

Step-by-Step Guide to Synchronous Volume Replication (Block Based) with Active-Active iSCSI Failover supported by Open-E[®] DSS[™] V7

Software Version: DSS ver. 7.00 up01

Presentation updated: August 2012

TO SET UP ACTIVE-ACTIVE iSCSI FAILOVER, PERFORM THE FOLLOWING STEPS:

1. Hardware configuration:
 - Set server hostnames and ethernet ports on both nodes (node-a, node-b)
2. Configure the node-b:
 - Create a Volume Group, iSCSI Volume
 - Configure Volume Replication mode (destination and source mode) – set mirror IP address, create Volume Replication task and start the replication task
3. Configure the node-a
 - Create a Volume Group, iSCSI Volume
 - Configure Volume Replication mode (source and destination mode) – set mirror IP address, create Volume Replication task and start the replication task.
4. Configure Failover (node-a and node-b)
5. Start Failover Service
6. Test Failover Function
7. Run Failback Function

Open-E DSS V7 Active-Active iSCSI Failover



1. Hardware Configuration

Hardware Requirements:

To run the Active-Active iSCSI Failover, two DSS systems are required. Both servers must be located and working in the Local Area Network. See below configuration settings as an example:

PING NODES
IP Addresses : 192.168.2.7; 192.168.3.7

Data Server (DSS220)
node-a
IP Address: 192.168.0.220

Data Server (DSS221)
node-b
IP Address: 192.168.0.221

RAID System 1

RAID System 2

- Port used for WEB GUI management
IP: 192.168.0.220 **eth0**
- Volume Replication, Auxiliary connection (Heartbeat)
IP: 192.168.1.220 **eth1**
- Storage Client Access, Auxiliary connection (Heartbeat)
IP: 192.168.2.220 **eth2**
- Storage Client Access, Auxiliary connection (Heartbeat)
IP: 192.168.3.220 **eth3**

- Port used for WEB GUI management
IP: 192.168.0.221 **eth0**
- Volume Replication, Auxiliary connection (Heartbeat)
IP: 192.168.1.221 **eth1**
- Storage Client Access, Auxiliary connection (Heartbeat)
IP: 192.168.2.221 **eth2**
- Storage Client Access, Auxiliary connection (Heartbeat)
IP: 192.168.3.221 **eth3**

Note:
It is strongly recommended to use direct point-to-point and if possible 10Gb connection for the volume replication.
Optionally it can work over the switch, but the most reliable is direct connection.

Virtual IP Address:
192.168.20.100 (resources pool node-a iSCSI Target0)

Virtual IP Address:
192.168.30.100 (resources pool node-b iSCSI Target1)

iSCSI Failover/Volume Replication (eth1)

Volume Groups (vg00)
iSCSI volumes (lv0000, lv0001)
iSCSI targets

Volume Groups (vg00)
iSCSI volumes (lv0000, lv0001)
iSCSI targets

NOTE:

To prevent switching loops, it's recommended to use RSTP (802.1w) or STP (802.1d) protocol on network switches used to build A-A Failover network topology.



Data Server (DSS2)
node-b
IP Address:192.168.0.221

1. Hardware Configuration

After logging on to the Open-E DSS V7 (node-b), please go to **SETUP** and choose „**Network interfaces**” option. In the **Hostname** box, replace the "dss" letters in front of the numbers with „node-b” server, in this example „**node-b-59979144**” and click **apply** button (this will require a reboot).

The screenshot shows the Open-E DSS V7 web interface. The top navigation bar includes 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. The current page is 'Setup > Network interfaces'. On the left, under 'Interfaces', a list shows 'eth0', 'eth1', 'eth2', and 'eth3'. On the right, the 'Server name' section has 'Server name:' set to 'dss2' and 'Comment:' set to 'Data Storage Software'. Below that, the 'Hostname' section has 'Hostname:' set to 'node-b-59979144'. At the bottom, the 'DNS settings' section has 'DNS' set to '194.204.152.34;194.204.159.1'. Each section has an 'apply' button. A blue box on the left contains instructions, with arrows pointing to the 'Network interfaces' and 'Hostname' sections.



Data Server (DSS2)
node-b
IP Address:192.168.0.221

1. Hardware Configuration

Next, select **eth0** interface and in the **IP address field**, change the IP address from 192.168.0.220 to 192.168.0.221.
Then click **apply** button (this will restart network configuration).

The screenshot shows the Open-E DSS V7 web interface. The top navigation bar includes 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. The breadcrumb trail indicates 'You are here: Setup > Network interfaces > eth0'. On the left, the 'Interfaces' panel lists eth0, eth1, eth2, and eth3, with eth0 selected. The main panel shows the configuration for the selected interface. A warning message states: 'Warning! You are currently connected through this interface.' The configuration options are: 'Active' (checked), 'DHCP' (unchecked), and 'Static' (selected). The 'IP address' field is set to '192.168.0.221', 'Netmask' is '255.255.255.0', 'Broadcast' is 'auto', and 'Gateway' is '192.168.0.1'. An 'apply' button is located at the bottom right of the configuration panel. The footer of the interface includes 'Event Viewer' and 'Data Storage Software V7 - All rights reserved'.



Data Server (DSS2)

node-b

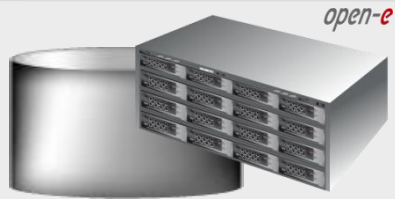
IP Address:192.168.0.221

1. Hardware Configuration

Next, select **eth1** interface and in the **IP address field**, change the IP address from 192.168.1.220 to 192.168 .1.221 and click **apply** button.

Repeat the steps for the interfaces **eth2** and **eth3** accordingly.

The screenshot shows the Open-E DSS V7 web interface. The top navigation bar includes 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. The current page is 'Setup > Network interfaces > eth1'. On the left, a list of interfaces shows 'eth1' selected. On the right, the 'Interface info' section displays 'Intel Corporation 82546GB Gigabit Ethernet Controller (rev 03)'. The 'IP address' section shows 'Active' checked, 'Static' selected, and the IP address field set to '192.168.1.221'. Other fields include 'Netmask: 255.255.255.0', 'Broadcast: auto', and 'Gateway:'. An 'apply' button is at the bottom right.



Data Server (DSS1)

node-a

IP Address:192.168.0.220

1. Hardware Configuration

After logging on to the node-a, please go to **SETUP** and choose „**Network interfaces**” option. In the **Hostname** box, replace the "dss" letters in front of the numbers with „node-a” server, in this example „**node-a-39166501**” and click **apply** button (this will require a reboot).

The screenshot shows the Open-E DSS V7 web interface. The top navigation bar includes 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. The current page is 'Setup > Network interfaces'. On the left, there is a list of network interfaces: eth0, eth1, eth2, and eth3. On the right, there are three configuration panels: 'Server name' (with 'Server name' set to 'dss1' and 'Comment' set to 'Data Storage Software'), 'Hostname' (with 'Hostname' set to 'node-a-39166501'), and 'DNS settings' (with 'DNS' set to '194.204.152.34;194.204.159.1'). Each panel has an 'apply' button. A blue arrow points from the text box to the 'node-a-39166501' hostname field.

Open-E DSS V7 Active-Active iSCSI Failover



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Data Server (DSS2)
node-b
IP Address:192.168.0.221

2. Configure the node-b

Under the **CONFIGURATION**, select „Volume manager”, then click on „Volume groups”.

In the **Unit manager** function menu, add the selected physical units (**Unit MD0** or other) to create a new volume group (in this case, **vg00**) and click **apply** button.

The screenshot shows the Open-E DSS V7 web interface. The top navigation bar includes 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. The breadcrumb trail indicates the current location: 'You are here: Configuration > Volume manager > Volume groups'. The main content area is divided into several sections:

- Vol. groups:** A section for managing volume groups, currently empty.
- Unit rescan:** A section with a 'rescan' button.
- Unit manager:** A section for managing physical units. It contains a table with the following data:

Unit	Size (GB)	Serial number	Status
<input checked="" type="checkbox"/> Unit MD0	298.10	N/A	available

Below the table, there is an 'Action:' dropdown menu set to 'new volume group' and a 'Name:' input field containing 'vg00'. An 'apply' button is located at the bottom of this section.
- Vol. replication:** A section for managing volume replication, currently empty.
- Drive identifier:** A section for identifying drives. It contains a table with the following data:

Unit	Serial number	Status
<input type="checkbox"/> Unit S000	9RA6VDG3	
<input type="checkbox"/> Unit S001	9SY0QWBT	

At the bottom of the interface, there is an 'Event Viewer' icon and a footer that reads 'Data Storage Software V7 - All rights reserved'.



Data Server (DSS2)

node-b

IP Address:192.168.0.221

2. Configure the node-b

Select the appropriate volume group (**vg00**) from the list on the left and create a **new iSCSI volume** of the required size. Please set 2 logical volumes in the Active-Active option. The 1st logical volume (**lv0000**) will be a destination of the replication process on node-b.

Next, check the box **Use volume replication**.

After assigning an appropriate amount of space for the iSCSI volume, click the **apply** button

The screenshot shows the Open-E DSS V7 web interface. The top navigation bar includes 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. The current page is 'Configuration > Volume manager > Volume groups > vg00'. On the left, under 'Vol. groups', 'vg00' is selected. Below it, 'Vol. replication' is visible. On the right, the 'Volume manager' section shows system volumes: SWAP (4.00 GB), Reserved for snapshots (0.00), Reserved for system (4.00), Reserved for replication (0.00), and Free (290.06). The 'Action' dropdown is set to 'new iSCSI volume' and 'Options' is 'Just create volume'. The 'Use volume replication' checkbox is checked. Under 'Block I/O', the 'Rate' is set to 'medium' and the size is '50 GB (+0.12 GB for replication)'. The 'apply' button is highlighted in red.



Data Server (DSS2)
node-b
IP Address:192.168.0.221

2. Configure the node-b

Next, create the 2nd logical volume on the node-b. Logical volume (lv0001) will be the source of the replication process on this node.

Next, check the box **Use volume replication**.

After assigning an appropriate amount of space for the iSCSI volume, click the **apply** button.

Logical Volume	Type	Snap.	Rep.	Init.	Blocksize (bytes)	Size (GB)
lv0000	iSCSI		✓		N/A	50.00
System volumes						Size (GB)
SWAP						4.00
Reserved for snapshots						0.00
Reserved for system						4.00
Reserved for replication						0.13
Free						239.94

Open-E DSS V7 Active-Active iSCSI Failover



Data Server (DSS2)

node-b

IP Address:192.168.0.221

2. Configure the node-b

2 logical iSCSI Volume Block I/O are now configured.

The screenshot shows the Open-E DSS V7 Volume manager interface. The 'Volume manager' section displays a table of logical volumes:

Logical Volume	Type	Snap.	Rep.	Init.	Blocksize (bytes)	Size (GB)
lv0000	iSCSI		✓		N/A	50.00
lv0001	iSCSI		✓		N/A	50.00

Below the table, the 'System volumes' section shows the following details:

- SWAP: 4.00 GB
- Reserved for snapshots: 0.00 GB
- Reserved for system: 4.00 GB
- Reserved for replication: 0.25 GB
- Free: 189.81 GB

The 'Action' dropdown is set to 'new NAS volume'. There are checkboxes for 'Use volume replication' and 'WORM', both of which are unchecked. A slider shows the current size (0 GB) and a maximum of 189.81 GB. An 'add:' field is set to 0.00 GB. An 'apply' button is visible at the bottom right.



iSCSI volume (lv0000) is set to destination



iSCSI volume (lv0001) is set to source



Data Server (DSS1)
node-a
IP Address:192.168.0.220

3. Configure the node-a

Under the **CONFIGURATION**, select „Volume manager” and then click on „Volume groups”.

Add the selected physical units (Unit S001 or other) to create a new volume group (in this case, vg00) and click **apply** button.



Volume Groups (vg00)

The screenshot shows the Open-E DSS V7 web interface. The top navigation bar includes 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. The breadcrumb trail indicates the current location: 'You are here: Configuration > Volume manager > Volume groups'. The main content area is divided into several panels:

- Vol. groups:** A panel with a settings icon and a help icon. An arrow points to this panel from the first instruction box.
- Unit rescan:** A panel with a refresh icon and a help icon, containing a red 'rescan' button.
- Unit manager:** A panel with a refresh icon and a help icon. It contains a table with the following data:

Unit	Size (GB)	Serial number	Status
<input checked="" type="checkbox"/> Unit S001	465.70	N/A	available

Below the table, there is an 'Action:' dropdown menu set to 'new volume group' and a 'Name:' text input field containing 'vg00'. A red 'apply' button is at the bottom. A note below the button says 'Please apply changes or press "reload" button to discard'. An arrow points from the second instruction box to the 'Unit S001' row and another arrow points to the 'Name:' field.
- Vol. replication:** A panel with a settings icon and a help icon.
- Drive identifier:** A panel with a refresh icon and a help icon. It contains a table with the following data:

Unit	Serial number	Status
<input type="checkbox"/> Unit S001	N/A	

At the bottom of the interface, there is an 'Event Viewer' icon and a footer that reads 'Data Storage Software V7 - All rights reserved'.



Data Server (DSS1)
node-a
IP Address:192.168.0.220

3. Configure the node-a

Select the appropriate volume group (**vg00**) from the list on the left and create a **new iSCSI volume** of the required size. Please set 2 logical volumes in Active-Active option. The 1st logical volume (**lv0000**) will be a source of the replication process on the node-a.

Next, check the box for „**Use volume replication**”

After assigning an appropriate amount of space for the iSCSI volume, click the **apply** button.

NOTE:
The source and destination volumes must be of identical size.



Data Server (DSS1)
node-a
IP Address:192.168.0.220

3. Configure the node-a

Next, create the 2nd logical volume on the node-a. Logical volume (lv0001) will be a destination of the replication process on this node.

Next check the box for „Use volume replication”.

After assigning an appropriate amount of space for the iSCSI volume, click the **apply** button.

The screenshot shows the Open-E DSS V7 configuration interface. The top navigation bar includes 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. The breadcrumb trail indicates the current location: 'Configuration > Volume manager > Volume groups > vg00'. The main content area is divided into two panels: 'Vol. groups' and 'Vol. replication'. The 'Vol. groups' panel shows a table with one entry: 'vg00'. The 'Vol. replication' panel shows a table with one entry: 'lv0000'. The 'Vol. replication' panel also has a 'Vol. replication' sub-panel with a table showing the following data:

Logical Volume	Type	Snap.	Rep.	Init.	Blocksize (bytes)	Size (GB)
lv0000	iSCSI		✓		N/A	50.00

Below the table, there are several sections: 'System volumes' (SWAP, Reserved for snapshots, Reserved for system, Reserved for replication, Free), 'Action:' (new iSCSI volume), 'Options:' (Just create volume), 'Use volume replication' (checked), 'File I/O' (File I/O, Initialize, Rate: medium), 'Block I/O' (Block I/O, slider from 0 to 407.53 GB), and an 'apply' button.

Open-E DSS V7 Active-Active iSCSI Failover



Data Server (DSS1)
node-a
IP Address:192.168.0.220

3. Configure the node-a

2 logical iSCSI Volume Block I/O are now configured.

The screenshot shows the Open-E DSS V7 Volume manager interface. The 'Volume manager' section displays a table of logical volumes:

Logical Volume	Type	Snap.	Rep.	Init.	Blocksize (bytes)	Size (GB)
Iv0000	iSCSI		✓		N/A	50.00
Iv0001	iSCSI		✓		N/A	50.00

Below the table, the 'System volumes' section shows the following details:

- SWAP: 4.00 GB
- Reserved for snapshots: 0.00 GB
- Reserved for system: 4.00 GB
- Reserved for replication: 0.25 GB
- Free: 357.41 GB

The 'Action' dropdown is set to 'new NAS volume'. There are checkboxes for 'Use volume replication' and 'WORM', both of which are unchecked. A slider shows the current size of 0 GB, with an 'add' field set to 0.00 GB. An 'apply' button is visible at the bottom right.

- iSCSI volume (Iv0000) is set to source
- iSCSI volume (Iv0001) is set to destination



Data Server (DSS2)
node-b
IP Address:192.168.0.221

2. Configure the node-b

Now, on the node-b, go to „**Volume replication**”. Within **Volume replication mode** function, check the **Destination** box for **lv0000** and check the **Source** box for **lv0001**. Then, click the **apply** button.

In the **Hosts binding** function, enter the IP address of the node-a (in our example, this would be 192.168.1.220), enter administrator password and click the **apply** button.

The screenshot shows the Open-E DSS V7 web interface. The breadcrumb trail is: Configuration > Volume manager > Volume replication. The 'Volume replication mode' table is as follows:

Logical Volume	Init	Source	Destination	Clear metadata
lv0000	done	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
lv0001	done	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Below the table is an 'apply' button and a note: 'Please apply changes or press "reload" button to discard'. The 'Hosts binding' section shows 'Define remote node' with 'Remote node IP address' set to 192.168.1.220 and a password field. A 'connect' button is at the bottom. At the bottom of the interface, an 'Event Viewer' shows a message: 'Volume replication tasks can not be created because there is no remote node connected.'

NOTE:

The Mirror server IP Address must be on the same subnet in order for the replication to communicate. VPN connections can work providing you are not using a NAT. Please follow example:

- node-a: 192.168.1.220
- node-b: 192.168.1.221

Open-E DSS V7 Active-Active iSCSI Failover



Data Server (DSS1)
node-a
IP Address:192.168.0.220

3. Configure the node-a

Next, on the node-a, go to „Volume replication”. Within Volume replication mode function, check the **Source** box for **lv0000** and check the **Destination** box for **lv0001**. Next, click the **apply** button.

The screenshot shows the Open-E DSS V7 web interface. The top navigation bar includes 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. The breadcrumb trail indicates the current location: 'You are here: Configuration > Volume manager > Volume replication'. The main content area is divided into several sections:

- Vol. groups:** A list containing 'vg00'.
- Volume replication mode:** A table with columns: Logical Volume, Init, Source, Destination, and Clear metadata. The table shows two entries: 'lv0000' and 'lv0001', both with 'Init' status 'done'. The 'Source' checkbox is checked for 'lv0000' and the 'Destination' checkbox is checked for 'lv0001'. An 'apply' button is visible below the table.
- Hosts binding:** A section showing 'Remote node' information: 'Host name: node-b-5...' and 'IP address: 192.168.1.221'. The 'Status' is 'Reachable'. A 'disconnect' button is present.
- Create new volume replication task:** A form with fields for 'Task name:' and 'Source volume:' (set to 'lv0000').

At the bottom, there is an 'Event Viewer' icon and a footer: 'Data Storage Software V7 - All rights reserved'.




Data Server (DSS1)

node-a

IP Address:192.168.0.220

3. Configure the node-a

In the **Create new volume replication task**, enter the task name in the **Task name** field, then click on the  button.

In the **Destination volume** field, select the appropriate volume (in this example, **lv0000**) and click **create** to confirm.

The screenshot shows the Open-E DSS V7 web interface. The top navigation bar includes 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. The breadcrumb trail indicates the current location: 'You are here: Configuration > Volume manager > Volume replication'. The main content area is divided into several sections. On the left, there is a 'Vol. groups' section with a search icon and a list containing 'vg00'. Below that is a 'Vol. replication' section. The central part of the interface is the 'Create new volume replication task' form. It contains the following fields: 'Task name' (text input with value 'MirrorTask-a'), 'Source volume' (dropdown menu with value 'lv0000'), 'Destination volume' (dropdown menu with value 'lv0000' and a right arrow button), and 'Bandwidth for SyncSource (MB)' (text input with value '40'). A red 'create' button is located at the bottom right of this form. Below the form is a 'Replication tasks manager' section with an 'Info' icon and the text 'No tasks have been found.' At the bottom of the page, there is an 'Event Viewer' icon and the footer text 'Data Storage Software V7 - All rights reserved'.



Data Server (DSS1)

node-a

IP Address:192.168.0.220

3. Configure the node-a

The screenshot shows the Open-E DSS V7 web interface. The top navigation bar includes 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. The breadcrumb trail indicates the current location: 'You are here: Configuration > Volume manager > Volume replication'. The interface is divided into several panels:

- Vol. groups:** Shows a single group named 'vg00'.
- Vol. replication:** Shows a single replication task named 'MirrorTask-a'.
- Hosts binding:** Displays a 'Remote node' configuration for 'node-b-5...' with IP address '192.168.1.221' and status 'Reachable'. A 'disconnect' button is visible.
- Create new volume replication task:** Shows an information message: 'No volumes with replication functionality found or all volumes have a task assigned already.'
- Replication tasks manager:** A table with columns 'Name', 'Start time', and 'Action'. It lists 'MirrorTask-a' with a start time of 'n/a'. A blue arrow points from a text box to the 'play' button in the 'Action' column.

At the bottom, there is an 'Event Viewer' section and a footer: 'Data Storage Software V7 - All rights reserved'.

Now, in the **Replication task manager** function, click the corresponding „play” button to start the Replication task on the node-a.



Data Server (DSS1)

node-a

IP Address:192.168.0.220

3. Configure the node-a

In the **Replication tasks manager** function, information is available on the currently running replication task. When a task is complete a date and time will appear.

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SETUP | CONFIGURATION | MAINTENANCE | STATUS | HELP

You are here: Configuration > Volume manager > Volume replication

Vol. groups

- vg00

Vol. replication

- MirrorTask-a

Replication tasks manager

Name	Start time	Action
MirrorTask-a	2012-08-12 15:04:05	[Play] [Stop] [Delete]

Source volume: lv0000
Destination volume: lv0000
Destination IP: 192.168.1.221
Protocol type: Synchronous

Event Viewer


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Data Server (DSS1)
node-a
IP Address:192.168.0.220

3. Configure the node-a

Under the **STATUS**, select „Tasks” and „Volume Replication”.

Click on the  button next to a task name (in this case „MirrorTask”) to display detailed information on the current replication task.

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SETUP | CONFIGURATION | MAINTENANCE | STATUS | HELP

You are here: Status > Tasks > Volume Replication

Tasks

- Data (File) Replication
- Antivirus
- Volume Replication**
- Snapshots

Running tasks


Name	Type	Start time
 MirrorTask-a	Volume replication	2012-08-12 15:04:05

Protocol type: Synchronous
Connection: Connected

Source info:
Logical volume: lv0000
Consistency: Consistent

Destination info:
Logical volume: lv0000
Consistency: Consistent
IP address: 192.168.1.221

Tasks log

Time	Name	Type	Status	Action
 2012-08-12 15:04:35	MirrorTask-a	Volume replication	OK	Started

★ Event Viewer

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NOTE:
Please allow the replication task to complete (similar to above with status being “Consistent”) before writing to the iSCSI Logical Volume.



Data Server (DSS2)
node-b
IP Address:192.168.0.221

2. Configure the node-b

Next, go to the node-b.
Within **Create new volume replication task**, enter the task name in the **Task name** field, then click on the button.

In the **Destination volume** field, select the appropriate volume (in this example, **lv0001**) and click **create** to confirm.

The screenshot shows the Open-E DSS V7 web interface. The top navigation bar includes 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. The breadcrumb trail indicates the current location: 'Configuration > Volume manager > Volume replication'. The main content area is divided into several sections:

- Vol. groups:** A list containing 'vg00'.
- Vol. replication:** A list containing 'MirrorTask-a_reverse'.
- Create new volume replication task:** A form with the following fields:
 - Task name: MirrorTask-b
 - Source volume: lv0001
 - Destination volume: lv0001
 - Bandwidth for SyncSource (MB): 40A 'create' button is located at the bottom right of this form.
- Replication tasks manager:** A table with the following data:

Name	Start time	Action
MirrorTask-a_reverse	n/a	[Play] [Stop] [Delete]

At the bottom of the interface, there is an 'Event Viewer' section and a footer that reads 'Data Storage Software V7 - All rights reserved'.



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Data Server (DSS2)
node-b
IP Address:192.168.0.221

2. Configure the node-b

In the **Replication tasks manager** function, click the corresponding „play” button to start the Replication task on the node-b: **MirrorTask-b**.

In this box you can find information about currently running replication tasks.

When a task is complete a date and time will appear.

The screenshot shows the Open-E DSS V7 web interface. The top navigation bar includes 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. The breadcrumb trail indicates the current location: 'You are here: Configuration > Volume manager > Volume replication'. The main content area is divided into several sections:

- Vol. groups:** Shows a single group named 'vg00'.
- Vol. replication:** Lists two replication tasks: 'MirrorTask-a_reverse' and 'MirrorTask-b'.
- Hosts binding:** Shows a remote node configuration for 'node-a-3...' with IP address '192.168.1.220' and status 'Reachable'. A 'disconnect' button is present.
- Create new volume replication task:** Displays an information message: 'No volumes with replication functionality found or all volumes have a task assigned already.'
- Replication tasks manager:** A table listing the replication tasks with their start times and action buttons (play, stop, delete).

Name	Start time	Action
MirrorTask-a_reverse	n/a	[play] [stop] [delete]
MirrorTask-b	2012-08-12 15:36:40	[play] [stop] [delete]

The 'Event Viewer' section is visible at the bottom left of the interface.



Data Server (DSS2)
node-b
IP Address:192.168.0.221

4. Create new target on the node-b

Choose **CONFIGURATION**, „iSCSI target manager” and „Targets” from the top menu.

In the **Create new target** function, uncheck the box **Target Default Name**.
In the **Name** field, enter a name for the new target and click **apply** to confirm.

iSCSI targets



NOTE:
Both systems must have the same Target name.



Data Server (DSS2)
node-b
IP Address:192.168.0.221

4. Create new target on the node-b

Next, you must set the 2nd target. Within the **Create new target** function, uncheck the box **Target Default Name**. In the **Name** field, enter a name for the 2nd new target and click **apply** to confirm.

The screenshot shows the Open-E DSS V7 web interface. The top navigation bar includes 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. The breadcrumb trail indicates 'You are here: Configuration > iSCSI target manager > Targets'. The main content area is divided into two panels. The left panel, titled 'Targets', shows a list with one entry: 'target0'. The right panel, titled 'Create new target', contains the following fields and options:

- Target Default Name
- Name: mirror-02
- Alias: target1
- apply button
- Message: Please apply changes or press "reload" button to discard

Below this panel is the 'Discovery CHAP user access' section with two radio buttons:

- No discovery CHAP user access authentication
- Enable discovery CHAP user access authentication
- apply button

At the bottom of the interface, there is an 'Event Viewer' link and a footer that reads 'Data Storage Software V7 - All rights reserved'.

iSCSI targets



NOTE:

Both systems must have the same Target name.



Data Server (DSS2)
node-b
IP Address:192.168.0.221

4. Create new target on the node-b

After that, select **target0** within the **Targets** field.

To assign appropriate volume to the target (**mirror-01->lv0000**) and click the **+** button located under **Action**.

NOTE:
Both systems must have the same SCSI ID and LUN#

WARNING:
Please do not switch on the write back (WB) cache !



Data Server (DSS2)
node-b
IP Address:192.168.0.221

4. Create new target on the node-b

Next, select **target1** within the **Targets** field.

To assign appropriate volume to the target (**mirror-02->lv0001**) and click the **+** button located under **Action**.

The screenshot shows the Open-E DSS V7 web interface. The breadcrumb navigation is: Configuration > iSCSI target manager > Targets > mirror-02 (target1). The 'Targets' section shows a list with 'target0' and 'target1' (selected). The 'Target volume manager' section contains an 'Info' box and a table:

Volume	SCSI ID	LUN	RO	WB	Action
lv0001	iZGxwlh33QBSpRdN	0	<input type="checkbox"/>	<input type="checkbox"/>	+ -

Below the table is the 'CHAP user access authentication' section with two radio buttons: 'No CHAP user access authentication' (selected) and 'Enable CHAP user access authentication'. An 'apply' button is at the bottom right.

NOTE:
Both systems must have the same SCSI ID and LUN#

WARNING:
Please do not switch on the write back (WB) cache !



Data Server (DSS1)
node-a
IP Address:192.168.0.220

5. Create new target on the node-a

On the node-a, choose **CONFIGURATION**, „iSCSI target manager” and „Targets” from the top menu.

Within the **Create new target** function, uncheck the box **Target Default Name**.
In the **Name** field, enter a name for the new target and click **apply** to confirm.

iSCSI targets



NOTE:
Both systems must have the same Target name.



Data Server (DSS1)
node-a
IP Address:192.168.0.220

5. Create new target on the node-a

Next, you must set the 2nd target. In the **Create new target** function, uncheck the box **Target Default Name**. In the Name field, enter a name for the 2nd new target and click **apply** to confirm.

The screenshot shows the Open-E DSS V7 web interface. The top navigation bar includes 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. The breadcrumb trail indicates 'You are here: Configuration > iSCSI target manager > Targets'. The main content area is divided into two panels. The left panel, titled 'Targets', shows a list with one entry: 'target0'. The right panel, titled 'Create new target', contains the following fields and options:

- Target Default Name
- Name: mirror-02
- Alias: target1
-
- Please apply changes or press "reload" button to discard

Below this panel is another section titled 'Discovery CHAP user access' with two radio button options:

- No discovery CHAP user access authentication
- Enable discovery CHAP user access authentication
-

At the bottom of the interface, there is an 'Event Viewer' icon and the footer text 'Data Storage Software V7 - All rights reserved'.

iSCSI targets



NOTE:

Both systems must have the same Target name.



Data Server (DSS1)
node-a
IP Address:192.168.0.220

5. Create new target on the node-a

Select the **target0** within the **Targets** field.

To assign appropriate volume to the target (**mirror-01->lv0000**) and click the **+** button located under **Action**.

NOTE:
Before clicking the **+** button again, please copy & paste the SCSI ID and LUN# from the node-b.

WARNING:
Please do not switch on the write back cache (WB) !



Data Server (DSS1)
node-a
IP Address:192.168.0.220

5. Create new target on the node-a

Select the **target1** within the Targets field.

To assign appropriate volume to the target (**mirror-02->lv0001**) and click the **+** button located under Action.

The screenshot shows the Open-E DSS V7 web interface. The breadcrumb navigation is: Configuration > iSCSI target manager > Targets > mirror-02 (target1). The 'Targets' section shows a list with 'target0' and 'target1' (selected). The 'Target volume manager' section contains two info boxes and a table:

Volume	SCSI ID	LUN	RO	WB	Action
lv0001	iZGxwlh33QBSpRdN	0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="button" value="+"/> <input type="button" value="-"/>

The 'CHAP user access authentication' section has two radio buttons: 'No CHAP user access authentication' (selected) and 'Enable CHAP user access authentication'. An 'apply' button is located at the bottom right of this section.

NOTE:
Before clicking the **+** button again, please copy & paste the SCSI ID and LUN# from the node-b.

WARNING:
Please do not switch on the write back cache (WB) !



Data Server (DSS1)
node-a
IP Address:192.168.0.220

6. Configure Failover

On the node-a, go to **SETUP** and select „Failover”.

In the **Auxiliary paths** function, select the 1st **New auxiliary path** on local and remote node and click the **add new auxiliary path** button.



Data Server (DSS1)
node-a
IP Address:192.168.0.220

6. Configure Failover

In the **Auxiliary paths** function, select the 2nd **New auxiliary path** on local and remote node and click the **add new auxiliary path** button.

Auxiliary paths

Info
Auxiliary path has been created successfully.

Status	node-a-3... interface (local node)	node-b-5... interface (remote node)
Inactive	eth1 (192.168.1.220)	eth1 (192.168.1.221)
Inactive	eth2 (192.168.2.220)	eth2 (192.168.2.221)

New auxiliary path

Interface on local node: eth3 (192.168.3.220)

Interface on remote node: eth3 (192.168.3.221)

cancel add new auxiliary path

Please apply changes or press "reload" button to discard

Ping nodes

Ping node IP address	node-a-3... status (local node)	node-b-5... status (remote node)
No ping nodes defined.		

★ Event Viewer

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Data Server (DSS1)

node-a

IP Address:192.168.0.220

6. Configure Failover

In the **Ping nodes** function, enter two ping nodes.
In the **IP address** field enter IP address and click the **add new ping node** button (according to the configuration in the third slide).
In this example, IP address of the first ping node is: 192.168.2.7 and the second ping node: 192.168.3.7



Data Server (DSS1)
node-a
IP Address:192.168.0.220

6. Configure Failover

Next, to go to the **Resources Pool Manager** function and click the **add virtual IP** button. After that, on local node enter **Virtual IP**, (in this example 192.168.20.100 according to the configuration in the third slide) and select two appropriate interfaces on local and remote nodes. Then, click **add** button.



Data Server (DSS1)

node-a

IP Address:192.168.0.220

6. Configure Failover

Also, in the **Resources Pool Manager** function, click the **add virtual IP** button on remote node section.

Next, enter **Virtual IP**, (in this example 192.168.30.100, according to the configuration in the third slide) and select two appropriate interfaces on local and remote nodes. Then, click **add** button.

The screenshot shows the Open-E DSS V7 web interface. The top navigation bar includes 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. The current page is 'Failover' under 'Setup'. The main content area displays a configuration for a remote node 'node-b-59979144 resources'. It shows the status as 'unknown' and synchronization status as 'not configured'. There are buttons for 'move' and 'sync between nodes'. Below this, there are tabs for 'Virtual IP addresses' and 'iSCSI resources'. The 'Virtual IP addresses' tab is active, showing an 'add virtual IP' form. The form fields are: Virtual IP: 192.168.30.100; Interface on local node: eth3 (192.168.3.220); Interface on remote node: eth3 (192.168.3.221); Netmask: 255.255.255.0; Broadcast (optional): (empty). There are 'cancel' and 'add' buttons at the bottom of the form. A blue box on the left contains instructions with arrows pointing to the 'add virtual IP' button, the 'Virtual IP' field, the 'Interface on local node' dropdown, and the 'Interface on remote node' dropdown.



Data Server (DSS1)
node-a
IP Address:192.168.0.220

6. Configure Failover

When you are finished with setting the virtual IP, go to the **iSCSI resources** tab on **local node resources** and click the **add or remove targets** button. After moving the target **mirror-01** from **Available targets** to **Targets already in cluster** click the **apply** button.



Data Server (DSS1)
node-a
IP Address:192.168.0.220

6. Configure Failover

Next, go to the **iSCSI resources** tab on **remote node resources** and click the **add or remove targets** button.
After moving the target **mirror-02** from **Available targets** to **Targets already in cluster** click the **apply** button.

The screenshot shows the Open-E DSS V7 web interface. The top navigation bar includes 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. The breadcrumb trail indicates the current location is 'Setup > Failover'. The main content area is divided into sections for 'Virtual IP addresses' and 'iSCSI resources'. Under 'iSCSI resources', there is a table with columns for 'Virtual IP', 'Interface on local node', and 'Interface on remote node'. Below this, there is a section for 'node-b-59979144 resources (remote node)' with buttons for 'move' and 'sync between nodes'. At the bottom, there are two list boxes: 'Available targets' and 'Targets already in cluster', with 'mirror-02' listed in the latter. There are 'cancel' and 'apply' buttons at the bottom right of the interface.



Data Server (DSS1)
node-a
IP Address:192.168.0.220

6. Configure Failover

After that, scroll to the top of the **Failover manager** function
At this point, both nodes are ready to start the Failover.
In order to run Failover service click the **start** button and confirm this action by clicking the **start** button again.

Failover manager Cluster status: Ready for Start
All required settings have been set up, cluster is ready to be started.
start

Resources pool

node-a-39166501 (local node) resources pool:
Status: inactive
Replication state: **synced**

node-b-59979144 (remote node) resources pool:
Status: inactive
Replication state: **synced**

[See details »](#)

Network statuses

Ping nodes: **2 of 2 reachable**
[See details »](#)

Auxiliary paths: 3 defined
[See details »](#)

Remote node status

Remote node availability: **Reachable**
Remote node hostname: **node-b-59979144**
Remote node IP: **192.168.1.221**
[See details »](#)

Auxiliary paths

★ Event Viewer

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NOTE:

If the start button is not red, the setup has not been completed.



Data Server (DSS1)
node-a
IP Address:192.168.0.220

7. Start Failover Service

After clicking the **start** button, configuration of both nodes is complete.

The screenshot shows the Open-E DSS V7 web interface. The top navigation bar includes 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. The current page is 'Failover manager'. The main content area displays the following information:

- Cluster status:** Running - OK (with a red 'stop' button)
- Resources pool:**
 - node-a-39166501 (local node) resources pool:**
 - Status: active on node-a-3... (local node)
 - Replication state: synced
 - node-b-59979144 (remote node) resources pool:**
 - Status: active on node-b-5... (remote node)
 - Replication state: synced
- Network statuses:**
 - Ping nodes: 2 of 2 reachable
 - Auxiliary paths: 3 of 3 reachable
- Remote node status:**
 - Remote node availability: Reachable
 - Remote node hostname: node-b-59979144
 - Remote node IP: 192.168.1.221

At the bottom, there is an 'Auxiliary paths' section with an 'Info' button and an 'Event Viewer' icon.

NOTE:

You can now connect via your iSCSI initiator and use your targets via the Virtual IP address e.g. 192.168.20.100 and 192.168.30.100 (For example, in a Microsoft Windows environment, please use Microsoft iSCSI Initiator).



Data Server (DSS1)
node-a
IP Address:192.168.0.220

8. Test Failover Function

In order to test Failover, go to **Resources pool manager** function. Then, in the **local node** resources, click on the **move to remote node** button and confirm this action by clicking the **move** button.

The screenshot shows the Open-E DSS V7 web interface. The top navigation bar includes 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. The current page is 'Resources pool manager'. It displays information for two nodes:

- node-a-39166501 resources (local node)**: Status is 'active on node-a-3... (local node)'. Synchronization status is 'synced'. There is a 'move to remote node' button and a 'sync between nodes' button.
- node-b-59979144 resources (remote node)**: Status is 'active on node-b-5... (remote node)'. Synchronization status is 'synced'. There is a 'move to local node' button and a 'sync between nodes' button.

At the bottom, there is an 'Event Viewer' section and a footer that reads 'Data Storage Software V7 - All rights reserved'.



Data Server (DSS1)

node-a

IP Address:192.168.0.220

8. Test Failover Function

After performing this step, the status for **local node** resources should state „active on node-b (remote node)” and the **Synchronization status** should state „syncd”.

The screenshot shows the Open-E DSS V7 web interface. The top navigation bar includes 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. The main content area is titled 'Resources pool manager' and displays the following information:

- node-a-39166501 resources (local node)**
 - Status: **active on node-b-5... (remote node)**
 - Synchronization status: **syncd**
 - Buttons: **move to local node** (red), **sync between nodes** (grey)
- node-b-59979144 resources (remote node)**
 - Status: **active on node-b-5... (remote node)**
 - Synchronization status: **syncd**
 - Buttons: **move to local node** (red), **sync between nodes** (grey)

At the bottom of the interface, there is an 'Event Viewer' icon and the text 'Data Storage Software V7 - All rights reserved'.



Data Server (DSS1)

node-a

IP Address:192.168.0.220

9. Run Failback Function

In order to test failback, click the **move to local node** button in the **Resources pool manager** box for local node resources and confirm this action by clicking the **move** button.



Data Server (DSS1)
node-a
IP Address:192.168.0.220

9. Run Failback Function

After completing this step, the status for node-a resources should state „active on node-a (local node)” and the **Synchronization status** should state „synced”. Then, you can apply the same actions for **node-b resources**.

NOTE:

The Active-Active option allows configuring resource pools on both nodes and makes it possible to run some active volumes on node-a and other active volumes on node-b. The Active-Active option is enabled with the TRIAL mode for 60 days or when purchasing the Active-Active Failover Feature Pack. The Active-Passive option allows configuring a resource pool only on one of the nodes. In such a case, all volumes are active on a single node only.

The configuration and testing of Active-Active iSCSI Failover is now complete.

The screenshot shows the Open-E DSS V7 web interface. The top navigation bar includes 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. The current page is 'Setup > Failover'. The main content area is titled 'Resources pool manager' and contains two resource pool sections. The first section is for 'node-a-39166501 resources (local node)'. It shows an 'Info' message: 'While a cluster is running you are not able to change settings. Please stop cluster in order to make changes.' Below this, the status is 'active on node-a-3... (local node)' and the synchronization status is 'synced'. There are buttons for 'move to remote node' and 'sync between nodes'. The second section is for 'node-b-59979144 resources (remote node)'. It shows an 'Info' message: 'Resources were moved successfully.' Below this, the status is 'active on node-b-5... (remote node)' and the synchronization status is 'synced'. There are buttons for 'move to local node' and 'sync between nodes'. At the bottom of the interface, there is an 'Event Viewer' section and a footer that reads 'Data Storage Software V7 - All rights reserved'.

NOTE:

The Active-Active configuration shown on page 3 is optional. In this option, each Virtual IP address has been assigned to a dedicated NIC. First Virtual IP to eth2 and the second Virtual IP to eth3.

It is also possible to assign both Virtual IP addresses to a single NIC. For example, the first and second Virtual IP can be assigned to eth2. Such an option can be considered in case of using 10Gb NIC and when there is not enough ports in the server or in the switch. Please find such an option shown on page 46.

Another configuration option can be bonding eth2 and eth3, and assigning both Virtual IP to the bond. Please find this option shown on page 47.

Finally, a Multipath I/O can be configured with Active-Active Failover. For Multipath with 2 paths, there will be 2 NICs and 4 Virtual IP addresses assigned. Please find this option shown on page 48. Moreover, page 49 presents a screenshot of the "Resources pool manager" function with 4 virtual IP added.

Open-E DSS V7 Active-Active iSCSI Failover



Hardware Configuration with 2 IP virtual addresses on the single NIC



PING NODES

IP Addresses : 192.168.2.7; 192.168.3.7

Data Server (DSS220)

node-a

IP Address:192.168.0.220

Data Server (DSS221)

node-b

IP Address:192.168.0.221

RAID System 1

Port used for WEB GUI management

IP:192.168.0.220

eth0

Volume Replication ,
Auxiliary connection (Heartbeat)

IP:192.168.1.220

eth1

Storage Client Access, Auxiliary connection (Heartbeat)

IP:192.168.2.220

eth2

Volume Groups (vg00)

iSCSI volumes (lv0000, lv0001)

iSCSI targets

Control

Switch 1

Switch 2

RAID System 2

Port used for WEB GUI management

IP:192.168.0.221

eth0

Volume Replication ,
Auxiliary connection (Heartbeat)

IP:192.168.1.221

eth1

Storage Client Access, Auxiliary connection (Heartbeat)

IP:192.168.2.221

eth2

Volume Groups (vg00)

iSCSI volumes (lv0000, lv0001)

iSCSI targets

Note:

It is strongly recommended to use direct point-to-point and if possible 10Gb connection for the volume replication.

Optionally it can work over the switch, but the most reliable is direct connection.

Virtual IP Address:
192.168.20.100 (resources pool
node-a iSCSI Target0)

Virtual IP Address:
192.168.30.100 (resources pool
node-b iSCSI Target1)

iSCSI Failover/Volume Replication (eth1)

NOTE:

To prevent switching loops, it's recommended to use RSTP (802.1w) or STP (802.1d) protocol on network switches used to build A-A Failover network topology.

Open-E DSS V7 Active-Active iSCSI Failover



Hardware Configuration with 2 IP virtual addresses on bond.

Data Server (DSS220)
node-a
IP Address: 192.168.0.220

Data Server (DSS221)
node-b
IP Address: 192.168.0.221

RAID System 1

RAID System 2

Port used for WEB GUI management
IP: 192.168.0.220 **eth0**

Port used for WEB GUI management
IP: 192.168.0.221 **eth0**

Volume Replication, Auxiliary connection (Heartbeat)
IP: 192.168.1.220 **eth1**

Volume Replication, Auxiliary connection (Heartbeat)
IP: 192.168.1.221 **eth1**

Storage Client Access, Auxiliary connection (Heartbeat)
IP: 192.168.2.220 **bond0 (eth2, eth3)**

Storage Client Access, Auxiliary connection (Heartbeat)
IP: 192.168.2.221 **bond0 (eth2, eth3)**

Volume Groups (vg00)

Volume Groups (vg00)

iSCSI volumes (lv0000, lv0001)

iSCSI volumes (lv0000, lv0001)

iSCSI targets

iSCSI targets

Virtual IP Address:
192.168.20.100 (resources pool node-a iSCSI Target0)

Virtual IP Address:
192.168.30.100 (resources pool node-b iSCSI Target1)

iSCSI Failover/Volume Replication (eth1)

Note:
It is strongly recommended to use direct point-to-point and if possible 10Gb connection for the volume replication.
Optionally it can work over the switch, but the most reliable is direct connection.

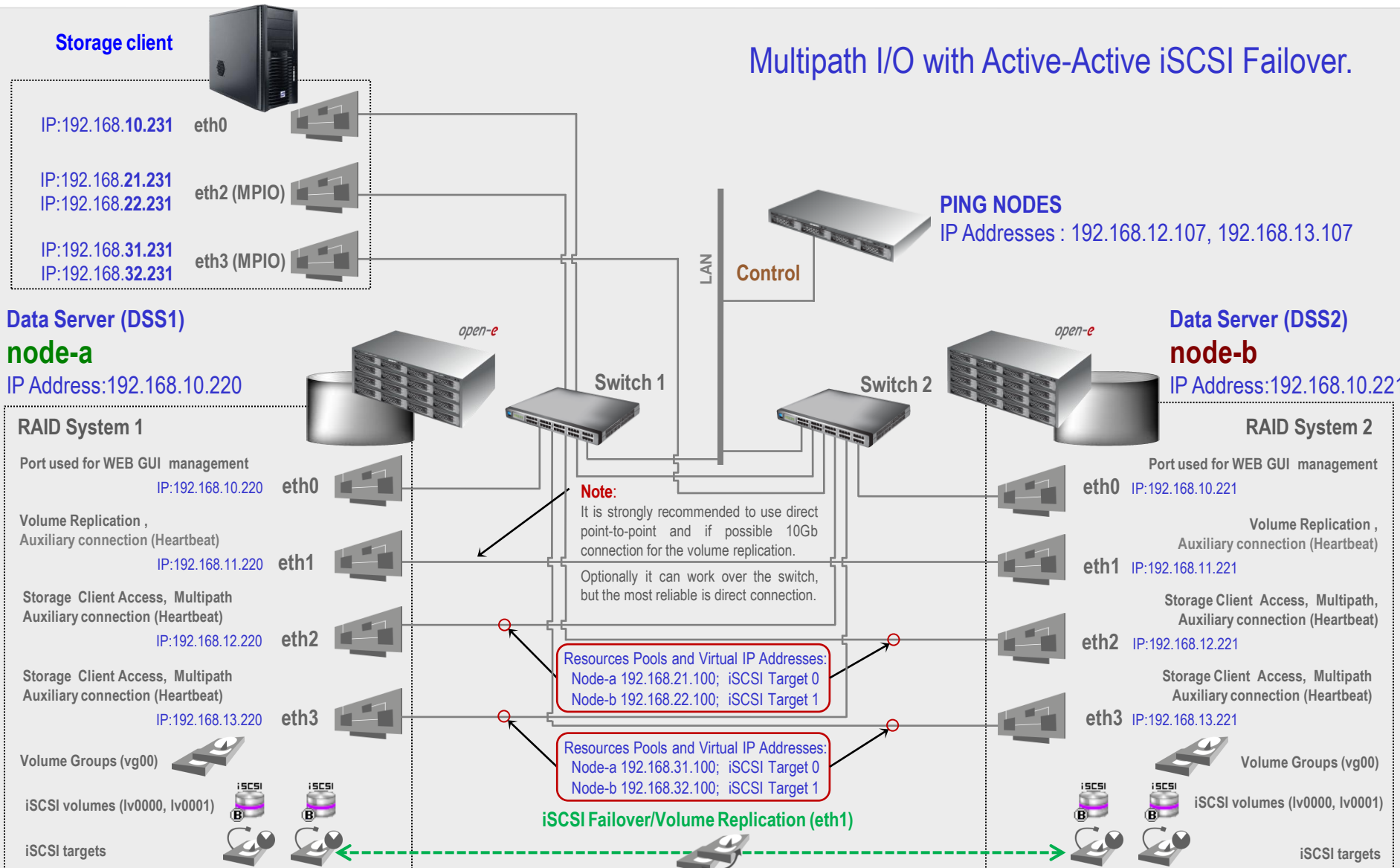
NOTE:

To prevent switching loops, it's recommended to use RSTP (802.1w) or STP (802.1d) protocol on network switches used to build A-A Failover network topology.

Open-E DSS V7 Active-Active iSCSI Failover



Multipath I/O with Active-Active iSCSI Failover.



NOTE:

To prevent switching loops, it's recommended to use RSTP (802.1w) or STP (802.1d) protocol on network switches used to build A-A Failover network topology.

The screenshot displays the Open-E DSS V7 Resources pool manager interface. The top navigation bar includes 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. The breadcrumb trail shows 'You are here: Setup > Failover'. The main content area is titled 'Resources pool manager' and contains an information box stating: 'While a cluster is running you are not able to change settings. Please stop cluster in order to make changes.' Below this, the interface is divided into sections for two nodes: 'node-a-64666157 resources (local node)' and 'node-b-60346976 resources (remote node)'. Each node section shows its status as 'active on node-a-6...' and 'synced' synchronization status. There are buttons for 'move to remote node' and 'sync between nodes'. Underneath, there are tabs for 'Virtual IP addresses' and 'iSCSI resources'. An 'add virtual IP' button is present. A table lists virtual IP addresses and their corresponding interfaces on both local and remote nodes. For node-a, the virtual IPs are 192.168.21.100 and 192.168.31.100. For node-b, they are 192.168.22.100 and 192.168.32.100. The interface also includes an 'Event Viewer' link at the bottom left and a footer with 'Data Storage Software V7 - All rights reserved'.

Resources pool manager

Info
While a cluster is running you are not able to change settings. Please stop cluster in order to make changes.

node-a-64666157 resources
(local node)

Status: **active on node-a-6...** (local node) move to remote node

Synchronization status: **synced** sync between nodes

Virtual IP addresses | iSCSI resources

add virtual IP

Virtual IP	Interface on local node:	Interface on remote node:
192.168.21.100	eth2 (192.168.12.220)	eth2 (192.168.12.221)
192.168.31.100	eth3 (192.168.13.220)	eth3 (192.168.13.221)

node-b-60346976 resources
(remote node)

Status: **active on node-b-6...** (remote node) move to local node

Synchronization status: **synced** sync between nodes

Virtual IP addresses | iSCSI resources

add virtual IP

Virtual IP	Interface on local node:	Interface on remote node:
192.168.22.100	eth2 (192.168.12.220)	eth2 (192.168.12.221)
192.168.32.100	eth3 (192.168.13.220)	eth3 (192.168.13.221)

★ Event Viewer

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Thank you!

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