

Using FlashDisk iSCSI-Host Storage Subsystems

with

VMware vSphere 5

Abstract

This application note explains configuration details for using Winchester Systems FlashDisk iSCSI-host storage systems with VMware vSphere 5.x to deliver high efficiency, flexibility, and availability in data center applications.

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Products covered by this document

These application notes apply to the following products:

• Winchester Systems FX Series FlashDisk iSCSI-host storage systems

For more information regarding individual models and their VMware compatibility, please visit www.winsys.com

VMware virtualization

The concept of virtualization originated in the 1960s but was not applied to x86 architecture until the 1990s. However, since the 1980s, x86 servers have been widely adopted in IT environments because they are much cheaper than mainframe computers. The distributed system of computing the architecture enables allows for reduced total cost of ownership but may create other challenges, such as low infrastructure utilization, increased physical infrastructure requirements and higher IT management costs, plus insufficient failover and disaster protection. Virtualization is an effective way to deal with these challenges.

In VMware virtualization technology, ESX Server has been a foundation of virtualized environments.



Figure 1: VMware ESX Server

Installed on an x86 or x64-based server, VMware ESX Server provides a virtualization layer on the host OS to consolidate all hardware resources, including processors, memory, storage, and networking. It applies them to virtual machines (i.e. virtual servers) running on the physical server. Each virtual machine can have its own OS and applications. By sharing hardware resources across multiple virtual machines, users can improve resource utilization and in turn greatly reduce costs involved in building physical data center infrastructure.

Besides optimized resource utilization, VMware virtualization also reduces deployment efforts and simplifies management tasks. Free from physical considerations and requirements, deploying virtual machines can be done in as little as just a few minutes. After deployment, managers can easily monitor the entire virtual data center through a unified management pane. When any of the physical devices fail, the high availability features of VMware ensure continuous system operation.

FlashDisk Storage Systems in VMware Virtualized Environments

Storage area network (SAN) is an architecture that brings storage resources into a pool and shares them among multiple hosts. SAN is the most suitable storage architecture for virtualized environments because when operating systems and applications are moved around virtual machines, data does not have to be copied and moved accordingly. Winchester Systems provides both FC-host RAID arrays and iSCSI-host RAID arrays to support SAN in VMware virtualized environments. FlashDisk arrays feature centralized management and configuration, redundant designs, and smart scalability to offer many benefits in SAN and virtualization environments.

In a data center featuring multiple storage systems, a powerful storage management tool is absolutely necessary. FlashDisk Global Manager allows system managers to configure, administer, and monitor multiple FlashDisk arrays locally or remotely through a user friendly interface. Integrating storage management tools into a VMware virtualized environment can make infrastructure more robust and easier to maintain.

In addition to the software component, the fault tolerant hardware modules and RAID functionalities of FlashDisk arrays further improve system availability. When controllers, power supplies, cooling modules or hard drives fail, they can all be hot-swapped without causing downtime or data loss.

In keeping up with data growth, the capacity of a single FlashDisk subsystem can be scaled by connecting expansion enclosures, which do not compromise industry-leading RAID performance. By allowing users to start with the capacity they need and expand when future needs arise, flexible scaling minimizes unnecessary investment and contributes to enhancing the core virtualization value of optimized resource utilization.

To ensure seamless integration of FlashDisk SAN storage into VMware virtualized environments, Winchester Systems performs comprehensive testing to verify compatibility with VMware products. For details about compatibility, please refer to the VMware Compatibility Guide.

Effective software suites optimize and manage IT environments through virtualization. They greatly reduce operating costs and increase IT service availability, security, and scalability while providing the flexibility to choose any OS, application, and hardware. VMware vSphere 5.x delivers many enhanced

Using Winchester Systems FlashDisk iSCSI-host Storage Systems with VMware vSphere 5.x features in terms of management, application services, infrastructure services, compatibility, and third party extensibility. For more details about VMware products, you can refer to <u>www.vmware.com</u>.

Configuration Considerations

Data Formats

To make data volumes on FlashDisk arrays accessible to ESX Server, they have to be configured as either a VMFS (Virtual Machine File System) volume or RDM (Raw Device Mapping) volume. VMFS is a VMware proprietary clustered file system and the most common access method. If users would like to allow multiple virtual machines and multiple physical servers to access a single volume, they should configure with the VMFS format.

Another way to allow virtual machines to access data volumes on storage is RDM. Virtual machines access VMFS volumes and RDM volumes in different ways. As shown in **Figure 2**, virtual machines can directly access a virtual disk in the VMFS format but their access to the RDM volume is enabled through a mapping file in the VMFS volume. This mapping file contains metadata that redirects disk access to physical devices.



Figure 2: Accessing a VMFS volume and an RDM volume

Treating the RDM volume as a local disk, virtual machines can format it in the proper way. RDM is especially useful in the following applications:

- 1. SAN-based snapshot/volume copy or other layered applications on virtual machines.
- 2. Leveraging Microsoft Clustering Services (MSCS) to implement virtual-to-virtual clusters or physical-to-virtual clusters. Clustered data and quorum disks have to be configured as RDM volumes.

Deployment of VMFS Volumes

The following guidelines can help you properly deploy VMFS volumes:

- Virtual machine boot disks and application data should be stored in separate VMFS volumes. Most I/O issued to boot disks involves paging activities and is sensitive to response time. By separating boot disks from application data, the risk of prolonged response time due to application related I/O can be mitigated.
- 2. Database platforms for enterprise data management, such as Microsoft SQL Server or Oracle, often use active logs and/or recovery data structures to track data changes. In cases of unplanned application or operating system disruptions, these active logs or recovery data structures are critical in ensuring system recovery and data consistency. Therefore, all virtual machines supporting such database platforms should be provided with an independent VMFS volume for storing active log files and recovery data structures. Furthermore, if files or structures are mirrored, the source and the target should be stored in separate VMFS volumes.
- 3. Application data, including database files, should be stored in a separate VMware file system. This file system should not contain any structures that are critical for application and/or database recovery.
- 4. It is recommended that VMFS volumes are no more than about 80% full. This ensures that administrators do not suddenly run out of space to accommodate user data and VMware snapshots for virtual machines.

RAID level

FlashDisk storage arrays allow users to protect data volumes with various RAID levels, including RAID 1, RAID 3, RAID 5, RAID 6, and RAID 10. Data volumes in the same storage array can be protected with different RAID levels. The following are general guidelines to configure RAID levels for data volumes in a VMware virtualized environment:

- 1. Virtual machine boot volumes are generally subject to low I/O rates. They can be configured with RAID 5 or 6 protection.
- 2. For most applications, RAID 5 or 6 is a proper level to protect virtual disks with. However, if the application involves extensive log ins, such as financial applications, RAID 10 may be a better option.
- Infrastructure servers, such as Domain Name System (DNS), perform most of their activities utilizing CPU and RAM and therefore are often subject to low I/O rates. If users use virtual machines as infrastructure servers, it is proper to provide them with RAID 5 or 6 protected volumes as storage space.
- 4. Log devices for databases should be RAID 10-protected volumes. Furthermore, if databases or application logs are mirrored, the source and

- Using Winchester Systems FlashDisk iSCSI-host Storage Systems with VMware vSphere 5.x the target should be located on separate sets of disks (in VMFS format, if applicable).
- 5. Virtual machines that generate high workloads of small-block random read I/O, such as Microsoft Exchange, should be allocated RAID 10-protected volumes for better performance.
- 6. Large file servers with the vast majority of the storage consumed by static files can be provided with RAID 5 or 6 protected volumes since I/O rates are expected to be low.

Configuration Example: Using FlashDisk iSCSI-host Storage with VMware vSphere 5.x

The below example explains how to make ESX Server boot from and leverage FlashDisk iSCSI-host storage using QLogic iSCSI initiator hardware.

Note: booting from SAN requires installing the operating system on one or more LUNs. By booting from SAN environments, you can enjoy easier server replacement, simplified backup, and improved management. To configure VMware ESX Server to boot from SAN, install an iSCSI host bus adapter (HBA) approved by both the VMware compatibility guide and Winchester Systems FlashDisk Compatibility Matrix.

Step 1: Create logical volume (LV) on FlashDisk and map storage to the server

This configuration step can be done by utilizing the Winchester Systems proprietary storage management suite – FlashDisk Global Manager. Please refer to your firmware user manual or the FlashDisk Global Manager user manual for details.

Step 2: Add FlashDisk iSCSI channel port IPs

In the SANsurfer iSCSI HBA Manager GUI, select the HBA port you mapped the LV to in the left-hand system tree pane. Select the Target Settings tab in the right-hand panel and click the I icon beside the target IP list. In the pop-up window, enter the IP address of the iSCSI channel port as shown in **Figure 3**, and click OK. The IP address will appear in the target IP list.

HBA M	odel:	QLE40	062C			iscsi	Port Alias Nan	ne:		
State:		Read	g,Link U	p		IPv4 A	ddress:	20.	0. 0.	21
HBA iS	CSI Name:	iqn.20	00-04.c	om.qlogic:	qle4062c.gs4081	0a13592.1				
Greye arget C)isable)nly 64 ote: Rig	d out er onfiguratio of Auto-dis devices ca ht click on	itries an on - a saw cover doo n be pers entry for	re Pol ed blan es not a sisted/b additio	tential B k iSCSI Na apply to Se ound. Any nal feature	oot devices a me will issue a Si ndTargets with C changes made to s.	and cann endTargets HAP entries o devices no	ot be modi command. t bound will no	ified. ot persist acros	ss card resets	•
	Ŀ	/ Auto-bii	nd Dis(TP Aud	255			rargets o	in save)	
Bind	Enable Target	Dynami	c	IPv4	Target Address	1			State	Π
			0.0.	Oine	Fernet Address			Reser	ved for FastIU.	-
			0.0.	O IPV0	larget Address			Reser	ved for FastIU.	
V	V		20.0					No Co	nnection Active	
2	V		20.0					No Co	nnection Active	
v	×.		20.0		OK	Cance		Unkno	wn	
2	×.		20.0		UN			Unkno	wn	
~	V		20.0	.0.9			6	No Co	nnection Active	
V	~		20.0	.0.13			7	No Co	nnection Active	
	~		20.0	.0.15			8	Unkno	wn	
~	¥		20.0	.0.9	ign.2002-10.c	om.	9	Sessi	on Active	
2	~		20.0	0.13	ign.2002-10.c	om.	10	Sessi	on Active	H
V	V		20.0	.0.5	ign.2002-10.c	om.	11	Sessi	on Active	
	K		20.0	.0.11	ign.2002-10.c	om.	12	Unkno	wn	1-
V			000	~ ~	1.		ial			
				Conf	n Daramotore	Config A	uthentication			
				Com	y Farameters		autonicouton			
				Com	y <u>Farameters</u>	gonig				

Figure 3: Adding a target IP address

Repeat the process until all IP addresses are added.

Step 3: Configure CHAP settings

In the SANsurfer iSCSI HBA Manager GUI, select the HBA port you would like to configure CHAP authentication on in the left-hand system tree pane. Select the Target Settings tab in the right-hand panel and click Configure Authentication. Both the storage system and the HBA need to have CHAP configured. In the FlashDisk console terminal, enable CHAP as shown in **Figure 4**: View and Edit Configuration Parameters > Host-side Parameters > Login Authentication with CHAP.



Figure 4: Enabling CHAP in the console terminal

After enabling CHAP, select View and Edit Configuration Parameters > Edit iSCSI Initiator List as shown below to configure CHAP authentication.

Hed Dec 4 13:34:12 2013 Cache St	atus: 1% Dirty
СВМ: ++++	
<pre></pre>	
VHost Alias Nameqlogic1vCHLHost IQN- iqn.2000-04.com.qlogic:qle4062c.vCHLUser Name- ioxstoragevCHLUser Password- ************************************	
C glogic1 C glogic2 Edit iSCSI Initiator List	
Arrow Keys:Move Cursor Enter:Select Esc:Exit Ctrl+L:Refree	sh Screen

Figure 5: CHAP password settings for iSCSI initiator

Configure the CHAP authentication of the iSCSI HBA through VMware. Go to vCenter > Storage Adapter > iSCSI Initiator > Properties > CHAP as shown below.

🛃 iSCSI In	iitiator (v	mhba1) Properties	_ 🗆 🗙
General Dynamic	: Discovery Statio	Discovery	
-iSCSI Properti			
Name:	CHAP C	redentials X	
Alias:			
Target disco	otherwise specifi	ed in the target's CHAP settings.	
Hardware Init	🖳 The CHAP :	secret and Mutual CHAP secret must be different.	
Network I	CHAP (target a	uthenticates host)	
Current/m	Select option:	Use CHAP unless prohibited by target	
MAC Addr		🗆 Use initiator name	
IP Setting	Name:	ioxsotrage	
IP Addres	Secret:	*okokokokokokok	
Subnet Ma			
Default Ga			
DNS Serve	Mutual CHAP (h	nost authenticates target)	
Preferred	Select option:		
Alternate		Use initiator name	
	Name:		
	Secret:		
· · · · · ·]
CUAD			Configure 1
		Close	l Help

Figure 6: CHAP configuration for iSCSI initiator

Step 4: Configure network settings

In the SANsurfer iSCSI HBA Manager GUI, select the HBA port you would like to configure network settings on in the left-hand system tree pane. Then select the Port Options tab in the right-hand panel and click the Network tab, as shown below. Configure all required network settings here.

IBA Model State: IBA iSCSI	: QLE406 Ready,I Name: iqn.200	2C . ink Up 0-04.com.qlog	jic:qle406	2c.gs4081	0a13592.1	iSCSI Port IPv4 Addre	Alias Name: ess:	20.	0.	0.	21
Network	Auto Discovery	Firmware	Factory	Defaults	Boot						
Obta Obta Addre: IPv4 A Subne Gatew	ain IP address auto the following IP ad ss State: Valid Ad ddress: 200. t Mask: 255. ay: 200.	matically (DH dress: 0 0 255 255 0 0	CP)	 Obtain Use the Address Link Loci Obtain Use the Address Routable Address Routable Default r Router # Default r 	n IPV6 link lo e following l s State: cal ID (8 byte n routable ad ne following n s State: e Address 1: s State: e Address 2: couter state: Adv. Link MTI router addre	cal address ink local add Inval s): dresses aut outable add Inval Inval	automatically iress: id Address omatically (R) resses: id Address id Address Router				

Repeat the process until all ports are properly configured.

Step 5: Configure boot settings

In the SANsurfer iSCSI HBA Manager GUI, select the HBA port you would like to establish boot-from-SAN access for in the left-hand system tree pane. Then select the Port Options tab and click the Boot tab. In BIOS Boot Mode Setting, select Manual Mode from the drop-down list. Then specify the LUN you would like to use as the boot disk by selecting Primary Boot Device IP and Primary Boot LUN from the drop-down lists, as shown below.

ort uptions	Port Information	Target Settings	Target Information	Statistics	Diagnostics			
HBA Model:	QLE4062C			iSCSI Port	Alias Name:			
State:	Ready,Lini	: Up		IPv4 Addre	ss:	20. 0.	0. 23	
HBA ISCSI N	lame: iqn.2000-0	4.com.qlogic:qle406	2c.gs40810a13592.2					
Network	Auto Discovery	irmware Factory	Defaults Boot					
DIOS BOOLI	Mode Setting:	M	anual Mode 🔻	DHCP B	oot Type:	Root Path 🔻		
					L.			
DHCF Vond	or ID.							
DHCP Client	t ID (7 char max):							
Primary Bo	ot Device ID:	NA		Primary	Boot LUN:	u -		
		-				2		
Secondary	Boot Device ID:	NA		- Seconda	ny Boot LUN:	T AV		
BIOS Versio	on:	1.1	4					
BIOS Versio	on:	1.1	4					
BIOS Versio	on: OS Only	1.1	4					
BIOS Versio	on: OS Only	1.1	4					

Figure 8: Configuring boot settings

Note: After the above steps are done, we suggest you enter the QLogic HBA BIOS (press ctrl + Q during server reboot) to check if all settings are successfully and correctly implemented.

Step 6: Set up the server to boot from a CD

Reboot the server. During server power up, enter the system BIOS configuration/setup utility. Select Startup Options and press enter. Select Startup Sequence Options and press enter. Then change First Startup Device to [CD-ROM].

Step 7: Install ESX Server

Use a CD-ROM to install ESX Server and choose the LUN on the FlashDisk as

Using Winchester Systems FlashDisk iSCSI-host Storage Systems with VMware vSphere 5.x the boot disk during installation. After going through the installation wizard, ESX Server is successfully installed.

Step 8: Add a VMFS datastore

In the vCenter GUI, select ESX Server from the inventory panel and click Storage in the Hardware panel. Click Add Storage as shown below.



Figure 9: Adding storage

The Add Storage window will pop up. First select Disk/LUN as the storage type as shown below, and then click Next.



Figure 10: Selecting Disk/LUN as storage type

In the list of all available iSCSI disks, select the one you would like to add as the new VMFS datastore as shown below. Click Next.

Select Disk/LUN Select a LUN to create a	a datastore or expand the current one				
Disk/LUN Select Disk/LUN	Name, Identifier, Path ID, LUN, Capacity	v, Expandable or VMF	S Label c	•	Cle
Current Disk Layout	Name	Path ID	LUN	Capacity VMFS Label	1
Properties	iSCSI Disk (naa.600d023100080	ign.2002-10.com	87	10.00 GB	
Formatting	iSCSI Disk (naa.600d023100080	ign.2002-10.com	47	10.00 GB	
Ready to Complete	iSCSI Disk (naa.600d023100080	ign.2002-10.com	63	10.00 GB	
	iSCSI Disk (naa.600d023100080	ign.2002-10.com	247	10.00 GB	
	iSCSI Disk (naa.600d023100053	ign.2002-10.com	55	10.00 GB	
	iSCSI Disk (naa.600d023100080	ign.2002-10.com	143	10.00 GB	
	i5CSI Disk (naa.600d023100080	ign.2002-10.com	223	10.00 GB	
	iSCSI Disk (naa.600d023100053	ign.2002-10.com	15	10.00 GB	
	iSCSI Disk (naa.600d023100080	ign.2002-10.com	87	10.00 GB	
	iSCSI Disk (naa.600d023100053	iqn.2002-10.com	47	10.00 GB	
	iSCSI Disk (naa.600d023100053	iqn.2002-10.com	39	10.00 GB	
	iSCSI Disk (naa.600d023100080	iqn.2002-10.com	199	10.00 GB	
	iSCSI Disk (naa.600d023100053	ign.2002-10.com	247	10.00 GB	
	iSCSI Disk (naa.600d023100080	iqn.2002-10.com	39	10.00 GB	
	iSCSI Disk (naa.600d023100053	iqn.2002-10.com	175	10.00 GB	
	iSCSI Disk (naa.600d023100080	iqn.2002-10.com	23	10.00 GB	
	iSCSI Disk (naa.600d023100080	ign.2002-10.com	255	10.00 GB	
	iSCSI Disk (naa.600d023100053	ign.2002-10.com	159	10.00 GB	
	iSCSI Disk (naa.600d023100080	ign.2002-10.com	215	10.00 GB	
	iSCSI Disk (naa.600d023100053	ign.2002-10.com	231	10.00 GB	
	iSCSI Disk (naa.600d023100080	ign.2002-10.com	15	10.00 GB	
	iSCSI Disk (paa.600d023100053	ian.2002-10.com	247	10.00 GB	

Figure 11: Selecting an iSCSI Disk

VMware vSphere 5.X has a new file system format called VMFS-5, supporting more than 2TB of data capacity via VMware virtualization.



Figure 12: VMFS-5 options for additional capacity

Using Winchester Systems FlashDisk iSCSI-host Storage Systems with VMware vSphere 5.x After going through the configuration process of entering the datastore name and maximum file size, click Finish.

Disk/LUN Ready to Complete	Disk layout:			
	Device WSI ISCSI Disk (naa.600d0231000800624 Location /vmfs/devices/disks/naa.600d0231000800624f70 Primary Partitions	Capacity 10.00 GB 03c345f42e473 Capacity	Available 10.00 GB	LUN 87
	File system:			
	Properties Datastore name: WINSYS RAID			
	Formatting File system: VMFS-3 Block size: 1 MB			
	Maximum file size: 256 GB			

Figure 13: Finishing datastore creation

Basic troubleshooting and FAQ

1. What information should I prepare when I need technical assistance?

Please provide the following information:

- ESX Server version (for example, ESXi 5.0)
- Storage model, its firmware version, and event logs
- Topology of your ESX Server, switch, and storage as shown below:



- Storage configuration including logical drives, logical volumes, partitions, and LUN mapping. You can obtain this information using FlashDisk Global Manager.

- Description of system behavior and associated problems

- ESX Server configuration with screenshots of Networking, Storage Adapters and Maps from the vCenter/VirtualCenter GUI

Networking screenshot example:

🕝 VCENTER - vSphere C	lient		
<u>Eile Edit View</u> Inventory <u>A</u> d	ministration <u>P</u> lug-ins <u>H</u> elp		
🖸 🔯 🔥 Home 🕨 🛃 Inventory	 Hosts and Clusters 		Search Inventory
a e :::			
CENTER Venter No.010.50	10.0.10.100 VMware ESXi, 5.0.0, 46951 Getting Started Summary Virtual Mag	2 hines Performance Configuration T	asks & Events Alarms Permissions Maps Storage Views
vcencer	Hardware	View: vSphere Standard Switch	vSphere Distributed Switch
Item Item <td< td=""><td>Memory Storage Networking Storage Adapters Network Adapters Advanced Settings</td><td>Standard Switch: vSwitch0 -Virual Machine Port Group VM Network 16 virtual machine(s)</td><td>Remove Properties</td></td<>	Memory Storage Networking Storage Adapters Network Adapters Advanced Settings	Standard Switch: vSwitch0 -Virual Machine Port Group VM Network 16 virtual machine(s)	Remove Properties
다 ESXIA-VM6-Inux-bus 단 ESXIA-VM7-Inux-bis 단 ESXIA-VM7-Inux-Isi 단 ESXIB-VM1-win-Isi 단 ESXIB-VM3-win-Isi 단 ESXIB-VM3-win-Isi 단 ESXIB-VM4-win-pys 단 ESXIB-VM5-Inux-Isi 단 ESXIB-VM5-Inux-Isi	Power Management Software Licensed Features Time Configuration DNS and Routing Authentication Services Power Management	ESXIB-VM3-VMn-Bi	
ESXIB-VM8-linux-pvs	Virtual Machine Startun/Shutdown		
Recent Tasks			Name, Target or Status contains: •
Name Target	Status	Details	Initiated by VCenter Server
Tasks @ Alarms			Administrator

Storage Adapters screenshot example:

- Getting Started 🔧 Summary 🔧 Virtual Machine	s 🔍 Resource Allocation 🔍 Performance	Configuration	Tasks & Events 🔨 Alarms 💙	Permissions	Maps 🛛 🗸
Hardware	Storage Adapters			Refresh	Rescan
Processors	Device	Туре	WWN		_
Memory	iSCSI Software Adapter				
Changes	📀 vmhba33	iSCSI	ign.1998-01.com.vmware:	esx4-1-686cdb	64:
Storage	82801EB (ICH5) SATA Controller				
Networking	🌀 vmhba2	Block SCSI			_
 Storage Adapters 	🌀 vmhba32	Block SCSI			
Network Adapters	AIC-8902 U320 0EM				•
Advanced Settings	•				
Software	Details				
Juitware	vmbha33			Prope	erties
Licensed Features	Model: iSCSI Softwa	re Adapter			
Time Configuration	iSCSI Name: iqn.1998-01.	com.vmware:esx4-1	-686cdb64		
DNS and Routing	iSCSI Alias:				
IPMI/iLO Settings	Connected Targets: 2	Devices: 2	Paths: 4		
Virtual Machine Startup/Shutdown	Warm Davies Date				
Virtual Machine Swapfile Location	View: Devices Paths				

VCENTER - vSphere Client _ 🗆 X Eile Edit View Inventory Administration Plug-ins Help 💽 🔝 🏠 Home 🕨 🚮 Inventory 🕨 🛐 Hosts and Clusters 🛃 🗸 Search Inventory Q **d** @ # 🗉 🛃 VCENTER 10.0.10.100 VMware ESXi, 5.0.0, 469512 vcenter 🖻 属 10.0.10.50 Getting Started Summary Virtual Machin Tasks & Events Alarms Permi: Maps Storage Views Hardware Statu 🚯 vcenter Virtual Machine Resources -0 Time since last data update: 00:10 Refresh * FREMAN ESXIA 🖃 📗 vm5cert 🖂 🏨 HA Overview
 IA

 10.0.10.100

 10.0.10.200

 ESXIA-VM1-win-Isi

 ESXIA-VM2-win-bus

 ESXIA-VM3-win-Isi
 ESXIB-V 1 G ESXIA-VM4-win-pvs ESXIA-VM5-linux-lsi ESXIA-VM6-linux-bus ESXMA ⊖ di-ESXIA ESXIA-VM7-linux-lsi ESXIA-VM8-linux-pvs ESXIB-VM1-win-lsi ESXIB-VM2-win-bus Map Relationships: Virtual Machine Resources h FRAME ESXM Host Options ESXIB-VM3-win-lsi ESXM Host to VM ESXIB-VM4-win-pvs ESXIB-VM5-linux-lsi Host to Network Host to Datastore ESXIB-VM6-linux-bus
 ESXIB-VM7-linux-lsi
 ESXIB-VM8-linux-pvs VM Options ESXIB-V VM to Network -Recent Tasks Name, Target or Status contains: • Initiated by Requested Start Ti... Name Target Status Detai vCenter Server 4 🖉 Tasks 🞯 Alarms Administrator

Maps screenshot example:

- ESX Server event logs can be obtained from the vCenter/VirtualCenter GUI. Click Administration in the top menu and select Export System Logs from the



2. Why am I unable to see the VMFS data volume I created before?

Using Winchester Systems FlashDisk iSCSI-host Storage Systems with VMware vSphere 5.x First check whether you can see the physical storage device you used to create the VMFS data volume in vCenter/VirtualCenter GUI. If not, check whether all cables are correctly connected and that storage LUN mapping is properly configured. Then execute Rescan in the Storage Adapters screen.

etting Started 🔪 Summary 🔪 Virtual Macl	hines Resource Allocation Performance Configuration Tasks & Events Alarms Permissions Mane
lardware	Storage Adapters Refresh Rescan.
Processors	Device Type WWN
Memory	iSCSI Software Adapter
Changes	Svmhba33 iSCSI iqn.1998-01.com.vmware:esx4-1-686cdb64:
Storage	82801EB (ICH5) SATA Controller
Networking	G vmhba2 Block SCSI
Storage Adapters	G vmhba32 Block SCSI
Network Adapters	AIC-8902 U320 0EM
Advanced Settings	
0	Details
oftware	
Licensed Features	vmhba33 Properties
Time Configuration	Model: ISCSI Software Adapter
DNS and Routing	iSCSI Name: iq1.1990-01.com.vmware.esx4-1-000cub04
IPMI /ILO Setting	Connected Targets: 2 Devices: 2 Paths: 4
The second	
virtuai Machine Startup/Shutdown	View: Devices Paths
Virtual Machine Swapfile Location	

If the problem is still not solved, please prepare the information mentioned in question 1 and contact us for further troubleshooting.

3. What are the storage configuration limitations in a VMware virtualized environment?

Please check:

<u>http://www.vmware.com/pdf/vsphere5/r50/vsphere-50-configuration-maximums.</u> <u>pdf</u> for details.

4. How can I ensure data paths successfully conduct failover with redundant controllers?

If you are using ESXi 5.0 with FlashDisk storage arrays and firmware version 3.64 or later, the system automatically handles this without any manual configuration.

5. Can virtual machines be migrated to a different datastore without interruption?

Yes, virtual machines can be migrated online to another data volume.

6. If I would like to implement multipathing, are there any special settings I should use on my storage? Should I install FlashPath?

No, there are no special settings required. FlashDisk storage supports MRU (Most Recently Used) in VMware, as shown below. Since VMware supports native multipathing, you do not need to install other software, including FlashPath, for multipathing implementation.

Runtime Name	Target	LUN	Status	F	Preferred	
vmhba33:C1:T4	.2 iqn.2002-10.com.winsys:raid.sn8237490.101:20.0.0	2	🔶 Active			
vmhba33:C0:T0	.2 iqn.2002-10.com.winsys:raid.sn8237490.001:20.0.0	2	🔷 Active	•		
vmhba33:C1:T5	.2 iqn.2002-10.com.winsys:raid.sn8237490.121:20.0.0	2	Active	9		
vmhba33:C0:T1	2 iqn.2002-10.com.winsys:raid.sn8237490.021:20.0.0	2	Active	e (I/O)		
Vame:	ign.1998-01.com.vmware:localhost-5b2b2380-00023d000001.	ian.2002-	10.com.winsvs:	raid.sn823	R	efresh
Vame: Runtime Name:	iqn.1998-01.com.vmware:localhost-5b2b2380-00023d000001, vmhba33:C0:T1:L2	iqn.2002-	10.com.winsys:	raid.sn823	R	efresh 20.0.0
Vame: Runtime Name: iSCSI	iqn.1998-01.com.vmware:localhost-5b2b2380-00023d000001, vmhba33:C0:T1:L2	iqn.2002-	10.com.winsys:	raid.sn823	R 37490.021:2	efresh 20.0.0
Name: Runtime Name: iSCSI Adapter: ISCSI Alias:	iqn.1998-01.com.vmware:localhost-5b2b2380-00023d000001, vmhba33:C0:T1:L2 iqn.1998-01.com.vmware:localhost-5b2b2380	iqn.2002-	10.com.winsys:	raid.sn823	R / 37490.021:2	efresh 20.0.0
Vame: Runtime Name: iSCSI Adapter: iSCSI Alias: Target:	iqn.1998-01.com.vmware:localhost-5b2b2380-00023d000001, vmhba33:C0:T1:L2 iqn.1998-01.com.vmware:localhost-5b2b2380 iqn.2002-	iqn.2002-	10.com.winsys:	raid.sn823	R	efresh 20.0.0

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