

VMware Storage



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Introduction to Storage Virtualization Intro to Storage Virtualization



# Getting Started with vSphere with Operations Management

## Introduction to Storage Virtualization

This walkthrough demonstrates the concept of shared storage in a vSphere with Operations Management environment. Use the arrow keys to navigate through the screens.





Before we walkthrough the configuration of iSCSI, let's review some storage basics. Internal hard-drives in a stand-alone ESXi host can be used to host VMware Virtual Machine files including configuration files and virtual hard drives. While this is acceptable for a single-server environment, a single server's internal disks do not provide highly available storage, nor does this solution scale well.



When multiple ESXi servers are clustered together, we can take advantage of VMware vMotion, High Availability (HA) and Distributed Resource Scheduler (DRS) to provide enhanced functionality, availability and manageability. Shared storage provides a common pool of storage for clustered hosts to access, enabling advanced vSphere features.





Shared storage can be provided in several different ways. VMware vSAN aggregates a mix of solid state and magnetic internal hard drives of multiple physical servers into a logical, highly available, high performance datastore.



An external storage array is another option for providing shared storage to multiple ESXi hosts. This storage can be presented to ESXi hosts using either file or block-based storage protocols. In file storage, the storage array (sometimes called a filer) creates and owns a file system, presenting the file system to a host to use. VMware ESXi can mount file-based storage using the NFS protocol.





In block storage, the storage array presents a raw set of hard drive blocks called a Logical Unit (LUN) to the connected hosts. The hosts are responsible for formatting and creating a file system on that space. Block-based storage, plus the storage adapters (HBA) and storage fabric (switches and cabling) are known as a Storage Area Network, or SAN. ESXi supports Fiber Channel (FC), Fiber Channel over Ethernet (FCoE) or iSCSI SANs. We'll focus on iSCSI for the remainder of this walkthrough.



ESXi hosts connect to iSCSI SANs using either 1Gb or 10Gb Ethernet connections. The SAN presents a raw LUN to ESXi. ESXi formats the LUN with the VMware File System (VMFS). Virtual Machines are stored in the VMFS datastore. Note: Redundancy is important to a reliable VMware vSphere environment. As such, iSCSI should be connected in a highly available manner.





**vm**ware<sup>.</sup>



In a typical vSphere environment, we combine two or more servers that have VMware ESXi installed into a cluster. Those hosts access the same shared storage datastores.





#### vmware<sup>.</sup>

The physical servers should have two or more storage adapters. For iSCSI, this means that two or more 1GbE or 10GbE NICs should be available in each physical ESXi host.





#### **vm**ware<sup>•</sup>

These NICs are connected to a pair of Ethernet switches. These switches should be capable of handling the expected amount of traffic necessary for the I/O activity of all the virtual machines' storage traffic.







#### **vm**ware<sup>\*</sup>

Business-class storage arrays typically contain two or more storage controllers (A and B sides) for high availability. Each storage controller has two or more front-end ports for host connectivity. These ports are cabled to the Ethernet switches in a highly available manner.





#### **vm**ware<sup>.</sup>

LUNs are owned by one or both storage controllers depending on your array architecture. LUNs are formatted with VMFS. Virtual machine files are stored in VMFS. The resulting environment provides multiple paths for storage traffic to flow from an ESXi host to the storage array to a LUN.







If any component in the SAN fails – a cabling failure, a NIC failure, a switch failure, or a storage controller failure – connectivity between the host and the datastore will be maintained on one or more surviving paths. 'The Setting up iSCSI Storage' walkthrough builds on the information presented here to help you configure iSCSI storage.



### vSphere 6.5 Storage Features

This whitepaper describes in detail the various features of the vSphere 6.5 Core Storage. Please visit:

vSphere 6.5 Storage Features



### NFS 4.1 Multipathing Configuration and Best Practices

With vSphere 6.0, ESXi incorporated the support for NFSv41 protocol. Multipathing is one of the feature which NFS41 provides. We will talk about configuring and best practices of configuring Multipathing feature of ESXi's NFS41 here.

## What is Multipathing?

Multipathing is a method to use multiple paths, each accessible through a different IP address, to access the storage. NFS 3 uses one TCP connection for I/O. As a result, ESXi supports I/O on only one IP address or hostname for the NFS server, and does not support multiple paths. Though we can configure multiple NICs in "NIC teaming" to access a particular IP address through different physical paths, this is not Multipathing

NFS 4.1, by contrast, provides multipathing for servers that support the session trunking. With session trunking, servers maintain the states per session. We can have multiple connections associated with a session. When the session trunking is available, we can use multiple IP addresses to access a single NFS volume.

## Path selection

Currently NFS41 client selects the paths in a Round-Robin fashion. It selects the path only from a list of active paths. If a path goes down then it is removed from the list of active paths till the connectivity is restored.

## Multipathing configuration

Before configuring Multipathing, check whether the NFS server has support for it. The IP addresses of the interfaces exposed by the server for Multipathing can be in the same subnet or in a different subnet.

The IP addresses for multiple paths need to be specified during volume mount. If one wants to add another path, volume needs to be unmounted and remounted. Although there can be more than two paths, the following sections are based on having two paths.

### Paths in same Subnet

When the two paths have IP addresses in the same subnet, the ESXi host will make an independent connection to each of the servers IP through its vmkernel portgroup IP which is in same subnet.

Note: Even if you configure multiple IP adresses in same subnet at ESXi, ESXi will chose only one IP adresss as source to establish connections with server IPs.



#### Steps to configure

Multipathing Configuration can be done through command line or through vSphere Web Client.

#### **Command line**

#esxcli storage nfs41 -H 192.168.1.30, 192.168.1.31 -s /mnt/share1 -v nfs41share1

#### vSphere Web Client

The configuration screen using vSphere Web Client is as follows.





#### Best practice configuration in same subnet

It is recommended to configure NIC Teaming to better utilize the bandwidth of physical NICs and avoid single point of failure of NICS. To configure NIC Teaming, attach multiple adapters to the vmkernel portgroup of NFS. Configure NIC Teaming with the IP hash load-balancing policy



### Paths in different Subnets

With different subnets we can configure multiple vmkernel portgroups to communicate with IP address in the respective subnets. This configuration provides independent connections from each vmkernel portgroup and provides better redundancy and bandwidth utilization than paths in the same subnet.

In the example below

- 192.168.1.y can be reached by vmk1, which is in same subnet as vmk1.
- 192.168.2.y can be reached by vmk2, which is in same subnet as vmk2.





### Steps to configure

#### **Command line**

[root@w2-nfs-esx106:~] esxcli storage nfs41 -H 192.168.1.101,192.168.3.101 -s /share2 -v nfs41Share2
[root@w2-nfs-esx106:~] esxcli storage nfs41 list
Volume Name Host(s) Share Accessible Mounted Read-Only Security sPE
Hardware Acceleration
.....
krb5i\_200g 192.168.1.101,192.168.3.101 /krb5i\_200g true true false AUTH\_SYS false Not
Supported

#### vSphere Web Client

The configuration screen using vSphere Web Client is as follows.

	Getting Started	Summary Monitor	Configure	Permissions	VMs	Resource Pools	Datastores	Networks	Update Manager		lev
📋 New Data	store									?	**
<ul> <li>1 Type</li> <li>2 Select NF</li> <li>3 Name and 4 Configure authentic</li> </ul>	S version d configuration & Kerberos ation	Name and config Specify name and If you plan to hosts" action Datastore name:	uration d configuration configure an instead.	n. existing datasto are1	re on nev	v hosts in the data	acenter, it is re	commended	to use the "Mount t	o additional	•
o neudyto	compre a	Folder: Server(s):	/mnt/share E.g: /datas 192.168.1 E.g: nas, r hat will back	1 store-001 .101,192.168.3.1 nas.it.com or 192 this datastore ha	101 2.168.0.1 as trunkin	g enabled, you ca	an enter additic	onal IPs abov	re, which the ESXi h	host will use	::
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4		M					Back	Next	0 item	s Copy Cancel	•

#### Best practice configuration for different subnets

With different subnets we can have independent connections from different vmkernel portgroups. To utilize the network bandwidth and to have better redundancy at physical layer, configure each portgroup to be in different virtual switch and configure each vmkernel portgroup for NIC Teaming.

by Broadcom © VMware LLC.

## Avoid Single Point of Failures

NIC teaming provide first level of redundancy at NIC level. As a generic NFS best practice and to avoid single point of failure further at physical switches and NAS level, configure them for redundancy at different levels.

### **Physical Switches**

This configuration provides second level of redundancy at physical switches. If switch1 goes down, traffic can be routed through switch2. With this solution, one has four potential NIC cards in the ESX server configured with IP hash failover and two pairs going to separate LAN switches – with each pair configured as teamed at the respective LAN switches.



For NAS level redundancy and more details, refer to the NFS Best Practices guide.

### Viewing the Multipath connections

"vsish" utility can be used to view the connection details for each mounted NFS41 share. The vSphere Client currently doesn't provide this information.

Following is the output for a share with two paths in different subnets.

```
[root@w2-nfs-esx106:~] esxcli storage nfs41 list
                                                          Share
                                                                          Accessible Mounted Read-Only
Volume Name
              Host(s)
Security isPE Hardware Acceleration
                192.168.1.101,192.168.3.101 /share2
                                                         true
                                                                 true
                                                                           false AUTH SYS false Not Supported
share2
share2 Datastore is associated with cluster "1". There are two connections associated with the session of this
cluster.
/>get /vmkModules/nfs41client/clusters/1/servers/1/sessions/00000009A601F597856341200000000/connections/1/info
NFSv4.1 Connection Info {
  network Address:tcp:192.168.1.101.8.1
  state:NFS41_S_CONN_UP
  sched:1
  orphaned:0
}
/>get /vmkModules/nfs41client/clusters/1/servers/1/sessions/00000009A601F597856341200000000/connections/2/info
NFSv4.1 Connection Info {
  network Address:tcp:192.168.3.101.8.1
  state:NFS41_S_CONN_UP
  sched:1
  orphaned:0
3
```



Configuring iSCSI Storage



## Getting Started with vSphere with Operations Management

Configuring iSCSI Storage

This walkthrough demonstrates how to connect to iSCSI storage on an ESXi host managed by vCenter with network connectivity provided by vSphere Standard Switches. Use the arrow keys to navigate through the screens.

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<b>vm</b> ware <sup>.</sup>	-7					
User name: root		VMware vSphere Web Client				
		The vSphere Web Client session has timed out.				
Password:	ws session authentication					
	Login					
Help						

Now that you understand how iSCSI is presented and connected, letâ€<sup>™</sup>s look at how to configure iSCSI in ESXi. We logon on to the vSphere Web Client.



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Go to the [Hosts and Clusters] view.

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e e	Q Filter

Select the [Host], go to the [Manage] tab and click on [Networking]. Under [VMkernel Adapters], click on [Add Host Networking].





Select [VMkernel Network Adapters] and click on [Next].

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prod-esxi41.xmwaredemo.loc     prod-esxi41.xmwaredemo.loc     prod-esxi41.xmwaredemo.loc     prod-esxi41.xmwaredemo.loc     1 Select connection type     Select target device     Select target device     Select target device     Somection settings     Sa Port properties     Sb IPv4 settings     4 Ready to complete	Al - Add Networking Select anget device for the new connection.   Select an existing standard switch  New standard switch  New standard switch	Back Next Finish Can	In Trasks      unning Failed      wall ports     id41.vmwaredemo.loc      Software Internet SCI <sup>4</sup> d41.vmwaredemo.loc      wnotifications     va-01     wnotifications     wnoti

We click on [Browse] to select an existing standard switch. You can also choose to create a new standard switch.



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Management	3 Connection settings	<ul> <li>Select</li> </ul>	an existing standard switch			d41.vmwaredemo.loc
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	3b IPv4 settings	O New s	Select a standard switch on whi	ch to create a VMkernel adapter.		wnotifications
	4 ready to complete		Switch	Discovered Iss		va-01
			fr vSwitch1	-		w notifications
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		l	<u>.</u>			
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We select the standard switch [vSwitch1] and click on [OK] and click on [Next].

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vsom-vora-01     vsom-vora-01     vsom-datacente     )    DMZCluster     )    Management     SecureServer          p 2 prod-esx41x	<ul> <li>1 Select connection type</li> <li>2 Select target device</li> <li>3 Connection settings</li> <li>3a Port properties</li> <li>3b IPv4 settings</li> <li>4 Ready to complete</li> </ul>	Port properties Specify VMkernel port settings VMkernel port settings Network label: VLAN ID: IP settings: TCP/IP stack: Available services Enable services:	iSCSI1 None (0) • iPv4 • Default • • Salt Tolerance logging Management traffic Virtual SAN traffic		unning Failed swall ports 641 vmwaredemo loc Software Internet SCI d41 vmwaredemo loc w notifications va-01 w notifications va-0 w notificatio
			Ba	ack Next Finish Ca	incel

Assign a name to the network and click on [Next].



Configure the IP settings. We choose to use static IP addresses and click on [Next].



Review the settings and click on [Finish].



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<ul> <li>✓ <sup>™</sup> vsom-vcva-01</li> <li>✓ <sup>™</sup> vsom-datacenter-01</li> <li>▶ <sup>™</sup> DMZCluster</li> </ul>	Settings Networking Storage	Alarm Definitions Tags Permissions	]			All Running Failed
ManagementCluster     GecureServersCluster	Virtual switches	VMkernel adapters		Q Filter	•)	Update network configuration
D 2 Boosesververwarenends	VMkernel adapters Physical adapters TCP/IP configuration Advanced	Device         Network Label           Image: Vmk0	Switch 월 vSwitch0 월 vSwitch1 월 vSwitch1	IP Address 10.152.4.41 10.154.190.41 10.158.190.41	TCP/IP Sta Default Default Default	Prod-essi41 ymwaredemo.loc     Open frewall ports     prod-essi41 ymwaredemo.loc     Change Software Internet SC:         prod-essi41 ymwaredemo.loc     Wy Tasks   More Tasks     Work In Progress
		All Properties IP Settings Pol Port properties Network label VLAN ID TCP/IP stack Enabled services	isCSI2 None (0) Default 		•	Alf (0) New (0) Ackno

As covered in the introduction, we need to have multiple iSCSI adapters configured across multiple physical NICs and physical switches. So we have also created another VMkernel Adapter here. Note that the second iSCSI network will need to be configured with a different IP address. The ESXI software iSCSI initiator supports a single iSCSI session with a single TCP connection for each iSCSI target. Next we go into [Virtual Switches].

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	TCP/IP configuration Advanced	월 Yokinhi 월 Yokitch1 Standard switch: vSwitch1 (ISCSI1) / X		Ċ	Open firewall ports     Open firewall ports     prod-esxi41 vmwaredemo.loc     My Tasks      More Tasks     Work In Progress
		Virtual Machines (0)           ♥ ISCSI2           VLAN ID:           ▼ VMkernel Ports (1)           vmk2:10.158.190.41           ♥ ISCSI1           VLAN ID:           ▼ VMkernel Ports (1)           vmk1:10.154.190.41	Image: Constraint of the second sec	• • •	Alarms     All (0) New (0) Ackno

We need to ensure that the TCP connections always traverse the same network as the initiator connects to the iSCSI. We will configure teaming and failover settings. We first select [iSCSI1] and click on the [Edit] icon.



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vmware <sup>®</sup> vSphere	e Web Client  🔒 🖉		A		🖸   root@localos +   Help +   🤇	<b>a</b> Se	arch
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		Active adapters		Adapter	Intel Corporation 82599EB 10-Gigabit SFI/SFP+ Network Connection	-	More rasks
		Standby adapters		Name	vmnic5	Υ.	n Progress
		Unused adapters		Location	PCI 04:00.1		Edit Settin
		💓 vmnic5		Driver Status	ixgbe		
				Status Configured speed, Duplex	Connected 10000 Mb, Full Duplex		
				Actual speed, Duplex	10000 Mb, Full Duplex	•	ns 🗆
					[	0	New (0) Ackno
		Select active and standby a	dapters	. During a failover, standby adapters	activate in the order specified above.		
					OK Can	el	
			_				

Go to [Teaming and Failover], click on the check box to [Override] failover border and make  $\hat{a} \in \mathbb{C}$  wmnic4 $\hat{a} \in \mathbb{C}$  as the only active adapter on iSCSI1 and click on [OK].

🖣 Home 🕨 🔊 🖡	prod-esxi41.vmwaredemo.l	ocal Actions -		=*	
	Summary Monitor Manage	Related Objects			▼ 🖻 Recent Tasks 🗆
✓ Invsom-datacenter-01 ► III DMZCluster	Settings Networking Storag	e Alarm Definitions Tags Permissions			All Running Failed
ManagementCluster     If SecureServersCluster     SecureServersCluster     SecureServersCluster	Virtual switches	Virtual switches			prod-esxi41.vmwaredemo.loc     Update network configuration     prod-esxi41 vmwaredemo.loc
	VMkernel adapters Physical adapters TCP/IP configuration Advanced	Switch 함 VSwitch0 한 vSwitch1 Standard switch: vSwitch1 (ISCSI2) / X	Discovered lasues	G	Vopdate network configuration     vopdate network configuration     vopdate network configuration     vopdate network configuration     prod-esxi41 vmwaredemo.low     My Tasks      More Tasl     Work In Progress
		VLAN580         VLAN580           VLAN ID: 580         Vitrual Machines (0)           VItrual Machines (0)         VILAN ID:           VLAN ID:         VMkernel Ports (1)           vmk2: 10.158.190.41         •           Viscositi         •	Physical Adapters     Physical Adapters     Wirmick 10000 Full		All (0) New (0) Ackno

We repeated the same process on the iSCSI2 and have changed the failover order to use "vmnic5†as active, and "vmnic4" as unused.



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Sphere Replication A → vSphere Replication S → III SecureServersCluster	Storage Adapters Storage Devices	+     E     ■     ■       Software iSCSI adapter	Q Filter Type Status Identifier	•	Queued  Check new notifications  vsom-vcva-01
🔂 prod-esxi36.vmwared 🔂 prod-esxi37.vmwared 🔂 prod-esxi38.vmwared	Host Cache Configuration	Software FCoE adapter SB700 SATA Controller [IDE Mo	SCSI Unknown		Queued Check new notifications
ि prod-esxi39.vmwared की DS2DB-SLESVMWSP की dvdstore-sql1		<ul> <li>vmhba32</li> <li>vmhba33</li> </ul>	Block SCSI Unknown Block SCSI Unknown		Queued Download patch definitions
한 OlioDB-SLESVMWSP 한 prod-exch07mb1			Block SCSI Unknown	*	vsom-vcva-01     Queued     Vitation = Marc Toolco
🔂 prod-exchcas2		Properties Devices Paths			Work In Progress
骨 prod-exchmb2 :: 骨 prod-file01 孫 prod-file02		General			
prod-win-SQL1		Model MegaRAID SAS GEN	N2 Controller		
WMmark-w2k3     WNX2 Simulator     prod-esxi41.vmwarede)n					✓ O Alarms
					All (0) New (0) Ackno

Here we see that we have a list of local storage adapters and no iSCSI adapter, so we will add a new iSCSI adapter by clicking on the add [+] icon and selecting [Software iSCSI Adapter].

(Home ) 🔊 I	prod-esxi41.vmwaredemo.loc	al Actions -		
V Note V Mware VCenter Log I * V Mware VCenter Log I * V Mware VCenter Orch V Shield Manager V Sphere Replication # V Sphere Replication # Secure Servers Cluster Prod-esxi33 / mwared Prod-esxi33 / mwared	Summary Monitor Manage Settings Networking Storage 44 Storage Adapters Storage Devices Host Cache Configuration	Related Objects Aiam Definitions Tags Permissions Storage Adapters	Filter      Seen added, select the adapter and use the / Cancel	cent Tasks
DS2DB-BLESYMWSP     dividstore-sql1     dividstore-sql1     dividstore-sql1     dividstore-sql1     dividstore-sql1     dividstore-schoras1     dividstore-schoras2     d		Winhba33     Block SCSI     Unknown       Image: state st	Commit C	ad patch definitions vcva-01 More Task prk in Progress

Click on [OK] on this prompt.

-



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vmware <sup>®</sup> vSphere Web Cli	ent 🔒 🖉				Ů i root@iocalos → i Help	- I Q Search -
(Home ) 🔊 I	prod-esxi41.vmwaredemo.loc	al Actions <del>-</del>			E	- <b>I</b>
	Summary Monitor Manage	Related Objects				🔹 🗊 Recent Tasks 🛛 🗖
← @ vsom-vcva-01 ← 🗎 vsom-datacenter-01 ト 🗊 DMZCluster	Settings Networking Storage	Alarm Definitions Tags Permiss	sions			All Running Failed Power On virtual machine
▶ 🖤 ManagementCluster		Storage Adapters				🕮 starwind-iscsi 💠
GecureServersCluster	Storage Adapters	+ 🔂 🛛 🖾 🖙			Q Filter	<ul> <li>Initialize powering On</li> </ul>
starwind-iscsi	Storage Devices	Adapter	Туре	Status	Identifier	Vsom-datacenter-01
	Host Cache Configuration	SB700/SB800 IDE Controller	stanwind-iscsi			
		🚱 vmhba1	Block SCSI	Unknown		Reconfigure port group
		🚱 vmhba35	Block SCSI	Unknown		prod-esxi41.vmwaredemo.loc
		iSCSI Software Adapter	<ul> <li>Reconfigure port group</li> </ul>			
		🚱 vmhba36	iSCSI	Online	iqn.1998-01.com.vmware:localhost-	prod-esxi41.vmwaredemo.loc
		4			*	<ul> <li>Update network configuration</li> </ul>
				100		🔋 prod-esxi41.vmwaredemo.loc+
		Adapter Details				My Tasks 👻 More Tasks
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		Dynamic Discovery Static Di				
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		iSCSI server				
			This lis	t is empty.		
						Alarme
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Here we will add the IP addresses of the iSCSI storage array. Click on [Add].

		mhba36 - Add Send Target !	Server		?	
Home Vsom-vcva-01 Msom-datacenter-01 DMZCluster ManagementCluster SecureServersCluster prod-esxi41.vmwaredem) Starwind-iscsi	prod-esxi41.vm     Summary Monit     Settings Networ      Settings Networ      Storage Adap     Storage Devic     Host Cache C	mhba36 - Add Send Target s ISCSI Server: 10.154.190 Port: 3260 Authentication Settings ✓ Inherit settings from pare	Server 6		•	Recent Tasks      All Running Failed      Power On virtual machine      starwind-iscsi      Initialize powering On      vsom-datacenter-01      Reconfigure virtual machine      starwind-iscsi
					ware:localhost-	Reconfigure port group     prod-esxi41.vmwaredemo.loc     Reconfigure port group     prod-esxi41.vmwaredemo.loc     Update network configuration     prod-esxi41.vmwaredemo.loc     My Tasks     More Tasks     Work in Progress
				OK Cancel	Advanced	vmhbadb - Add Send

We specify the IP and the port and click on [OK].



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vmware <sup>®</sup> vSphere Web Cli	ent 🔒 🖉				Ů l root@localos ◄		I Q Search	
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	Summary Monitor Manage	Related Objects					🔹 🛐 Recent Tasks	
vsom-vcva-U1      vsom-datacenter-01      MDMZCluster	Settings Networking Storage	Alarm Definitions Tags Permis	sions				All Running Faile	ed ienti*
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🕞 🔋 prod-esxi41.vmwaredem).	Storage Devices	Adapter	Туре	Status	Identifier	•	prod-esxi41.vmwaredemo     Vpdate Internet SCSI auth	).loc ienti
	Host Cache Configuration	SB700/SB800 IDE Controller	Block SCSI	Unknown			prod-esxi41.vmwaredemo	0.100
		vmhba35	Block SCSI	Unknown		::	prod-esxi41.vmwaredemo	).lo(
		ISCSI Software Adapter				T P	My Tasks 👻 More T	asks
		Due to recent configuration changes, a rescan of this storage adapter is recommended.					🔹 📝 Work In Progress	
		Adapter Details						
		Properties Devices Paths	Targets Ne	twork Port Bin	ding Advanced Options			
		Dynamic Discovery Static Di	scovery					
		10001	Add	Remove	e Authentication Adv	anced	All (0) New (0) Ackno	J
		10.154.190.6:3260						
		10.160.190.6:3260						
								•

In our demo environment, the iSCSI array has two controllers with a single NIC each. So we have also added a second target address here. With both the targets added, we will now rescan the iSCSI software adapters to find the LUNs that are available. Click on the [Rescan] icon.

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VmWare <sup>®</sup> vSphere Web Cl	lient 🔒 🖉	U I root@docalos + I Help + Iemo.local Actions + 🗮	C Search
Vsom-vcva-01       ✓       Ø vsom-vcva-01       ✓       DMZCluster       ✓       Ø ManagementCluster	Summary Monitor M Settings Networking	anage Related Objects Storage Alarm Definitions Tags Permissions Storage Adapters	Recent Tasks      All Running Failed      Update Internet SCSI authenti     prod-esxi41.vmwaredemo.loc;;;
▶	Storage Adapters Storage Devices Host Cache Configu	prod-esxi41.xmwaredemo.local - Rescan Storage     Ter     Scan for new Storage Devices     Rescan all host bus adapters for new storage devices.     Rescanning all adapters can be slow.     Scan for new VMFS Volumes     Rescan all known storage devices for new VMFS volumes that have been added     since the last scan. Rescanning horwn storage for new file systems is faster than     rescanning for new storage.     ended.	Add Internet SCSI send target     prod-esx41 vmwaredemo loc     Update Internet SCSI suthenti     prod-esx41 vmwaredemo loc     Add Internet SCSI send target     prod-esx41 vmwaredemo loc     My Tasks
		OK Cancel Options           Dynamic Discovery         Static Discovery           Add         Remove         Authentication         Advanced           ISCSI server         10.154.190.6:3260         10.160.190.6:3260	• C Alarms

Select the areas that need to be scanned and click on [OK].



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		ROCKET ISCSI Disk (eui.)	95f4f0 disk	100.00 GB	Attached U	nknown	All (0) Now	(0) Ackno
							All (U)	(U) ACKIU
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Once the scan is complete; we go into the [Devices] tab and see that an iSCSI disk has been found. We then switch to the [Paths] tab.

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SB700 SATA Controller [IDE Mode] I vmba33 Block SCSI Unknown Hy Tasks - More Tasks Due to recent configuration changes, a rescan of this storage adapter is recommended. Adapter Details Properties Devices Paths Targets Network Port Binding Advanced Options Enable Disable Runtime Name Target Vmhba36.C3.T0.L0 ign.2008-08.com.starwindsoftw 0 Active Vmhba36.C0.T0.L0 ign.2008-08.com.starwindsoftw 0 Active I moba36.C0.T0.L0 ign.2008-08.com.starwindsoftw 0 Active			S vmhba2	SCSI	Unknown			🖌 🖌 Add Internet SCSI se	nd target		
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			vmhba36:C0:T0:L0	iqn.2008-08.com.sta	arwindsoftw	0 🔶 Active			No. No.		

We see that there is one path for each VMkernel adapter that was configured. This enables high availability to our iSCSI storage array. With the new LUN found, we will go ahead an configure a new VMware file system on the newly found LUN. We click on [Actions].



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		vmhba36:CU:TU:LU	Ign.2008-08.com.st	arwindsoftw	U 🧄 Active		▲ prod-file03	

Click on [New Datastore].



Click on [Next].



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vsom-vcva-01	1 Location	Туре		unning Failed
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🕨 🖗 Management	3 Name and device selection	Create a VMFS datastore on a disk/LUN.		d41.vmwaredemo.loc <sub>11</sub>
GecureServer     SecureServer     SecureServer	4 Partition configuration	○ NFS		all HBAs
prod-esxi41.v	5 Ready to complete	Create an NFS datastore on an NFS share over the network.		d41.vmwaredemo.loc
				nternet SCSI authenti
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Select VMFS and click on [Next].

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vmware <sup>,</sup> vSphere	Web Client 🔒 🗗				) I root@localo:		p 🖌   🔍 8	learch 🔹
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vsom-vcva-01	✓ 1 Location	Datastore name: iSCSI-Datastore-1						unning Failed
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Management	3 Name and device selection	Name	LUN	Capacity	Hardware Acceler	Drive Type	Snapshot Vo	d41.vmwaredemo.loc <sub>11</sub>
I SecureServer	4 VMFS version	ROCKET ISCSI Disk (eui.95f4f07bd2742735)	0	100.00 GB	Unknown	Non-SSD		all HBAs
prod-esxi41.v	5 Partition configuration	Local SMC Disk (naa.600304800653b9001a95d51823	0	1.09 TB	Not supported	Non-SSD		d41.vmwaredemo.loc
	6 Ready to complete							d41.vmwaredemo.loc
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Assign a name and select the newly found LUN. Click on [Next].



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			Back Next Finish	Cancel
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Select the VMFS version and click on [Next].

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✓ @ vsom-vcva-01 ✓ 1 Location	Partition Layout	Datastore Details		unning Failed
Vsom-datacenter		Partition Configuration Use all a	available partitions	VMFS ·
🕨 Management 🗸 3 Name and device selection		Datastore Size	100.00 🔹 GB	d41.vmwaredemo.loc <sub>22</sub>
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Choose the partition layout and click on [Next].



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Review the settings and click on [Finish].

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The VMFS datastore has been created on the iSCSI LUN. We go into the [Related Objects] tab.



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Under [Datastores], we see that the new iSCSI datastore is now available. Here we can create virtual machines and virtual machine templates. This concludes the walkthrough on iSCSI storage. Select the next walkthrough of your choice using the navigation panel.



## vSphere Core Storage

#### vSphere Core Storage on core.vmware.com

Visit core.vmware.com to learn about core storage features and capabilities in vSphere.



## vSphere 6.7 Storage Features

## vSphere 6.7 Storage

This whitepaper describes in detail the various features of vSphere 6.7 Storage. Please visit:

vSphere 6.7 Storage



