



Step-by-Step Guide

Open-E JovianDSS Fibre Channel High-Availability Cluster

The aim of this document is to demonstrate how to set up a High-Availability Cluster with Fibre Channel.

Open-E JovianDSS includes failover functionality for SMB, NFS and iSCSI, FC enabling you to set up High Availability Load-Balanced Storage Clusters.

By using the Open-E JovianDSS High Availability Cluster Feature Pack you can ensure reliability and redundancy through failover in case of a server crash.

The HA cluster management software enables you to quickly access all features related to your cluster setup.

Whether for initial configuration or re-configuration after a failover – everything is in one place and guarantees ease of use for the storage administrator.

Data can be simultaneously accessed via SMB, NFS or iSCSI and via one more Virtual IP addresses. Standalone VIP feature creates a connection to the data which is independent of the physical network path.

Fibre Channel HA Cluster uses Asymmetric Logical Unit Access (ALUA) to configure the paired targets. LUNs are visible on both configured targets by the initiator that has access to those LUNs by paths. Depending on the path status, the initiator knows which path should be used to access LUNs. The initiator accesses LUNs by using an active path, while standby path is used for a target that does not have access to LUNs. An active path is set for a target when the pool is present on the same node where the target is. A standby path is used for a target when a pool is present on the other node.

High availability is achieved by detecting hardware failures and automatically moving the VIP and for Fibre Channel the active path from the primary to the secondary node without the client servers noticing a timeout.

Software version up26 supports Single node Fibre Channel Target with all Fibre Channel clients.

Fibre Channel HA Cluster was tested and supported with RH Linux cluster and with VMware cluster only !

FC Cluster for VMware

(ALUA failover with VMware ESXi 6.5. or newer)

It is required to register SCST devices with VMW_SATP_DEFAULT_AP plugin in ESX root console.

Login to ESX console and add new rules for SCST file I/O and block I/O devices:

```
esxcli storage nmp satp rule add -s VMW_SATP_DEFAULT_AP -V "SCST_FIO" -M "Storage" -c tpgs_on -P VMW_PSP_MRU -e "SCST_FIO Storage Device" -o enable_action_OnRetryErrors
```

```
esxcli storage nmp satp rule add -s VMW_SATP_DEFAULT_AP -V "SCST_BIO" -M "Storage" -c tpgs_on -P VMW_PSP_MRU -e "SCST_BIO Storage Device" -o enable_action_OnRetryErrors
```

execute:

```
esxcli storage core claimrule load
```

check if new rule is listed in:

```
esxcli storage nmp satp rule list
```

reboot the VMware server

check if correct plugin is used for SCST devices:

```
esxcli storage nmp satp rule list | grep SCST
```

The Storage Array Type should be set to VMW_SATP_DEFAULT_AP

FC Cluster for RH Linux

(ALUA failover with RH Linux)

--- multipath install on RH: yum -install multipath-tools

/etc/multipath.conf

```
defaults {
    Uid_attribute        "ID_SERIAL"
    Getuid_callout       "/lib/udev/scsi_id --whitelisted --export --page=0x80 --device=/dev/%n"
}

blacklist_exceptions {
    Property             "ID_SERIAL"
}

devices {
    device {
        Vendor           "SCST_[BF]IO"
        Product          "Storage"
        hardware_handler  "1 alua"
        path_selector     "service-time 0"
        path_grouping_policy "failover"
        Failback          "manual"
        prio              "alua"
        prio_args         ""
        Path_checker      "tur"
        Rr_weight         "priorities"
        Fast_io_fail_tmo  300
        No_path_retry     500
    }
}
```

--- restart multipath: multipath -r

--- check multipath: multipath -l -v2

-- list WWN: cat /sys/class/fc_host/host*/port_name

this command list WWN in hex format : 0x2100000e1e28c7c0 (this is just example WWN)

but the GUI accept following format : 21:00:00:0e:1e:28:c7:c0

so this need to be typed manually (no copy & paste)

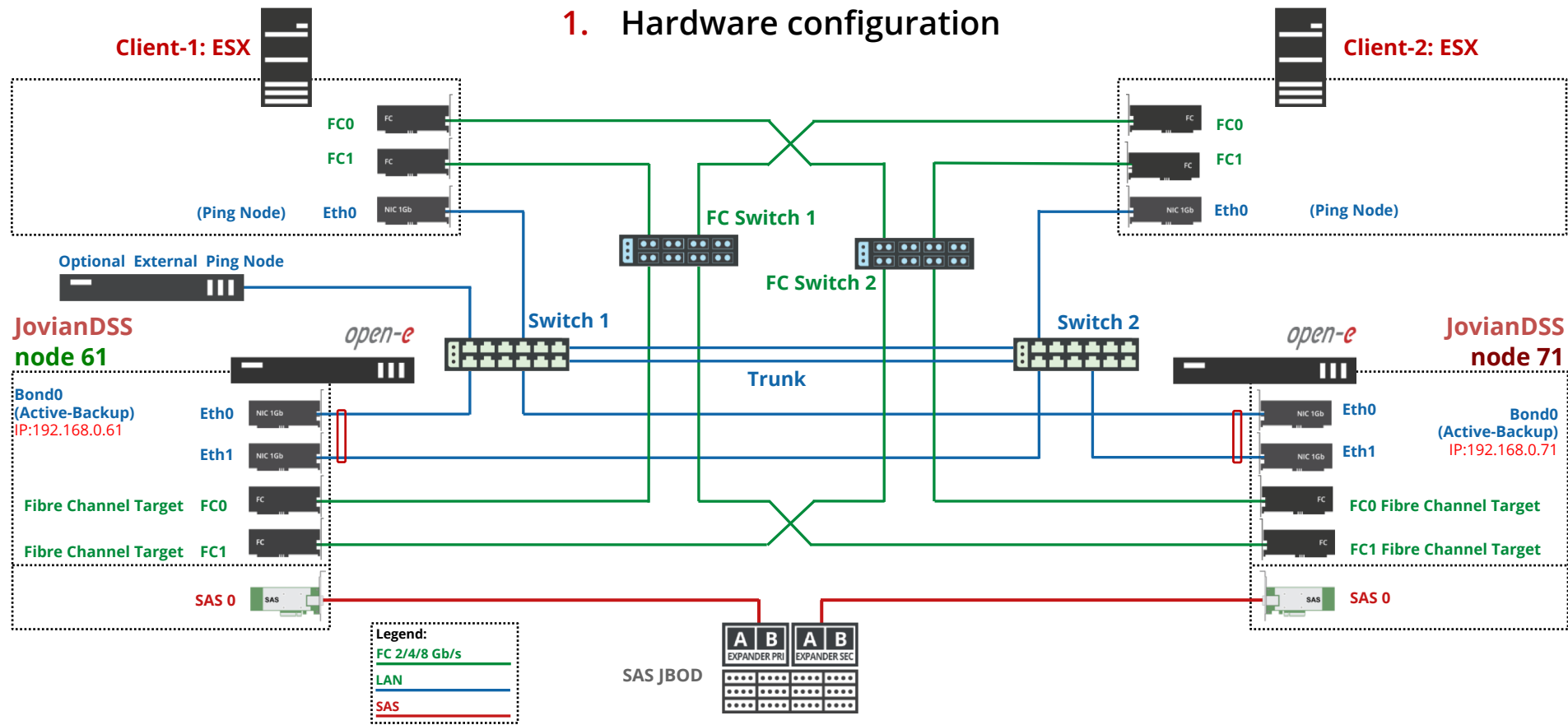
To set up a High-Availability Cluster, perform the following steps:

1. Hardware configuration
2. ESX Storage adapter
3. Storage settings
4. Cluster Binding
5. Ping Nodes
6. Start cluster
7. Pool
8. Add Initiator
9. Add group wizard
10. Add remote target
11. Rescan adapters
12. Check adapters after rescan
13. Edit multipath
14. Path check
15. Move cluster
16. Cluster check after test move

Open-E JovianDSS Fibre Channel High-Availability Cluster



1. Hardware configuration

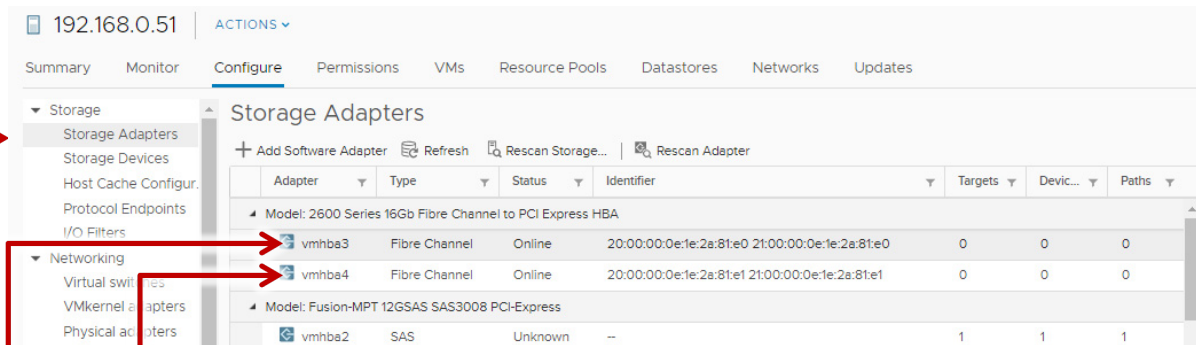


2. ESX Storage adapter



ESX host
IP Address: 192.168.0.51

In **Storage Adapters**, check the settings of both Fibre Channel adapters.



The screenshot shows the ESX configuration interface for the host 192.168.0.51. The 'Configure' tab is selected, and the 'Storage' section is expanded, showing 'Storage Adapters'. The 'Storage Adapters' table lists three adapters:

Adapter	Type	Status	Identifier	Targets	Devic...	Paths
Model: 2600 Series 16Gb Fibre Channel to PCI Express HBA						
vmhba3	Fibre Channel	Online	20:00:00:0e:1e:2a:81:e0 21:00:00:0e:1e:2a:81:e0	0	0	0
vmhba4	Fibre Channel	Online	20:00:00:0e:1e:2a:81:e1 21:00:00:0e:1e:2a:81:e1	0	0	0
Model: Fusion-MPT 12GSAS SAS3008 PCI-Express						
vmhba2	SAS	Unknown	--	1	1	1

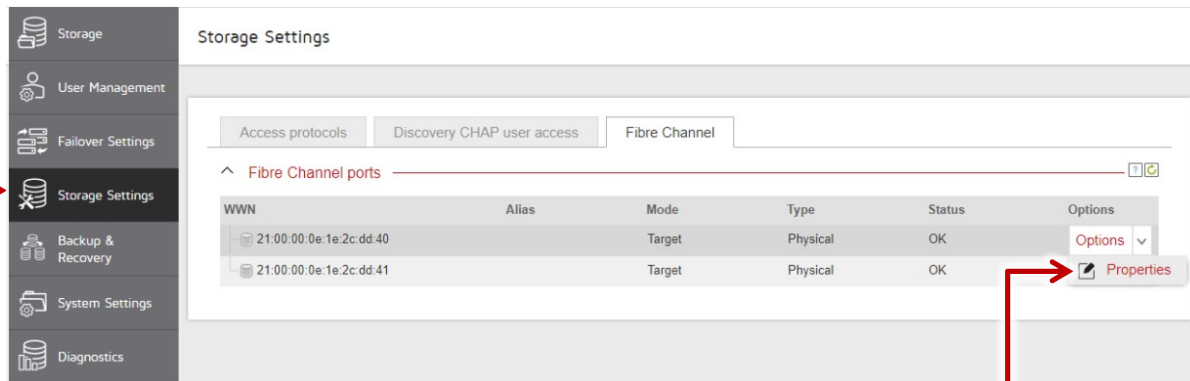
Red arrows point from the text box to the 'Storage Adapters' section and the two Fibre Channel adapters (vmhba3 and vmhba4).

3. Storage settings



JovianDSS: **node 61**
IP Address: 192.168.0.61

Go to menu **Storage Settings**. In the **Options** drop-down menu select **Properties**.



Storage Settings

Access protocols | Discovery CHAP user access | Fibre Channel

^ Fibre Channel ports

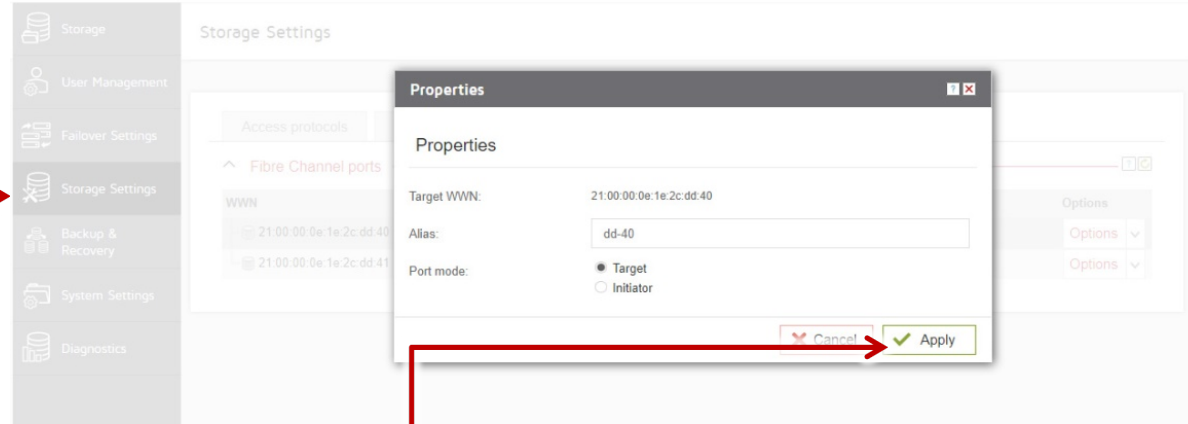
WWN	Alias	Mode	Type	Status	Options
21:00:00:0e:1e:2c:dd:40		Target	Physical	OK	Options
21:00:00:0e:1e:2c:dd:41		Target	Physical	OK	Properties

3. Storage settings



JovianDSS: **node 61**
IP Address: 192.168.0.61

In the **Properties** menu, enter the **Alias** name and click the **Apply** button.



3. Storage settings

open-e

JovianDSS: **node 61**
IP Address: 192.168.0.61

For another **WWN**, go to the **Options** drop-down menu for this WWN, select **Properties** and enter the **Alias** name accordingly. In this example second alias is **dd-41**.

The screenshot shows the 'Storage Settings' page in the Open-E JovianDSS web interface. The left sidebar contains a menu with options: Storage, User Management, Failover Settings, Storage Settings (highlighted), Backup & Recovery, System Settings, and Diagnostics. The main content area is titled 'Storage Settings' and has three tabs: 'Access protocols', 'Discovery CHAP user access', and 'Fibre Channel' (selected). Under the 'Fibre Channel' tab, there is a section 'Fibre Channel ports' with a table of configured ports. The table has columns for WWN, Alias, Mode, Type, Status, and Options. Two ports are listed: WWN 21:00:00:0e:1e:2c:dd:40 with Alias dd-40, and WWN 21:00:00:0e:1e:2c:dd:41 with Alias dd-41. Both are in 'Target' mode, 'Physical' type, and 'OK' status. Red arrows indicate the workflow: from the 'Storage Settings' menu item to the 'Fibre Channel' tab, then to the 'Options' dropdown for the second WWN (dd-41), and finally to the 'Properties' option in the dropdown.

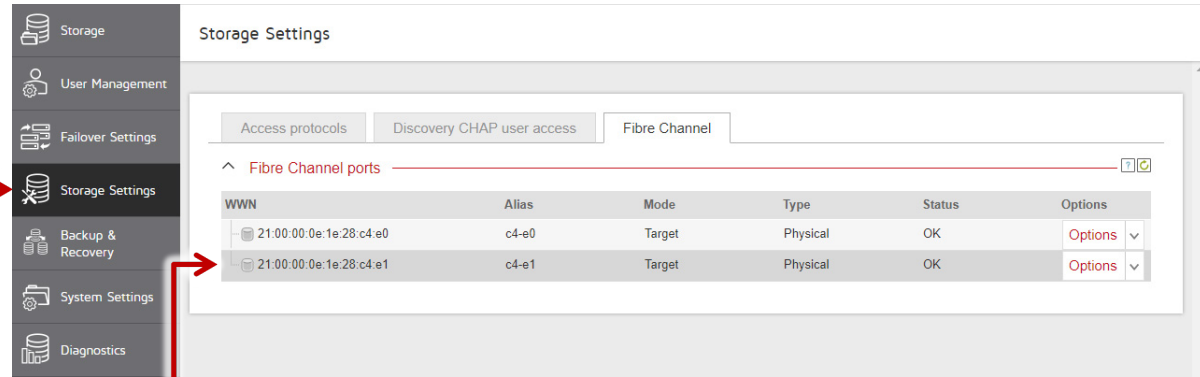
WWN	Alias	Mode	Type	Status	Options
21:00:00:0e:1e:2c:dd:40	dd-40	Target	Physical	OK	Options
21:00:00:0e:1e:2c:dd:41	dd-41	Target	Physical	OK	Options

3. Storage settings



JovianDSS: **node 71**
IP Address: 192.168.0.71

Targets on the second node are also active.



WWN	Alias	Mode	Type	Status	Options
21:00:00:0e:1e:28:c4:e0	c4-e0	Target	Physical	OK	Options ▾
21:00:00:0e:1e:28:c4:e1	c4-e1	Target	Physical	OK	Options ▾

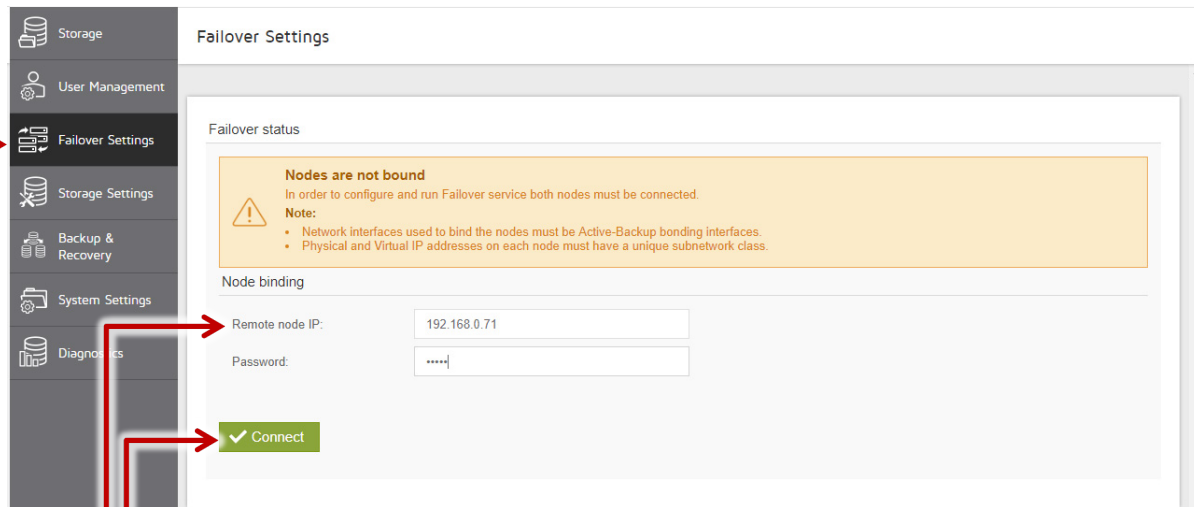
4. Cluster Binding



JovianDSS: **node 61**
IP Address: 192.168.0.61

In the main menu select the **Failover settings** and enter IP address of the Bond interface of the second node and enter the current administrator password (default: admin) and click on the **Connect** button.

The Bond interface will function as a ring path (heartbeat) and as the persistent reservation synchronization path.



Storage

User Management

Failover Settings

Storage Settings

Backup & Recovery

System Settings

Diagnostics

Failover Settings

Failover status

Nodes are not bound
In order to configure and run Failover service both nodes must be connected.

Note:

- Network interfaces used to bind the nodes must be Active-Backup bonding interfaces.
- Physical and Virtual IP addresses on each node must have a unique subnetmask class.

Node binding

Remote node IP:

Password:

5. Ping nodes

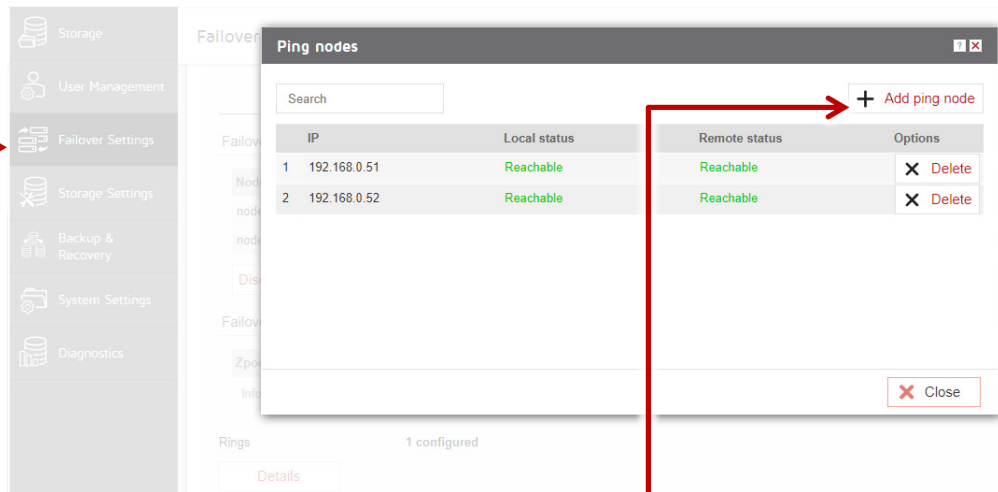


JovianDSS: **node 61**

IP Address: 192.168.0.61

In **Failover settings** click the **Edit** button in the **Ping nodes** section and enter at least two ping nodes.

Ping node IP addresses must be reachable from Ring interfaces, so the ping node must use the same network subnet as the ring interfaces.



The screenshot shows the 'Failover Settings' page with a sidebar menu on the left containing: Storage, User Management, Failover Settings (selected), Storage Settings, Backup & Recovery, System Settings, and Diagnostics. The main content area is titled 'Failover' and contains a 'Ping nodes' section. This section has a search bar and a table with two columns: 'IP' and 'Local status'. The table lists two nodes: Node 1 with IP 192.168.0.51 and Node 2 with IP 192.168.0.52, both with a 'Reachable' status. To the right of the table is a 'Remote status' column showing 'Reachable' for both nodes, and an 'Options' column with a 'Delete' button for each. Above the table is a '+ Add ping node' button. Below the table is a 'Close' button. A red arrow points from the 'Edit' button in the 'Ping nodes' section of the sidebar to the '+ Add ping node' button in the main content area.

IP	Local status	Remote status	Options
1 192.168.0.51	Reachable	Reachable	Delete
2 192.168.0.52	Reachable	Reachable	Delete

6. Start cluster

open-e

JovianDSS: **node 61**
IP Address: 192.168.0.61

Now, all required settings are completed.

Click **the Start Failover** button in order to start the HA-cluster service.

Failover Settings

Failover status

Windows Failover Clustering
To ensure proper functioning of Windows Failover Clustering feature (including Hyper-V in cluster environment) it is required to enable SCSI-3 Persistent Reservation Synchronization.

Failover status: **Ready to start**

Start Failover

Failover nodes

Node	Connection status	Failover status
node-61 (IP: 192.168.0.61, node ID: cfce4829)	Reachable	N/A
node-71 (IP: 192.168.0.71, node ID: 22566a06)	Reachable	N/A

Failover resources

Zpool name	Active on node	Status
Information about failover resources is not available until failover is started.		

Rings

1 configured

Ping nodes

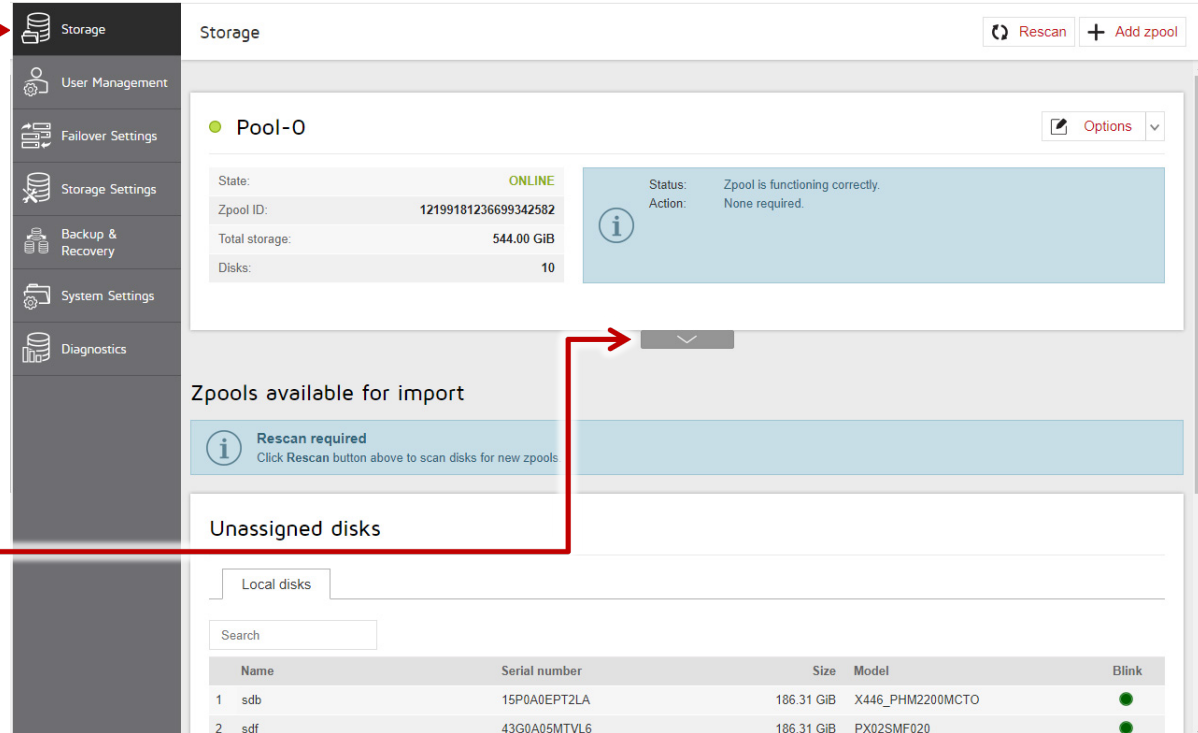
2 of 2 reachable

7. Pool

open-e

JovianDSS: **node 61**
IP Address: 192.168.0.61

In the main menu, select **Storage**. In order to access the pool setup menu click the down arrow button in the middle bottom of the pool status section.



Storage

Storage

Pool-0

State: **ONLINE**

Zpool ID: 12199181236699342582

Total storage: 544.00 GiB

Disks: 10

Status: Zpool is functioning correctly.
Action: None required.

Zpools available for import

Rescan required
Click Rescan button above to scan disks for new zpools

Unassigned disks

Local disks

Search

Name	Serial number	Size	Model	Blink
1 sdb	15P0A0EPT2LA	186.31 GiB	X446_PHM2200MCTO	●
2 sdf	43G0A05MTVL6	186.31 GiB	PX02SMF020	●

8. Add Initiator

open-e

JovianDSS: **node 61**
IP Address: 192.168.0.61

In the pool menu select **Fibre Channel**.

The screenshot displays the 'Storage' management interface. On the left is a sidebar menu with options: Storage, User Management, Failover Settings, Storage Settings, Backup & Recovery, System Settings, and Diagnostics. The 'Storage' section is active, showing details for a storage pool with State: ONLINE, Zpool ID: 12199181236699342582, Total storage: 544.00 GiB, and Disks: 10. A status box indicates the zpool is functioning correctly. Below this are tabs for Status, Disk groups, iSCSI targets, Fibre Channel, Shares, Snapshots, and Virtual IPs. The 'Fibre Channel' tab is selected, showing 'Fibre Channel groups' with a 'Public group' (Targets: 0, Zvols: 0, Status: Active) and 'Zvols available to be assigned to Fibre Channel groups'. Under 'Targets and initiators assigned to this zpool', there are sections for 'Fibre Channel targets' and 'Fibre Channel initiators'. A search bar and an 'Add initiator' button are present. At the bottom, it says 'Zpools available for import'.

8. Add Initiator



ESX host
IP Address: 192.168.0.51

From **Storage Adapters** in VMware please select the text, then use the pop-up menu to copy the selected text to the clipboard.

Summary Monitor **Configure** Permissions VMs Resource Pools Datastores Networks Updates

Storage

- Storage Adapters
- Storage Devices
- Host Cache Configur.
- Protocol Endpoints
- I/O Filters

Networking

- Virtual switches
- VMkernel adapters
- Physical adapters
- TCP/IP configuration

Virtual Machines

Storage Adapters

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

Adapter	Type	Status	Identifier	Targets	Devic...	Paths
Model: 2600 Series 16Gb Fibre Channel to PCI Express HBA						
vmhba3	Fibre Channel	Online	20:00:00:0e:1e:2a:81:e0 2100:00:0e:1e:2a:81:e0	0	0	0
vmhba4	Fibre Channel	Online	20:00:00:0e:1e:2a:81:e1 2100:00:0e:1e:2a:81:e2			
Model: Fusion-MPT 12GSAS SAS3008 PCI-Express						
vmhba2	SAS	Unknown	--			
Model: Patsburg 6 Port SATA AHCI Controller						

Copy Ctrl+C

Search Google for "2100:00:0e:1e:2a:81:e0"

Print... Ctrl+P

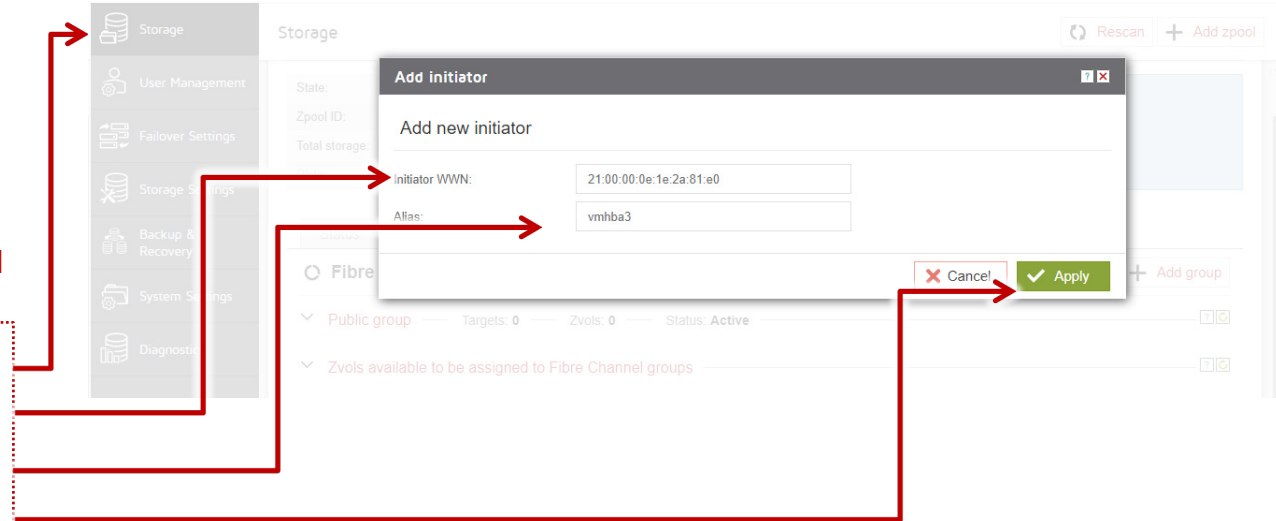
Inspect Ctrl+Shift+I

8. Add Initiator

open-e

JovianDSS: **node 61**
IP Address: 192.168.0.61

In **Add Initiator** please paste the previously saved text from the clipboard into the **Initiator WWN** field, and enter the **Alias** initiator. Next, click the **Apply** button. Repeat these steps for the second adapter.



8. Add Initiator

open-e

JovianDSS: **node 61**
IP Address: 192.168.0.61

Initiators have been added.

The screenshot shows the 'Storage' management interface. The left sidebar contains navigation links: Storage, User Management, Failover Settings, Storage Settings, Backup & Recovery, System Settings, and Diagnostics. The main panel displays the 'Storage' configuration for a zpool. The 'Fibre Channel' tab is selected, showing 'Fibre Channel groups' and 'Targets and initiators assigned to this zpool'. Two initiators, 'vmhba3' and 'vmhba4', are listed in a table.

Alias	WWN	Options
vmhba3	21:00:00:0e:1e:2a:81:e0	Options
vmhba4	21:00:00:0e:1e:2a:81:e1	Options

9. Add group wizard

open-e

JovianDSS: **node 61**
IP Address: 192.168.0.61

In **Add Fibre Channel group** wizard, in Properties step, please enter the name of **Group alias**. To confirm this name click the **Next** button.

Add Fibre Channel group

1. Properties

Group alias:

2. Targets

3. Initiators WWN

4. Zvols

5. Summary

Cancel Next >

9. Add group wizard

open-e

JovianDSS: **node 61**
IP Address: 192.168.0.61

In the **Targets** step please Select proper WWNs and click the **Next** button.

Add Fibre Channel group

1. Properties
2. **Targets**
3. Initiators V
4. Zvols
5. Summary

Select targets

WWN	Alias	Mode	Type	Status
<input checked="" type="checkbox"/> 21:00:00:0e:1e:2c:dd:40	dd-40	Target	Physical	OK
<input checked="" type="checkbox"/> 21:00:00:0e:1e:2c:dd:41	dd-41	Target	Physical	OK

Cancel Back **Next**

vmhba3 21:00:00:0e:1e:2a:81:e0 Options
vmhba4 21:00:00:0e:1e:2a:81:e1 Options

9. Add group wizard

open-e

JovianDSS: **node 61**
IP Address: 192.168.0.61

In the **Initiators WWN** step please select proper **Aliases** and click the **Next** button.

Add Fibre Channel group

1. Properties
2. Targets
3. Initiators WWN
5. Summary

Select WWN initiators

Search

+ Add initiator

Alias	WWN	Options
<input checked="" type="checkbox"/> vmhba3	21:00:00:0e:1e:2a:81:e0	Options ▼
<input checked="" type="checkbox"/> vmhba4	21:00:00:0e:1e:2a:81:e1	Options ▼

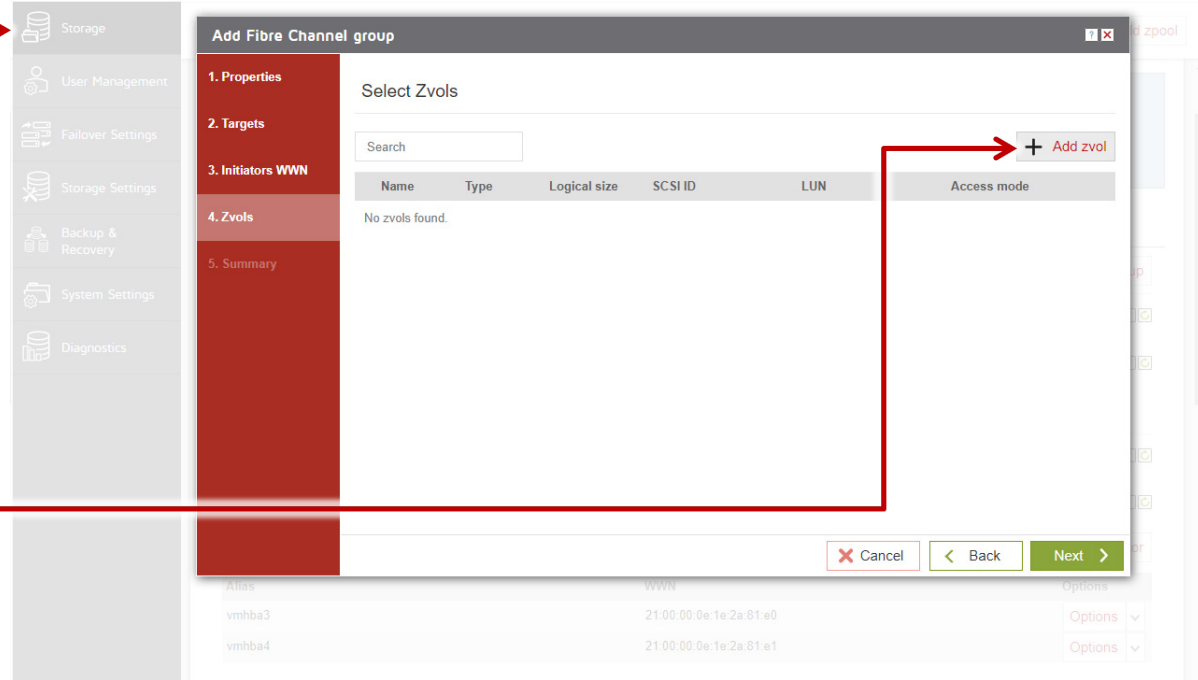
Cancel < Back Next >

9. Add group wizard



JovianDSS: **node 61**
IP Address: 192.168.0.61

In **Zvols** step please click the **Add zvol** button.



Add Fibre Channel group

1. Properties
2. Targets
3. Initiators WWN
4. Zvols
5. Summary

Select Zvols

Search

Name	Type	Logical size	SCSI ID	LUN	Access mode
No zvols found.					

+ Add zvol

Cancel Back Next

Alias	WWN	Options
vmhba3	21:00:00:0e:1e:2a:81:e0	Options
vmhba4	21:00:00:0e:1e:2a:81:e1	Options

9. Add group wizard

open-e

JovianDSS: **node 61**
IP Address: 192.168.0.61

In **Add new zvol**, enter the name of a new Zvol and the appropriate size and click **Add** button.

Storage

User Management

Failover Settings

Storage Settings

Backup & Recovery

System Settings

Diagnostics

1. Properties

2. Targets

4. Zvols

5. Summary

Alias

vmhba3

vmhba4

Add new zvol

Zvol properties

Name: zvol00

Size: 1024 GIB

522.87 GIB physical available

Provisioning:

☐ Thick provisioned

☒ Thin provisioned (default)

Deduplication: Disabled (default)

Number of the data copies: 1 (default)

Compression: lz4 (default)

Volume block size: 128 KiB (default)

Write cache logging (Sync): Always (default)

Write cache logging (Log bias): Write log device (Latency)

Primary cache: All (default)

Secondary cache: All (default)

Cancel Add

9. Add group wizard

open-e

JovianDSS: **node 61**
IP Address: 192.168.0.61

After creating new **Zvols** click the **Next** button.

Add Fibre Channel group

1. Properties
2. Targets
3. Initiators WWN
4. Zvols
5. Summary

Select Zvols

Search + Add zvol

Name	Type	Logical size	SCSI ID	LUN	Access mode
<input checked="" type="checkbox"/> zvol00	zvol	1.00 TiB	Auto	Auto	Write-through (default)

Cancel Back Next

9. Add group wizard

open-e

JovianDSS: **node 61**
IP Address: 192.168.0.61

In **Summary** you are able to see an overview of the configuration of the **Fibre Channel Group**. If the settings need to be modified, click the **Back** button and make the required changes. If it is correct, click **Add**.

Go to the second node and create **Fibre Channel Group** accordingly.

Add Fibre Channel group

1. Properties

2. Targets

3. Initiators WWN

4. Zvols

5. Summary

WWN	Alias	Mode	Type	Status
21:00:00:0e:1e:2c:dd:40	dd-40	Target	Physical	OK
21:00:00:0e:1e:2c:dd:41	dd-41	Target	Physical	OK

WWN Initiators

WWN	Alias
21:00:00:0e:1e:2a:81:e0	vmhba3
21:00:00:0e:1e:2a:81:e1	vmhba4

Zvols

Name	Type	Logical size	SCSI ID	LUN	Access mode
zvol00	zvol	1.00 TiB	Auto	Auto	Write-through (default)

Cancel Back Add

10. Add remote target

open-e

JovianDSS: **node 61**
IP Address: 192.168.0.61

After completion of the **Fibre Channel Group** wizard return to the **Storage**. Beside you will see the **Fibre channel targets** you are able to view and an overview of the configuration targets.

In the **Options** drop-down menu select **Properties**.

The screenshot shows the Open-E JovianDSS Storage configuration interface. The left sidebar contains the following menu items: Storage, User Management, Failover Settings, Storage Settings, Backup & Recovery, System Settings, and Diagnostics. The main panel displays the 'Storage' configuration page. At the top right, there are buttons for 'Rescan' and 'Add zpool'. The page is divided into several sections:

- Initiator aliases:** A table with columns 'Initiator alias' and 'WWN'. It lists 'vmhba3' (21:00:00:0e:1e:2a:81:e0) and 'vmhba4' (21:00:00:0e:1e:2a:81:e1). Each row has an 'Options' dropdown menu.
- Zvol:** A table with columns 'Zvol', 'SCSI ID', 'LUN', 'Access mode', and 'Options'. It lists 'zvol00' (2592b0dce6b1d1d2, LUN 0, Write-through). It has an 'Options' dropdown menu.
- Public group:** A summary section showing 'Targets: 0', 'Zvols: 0', and 'Status: Active'.
- Zvols available to be assigned to Fibre Channel groups:** A summary section.
- Targets and initiators assigned to this zpool:** A section with a search bar and two sub-sections:
 - Fibre Channel targets:** A table with columns 'Target alias', 'WWN', 'Type', 'Status', and 'Options'. It lists 'dd-40' (21:00:00:0e:1e:2c:dd:40, Physical, OK) and 'dd-41' (21:00:00:0e:1e:2c:dd:41, Physical, OK). Each row has an 'Options' dropdown menu. A red arrow points from the 'Options' dropdown of 'dd-41' to the 'Properties' option in the dropdown menu.
 - Fibre Channel initiators:** A section with a search bar.
- Alias:** A table with columns 'Alias' and 'WWN'. It lists 'vmhba3' (21:00:00:0e:1e:2a:81:e0). It has an 'Options' dropdown menu.

10. Add remote target

open-e

JovianDSS: **node 61**
IP Address: 192.168.0.61

In the target properties select
Remote port for alias **dd-40** and click
the **Apply** button.

The screenshot shows the Open-E JovianDSS interface. On the left is a sidebar with menu items: Storage, User Management, Failover Settings, Storage Settings, Backup & Recovery, System Settings, and Diagnostics. The main area displays the 'Storage' configuration page. A modal window titled 'Edit target properties' is open, showing 'Target dd-40 properties'. The 'Target WWN' is 21:00:00:0e:1e:28:dd:40. The 'Alias' is dd-40. The 'Remote port (mapping)' dropdown is open, showing two options: 21:00:00:0e:1e:28:c4:e0 (c4-e0) and 21:00:00:0e:1e:28:c4:e1 (c4-e1). The 'Apply' button is highlighted. A red arrow points from the 'Storage' menu item in the left sidebar to the 'Edit target properties' dialog. Another red arrow points from the 'Remote port (mapping)' dropdown to the 'Apply' button.

Zvol	Type	Logical size	Physical size	Compression	Provisioning	Options
zvol00	zvol	1.00 TiB	56.00 KiB	1.00	thin	Options

10. Add remote target

open-e

JovianDSS: **node 61**
IP Address: 192.168.0.61

Next, in this step select **Remote port** for the second target for the alias **dd-41**. Next, click the **Apply** button.

The screenshot shows the 'Edit target properties' dialog for target 'dd-41'. The 'Remote port (mapping)' dropdown is open, showing two options: '21:00:00:0e:1e:2c:dd:41' and '21:00:00:0e:1e:28:c4:e0 (c4-e0)'. The second option is selected. The 'Apply' button is highlighted. A red arrow points from the 'Remote port' text in the instruction box to the selected port in the dropdown. Another red arrow points from the 'Apply' button in the dialog to the 'Apply' button in the instruction box.

Zvol	Type	Logical size	Physical size	Compression	Provisioning	Options
zvol00	zvol	1.00 TiB	56.00 KiB	1.00	thin	Options

11. Rescan adapters



ESX host
IP Address: 192.168.0.51

In **Storage Adapters**, you can check the connection of both remote ports for rescan.

Adapter	Type	Status	Rescans all storage adapters on the host to discover newly added storage devices and/or VMFS volumes.		
Model: 2600 Series 16Gb Fibre Channel to PCI Express HBA					
vmhba3	Fibre Channel	Online	20:00:00:0e:1e:2a:81:e0	21:00:00:0e:1e:2a:81:e0	4
vmhba4	Fibre Channel	Online	20:00:00:0e:1e:2a:81:e1	21:00:00:0e:1e:2a:81:e1	4
Model: Fusion-MPT 12GSAS SAS3008 PCI-Express					
vmhba2	SAS	Unknown	--	--	1
Model: Patsburg 6 Port SATA AHCI Controller					

12. Check adapters after rescan



ESX host
IP Address: 192.168.0.51

After the rescan, the new device
(SCST_FIO) is listed below.

Summary Monitor **Configure** Permissions VMs Resource Pools Datastores Networks Updates

Storage

- Storage Adapters
- Storage Devices
- Host Cache Configur.
- Protocol Endpoints
- I/O Filters

Networking

- Virtual switches
- VMkernel adapters
- Physical adapters
- TCP/IP configuration

Virtual Machines

- VM Startup/Shutdo...
- Agent VM Settings
- Default VM Compati...
- Swap File Location

System

- Licensing
- Host Profile
- Time Configuration

Storage Adapters

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

Adapter	Type	Status	Identifier	Targets	Devic...	Paths
Model: 2600 Series 16Gb Fibre Channel to PCI Express HBA						
vmhba3	Fibre Channel	Online	20:00:00:0e:1e:2a:81:e0 21:00:00:0e:1e:2a:81:e0	4	1	4
vmhba4	Fibre Channel	Online	20:00:00:0e:1e:2a:81:e1 21:00:00:0e:1e:2a:81:e1	4	1	4
Model: Fusion-MPT 12GSAS SAS3008 PCI-Express						
vmhba2	SAS	Unknown	--	1	1	1
Model: Patsburg 6 Port SATA AHCI Controller						

Copy All 5 items

Properties Devices Paths

Refresh Attach Detach Rename... Turn On LED Turn Off LED Erase Partitions... Mark as Flash Disk Mark as Local

Name	LUN	Type	Capacity	Datastore	Hardware Accelera...	Drive T...	Transport
SCST_FIO Fibre Channel Disk (eui.32353...)	0	disk	1.00 TB	Not Consumed	Supported	HDD	Fibre Channel

13. Edit multipath



ESX host
IP Address: 192.168.0.51

Next, go to **Storage Devices** and
please click **Edit Multipath**.

Summary Monitor **Configure** Permissions VMs Resource Pools Datastores Networks Updates

Storage
Storage Adapters
Host Cache Configur...
Storage Devices
Protocol Endpoints
I/O Filters
Networking
Virtual switches
VMkernel adapters
Physical adapters
TCP/IP configuration
Virtual Machines
VM Startup/Shutdo...
Agent VM Settings
Default VM Compati...
Swap File Location
System
Licensing
Host Profile
Time Configuration
Authentication Servi...
Certificate
Power Management
Advanced system s...
System Resource Re...

Storage Devices

Refresh Attach Detach Rename... Turn On LED Turn Off LED Erase Partitions... Mark as Flash Disk Mark as Local

Name	L...	Type	Capacity	Datastore	Operational S...	Hardware Accel...
Local Intel Enclosure Svc Dev (naa.5001e6734f...	0	enclos...		Not Consumed	Attached	Not supported
SCST_FIO Fibre Channel Disk (eui.3235393262...	0	disk	1.00 TB	Not Consumed	Attached	Supported
Local ATA Disk (t10.ATA_____INTEL_SSDSC2B...	0	disk	93.16 GB	datastore1	Attached	Not supported

Copy All 3 items

Properties

General

Name	SCST_FIO Fibre Channel Disk (eui.3235393262306463)
Identifier	eui.3235393262306463
Type	disk
Location	/vmfs/devices/disks/eui.3235393262306463
Capacity	1.00 TB
Drive Type	HDD
Hardware Acceleration	Supported
Transport	Fibre Channel
Owner	NMP
Sector Format	512e

Path Selection Policy Most Recently Used (VMware)
Storage Array Type Policy VMW_SATP_DEFAULT_AP

[Edit Multipathing...](#)

13. Edit multipath



ESX host
IP Address: 192.168.0.51

In Edit Multipathing Policies select
Round Robin (VMware) and click the
OK button.

The screenshot shows the 'Edit Multipathing Policies' dialog box in the Open-E JovianDSS interface. The dialog box is titled 'Edit Multipathing Policies' and shows a list of path selection policies. The 'Round Robin (VMware)' policy is selected. The dialog box also shows a table of storage devices with columns for Runtime Name, Status, Target, LUN, and Preferred. The 'OK' button is highlighted with a red arrow.

Runtime Name	Status	Target	LUN	Preferred
vmhba4:C0:T0:L0	Standby	20:00:00:0e:1e:28:c4:e0 2t:00:00:...	0	
vmhba3:C0:Tt:L0	Active	20:00:00:0e:1e:2c:dd:40 2t:00:00:...	0	
vmhba3:C0:T0:L0	Standby	20:00:00:0e:1e:28:c4:e0 2t:00:00:...	0	
vmhba4:C0:T3:L0	Standby	20:00:00:0e:1e:28:c4:e1 2t:00:00:...	0	

14. Path check



ESX host
IP Address: 192.168.0.51

Then, in **Storage Devices**, there should be 4 active and 4 passive paths listed.

The first initiator port “sees” 2 active target ports and the second initiator “sees” also the same 2 active targets. Similarly with standby paths. The first initiator port “sees” 2 passive target ports and the second initiator “sees” also the same 2 passive targets.

The screenshot shows the Open-E storage management interface. On the left, a sidebar menu has 'Storage Devices' selected. The main panel displays a table of storage devices. The 'SCST_FIO Fibre Channel Disk (eui.323539326...)' is highlighted. Below this, the 'Paths' tab is active, showing a table of storage paths.

Name	L...	Type	Capacity	Datastore	Operational S...	Hardware Accel...
Local Intel Enclosure Svc Dev (naa.5001e6734f...	0	enclos...		Not Consumed	Attached	Not supported
SCST_FIO Fibre Channel Disk (eui.323539326...	0	disk	1.00 TB	Not Consumed	Attached	Supported
Local ATA Disk (t10.ATA_____INTEL_SSDSC2B...	0	disk	93.16 GB	datastore1	Attached	Not supported

Runtime Name	Status	Target	Name
vmhba4:C0:T2:L0	Active (I/O)	20:00:00:0e:1e:2c:dd:41 21:00:00:0e:1e:2c:dd:41	vmhba4:C0:T2:L0
vmhba3:C0:T2:L0	Active (I/O)	20:00:00:0e:1e:2c:dd:41 21:00:00:0e:1e:2c:dd:41	vmhba3:C0:T2:L0
vmhba3:C0:T1:L0	Active (I/O)	20:00:00:0e:1e:2c:dd:40 21:00:00:0e:1e:2c:dd:40	vmhba3:C0:T1:L0
vmhba4:C0:T1:L0	Active (I/O)	20:00:00:0e:1e:2c:dd:40 21:00:00:0e:1e:2c:dd:40	vmhba4:C0:T1:L0
vmhba4:C0:T3:L0	Standby	20:00:00:0e:1e:28:c4:e1 21:00:00:0e:1e:28:c4:e1	vmhba4:C0:T3:L0
vmhba3:C0:T3:L0	Standby	20:00:00:0e:1e:28:c4:e1 21:00:00:0e:1e:28:c4:e1	vmhba3:C0:T3:L0
vmhba4:C0:T0:L0	Standby	20:00:00:0e:1e:28:c4:e0 21:00:00:0e:1e:28:c4:e0	vmhba4:C0:T0:L0
vmhba3:C0:T0:L0	Standby	20:00:00:0e:1e:28:c4:e0 21:00:00:0e:1e:28:c4:e0	vmhba3:C0:T0:L0

15. Move cluster

open-e

JovianDSS: **node 61**
IP Address: 192.168.0.61

Go to the main menu **Storage**. Now, in order to test failover, in the **Options** drop-down menu select **Move**.

The pool will be exported on the current node and will be imported on the second node.

The screenshot displays the Open-E JovianDSS Storage management interface. On the left is a sidebar menu with options: Storage, User Management, Failover Settings, Storage Settings, Backup & Recovery, System Settings, and Diagnostics. The main panel shows the 'Storage' section for 'Pool-0', which is in an 'ONLINE' state. It lists the Zpool ID as 12199181236699342582 and shows 10 disks. Below this, the 'Fibre Channel groups' section is active, showing 'Group1' with 2 targets and 1 Zvol, in an 'Active' status. A table lists two targets with their WWNs and physical status. An 'Options' dropdown menu is open for the first target, showing options: Delete Zpool, Export Zpool, Clear error counters, and Move. Red arrows indicate the navigation path from the 'Storage' menu item to the 'Move' option in the dropdown.

Target alias	WWN	Type	Status	Options
dd-40	21:00:00:0e:1e:2c:dd:40	Physical	OK	Options
dd-41	21:00:00:0e:1e:2c:dd:41	Physical	OK	Options

Initiator alias	WWN	Options
vmhba3	21:00:00:0e:1e:2a:81:e0	Options
vmhba4	21:00:00:0e:1e:2a:81:e1	Options

15. Move cluster

open-e

JovianDSS: **node 61**
IP Address: 192.168.0.61

After moving, the pool is active on the node-7.

The screenshot displays the 'Storage' management page in the Open-E JovianDSS web interface. The left sidebar contains navigation links: Storage, User Management, Failover Settings, Storage Settings, Backup & Recovery, System Settings, and Diagnostics. The main content area shows the 'Storage' configuration. At the top right, there are 'Rescan' and 'Add zpool' buttons. A message states: 'No local zpools have been found on the system. To create a zpool on this node please select an "Add zpool" button.' Below this, a pool is listed with the status 'Active on node node-71' and a 'Move to this node' button. The pool details show 'Status: ONLINE' and 'Zpool ID: 12199181236699342582'. A section titled 'Zpools available for import' shows a message: 'No external zpools available for the import have been found.'

16. Cluster check after test move



ESX host
IP Address: 192.168.0.51

Now, In **Paths** we see the active-standby paths swapped.
(rescan or refresh on vCenter GUI may be required)

The screenshot shows the vCenter configuration interface for a storage device. The left sidebar lists various configuration categories, with 'Storage' expanded. The main panel displays 'Storage Devices' and 'Paths'.

Storage Devices

Name	LUN	Type	Capacity	Datstore	Operational S...	Hardware Accele
Local Intel Enclosure Svc Dev (naa.5001e6734f...	0	enclos...		Not Consumed	Attached	Not supported
SCST_FIO Fibre Channel Disk (eui.323539326...	0	disk	1.00 TB	Not Consumed	Attached	Supported
Local ATA Disk (t10.ATA_____INTEL_SSDSC2B...	0	disk	93.16 GB	datstore1	Attached	Unknown

Paths

Runtime Name	Status	Target	Name
vmhba4:C0:T2:L0	Standby	20:00:00:0e:1e:2c:dd:41 21:00:00:0e:1e:2c:dd:41	vmhba4:C0:T2:L0
vmhba3:C0:T2:L0	Standby	20:00:00:0e:1e:2c:dd:41 21:00:00:0e:1e:2c:dd:41	vmhba3:C0:T2:L0
vmhba3:C0:T1:L0	Standby	20:00:00:0e:1e:2c:dd:40 21:00:00:0e:1e:2c:dd:40	vmhba3:C0:T1:L0
vmhba4:C0:T1:L0	Standby	20:00:00:0e:1e:2c:dd:40 21:00:00:0e:1e:2c:dd:40	vmhba4:C0:T1:L0
vmhba4:C0:T3:L0	Active (I/O)	20:00:00:0e:1e:28:c4:e1 21:00:00:0e:1e:28:c4:e1	vmhba4:C0:T3:L0
vmhba3:C0:T3:L0	Active (I/O)	20:00:00:0e:1e:28:c4:e1 21:00:00:0e:1e:28:c4:e1	vmhba3:C0:T3:L0
vmhba4:C0:T0:L0	Active (I/O)	20:00:00:0e:1e:28:c4:e0 21:00:00:0e:1e:28:c4:e0	vmhba4:C0:T0:L0
vmhba3:C0:T0:L0	Active (I/O)	20:00:00:0e:1e:28:c4:e0 21:00:00:0e:1e:28:c4:e0	vmhba3:C0:T0:L0

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