

Open-E JovianDSS High-Availability Cluster Step-by-Step

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Open-E JovianDSS High-Availability Cluster



1. Hardware configuration

Client-1 : ESXi,
Citrix XEN, Hyper-V



Bond0 (active backup)

Bond0: 192.168.21.101, 192.168.2.101

(NFS or iSCSI) (Ping Node)



Client -2 : ESXi,
Citrix XEN, Hyper-V



Bond0 (active backup)

Bond0: 192.168.21.102, 192.168.2.102

(NFS or iSCSI) (Ping Node)



JovianDSS
node-a



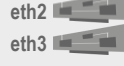
open-e

Port used for WEB GUI management

Storage Client Access,
Bond0 (active backup)
IP:192.168.0.220



Ring, Ping node
Bond1 (active backup)
IP:192.168.2.220



NOTE:

Ring path (heartbeat) and Ping nodes
must run on Active-Backup Bonding.
Ring and Ping IP must be configured
in the same network subnet.

Virtual IP Address:
192.168.21.100

JovianDSS
node-b



open-e

Port used for WEB GUI management

Storage Client Access,
Bond0 (active backup)
IP:192.168.0.221



Ring, Ping node
Bond1 (active backup)
IP:192.168.2.221



SAS HBA



SAS HBA



JBOD



2. Create new Pool

Go to menu **Storage** and click on **Add zpool** button. Add data group by selecting the required amount of disks and select **Mirror(multiple groups)** from the drop-down menu and click on **Add group** button, then click on the **Next** button.

Zpool wizard

1. Add data group

Available disks

Show only unused disks Rescan disks

| Name | Id | Size | Blink |
|---|---------------------------------------|-----------|-------|
| <input checked="" type="checkbox"/> sdb | scsi-SVMware_Virtual_disk_6000c291... | 16.00 GiB | ● |
| <input checked="" type="checkbox"/> sdc | scsi-SVMware_Virtual_disk_6000c29a... | 16.00 GiB | ● |
| <input checked="" type="checkbox"/> sdd | scsi-SVMware_Virtual_disk_6000c293... | 16.00 GiB | ● |
| <input checked="" type="checkbox"/> sde | scsi-SVMware_Virtual_disk_6000c295... | 16.00 GiB | ● |
| <input type="checkbox"/> sdf | scsi-SVMware_Virtual_disk_6000c291... | 16.00 GiB | ● |
| <input type="checkbox"/> sdg | scsi-SVMware_Virtual_disk_6000c29c... | 16.00 GiB | ● |
| <input type="checkbox"/> sdh | scsi-SVMware_Virtual_disk_6000c298... | 16.00 GiB | ● |
| <input type="checkbox"/> sdi | scsi-SVMware_Virtual_disk_6000c292... | 16.00 GiB | ● |

Select redundancy for group: Mirror (multiple groups) ▼ + Add group

Cancel Next >

Warning: To add first Data Group to your zpool please **select disks** on the list on the left, **select redundancy type** and click "Add group" button.

Data groups Size

Zpool storage capacity: 0.00 B
Used licensed storage capacity: 0.00 B

Other groups Size

2.1. Add write log (SLOG for ZIL)

Select 2 disks for the write log and click on **Add group** button then click on the **Next** button.

Zpool wizard

1. Add data group

2. Add write log

3. Add read cache

4. Add spare disks

5. Zpool properties

6. Summary

Available disks

Show only unused disks Rescan disks

| Name | Id | Size | Blink |
|---|---------------------------------------|-----------|-------|
| <input checked="" type="checkbox"/> sdf | scsi-SVMware_Virtual_disk_6000c291... | 16.00 GiB | ● |
| <input checked="" type="checkbox"/> sdg | scsi-SVMware_Virtual_disk_6000c29c... | 16.00 GiB | ● |
| <input type="checkbox"/> sdh | scsi-SVMware_Virtual_disk_6000c298... | 16.00 GiB | ● |
| <input type="checkbox"/> sdi | scsi-SVMware_Virtual_disk_6000c292... | 16.00 GiB | ● |

Select redundancy for group: Mirror + Add group

Cancel Back Next

Data groups

| Group | Size |
|--------|-----------|
| Mirror | × |
| sdb | 16.00 GiB |
| sdc | 16.00 GiB |
| Mirror | × |
| sdd | 16.00 GiB |
| sde | 16.00 GiB |

Zpool storage capacity: 32.00 GiB
Used licensed storage capacity: 32.00 GiB

Other groups

| Group | Size |
|-------|------|
| | |

Notifications 0 0 0

2.2. Add Read Cache

Select disk (or disks) for level-2 read cache and click on the **Add group** button then click on the **Next** button.

The screenshot shows the 'Zpool wizard' interface with the following components:

- Wizard Steps:** 1. Add data group, 2. Add write log, 3. Add read cache (selected), 4. Add spare disks, 5. Zpool properties, 6. Summary.
- Available disks table:**

| Name | Id | Size | Blink |
|---|---------------------------------------|-----------|-------|
| <input checked="" type="checkbox"/> sdh | scsi-SVMware_Virtual_disk_6000c298... | 16.00 GiB | ● |
| <input type="checkbox"/> sdi | scsi-SVMware_Virtual_disk_6000c292... | 16.00 GiB | ● |
- Data groups table:**

| Data groups | Size |
|-------------|-----------|
| Mirror | × |
| sdb | 16.00 GiB |
| sdc | 16.00 GiB |
| Mirror | × |
| sdd | 16.00 GiB |
| sde | 16.00 GiB |
- Other groups table:**

| Other groups | Size |
|-------------------|-----------|
| Mirrored write lo | × |
| sdf | 16.00 GiB |
| sdg | 16.00 GiB |
- Summary:** Zpool storage capacity: 32.00 GiB, Used licensed storage capacity: 32.00 GiB.
- Redundancy:** Select redundancy for group: Single
- Buttons:** + Add group, Cancel, Back, Next

2.3. Add Spare Disk

Select spare disk (or disks) and click on the **Add group** button then click on the **Next** button.

The screenshot shows the 'Zpool wizard' interface in the Open-E JovianDSS web console. The wizard is currently on step 4, 'Add spare disks'. The 'Available disks' table shows a single disk 'sdi' selected. The 'Add group' button is highlighted with a blue arrow. The 'Data groups' and 'Other groups' sections show the current pool configuration.

| Name | Id | Size | Blink | |
|-------------------------------------|-----|---------------------------------------|-----------|--------------------------------------|
| <input checked="" type="checkbox"/> | sdi | scsi-SVMware_Virtual_disk_6000c292... | 16.00 GiB | ● |

| Data groups | Size |
|-------------|-----------|
| Mirror | × |
| sdb | 16.00 GiB |
| sdc | 16.00 GiB |
| Mirror | × |
| sdd | 16.00 GiB |
| sde | 16.00 GiB |

| Other groups | Size |
|-------------------|-----------|
| Mirrored write lo | × |
| sdf | 16.00 GiB |
| sdg | 16.00 GiB |
| Read cache | × |
| sdh | 16.00 GiB |

Zpool storage capacity: 32.00 GiB
Used licensed storage capacity: 32.00 GiB

Select redundancy for group: Single

+ Add group ✕ Cancel < Back Next >

To confirm the pool name click on the **Next** button then click on the next screen and click on the **Add pool** button.

The screenshot shows the Open-E JovianDSS web interface. A 'Zpool wizard' dialog box is open, displaying a progress bar with six steps: 1. Add data group, 2. Add write log, 3. Add read cache, 4. Add spare disks, 5. Zpool properties (current step), and 6. Summary. The 'Zpool name' field is set to 'Pool-0'. Below the field, it says 'Zpool name: Defines name of the zpool in the system.' At the bottom of the wizard, there are three buttons: 'Cancel', 'Back', and 'Next'. A blue arrow points from the 'Next' button in the wizard to the 'Next' button in the text box.

3. Create iSCSI Target

The Pool menu can be open by clicking the **down arrow - icon** button.

3. Create iSCSI Target

In the pool menu select **iSCSI targets** and click on the **Add new target** button.

The screenshot displays the Open-E JovianDSS web interface. The left sidebar contains navigation options: Storage, User Management, Failover Settings, Storage Settings, System Settings, and Diagnostics. The main content area shows the configuration for 'Pool-0', which is in an 'ONLINE' state. Key details include Zpool ID: 2005253826725532254, Total storage: 31.75 GiB, and 8 disks. A status box indicates the zpool is functioning correctly. Below this, the 'iSCSI targets' tab is selected, showing 'No targets found' and an 'Add new target' button. A notification bar at the bottom shows 1 information message.

3. Create iSCSI Target

To confirm default iSCSI target name click the **Next** button.

The screenshot shows the Open-E JovianDSS web interface. The 'Storage' section is active, and the 'Target Wizard' dialog box is open. The wizard has four steps: 1. Target name, 2. Zvols, 3. Access, and 4. Summary. The 'Target name' field is filled with 'iqn.2015-10:dss.target0'. A blue box on the left contains the instruction 'To confirm default iSCSI target name click the Next button.' with two blue arrows pointing to the 'Next' button and the 'Target name' field.

3. Create iSCSI Target

In order to create a new volume assigned to the target click on the **Add new zvol** button.

The screenshot shows the Open-E JovianDSS web interface. A 'Target Wizard' dialog box is open, currently on step 2, 'Zvols'. The dialog has a sidebar with steps: 1. Target name, 2. Zvols, 3. Access, and 4. Summary. Step 2 is highlighted in red. The main area shows 'Zvols available for target' with a search input field and a '+ Add new zvol' button. A blue arrow points from the text box on the left to this button. Below the search field is a table with columns: Name, Type, Logical size, SCSI ID, LUN, and Access mode. The table is currently empty. At the bottom of the dialog are 'Cancel', 'Back', and 'Next' buttons. The background shows the 'Storage' section of the web interface with tabs for 'Storage', 'User Management', 'Failover Settings', 'Storage Settings', 'System Settings', and 'Diagnostics'. The 'Storage' tab is active, showing 'Unassigned disks'.

3. Create iSCSI Target

Enter the zvol name and size. Optionally you can Select Thin provisioning and other options if required and click on the Add button.

The screenshot displays the 'Add new zvol' dialog box within the Open-E JovianDSS web interface. The dialog is titled 'Add new zvol' and contains the following fields and options:

- Name: zvol-00
- Size: 1000 GiB (27.12 GiB physical available)
- Provisioning: Thin provisioned (default), Thick provisioned (default)
- Deduplication: Disabled (default)
- Copies: 1 (default)
- Compression: lz4 (default)
- Volume block size: 128 KiB (default)
- Sync: Always (default)
- Log bias: Latency (default)
- Primary cache: All (default)
- Secondary cache: All (default)

At the bottom of the dialog, there are two buttons: 'Cancel' and 'Add'.

3. Create iSCSI Target

Now, click on the **Next** button.

On the next screen, in the access step of the wizard click on the **Next** button and finally in last step of the wizard click on the **Add** button.

Target Wizard

1. Target name

2. Zvols

3. Access

4. Summary

Zvols available for target

Search + Add new zvol

| Name | Type | Logical size | SCSI ID | LUN | Access mode |
|---|------|--------------|------------------|-----|----------------------|
| <input checked="" type="checkbox"/> zvol-00 | zvol | 1000.00 GiB | P1XpxWimhYZHL... | 0 | Read-write (default) |

Cancel Back Next

3. Create iSCSI Target

New iSCSI target with the assigned zvol-00 is up and running.

Optionally, also an NFS share can be created, but it is not shown in this document.

The screenshot displays the Open-E JovianDSS web interface. The left sidebar contains navigation options: Storage, User Management, Failover Settings, Storage Settings, System Settings, and Diagnostics. The main content area shows the 'Storage' configuration for 'Pool-0', which is in an 'ONLINE' state. A status message indicates 'Zpool is functioning correctly. Action: None required.' Below this, there are tabs for 'Status', 'Disk groups', 'iSCSI targets', 'Snapshots', 'Shares', and 'Virtual IPs'. The 'iSCSI targets' tab is active, showing a table with one target: 'iqn.2015-10.dss.target0' with status 'Active' and 'Zvols: 1'. A search bar is present above the table. Below the table, there is a section for 'Zvols not attached to targets' with 'Zvols: 0' and another search bar. At the bottom, a notification bar shows 0 errors, 0 warnings, and 1 info message.

| Name | Type | SCSI ID | LUN | Logical size | Physical size | Compression | Provisioning |
|-----------|------|-----------------|-----|--------------|---------------|-------------|--------------|
| 1 zvol-00 | zvol | P1XpWimhYZHLBfe | 0 | 1000.00 GiB | 64.00 KiB | 1.00 | thin |

| Name | Type | Logical size | Physical size | Compression | Provisioning |
|------------------|------|--------------|---------------|-------------|--------------|
| No volumes found | | | | | |

4. Network Configuration

Select **System Settings** from main menu and next select **Network** tab. Click on the **Create Bond interface** button. Enter all required details of the Bond and click on the Apply button.

Create new channel bonding interface

You have selected interface (eth0) that you are currently connected through.

Available interfaces

| Name | IP | DHCP | Interface details | Cable | Active | Bond | Select |
|------|---------------|------|-------------------------------|-------|--------|------|-------------------------------------|
| eth0 | 192.168.0.220 | No | VMware VMXNET3 Ethernet Co... | cable | Yes | | <input checked="" type="checkbox"/> |
| eth1 | 192.168.1.220 | No | VMware VMXNET3 Ethernet Co... | cable | Yes | | <input checked="" type="checkbox"/> |
| eth2 | 192.168.2.220 | No | VMware VMXNET3 Ethernet Co... | cable | Yes | | <input type="checkbox"/> |
| eth3 | 192.168.3.220 | No | VMware VMXNET3 Ethernet Co... | cable | Yes | | <input type="checkbox"/> |

Bonding options

Type: Active-backup

Primary interface: eth0

MAC: 02:c3:23:aa:3a:45

Internet protocol: DHCP Static

IP: 192.168.0.220

Netmask: 255.255.255.0

Broadcast: automatic

Gateway: 192.168.0.2

Cancel Apply

4.1. Network Configuration Create Bonds.

Next, please repeat the same steps for the second Bond.

| Name | IP | DHCP | Interface details | Cable | Active | Bond | Select |
|------|---------------|------|----------------------------------|-------|--------|-------|-------------------------------------|
| eth0 | N/A | No | VMware VMXNET3 Ethernet Contr... | cable | No | bond0 | <input type="checkbox"/> |
| eth1 | N/A | No | VMware VMXNET3 Ethernet Contr... | cable | No | bond0 | <input type="checkbox"/> |
| eth2 | 192.168.2.220 | No | VMware VMXNET3 Ethernet Contr... | cable | Yes | | <input checked="" type="checkbox"/> |
| eth3 | 192.168.3.220 | No | VMware VMXNET3 Ethernet Contr... | cable | Yes | | <input checked="" type="checkbox"/> |

Bonding options

Type: Active-backup

Primary interface: eth2

MAC: 02:59:88:22:55:7b

Internet protocol: DHCP Static

IP: 192.168.2.220

Netmask: 255.255.255.0

Broadcast: automatic

Gateway: none

4.2. Network Configuration. Select Default gateway

Both Bonds are created properly. Overview is shown in the Interfaces field.
Next, in the Default gateway field, click on the **Change** button.

The screenshot shows the 'System Settings' page in the Open-E JovianDSS web interface. The 'Network' tab is selected, and the 'Interfaces' section is expanded. A table lists the network interfaces, including two bond interfaces (bond0 and bond1) and their constituent ethernet interfaces (eth0, eth1, eth2, eth3). The 'Default gateway' section is also visible, with a 'Change' button highlighted by a blue arrow from the text box on the left.

| Name | IP | DHCP | Vendor | Negotiated speed | Cable | Active | |
|--------------|---------------|------|---|------------------|-------|--------|---------|
| bond0 | 192.168.0.220 | No | Ethernet Bonding Driver | 10000 Mbps | cable | Yes | Options |
| bond1 | 192.168.2.220 | No | Ethernet Bonding Driver | 10000 Mbps | cable | Yes | Options |
| eth0 (bond0) | N/A | No | VMware VMXNET3 Ethernet Controller (rev 01) | 10000 Mbps | cable | No | Options |
| eth1 (bond0) | N/A | No | VMware VMXNET3 Ethernet Controller (rev 01) | 10000 Mbps | cable | No | Options |
| eth2 (bond1) | N/A | No | VMware VMXNET3 Ethernet Controller (rev 01) | 10000 Mbps | cable | No | Options |
| eth3 (bond1) | N/A | No | VMware VMXNET3 Ethernet Controller (rev 01) | 10000 Mbps | cable | No | Options |

4.2. Network Configuration. Select Default gateway

Select proper interface and click on the **Apply** button.

The screenshot shows the Open-E JovianDSS System Settings interface. A modal dialog titled "Select default gateway" is open, displaying a table of available interfaces. The table has columns for "Interface", "Interface details", "Gateway", "Active", and "Select". Two interfaces are listed: "bond0" and "bond1", both using "Ethernet Bonding Driver" and having a "static" gateway. The "Active" column shows "Yes" for both. The "Select" column has radio buttons, with the one for "bond0" selected. Below the table are "Cancel" and "Apply" buttons. Blue arrows point from the text box to the "bond0" row and the "Apply" button.

| Interface | Interface details | Gateway | Active | Select |
|-----------|-------------------------|---------|--------|----------------------------------|
| 1 bond0 | Ethernet Bonding Driver | static | Yes | <input checked="" type="radio"/> |
| 2 bond1 | Ethernet Bonding Driver | static | Yes | <input type="radio"/> |

4. Network Configuration. (second cluster node)

Go to the **second cluster node** and create both Bond interfaces accordingly.

The screenshot shows properly created Bonds and default gateway on the second node.

The screenshot displays the 'System Settings' page for the 'Network' tab. The 'Interfaces' section shows a table of configured network interfaces, including two bond interfaces (bond0 and bond1) and their associated physical interfaces (eth0, eth1, eth2, eth3). The 'Default gateway' section shows the configuration for the bond0 interface.

| Name | IP | DHCP | Vendor | Negotiated speed | Cable | Active | Options |
|--------------|---------------|------|---|------------------|-------|--------|---------|
| bond0 | 192.168.0.221 | No | Ethernet Bonding Driver | 10000 Mbps | cable | Yes | Options |
| bond1 | 192.168.2.221 | No | Ethernet Bonding Driver | 10000 Mbps | cable | Yes | Options |
| eth0 (bond0) | N/A | No | VMware VMXNET3 Ethernet Controller (rev 01) | 10000 Mbps | cable | No | Options |
| eth1 (bond0) | N/A | No | VMware VMXNET3 Ethernet Controller (rev 01) | 10000 Mbps | cable | No | Options |
| eth2 (bond1) | N/A | No | VMware VMXNET3 Ethernet Controller (rev 01) | 10000 Mbps | cable | No | Options |
| eth3 (bond1) | N/A | No | VMware VMXNET3 Ethernet Controller (rev 01) | 10000 Mbps | cable | No | Options |

Default gateway

Interface: **bond0**

Interface details: **Ethernet Bonding Driver**

Gateway: **static**

[Change](#)

4.3. Network

Configuration. Enter
DNS IP

Assign a unique server name and configure DNS settings select the **System settings** from main menu and select **Network** tab. Next scroll down to **Settings** field. Enter the required server name, enter the DNS IP and click the Apply button.

Repeat the same steps on the second cluster node.

The screenshot displays the 'System Settings' page in the Open-E JovianDSS web interface. The left sidebar contains navigation options: Storage, User Management, Failover Settings, Storage Settings, System Settings (highlighted), and Diagnostics. The main content area shows network configuration details for interface 'bond0', including 'Ethernet Bonding Driver' and 'static' gateway. Below this is a 'Settings' section with a 'Change' button and a 'Server & Host name' group containing fields for 'Server name' (node-a), 'Server description' (Open-E JovianDSS), and 'Hostname' (node-a-JNFR0011). A 'DNS settings' group contains a 'DNS' field with the value 192.168.0.10. An 'Apply' button is at the bottom. A blue callout box on the left has arrows pointing to the 'System Settings' menu item, the 'Settings' field, and the 'DNS' input field.

5. Time and date settings

Select **Continuous NTP synchronization** and click apply. Repeat this step for the second cluster node as well.

The screenshot shows the Open-E JovianDSS web interface. The left sidebar contains navigation options: Storage, User Management, Failover Settings, Storage Settings, System Settings (highlighted), and Diagnostics. The main content area is titled 'System Settings' and has tabs for Administration, Network, System, Settings management, and Update. The 'System' tab is active, and the 'Time and date settings' section is expanded. The settings include: Time zone: Europe/Berlin; Set time and date: Manual (selected) and Continuous NTP synchronization (selected); Current time: 21:43:53; Current date: 2015-10-10; NTP server: 0.pool.ntp.org,1.pool.ntp.org,2.; and a 'Synchronize time now' button. A green 'Apply' button is at the bottom. A blue callout box with arrows points to the 'Continuous NTP synchronization' radio button and the 'Apply' button. The bottom status bar shows 'Notifications' with 0 errors, 0 warnings, and 13 info items.

6. Nodes Binding

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

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

The screenshot shows the Open-E JovianDSS web interface. The main content area is titled "Failover Settings". Under "Failover status", there is a yellow warning box that says "Nodes are not bound" and provides instructions: "In order to configure and run Failover service both nodes must be connected. Note that interfaces used to bind the nodes must be Active-Backup bonding interfaces." Below this, the "Node binding" section contains a form with two input fields: "Remote node IP:" with the value "192.168.2.221" and "Password:" with masked characters ".....". A green "Connect" button with a checkmark is positioned below the form. The left sidebar menu has "Failover Settings" highlighted. The top navigation bar includes "About", "Help", and "Logout" links. At the bottom, a notification bar shows "Notifications" with 0 error, 0 warning, and 13 info icons.

7. Ping Nodes

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

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

The screenshot shows the 'Failover Settings' page in the Open-E JovianDSS web interface. A modal window titled 'Ping nodes' is open, displaying a table of configured ping nodes. The table has columns for 'IP', 'Local status', and 'Remote status'. Two nodes are listed, both with 'Reachable' status in both columns. Each row has a 'Delete' button. A '+ Add ping node' button is visible in the top right of the modal. A blue arrow points from the text box to this button.

| | IP | Local status | Remote status | |
|---|---------------|--------------|---------------|---------------------------------|
| 1 | 192.168.2.101 | Reachable | Reachable | <input type="checkbox"/> Delete |
| 2 | 192.168.2.102 | Reachable | Reachable | <input type="checkbox"/> Delete |

8. Critical I/O handling setup

It is strongly recommended to select **Immediate** option in order to execute immediate reboot in case of critical I/O error.

The screenshot shows the Open-E JovianDSS web interface. The left sidebar contains navigation options: Storage, User Management, Failover Settings, Storage Settings, System Settings (highlighted), and Diagnostics. The main content area is titled "System Settings" and includes several sections:

- Remote Log Server:** A section with a green checkmark and an "Apply" button. It contains a toggle for "Log events to a remote server" which is currently turned off.
- Critical I/O errors:** A section with a green checkmark and an "Apply" button. It contains a "Reboot procedure" section with the text: "System may require reboot when critical I/O errors occur. Please select how such errors should be handled." Below this, there are three radio button options for the "Reboot policy":
 - Immediate:** Selected. Description: "System will reboot the machine immediately after a pool has I/O suspended state. No event will be recorded about the reason of it. This option is recommended for cluster configurations because it immediately triggers the failover and therefore it's the fastest way to restore the access to the data."
 - Automatic:** Description: "System will restart in 30 seconds from when the errors appear."
 - Manual:** Description: "System will prompt for manual restart."

At the bottom of the page, there is a "Notifications" bar showing 0 errors, 0 warnings, and 19 info messages. A blue arrow points from the text box on the left to the "Immediate" radio button option.

9. Start the Cluster Service

Now, all required settings are completed.

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

The screenshot shows the JovianDSS web interface with the following sections:

- Failover status:** Shows "Ready to start" and a green "Start Failover" button with a checkmark.
- Failover nodes:** A table with columns for Node, Connection status, and Failover status.
- Failover resources:** A table with columns for Zpool name, Active on node, and Status.
- Rings:** Shows "1 configured" with a "Details" button.
- Ping nodes:** Shows "2 of 2 reachable" with an "Edit" button.

| Node | Connection status | Failover status |
|--|-------------------|-----------------|
| node-a-JNFR0011 (IP: 192.168.2.220, node ID: 2580a627) | Reachable | N/A |
| node-b-JNFR0012 (IP: 192.168.2.221, node ID: 56c190c4) | Reachable | N/A |

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

Notifications: 0 (red), 0 (yellow), 14 (blue)

10. Enter the Virtual IP

In main menu **Storage**, select **Virtual IPs** tab then click on the **Add virtual IP** button and enter the virtual IP address and assign it to the required interfaces.

The screenshot displays the Open-E JovianDSS web interface. The main menu on the left includes 'Storage', 'User Management', 'Failover Settings', 'Storage Settings', 'System Settings', and 'Diagnostics'. The 'Storage' section is active, showing 'Pool-0' with a status of 'ONLINE'. A modal dialog titled 'Add virtual IP' is open, containing the following fields:

- Virtual IP address: 192.168.21.100
- Name: vip-00
- Netmask: 255.255.255.0
- Network interface: bond0 (192.168.0.220)
- Remote network interface: bond1 (192.168.2.221)

Buttons for 'Cancel' and 'Apply' are visible at the bottom of the dialog. The background interface also shows 'Virtual IPs' and 'Zpools available for import' sections.

11. System Monitoring Setup

It is recommended to setup the system monitoring with **Remote Log Server** or **SNMP**.

node-a-JNFR0011 x node-b-JNFR0012 x +

open-e JovianDSS About Help Logout

Storage
User Management
Failover Settings
Storage Settings
System Settings
Diagnostics

System Settings

Apply

Remote Log Server

Log events to a remote server

Apply

Critical I/O errors

Reboot procedure

System may require reboot when critical I/O errors occur. Please select how such errors should be handled.

Reboot policy:

- Immediate**
System will reboot the machine immediately after a pool has I/O suspended state. No event will be recorded about the reason of it. This option is recommended for cluster configurations because it immediately triggers the failover and therefore it's the fastest way to restore the access to the data.
- Automatic**
System will restart in 30 seconds from when the errors appear.
- Manual**
System will prompt for manual restart.

Apply

Notifications 0 0 19

11. System Monitoring Setup

Setup proper E-mail notifications.

The screenshot shows the 'System Settings' page in the Open-E JovianDSS web interface. The left sidebar contains navigation options: Storage, User Management, Failover Settings, Storage Settings, System Settings (highlighted), and Diagnostics. The main content area is titled 'System Settings' and features a section for 'E-mail notifications'. A green checkbox labeled 'Enable e-mail notifications' is checked. Below this, there are input fields for 'E-mail:' (containing 'name@example.com'), 'SMTP server:' (containing 'smtp.example.com'), and 'SMTP port:' (containing '25'). There are also checkboxes for 'Use authentication:' and 'Encryption:'. Under 'Destination e-mail:', the radio button for 'Use default e-mail address' is selected. A 'Send test message' button is located below the settings. At the bottom of the section, a green 'Apply' button is visible. Below the E-mail notifications section, there is a 'Remote Log Server' section with a checkbox for 'Log events to a remote server' which is unchecked, and another 'Apply' button. At the very bottom of the page, a status bar shows 'Notifications' with 0 error icons, 0 warning icons, and 19 information icons.

12. Failover test

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

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

The screenshot shows the Open-E JovianDSS web interface. The sidebar menu on the left has 'Storage' selected. The main content area displays details for 'Pool-0', including its state (ONLINE), Zpool ID (2005253826725532254), total storage (31.75 GiB), and number of disks (8). A status message indicates the zpool is functioning correctly. The 'Options' dropdown menu is open, showing 'Move' as the selected option. Below the pool details, there is a section for 'Zpools available for import' with a 'Rescan required' message. At the bottom, there is a table for 'Unassigned disks' which is currently empty.

12. Failover test

Go to the second node.

In order to move pool activity from the second node back to the first node, select the **Move** function from **Options** menu. Now the pool will be exported at the second node and next will be imported back on the first one.

Node Reboot Test:
Once the failover is completed, go to the first node and select reboot option from drop-down menu next to the **Logout** button. Pool activity will be moved to other cluster node.

node-a-JNFR0011 x node-b-JNFR0012 x +

open-e JovianDSS

About Help Logout

Storage Rescan Add zpool

Storage

User Management

Failover Settings

Storage Settings

System Settings

Diagnostics

Pool-0

State: ONLINE

Zpool ID: 2005253826725532254

Total storage: 31.75 GiB

Disks: 8

Status: Pool is functioning correctly.

Action: None required.

Options

Delete Zpool

Export Zpool

Move

Zpools available for import

Rescan required

Press Rescan storage button above to scan disks for new zpools.

Unassigned disks

Search

| Name | Serial number | Size | Model | Blink |
|----------------------------|---------------|------|-------|-------|
| No unassigned disks found. | | | | |

Notifications 0 0 19

NOTE:

The step-by-step guide is based on configuration from page 3, use single Bonding for storage access. This will work with iSCSI and NFS.

Next on page 33 will show setup with two storage access paths and two virtual IPs. This setup can be used for iSCSI Initiators with multipath. It can be used also without multipath, just to separate load on 2 separate network paths.

On page 34 instead of just two storage paths, there are two Bonding. This setup can be used also for iSCSI Initiators with multipath or for mixed iSCSI/NFS environments.

Page 34 additionally shows 2 optional JBODs, which can be mirrored with mirrored disk groups in order to eliminate a JBOD as single point of failure.

Open-E JovianDSS High-Availability Cluster



Client-1 : ESXi,
Citrix XEN, Hyper-V



Client-2 : ESXi,
Citrix XEN, Hyper-V



eth0:192.168.21.101 (iSCSI-MPIO or NFS)
eth1:192.168.31.101 (iSCSI-MPIO or NFS)
eth0 or eth1:192.168.2.101 (Ping Node)



eth0 (iSCSI-MPIO or NFS) eth0:192.168.21.102
eth1 (iSCSI-MPIO or NFS) eth1:192.168.31.102
(Ping Node) eth0 or eth1:192.168.2.102



JovianDSS
node-a



open-e

Port used for WEB GUI management
Storage Client Access,
eth0:192.168.0.220
eth1:192.168.1.220
(iSCSI-MPIO) or NFS
Ring, Ping node
Bond (active backup)
Bond0:192.168.2.220



NOTE:

Ring path (heartbeat) and Ping nodes must run on Active-Backup Bonding. Ring and Ping IP must be configured in the same network subnet.

Virtual IP Addresses:
192.168.21.100
192.168.31.100



open-e

JovianDSS
node-b

Port used for WEB GUI management
Storage Client Access,
eth0:192.168.0.221
eth1:192.168.1.221
(iSCSI-MPIO) or NFS
Ring, Ping node
Bond (active backup)
Bond0:192.168.2.221



SAS HBA



SAS HBA



JBOD



Open-E JovianDSS High-Availability Cluster



Client-1 : ESXi,
Citrix XEN, Hyper-V



Client-2 : ESXi,
Citrix XEN, Hyper-V



eth0:192.168.21.101 (iSCSI-MPIO or NFS)
eth1:192.168.31.101 (iSCSI-MPIO or NFS)
eth0 or eth1:192.168.2.101 (Ping Node)



eth0 (iSCSI-MPIO or NFS) eth0:192.168.21.102
eth1 (iSCSI-MPIO or NFS) eth1:192.168.31.102
(Ping Node) eth0 or eth1:192.168.2.102



JovianDSS
node-a



JovianDSS
node-b



Port used for WEB GUI management,
Storage Client Access
Bond0:192.168.0.220
(iSCSI-MPIO or NFS)



Port used for WEB GUI management
Storage Client Access
Bond0:192.168.0.221
(iSCSI-MPIO or NFS)



Storage Client Access
Bond1:192.168.2.220
(iSCSI-MPIO or NFS)



Storage Client Access
Bond1:192.168.2.221
(iSCSI-MPIO or NFS)



Ring, Ping node
Bond (active backup)
Bond2:192.168.4.220



Ring, Ping node
Bond (active backup)
Bond2:192.168.4.221



NOTE:
Ring path (heartbeat) and Ping nodes
must run on Active-Backup Bonding.
Ring and Ping IP must be configured in
the same network subnet.

Virtual IP Addresses:
192.168.21.100
192.168.31.100

SAS HBA



SAS HBA



JBOD 1



JBOD 2



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