



Configuring VMware vCenter 6.7 to use Zadara VPSA iSCSI storage (including increasing bandwidth by using multiple iSCSI paths)

This guide is based on the new look and feel of vCenter Appliance 6.7 using HTML5.

Instructions for setting up iSCSI connectivity in previous versions of vCenter can be found [here](#).

Further information on Zadara / VMware iSCSI best practices can be found [here](#).

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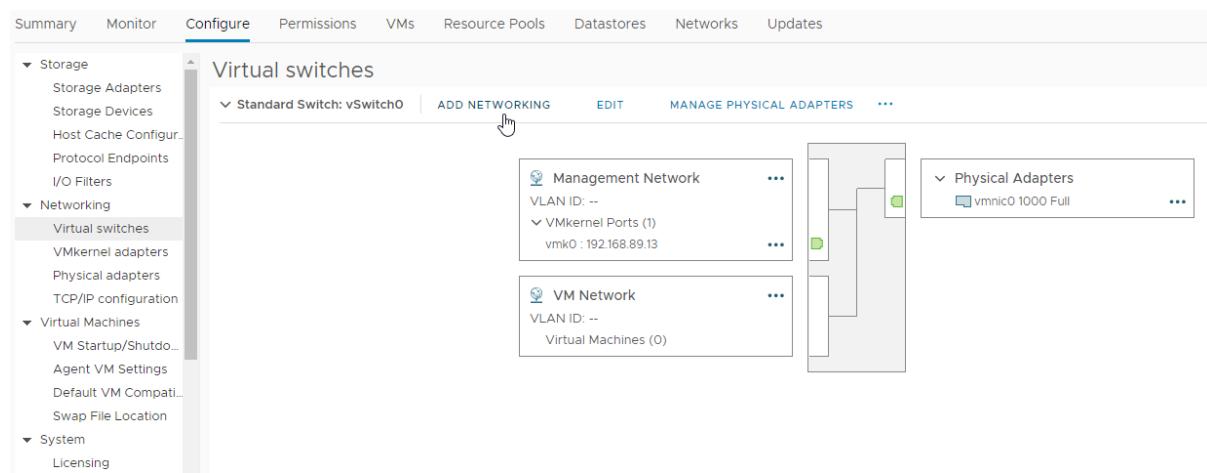
Connecting ESXi hosts to Zadara Storage using iSCSI

These steps will need to be performed on each ESXi host, as required, within the vSphere Datacenter.

Zadara only supports Port Binding for HA as a single Target IP is made available to all ESXi host Adapters. This is used to maintain iSCSI sessions for HA and multipath capabilities rather than relying on underlying NIC teaming which is not a valid configuration.

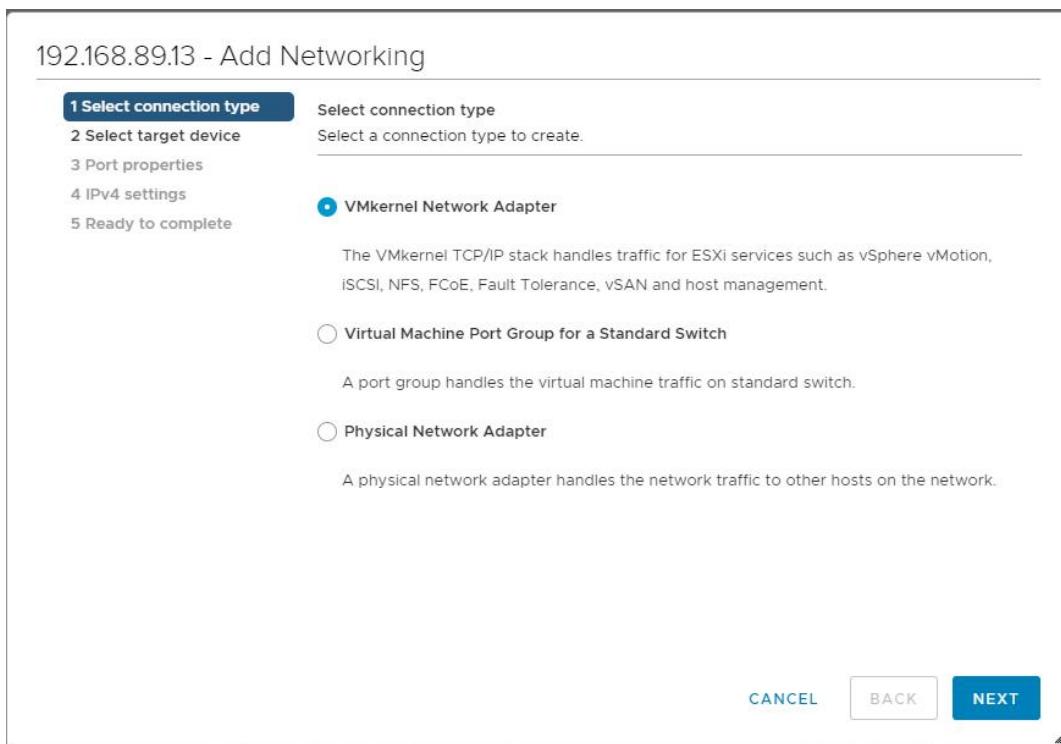
Adding a new VMkernel Network Adapter to each ESXi host.

Under ‘Networking – Virtual switches’ select ‘Add Networking’:



The screenshot shows the vSphere Web Client interface. The left sidebar has a tree view with 'Storage' and 'Networking' expanded. Under 'Networking', 'Virtual switches' is selected. The main pane shows 'Virtual switches' with a 'Standard Switch: vSwitch0' listed. Below it are 'Management Network' and 'VM Network'. To the right is a network diagram with a central switch connected to two green VMkernel ports (labeled 'vmk0') and one blue Physical Adapter (labeled 'vmnic0 1000 Full'). At the bottom right of the main pane are 'MANAGE PHYSICAL ADAPTERS' and three dots buttons. The top navigation bar includes 'Summary', 'Monitor', 'Configure' (which is underlined), 'Permissions', 'VMs', 'Resource Pools', 'Datastores', 'Networks', and 'Updates'.

Select ‘VMkernel Network Adapter’:



192.168.89.13 - Add Networking

1 Select connection type

2 Select target device
3 Port properties
4 IPv4 settings
5 Ready to complete

Select connection type
Select a connection type to create.

VMkernel Network Adapter
The VMkernel TCP/IP stack handles traffic for ESXi services such as vSphere vMotion, iSCSI, NFS, FCoE, Fault Tolerance, vSAN and host management.

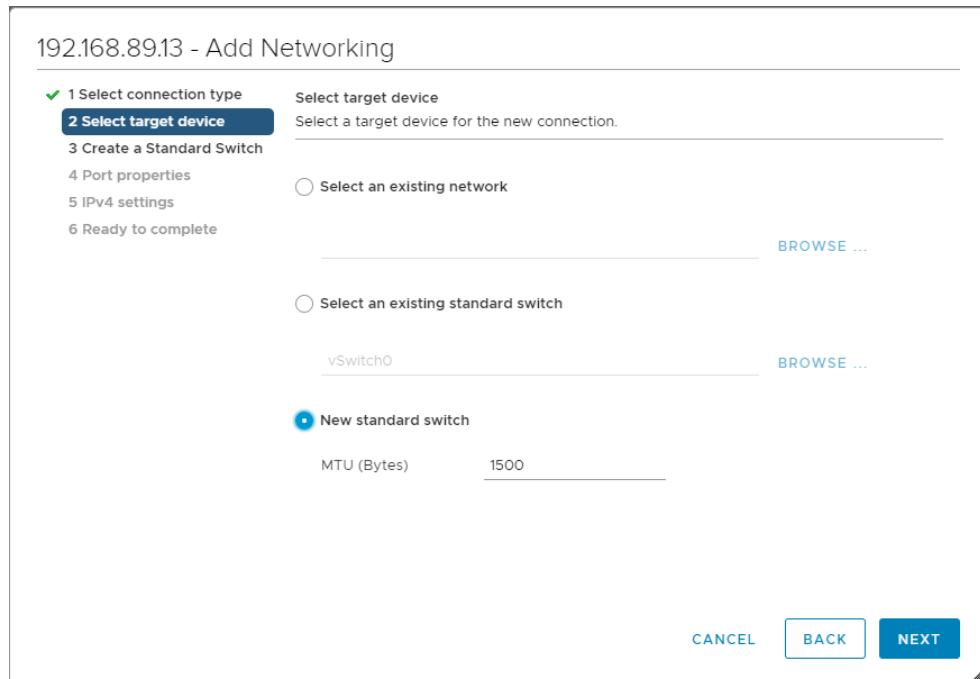
Virtual Machine Port Group for a Standard Switch
A port group handles the virtual machine traffic on standard switch.

Physical Network Adapter
A physical network adapter handles the network traffic to other hosts on the network.

CANCEL **BACK** **NEXT**

Next...

Select 'New standard switch':



192.168.89.13 - Add Networking

✓ 1 Select connection type
2 **Select target device**
3 Create a Standard Switch
4 Port properties
5 IPv4 settings
6 Ready to complete

Select target device
Select a target device for the new connection.

Select an existing network
 Select an existing standard switch
 New standard switch

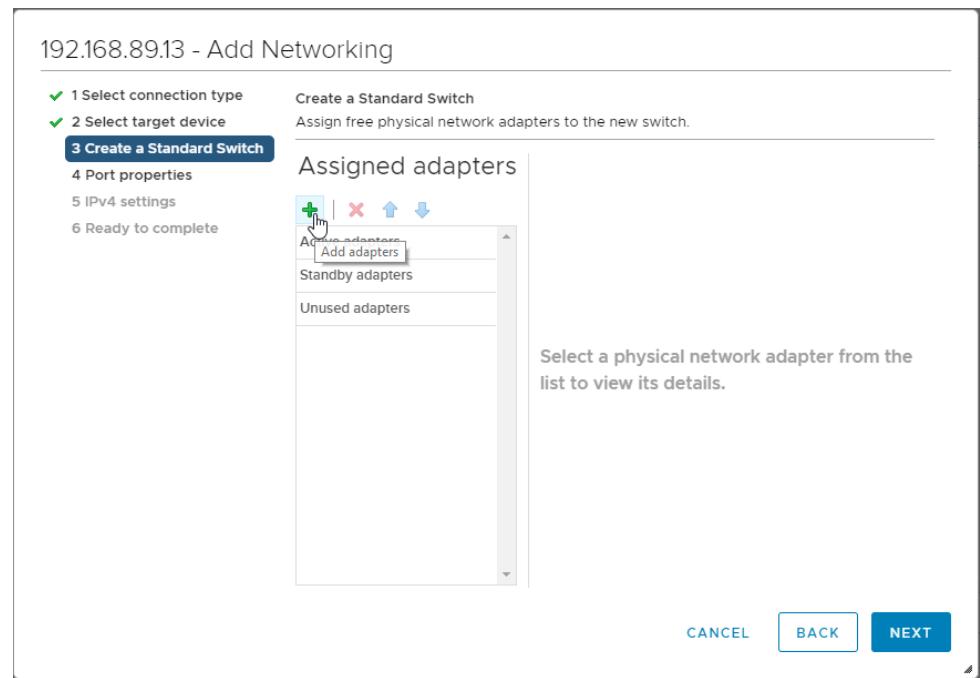
vSwitch0 [BROWSE ...](#)

MTU (Bytes) 1500

CANCEL BACK NEXT

Next...

Add both of the required 10G/40G physical adapters:



192.168.89.13 - Add Networking

✓ 1 Select connection type
✓ 2 Select target device
3 **Create a Standard Switch**
4 Port properties
5 IPv4 settings
6 Ready to complete

Create a Standard Switch
Assign free physical network adapters to the new switch.

Assigned adapters

[+ Add adapters](#)

Standby adapters
Unused adapters

Select a physical network adapter from the list to view its details.

CANCEL BACK NEXT

Add adapters... Next...

Add Physical Adapters to the Switch

Network Adapters		All	Properties	CDP	LLDP
	vmnic1	Adapter	Mellanox Technologies MT27520 Family		
	vmnic1000202	Name	vmnic1000202		
	vmnic2	Location	PCI 0000:02:00.0		
		Driver	nmlx4_en		
		Status	Connected		
		Actual speed, Duplex	40000 Mb, Full Duplex		
		Configured speed, Duplex	40000 Mb, Full Duplex		
		Networks	172.28.228.112-172.28.228.115 (VLAN3) 172.28.224.96-172.28.224.111 (VLAN12) 172.27.176.96-172.27.176.111 (VLAN12) 0.0.0.1-255.255.255.254 (VLAN25) 0.0.0.1-255.255.255.254 (VLAN501)		
		Network I/O Control	Allowed		
		SR-IOV	Disabled		
		Cisco Discovery Protocol	Cisco Discovery Protocol is not available on this physical network adapter		
			CANCEL		OK

Select the 1st adapter then OK. Return here and add the 2nd adapter then OK.

192.168.89.13 - Add Networking

3 Create a Standard Switch

- ✓ 1 Select connection type
- ✓ 2 Select target device
- 3 Create a Standard Switch**
- 4 Port properties
- 5 IPv4 settings
- 6 Ready to complete

Create a Standard Switch
Assign free physical network adapters to the new switch.

Assigned adapters		All	Properties	CDP	LLDP
Active adapters		Adapter	Mellanox Technologies MT27520 Family		
		Name	vmnic1000202		
		Location	PCI 0000:02:00.0		
		Driver	nmlx4_en		
		Status	Connected		
		Actual speed, Duplex	40000 Mb, Full Duplex		
		Configured speed, Duplex	40000 Mb, Full Duplex		
		Networks	172.28.224.96-172.28.228.112 172.28.228.112-172.28.228.115 172.27.176.96-172.27.176.111 0.0.0.1-255.255.255.254 0.0.0.1-255.255.255.255 0.0.0.1-255.255.255.255		
		Network I/O Control	Allowed		
			CANCEL		BACK
			BACK		NEXT

Once both adapters have been assigned, Next...

192.168.89.13 - Add Networking

✓ 1 Select connection type
 ✓ 2 Select target device
 ✓ 3 Create a Standard Switch
4 Port properties
 5 IPv4 settings
 6 Ready to complete

Port properties
 Specify VMkernel port settings.

VMkernel port settings

Network label	VMK_ISCSI_1
VLAN ID	10
IP settings	IPv4
MTU	Get MTU from switch 1500
TCP/IP stack	Default
Available services	
Enabled services	<input type="checkbox"/> vMotion <input type="checkbox"/> Provisioning <input type="checkbox"/> Fault Tolerance logging <input type="checkbox"/> Management <input type="checkbox"/> vSphere Replication <input type="checkbox"/> vSphere Replication NFC <input type="checkbox"/> vSAN

CANCEL **BACK** **NEXT**

Provide a Network label and specify a VLAN ID (if required). Next...

192.168.89.13 - Add Networking

✓ 1 Select connection type
 ✓ 2 Select target device
 ✓ 3 Create a Standard Switch
 ✓ 4 Port properties
5 IPv4 settings
 6 Ready to complete

IPv4 settings
 Specify VMkernel IPv4 settings.

Obtain IPv4 settings automatically
 Use static IPv4 settings

IPv4 address 172.27.225.103
 Subnet mask 255.255.252.0
 Default gateway Override default gateway for this adapter 192.168.90.1
 DNS server addresses 8.8.8.8
 8.8.4.4

CANCEL **BACK** **NEXT**

Provide the relevant IP address, Subnet Mask and Default Gateway details. Next...

192.168.89.13 - Add Networking

<ul style="list-style-type: none"> ✓ 1 Select connection type ✓ 2 Select target device ✓ 3 Create a Standard Switch ✓ 4 Port properties ✓ 5 IPv4 settings 6 Ready to complete 	Ready to complete Review your settings selections before finishing the wizard.						
<table border="0" style="width: 100%;"> <tr> <td style="width: 30%; vertical-align: top;"> New standard switch Assigned adapters Switch MTU New port group VLAN ID vMotion Provisioning Fault Tolerance logging Management vSphere Replication vSphere Replication NFC VSAN </td> <td style="width: 70%; vertical-align: top;"> vSwitch1 vmnic1000202, vmnic2 1500 VMK_iSCSI_1 10 Disabled Disabled Disabled Disabled Disabled Disabled Disabled </td> </tr> <tr> <td colspan="2" style="text-align: center; padding-top: 10px;"> NIC settings MTU 1500 TCP/IP stack Default </td> </tr> <tr> <td colspan="2" style="text-align: center; padding-top: 10px;"> IPv4 settings IPv4 address 172.27.225.103 (static) Subnet mask 255.255.252.0 </td> </tr> </table>		New standard switch Assigned adapters Switch MTU New port group VLAN ID vMotion Provisioning Fault Tolerance logging Management vSphere Replication vSphere Replication NFC VSAN	vSwitch1 vmnic1000202, vmnic2 1500 VMK_iSCSI_1 10 Disabled Disabled Disabled Disabled Disabled Disabled Disabled	NIC settings MTU 1500 TCP/IP stack Default		IPv4 settings IPv4 address 172.27.225.103 (static) Subnet mask 255.255.252.0	
New standard switch Assigned adapters Switch MTU New port group VLAN ID vMotion Provisioning Fault Tolerance logging Management vSphere Replication vSphere Replication NFC VSAN	vSwitch1 vmnic1000202, vmnic2 1500 VMK_iSCSI_1 10 Disabled Disabled Disabled Disabled Disabled Disabled Disabled						
NIC settings MTU 1500 TCP/IP stack Default							
IPv4 settings IPv4 address 172.27.225.103 (static) Subnet mask 255.255.252.0							

[CANCEL](#)
[BACK](#)
FINISH


Review the settings and Finish.

Repeat the previous steps to add a 2nd VMkernel Port, this time to the ‘existing standard switch’ that was just created (e.g. vSwitch1):

192.168.89.13 - Add Networking

<ul style="list-style-type: none"> ✓ 1 Select connection type 2 Select target device 3 Port properties 4 IPv4 settings 5 Ready to complete 	Select target device Select a target device for the new connection.
<p><input type="radio"/> Select an existing network</p> <p style="text-align: right;">BROWSE ...</p> <p><input checked="" type="radio"/> Select an existing standard switch</p> <p>vSwitch1 <input style="border: 1px solid #ccc; border-radius: 5px; padding: 2px 10px; margin-left: 10px;" type="button" value="BROWSE ..."/></p> <p><input type="radio"/> New standard switch</p> <p>MTU (Bytes) 1500</p>	

[CANCEL](#)
[BACK](#)
NEXT

192.168.89.13 - Add Networking

3 Port properties

Specify VMkernel port settings.

VMkernel port settings	Network label	VMK_ISCSI_2
VLAN ID	10	
IP settings	IPv4	
MTU	Get MTU from switch	1500
TCP/IP stack	Default	
Available services	<input type="checkbox"/> vMotion <input type="checkbox"/> Provisioning <input type="checkbox"/> Fault Tolerance logging <input type="checkbox"/> Management <input type="checkbox"/> vSphere Replication <input type="checkbox"/> vSphere Replication NFC <input type="checkbox"/> vSAN	
Enabled services		

CANCEL **BACK** **NEXT**

Provide a Network label and specify a VLAN ID (if required). Next...

192.168.89.13 - Add Networking

4 IPv4 settings

Specify VMkernel IPv4 settings.

<input type="radio"/> Obtain IPv4 settings automatically	
<input checked="" type="radio"/> Use static IPv4 settings	
IPv4 address	172.27.225.104
Subnet mask	255.255.252.0
Default gateway	<input type="checkbox"/> Override default gateway for this adapter 192.168.90.1
DNS server addresses	8.8.8.8 8.8.4.4

CANCEL **BACK** **NEXT**

Provide the relevant IP address, Subnet Mask and Default Gateway details. Next...

192.168.89.13 - Add Networking

Ready to complete
Review your settings selections before finishing the wizard.

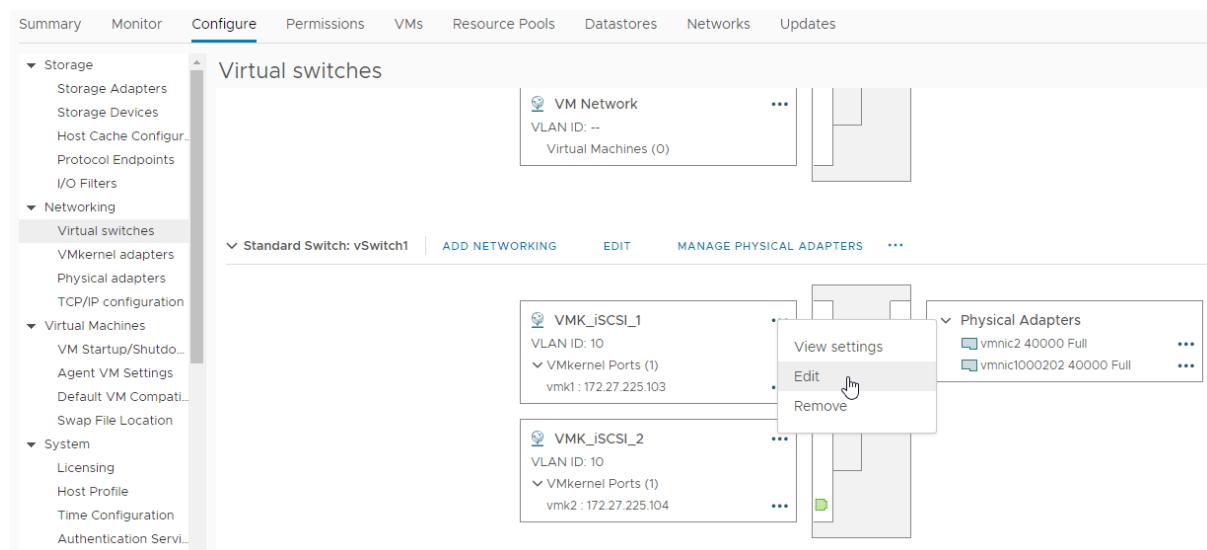
New port group	VMK_iSCSI_2
Standard switch	vSwitch1
VLAN ID	10
vMotion	Disabled
Provisioning	Disabled
Fault Tolerance logging	Disabled
Management	Disabled
vSphere Replication	Disabled
vSphere Replication NFC	Disabled
vSAN	Disabled
NIC settings	
MTU	1500
TCP/IP stack	Default
IPv4 settings	
IPv4 address	172.27.225.104 (static)
Subnet mask	255.255.252.0

CANCEL **BACK** **FINISH**

Review the settings and Finish.

We now need to configure each VMkernel adapter's 'Failover order' to set one of the adapters as 'Unused' for each adapter.

Click on the three dots in the top right corner of the 1st VMkernel adapter box and select 'Edit':



The screenshot shows the vSphere Web Client interface under the 'Configure' tab. The left sidebar menu is expanded, showing sections for Storage, Networking, Virtual Machines, and System. In the 'Networking' section, 'Virtual switches' is selected, and it displays a list of virtual switches, including 'VM Network' and 'Standard Switch: vSwitch1'. Below this, two VMkernel adapters are listed: 'VMK_iSCSI_1' and 'VMK_iSCSI_2'. Each adapter has a context menu open with options: 'View settings', 'Edit' (which is highlighted with a cursor), and 'Remove'. To the right of the adapters, a list of physical adapters is shown, including 'vmnic2 40000 Full' and 'vmnic1000202 40000 Full'.

VMK_iSCSI_1 - Edit Settings

Teaming and failover

Properties	Load balancing	<input type="checkbox"/> Override <input type="text"/> Route based on originating virtual port
Security	Network failure detection	<input type="checkbox"/> Override <input type="text"/> Link status only
Traffic shaping	Notify switches	<input type="checkbox"/> Override <input type="text"/> Yes
Teaming and failover	Fallback	<input type="checkbox"/> Override <input type="text"/> Yes

Failover order

Override

Active adapters: vmnic1000202

Standby adapters: vmnic2

Unused adapters: vmnic2

All Properties CDP LLDP

Adapter: Mellanox Technologies MT27520 Family
Name: vmnic2
Location: PCI 0000:02:00.0
Driver: nmlx4_en

Status: Connected
Actual speed, Duplex: 40000 Mb, Full Duplex
Configured speed, Duplex: 40000 Mb, Full Duplex
Networks: 172.27.176.96-172.27.176.111 (VLAN12)
172.28.224.96-172.28.224.111 (VLAN10)

Select active and standby adapters. During a failover, standby adapters activate in the order specified above.

CANCEL **OK**

Under ‘Teaming and failover’, check the ‘Failover order’ Override box and move the 2nd physical adapter down to be an ‘Unused adapter’. OK...

VMK_iSCSI_2 - Edit Settings

Teaming and failover

Properties	Load balancing	<input type="checkbox"/> Override <input type="text"/> Route based on originating virtual port
Security	Network failure detection	<input type="checkbox"/> Override <input type="text"/> Link status only
Traffic shaping	Notify switches	<input type="checkbox"/> Override <input type="text"/> Yes
Teaming and failover	Fallback	<input type="checkbox"/> Override <input type="text"/> Yes

Failover order

Override

Active adapters: vmnic2

Standby adapters: vmnic1000202

Unused adapters: vmnic1000202

All Properties CDP LLDP

Adapter: Mellanox Technologies MT27520 Family
Name: vmnic1000202
Location: PCI 0000:02:00.0
Driver: nmlx4_en

Status: Connected
Actual speed, Duplex: 40000 Mb, Full Duplex
Configured speed, Duplex: 40000 Mb, Full Duplex
Networks: 172.27.176.96-172.27.176.111 (VLAN12)
172.28.224.96-172.28.224.111 (VLAN10)

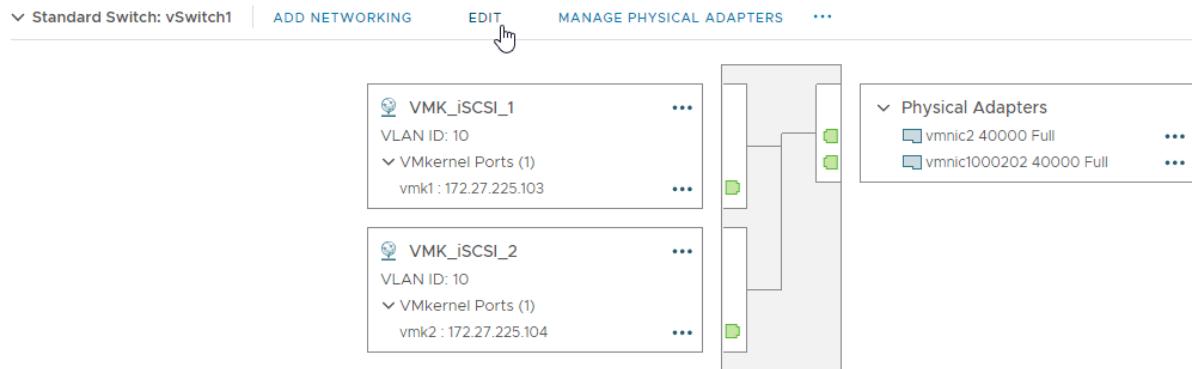
Select active and standby adapters. During a failover, standby adapters activate in the order specified above.

CANCEL **OK**

Now select ‘Edit’ for the 2nd VMkernel adapter and perform the same steps as above, but this time move the 1st adapter down to be an ‘Unused adapter’. OK...

Next we need to change the default Security settings for the new vSwitch (e.g. vSwitch1):

For the vSwitch, select 'Edit'.



vSwitch1 - Edit Settings

Properties

Security (selected)

Promiscuous mode: Reject

MAC address changes: Reject

Forged transmits: Reject

CANCEL **OK**

The 'MAC address changes' and 'Forged transmits' fields are highlighted with an orange border.

Under 'Security' change 'MAC address changes' and 'Forged transmits' to 'Reject'. OK...

vSwitch1 - Edit Settings

Properties	Load balancing	Route based on originating virtual port					
Security	Network failure detection	Link status only					
Traffic shaping	Notify switches	Yes					
Teaming and failover	Failback	No					
Failover order							
<table border="1"> <thead> <tr> <th>Active adapters</th> </tr> </thead> <tbody> <tr> <td>vmnic1000202</td> </tr> <tr> <td>vmnic2</td> </tr> <tr> <td>Standby adapters</td> </tr> <tr> <td>Unused adapters</td> </tr> </tbody> </table> <p>Select a physical network adapter from the list to view its details.</p> <p>Select active and standby adapters. During a failover, standby adapters activate in the order specified above.</p>			Active adapters	vmnic1000202	vmnic2	Standby adapters	Unused adapters
Active adapters							
vmnic1000202							
vmnic2							
Standby adapters							
Unused adapters							

CANCEL OK

Then under 'Teaming and failover', change 'Failback' to 'No'. OK...

We are now ready to add these new VMkernel ports to the iSCSI software adapter.

Under 'Storage – Storage Adapters' select the relevant iSCSI software adapter. In the lower pane select 'Network Port Binding' and then 'Add':

Summary Monitor Configure Permissions VMs Resource Pools Datastores Networks Updates

▼ Storage ▲ Storage Adapters

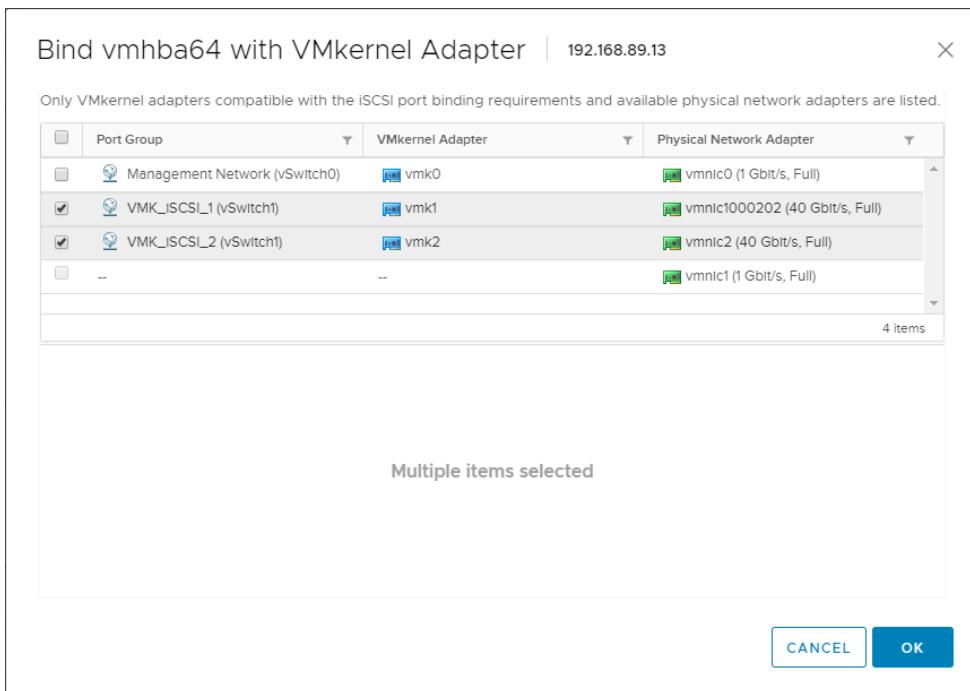
+ Add Software Adapter Refresh Rescan Storage... Rescan Adapter

Adapter	Type	Status	Identifier	Targets	Devices	Paths
vmhba64	iSCSI	Online	iqn1998-01.com.vmware:uk-ops-01-03-03a3a2c1	0	0	0
vmhba2	SAS	Unknown	--	4	4	4
Wellenburg AHCI Controller						

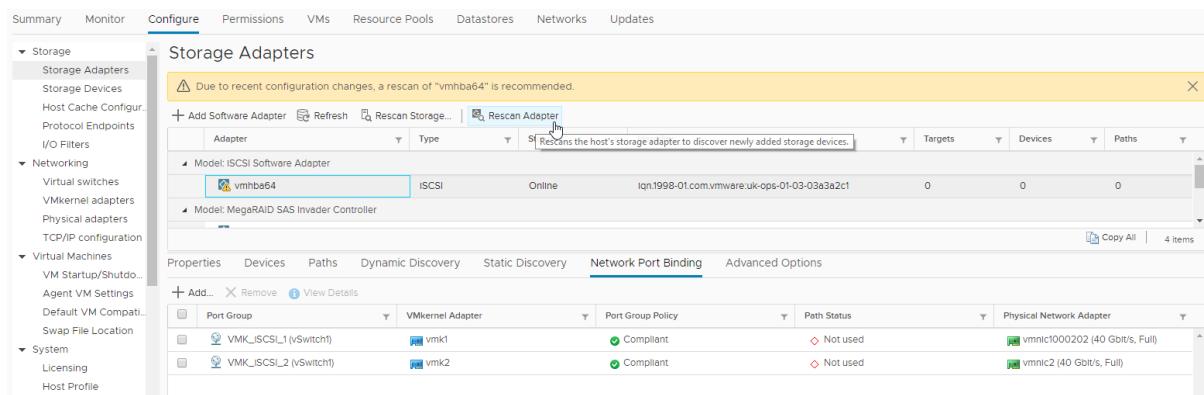
Properties Devices Paths Dynamic Discovery Static Discovery Network Port Binding Advanced Options

+ Add... Remove View Details

Port Group VMkernel Adapter Port Group Policy Path Status Physical Network Adapter



Select the two VMkernel adapters that were created. OK...



Storage Adapters

Adapter Type Status Targets Devices Paths

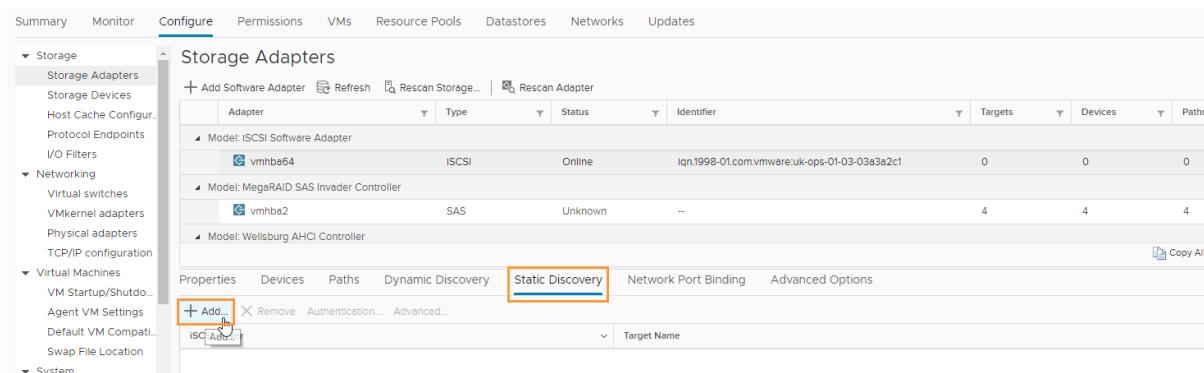
vmhba64	ISCSI	Online	iqn.1998-01.com.vmware:uk-ops-01-03-03a3a2c1	0	0	0
---------	-------	--------	--	---	---	---

Properties Devices Paths Dynamic Discovery Static Discovery Network Port Binding Advanced Options

Adapter Port Group VMkernel Adapter Port Group Policy Path Status Physical Network Adapter

VMK_ISCSI_1 (vSwitch1)	vmk1	Compliant	Not used	vmnic1000202 (40 Gbit/s, Full)
VMK_ISCSI_2 (vSwitch1)	vmk2	Compliant	Not used	vmnic2 (40 Gbit/s, Full)

Select 'Rescan Adapter'.



Storage Adapters

Adapter Type Status Identifier Targets Devices Paths

vmhba64	ISCSI	Online	iqn.1998-01.com.vmware:uk-ops-01-03-03a3a2c1	0	0	0
vmhba2	SAS	Unknown	--	4	4	4

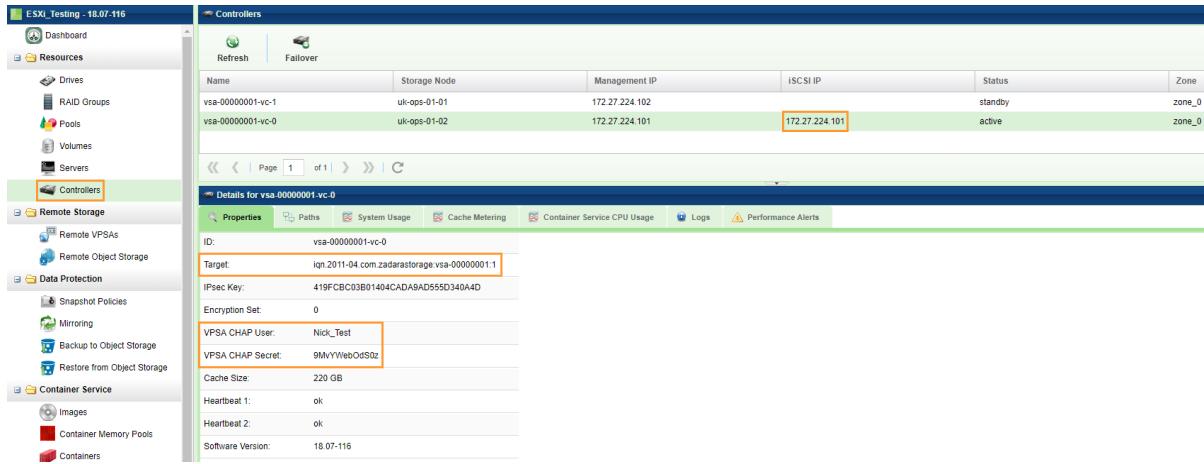
Properties Devices Paths Dynamic Discovery **Static Discovery** Network Port Binding Advanced Options

+ Add... X Remove Authentication... Advanced...

Next, select 'Static Discovery' in the lower pane and 'Add'. Here we need to add in the iSCSI Target server details. We need to obtain this information from the VPSA. If you use Dynamic Discovery with

multiple VPSA Arrays in multiple VLANs then host rescan and reboots will be excessive as each VMkernel will have to wait for a timeout for the VPSA Controllers to which it is not bound to occur, this is a result of the underlying VMKernel architecture and a commonly misconfigured setup.

Under the ‘Controllers’ tab, select the ‘Active’ controller:



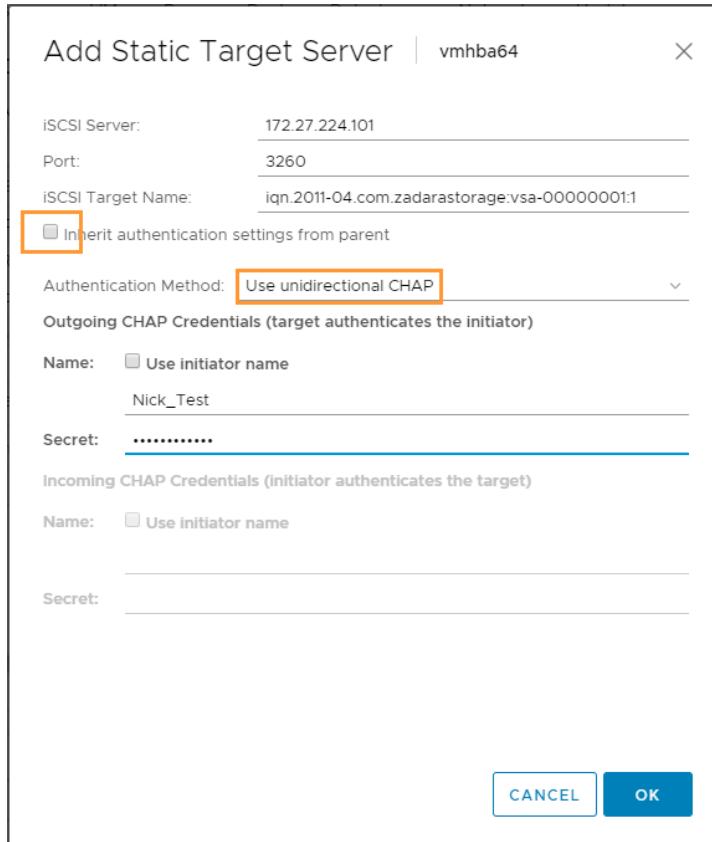
Name	Storage Node	Management IP	iSCSI IP	Status	Zone
vsa-00000001-vc-1	uk-ops-01-01	172.27.224.102		standby	zone_0
vsa-00000001-vc-0	uk-ops-01-02	172.27.224.101	172.27.224.101	active	zone_0

Details for vsa-00000001-vc-0

ID:	vsa-00000001-vc-0
Target:	iqn.2011-04.com.zadarastorage:vsa-00000001:1
IPSec Key:	419FCBC03B01494CADA9AD55SD340A4D
Encryption Set:	0
VPSA CHAP User:	Nick_Test
VPSA CHAP Secret:	9MvYYWebOdS0z
Cache Size:	220 GB
Heartbeat 1:	ok
Heartbeat 2:	ok
Software Version:	18.07-116

Make a note of the IP address under ‘iSCSI IP’.

In the lower pane we can obtain the information needed (Target, VPSA CHAP User and Secret) which can be copied & pasted into the vSphere ‘Add Static Target Server’ boxes.



Add Static Target Server | vmhba64

iSCSI Server: 172.27.224.101

Port: 3260

iSCSI Target Name: iqn.2011-04.com.zadarastorage:vsa-00000001:1

Inherit authentication settings from parent

Authentication Method: Use unidirectional CHAP

Outgoing CHAP Credentials (target authenticates the initiator)

Name: Use initiator name
Nick_Test

Secret: *****

Incoming CHAP Credentials (initiator authenticates the target)

Name: Use Initiator name

Secret:

CANCEL OK

Untick ‘Inherit authentication settings from parent’, select ‘Use unidirectional CHAP’ and enter all of the details obtained above.

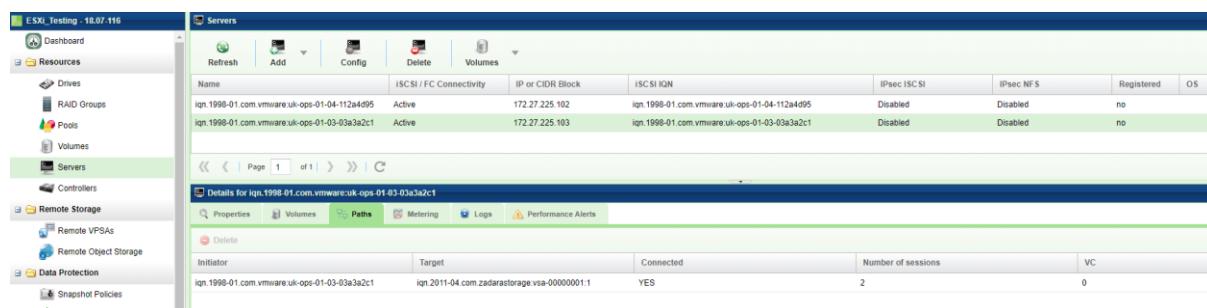
Storage Adapters

⚠ Due to recent configuration changes, a rescan of "vmhba64" is recommended.

+ Add Software Adapter  Refresh  Rescan Storage...  Rescan Adapter

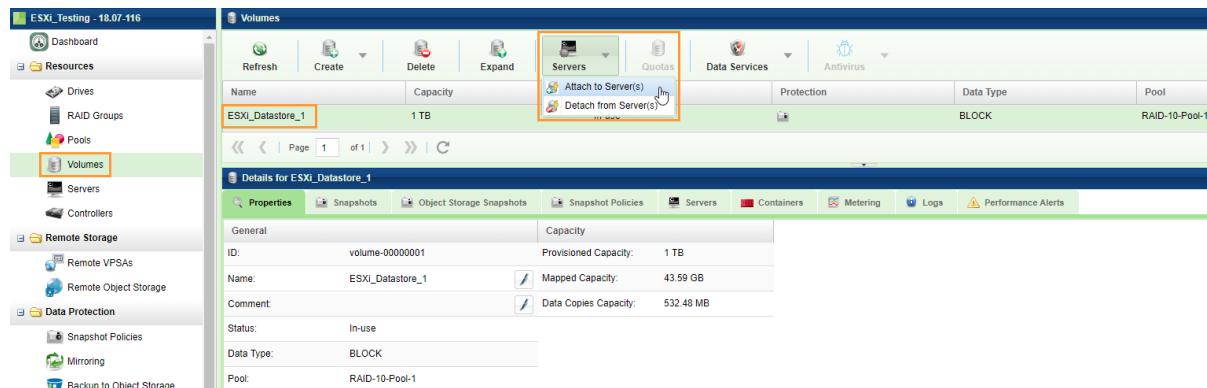
Adapter	Type	Status
---------	------	--------

Rescan the iSCSI software adapter.



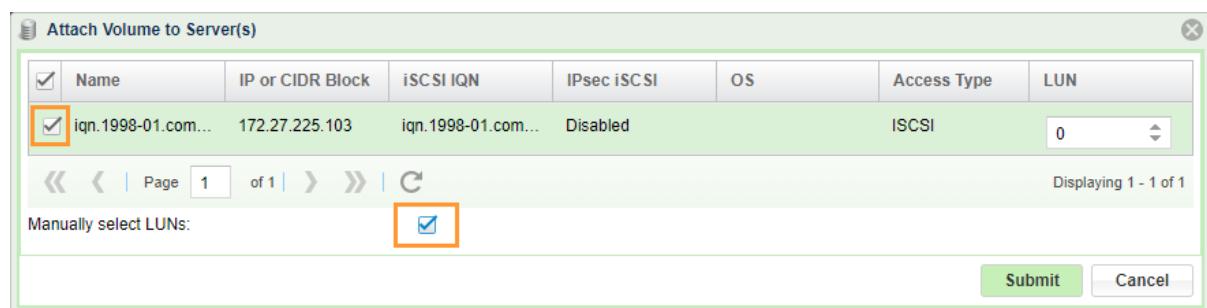
Name	ISCSI / FC Connectivity	IP or CIDR Block	ISCSI IQN	IPsec iSCSI	IPsec NFS	Registered	OS
iqn.1998-01.com.vmware.uk-ops-01-04-112a4d95	Active	172.27.225.102	iqn.1998-01.com.vmware.uk-ops-01-04-112a4d95	Disabled	Disabled	no	
iqn.1998-01.com.vmware.uk-ops-01-03-03a3a2c1	Active	172.27.225.103	iqn.1998-01.com.vmware.uk-ops-01-03-03a3a2c1	Disabled	Disabled	no	

Looking in the VPSA under 'Servers' the new ESXi host (IQN NAME and IP address) should have appeared.



Name	Capacity	Servers	Quotas	Data Services	Protection	Data Type	Pool
ESXi_Datastore_1	1 TB					BLOCK	RAID-10-Pool-1

This 'Server' now needs to be attached to the required Volume(s). Go to the 'Volumes' view, select the required Volume, then under the 'Servers' dropdown button, select 'Attach to Server(s)'.



<input checked="" type="checkbox"/>	Name	IP or CIDR Block	iSCSI IQN	IPsec iSCSI	OS	Access Type	LUN
<input checked="" type="checkbox"/>	iqn.1998-01.com...	172.27.225.103	iqn.1998-01.com...	Disabled		iSCSI	0

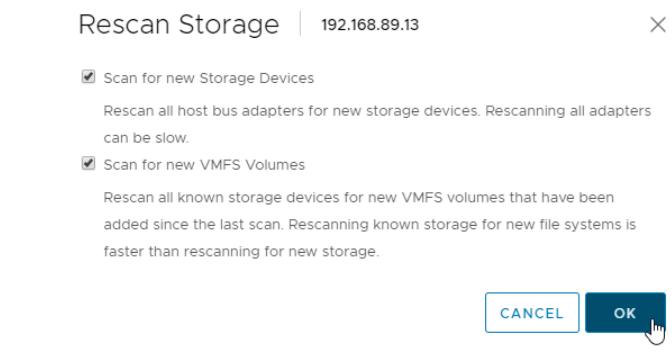
Manually select LUNs:

Tick the box to select the relevant server and also tick the box to 'Manually select LUNs' (**Note: Do this even if the LUN will be the default '0'**) All ESX Hosts must have the same LUN ID for the same Volume.



Now go back to the vSphere client and under ‘Storage Adapters’ select ‘Rescan Storage...’.

The screenshot shows the 'Configure' tab selected in the vSphere Client. Under the 'Storage' category, 'Storage Adapters' is expanded. A 'Rescan Storage' button is highlighted with a red box. A tooltip for the button reads: 'Rescans all storage adapters on the host to discover newly added storage devices and/or VMFS volumes.' Below the table, the 'Network Port Binding' tab is selected.



OK...

The screenshot shows the 'Network Port Binding' tab selected. It lists two entries: 'VMK_ISCSL_1 (vSwitch1)' and 'VMK_ISCSL_2 (vSwitch1)', each associated with a VMkernel Adapter 'vmk1' and 'vmk2' respectively. The 'Path Status' column for both entries shows 'Active' with green diamond icons. The 'Physical Network Adapter' column shows 'vmnic1000202 (40 Gbit/s, Full)' and 'vmnic2 (40 Gbit/s, Full)'.

Note that the ‘Path status’ has now changed to ‘Active’.

The screenshot shows the 'Storage Devices' tab selected. It lists various storage devices, including 'Zadara iSCSI Disk' (labeled as 'Attached') and several 'Local AVAGO Disk' entries. A 'Refresh' button is highlighted with a red box. The table includes columns for Name, LUN, Type, Capacity, Datastore, Operational State, Hardware Acceleration, Drive Type, and Transport.

Next, go to ‘Storage Devices’ and select ‘Refresh’. The VPSA Volume should now appear in the list of Datastores and can now be used.



Next, set the new Datastore to use the ‘Round Robin’ Multipath selection policy:

The screenshot shows the 'Storage Devices' section of the Zadara interface. A table lists various storage components, including local ATA and AVAGO disks, and Zadara iSCSI disks. In the 'Multipathing Policies' section, the 'Path Selection Policy' is set to 'Round Robin (VMware)'. An orange arrow points to the 'Edit Multipathing...' button.

The final task is to change the Round Robin IOPS Limit for all Zadara Devices using the instructions here: <https://support.zadarastorage.com/hc/en-us/articles/360000501266-VMware-Set-Round-Robin-IOPS-Limit-for-all-Zadara-Devices>.

Optional: Adding additional VMkernel adapters to increase bandwidth

Repeat the steps from the previous section to add 2 more (or as many as are required) VMkernel adapters. E.g. create VMK_iSCSI_3 and VMK_iSCSI_4.

The key here is to alternate the ‘Active adapter’ and the ‘Unused adapter’ in the ‘Teaming and failover’ Override setting of each new VMkernel adapter. I.e. VMK_iSCSI_3 should use the 1st adapter and VMK_iSCSI_4 should use the 2nd adapter.

The screenshot shows the 'Configure' tab of the vSphere Web Client. Under 'Storage Adapters', it lists several adapters: vmhba64 (iSCSI, Online), vmhba2 (SAS, Unknown), and vmhba1 (AHCI, Unknown). Below the table, there is a 'Network Port Binding' section where two VMkernel adapters (vmk1 and vmk2) are bound to physical network adapters (vmnic1 and vmnic2 respectively). An orange box highlights the '+ Add Adapter' button.



Once the above has been configured, the new VMkernel adapters can be added to the iSCSI Software adapter:

Bind vmhba64 with VMkernel Adapter | 192.168.89.13

Only VMkernel adapters compatible with the iSCSI port binding requirements and available physical network adapters are listed.

Port Group	VMkernel Adapter	Physical Network Adapter
Management Network (vSwitch0)	vmk0	vmnic0 (1 Gbit/s, Full)
<input checked="" type="checkbox"/> VMK_ISCSI_3 (vSwitch1)	vmk3	vmnic1000202 (40 Gbit/s, Full)
<input checked="" type="checkbox"/> VMK_ISCSI_4 (vSwitch1)	vmk4	vmnic2 (40 Gbit/s, Full)
--	--	vmnic1 (1 Gbit/s, Full)

Multiple items selected

CANCEL OK

OK...

Storage Adapters

⚠ Due to recent configuration changes, a rescan of "vmhba64" is recommended.

Adapter	Type	Status	Targets	Devices	Paths
vmhba64	iSCSI	Online	1	1	2

Properties Devices Paths Dynamic Discovery Static Discovery Network Port Binding Advanced Options

+ Add... × Remove View Details

Port Group	VMkernel Adapter	Port Group Policy	Path Status	Physical Network Adapter
VMK_ISCSI_1 (vSwitch1)	vmk1	Compliant	Active	vmnic1000202 (40 Gbit/s, Full)
VMK_ISCSI_2 (vSwitch1)	vmk2	Compliant	Active	vmnic2 (40 Gbit/s, Full)
VMK_ISCSI_3 (vSwitch1)	vmk3	Compliant	Not used	vmnic1000202 (40 Gbit/s, Full)
VMK_ISCSI_4 (vSwitch1)	vmk4	Compliant	Not used	vmnic2 (40 Gbit/s, Full)

Rescan the adapter.

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Servers

Name	iSCSI / FC Connectivity	IP or CIDR Block	iSCSI IQN	IPsec iSCSI	IPsec NFS	Registered
ign.1998-01.com.vmware.uk-ops-01-04-112a4d95	Active	172.27.225.102	ign.1998-01.com.vmware.uk-ops-01-04-112a4d95	Disabled	Disabled	no
ign.1998-01.com.vmware.uk-ops-01-03-03a3a2c1	Active	172.27.225.103	ign.1998-01.com.vmware.uk-ops-01-03-03a3a2c1	Disabled	Disabled	no

Details for ign.1998-01.com.vmware.uk-ops-01-03-03a3a2c1

Properties	Volumes	Paths	Metering	Logs	Performance Alerts
<input type="button" value="Delete"/>					

Initiator Target Connected Number of sessions VC

Initiator	Target	Connected	Number of sessions	VC
ign.1998-01.com.vmware.uk-ops-01-03-03a3a2c1	ign.2011-04.com.zadarastorage.vsa-0000001.1	YES	4	0



In the VPSA, under 'Servers – Paths' it should now indicate 4 (or however many) sessions.

Final checks

To be prudent, it is worth checking in the ‘Virtual switches’ view, for the new vSwitch, that each VMkernel shows only one connection to a Physical adapter.

Select each VMkernel in turn and confirm that they alternate and that there are an equal number of connections to each Physical adapter.

