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ENTERPRISE LEVEL STORAGE OS
for EVERY BUSINESS

How to setup DSS V6 iSCSI Failover with XenServer using Multipath



DSS V6
DATA STORAGE SOFTWARE

16 TB



Easy to use, GUI based management provides performance and security.



Reliable disk based backup and recovery, along with Snapshot capability enable fast and reliable backup and restore.



Easy to implement remote Replication, at block or volume level, enables cost-effective disaster recovery.



IP based storage management combines NAS and iSCSI functionality for centralized storage and storage consolidation.

Software Version: DSS ver. 6.00 up55

Presentation updated: February 2011

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TO SET UP VOLUME REPLICATION WITH FAILOVER WITH MULTIPATH, PERFORM THE FOLLOWING STEPS:

1. Hardware configuration:
 - Settings server names, ethernet ports on both nodes.
2. Configure the Secondary node:
 - Create a Volume Group, iSCSI Volume
 - Configure Volume Replication mode (destination mode) – settings mirror IP address
3. Configure the Primary node
 - Create a Volume Group, iSCSI Volume
 - Configure Volume Replication mode (source mode) – settings mirror IP address, creating Volume Replication task and start replication task.
4. Create new target on Secondary node
5. Create new target on Primary node
6. Configure iSCSI Failover (primary and secondary node, unicast)
7. Configure virtual IP and Auxiliary connection
8. Start Failover Service
9. Test Failover Function
10. Run Failback Function
11. Configure MPIO on XenServer (49÷74 slides)

Synchronous Volume Replication with Failover with Multipath

Storage Client

IP Address : 192.168.10.251
 IP Address : 192.168.20.251
 (Multipath - Round Robin)

PING NODEs

IP Address : 192.168.1.106; 192.168.1.107
 IP Address : 192.168.2.106; 192.168.2.107

Data Server (DSS1)

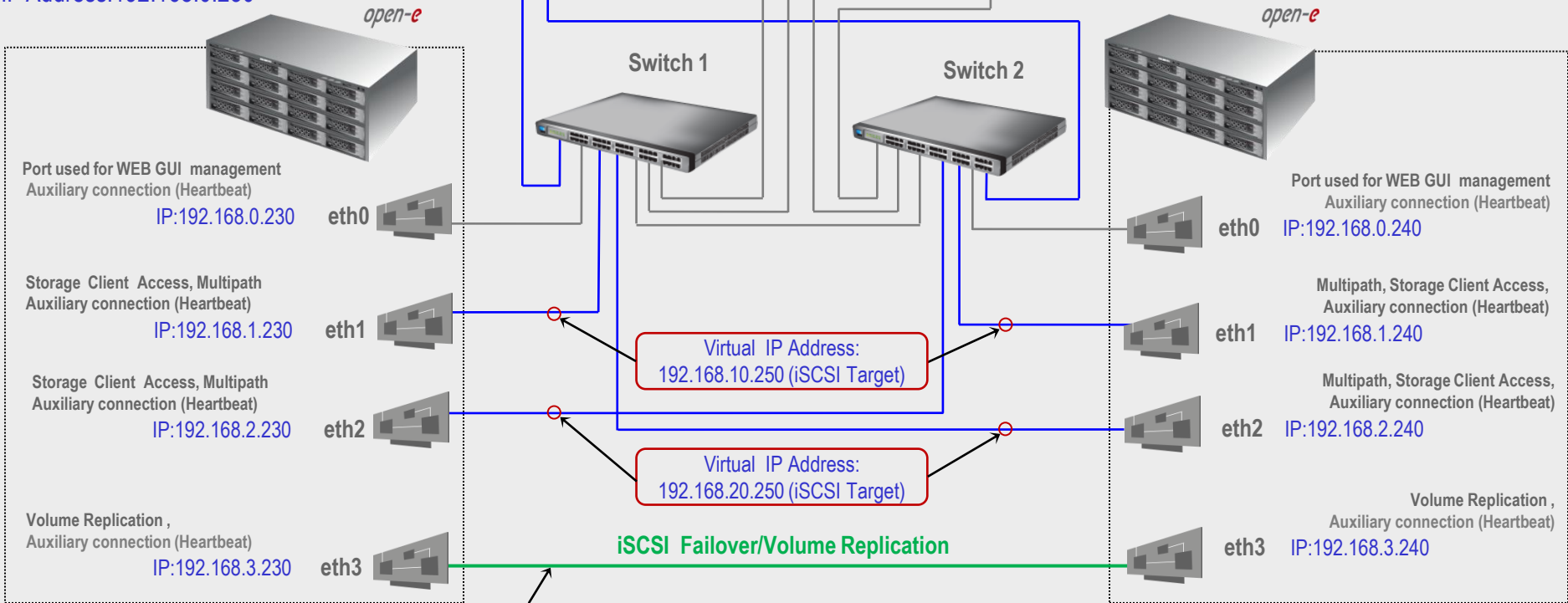
Primary node

IP Address: 192.168.0.230

Data Server (DSS2)

Secondary node

IP Address: 192.168.0.240



Note: Direct point-to-point connection is recommended for the volume replication.



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Data Server (DSS2)
Secondary node
IP Address:192.168.0.240

1. Hardware Configuration

After logging on the DSS V6 please go to „**SETUP**” tab, „**network**” and „**Interfaces**”. In „**Server name**” function enter Server name, in this example „**dss2**” and click **apply** button. (All connections will be restarted)

The screenshot shows the open-e web interface for Data Storage Software V6. The navigation menu includes SETUP, CONFIGURATION, MAINTENANCE, STATUS, and HELP. The current page is 'Interfaces' under the 'network' section. On the left, there are two panels: 'Interfaces' and 'iSCSI Failover', both listing network interfaces eth0, eth1, eth2, and eth3. The 'Server name' configuration panel is active, showing a text input field with 'dss2' and a comment field with 'Data Storage Software'. An 'apply' button is visible. Below it is the 'Hostname' panel, which includes an information message and a text input field with 'dssA0000032'. At the bottom, there is a 'DNS settings' panel with an empty text input field and an 'apply' button. The footer of the interface includes 'Event Viewer' and 'Data Storage Software V6 - All rights reserved'.



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Data Server (DSS2)

Secondary node

IP Address: 192.168.0.240

1. Hardware Configuration

Next select **eth0** interface and change IP Address from 192.168.0.220 in field IP address to 192.168.0.240, and click **apply** button. (This will restart network configuration).

The screenshot shows the open-e web interface for configuring the eth0 interface. The breadcrumb path is "You are here: SETUP > network > Interfaces > eth0". The "Interfaces" section on the left shows a list of interfaces: eth0 (selected), eth1, eth2, and eth3. The "IP address" section on the right shows a warning: "Warning! You are currently connected through this interface." Below the warning, the "Static" option is selected for the IP configuration. The IP address field is set to 192.168.0.240, the netmask is 255.255.255.0, and the broadcast is set to auto. The MAC address is 00:E0:81:58:4F:C3. An "apply" button is visible at the bottom right of the configuration section. At the bottom of the interface, there is an "Event Viewer" icon and a footer that reads "Data Storage Software V6 - All rights reserved".



Data Server (DSS2)
Secondary node
IP Address: 192.168.0.240

1. Hardware Configuration

Now select **eth1** interface and change IP address from 192.168.1.220 in field IP address to 192.168.1.240 and click **apply** button.

Next change IP address for **eth2** and **eth3** from 192.168.2.220 and 192.168.3.220 to 192.168.2.240 and 192.168.3.240 accordingly.

The screenshot shows the open-e web interface for configuring network interfaces. The breadcrumb trail is "You are here: SETUP > network > Interfaces > eth1".

- Interfaces:** A list of interfaces (eth0, eth1, eth2, eth3) with radio buttons. **eth1** is selected.
- Interface info:** Shows "Intel Corporation 82557/8/9/0/1 Ethernet Pro 100 (rev 10)".
- IP address:** Configuration options for the selected interface.
 - Active
 - MAC: 00:E0:81:58:4F:C5
 - DHCP
 - Static
 - IP address: 192.168.1.240
 - Netmask: 255.255.255.0
 - Broadcast: auto
 - Gateway: (empty)

An **apply** button is visible at the bottom right of the IP address section. A note at the bottom says "Please apply changes or press 'reload' button to discard".



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Data Server (DSS1)

Primary node

IP Address:192.168.0.230

1. Hardware Configuration

After logging on the primary node please go to „**SETUP**” tab, „**network**” and „**Interfaces**”. In „**Server name**” function enter Server name. In this example enter **dss1** and click **apply** button. (All connection will be restarted).

The screenshot shows the open-e web interface. At the top, there is a navigation bar with tabs for SETUP, CONFIGURATION, MAINTENANCE, STATUS, and HELP. The current page is titled "Interfaces" and is part of the "network" section. On the left, there are two panels: "Interfaces" and "iSCSI Failover", both showing a list of network interfaces (eth0, eth1, eth2, eth3). The "Server name" configuration panel is active, showing a text input field with "dss1" and a comment field with "Data Storage Software". Below the input fields is an "apply" button. A message below the panel says "Please apply changes or press 'reload' button to discard". The "Hostname" panel is also visible, showing an "Info" message and a text input field with "dssA0000031" and an "apply" button. The "DNS settings" panel is at the bottom, showing a text input field and an "apply" button. The footer of the interface includes "Event Viewer:" with an envelope icon and "Data Storage Software V6 - All rights reserved".



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Data Server (DSS1)
Primary node
IP Address: 192.168.0.230

1. Hardware Configuration

Next select **eth0** interface and change IP Address from 192.168.0.220 in field IP address to 192.168.0.230, and click **apply** button. (This will restart network configuration).

The screenshot shows the open-e web interface for configuring the network. The breadcrumb trail is "You are here: SETUP > network > Interfaces > eth0".

- Interfaces:** A list of interfaces (eth0, eth1, eth2, eth3) is shown on the left. The **eth0** interface is selected and highlighted with a red dot.
- Interface info:** Shows "Intel Corporation 82571EB Gigabit Ethernet Controller (rev 06)".
- IP address:** A warning message states "Warning! You are currently connected through this interface." Below this, the configuration options are:
 - Active
 - MAC: 00:15:17:18:E7:F4
 - DHCP
 - Static
 - IP address: 192.168.0.230
 - Netmask: 255.255.255.0
 - Broadcast: auto
 - Gateway: (empty field)
- apply** button: A red button labeled "apply" is located at the bottom right of the IP address configuration section.
- Footer:** "Please apply changes or press 'reload' button to discard" and "Data Storage Software V6 - All rights reserved".



Data Server (DSS1)
Primary node
IP Address:192.168.0.230

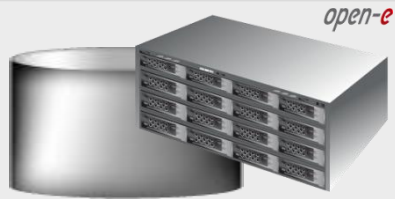
1. Hardware Configuration

Now select **eth1** interface and change IP address from 192.168.1.220 in field IP address to 192.168 .1.230 and click **apply** button.

Next change IP address for **eth2** and **eth3** from 192.168.2.220 and 192.168.3.220 to 192.168 .2.230 and 192.168 .3.230 accordingly.

The screenshot shows the open-e web interface for configuring network interfaces. The breadcrumb trail is "You are here: SETUP > network > Interfaces > eth1".

- Interfaces:** A list of interfaces (eth0, eth1, eth2, eth3) with radio buttons. **eth1** is selected.
- Interface info:** Shows "Intel Corporation 82571EB Gigabit Ethernet Controller (rev 06)".
- IP address:** Configuration panel for the selected interface.
 - Active
 - MAC: 00:15:17:18:E7:F5
 - DHCP
 - Static
 - IP address: 192.168.1.230
 - Netmask: 255.255.255.0
 - Broadcast: auto
 - Gateway: (empty)
- Buttons:** An "apply" button is visible at the bottom right of the IP address configuration panel.
- Footer:** "Please apply changes or press 'reload' button to discard" and "Data Storage Software V6 - All rights reserved".



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Data Server (DSS2)

Secondary node

IP Address:192.168.0.240

2. Configure the Secondary node

Under the „CONFIGURATION” tab, select „volume manager” and next Vol. Groups.

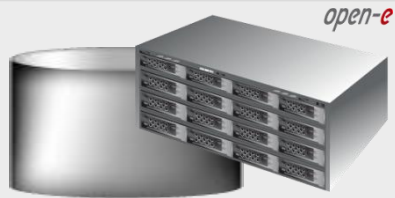


Volume Groups (vg00)

In **Unit manager** function 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 web interface with the following elements:

- Header: open-e | ENTERPRISE CLASS STORAGE OS for EVERY BUSINESS | DATA STORAGE SOFTWARE V6
- Navigation: SETUP | CONFIGURATION | MAINTENANCE | STATUS | HELP
- Breadcrumbs: You are here: CONFIGURATION > volume manager > Vol. groups
- Left sidebar: Vol. groups (selected), Vol. replication
- Main content area:
 - Unit rescan**: rescan button
 - Unit manager**:
 - Table with columns: Unit, Size (GB), Serial number, Status
 - Row: Unit MD0, 298.10, N/A, available
 - Action: new volume group (dropdown)
 - Name: vg00
 - apply button
 - Text: Please apply changes or press "reload" button to discard
 - Drive identifier**:
 - Table with columns: Unit, Serial number, Status
 - Row 1: Unit S000, 9SY0QWBT
 - Row 2: Unit S001, 9RA6VDG3
 - apply button



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Data Server (DSS2)
Secondary node
IP Address: 192.168.0.240

2. Configure the Secondary node

Select the appropriate volume group (**vg00**) from the list on the left and create a **new iSCSI volume** of the required size. This logical volume will be the destination of the replication process.

Next check the box with **Use volume replication**

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

The screenshot shows the open-e web interface for configuring a secondary node. The navigation menu includes SETUP, CONFIGURATION, MAINTENANCE, STATUS, and HELP. The current page is 'CONFIGURATION > volume manager > Vol. groups > vg00'. The 'Vol. groups' panel on the left shows 'vg00' selected. The 'Vol. replication' panel is also visible. The main configuration area for 'Volume manager' includes a table of system volumes and a form for creating a new iSCSI volume.

System volumes	Size (GB)
SWAP	4.00
Reserved for snapshots	0.00
Reserved for system	4.00
Reserved for replication	0.00
Free	290.06

Action: new iSCSI volume
Options: Just create volume

Use volume replication

File I/O
 Initialize
Rate: medium

Block I/O

0 290.06
add: 150 GB (+0.12 GB for replication)

apply

Please apply changes or press "reload" button to discard



Data Server (DSS2)

Secondary node

IP Address: 192.168.0.240

2. Configure the Secondary node

The destination iSCSI Volume Block I/O is now configured.



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SETUP | CONFIGURATION | MAINTENANCE | STATUS | HELP

You are here: CONFIGURATION > volume manager > Vol. groups > vg00

Vol. groups

- vg00

Vol. replication

Volume manager

Info
Logical volume lv0000 has been created successfully.

Logical Volume	Type	Snap.	Rep.	Init.	Blocksize (bytes)	Size (GB)
lv0000	B		✓		N/A	150.00
System volumes						Size (GB)
SWAP						4.00
Reserved for snapshots						0.00
Reserved for system						4.00
Reserved for replication						0.13
Free						139.94

Action: new NAS volume

Use volume replication

WORM

0 139.94

add: 0.00 GB

apply

Event Viewer: [icon]

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Data Server (DSS2)
Secondary node
IP Address: 192.168.0.240

2. Configure the Secondary node

Now, select the **Vol. replication** and check the box under **Destination** and click the **apply** button

Next, under **Mirror Server IP** function, enter the IP address of the Primary node (in our example, this would be 192.168.3.230) and click the **apply** button

The screenshot shows the open-e web interface for configuring volume replication. The navigation menu includes SETUP, CONFIGURATION, MAINTENANCE, STATUS, and HELP. The breadcrumb trail indicates the current location: CONFIGURATION > volume manager > Vol. replication.

The interface is divided into several sections:

- Vol. groups:** A list containing 'vg00'.
- Vol. replication:** A section with a table for volume replication mode and a 'Mirror server IP' configuration area.
- Volume replication mode table:**

Logical Volume	Init	Source	Destination	Clear metadata
lv0000	done	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
- Mirror server IP:** A form with 'IP address:' set to '192.168.3.230' and 'WAN' unchecked.
- Create new volume replication task:** An info message stating 'Mirror Server IP is not set.'
- Replication tasks manager:** A section with an info message.

Blue arrows from the instructional text point to the 'Destination' checkbox in the table and the 'IP address' input field.

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:

- Source: 192.168.3.230
- Destination: 192.168.3.240



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Data Server (DSS1)

Primary node

IP Address:192.168.0.230

3. Configure the Primary node

Under the „CONFIGURATION” tab, select „volume manager” and next „Vol. 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 web interface with the following elements:

- Header: open-e | ENTERPRISE CLASS STORAGE OS for EVERY BUSINESS | DATA STORAGE SOFTWARE V6
- Navigation tabs: SETUP, CONFIGURATION, MAINTENANCE, STATUS, HELP
- Breadcrumb: You are here: CONFIGURATION > volume manager > Vol. groups
- Left sidebar: Vol. groups (vg00), Vol. replication
- Main content area:
 - Unit rescan: rescan button
 - Unit manager table:

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

Action: new volume group
Name: vg00

apply button

Please apply changes or press "reload" button to discard
 - Drive identifier table:

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

apply button



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Data Server (DSS1)
Primary node
IP Address:192.168.0.230

3. Configure the Primary node

Select the appropriate volume group (**vg00**) from the list on the left and create a **new iSCSI volume** of the required size. This logical volume will be the destination of the replication process

Next, check box **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.

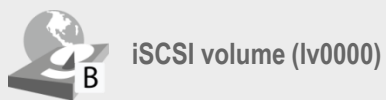
The screenshot shows the open-e web interface for configuring a volume. The breadcrumb trail is: CONFIGURATION > volume manager > Vol. groups > vg00. The 'Volume manager' section shows system volumes: SWAP (4.00 GB), Reserved for snapshots (0.00), Reserved for system (4.00), Reserved for replication (0.00), and Free (457.66 GB). The 'Action' dropdown is set to 'new iSCSI volume' and 'Options' is 'Just create volume'. The 'Use volume replication' checkbox is checked. Under 'File I/O', 'Initialize' is checked with a 'Rate' of 'medium'. Under 'Block I/O', a slider is set to 150 GB, with a note '(+0.12 GB for replication)'. The 'apply' button is highlighted in red. A footer note says 'Please apply changes or press "reload" button to discard'.



Data Server (DSS1)
Primary node
IP Address:192.168.0.230

3. Configure the Primary node

The source iSCSI Volume Block I/O is now configured.



Logical Volume	Type	Snap.	Rep.	Init.	Blocksize (bytes)	Size (GB)
lv0000	B2		✓		N/A	150.00
System volumes						Size (GB)
SWAP						4.00
Reserved for snapshots						0.00
Reserved for system						4.00
Reserved for replication						0.13
Free						307.53



Data Server (DSS1)
Primary node
IP Address:192.168.0.230

3. Configure the Primary node

Now, select **Vol. replication**, and check the box under **Source** and click the **apply** button

Next , under **Mirror Server IP** function, enter the IP address of the Secondary node (in our example this would be 192.168.3.240) and click the **apply** button

The screenshot shows the open-e web interface for configuring volume replication. The breadcrumb trail is: CONFIGURATION > volume manager > Vol. replication. The left sidebar has 'Vol. groups' (containing 'vg00') and 'Vol. replication' selected. The main content area has three panels:

- Volume replication mode:** A table with columns: Logical Volume, Init, Source, Destination, Clear metadata. The row for 'lv0000' shows 'done' in the Init column, a checked box in the Source column, and unchecked boxes in the Destination and Clear metadata columns. An 'apply' button is at the bottom right.
- Mirror server IP:** A form with 'IP address:' set to '192.168.3.240' and an unchecked 'WAN' checkbox. An 'apply' button is at the bottom right. A note below says 'Please apply changes or press "reload" button to discard'.
- Create new volume replication task:** An info message: 'Mirror Server IP is not set.'
- Replication tasks manager:** An info message.

At the bottom, there is an 'Event Viewer' icon and a footer: 'Data Storage Software V6 - All rights reserved'.



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Data Server (DSS1)

Primary node

IP Address:192.168.0.230

3. Configure the Primary node

Enter the task name in field **Task name** next 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 web interface for configuring volume replication. The breadcrumb trail is: CONFIGURATION > volume manager > Vol. replication. The left sidebar shows a tree view with 'Vol. groups' containing 'vg00' and 'Vol. replication'. The main content area has three panels: 1. 'Mirror server IP' with 'IP address' set to '192.168.3.240' and a 'WAN' checkbox, with an 'apply' button. 2. 'Create new volume replication task' with 'Task name' set to 'MirrorTask', 'Source volume' set to 'lv0000', 'Destination volume' set to 'lv0000', and 'Bandwidth for SyncSource (MB)' set to '40'. There is an 'arrow' button next to the destination volume field and a 'create' button. 3. 'Replication tasks manager' showing an info message: 'No tasks have been found.' The footer includes 'Event Viewer' and 'Data Storage Software V6 - All rights reserved'.



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Data Server (DSS1)
Primary node
IP Address: 192.168.0.230

3. Configure the Primary node

Now, in the **Replication task manager** function, click on button under to start the Replication task on the Primary node

The screenshot shows the open-e web interface for configuring a replication task. The breadcrumb trail is: You are here: CONFIGURATION > volume manager > Vol. replication. The left sidebar shows a tree view with 'Vol. groups' containing 'vg00' and 'Vol. replication' containing 'MirrorTask'. The main content area has several sections: 1. An 'apply' button. 2. 'Mirror server IP' section with 'IP address: 192.168.3.240' and a 'WAN' checkbox. 3. 'Create new volume replication task' section with an 'Info' message: 'No volumes with replication functionality found or all volumes have a task assigned already.' 4. 'Replication tasks manager' section with a table:

Name	Start time	Action
MirrorTask	n/a	

At the bottom, there is an 'Event Viewer' icon and a footer: 'Data Storage Software V6 - All rights reserved'.



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Data Server (DSS1)
Primary node
IP Address:192.168.0.230

3. Configure the Primary node

In the **Replication tasks manager** function information is available about the current running replication task.

The screenshot shows the open-e web interface for configuring a primary node. The navigation menu includes SETUP, CONFIGURATION, MAINTENANCE, STATUS, and HELP. The current page is CONFIGURATION > volume manager > Vol. replication.

Vol. groups

- vg00

Vol. replication

- MirrorTask

Mirror server IP

IP address: 192.168.3.240
 WAN
apply

Create new volume replication task

Info
No volumes with replication functionality found or all volumes have a task assigned already.

Replication tasks manager

Name	Start time	Action
MirrorTask	2011-02-08 20:58:31	
Source volume:	lv0000	
Destination volume:	lv0000	
Destination IP:	192.168.3.240	
Protocol type:	Synchronous	

Event Viewer:

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Data Server (DSS1)
Primary node
IP Address:192.168.0.230

3. Configure the Primary node

Under the „STATUS” tab,
select „tasks” and Volume
Replication

Click on the button with
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

- Backup
- Restore from backup
- Data Replication
- Antivirus
- Volume Replication**
- Snapshots

Running tasks

Name	Type	Start time
MirrorTask	Volume replication	2011-02-08 20:58:31

Protocol type: Synchronous
Connection: Connected

Source info:
Logical volume: lv0000
Consistency: Consistent

Destination info:
Logical volume: lv0000
Consistency: Consistent
IP address: 192.168.3.240

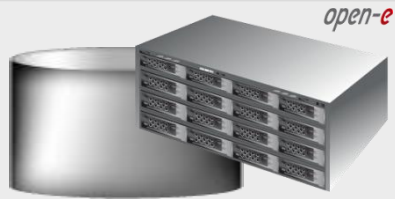
Tasks log

Time	Name	Type	Status	Action
2011-02-08 20:58:36	MirrorTask	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)
Secondary node
IP Address:192.168.0.240

4. Create new target on the Secondary node

Choose „**CONFIGURATION**“, „**iSCSI target manager**“ and „**Targets**“ from the menu

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

iSCSI targets



NOTE:

Both systems must have the same Target name.



Data Server (DSS2)
Secondary node
IP Address:192.168.0.240

4. Create new target on the Secondary node

Select target0 within the Targets field.

To assign a volume to the target, click the button  located under **Action**

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SETUP | CONFIGURATION | MAINTENANCE | STATUS | HELP

You are here: CONFIGURATION > iSCSI target manager > Targets > iqn.2011-02:zen-demo (target0)

Targets

- target0


CHAP users

Target volume manager

Info
Currently there are no LUN's added to this target. In order to add a LUN, click on the plus "+" sign in the "Action" column for this LUN.

Info
There are logical volumes selected as mirror destination volume. In order to access such volume, you can stop mirror task and switch destination mode to source mode or create a snapshot on the destination volume and assign the snapshot to a new target.

Info
Please note that in order to access iSCSI-enabled data from an initiator, the target needs to have a LUN 0, otherwise the data in all other LUNs will be inaccessible. The data will also be inaccessible if you select an inactive snapshot or a destination volume (volume replication) as LUN 0.


Volume	SCSI ID	LUN	RO	WB	Action
lv0000	000000000000000000	0	<input type="checkbox"/>	<input type="checkbox"/>	

Please apply changes or press "reload" button to discard

Discovery CHAP user access

Enable CHAP user access authentication

apply

Event Viewer: 

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

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



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Data Server (DSS1)
Primary node
IP Address:192.168.0.230

5. Create new target on the Primary node

Choose „CONFIGURATION” and „iSCSI target manager” and „Targets” from the menu

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

iSCSI targets



NOTE:

Both systems must have the same Target name.



Data Server (DSS1)
Primary node
IP Address:192.168.0.230

5. Create new target on the Primary node

Select the target0 within the Targets field

To assign a volume to the target, click the button  located under **Action**

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SETUP | CONFIGURATION | MAINTENANCE | STATUS | HELP

You are here: CONFIGURATION > iSCSI target manager > Targets > **iqn.2011-02:zen-demo (target0)**


Targets

- target0

Target volume manager

Info
Currently there are no LUN's added to this target. In order to add a LUN, click on the plus "+" sign in the "Action" column for this LUN.

Info
Please note that in order to access iSCSI-enabled data from an initiator, the target needs to have a LUN 0, otherwise the data in all other LUNs will be inaccessible. The data will also be inaccessible if you select an inactive snapshot or a destination volume (volume replication) as LUN 0.

Volume	SCSI ID	LUN	RO	WB	Action
lv0000	0000000000000000	0	<input type="checkbox"/>	<input type="checkbox"/>	

Please apply changes or press "reload" button to discard

Discovery CHAP user access


Enable CHAP user access authentication

apply

Target IP access

Deny access:

Allow access:

Event Viewer: 

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



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Data Server (DSS1)

Primary node

IP Address:192.168.0.230

6. Configure iSCSI Failover

Now, select iSCSI Failover

In the Failover configuration function, check the box **Enable iSCSI failover functionality**. Select **Network connection mode** (in this example **Unicast**) and select **Network interface for unicast** (192.168.0.230). Next enter the **Secondary node IP** and the **Ping Node IP** (must be on the same subnet) and click the **apply** button.



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Data Server (DSS2)
Secondary node
IP Address:192.168.0.240

6. Configure iSCSI Failover

Now, select iSCSI Failover

Now, in **Failover configuration** function, check the box **Enable iSCSI failover functionality**. Select **Network connection mode** (in this example **Unicast**) and select **Network interface for unicast** (bond0). After choose **Secondary node on localhost** enter **Primary node IP** address and click the **apply** button

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SETUP CONFIGURATION MAINTENANCE STATUS HELP

You are here: SETUP > network > iSCSI Failover

Interfaces

- eth0
- eth1
- eth2
- eth3

Failover status

Info
Failover statistics are unavailable due to the iSCSI Failover service being disabled. Please go to Failover Configuration to enable it.

Failover configuration

Enable iSCSI failover functionality

Network connection mode: Unicast

Network interface for unicast: eth0 » 192.168.0.240

Primary node on localhost
Secondary node IP:
Ping node IP(s):

Show advanced >>

Secondary node on localhost
Primary node IP: 192.168.0.230

Show advanced >>

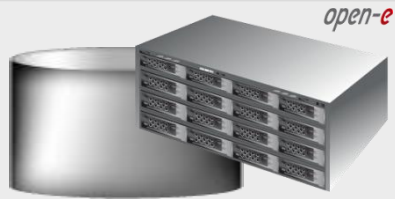
apply

Please apply changes or press "reload" button to discard

Failover Tasks

Event Viewer: [icon]

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Data Server (DSS1)
Primary node
IP Address:192.168.0.230

7. Configure Virtual IP and Auxillary connection

Now, select the eth0 within iSCSI Failover. In the Auxillary connection function check box Use this network interface to communicate between the nodes next enter IP address for Unicast remote IP and click the apply button.

The screenshot shows the open-e web interface for configuring network settings. The breadcrumb trail indicates the current location: SETUP > network > iSCSI Failover. The interface is divided into two main sections: 'Interfaces' and 'iSCSI Failover'. The 'Virtual IP Settings' section is also visible, showing an info message, MAC address (00:15:17:18:e7:f4), and an unchecked 'Enable virtual IP' checkbox. The 'Auxillary connection' section is the focus, with the checkbox 'Use this network interface to communicate between the nodes' checked. The 'Unicast remote IP' field is set to 192.168.0.240. A blue callout box with arrows points to the 'eth0' selection in the 'iSCSI Failover' list and the 'Use this network interface...' checkbox in the 'Auxillary connection' section. The footer of the interface includes an 'Event Viewer' icon and the text 'Data Storage Software V6 - All rights reserved'.



Data Server (DSS1)
Primary node
IP Address:192.168.0.230

7. Configure Virtual IP and Auxiliary connection

Now, select the **eth1** within **iSCSI Failover**. In the **Virtual IP Settings** function check box **Enable virtual IP** and enter IP address, Netmask, Broadcast, and click the **apply** button.

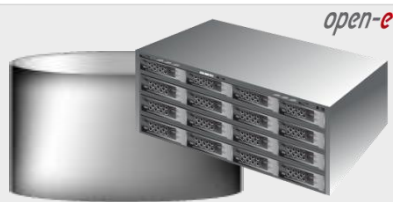
By setting the address of the secondary node in a **Failover configuration**, automatic detection of the interface for communication. This step is necessary to complement the destination IP address used in unicast.

The screenshot shows the open-e web interface with the following configuration steps:

- Virtual IP Settings:** The "Enable virtual IP" checkbox is checked. The IP address is set to 192.168.10.250, the netmask to 255.255.255.0, and the broadcast address to 192.168.10.255.
- iSCSI Failover:** The "eth1" interface is selected for communication between nodes. The unicast remote IP is set to 192.168.1.240.

Blue arrows from the text boxes point to the "eth1" selection in the iSCSI Failover panel and the "Enable virtual IP" checkbox in the Virtual IP Settings panel.

NOTE:
There need to be at least two *auxiliary connections*. The interface with the virtual IP can also serve as one of the auxiliary connections. Please set the Virtual IP Address in a different network subnet then the physical IP Address. To have additional iSCSI Failover systems, please set this pair in a different network subnet from the other iSCSI Failover systems. This limitation will be removed in the future.



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Data Server (DSS1)

Primary node

IP Address:192.168.0.230

7. Configure Virtual IP and Auxillary connection

Now, select the **eth2** within **iSCSI Failover**. In the **Virtual IP Settings** function check box **Enable virtual IP** and enter IP address, Netmask, Broadcast, and click the **apply** button.

By setting the address of the secondary node in a **Failover configuration**, automatic detection of the interface for communication. This step is necessary to complement the destination IP address used in unicast.

The screenshot shows the open-e web interface with the following configuration steps:

- Virtual IP Settings:** The "Enable virtual IP" checkbox is checked. The IP address is set to 192.168.20.250, the netmask to 255.255.255.0, and the broadcast to 192.168.20.255. The MAC address is 00:15:17:18:e7:f6.
- iSCSI Failover:** The "eth2" interface is selected for communication between nodes. The unicast remote IP is set to 192.168.2.240.

Blue arrows from the text boxes point to the "eth2" selection in the iSCSI Failover panel and the "Enable virtual IP" checkbox in the Virtual IP Settings panel.



Data Server (DSS1)
Primary node
IP Address:192.168.0.230

7. Configure Virtual IP and Auxillary connection

Now, select the eth3 within iSCSI Failover. In the Auxillary connection function check box Use this network interface to communicate between the nodes next enter IP address for Unicast remote IP and click the **apply** button.

The screenshot shows the open-e web interface for configuring network settings. The breadcrumb trail indicates the path: SETUP > network > iSCSI Failover. The 'Interfaces' section shows a list of network interfaces: eth0, eth1, eth2, and eth3. The 'iSCSI Failover' section also shows the same list of interfaces, with eth3 selected. The 'Virtual IP Settings' section includes an information box, a MAC address field (00:15:17:18:e7:f7), and an unchecked checkbox for 'Enable virtual IP'. The 'Auxillary connection' section has a checked checkbox for 'Use this network interface to communicate between the nodes' and a text input field for 'Unicast remote IP' containing the value 192.168.3.240. Both sections have an 'apply' button. A footer note says 'Please apply changes or press "reload" button to discard'. The footer also contains 'Event Viewer:' with an envelope icon and 'Data Storage Software V6 - All rights reserved'.



Data Server (DSS2)
Secondary node
IP Address:192.168.0.240

7. Configure Virtual IP and Auxillary connection

Now, select the eth0 within iSCSI Failover.
In the **Auxiliary connection** function enter IP address for **Unicast remote IP** and click the **apply** button.

The screenshot shows the open-e web interface for configuring iSCSI Failover. The breadcrumb trail is "You are here: SETUP > network > iSCSI Failover".

- Interfaces:** A list of network interfaces: eth0, eth1, eth2, and eth3. eth0 is selected.
- iSCSI Failover:** A list of network interfaces: eth0, eth1, eth2, and eth3. eth0 is selected.
- Virtual IP Settings:**
 - Info: Virtual IP must be set in different subnetwork than physical IP on this machine and must be in different subnetwork than Virtual IP sets on other machines in the same network area configured also as failover.
 - MAC: 00:e0:81:58:4f:c3
 - Enable virtual IP
 - apply** button
- Auxiliary connection:**
 - Use this network interface to communicate between the nodes.
 - Unicast remote IP: 192.168.0.230
 - apply** button
 - Please apply changes or press "reload" button to discard

Event Viewer: [icon]

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Data Server (DSS2)
Secondary node
IP Address: 192.168.0.240

7. Configure Virtual IP and Auxiliary connection

Now, select the **eth1** within **iSCSI Failover**. In the **Virtual IP Settings** function check the box **Enable virtual IP** and enter **IP address, Netmask, Broadcast**, and click the **apply** button.

By setting the address of the primary node in a **Failover configuration**, automatic detection of the interface for communication. This step is necessary to complement the destination IP address used in unicast.

The screenshot shows the open-e web interface with the following configuration steps visible:

- Virtual IP Settings:**
 - MAC: 00:e0:81:58:4f:c5
 - Enable virtual IP
 - IP address: 192.168.10.250
 - Netmask: 255.255.255.0
 - Broadcast: 192.168.10.255
 - apply button
- iSCSI Failover:**
 - eth0
 - eth1
 - eth2
 - eth3
- Auxiliary connection:**
 - Use this network interface to communicate between the nodes.
 - Unicast remote IP: 192.168.1.230
 - apply button



Data Server (DSS2)
Secondary node
IP Address:192.168.0.240

7. Configure Virtual IP and Auxiliary connection

Next, select the eth2 within iSCSI Failover. In the **Virtual IP Settings** function check the box **Enable virtual IP** and enter **IP address, Netmask, Broadcast**, and click the **apply** button.

By setting the address of the primary node in a **Failover configuration**, automatic detection of the interface for communication. This step is necessary to complement the destination IP address used in unicast.

The screenshot shows the open-e web interface with the following configuration steps:

- Interfaces:** A list of network interfaces (eth0, eth1, eth2, eth3) is shown. eth2 is selected.
- iSCSI Failover:** A list of network interfaces (eth0, eth1, eth2, eth3) is shown. eth2 is selected.
- Virtual IP Settings:** The "Enable virtual IP" checkbox is checked. The IP address is set to 192.168.20.250, the netmask to 255.255.255.0, and the broadcast to 192.168.20.255. The "apply" button is visible.
- Auxiliary connection:** The checkbox "Use this network interface to communicate between the nodes" is checked. The unicast remote IP is set to 192.168.2.230. The "apply" button is visible.



Data Server (DSS2)
Secondary node
IP Address:192.168.0.240

7. Configure Virtual IP and Auxillary connection

Now, select the eth3 within iSCSI Failover. In the Auxillary connection function check box **Use this network interface to communicate between the nodes** next enter IP address for **Unicast remote IP** and click the **apply** button.

The screenshot shows the open-e web interface with the following configuration steps:

- Virtual IP Settings:** The 'Info' section states: "Virtual IP must be set in different subnetwork than physical IP on this machine and must be in different subnetwork than Virtual IP sets on other machines in the same network area configured also as failover." The MAC address is 00:04:23:b6:ec:83. The 'Enable virtual IP' checkbox is unchecked. An 'apply' button is present.
- iSCSI Failover:** The 'Interfaces' list includes eth0, eth1, eth2, and eth3. The 'iSCSI Failover' list also includes eth0, eth1, eth2, and eth3. A blue arrow points from the text box to the 'eth3' entry in the 'iSCSI Failover' list.
- Auxillary connection:** The checkbox 'Use this network interface to communicate between the nodes.' is checked. The 'Unicast remote IP' field contains the value 192.168.3.230. An 'apply' button is present. A note at the bottom says: "Please apply changes or press 'reload' button to discard".

Event Viewer: [icon]

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
Data Server (DSS1)

Primary node

IP Address:192.168.0.230

8. Start Failover Service

Next, select iSCSI Failover

Move the **iSCSI Tasks** to be used for the failover service to the **Failover Tasks** area by clicking  button and click **apply**

The screenshot shows the open-e web interface for configuring iSCSI failover. The breadcrumb path is 'You are here: SETUP > network > iSCSI Failover'. The left sidebar has 'iSCSI Failover' selected. The main content area is divided into 'iSCSI Tasks' and 'Failover Tasks'. The 'iSCSI Tasks' list is empty, and the 'Failover Tasks' list contains 'MirrorTask'. A blue arrow points from the 'iSCSI Tasks' area to the 'Failover Tasks' area, indicating the move operation. The 'apply' button is visible at the bottom of the 'Failover Tasks' panel. The footer of the interface reads 'Data Storage Software V6 - All rights reserved'.



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Data Server (DSS1)

Primary node

IP Address:192.168.0.230

8. Start Failover Service

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SETUP CONFIGURATION MAINTENANCE STATUS HELP

You are here: SETUP > network > iSCSI Failover

Interfaces

- eth0
- eth1
- eth2
- eth3

iSCSI Failover

- eth0
- eth1
- eth2
- eth3

Search: Search:

MirrorTask

apply

Failover manager

start stop

In order to delegate (switch) active server state to the passive server click the Manual failover button. This will initiate a failover event and switch the primary server to suspend mode, while the secondary server will be promoted to active mode. Please note this will stop the volume replication process.

Manual failover

Event Viewer: [icon]

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At this point both nodes are ready to start the Failover service



Data Server (DSS1)
Primary node
IP Address:192.168.0.230

8. Start Failover Service

After clicking the **start** button configuration of both nodes will be complete

The screenshot shows the open-e web interface for configuring iSCSI Failover. The breadcrumb trail is 'You are here: SETUP > network > iSCSI Failover'. The left sidebar has two sections: 'Interfaces' with radio buttons for eth0, eth1, eth2, and eth3; and 'iSCSI Failover' with radio buttons for eth0, eth1, eth2, and eth3. The main content area has an 'Interaces' section with two empty boxes and an 'apply' button. Below it is the 'Failover manager' section, which displays an 'Info' message: 'Configuration of both nodes finished successfully.' with a green checkmark. There are 'start' and 'stop' buttons, and a 'Manual failover' button. Below the buttons is a paragraph of text: 'In order to delegate (switch) active server state to the passive server click the Manual failover button. This will initiate a failover event and switch the primary server to suspend mode, while the secondary server will be promoted to active mode. Please note this will stop the volume replication process.'

NOTE:

You can now connect via your iSCSI initiator and use your targets via the Virtual IP address e.g. 192.168.10.250 (For example, in a Microsoft Windows environment, download Microsoft iSCSI Initiator ver 2.0 or later).



open-e
Data Server (DSS1)
Primary node
IP Address:192.168.0.230

8. Start Failover Service

After start Failover, check the status in **Failover status** function. All must read OK. In the task status, the destination volume must be consistent

iSCSI Failover/Volume Replication



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SETUP CONFIGURATION MAINTENANCE STATUS HELP

You are here: SETUP > network > iSCSI Failover

Interfaces

- eth0
- eth1
- eth2
- eth3

iSCSI Failover

- eth0
- eth1
- eth2
- eth3

Failover status

Names	Status
Global status	
Service running	ok
Node status	primary/active
Ping node group status	ok
Individual ping node status:	
IP: 192.168.2.107	ok
IP: 192.168.2.106	ok
IP: 192.168.1.107	ok
IP: 192.168.1.106	ok
Communication via:	
eth0	ok
eth1	ok
eth2	ok
eth3	ok
Task status	
MirrorTask	running

Failover configuration

Event Viewer: [icon]

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open-e

Data Server (DSS1)

Primary node

IP Address:192.168.0.230

9. Test Failover Function

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SETUP CONFIGURATION MAINTENANCE STATUS HELP

You are here: SETUP > network > iSCSI Failover

Interfaces

- eth0
- eth1
- eth2
- eth3

iSCSI Failover

- eth0
- eth1
- eth2
- eth3

Failover manager

Info
Configuration of both nodes finished successfully.

start stop

In order to delegate (switch) active server state to the passive server click the Manual failover button. This will initiate a failover event and switch the primary server to suspend mode, while the secondary server will be promoted to active mode. Please note this will stop the volume replication process.

Manual failover

Event Viewer: [icon]

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In order to test Failover in **Manual Failover**, function, click on the **Manual failover** button.



open-e
Data Server (DSS1)
Primary node
IP Address:192.168.0.230

9. Test Failover Function

The screenshot shows the open-e web interface for configuring iSCSI failover. The breadcrumb trail is "You are here: SETUP > network > iSCSI Failover". The left sidebar has two sections: "Interfaces" and "iSCSI Failover", both listing network interfaces eth0, eth1, eth2, and eth3. The main content area is split into two panes. The top pane is for interface configuration, and the bottom pane is the "Failover manager". The "Failover manager" pane shows an "Info" message: "Server is in suspend mode." with a green checkmark icon. Below this are "start" and "stop" buttons. At the bottom of the pane is a "Manual failover" button. A blue arrow points from a text box on the left to the "Info" icon in the failover manager.

After clicking on the **Manual failover** button, primary node enters suspend mode



Data Server (DSS1)
Primary node
IP Address:192.168.0.230

9. Test Failover Function

The **Failover status** function shows the **Global status** of the primary node. Status service is in **suspend** mode and the node is **inactive**.

Names	Status
Global status	
Service running	suspend
Node status	inactive
Ping node group status	unknown
Individual ping node status:	
IP: 192.168.2.107	ok
IP: 192.168.2.106	ok
IP: 192.168.1.107	ok
IP: 192.168.1.106	ok
Communication via:	
eth0	unknown
eth1	unknown
eth2	unknown
eth3	unknown
Task status	
MirrorTask	stopped



open-e
Data Server (DSS2)
Secondary node
IP Address: 192.168.0.240

9. Test Failover Function

In Failover status function **Global status** shows the status of the secondary node. The service status is **degraded** and Node status is **active**.

Names	Status
Global status	
Service running	degraded
Node status	secondary/active
Ping node group status	ok
Individual ping node status:	
IP: 192.168.2.107	ok
IP: 192.168.2.106	ok
IP: 192.168.1.107	ok
IP: 192.168.1.106	ok
Communication via:	
eth0	failed
eth1	failed
eth2	failed
eth3	failed
Task status	
MirrorTask_reverse	stopped



Data Server (DSS2)
Secondary node
IP Address: 192.168.0.240

10. Run Failback Function

In order to run Failback in Failover manager function click on the **Sync volumes** button first.



open-e
Data Server (DSS2)
Secondary node
IP Address: 192.168.0.240

10. Run Failback Function

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SETUP | CONFIGURATION | MAINTENANCE | STATUS | HELP

You are here: SETUP > network > iSCSI Failover

Interfaces

- eth0
- eth1
- eth2
- eth3

iSCSI Failover

- eth0
- eth1
- eth2
- eth3

Failover status

Names	Status
Global status	
Service running	degraded
Node status	secondary/active
Ping node group status	ok
Individual ping node status:	
IP: 192.168.2.107	ok
IP: 192.168.2.106	ok
IP: 192.168.1.107	ok
IP: 192.168.1.106	ok
Communication via:	
eth0	failed
eth1	failed
eth2	failed
eth3	failed
Task status	
MirrorTask_reverse	running
Connection:	Connected
Source info:	
Logical volume:	lv0000
Consistency:	Consistent

Event Viewer: [icon]

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After synchronization the task status of the destination volume must be **Consistent**



open-e
Data Server (DSS2)
Secondary node
IP Address: 192.168.0.240

10. Run Failback Function

The screenshot shows the open-e web interface for the Failover manager. The top navigation bar includes 'open-e', 'ENTERPRISE CLASS STORAGE OS for EVERY BUSINESS', and 'DATA STORAGE SOFTWARE V6'. The main menu has 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. The breadcrumb trail reads 'You are here: SETUP > network > iSCSI Failover'. The left sidebar has two sections: 'Interfaces' and 'iSCSI Failover', both listing 'eth0', 'eth1', 'eth2', and 'eth3'. The main content area is titled 'Failover manager' and contains two information boxes. The first box states: 'Volume replication process started. Please go to Failover Status to check the status of your tasks.' The second box states: 'When in secondary mode, the start and stop buttons control this node only. Please use the relevant buttons on the primary node to control both nodes.' Below these boxes are 'start' and 'stop' buttons. A 'Sync volumes' button is also present. At the bottom of the main content area is a 'Failback' button. An 'apply' button is located at the top right of the main content area. The footer of the interface includes 'Event Viewer:' with an envelope icon and 'Data Storage Software V6 - All rights reserved'.

In order to return the active server state to the Primary server click on the **Failback** button



open-e
Data Server (DSS1)
Primary node
IP Address:192.168.0.230

10. Run Failback Function

After clicking on **Failback** button (in **Failover manager** function on Secondary node) Primary node is now active.



Data Server (DSS1)
Primary node
IP Address:192.168.0.230

10. Run Failback Function

Primary node is active again and ready for Failover.

iSCSI Failover/Volume Replication



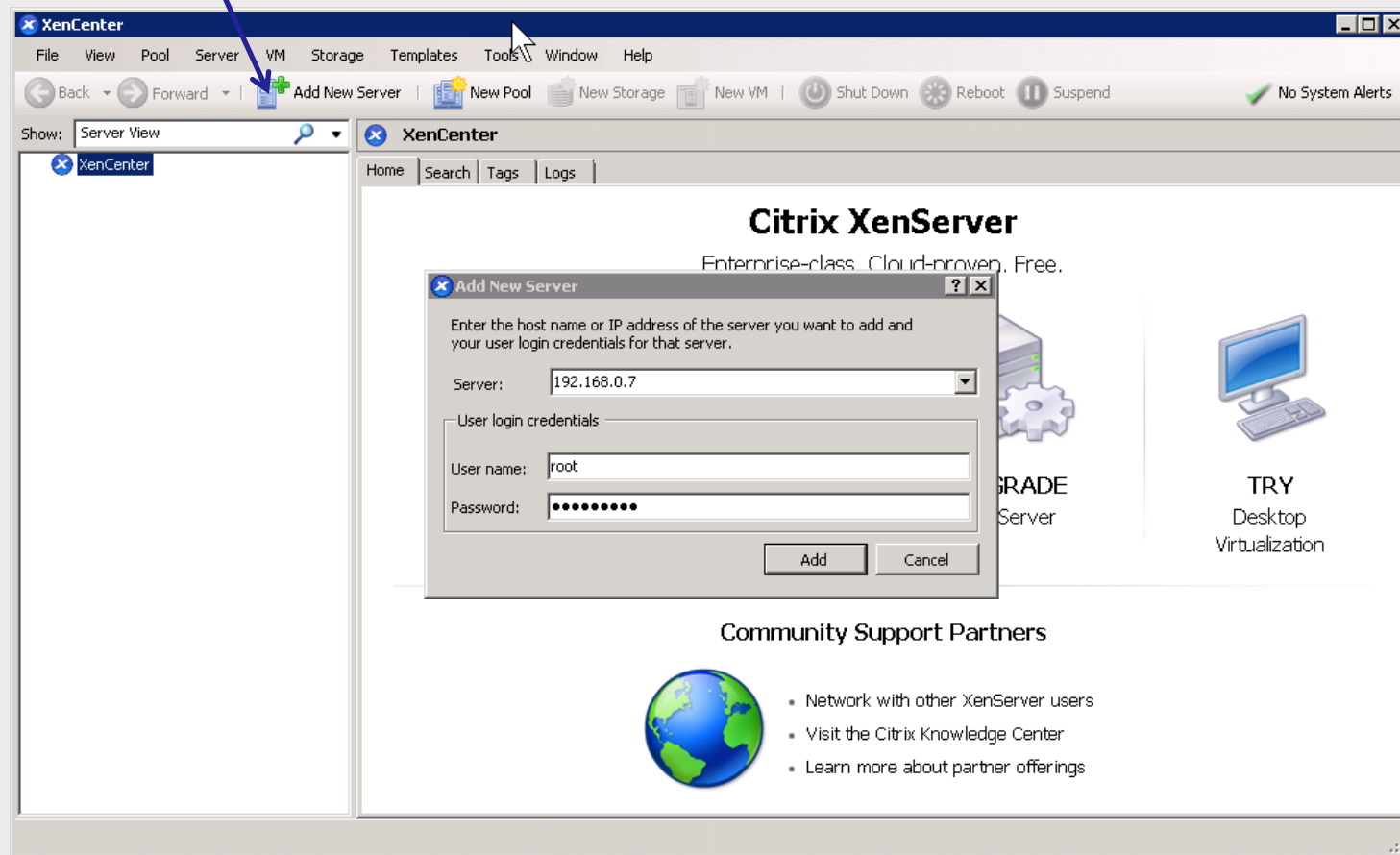
The configuration and testing of iSCSI Failover/Failback is now finished.

Names	Status
Global status	
Service running	ok
Node status	primary/active
Ping node group status	ok
Individual ping node status:	
IP: 192.168.2.107	ok
IP: 192.168.2.106	ok
IP: 192.168.1.107	ok
IP: 192.168.1.106	ok
Communication via:	
eth0	ok
eth1	ok
eth2	ok
eth3	ok
Task status	
MirrorTask	running

Configure MPIO on XenServer

Navigate in the XenCenter and click on „Add New Server”.

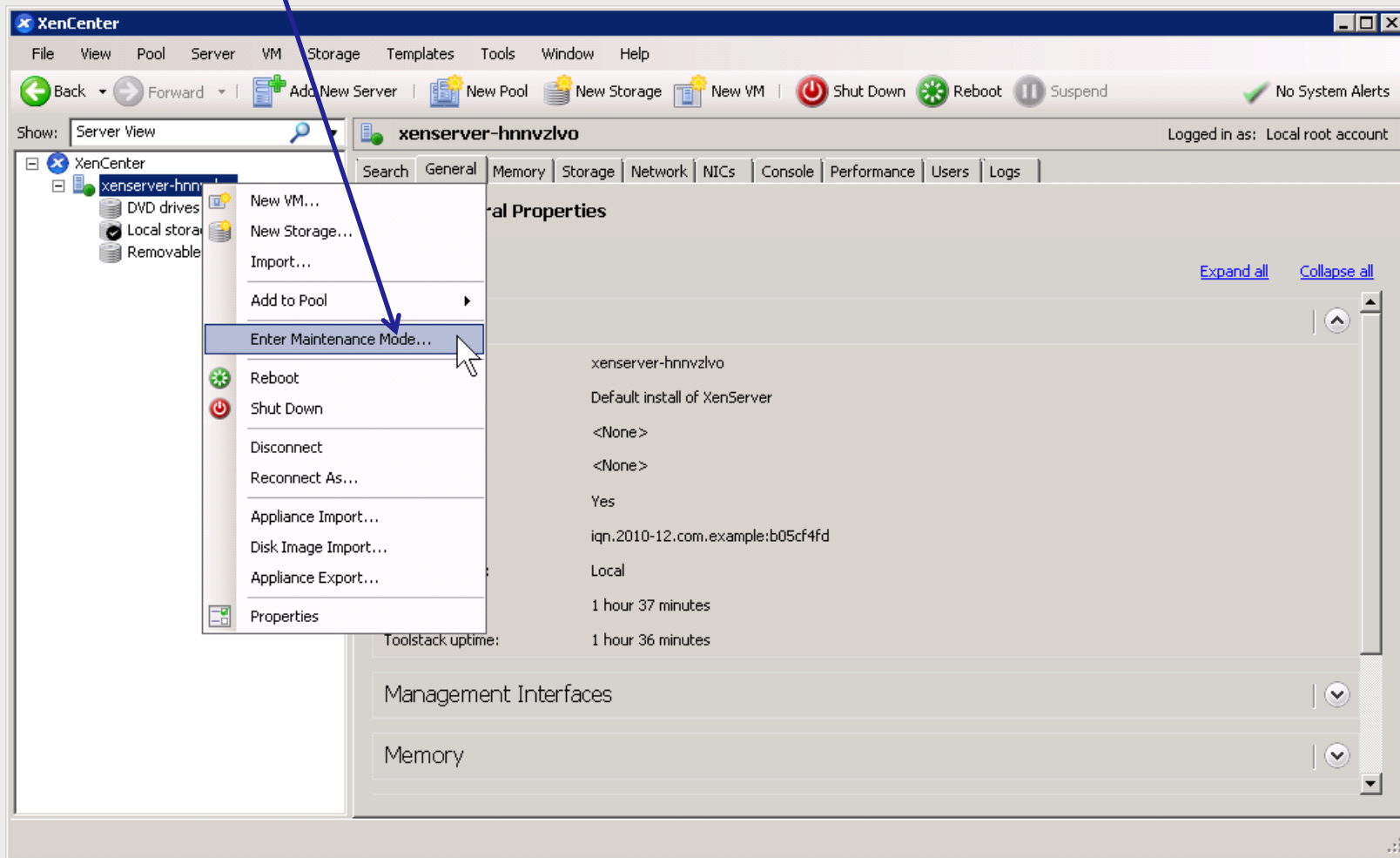
Step 1



Configure MPIO on XenServer

Enter Maintenance Mode

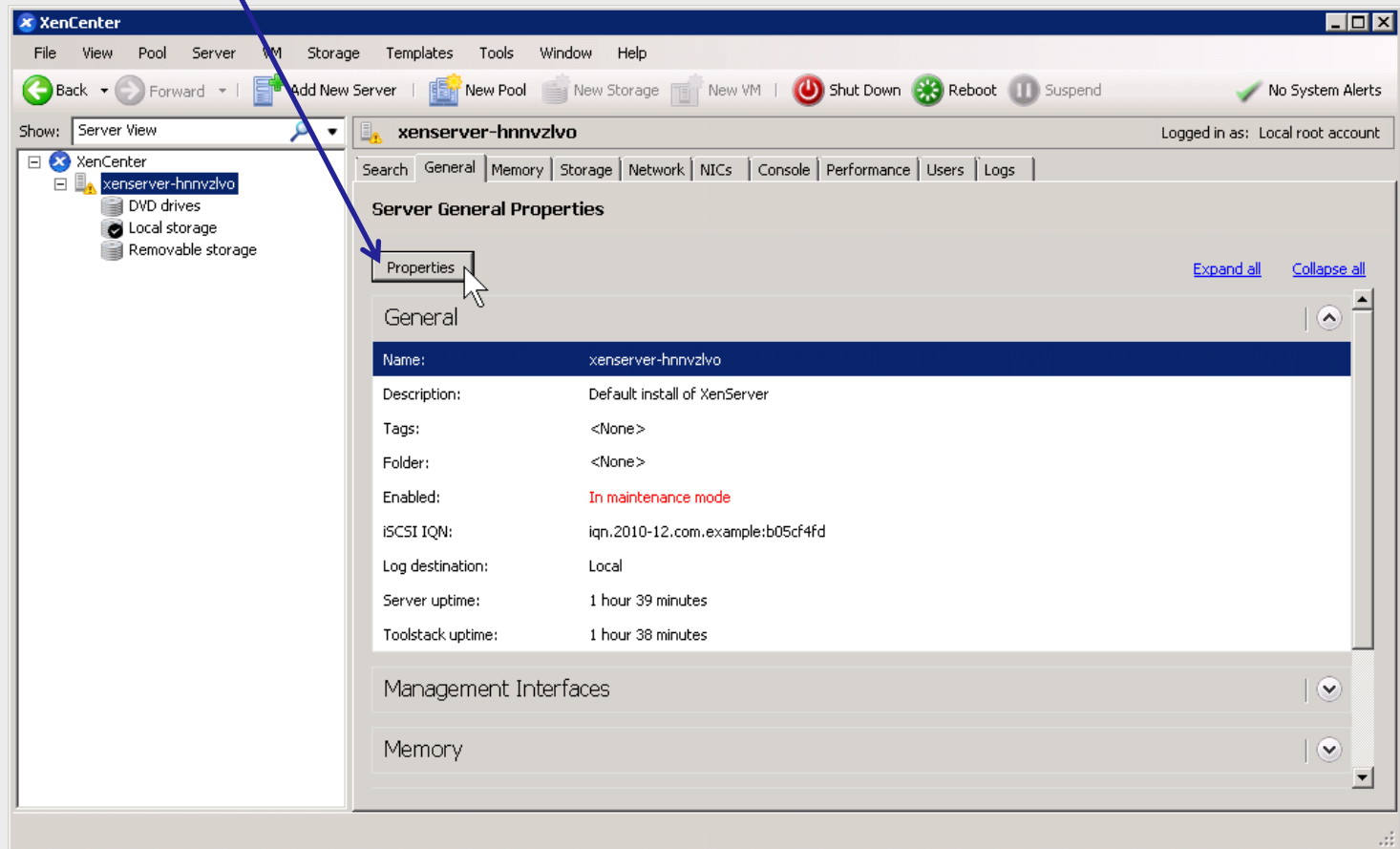
Step 2



Configure MPIO on XenServer

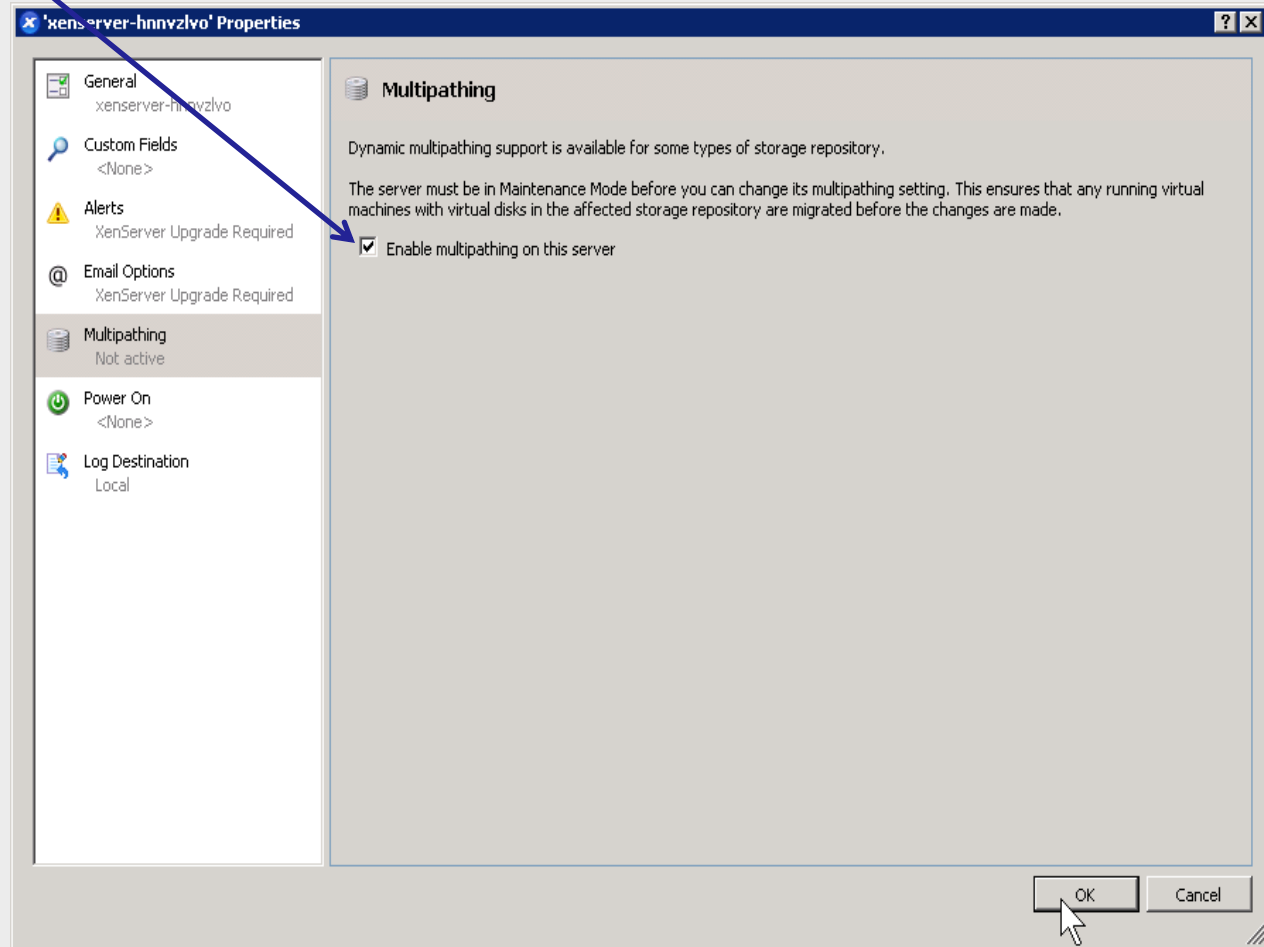
In the Maintenance Mode in General tab please click on the „Properties” button.

Step 3



In the Multipathing section click on the „Enable multipathing on this server” and the „OK” to

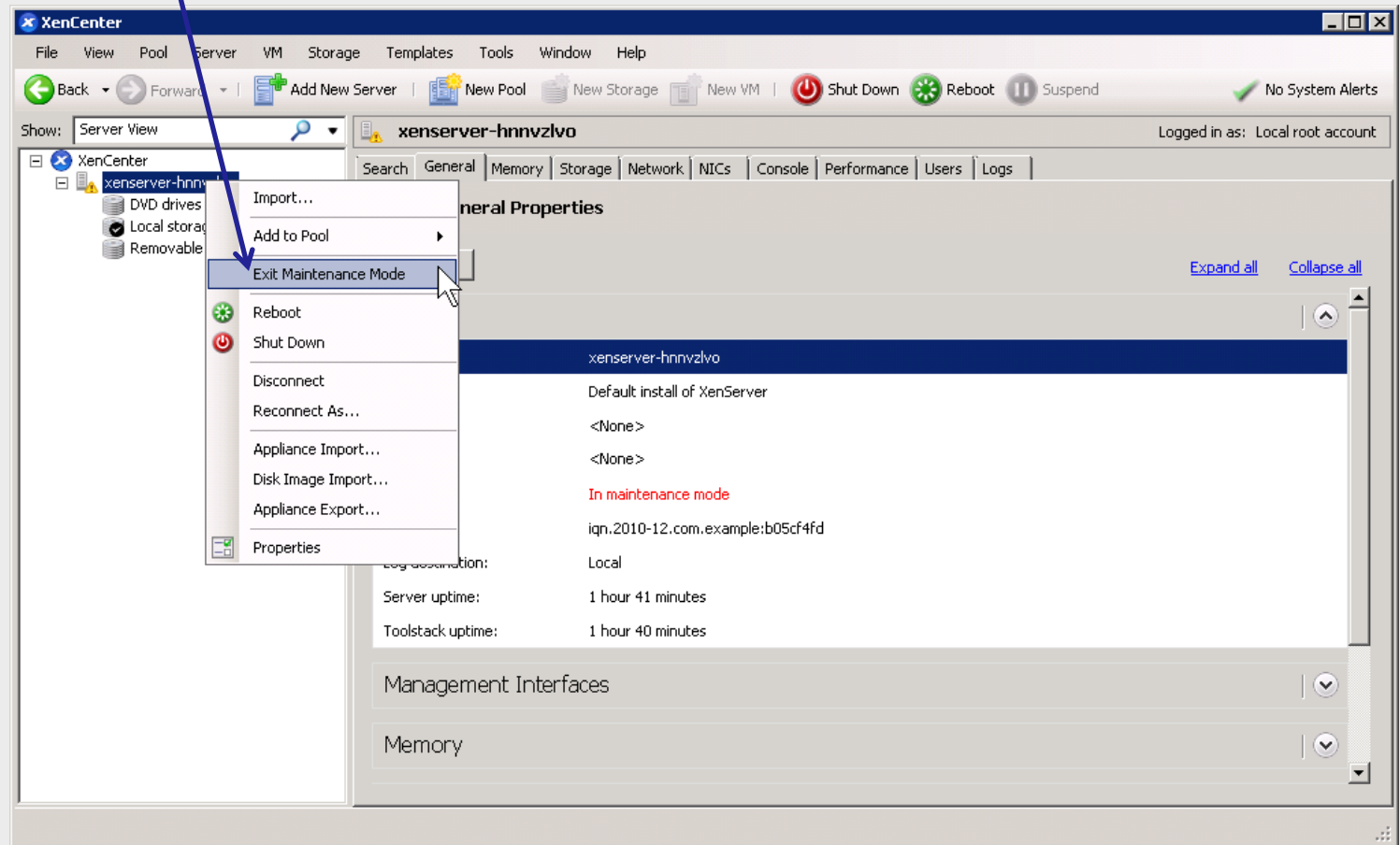
Step 4



Configure MPIO on XenServer

Exit Maintenance Mode

Step 5



Configure MPIO on XenServer

Navigate to the Network tab and click on „Configure ...” button.

Step 6

Server Networks

Networks

Name	Description	NIC	VLAN	Auto	Link Status	MAC	MTU
Network 0		NIC 0	-	Yes	Connected	00:04:23:dd:90:c8	1500
Network 1		NIC 1	-	Yes	Connected	00:04:23:dd:90:c9	1500
Network 2		NIC 2	-	Yes	Connected	00:04:23:b6:ea:82	1500
Network 3		NIC 3	-	Yes	Connected	00:04:23:b6:ea:83	1500

Add Network... Properties Remove Network

Management Interfaces

Click Configure to add, remove or edit your management interfaces.

Server	Interface	Network	IP Address	Subnet mask	Gateway	DNS
xenserver-demo	Primary	Network 0	192.168.0.7	255.255.255.0	192.168.0.2	192.168.0.10

Configure...

Step 7

In „Management Interfaces” menu, please click on „New Interface” button.

Management Interfaces

You can configure the primary management interface on server "xenserver-demo" here. You can also configure additional management interfaces, for example, for storage or other types of traffic.

Primary
Network 0

Primary

Network: Network 0

Network settings

Automatically obtain network settings using DHCP

Use these network settings:

IP address: 192.168.0.7

Subnet mask: 255.255.255.0

Gateway: 192.168.0.2

Preferred DNS server: 192.168.0.10

Alternate DNS server:

New Interface

OK Cancel

Step 8

Next, please enter IP address and Subnet mask of the **first** path and click on the „**OK**” button.

Management Interfaces

You can configure the primary management interface on server "xenserver-demo" here. You can also configure additional management interfaces, for example, for storage or other types of traffic.

- Primary Network 0
- Interface 1 Network 1**

Interface 1

Name:

Network:

Network settings

- Automatically obtain network settings using DHCP
- Use these network settings:

IP address:

Subnet mask:

Gateway:

Step 9

Next, please enter IP address and Subnet mask of the **second** path and click on the „OK” button.

Management Interfaces

You can configure the primary management interface on server "xenserver-demo" here. You can also configure additional management interfaces, for example, for storage or other types of traffic.

- Primary Network 0
- Interface 1 Network 1
- Interface 2 Network 2**

Interface 2

Name:

Network:

Network settings

Automatically obtain network settings using DHCP

Use these network settings:

IP address:

Subnet mask:

Gateway:

Step 10

In the „Management Interfaces” section there are two interfaces configured.

In this example:
192.168.10.251
192.168.20.251

The screenshot shows the XenCenter interface for a server named 'xenserver-demo'. The 'Network' tab is selected, displaying the 'Server Networks' section. Below this, the 'Management Interfaces' section is visible, containing a table of configured interfaces. A blue arrow points from the text box on the left to the 'Management Interfaces' table.

Name	Description	NIC	VLAN	Auto	Link Status	MAC	MTU
Network 0		NIC 0	-	Yes	Connected	00:04:23:dd:90:c8	1500
Network 1		NIC 1	-	Yes	Connected	00:04:23:dd:90:c9	1500
Network 2		NIC 2	-	Yes	Connected	00:04:23:b6:ea:82	1500
Network 3		NIC 3	-	Yes	Connected	00:04:23:b6:ea:83	1500

Server	Interface	Network	IP Address	Subnet mask	Gateway	DNS
xenserver-demo	Primary	Network 0	192.168.0.7	255.255.255.0	192.168.0.2	192.168.0.10
xenserver-demo	Interface 1	Network 1	192.168.10.251	255.255.255.0		
xenserver-demo	Interface 2	Network 2	192.168.20.251	255.255.255.0		

Edit the multipath configuration file:

```
/etc/multipath.conf
```

and add blue lines into “devices” section.

```
nano /etc/multipath.conf
```

```
...
```

```
## some vendor specific modifications
```

```
devices {
```

```
    device {
```

```
        vendor          "SCST_FIO|SCST_BIO"
```

```
        product         "*"
```

```
        path_selector   "round-robin 0"
```

```
        path_grouping_policy  multibus
```

```
        rr_min_io       100    }
```

```
...
```

Exit the nano editor with save: ctrl-x -> Y -> enter to confirm

```
root@xenserver-demo:~
GNU nano 1.3.12 File: /etc/multipath.conf

## following lines.
#blacklist_exceptions (
#   device (
#       vendor "IBM"
#       product "S/390.*"
#   )
#)

## Use user friendly names, instead of using WWIDs as names.
defaults (
    user_friendly_names no
)
##
## some vendor specific modifications
devices (
    device (
        vendor          "SCST_FIO|SCST_BIO"
        product         "*"
        path_selector    "round-robin 0"
        path_grouping_policy multibus
        rr_min_io        100
    )
    device (
        vendor "DELL"
        product "MD3000i"
        path_grouping_policy group_by_prio
        getuid_callout "/sbin/scsi_id -g -u -s /block/%n"
        path_checker rdac
        prio_callout "/sbin/mpath_prio_rdac /dev/%n"
        hardware_handler "1 rdac"
        failback immediate
    )
    device (
```

In order to disable the physical IP network subnet please edit rc.local file:

```
nano /etc/rc.local
```

And add the line:

```
iptables -I INPUT -s 192.168.0.230 -j DROP
```

Exit the Nano with save: ctrl-x -> Y -> enter to confirm

Run the rc.local script with:

```
/etc/rc.local
```

NOTE: it is not necessary to disable the secondary NIC: 192.168.0.240 because it is not exported while XenServer connecting to the SR.

In order to test the settings please run:

```
iptables -L
```

In order to add or remove directly from command line please use following commands:

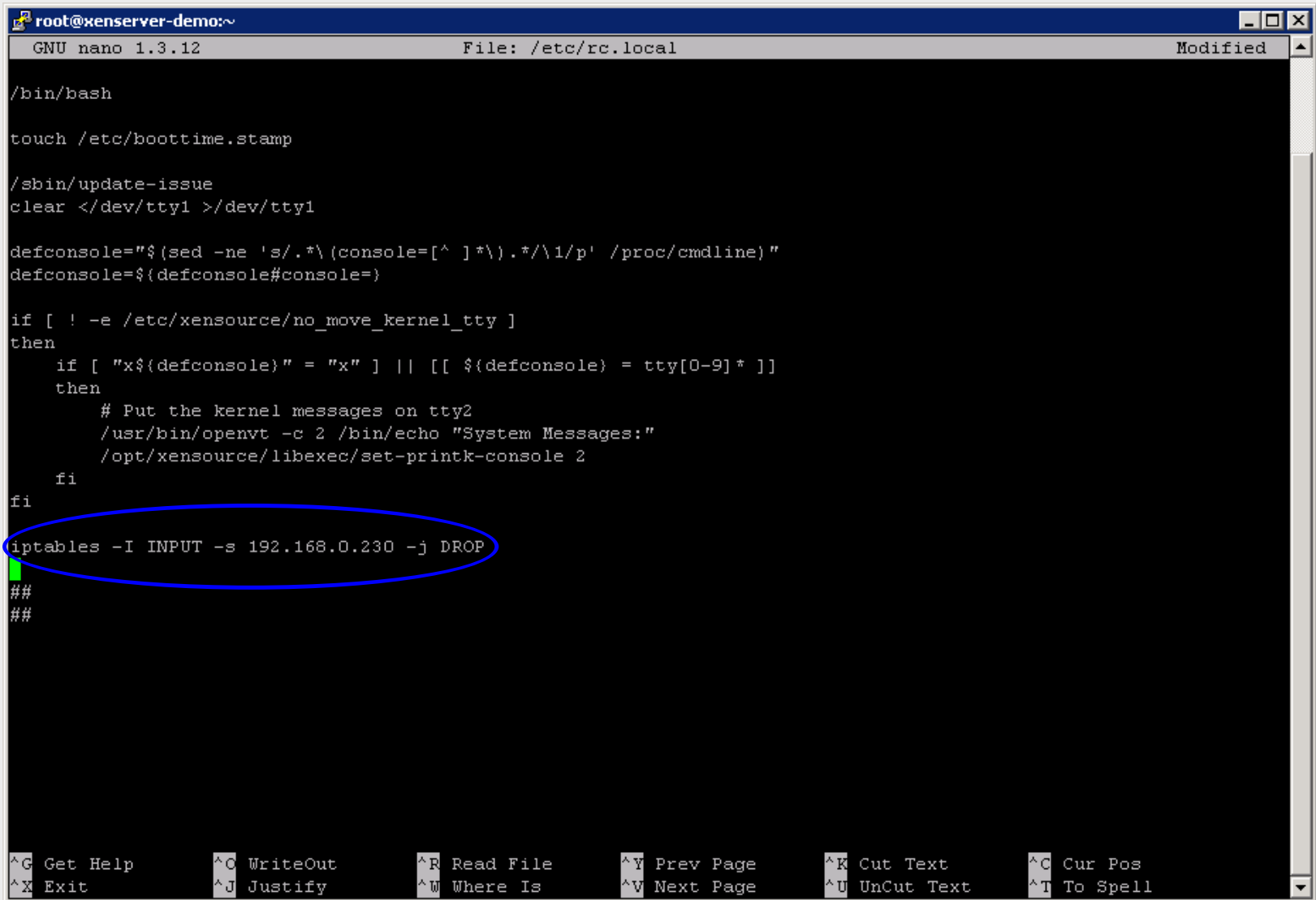
Enter "DROP" action for 192.168.0.230

```
iptables -I INPUT -s 192.168.0.230 -j DROP
```

Remove the "DROP" action for 192.168.0.230

```
iptables -D INPUT -s 192.168.0.230 -j DROP
```

Using XenServer CLI – edit /etc/rc.local



```
root@xenserver-demo:~
GNU nano 1.3.12 File: /etc/rc.local Modified
/bin/bash
touch /etc/boottime.stamp
/sbin/update-issue
clear </dev/tty1 >/dev/tty1
defconsole="$(sed -ne 's/.*\ (console=[^ ]*)\ */\1/p' /proc/cmdline)"
defconsole=${defconsole#console=}
if [ ! -e /etc/xensource/no_move_kernel_tty ]
then
  if [ "x${defconsole}" = "x" ] || [[ ${defconsole} = tty[0-9]* ]]
  then
    # Put the kernel messages on tty2
    /usr/bin/openvt -c 2 /bin/echo "System Messages:"
    /opt/xensource/libexec/set-printk-console 2
  fi
fi
iptables -I INPUT -s 192.168.0.230 -j DROP
##
##
^G Get Help      ^O WriteOut     ^R Read File    ^Y Prev Page    ^K Cut Text     ^C Cur Pos
^X Exit          ^J Justify      ^W Where Is    ^V Next Page    ^U UnCut Text   ^T To Spell
```


In order to check the settings, please run the list command:

```
Multipath -v3  
Multipath -ll
```

Now:

```
pgpolicy = multibus  
minio = 100
```

And both paths are
[active] [ready]

```
root@xenserver-demo:~  
3600605b000161ab00f8e8ce6c527141b: selector = round-robin 0 (internal default)  
3600605b000161ab00f8e8ce6c527141b: features = 0 (internal default)  
3600605b000161ab00f8e8ce6c527141b: hwhandler = 0 (internal default)  
3600605b000161ab00f8e8ce6c527141b: rr_weight = 1 (internal default)  
3600605b000161ab00f8e8ce6c527141b: minio = 1000 (config file default)  
3600605b000161ab00f8e8ce6c527141b: no_path_retry = NONE (internal default)  
pg_timeout = NONE (internal default)  
3600605b000161ab00f8e8ce6c527141b: set ACT_CREATE (map does not exist)  
3600605b000161ab00f8e8ce6c527141b: failed to load map (a path might be in use)  
3600605b000161ab00f8e8ce6c527141b: domap (0) failure for create/reload map  
sdb: ownership set to 2303030303030303030  
sdb: not found in pathvec  
sdb: mask = 0xc  
sdb: state = 2  
sdb: prio = 1  
sdc: ownership set to 2303030303030303030  
sdc: not found in pathvec  
sdc: mask = 0xc  
sdc: state = 2  
sdc: prio = 1  
2303030303030303030: pgfailover = -1 (internal default)  
2303030303030303030: pggpolicy = multibus (controller setting)  
2303030303030303030: selector = round-robin 0 (controller setting)  
2303030303030303030: features = 0 (internal default)  
2303030303030303030: hwhandler = 0 (internal default)  
2303030303030303030: rr_weight = 1 (internal default)  
2303030303030303030: minio = 100 (controller setting)  
2303030303030303030: no_path_retry = NONE (internal default)  
pg_timeout = NONE (internal default)  
2303030303030303030: set ACT_NOTHING (map unchanged)  
[root@xenserver-demo ~]#  
[root@xenserver-demo ~]# multipath -ll  
2303030303030303030 dm-0 SCST_BIO,0000000000000000  
[size=150G][features=0][hwhandler=0][rw]  
\_ round-robin_0 [prio=2][active]  
  \_ 20:0:0:0 sdc 8:32 [active][ready]  
  \_ 19:0:0:0 sdb 8:16 [active][ready]  
[root@xenserver-demo ~]#
```

Configure MPIO on XenServer

Next, in the „Storage” tab click on „New SR ...” button.

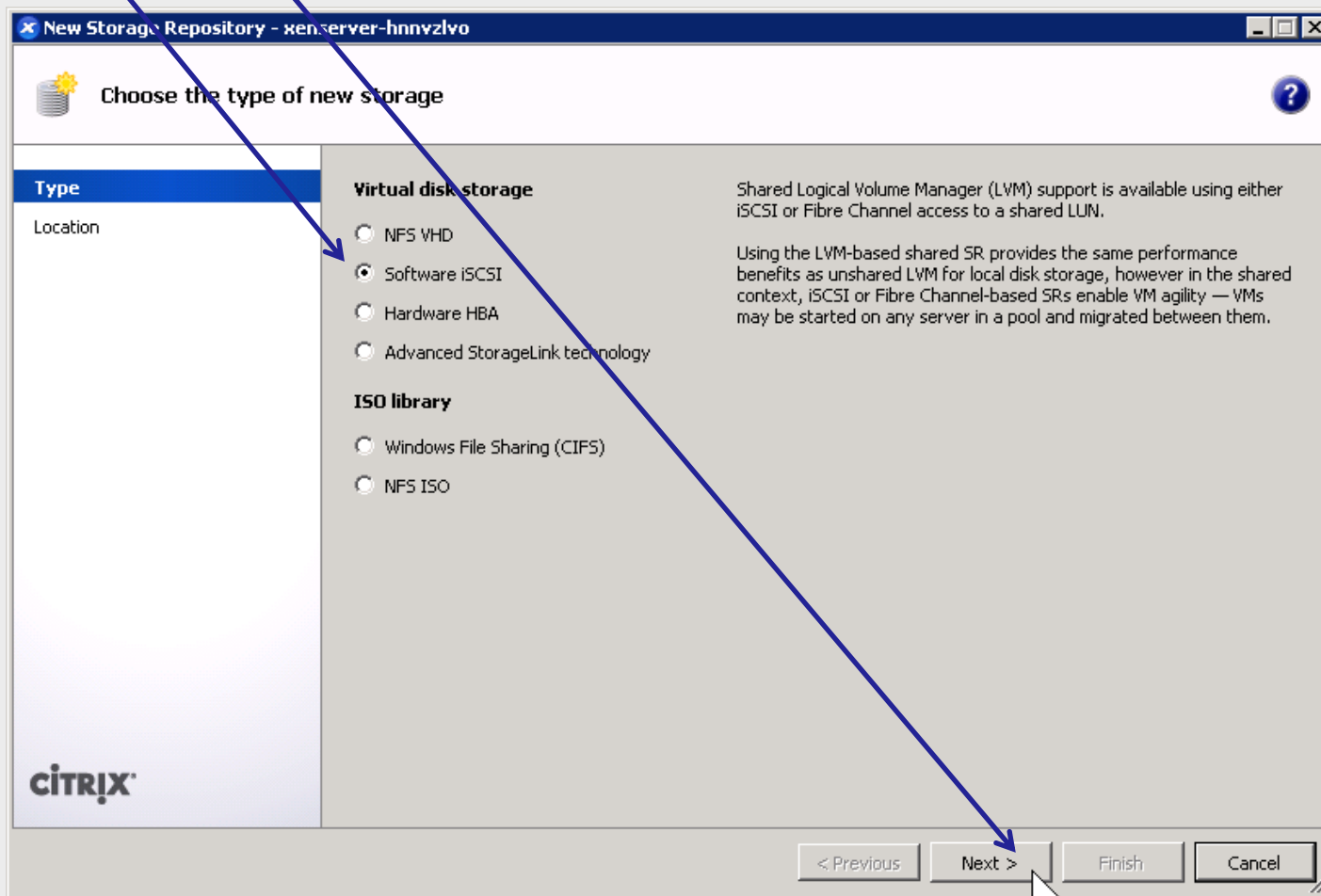
Step 11

The screenshot shows the XenCenter interface for the server 'xenserver-hnnvzlv0'. The 'Storage' tab is active, displaying a table of storage repositories. A blue arrow points from a text box to the 'New SR...' button at the bottom of the window.

Name	Description	Type	Shared	Usage	Size	Virtual alloc.
<input checked="" type="checkbox"/> Local storage		LVM	No	0% (20 MB used)	919.6 GB	16 MB
<input type="checkbox"/> Removable storage		udev	No	0% (0 B used)	0 B	0 B
<input type="checkbox"/> DVD drives	Physical DVD drives	udev	No	100% (6 GB used)	6 GB	6 GB

Now, select the „Software iSCSI ” and click on the „Next >” button.

Step 12



In the Target Hosts field please enter IP address of the **first** NIC of iSCSI targets and click on the „Discover IQNs” button.

Step 13

New Storage Repository - xenserver-demo

Enter a name and path for the new iSCSI storage

Type

Location

Select a name and provide a target host for your new iSCSI storage, indicating your target IQN and your target LUN before proceeding.

Name: iSCSI virtual disk storage

Target Host: 192.168.10.250 : 3260

Use CHAP

User: _____

Password: _____

Target IQN: _____

Target LUN: _____

Discover IQNs

Discover LUNs

CITRIX

< Previous Next > Finish Cancel

Configure MPIO on XenServer

Now, please select the target showing on the first NIC
iqn.2011-02:xen.demo
(192.168.10.250).

Step 14

New Storage Repository - xenserver-demo

Enter a name and path for the new iSCSI storage

Type

Location

Select a name and provide a target host for your new iSCSI storage, indicating your target IQN and your target LUN before proceeding.

Name: iSCSI virtual disk storage

Target Host: 192.168.10.250 : 3260

Use CHAP

User:

Password:

Target IQN: iqn.2011-02:xen-demo (192.168.20.250:3260)

Target LUN: iqn.2011-02:xen-demo (192.168.20.250:3260)
iqn.2011-02:xen-demo (192.168.0.230:3260)
iqn.2011-02:xen-demo (192.168.1.230:3260)
iqn.2011-02:xen-demo (192.168.3.230:3260)
iqn.2011-02:xen-demo (192.168.10.250:3260)
iqn.2011-02:xen-demo (192.168.2.230:3260)
* (192.168.10.250:3260)

Discover IQNs

Discover LUNs

CITRIX

< Previous Next > Finish Cancel

Next, please click „Discover LUNs” button and select the LUN.

Step 15

New Storage Repository - xenserver-demo

Enter a name and path for the new iSCSI storage

Type

Location

Select a name and provide a target host for your new iSCSI storage, indicating your target IQN and your target LUN before proceeding.

Name: iSCSI virtual disk storage

Target Host: 192.168.10.250 : 3260

Use CHAP

User:

Password:

Target IQN: iqn.2011-02:xen-demo (192.168.10.250:3260)

Target LUN:

Discover IQNs

Discover LUNs

CITRIX

< Previous Next > Finish Cancel

Next, please click „Finish” button .

Step 16

New Storage Repository - xenserver-demo

Enter a name and path for the new iSCSI storage

Type

Location

Select a name and provide a target host for your new iSCSI storage, indicating your target IQN and your target LUN before proceeding.

Name:

Target Host: :

Use CHAP

User:

Password:

Target IQN:

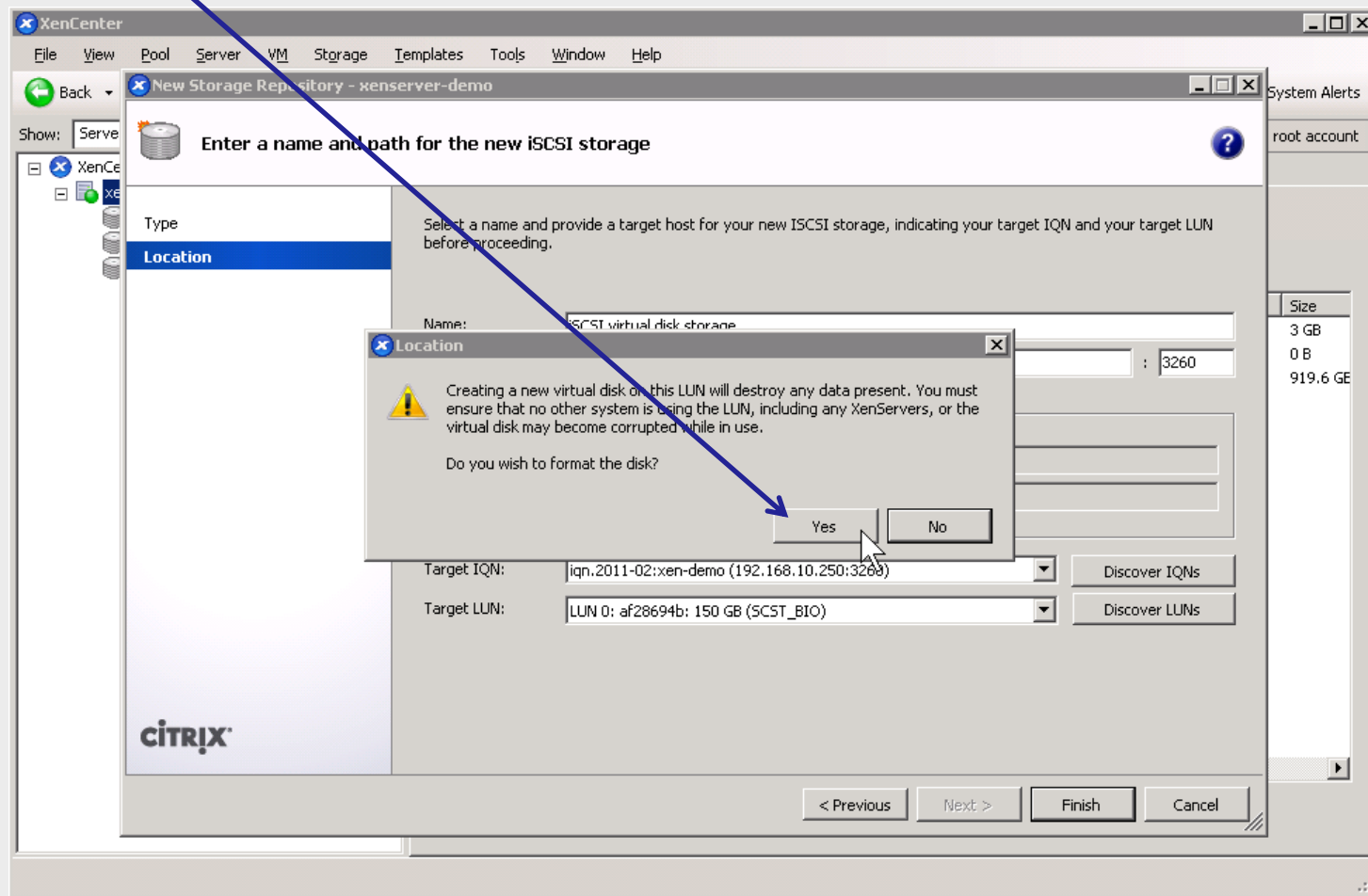
Target LUN:

CITRIX

< Previous Next > **Finish** Cancel

Next, please format the disk.
Please read the warning message.

Step 17



Configure MPIO on XenServer

In the „Storage” tab, new “iSCSI virtual disk storage” appear.

Step 18

The screenshot shows the XenCenter interface for a server named 'xenserver-demo'. The 'Storage' tab is active, displaying a table of storage repositories. A blue box on the left contains text that points to the 'iSCSI virtual disk storage' entry in the table. The table lists four storage repositories: DVD drives, iSCSI virtual disk storage, Removable storage, and Local storage. The 'iSCSI virtual disk storage' entry is highlighted, showing it is an LVM over iSCSI type with a size of 150 GB and 0 B of virtual allocation.

Name	Description	Type	S...	Usage	Size	Virtual allocation
DVD drives on xenserver-demo	Physical DVD drives on xenserver-demo	udev	No	100% (3 GB used)	3 GB	3 GB
iSCSI virtual disk storage	iSCSI SR [192.168.10.250 (iqn.2011-02:xen-demo)]	LVM over iSCSI	Yes	0% (4 MB used)	150 GB	0 B
Removable storage on xens...		udev	No	0% (0 B used)	0 B	0 B
Local storage on xenserver-...		LVM	No	0% (276 MB used)	919.6 GB	384 MB

Configure MPIO on XenServer

In order to check Multipath settings, please select the "iSCSI virtual disk storage" and in the "General" tab Multipathing section must show "2 of 2 paths active".

Step 19

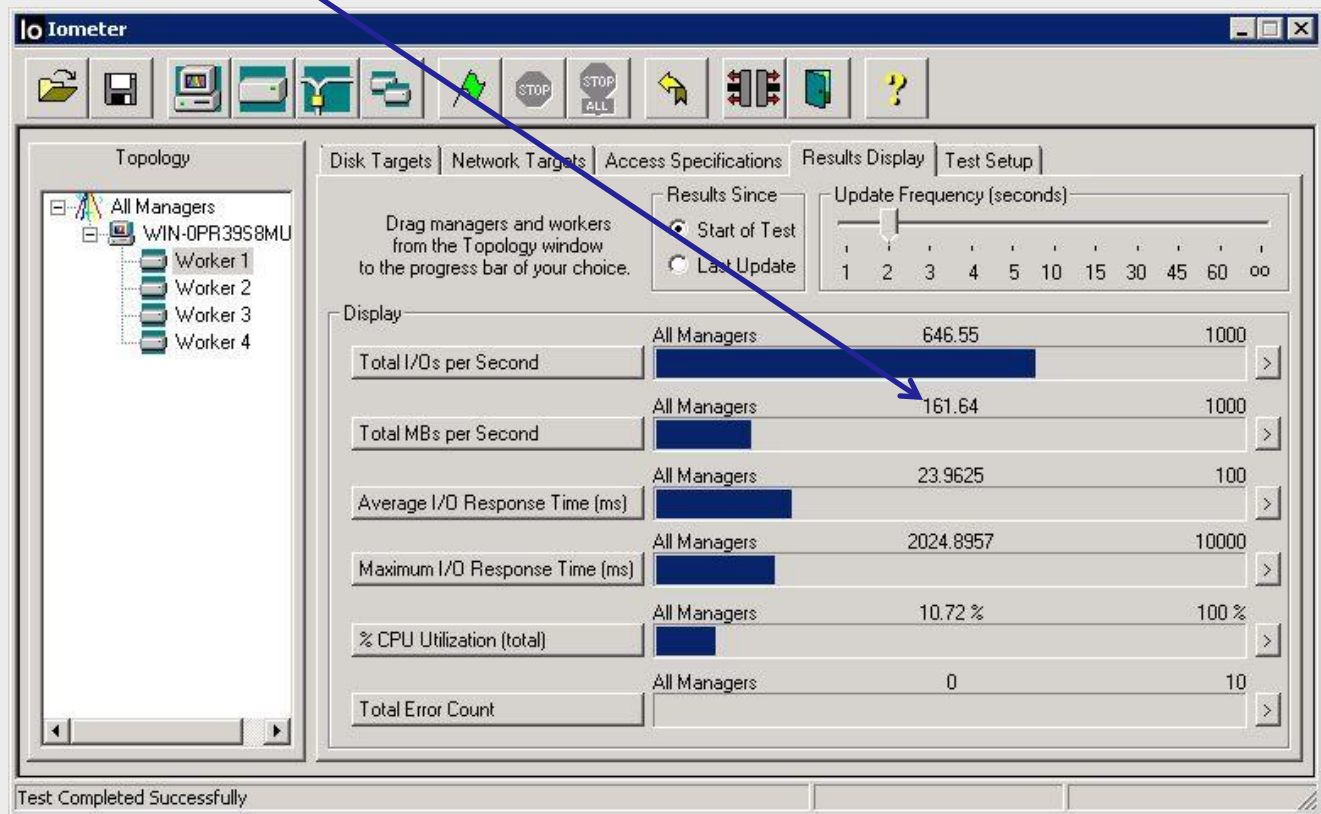
The screenshot shows the XenCenter web interface. The left sidebar displays a tree view with 'XenCenter' expanded, showing 'xenserver-demo' and its sub-items: 'DVD drives', 'iSCSI virtual disk storage' (highlighted), 'Local storage', and 'Removable storage'. The main content area shows the 'iSCSI virtual disk storage' configuration page. The 'General' tab is selected, displaying 'Storage General Properties'. Below this, there is a 'Properties' section and a 'Status' section. The 'Multipathing' section is expanded, showing a table with one entry: 'xenserver-demo: 2 of 2 paths active (2 iSCSI sessions)'. A mouse cursor is pointing at this entry. The top navigation bar includes 'File', 'View', 'Pool', 'Server', 'VM', 'Storage', 'Templates', 'Tools', 'Window', and 'Help'. The top right corner shows 'No System Alerts' and 'Logged in as: Local root account'.

Storage General Properties	
General	
Name:	iSCSI virtual disk storage
Description:	iSCSI SR [192.168.10.250 (iqn.2011-02:xen-demo)]
Tags:	<None>
Folder:	<None>
Type:	LVM over iSCSI
Size:	4 MB used of 150 GB total (0 B allocated)
SCSI ID:	230303030303030
UUID:	15f6e8f2-839d-a934-8b38-d1022ac4aab6
Status	
Multipathing	
xenserver-demo:	2 of 2 paths active (2 iSCSI sessions)

Now install the Windows 2008 virtual machine on the new added iSCSI Virtual disk storage and run Iometer in order to check the performance.

Step 20

Verify the performance with „lometer” running on



Now you have completed the configuration of Multipath I/O on DSS V6 with XenServer.

Thank you!