNCTION SELECTION

1 Diagnostic Routines

This selection will test the machine hardware. Wrap plugs and other advanced functions will not be used.

2 Advanced Diagnostics Routines

This selection will test the machine hardware. Wrap plugs and other advanced functions will be used.

3 Task Selection (Diagnostics, Advanced Diagnostics, Service Aids, etc.)

This selection will list the tasks supported by these procedures. Once a task is selected, a resource menu may be presented showing all resources supported by the task.

4 Resource Selection

This selection will list the resources in the system that are supported by these procedures. Once a resource is selected, a task menu will be presented showing all tasks that can be run on the resource(s).

99 Exit Diagnostics

NOTE: The terminal is not properly initialized. You will be prompted to initialize the terminal after selecting one of the above options.

To make a selection, type the number and press Enter. [1]

Use the arrow key to move down until RAID array

```

TASKS SELECTION LIST                                     801004

From the list below, select a task by moving the cursor to
the task and pressing 'Enter'.
To list the resources for the task highlighted, press 'List'.
[TOP]
  Run Diagnostics
  Display or Change Diagnostic Run Time Options

  Add Resource to Resource List
  Backup and Restore Media
  Certify Media
  Configure Dials and Lpfkeys
  Delete Resource from Resource List
  Disk Maintenance
  Display Configuration and Resource List
  Display Firmware Device Node Information
  Display Hardware Error Report
[MORE...11]

Esc+1=Help      Esc+4=List      F10=Exit      Enter
F3=Previous Menu

```

Use the arrow key to move down until RAID array

```

TASKS SELECTION LIST                                     801004

From the list below, select a task by moving the cursor to
the task and pressing 'Enter'.
To list the resources for the task highlighted, press 'List'.

[MORE...11]
  Display Hardware Error Report
  Display Hardware Vital Product Data
  Display Multipath I/O (MPIO) Device Configuration
  Display Resource Attributes
  Display Service Hints
  Display or Change Bootlist
  Format Media
  Hot Plug Task
  Identify and Attention Indicators
  Microcode Tasks
  Process Supplemental Media
  RAID Array Manager
[BOTTOM]

Esc+1=Help      Esc+4=List      F10=Exit      Enter
F3=Previous Menu

```

Select correct Disk Array Manager (PCI-X in our case)

```
RAID Array Manager 801004

Move cursor to desired item and press Enter.

IBM SAS Disk Array Manager
PCI SCSI Disk Array Manager
PCI-X SCSI Disk Array Manager

Esc+1=Help      Esc+4=List      F10=Exit      Enter
F3=Previous Menu
```

Select Diagnostics and Recovery

```
PCI-X SCSI Disk Array Manager

Move cursor to desired item and press Enter.

List PCI-X SCSI Disk Array Configuration
Create an Array Candidate pdisk and Format to 522 Byte Sectors
Create a PCI-X SCSI Disk Array
Delete a PCI-X SCSI Disk Array
Add Disks to an Existing PCI-X SCSI Disk Array
Configure a Defined PCI-X SCSI Disk Array
Change/Show Characteristics of a PCI-X SCSI Disk Array
Reconstruct a PCI-X SCSI Disk Array
Change/Show PCI-X SCSI pdisk Status
Diagnostics and Recovery Options

Esc+1=Help      Esc+2=Refresh      Esc+3=Cancel      F8=Image
F9=Shell        F10=Exit           Enter=Do
```

Select Format Physical Disk

```

Diagnostics and Recovery Options

Move cursor to desired item and press Enter.

Certify Physical Disk Media
Download Microcode to a Physical Disk
Format Physical Disk Media (pdisk)
Format Physical Disk Media (hdisk)
Display pdisk Vital Product Data
Display Physical Disk Microcode Level
SCSI and SCSI RAID Hot Swap Manager
Reclaim Controller Cache Storage
Controller Rechargeable Battery Maintenance
Configure a Defined PCI-X SCSI RAID Controller
Unconfigure an Available PCI-X SCSI RAID Controller

Esc+1=Help      Esc+2=Refresh      Esc+3=Cancel      F8=Image
F9=Shell        F10=Exit          Enter=Do

```

Prompted for controller

```

Diagnostics and Recovery Options

Move cursor to desired item and press Enter.

Certify Physical Disk Media
Download Microcode to a Physical Disk
Format Physical Disk Media (pdisk)
Format Physical Disk Media (hdisk)
Display pdisk Vital Product Data
Display Physical Disk Microcode Level
SCSI and SCSI RAID Hot Swap Manager

Available Controllers

Move cursor to desired item and press F7.
ONE OR MORE items can be selected.
Press Enter AFTER making all selections.

sisioa0 Available 00-08 PCI-XDDR Dual Channel U320 SCSI RAID Adapter

Esc+1=Help      Esc+2=Refresh      Esc+3=Cancel
F7=Select       F8=Image          F10=Exit
Es Enter=Do     /=Find            n=Find Next
F9

```

List of disk are presented. Notice current RWProtected

```

Diagnostics and Recovery Options

Move cursor to desired item and press Enter.

Certify Physical Disk Media
Download Microcode to a Physical Disk
Format Physical Disk Media (pdisk)
Format Physical Disk Media (hdisk)

Format Physical Disk Media (pdisk)

Move cursor to desired item and press F7. Use arrow keys to scroll.
ONE OR MORE items can be selected.
Press Enter AFTER making all selections.

pdisk0  00-08-00-3,0  RWProtected Array Candidate  35.1GB
pdisk1  00-08-00-4,0  RWProtected Array Candidate  35.1GB
pdisk2  00-08-00-5,0  RWProtected Array Candidate  35.1GB
pdisk3  00-08-00-8,0  RWProtected Array Candidate  35.1GB

Esc+1=Help      Esc+2=Refresh      Esc+3=Cancel
F7=Select       F8=Image          F10=Exit
Es Enter=Do     /=Find            n=Find Next
F9

```

Select the disk to format

```

Diagnostics and Recovery Options

Move cursor to desired item and press Enter.

Certify Physical Disk Media
Download Microcode to a Physical Disk
Format Physical Disk Media (pdisk)
Format Physical Disk Media (hdisk)

Format Physical Disk Media (pdisk)

Move cursor to desired item and press F7. Use arrow keys to scroll.
ONE OR MORE items can be selected.
Press Enter AFTER making all selections.

> pdisk0  00-08-00-3,0  RWProtected Array Candidate  35.1GB
> pdisk1  00-08-00-4,0  RWProtected Array Candidate  35.1GB
> pdisk2  00-08-00-5,0  RWProtected Array Candidate  35.1GB
> pdisk3  00-08-00-8,0  RWProtected Array Candidate  35.1GB

Esc+1=Help      Esc+2=Refresh      Esc+3=Cancel
F7=Select       F8=Image          F10=Exit
Es Enter=Do     /=Find            n=Find Next
F9

```

And Confirm

```

Diagnostics and Recovery Options

Move cursor to desired item and press Enter.

Certify Physical Disk Media
Download Microcode to a Physical Disk
Format Physical Disk Media (pdisk)
Format Physical Disk Media (hdisk)
Display pdisk Vital Product Data
Display Physical Disk Microcode Level
SCSI and SCSI RAID Hot Swap Manager
Reclaim Controller Cache Storage

      ARE YOU SURE?

Continuing may delete information you may want
to keep. This is your last chance to stop
before continuing.

      Press Enter to continue.
      Press Cancel to return to the application.

Esc+1=Help          Esc+2=Refresh      Esc+3=Cancel
Es F8=Image         F10=Exit          Enter=Do
F9

```

Progress indicator and post processing

```

Format in Progress
|#####--| - 96%
Post processing device.pdisk0 Defined

Post processing device.pdisk1 Defined

Post processing device.pdisk2 Defined

Post processing device.pdisk3 Defined
|#####| \ 100%
Formats complete.

Press the Enter key to continue ...

```

Enter returns to diag and rec. ESC+3

```

PCI-X SCSI Disk Array Manager

Move cursor to desired item and press Enter.

List PCI-X SCSI Disk Array Configuration
Create an Array Candidate pdisk and Format to 522 Byte Sectors
Create a PCI-X SCSI Disk Array
Delete a PCI-X SCSI Disk Array
Add Disks to an Existing PCI-X SCSI Disk Array
Configure a Defined PCI-X SCSI Disk Array
Change/Show Characteristics of a PCI-X SCSI Disk Array
Reconstruct a PCI-X SCSI Disk Array
Change/Show PCI-X SCSI pdisk Status
Diagnostics and Recovery Options

Esc+1=Help      Esc+2=Refresh      Esc+3=Cancel      F8=Image
F9=Shell        F10=Exit          Enter=Do

```

Make disk Array Candidates - Select controller

```

PCI-X SCSI Disk Array Manager

Move cursor to desired item and press Enter.

List PCI-X SCSI Disk Array Configuration
Create an Array Candidate pdisk and Format to 522 Byte Sectors
Create a PCI-X SCSI Disk Array
Delete a PCI-X SCSI Disk Array
Add Disks to an Existing PCI-X SCSI Disk Array
Configure a Defined PCI-X SCSI Disk Array
Change/Show Characteristics of a PCI-X SCSI Disk Array

Available Controllers

Move cursor to desired item and press F7.
ONE OR MORE items can be selected.
Press Enter AFTER making all selections.

sisioa0 Available 00-08 PCI-XDDR Dual Channel U320 SCSI RAID Adapter

Esc+1=Help      Esc+2=Refresh      Esc+3=Cancel
F7=Select       F8=Image          F10=Exit
Es Enter=Do     /n=Find           n=Find Next
F9

```

Select disk to format

```

PCI-X SCSI Disk Array Manager

Move cursor to desired item and press Enter.
List PCI-X SCSI Disk Array Configuration
  Create an Array Candidate pdisk and Format to 522 Byte Sectors
  Create a PCI-X SCSI Disk Array
  Delete a PCI-X SCSI Disk Array

  Create an Array Candidate pdisk and Format to 522 Byte Sectors

Move cursor to desired item and press F7. Use arrow keys to scroll.
  ONE OR MORE items can be selected.
Press Enter AFTER making all selections.

> pdisk0  00-08-00-3,0  Active      Array Candidate  35.1GB
> pdisk1  00-08-00-4,0  Active      Array Candidate  35.1GB
> pdisk2  00-08-00-5,0  Active      Array Candidate  35.1GB
> pdisk3  00-08-00-8,0  Active      Array Candidate  35.1GB

Esc+1=Help      Esc+2=Refresh      Esc+3=Cancel
F7=Select        F8=Image           F10=Exit
Es  Enter=Do     /=Find             n=Find Next
F9
  
```

Confirm selection

```

PCI-X SCSI Disk Array Manager

Move cursor to desired item and press Enter.
List PCI-X SCSI Disk Array Configuration
  Create an Array Candidate pdisk and Format to 522 Byte Sectors
  Create a PCI-X SCSI Disk Array
  Delete a PCI-X SCSI Disk Array
  Add Disks to an Existing PCI-X SCSI Disk Array
  Configure a Defined PCI-X SCSI Disk Array
  Change/Show Characteristics of a PCI-X SCSI Disk Array
  Reconstruct a PCI-X SCSI Disk Array

  ARE YOU SURE?

Continuing may delete information you may want
to keep. This is your last chance to stop
before continuing.

  Press Enter to continue.
  Press Cancel to return to the application.

Esc+1=Help      Esc+2=Refresh      Esc+3=Cancel
Es  F8=Image       F10=Exit           Enter=Do
F9
  
```

Format Progress and Completion

```

Format in progress
|#####--| - 96%
Post processing device.pdisk0 Defined

Post processing device.pdisk1 Defined

Post processing device.pdisk2 Defined

Post processing device.pdisk3 Defined
|##### \ 100%
Formats complete.

Press the Enter key to continue ...

```

Enter returns to diag and rec. ESC+3

```

PCI-X SCSI Disk Array Manager

Move cursor to desired item and press Enter.

List PCI-X SCSI Disk Array Configuration
Create an Array Candidate pdisk and Format to 522 Byte Sectors
Create a PCI-X SCSI Disk Array
Delete a PCI-X SCSI Disk Array
Add Disks to an Existing PCI-X SCSI Disk Array
Configure a Defined PCI-X SCSI Disk Array
Change/Show Characteristics of a PCI-X SCSI Disk Array
Reconstruct a PCI-X SCSI Disk Array
Change/Show PCI-X SCSI pdisk Status
Diagnostics and Recovery Options

Esc+1=Help      Esc+2=Refresh      Esc+3=Cancel      F8=Image
F9=Shell        F10=Exit           Enter=Do

```


Build Mirrored pair for RootVG

```

PCI-X SCSI Disk Array Manager

Move cursor to desired item and press Enter.

List PCI-X SCSI Disk Array Configuration
Create an Array Candidate pdisk and Format to 522 Byte Sectors
Create a PCI-X SCSI Disk Array
Delete a PCI-X SCSI Disk Array
Add Disks to an Existing PCI-X SCSI Disk Array
Configure a Defined PCI-X SCSI Disk Array
Change/Show Characteristics of a PCI-X SCSI Disk Array

Available Controllers

Move cursor to desired item and press F7.
ONE OR MORE items can be selected.
Press Enter AFTER making all selections.

sisioa0 Available 00-08 PCI-XDDR Dual Channel U320 SCSI RAID Adapter

Esc+1=Help      Esc+2=Refresh      Esc+3=Cancel
F7=Select       F8=Image          F10=Exit
Es Enter=Do      /=Find            n=Find Next

```

Select RAID level 10 - Mirrored

```

PCI-X SCSI Disk Array Manager

Move cursor to desired item and press Enter.

List PCI-X SCSI Disk Array Configuration
Create an Array Candidate pdisk and Format to 522 Byte Sectors
Create a PCI-X SCSI Disk Array
Delete a PCI-X SCSI Disk Array
Add Disks to an Existing PCI-X SCSI Disk Array
Configure a Defined PCI-X SCSI Disk Array

Select a Raid Level

Move cursor to desired item and press Enter.

0
5
10
6

Esc+1=Help      Esc+2=Refresh      Esc+3=Cancel
F8=Image       F10=Exit           Enter=Do
Es /=Find        n=Find Next
F9

```

Stripe size

```

PCI-X SCSI Disk Array Manager

Move cursor to desired item and press Enter.

List PCI-X SCSI Disk Array Configuration
Create an Array Candidate pdisk and Format to 522 Byte Sectors
Create a PCI-X SCSI Disk Array
Delete a PCI-X SCSI Disk Array
Add Disks to an Existing PCI-X SCSI Disk Array
Configure a Defined PCI-X SCSI Disk Array
Change/Show Characteristics of a PCI-X SCSI Disk Array

Select a Stripe Size (in Kb)

Move cursor to desired item and press Enter.

16 Kb
64 Kb (recommended)
256 Kb

Esc+1=Help      Esc+2=Refresh      Esc+3=Cancel
F8=Image        F10=Exit          Enter=Do
Es /=Find       n=Find Next
Fs
  
```

Select Drives to Include

```

PCI-X SCSI Disk Array Manager

Move cursor to desired item and press Enter.

List PCI-X SCSI Disk Array Configuration

Select Disks to Use in the Array

Move cursor to desired item and press F7. Use arrow keys to scroll.
ONE OR MORE items can be selected.
Press Enter AFTER making all selections.

# RAID 10 supports a minimum of 2 and a maximum of 18 drives.

# The total number of drives must be a multiple of 2.

> pdisk0 00-08-00-3,0 Active Array Candidate 35.1GB
> pdisk1 00-08-00-4,0 Active Array Candidate 35.1GB
pdisk2 00-08-00-5,0 Active Array Candidate 35.1GB
pdisk3 00-08-00-8,0 Active Array Candidate 35.1GB

Esc+1=Help      Esc+2=Refresh      Esc+3=Cancel
F7=Select       F8=Image          F10=Exit
Es Enter=Do     /=Find            n=Find Next
Fs
  
```

Confirm Selections

```

Create a PCI-X SCSI Disk Array

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                     [Entry Fields]
Controller                           sisioa0
RAID Level                             10
Stripe Size in KB                       64
Selected Disks                          pdisk0 pdisk1

Esc+1=Help      Esc+2=Refresh      Esc+3=Cancel      Esc+4=List
Esc+5=Reset     F6=Command          F7=Edit          F8=Image
F9=Shell        F10=Exit                       Enter=Do
  
```

Complete hdisk0 defined - rootvg

```

COMMAND STATUS

Command: OK          stdout: yes          stderr: no

Before command completion, additional instructions may appear below.

.

hdisk0 Available

Esc+1=Help      Esc+2=Refresh      Esc+3=Cancel      F6=Command
F8=Image        F9=Shell          F10=Exit          /=Find
n=Find Next
  
```

Repeat for Data Volume Select controller

```

PCI-X SCSI Disk Array Manager

Move cursor to desired item and press Enter.

List PCI-X SCSI Disk Array Configuration
Create an Array Candidate pdisk and Format to 522 Byte Sectors
Create a PCI-X SCSI Disk Array
Delete a PCI-X SCSI Disk Array
Add Disks to an Existing PCI-X SCSI Disk Array
Configure a Defined PCI-X SCSI Disk Array
Change/Show Characteristics of a PCI-X SCSI Disk Array

Available Controllers

Move cursor to desired item and press F7.
ONE OR MORE items can be selected.
Press Enter AFTER making all selections.

sisioa0 Available 00-08 PCI-XDDR Dual Channel U320 SCSI RAID Adapter

Esc+1=Help      Esc+2=Refresh      Esc+3=Cancel
F7=Select       F8=Image          F10=Exit
Es Enter=Do      /=Find            n=Find Next
F9

```

Select RAID level 10 - Mirrored

```

PCI-X SCSI Disk Array Manager

Move cursor to desired item and press Enter.

List PCI-X SCSI Disk Array Configuration
Create an Array Candidate pdisk and Format to 522 Byte Sectors
Create a PCI-X SCSI Disk Array
Delete a PCI-X SCSI Disk Array
Add Disks to an Existing PCI-X SCSI Disk Array
Configure a Defined PCI-X SCSI Disk Array

Select a Raid Level

Move cursor to desired item and press Enter.

0
5
10
6

Esc+1=Help      Esc+2=Refresh      Esc+3=Cancel
F8=Image        F10=Exit           Enter=Do
Es /=Find         n=Find Next
F9

```

Stripe size

```

PCI-X SCSI Disk Array Manager

Move cursor to desired item and press Enter.

List PCI-X SCSI Disk Array Configuration
Create an Array Candidate pdisk and Format to 522 Byte Sectors
Create a PCI-X SCSI Disk Array
Delete a PCI-X SCSI Disk Array
Add Disks to an Existing PCI-X SCSI Disk Array
Configure a Defined PCI-X SCSI Disk Array
Change/Show Characteristics of a PCI-X SCSI Disk Array

Select a Stripe Size (in Kb)

Move cursor to desired item and press Enter.

16 Kb
64 Kb (recommended)
256 Kb

Esc+1=Help      Esc+2=Refresh      Esc+3=Cancel
F8=Image        F10=Exit          Enter=Do
Es /=Find       n=Find Next
F9

```

Select Drives to Include

```

PCI-X SCSI Disk Array Manager

Move cursor to desired item and press Enter.

List PCI-X SCSI Disk Array Configuration

Select Disks to Use in the Array

Move cursor to desired item and press F7. Use arrow keys to scroll.
ONE OR MORE items can be selected.
Press Enter AFTER making all selections.

# RAID 10 supports a minimum of 2 and a maximum of 18 drives.

# The total number of drives must be a multiple of 2.

> pdisk2 00-08-00-5,0 Active Array Candidate 35.1GB
> pdisk3 00-08-00-8,0 Active Array Candidate 35.1GB

Esc+1=Help      Esc+2=Refresh      Esc+3=Cancel
F7=Select       F8=Image          F10=Exit
Es Enter=Do      /=Find            n=Find Next
F9

```

Confirm Selections

```

Create a PCI-X SCSI Disk Array

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                     [Entry Fields]

Controller                          sisioa0
RAID Level                           10
Stripe Size in KB                    64
Selected Disks                       pdisk2 pdisk3

Esc+1=Help      Esc+2=Refresh      Esc+3=Cancel      Esc+4=List
Esc+5=Reset     F6=Command         F7=Edit          F8=Image
F9=Shell       F10=Exit                       Enter=Do
  
```

Complete hdisk1 defined - datavg

```

COMMAND STATUS

Command: OK          stdout: yes          stderr: no

Before command completion, additional instructions may appear below.

.

hdisk1 Available

Esc+1=Help      Esc+2=Refresh      Esc+3=Cancel      F6=Command
F8=Image       F9=Shell          F10=Exit          /=Find
n=Find Next
  
```

Enter returns to diag and rec. ESC+3

```

PCI-X SCSI Disk Array Manager

Move cursor to desired item and press Enter.

List PCI-X SCSI Disk Array Configuration
Create an Array Candidate pdisk and Format to 522 Byte Sectors
Create a PCI-X SCSI Disk Array
Delete a PCI-X SCSI Disk Array
Add Disks to an Existing PCI-X SCSI Disk Array
Configure a Defined PCI-X SCSI Disk Array
Change/Show Characteristics of a PCI-X SCSI Disk Array
Reconstruct a PCI-X SCSI Disk Array
Change/Show PCI-X SCSI pdisk Status
Diagnostics and Recovery Options

Esc+1=Help      Esc+2=Refresh      Esc+3=Cancel      F8=Image
F9=Shell        F10=Exit          Enter=Do

```

List the Disk Array Configuration – Select Controller

```

PCI-X SCSI Disk Array Manager

Move cursor to desired item and press Enter.

List PCI-X SCSI Disk Array Configuration
Create an Array Candidate pdisk and Format to 522 Byte Sectors
Create a PCI-X SCSI Disk Array
Delete a PCI-X SCSI Disk Array
Add Disks to an Existing PCI-X SCSI Disk Array
Configure a Defined PCI-X SCSI Disk Array
Change/Show Characteristics of a PCI-X SCSI Disk Array

Available Controllers

Move cursor to desired item and press F7.
ONE OR MORE items can be selected.
Press Enter AFTER making all selections.

sisioa0 Available 00-08 PCI-XDDR Dual Channel U320 SCSI RAID Adapter

Esc+1=Help      Esc+2=Refresh      Esc+3=Cancel
F7=Select       F8=Image          F10=Exit
Es Enter=Do     /n=Find           n=Find Next
F9

```

Arrays are defined but NOT ready - Rebuilding

```

COMMAND STATUS

Command: OK          stdout: yes          stderr: no

Before command completion, additional instructions may appear below.

[TOP]
-----
Name      Location      State      Description      Size
-----
sisioa0   00-08         Available  PCI-XDDR Dual Channel U320 SCSI RAID Adapter
scsi0     00-08-00-07,0 NoLink     No remote adapter target
scsi1     00-08-01-07,0 NoLink     No remote adapter target

hdisk0    00-08-ff-0,0  Rebuilding RAID 10 Array      35.1GB Create 50%
pdisk0    00-08-00-3,0  Active     Array Member      35.1GB
pdisk1    00-08-00-4,0  Active     Array Member      35.1GB

hdisk1    00-08-ff-0,1  Rebuilding RAID 10 Array      35.1GB Create 3%
[MORE...4]

Esc+1=Help      Esc+2=Refresh      Esc+3=Cancel      F6=Command
F8=Image        F9=Shell           F10=Exit          /=Find
n=Find Next

```

Builds are complete – NOW ready for use

```

COMMAND STATUS

Command: OK          stdout: yes          stderr: no

Before command completion, additional instructions may appear below.

[TOP]
-----
Name      Location      State      Description      Size
-----
sisioa0   00-08         Available  PCI-XDDR Dual Channel U320 SCSI RAID Adapter
scsi0     00-08-00-07,0 NoLink     No remote adapter target
scsi1     00-08-01-07,0 NoLink     No remote adapter target

hdisk0    00-08-ff-0,0  Optimal    RAID 10 Array      35.1GB
pdisk0    00-08-00-3,0  Active     Array Member      35.1GB
pdisk1    00-08-00-4,0  Active     Array Member      35.1GB

hdisk1    00-08-ff-0,1  Optimal    RAID 10 Array      35.1GB
[MORE...4]

Esc+1=Help      Esc+2=Refresh      Esc+3=Cancel      F6=Command
F8=Image        F9=Shell           F10=Exit          /=Find
n=Find Next

```


Use ESC-3 to back out to main menu and select 99

FUNCTION SELECTION

1 Diagnostic Routines

This selection will test the machine hardware. Wrap plugs and other advanced functions will not be used.

2 Advanced Diagnostics Routines

This selection will test the machine hardware. Wrap plugs and other advanced functions will be used.

3 Task Selection (Diagnostics, Advanced Diagnostics, Service Aids, etc.)

This selection will list the tasks supported by these procedures. Once a task is selected, a resource menu may be presented showing all resources supported by the task.

4 Resource Selection

This selection will list the resources in the system that are supported by these procedures. Once a resource is selected, a task menu will be presented showing all tasks that can be run on the resource(s).

99 Exit Diagnostics

NOTE: The terminal is not properly initialized. You will be prompted to initialize the terminal after selecting one of the above options. To make a selection, type the number and press Enter. [1]

Eject CD and halt

The system is now ready to be powered off or rebooted....

Do you want the system to eject the CD?

[Y/N] default is N

Y

Do you want the system to reboot or halt?

[R/H] default is H

H

....Halt completed....

Insert VIOS Install media and Activate LPAR

```

IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM
IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM
IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM
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IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM
IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM
IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM
/
Elapsed time since release of system processors: 21420 mins 20 secs

```

```

-----
Welcome to the Virtual I/O Server.
boot image timestamp: 00:23 04/01
The current time and date: 18:10:22 10/21/2008
number of processors: 1 size of memory: 1024MB
boot device: /pci@800000020000003/pci@2,3/ide@1/disk@0:\ppc\chrp\bootfile.exe
kernel size: 12162439; 32 bit kernel
-----

```

Select Console

```

kernel size: 12162439; 32 bit kernel
-----

***** Please define the System Console. *****

Type a 1 and press Enter to use this terminal as the
system console.
Pour definir ce terminal comme console systeme, appuyez
sur 1 puis sur Entree.
Taste 1 und anschliessend die Eingabetaste druecken, um
diese Datenstation als Systemkonsole zu verwenden.
Premere il tasto 1 ed Invio per usare questo terminal
come console.
Escriba 1 y pulse Intro para utilizar esta terminal como
consola del sistema.
Escriuiu 1 i i premeu Intro per utilitzar aquest
terminal com a consola del sistema.
Digite um 1 e pressione Enter para utilizar este terminal
como console do sistema.

```

Select Language to use during install

```
>>> 1 Type 1 and press Enter to have English during install.
     2 Entreu 2 i premeu Intro per veure la instal·laci· en catal
     3 Entrez 3 pour effectuer l'installation en fran·ais.
     4 F·r Installation in deutscher Sprache 4 eingeben
       und die Eingabetaste dr·cken.
     5 Immettere 5 e premere Invio per l'installazione in Italiano.
     6 Digite 6 e pressione Enter para usar Portugu·s na instala··o.
     7 Escriba 7 y pulse Intro para la instalaci·n en espa·ol.

     88 Help ?

>>> Choice [1]:
```

Start the install

```
                Welcome to Base Operating System
                Installation and Maintenance

Type the number of your choice and press Enter. Choice is indicated by >>>.

>>> 1 Start Install Now with Default Settings

     2 Change/Show Installation Settings and Install

     3 Start Maintenance Mode for System Recovery

     4 Configure Network Disks (iSCSI)

     88 Help ?
     99 Previous Menu

>>> Choice [1]:
```

Review the install parameters verify Disk for RootVG

```

                                System Backup Installation Summary

Disks: hdisk0
Use Physical Location Maps: No
Shrink File Systems: No
Import User Volume Groups: No
Recover Devices: No

>>> 1 Continue with Install
                                +-----+
      88 Help ?                   | WARNING: Base Operating System Installation will
      99 Previous Menu           | destroy or impair recovery of ALL data on the
                                | destination disk hdisk0.
>>> Choice [1]:

```

Install Continues

```

                                Installing Base Operating System

Please wait...

Approximate      Elapsed time
% tasks complete (in minutes)

      4              0      Forming the jfs log.

```

After installation is complete:

- Load maintenance (fixpack) media
 - Run command → updateios
- Configure TCP/IP
 - Run command → cfgassist

Tip

This example is adding internal disk storage

- Put VIOS commands into a notepad file and use cut and paste with putty to enter multiple commands in a single click
- lsdev – list disk devices
- lsdev – list virtual devices
- cfgdev – scan for new devices added with DLPAR
- lsdev – look for new devices
 - vhost1, vhost2, vhost3
- mkvg – make a volume group to split into virtual disk
- mklv – make the logical volumes (virtual disks)
- mkvdev – attach logical volumes to the vSCSI adapter for the client

```

$ lsdev -type disk
name      status      description
hdisk0    Available   SAS RAID 10 Disk Array
hdisk1    Available   SAS RAID 10 Disk Array

$ lsdev -virtual
name      status      description
vasi0     Available   Virtual Asynchronous Services Interface (VASI)
vbsd0     Available   Virtual Block Storage Device (VBSD)
vhost0    Available   Virtual SCSI Server Adapter
vhost1    Available   Virtual SCSI Server Adapter
vsa0      Available   LPAR Virtual Serial Adapter

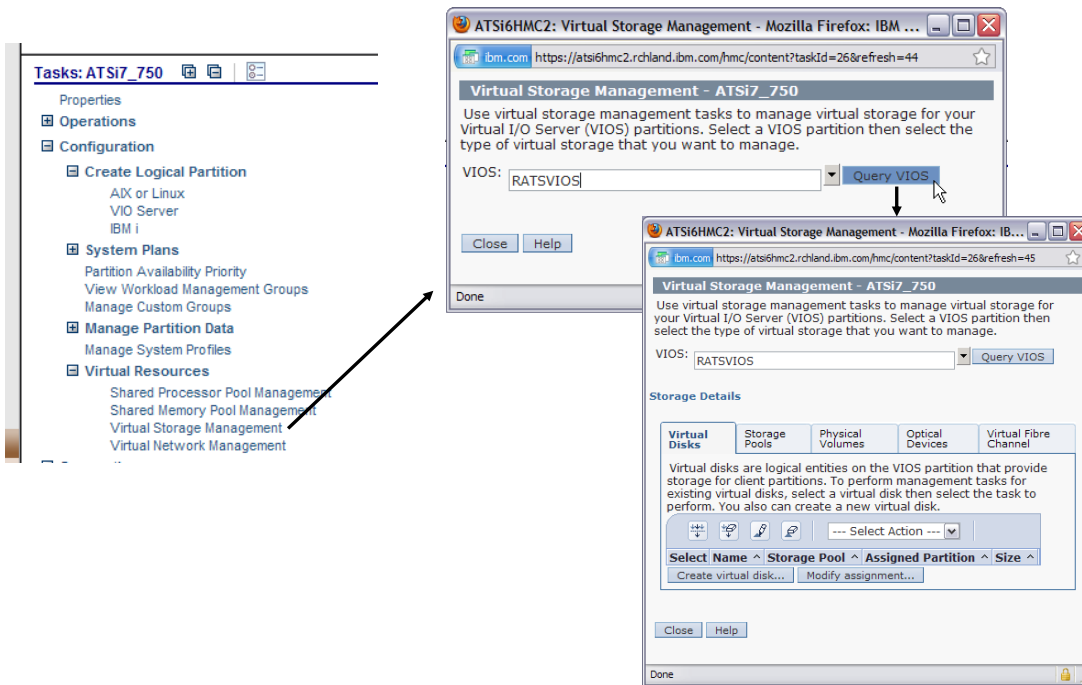
$ cfgdev
$ lsdev -virtual
name      status      description
vasi0     Available   Virtual Asynchronous Services Interface (VASI)
vbsd0     Available   Virtual Block Storage Device (VBSD)
vhost0    Available   Virtual SCSI Server Adapter
vhost1    Available   Virtual SCSI Server Adapter
vhost2    Available   Virtual SCSI Server Adapter
vhost3    Available   Virtual SCSI Server Adapter
vsa0      Available   LPAR Virtual Serial Adapter

$ mkvg -f -vg i5_hdset1 hdisk1
i5_hdset1
0516-1254 mkvg: Changing the PVID in the ODM.
$
mklv -lv vdom_301 i5_hdset1 35G
mklv -lv vdom_302 i5_hdset1 35G
mklv -lv vdom_303 i5_hdset1 35G
mklv -lv vdom_304 i5_hdset1 35G
mklv -lv vdom_305 i5_hdset1 35G
mklv -lv vdom_306 i5_hdset1 35G

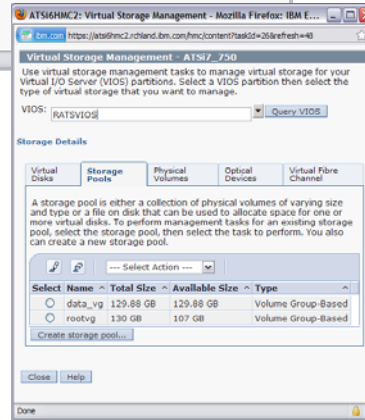
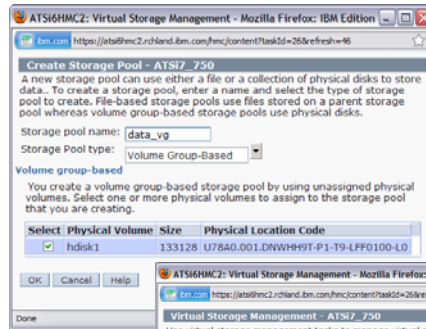
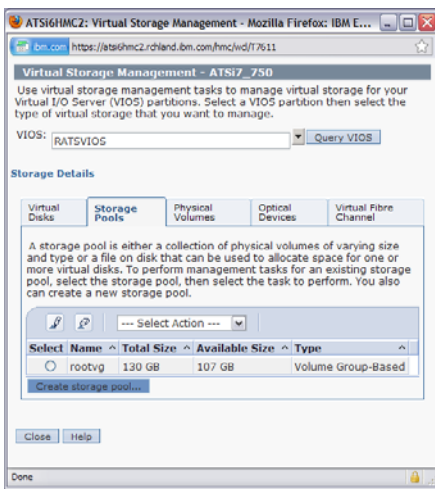
mkvdev -vdev vdom_301 -vadapter vhost3 -dev vvdom_301
mkvdev -vdev vdom_302 -vadapter vhost3 -dev vvdom_302
mkvdev -vdev vdom_303 -vadapter vhost3 -dev vvdom_303
mkvdev -vdev vdom_304 -vadapter vhost3 -dev vvdom_304
mkvdev -vdev vdom_305 -vadapter vhost3 -dev vvdom_305
mkvdev -vdev vdom_306 -vadapter vhost3 -dev vvdom_306

```

HMC GUI management of Storage with VIOS

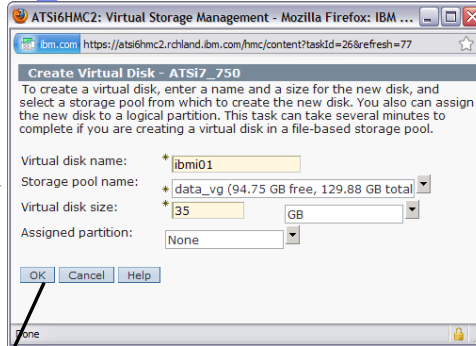
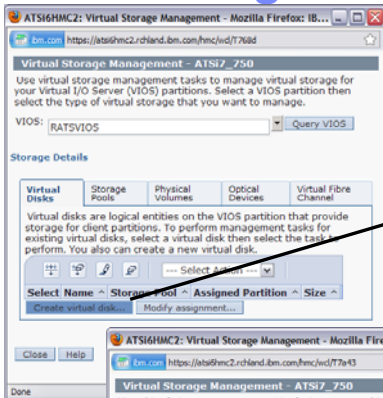


HMC management of Volume Groups with VIOS

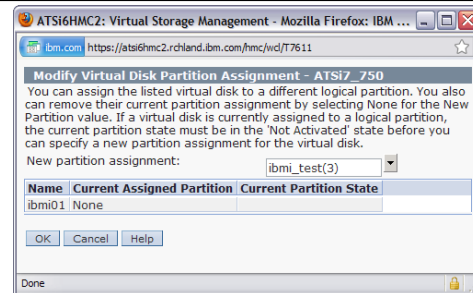


Volume groups are managed using the Storage Pools tab

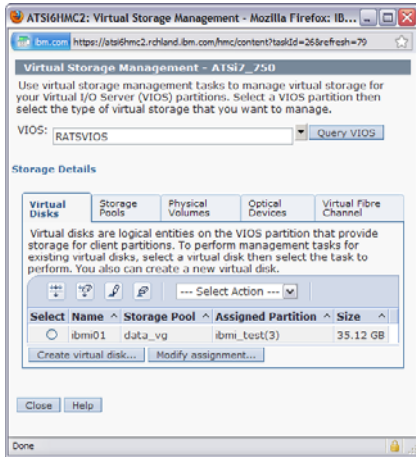
HMC management of Logical Volumes with VIOS



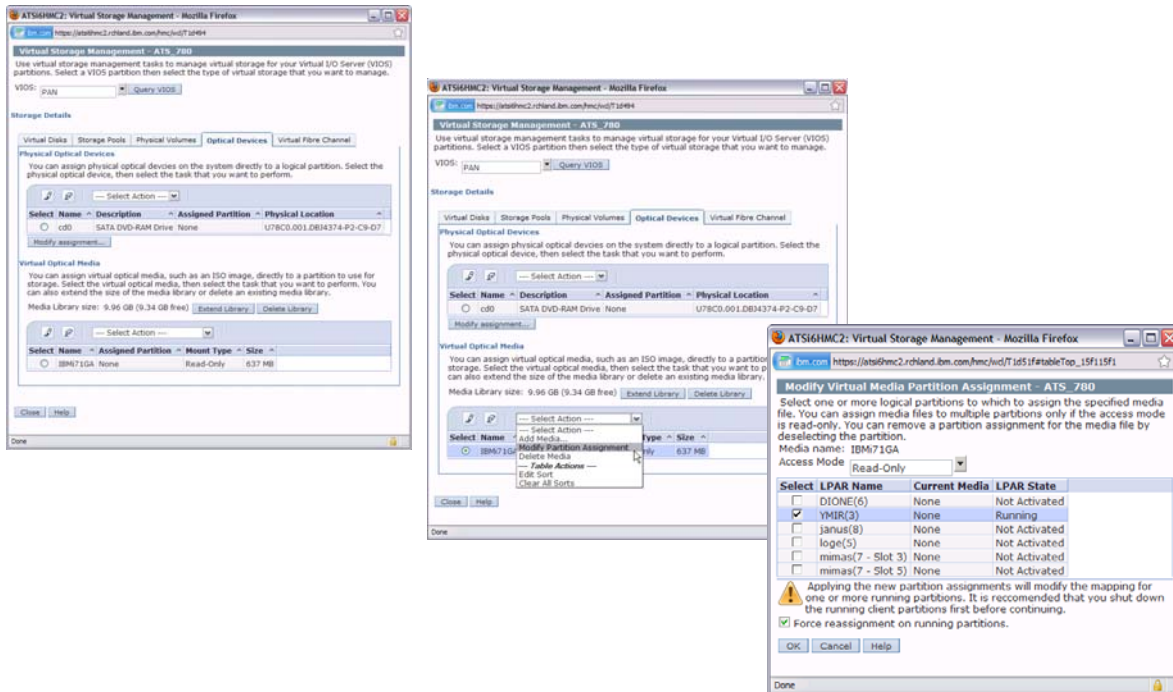
Logical Volumes are managed using the Virtual Disk tab



HMC management of Logical Volumes with VIOS



HMC management of Media Repository with VIOS



HMC management of NPIV Virtual Fibre Channel with VIOS

The left screenshot shows the 'Virtual Fibre Channel' tab in the HMC interface. It displays a table with columns: Select, Name, Description, Physical Location Code, Connected Partitions, and Available Connections. Two rows are visible, both for 'fcs0' and 'fcs1' adapters.

Select	Name	Description	Physical Location Code	Connected Partitions	Available Connections
<input type="radio"/>	fcs0	8Gb PCI Express Dual Port FC Adapter (df1000f114108a03)	U78C0.001.D814374-P2-C2-T1	1	63
<input type="radio"/>	fcs1	8Gb PCI Express Dual Port FC Adapter (df1000f114108a03)	U78C0.001.D814374-P2-C2-T2	0	64

The right screenshot shows the 'Modify Virtual Fibre Channel Partition Assignment' dialog box. It contains a table with columns: Select, Partition Name, Partition State, World Wide Port Names, and Current Assignment. Three rows are visible, all for 'fcs0'.

Select	Partition Name	Partition State	World Wide Port Names	Current Assignment
<input checked="" type="checkbox"/>	YMIR	Running	c0507602f58e0000 c0507602f58e0001	fcs0
<input checked="" type="checkbox"/>	loge	Not Activated	c0507602f58e0008 c0507602f58e0009	fcs0
<input checked="" type="checkbox"/>	mimas	Not Activated	c0507602f58e001a c0507602f58e001b	fcs0

79 Power is performance redefined

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Virtual SCSI Server Configuration

- Add Physical devices to VIO Server
- Create a volume group on one or more disks with `mkvg`
 - Like creating an ASP

```
mkvg [-f] [-vg VolumeGroup] PhysicalVolume
mkvg -f -vg rootvg_clients hdisk2 rootvg_clients
```
- Create logical volumes on the volume group
 - Like CRTNWSSTG

```
mklv [-mirror] [-lv NewLogicalVolume | -prefix Prefix ]
  VolumeGroup Size [PhysicalVolume ... ]
mklv -lv rootvg_dbsrv rootvg_clients 2G rootvg_dbsrv
```
- Define the client virtual SCSI adapter on the HMC
 - In VIO Client partition profile select Virtual I/O tab
 - Choose SCSI radio button and press create button
 - Enter slot number to match allowed partition slot
 - Choose the Client radio button
 - Assign remote slot number to match defined slot

80 Power is performance redefined

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Virtual SCSI Server Configuration (continued)

➤ Define the virtual SCSI server adapter on the HMC

- In VIO Server partition profile select Virtual I/O tab
 - Choose SCSI radio button and press create button
 - Assign a slot number of 2 or higher (used for ID)
 - Choose the Server radio button
 - Select only selected partition

➤ Run VIOS command `cfgdev` to scan for new device

➤ Run `lsdev -virtual` to check new virtual SCSI Adapter

- Like `WRKHDWRSC *cmn`

```
lsdev -virtual
```

```
name      status      description
vhost0    Available   Virtual SCSI Server Adapter
```

➤ Create a virtual target device on VIO Server

- Like `ADDNWSSTGL`

```
mkvdev -vdev TargetDevice -vadapter
```

```
VirtualSCSIServerAdapter [-dev DeviceName
```

```
mkvdev -vdev rootvg_dbsrv -vadapter vhost0 -dev vdbsrv
```

```
vdbsrv Available
```

```
(Use -vdev hdiskx to assign entire hdiskx)
```

Virtual SCSI Server Configuration (continued)

➤ Use `lsdev` and `lsmmap` to look at new device

```
$ lsdev -virtual
```

```
name      status      description
vhost0    Available   Virtual SCSI Server Adapter
vdbsrv     Available   Virtual Target Device - Logical Volume
```

```
$ lsmmap -vadapter vhost0
```

```
SVSA      Physloc      Client PartitionID
vhost0    U9111.520.10DDEEC-V1-C20    0x00000000
```

```
VTD      vdbsrv
LUN      0x8100000000
Backing device rootvg_dbsrv
Physloc
```

➤ Activate client LPAR – disk will show up in the hardware

```
$mkvdev -sea ent0 -vadapter ent2 -default ent2 -defaultid 1
$mkvdev -sea ent1 -vadapter ent3 ent4 -default ent3 -defaultid 2
```

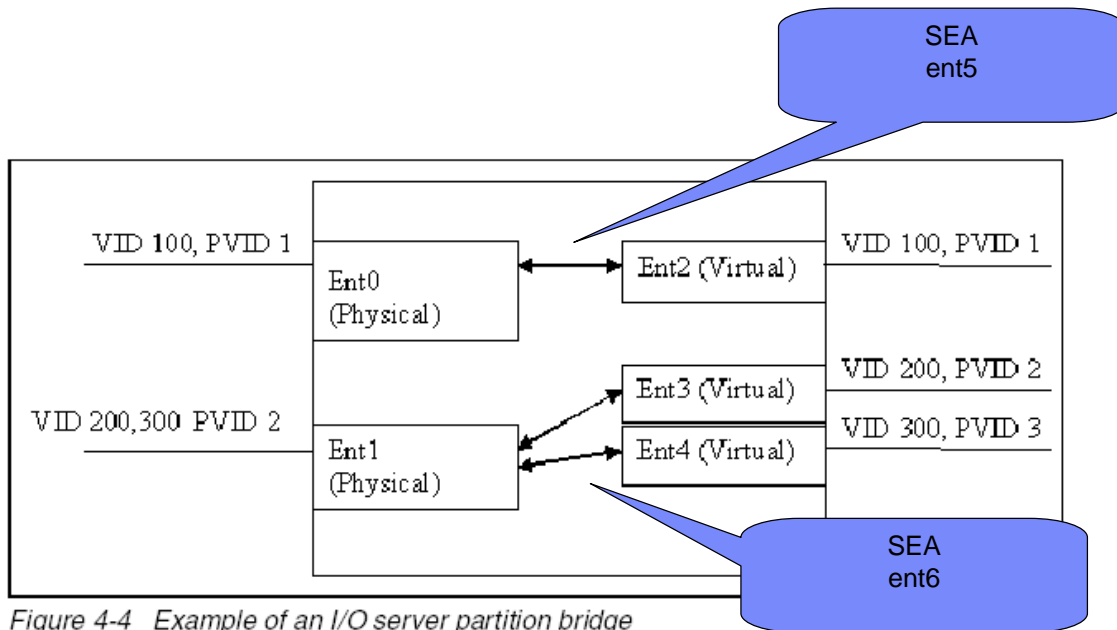


Figure 4-4 Example of an I/O server partition bridge

Shared Ethernet Adapter Server Configuration

- Add Physical devices to VIO Server
- Add Virtual Ethernet adapter to Server from HMC
 - Must specify 'Trunk adapter' (see next page)
- Verify that the Virtual Ethernet Trunk adapter is available

```
$ lsdev -virtual
```

name	status	description
ent2	available	Virtual I/O Ethernet Adapter

- Select the physical adapter

```
$ lsdev -type adapter
```

name	status	description
ent0	available	2-Port 10/100/1000 Base-TX PCI-X Ada

- Create new ent3 device as Shared Ethernet Adapter

```
$ mkvdev -sea ent0 -vadapter ent2 -default ent2 -defaultid 1
ent3 Available
```

SEA Server Configuration (continued)

➤ Confirm that newly created SEA is available

```
$ lsdev -virtual
name      status      description
ent3      available   Shared Ethernet Adapter
```

➤ SEA will form a bridge between inter-partition VLAN and external network

➤ Setup hostname and IP address for SEA

```
$ mktcpip -hostname Hostname -inetaddr Address
  -interface Interface [-start] [-netmask Subnetmask]
  [-cabletype CableType] [-gateway Gateway]
  [-nsrvaddr NameServer [-nsrvdomain Domain]]

$ mktcpip -hostname iosrv1 -inetaddr 9.3.5.150 -interface en5
```

➤ Add Virtual Adapter to LPARs with HMC

➤ Match VLAN IDs or PVID (Port Virtual ID)

VIO Server Command Line Interface

- **Install Commands**
 - ➔ - **updateios**, *lssw*, **ioslevel**, *remote_manamement*,
 - **oem_setup_env**, *oem_platform_level*
- **LAN Commands**
 - ➔ - **cfgassist**
 - *ping*, **mktcpip**, *hostname*, *traceroute*, *cfglnagg*,
 - *netstatus*, *entstatus*, *cfgnamesrv*, *optimizene*, *lsnetsvc*
- **Device Commands**
 - *mkdev*, *rmdev*, **lsdev**, *chdev*, *cfgdev*, **lsmap**
 - *mkpath*, *chpath*, *lspath*, *mpath*
- **Physical Volume Commands**
 - *lspv*, *migratepv*
- **Logical Volume Commands**
 - *lslv*, *mklv*, *extendlv*, *rmlv*
- **Volume Group Commands**
 - *lsvg*, *mkvg*, *chvg*, *extendvg*, *reducevg*, *mirrorios*, *unmirrorios*
 - *activatevg*, *deactivatevg*, *importvg*, *exportvg*, *syncvg*
 - **savevgstruct**, **restorevgstruct**, **backupios**

VIO Server Command Line Interface (Continued)

- **Security Commands**
 - *lsgcl, cleargcl, lsfailedlogin*
- **UserID Commands**
 - *mkuser, mkceuser, lsuser, chuser, rmuser, passwd*
- **Maintenance Command**
 - *diagmenu, shutdown, checkfs*
 - *startrace, stopstrace, catracerpt,*
 - *bootlist, snap, startsysdump*
 - *topas*
 - *mount, unmount, showmount*
 - *starttelnetd, stoptelnetd*

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LINPACK	http://www.netlib.org/benchmark/performance.pdf
Pro/E	http://www.proe.com
GPC	http://www.spec.org/gpc
VolanoMark	http://www.volano.com
STREAM	http://www.cs.virginia.edu/stream/
SAP	http://www.sap.com/benchmark/
Oracle Applications	http://www.oracle.com/apps_benchmark/
PeopleSoft - To get information on PeopleSoft benchmarks, contact PeopleSoft directly	
Siebel	http://www.siebel.com/crm/performance_benchmark/index.shtml
Baan	http://www.ssaaglobal.com
Fluent	http://www.fluent.com/software/fluent/index.htm
TOP500 Supercomputers	http://www.top500.org/
Ideas International	http://www.ideasinternational.com/benchmark/bench.html
Storage Performance Council	http://www.storageperformance.org/results

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GAUSSIAN	http://www.gaussian.com
ANSYS	http://www.ansys.com/services/hardware-support-db.htm
ABAQUS	Click on the "Benchmarks" icon on the left hand side frame to expand. Click on "Benchmark Results in a Table" icon for benchmark results.
ECLIPSE	http://www.simulia.com/support/v68/v68_performance.php
MM5	http://www.mmm.ucar.edu/mm5/
MSC.NASTRAN	http://www.mssoftware.com/support/prod%5Fsupport/nastran/performance/v04_sngl.cfm
STAR-CD	www.cd-adapco.com/products/STAR-CD/performance/320/index/html
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