IBM VIOS for IBM i Administrators – Setup and Configuration

Session ID: VT 445-3

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Certified I/T Specialist – IBM Lab Services





References

PowerVM Virtualization on IBM System p: Introduction and Configuration Fourth Edition - SG24-7940

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 - http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/iphc q/iphcq.pdf

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IEM

IBM i as a client to VIOS and Internal Disk



Hosting by two VIOS LPARS provides the most resilient environment

Not required but recommended Power is performance redefined

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IBM i as a client to VIOS with NPIV





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

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Active Memory Sharing

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IBM IBM Power Systems **Storage Terms and Options VIOS Terms Logical Volumes Physical Volumes** Volumes Groups or File Backed hdiskn lvnn **DDnnn IBM i Terms** Auxiliary Storage **Network Server Storage Devices** Pool (ASP) Space (NWSSTG) Power is performance redefined 8

TRM

Storage: Logical Volume Management

Physical Volumes



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

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- Disks autodetected at boot or by cfgdev (or cfgmgr in aix)
- Naming
- hdisk-nGranularity
 - 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
 - Ispv
 - lspv hdisk0
 - lspv –l hdisk0
- May represent a disk array
- May be internal or external (SAN) storage







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 \rightarrow create the virtual media repository
 - mkvopt \rightarrow add an iso to the repository
 - rmvopt \rightarrow remove a file from the repository
 - mkvdev -fbo \rightarrow connect to client lpar
 - Isrep \rightarrow list images in the repository
 - loadopt → load an image for the client
 - unloadopt \rightarrow unliad an image for a client

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



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

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Check the S	ystem Pro	perties for VIO	S Suppo	ort
ATSi6HMC2: Hardware Management	Console Workplace (V7R3.3.0.2) -	Mozilla Firefox		_
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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	
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IBM Power Systems	IBM
IBM Power Systems Virtual I/O Server Overview (Continued)	IBM
BM Power Systems Virtual I/O Server Overview (Continued) ≻Virtual I/O is client server based	IBM
IBM Power Systems Virtual I/O Server Overview (Continued) ➤Virtual I/O is client server based ➤VIO server owns physical resources	IBM
IBM Power Systems 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	IBM
IBM Power Systems 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	<u>IBM</u>
IBM Power Systems 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	IBM
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 IBM Power Systems 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 	IBM
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 Wrual 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 oen_setup_env cmd. Physical Disk subsystem Physical Ethernet Adapter 	IBM

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 \succ Treat as an appliance 17 Power is performance redefined **IBM Power Systems** 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
- **V**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

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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 SC	SI) 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 physic	cal 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	
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Step one Install VIOS

This example is using internal disk

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

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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

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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

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Boot Diagnostic Utilities CD

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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 25 Power is performance redefined

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Select the boot device

5 10.1.1.1 - PuTTY	
Version SF230_145 SMS 1.6 (c) Copyright IBM Corp. 2000,2005 All rights reserved	
Main Menu Selup Renote IFL (Initial Program Load) Change SCS: Settings Select Concle. 	
. Belect Boot Uptions	
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1. Diskette	
2. Tane	
3. CD/DVD	
4. IDE	
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Select the boot device

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3 Virtual Ethernet (loc=U9406.520.109E20F-V3-C2-T1)	
1 SCSI CD-ROM	
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(loc=U9406.520.109E20F-V3-C3-T1-W8120000000000	00-L0)
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	3. Service Mode Boot
	Variantian Jours
	M = return to Main Menu
	rsc key = return to previous screen X = eXit System Management Services
	Type menu item number and press Enter or select Navigation key:2
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Install continues

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A 10.1.1.1 - PuTTY - O X 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, appuvez 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 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.

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To continue, press Enter.

Select vt320 as terminal type

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	The fo	llowing are	some of	the te	rminal	types	that	are	supported.
	ibm31	01	tvi912		vt330)			
	ibm31	51	tvi925		vt340)			
	ibm31	61	tvi920		wyse3	30			
	ibm31	62	tvi950		wyse	50			
	ibm31	63	vs100		wyse	50			
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	lft		sun						
	NOTE:	If you are	using a	Graphi	cs Disp	olay, s	uch a	ns a	
		5081 or 60	91 displ	ay, ent	er 'lft	:' as t	he		
		terminal t	ype.						
		If the nex	t screen	is unr	eadable	e, pres	s <c1< th=""><th>RL></th><th>с.</th></c1<>	RL>	с.
I	Please	enter a te	rminal t	ype, or	press	Enter	to re	eturr	ı.

vt320

31 Power is performance redefined

IRM IBM Power Systems **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]

IBM

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	
	[MORE11]	
	Esc+1=Help Esc+4=List F10=Exit Enter	
	F3=Previous Menu	
2 Power is per	formance redefined	@ 2014 /DN 0
3		© 2011 IBM Corp

IBM Power Systems

IBM

Use the arrow key to move down until RAID array

TASKS SELECTIO	N LIST		8	01004
From the list	below, select a task	by moving the cur	rsor to	
the task and p	ressing 'Enter'.			
To list the re	sources for the task	highlighted, pres	s 'List'.	
[MORE11]				
Display Hard	ware Error Report			
Display Hard	ware Vital Product Da	ata		
Display Mult	ipath I/O (MPIO) Dev:	ice Configuration		
Display Reso	urce Attributes			
Display Serv	ice Hints			
Display or C	hange Bootlist			
Format Media				
Hot Plug Tas	k			
Identify and	Attention Indicators	s		
Microcode Ta	sks			
Process Supp	lemental Media			
RAID Array M	anager			
[BOTTOM]				
Esc+1=Help	Esc+4=List	F10=Exit	Enter	
F3=Previous Me	nu			

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

	oneci bisk Anay Manayer	(FCI-A III 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	
Dower is port	ormanae redefined	
35 Fowerts peri	ormance redenned	© 2011 IBM Corpo
IBM Power Systems		18
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 S	ectors
	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	
	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

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

37 Power is performance redefined

IRM IBM Power Systems **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 n=Find Next Es Enter=Do /=Find F9

IBM

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List of disk are presented. Notice current RWProtected

Move cursor to	desired item	and press Enter.		
Certify Phys	sical Disk Medi	a		
Download Mic	crocode to a Ph	ysical Disk		
Format Physi	ical Disk Media	(pdisk)		
Format Physi	ical Disk Media	(hdisk)		
	Format	Physical Disk Media (pdisk)	
Move cursor	to desired it	em and press F7. Use a	rrow keys	to scroll.
ONE OR	MORE items can	be selected.		
Press Enter	AFTER making	all selections.		
pdisk0	00-08-00-3,0	RWProtected Array Can	didate 3	S5.IGB
pdisk0 pdisk1	00-08-00-3,0 00-08-00-4,0	RWProtected Array Can RWProtected Array Can	didate 3 didate 3	35.1GB 35.1GB
pdisk0 pdisk1 pdisk2	00-08-00-3,0 00-08-00-4,0 00-08-00-5,0	RWProtected Array Can RWProtected Array Can RWProtected Array Can	didate 3 didate 3 didate 3	85.1GB 85.1GB 85.1GB
pdisk0 pdisk1 pdisk2 pdisk3	00-08-00-3,0 00-08-00-4,0 00-08-00-5,0 00-08-00-8,0	RWProtected Array Can RWProtected Array Can RWProtected Array Can RWProtected Array Can	didate 3 didate 3 didate 3 didate 3	85.1GB 85.1GB 85.1GB 85.1GB
pdisk0 pdisk1 pdisk2 pdisk3 Esc+1=Help	00-08-00-3,0 00-08-00-4,0 00-08-00-5,0 00-08-00-8,0	RWProtected Array Can RWProtected Array Can RWProtected Array Can RWProtected Array Can sc+2=Refresh	didate 3 didate 3 didate 3 didate 3 Esc+3=Car	85.1GB 85.1GB 85.1GB 85.1GB 85.1GB
pdisk0 pdisk1 pdisk2 pdisk3 Esc+1=Help F7=Select	00-08-00-3,0 00-08-00-4,0 00-08-00-5,0 00-08-00-8,0 E	RWProtected Array Can RWProtected Array Can RWProtected Array Can RWProtected Array Can sc+2=Refresh B=Image	didate 3 didate 3 didate 3 didate 3 Esc+3=Car F10=Exit	85.1GB 85.1GB 85.1GB 85.1GB 85.1GB

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IBM Power Systems

IBM Power Systems					IBI
Select the	e disk to for	rmat			
D)iagnostics and Recovery C	Options			
Мо	we cursor to desired item	a and press Enter.			
	Certify Physical Disk Med	lia			
;	Download Microcode to a P	Physical Disk			
;	Format Physical Disk Medi	a (pdisk)			
1	Format Physical Disk Medi	la (hdisk)			
	Forma	at Physical Disk Media (pdisk)		
	Move cursor to desired i	tem and press F7. Use a	arrow keys to	o scroll.	
	ONE OR MORE items ca	an be selected.			
	Press Enter AFTER making	g all selections.			
	> pdisk0 00-08-00-3,0) RWProtected Array Car	ndidate 35.	.1GB	
	> pdisk1 00-08-00-4,0) RWProtected Array Car	didate 35	.1GB	
	> pdisk2 00-08-00-5,0) RWProtected Array Car	ndidate 35	.1GB	
) RWProtected Array Car	didate 35	.1GB	
	> pdisk3 00-08-00-8,0				
	> pdisk3 00-08-00-8,0			_	
	<pre>> pdisk3 00-08-00-8,(Esc+1=Help</pre>	Esc+2=Refresh	Esc+3=Cance	əl	

And Co	ontirm			
	Diagnostics and Re	ecovery Options		
	Move gurgor to desi	red item and press Enter		
		fied item and piess miter.		
	Certify Physical	Disk Media		
	Download Microcod	le to a Physical Disk		
	Format Physical I	Disk Media (pdisk)		
	Format Physical I	Disk Media (hdisk)		
	Display pdisk Vit	al Product Data		
	Display Physical	Disk Microcode Level		
	SCSI and SCSI RAI	ID Hot Swap Manager		
	Reclaim Controlle	er Cache Storage		
		ARE YOU SUR	E?	
	Continuing may d	delete information you may	want	
	to keep. This i	is your last chance to stop		
	before continuin	ng.		
	Press Enter	to continue.		
	Press Cancel	to return to the applicat	ion.	
	Esc+1=Help	Esc+2=Refresh	Esc+3=Cancel	
	Es F8=Image	F10=Exit	Enter=Do	
	F9			
1 Power is per	rformance redefined			© 2011 IBM Corporation
11 Power is per	rformance redefined			© 2011 IBM Corporation
11 Power is per	rformance redefined			© 2011 IBM Corporation
IBM Power Systems	rformance redefined	or and post	processing	© 2011 IBM Corporation
IBM Power Systems Progres	rformance redefined	or and post	processing	© 2011 IBM Corporation
IBM Power Systems Progres	rformance redefined	or and post	processing	© 2011 IBM Corporation
IBM Power Systems Progres	rformance redefined	or and post	processing	© 2011 IBM Corporation
IBM Power Systems Progres	rformance redefined ss indicat Format in Progress ###################################	or and post	processing	© 2011 IBM Corporation
IBM Power Systems Progree	Format in Progress ###################################	or and post	processing #### - 96%	© 2011 IBM Corporation
IBM Power Systems Progree	formance redefined	or and post vice.pdisk0 Defined vice.pdisk1 Defined vice.pdisk2 Defined	processing	© 2011 IBM Corporation
IBM Power Systems Progres	rformance redefined SS indicate Format in Progress ###################################	or and post	processing #### - 96%	© 2011 IBM Corporation
IBM Power Systems Progres	rformance redefined SS inclicat Format in Progress ###################################	or and post	processing #### - 96%	© 2011 IBM Corporation
IBM Power Systems Progres	rformance redefined SS indicat Format in Progress ###################################	or and post	processing #### - 96%	© 2011 IBM Corporation
IBM Power Systems Progres	rformance redefined ss indicate Format in Progress ########################## Post processing dev Post processing dev Post processing dev Post processing dev Post processing dev Formats complete.	or and post	processing #### - 96%	© 2011 IBM Corporation
IBM Power Systems Progres	rformance redefined SS inclicat Format in Progress ###################################	or and post	processing #### - 96%	© 2011 IBM Corporation
IBM Power Systems Progres	rformance redefined SS indicat Format in Progress ###################################	or and post	processing #### - 96%	
IBM Power Systems Progres	rformance redefined SS indicat Format in Progress ###################################	or and post	processing #### - 96%	
IBM Power Systems Progres	rformance redefined ss indicat Format in Progress ###################################	or and post	processing #### - 96%	
IBM Power Systems Progres	rformance redefined ss indicate Format in Progress #################### Post processing dev Post processing dev	or and post	processing #### - 96%	© 2011 IBM Corporation
IBM Power Systems Progres	rformance redefined SS inclicate Format in Progress #################### Post processing dev Post processing dev Post processing dev ####################################	or and post	processing #### - 96%	© 2011 IBM Corporation
IBM Power Systems Progres	rformance redefined SS inclicate Format in Progress ###################################	or and post	processing #### - 96%	

Enter returns to diag and rec. ESC+3

PCT-X SCST Die	k Array Manager		
FCI-A BCBI DIS	r Array Manager		
Move cursor to	desired item and press	s Enter.	
List PCI-X SC	SI Disk Array Configu	ration	
Create an Arr	ay Candidate pdisk and	l 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 SCS	I Disk Array	
Configure a D	efined PCI-X SCSI Dis	c Array	
Change/Show C	haracteristics of a PO	CI-X SCSI Disk Array	
Reconstruct a	PCI-X SCSI Disk Array	Ŧ	
Change/Show P	CI-X SCSI pdisk Status	5	
Diagnostics a	nd Recovery Options		
Esc+1=Help	Esc+2=Refresh	Esc+3=Cancel	F8=Image
F9=Shell	F10=Exit	Enter=Do	

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IBM Power Systems				IBJ
Make d	isk Array (Candidates	- Select con	troller
	PCI-X SCSI Disk Arr	ray Manager		
	Move cursor to desig	red item and press Enter.		
	List PCI-X SCSI Dis	Array Configuration		
	Create an Array Ca	andidate pdisk and Format (to 522 Byte Sectors	
	Create a PCI-X SCS	SI Disk Array		
	Delete a PCI-X SC	SI Disk Array		
	Add Disks to an Ex	kisting PCI-X SCSI Disk Arr	cay	
	Configure a Define	ed PCI-X SCSI Disk Array		
	Change/Show Charac	cteristics of a PCI-X SCSI	Disk Array	
		Available Control	llers	
	Move cursor to a	desired item and press F7.		
	ONE OR MORE	items can be selected.		
	Press Enter AFT	ER making all selections.		
	sisioa0 Availa	able 00-08 PCI-XDDR Dual Ch	nannel U320 SCSI RAID Adapte	er
	Esc+1=Help	Esc+2=Refresh	Esc+3=Cancel	
	F7=Select	F8=Image	F10=Exit	
		(-Tind	- Tind North	

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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	E	Sc+2=Refresh		Esc+3=C	ancel
F7=Select	F	'8=Image		F10=Exi	t
Enter=Do	/	=Find		n=Find	Next

F9 45 Power is performance redefined

Es



Format Progress and Completion

47 Power is performance redefined

TRM IBM Power Systems 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

	List PCI-X SCSI Dis	Array Configuration		
	Create an Array Cano	lidate pdisk and Format t	o 522 Byte Sectors	
	Create a PCI-X SCSI	Disk Array		
	Delete a PCI-X SCSI	Disk Array		
	Add Disks to an Exis	sting PCI-X SCSI Disk Arr	ay	
	Configure a Defined	PCI-X SCSI Disk Array		
	Change/Show Characte	eristics of a PCI-X SCSI	Disk Array	
		Available Control	lers	
	Move cursor to dea	sired item and press F7.		
	ONE OR MORE it	tems can be selected.		
	Press Enter AFTER	making all selections.		
	sisioa0 Availab	Le 00-08 PCI-XDDR Dual Ch	annel 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	



IBM Power Systems 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 Kh 64 Kb (recommended) 256 Kb Esc+1=Help Esc+2=Refresh Esc+3=Cancel F8=Image F10=Exit Enter=Do /=Find n=Find Next Es FS 51 Power is performance redefined © 2011 IBM Corporation TRN IBM Power Systems 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

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Es

Esc+1=Help

F7=Select

Enter=Do

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Esc+3=Cancel

n=Find Next

F10=Exit

Esc+2=Refresh

F8=Image

/=Find

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Confirm Selections

Create a PCI-X	SCSI Disk Array			
Type or select va	alues in entry fields	5.		
Press Enter AFTE	R making all desired	changes.		
			[Entry Fields]	
Controller		£	sisioa0	
RAID Level		1	L0	
Stripe Size in	КВ	e	54	
Selected Disks		I	disk0 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		

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IBM Power Systems					IBM
Comple	ete hdisk() defined	- rootvg		
1.1	COMMAND STATUS				
	Command: OK	stdout: yes	stderr: no		
	Before command com	pletion, additional	instructions may ap	pear below.	
	hdisk0 Available				
	Esc+1=Help	Esc+2=Refresh	Esc+3=Cancel	F6=Command	

IBM

IBM Power Systems

c 0 ÷. . . 11 i. . .

_	PCI-X SCSI Disk Array M	anager		
	Move cursor to desired i	tem and press Enter.		
	List PCI-X SCSI Disk A	rray Configuration		
	Create an Array Candid	ate pdisk and Format to	522 Byte Sectors	
	Create a PCI-X SCSI Di	sk Array		
	Delete a PCI-X SCSI Di	sk Array		
	Add Disks to an Existi	ng PCI-X SCSI Disk Arra	ay .	
	Configure a Defined PC	I-X SCSI Disk Array		
	Change/Show Characteri	stics of a PCI-X SCSI 1	Disk Array	
		Available Control.	ers	
	x	- 1 item and an an 177		
	Move cursor to desir	ed item and press F/.		
	ONE OR MORE Item	s can be selected.		
	Press Enter AFTER ma	king all selections.		
	gigios0 Available	00-09 DCT-VDDD Dupl Ch	annal 11220 SCST BATD Adaptor	
	SISIOAU AVAILADIE	00-08 PCI-XDDR Dual Cil	Miller 0320 SCSI RAID Adapter	
	Esc+1=Help	Esc+2=Refresh	Fac+3=Cancel	
	E3C+1=heip	ESC+2-REITESH	F10=Evit	
	Fg Enter=Do	/=Find	n=Find Next	
		/-1 IIId	II-T THE NEXT	
5 Power is per	ormance redefined			© 2011 IBM Corporation
IBM Power Systems				IBM
IBM Power Systems				ĪBM
BM Power Systems	RAID level 1	0 - Mirrore	d	IBM
BM Power Systems	RAID level 1	0 - Mirrore	d	IBM
BM Power Systems	RAID level 1 PCI-X SCSI Disk Array M	0 - Mirrore	d	IBM
BM Power Systems	PCI-X SCSI Disk Array M	0 - Mirrore anager	d	IBM
BM Power Systems	PCI-X SCSI Disk Array M Move cursor to desired i	0 - Mirrore anager tem and press Enter.	d	IBM
BM Power Systems	PCI-X SCSI Disk Array M Move cursor to desired i	0 - Mirrore anager tem and press Enter.	d	IBM
BM Power Systems	PCI-X SCSI Disk Array M Move cursor to desired i List PCI-X SCSI Disk A	0 - Mirrore anager tem and press Enter. rray Configuration ata pdigk and Formation	d	IBM
BM Power Systems	PCI-X SCSI Disk Array M Move cursor to desired i List PCI-X SCSI Disk A Create an Array Candid	0 - Mirrore anager tem and press Enter. rray Configuration ate pdisk and Format to sk Array	d 522 Byte Sectors	
IBM Power Systems	PCI-X SCSI Disk Array M Move cursor to desired i List PCI-X SCSI Disk A Create an Array Candid Create a PCI-X SCSI Di Polita a PCI X SCSI Di	0 - Mirrore anager tem and press Enter. rray Configuration ate pdisk and Format to sk Array	d 522 Byte Sectors	
IBM Power Systems	PCI-X SCSI Disk Array M Move cursor to desired i List PCI-X SCSI Disk A Create an Array Candid Create a PCI-X SCSI Di Delete a PCI-X SCSI Di	0 - Mirrore anager tem and press Enter. rray Configuration ate pdisk and Format to sk Array sk Array	d 522 Byte Sectors	IBM
IBM Power Systems	PCI-X SCSI Disk Array M Move cursor to desired i List PCI-X SCSI Disk A Create an Array Candid Create a PCI-X SCSI Di Delete a PCI-X SCSI Di Add Disks to an Existi	0 - Mirrore anager tem and press Enter. rray Configuration ate pdisk and Format to sk Array sk Array ng PCI-X SCSI Disk Array	d o 522 Byte Sectors	IBM
BM Power Systems	PCI-X SCSI Disk Array M Move cursor to desired i List PCI-X SCSI Disk A Create an Array Candid Create a PCI-X SCSI Di Delete a PCI-X SCSI Di Add Disks to an Existi Configure a Defined PC	0 - Mirrore anager tem and press Enter. rray Configuration ate pdisk and Format to sk Array sk Array ng PCI-X SCSI Disk Array	d o 522 Byte Sectors	IBM
BM Power Systems	PCI-X SCSI Disk Array M Move cursor to desired i List PCI-X SCSI Disk A Create an Array Candid Create a PCI-X SCSI Di Delete a PCI-X SCSI Di Add Disks to an Existi Configure a Defined PC	O - Mirrore anager tem and press Enter. rray Configuration ate pdisk and Format to sk Array sk Array ng PCI-X SCSI Disk Array I-X SCSI Disk Array Select a Raid 1	d o 522 Byte Sectors by wevel	IBM
BM Power Systems	RAID level 1 PCI-X SCSI Disk Array M Move cursor to desired i List PCI-X SCSI Disk A Create an Array Candid Create a PCI-X SCSI Di Delete a PCI-X SCSI Di Add Disks to an Existi Configure a Defined PC	O - Mirrore anager tem and press Enter. rray Configuration ate pdisk and Format to sk Array sk Array ng PCI-X SCSI Disk Array I-X SCSI Disk Array Select a Raid 1	d 5 522 Byte Sectors NY Level	IBM
BM Power Systems	RAID level 1 PCI-X SCSI Disk Array M Move cursor to desired i List PCI-X SCSI Disk A Create an Array Candid Create a PCI-X SCSI Di Delete a PCI-X SCSI Di Add Disks to an Existi Configure a Defined PC Move cursor to desir	O - Mirrore anager tem and press Enter. rray Configuration ate pdisk and Format to sk Array sk Array ng PCI-X SCSI Disk Array I-X SCSI Disk Array Select a Raid I sed item and press Enter	d 522 Byte Sectors NY wevel 	IBM
IBM Power Systems	RAID level 1 PCI-X SCSI Disk Array M Move cursor to desired i List PCI-X SCSI Disk A Create an Array Candid Create a PCI-X SCSI Di Delete a PCI-X SCSI Di Add Disks to an Existi Configure a Defined PC Move cursor to desir	O - Mirrore anager tem and press Enter. rray Configuration ate pdisk and Format to sk Array sk Array ng PCI-X SCSI Disk Array <u>Select a Raid 1</u> select a Raid 1	d 522 Byte Sectors Ny wevel	IBM
IBM Power Systems	PCI-X SCSI Disk Array M Move cursor to desired i List PCI-X SCSI Disk A Create an Array Candid Create a PCI-X SCSI Di Delete a PCI-X SCSI Di Add Disks to an Existi Configure a Defined PC Move cursor to desir 0	O - Mirrore anager tem and press Enter. rray Configuration ate pdisk and Format to sk Array sk Array ng PCI-X SCSI Disk Array <u>Select a Raid 1</u> ed item and press Enter	d 522 Byte Sectors NY wevel 	IBM
IBM Power Systems	PCI-X SCSI Disk Array M Move cursor to desired i List PCI-X SCSI Disk A Create an Array Candid Create a PCI-X SCSI Di Delete a PCI-X SCSI Di Add Disks to an Existi Configure a Defined PC Move cursor to desir 0 5	O - Mirrore anager tem and press Enter. rray Configuration ate pdisk and Format to sk Array sk Array ng PCI-X SCSI Disk Array Select a Raid 1 select a Raid 1	d 522 Byte Sectors Ny Level 	IBM
IBM Power Systems	PCI-X SCSI Disk Array M Move cursor to desired i List PCI-X SCSI Disk A Create an Array Candid Create a PCI-X SCSI Di Delete a PCI-X SCSI Di Add Disks to an Existi Configure a Defined PC Move cursor to desir 0 5 10	O - Mirrore anager tem and press Enter. rray Configuration ate pdisk and Format to sk Array sk Array ng PCI-X SCSI Disk Array <u>Select a Raid 1</u> sed item and press Enter	d 522 Byte Sectors Ay 	
IBM Power Systems	PCI-X SCSI Disk Array M Move cursor to desired i List PCI-X SCSI Disk A Create an Array Candid Create a PCI-X SCSI Di Delete a PCI-X SCSI Di Add Disks to an Existi Configure a Defined PC Move cursor to desir 0 5 10 6	O - Mirrore anager tem and press Enter. rray Configuration ate pdisk and Format to sk Array sk Array ng PCI-X SCSI Disk Array I-X SCSI Disk Array Select a Raid I sed item and press Enter	o 522 Byte Sectors By Level	

Esc+2=Refresh

F10=Exit

n=Find Next

Esc+3=Cancel

Enter=Do

Es

F9

Esc+1=Help

F8=Image

/=Find

IBM Power Systems 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 Kh 64 Kb (recommended) 256 Kb Esc+1=Help Esc+2=Refresh Esc+3=Cancel F8=Image F10=Exit Enter=Do /=Find n=Find Next Es FS 57 Power is performance redefined © 2011 IBM Corporation IBM Power Systems 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

F10=Exit

n=Find Next

Es F9 F7=Select

Enter=Do

F8=Image /=Find

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Confirm Selections

ype or select v	alues in entry fields	5.		
 Press Enter AFTE	R making all desired	changes.		
			[Entry Fields]	
Controller		s	isioa0	
RAID Level		10	0	
Stripe Size in	I KB	64	4	
Selected Disks	I	po	disk2 pdisk3	
Esc+1=Help	Esc+2=Refresh	Esc+3=Cancel	Esc+4=List	
Esc+5=Reset	F6=Command	F7=Edit	F8=Image	

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IBM Power Systems	3				IBN
Compl	ete hdisk	1 defined	- datava		
	COMMAND STATUS		3		
	Command: OK	stdout: yes	stderr: no		
	Before command co	mpletion, additional	instructions may a	ppear below.	
	hdisk1 Available				

Enter returns to diag and rec. ESC+3

	PCI-X SCSI Disk	k Array Manager					
	Move cursor to d	desired item and prea	s Enter.				
	List PCI-X SCS Create an Arra Create a PCI-X	SI Disk Array Config ay Candidate pdisk av & SCSI Disk Array	aration ad Format to 522	2 Byte Sectors			
	Delete a PCI-X	X SCSI Disk Array					
	Add Disks to a	an Existing PCI-X SC	I Disk Array				
	Configure a De Change/Show Ch	efined PCI-X SCSI Dis haracteristics of a 1	CI-X SCSI Disk	Array			
	Reconstruct a	PCI-X SCSI Disk Arra	У	-			
	Change/Show PC	CI-X SCSI pdisk Stat	IS				
	Diagnostics an	nd Recovery Options					
	Esc+1=Help	Esc+2=Refresh	Esc+3=Cance	1 F8=Image			
	- F9=Shell	F10=Exit	Enter=Do	-			
Power is perfo							
1 Power is perfo							
1 Power is perfo		ray Conf	ouratio		Cont		Ē
1 Power is perfo	Disk Ar	ray Conf	guratic	on – Select	t Con	troller	
1 Power is perfo	Disk Ar PCI-X SCSI Disk	TRAY CONF k Array Manager	guratic	on – Select	t Con	troller	
1 Power is perfo	Disk Ar PCI-X SCSI Disk Move cursor to d	TRAY Conf k Array Manager desired item and pres	guratic	on – Select	t Con	troller	
1 Power is perfo	Disk Ar PCI-X SCSI Disk Move cursor to d List PCI-X SCS	Tray Conf k Array Manager desired item and pres	guratic s Enter.	0 <mark>n –</mark> Select	t Con	troller	
1 Power is perfo	Disk Ar PCI-X SCSI Disk Move cursor to d List PCI-X SCS Create an Arra Create a PCI-Y	Tray Conf k Array Manager desired item and pres SI Disk Array Confign ay Candidate pdisk ar & SCSI Disk Array	guratic s Enter. wration ad Format to 522	DN — Select	t Con	troller	
1 Power is perfo	Disk Ar PCI-X SCSI Disk Move cursor to d List PCI-X SCS Create an Arra Create a PCI-X Delete a PCI-X	Tray Conf k Array Manager desired item and press SI Disk Array Configu ay Candidate pdisk an K SCSI Disk Array X SCSI Disk Array	guratic s Enter. aration ad Format to 522	Dn — Select	t Con	troller	
1 Power is perfo	Disk Ar PCI-X SCSI Disk Move cursor to d List PCI-X SCS Create an Arra Create a PCI-X Delete a PCI-X Add Disks to a	Tray Confi k Array Manager desired item and pres SI Disk Array Config ay Candidate pdisk ar X SCSI Disk Array X SCSI Disk Array an Existing PCI-X SC	guratic s Enter. wration ad Format to 522	Dn — Select	t Con	troller	
1 Power is perfo	Disk Ar PCI-X SCSI Disk Move cursor to d List PCI-X SCS Create an Arra Create a PCI-X Delete a PCI-X Add Disks to a Configure a De	Tray Conf k Array Manager desired item and press SI Disk Array Confign ay Candidate pdisk an X SCSI Disk Array X SCSI Disk Array an Existing PCI-X SCS efined PCI-X SCSI Disk	guratic s Enter. aration ad Format to 522 SI Disk Array sk Array	DN — Select	t Con	troller	
1 Power is perfo	Disk Ar PCI-X SCSI Disk Move cursor to d List PCI-X SCS Create an Arra Create a PCI-X Delete a PCI-X Add Disks to a Configure a De Change/Show Ch	Tray Configuest k Array Manager desired item and press SI Disk Array Configue ay Candidate pdisk and X SCSI Disk Array X SCSI Disk Array an Existing PCI-X SCSI efined PCI-X SCSI Disk haracteristics of a 1	guratic ss Enter. aration ad Format to 522 SI Disk Array sk Array scI-X SCSI Disk	DN — Select Byte Sectors	t Con	troller	
1 Power is perfo	Disk Ar PCI-X SCSI Disk Move cursor to d List PCI-X SCS Create an Arra Create a PCI-X Delete a PCI-X Add Disks to a Configure a De Change/Show Ch	Tray Configuest k Array Manager desired item and press SI Disk Array Configuest ay Candidate pdisk are X SCSI Disk Array an Existing PCI-X SCSI Disk haracteristics of a Disk baracteristics of a Disk	guratic s Enter. aration ad Format to 522 SI Disk Array scI-X SCSI Disk ole Controllers	DN — Select Byte Sectors Array	t Con	troller	
1 Power is perfo	Disk Ar PCI-X SCSI Disk Move cursor to d List PCI-X SCS Create an Arra Create a PCI-X Delete a PCI-X Add Disks to a Configure a De Change/Show Ch	Tray Confi k Array Manager desired item and press SI Disk Array Configu ay Candidate pdisk au X SCSI Disk Array an Existing PCI-X SCSI efined PCI-X SCSI Disk haracteristics of a 1 Availab to desired item and	guratic s Enter. uration d Format to 522 EI Disk Array k Array CI-X SCSI Disk ole Controllers press F7.	DN — Select 2 Byte Sectors Array	t Con	troller	
IBM Power Systems List the	Disk Ar PCI-X SCSI Disk Move cursor to d List PCI-X SCS Create an Arra Create a PCI-X Delete a PCI-X Add Disks to a Configure a De Change/Show Ch	Tray Configues k Array Manager desired item and press SI Disk Array Configue ay Candidate pdisk and X SCSI Disk Array an Existing PCI-X SCSI efined PCI-X SCSI Disk haracteristics of a D Availab to desired item and MORE items can be set	guratic ss Enter. aration ad Format to 522 SI Disk Array acI-X SCSI Disk cle Controllers press F7. .ected.	DN — Select Byte Sectors Array	Con	troller	
1 Power is perfo	Disk Ar PCI-X SCSI Disk Move cursor to d List PCI-X SCS Create an Arra Create a PCI-X Delete a PCI-X Add Disks to a Configure a De Change/Show Ch Move cursor ONE OR M Press Enter	Tray Confi k Array Manager desired item and press SI Disk Array Config ay Candidate pdisk and X SCSI Disk Array an Existing PCI-X SCSI efined PCI-X SCSI Disk haracteristics of a D Availal to desired item and MORE items can be set AFTER making all set	guratic s Enter. aration ad Format to 522 SI Disk Array CI-X SCSI Disk ole Controllers press F7. ected. ections.	DN — Select Byte Sectors Array	t Con	troller	BI
IBM Power Systems	Disk Ar PCI-X SCSI Disk Move cursor to d List PCI-X SCS Create an Arra Create a PCI-X Delete a PCI-X Add Disks to a Configure a De Change/Show Ch Move cursor ONE OR M Press Enter sisioa0 Av	Tray Configues k Array Manager desired item and press SI Disk Array Configue ay Candidate pdisk and X SCSI Disk Array an Existing PCI-X SCSI effined PCI-X SCSI Disk haracteristics of a 1 Available MORE items can be set AFTER making all set vailable 00-08 PCI-X	guratic ss Enter. aration dd Format to 522 SI Disk Array cCI-X SCSI Disk cle Controllers press F7. .ected. .ections.	DN — Select Byte Sectors Array	apter	troller	
1 Power is perfo	Disk Ar PCI-X SCSI Disk Move cursor to d List PCI-X SCS Create an Arra Create a PCI-X Delete a PCI-X Add Disks to a Configure a De Change/Show Ch Move cursor ONE OR M Press Enter sisioa0 Av Esc+1=Help	ray Confi k Array Manager desired item and press SI Disk Array Configu ay Candidate pdisk au X SCSI Disk Array an Existing PCI-X SCSI efined PCI-X SCSI Disk haracteristics of a D Availal to desired item and MORE items can be set AFTER making all set vailable 00-08 PCI-X	guratic as Enter. uration ad Format to 522 EI Disk Array ocl-X SCSI Disk ole Controllers press F7. ected. ections. DR Dual Channel fresh	DN — Select 2 Byte Sectors Array . U320 SCSI RAID Add Esc+3=Cancel	apter	troller	BI
IBM Power Systems List the	Disk Ar PCI-X SCSI Disk Move cursor to d List PCI-X SCS Create an Arra Create a PCI-X Delete a PCI-X Add Disks to a Configure a De Change/Show Ch Move cursor ONE OR M Press Enter sisioa0 Av Esc+1=Help F7=Select	ray Confi k Array Manager desired item and press SI Disk Array Configu ay Candidate pdisk and X SCSI Disk Array an Existing PCI-X SCI efined PCI-X SCSI Disk haracteristics of a 1 Availal to desired item and MORE items can be sei AFTER making all sei vailable 00-08 PCI-XI Esc+2=Re F8=Image	guratic s Enter. aration ad Format to 522 T Disk Array cCI-X SCSI Disk ole Controllers press F7. .ected. .ections. DDR Dual Channel sfresh	DN — Select P Byte Sectors Array . U320 SCSI RAID Add Esc+3=Cancel F10=Exit	apter	troller	

Arrays are defined but NOT ready - Rebuilding

	COMMAND	STATUS				
	Command:	ок	stdout: yes	stderr: 1	10	
	Before co	mmand completi	on, addition	al instructions may	y appear below.	
	[TOP]					
	Name	Location	State	Description	Size	
	sisioa0	00-08	Available	PCI-XDDR Dual Char	nnel U320 SCSI RAID	Adapter
	scsi0	00-08-00-07,0	NoLink	No remote adapter	target	
	scsil	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	
	pdiskl	00-08-00-4,0	Active	Array Member	35.1GB	
	hdiskl	00-08-ff-0,1	Rebuilding	RAID 10 Array	35.1GB Create 3%	
	[MORE4	1				
	Esc+1=Hel	p Esc	+2=Refresh	Esc+3=Cancel	F6=Command	
	F8=Image	F9=	Shell	F10=Exit	/=Find	
	n=Find Ne	xt				
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Builds are complete – NOW ready for use

COMMAND	STATUS			
Command:	OK	stdout: yes	stderr: :	no
Before co	mmand completi	on, additior	al instructions mag	y appear below.
[TOP]				
Name	Location	State	Description	Size
sisioa0	00-08	Available	PCI-XDDR Dual Cha	nnel U320 SCSI RAID Adapter
scsi0	00-08-00-07,0	NoLink	No remote adapter	target
scsil	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
[MORE4	1			
Esc+1=Hel	.p Esc	+2=Refresh	Esc+3=Cancel	F6=Command
F8=Image	F9=	Shell	F10=Exit	/=Find
n=Find Ne	ext			

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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).
9	9 Exit Diagnostics
N	OTE: The terminal is not properly initialized. You will be prompted to
	initialize the terminal after selecting one of the above options.
т	o make a selection, type the number and press Enter. [1]

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Insert VIOS Install media and Activate LPAR

IEMIE

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: 1024ME boot device: /pci@800000020000003/pci@2,3/ide@1/disk@0:\ppc\chrp\bootfile.exe kernel size: 12162439; 32 bit kernel

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IBM Power Systems **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. Escriviu 1 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.



Poview the install parameters verify Disk for PootVG

Disks: hdisk0 Use Physical Location Maps: No Shrink File Systems: No Import User Volume Groups: No Recover Devices: No >>> 1 Continue with Install
Use Physical Location Maps: No Shrink File Systems: No Import User Volume Groups: No Recover Devices: No >>> 1 Continue with Install
Shrink File Systems: No Import User Volume Groups: No Recover Devices: No >>> 1 Continue with Install t
Import User Volume Groups: No Recover Devices: No >>> 1 Continue with Install
Recover Devices: No >>> 1 Continue with Install *
<pre>>>> 1 Continue with Install</pre>
<pre>>>> 1 Continue with Install t</pre>
<pre>>>> 1 Continue with Install</pre>
<pre>>>> 1 Continue with Install +</pre>
>>> 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.
99 Previous Menu destroy or impair recovery of ALL data on the destination disk hdisk0.
destination disk hdisk0.
>>> Choice [1]:
ower Systems
stall Continues
Installing Base Operating System
installing base operating System
Please wait
Approximate Elapsed time
<pre>% tasks complete (in minutes)</pre>
4 0 Forming the jfs log.
After installation is complete:
Alter installation is complete:
Approximate Elapsed time % tasks complete (in minutes)

	C ladors torn 1	18K	description
•	s isdev -type d	status	
	hdisk0 hdisk1	Available Available	SAS RAID 10 Disk Array SAS RAID 10 Disk Array
is example is adding internal	¢ ladar mini	1	-
disk storage	s isdev -virtua name	status	description
Put VIOS commands into a	vasi0 vbsd0	Available	Virtual Asynchronous Services Interface (VASI Virtual Block Storage Device (VBSD)
notepad file and use cut and	vhost0	Available	Virtual SCSI Server Adapter
paste with putty to enter	vhost1 vsa0	Available Available	Virtual SCSI Server Adapter
multiple commands in a	VBUU	AVALIADIC	LINE VIICUAL DELIAI Adaptei
	\$ cfadev		
	\$ lsdev -virtua	1	
lsdev – list disk devices	name vasi0	status Available	description Virtual Asynchronous Services Interface (VASI
lsdev – list virtual devices	vbsd0	Available	Virtual Block Storage Device (VBSD)
cfgdev – scan for new	vhost0 vhost1	Available Available	vırtual SCSI Server Adapter Virtual SCSI Server Adapter
devices added with DI PAR	vhost2	Available	Virtual SCSI Server Adapter
Isdev – look for new devices	vsa0	Available	LPAR Virtual Serial Adapter
what what what	š mkya -f -ya i	5 hdset1 hdi	sk1
	i5_hdset1		
mkvg – make a volume	0516-1254 mkvg:	Changing the	e PVID in the ODM.
group to split into virtual disk	mklv -lv vdom_3	01 i5_hdset1	35G
mklv – make the logical	mklv -lv vdom_3	02 i5_hdset1	35G 35G
volumes (virtual disks)	mklv -lv vdom_3	04 i5_hdset1	356
mkyday – attach logical	mklv -lv vdom_3 mklv -lv vdom_3	05 i5_hdset1 06 i5 hdset1	35G 35G
volumes to the VSCSI	mkvdev -vdev vd mkvdev -vdev vd	om_301 -vada om 302 -vada	pter vhost3 -dev vvdom_301 pter vhost3 -dev vvdom 302
adapter for the client	mkvdev -vdev vd	om_303 -vadaj	pter vhost3 -dev vvdom_303
	mkvdev -vdev vd mkvdev -vdev vd	om_304 -vada) om_305 -vada)	pter vhost3 -dev vvdom_304 pter vhost3 -dev vvdom_305
	mkvdev -vdev vd	om_306 -vada	pter vhost3 -dev vvdom_306
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Power is performance redefine Power Systems	d		© 2011 IB
Power is performance redefine Power Systems MC GUI manag	Jement	of Sto	© 2011 IB
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Power Systems MC GUI manage Tasks: AT Si7_750 Properties		of Sti 6HMC2: Virtual S com https://atsi6hm all Storage Mad rulal storage Mad	© 2011 IBA
Power is performance redefine Power Systems MC GUI manage Tasks: ATSi7_750 Properties Properties Operations	Jement	Of Sto 6HMC2: Virtual S com https://atai6hm al Storage Ma rtual storage ma	© 2011 IB Drage with VIOS Storage Management - Mozilla Firefox: IBM c2.rchland.bm.com/hmc/content?taskid=26&refresh=44 c2.rchland.bm.com/hmc/content?taskid=26&refresh=44 magement tasks to manage for yours partitions. Select a VIOS partition then select the
Power is performance redefine Power Systems MC GUI manage Tasks: ATSI7_750 Properties Operations Configuration	Jement Watsu Virtua Virtua Virtua Virtua Virtua	Of Sto 6HMC2: Virtual S com https://atsi6hm tal Storage Ma trual storage ma fvirtual storage	© 2011 IBA
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Power is performance redefine Power Systems MC GUI manac Tasks: ATSi7_750 Properties Operations Configuration Create Logical Partition AX or Linux VIO Servers	Jement Virtual Virt	of Sto 6HMC2: Virtual S com https://atsi6hm al Storage Ma I/O Server (VIO) virtual storage RATSVIOS	© 2011 IB Drage with VIOS Corage Management - Mozilla Firefox: IBM c2.rdland.bm.com/nmc/content?taskid=265#refresh=41 Cardiand.bm.com/nmc/content?taskid
Power is performance redefine Power Systems MC GUI manage Tasks: ATSI7_750 Properties Operations Configuration AX or Linux VIO Server BMI	ement Use virtual type of VIOS:	of Studies SHMC2: Virtual S com https://atai6hm al Storage Ma rtual storage ma r/O Server (VIO) virtual storage RATSVIOS	© 2011 IBA
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Power is performance redefine Power Systems Tasks: ATSI7_750 Tasks: ATSI7_750 Properties Operations Configuration Create Logical Partition Alt or Linux VIO Server IBM i System Plans Partition Availability Priority View Workdad Management Groups Manage Custom Groups Manage System Profiles	d Jement Vistual Vistu	of Sto 6HMC2: Virtual S com https://atsi6hm ial Storage Ma rtual storage Ma rtual storage RATSVIOS	© 2011 IBA
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Power is performance redefine Power Systems MCC GUI manage Properties Properties Configuration Create Logical Partition AX or Linux VIO Server BHI System Plans Partition Availability Priority Vio Server BHI System Plans Partition Data Manage Custom Groups Manage Partition Data Manage System Profiles Virtual Resources Shared Processor Pool Management Virtual Network Management Virtual Network Management Virtual Network Management Virtual Network Management	d Jement Vistu Vistu Vistu Vistu Vistu Vistu Vistu Vistu Vistu Vistu Vistu Vistu	of Sto 6HMC2: Virtual S com https://atu6hm https://atu6hm https://atu6hm https://atu6hm https://atu6hm https://atu6hm virtual storage RATSVIOS	State State St
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HMC management of Volume Groups with VIOS



HMC management of Logical Volumes with VIOS



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HMC management of NPIV Virtual Fibre Channel with VIOS

Al Storom, 22 Virtual Storoge Management - Mozina Firetox	
Virtual Storage Management - ATS_780 Lise virtual storage management tasks to manage virtual storage for your Virtual 1/0 Server (V/0S) partitions. Select a V/0S part	tion then select the type of virtual
Storage that you want to manage. VIOS: Plant to manage.	autor uner seret une type of Hituar
Corpose Datalle	
Virtual Disks Storage Pools Physical Volumes Octical Devices Virtual Fibre Channel	
Physical Fibre Channel adapters that support N_Port ID Virtualization (NPIV) provide the ability to link these ports to client logi can communicate directly with storage devices in a storage area network (SAM). Select a port then click Modify partition connec	cal partitions so that the partitions tions.
I P Select Action 💌	
Select Name Description Physical Location Code Connected Part © fcs0 8Gb PCI Express Dual Port FC Adapter (df1000f114108a03) U78C0.001.0BJ4374-P2-C2-T1 1	Itions ^ Available Connections ^
fcs1 86b PCI Express Dual Port FC Adapter (df1000f114108a03) U78C0.001.D834374-P2-C2-T2 0 Modify partition connections	64
Close Help	ATSI6HMC2: Virtual Storage Management - Mozilla Firefox
Cone	Modify Virtual Fibre Channel Partition Assignment - ATS_780
	A selected row in the table indicates that the physical port is assigned to the logical partition. Select additional partitions to assign to the port or deselect partitions that are currently actioned to the port.
	Available connections: 63
	Select Partition Name Partition State World Wide Port Names Current Assignment
	V loge Not Activated 0507602f58e0008 fcs0
	Image: Windows Construction Not Activated C050760258e0009 Image: Windows Construction C050760258e001b fcs0
	One of more of the connections are currently assigned to a running partition. While some connections can be modified safely while a partition is running, it is generally
	safer to modify connections when a partition is shutdown. If you would like to proceed anyway, select the checkbox below, and select OK.
	OK Cancel Help
	Done
IBM Power Systems	13
IBM Power Systems	IE war Configuration
IBM Power Systems Virtual SCSI Serv	IB ver Configuration
IBM Power Systems Virtual SCSI Serv ≻Add Physical devices to VIO Server	IB ver Configuration
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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)
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```

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Virtual SCSI Server Configuration (continued) >Use lsdev and lsmap to look at new device

```
$ lsdev -virtual
name
          status
                      description
                      Virtual SCSI Server Adapter
vhost0
         Available
vdbsrv
         Available Virtual Target Device - Logical Volume
$ lsmap -vadapter vhost0
SVSA
                                         Client PartitionID
                Physloc
                                               0x0000000
vhost0
                U9111.520.10DDEEC-V1-C20
VTD
                vdbsrv
                0x8100000000
LUN
Backing device rootvg_dbsrv
Physloc
```

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



TRM



VIO Server Command Line Interface (Continued)

- Security Commands
 - Isgcl, cleargcl, Isfailedlogin
- UserID Commands
 - mkuser, mkceuser, Isuser, chuser, rmuser, passwd

Maintenace Command

- diagmenu, shutdown, checkfs
- starttrace, stopstrace, catracerpt,
- bootlist, snap, startsysdump
- topas
- mount, unmount, showmount
- starttelnetd, stoptelnetd

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All performance measurements were made with AIX or AIX 5L operating systems unless otherwise indicated to have used Linux. For new and upgraded systems, AIX Version 4.3, AIX 5L or AIX 6 were used. All other systems used previous versions of AIX. The SPEC CPU2006, SPEC2000, LINPACK, and Technical Computing benchmarks were compiled using IBM's high performance C, C++, and FORTRAN compilers for AIX 5L and Linux. For new and upgraded systems, the latest versions of these compilers were used: XL C Enterprise Edition V7.0 for AIX, XL C/C++ Enterprise Edition V7.0 for AIX, XL C/C++ Advanced Edition V7.0 for Linux, and XL FORTRAN Advanced Edition V9.1 for Linux. The SPEC CPU95 (retired in 2000) tests used preprocessors, KAP 3.2 for FORTRAN and KAP/C 1.4.2 from Kuck & Associates and VAST-2 v4.01X8 from Pacific-Sierra Research. The preprocessors were purchased separately from these vendors. Other software packages like IBM ESSL for AIX, MASS for AIX and Kazushige Goto's BLAS Library for Linux were also used in some benchmarks.

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TPC	http://www.tpc.org
SPEC	http://www.spec.org
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.shtm
Baan	http://www.ssaglobal.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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For a definition/explanation of each benchmark and the full list of detailed results, visit the Web site of the benchmark consortium or benchmark vendor.

SPEC	nttp://www.spec.org	
LINPACK	http://www.netlib.org/benchmark/performance.pdf	
Pro/E	http://www.proe.com	
GPC	http://www.spec.org/gpc_	
STREAM	http://www.cs.virginia.edu/stream/	
Fluent	http://www.fluent.com/software/fluent/index.htm	
TOP500 Supercomputers	http://www.top500.org/	
AMBER	http://amber.scripps.edu/	
FLUENT	http://www.fluent.com/software/fluent/fl5bench/index.htm	
GAMESS	http://www.msg.chem.iastate.edu/gamess	
GAUSSIAN	http://www.gaussian.com	
ANSYS	http://www.ansys.com/services/hardware-support-db.htm	
	Click on the "Benchmarks" icon on the left hand side frame to expand. Click on "Benchmark R	Results in a Table" icon for benchmark results.
ABAQUS	http://www.simulia.com/support/v68/v68_performance.php	
ECLIPSE	http://www.sis.slb.com/content/software/simulation/index.asp?seg=geoquest&	
MM5	http://www.mmm.ucar.edu/mm5/	
MSC.NASTRAN	http://www.mscsoftware.com/support/prod%5Fsupport/nastran/performance/v04_sngl.cfm	
STAR-CD	www.cd-adapco.com/products/STAR-CD/performance/320/index/html	
NAMD	http://www.ks.uiuc.edu/Research/namd	
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