Step-by-Step Guide

Open-E JovianDSS High-Availability Cluster

Software Version: JovianDSS ver. 1.00 up19

Last update: April 2018

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

Open-E JovianDSS includes failover functionality for SMB, NFS and iSCSI enabling you to set up High Availability Load-Balanced Storage Clusters.
By using the Open-E JovianDSS High Availability Cluster Feature Pack you can ensure reliability
and redundancy through failover in case of a server crash.

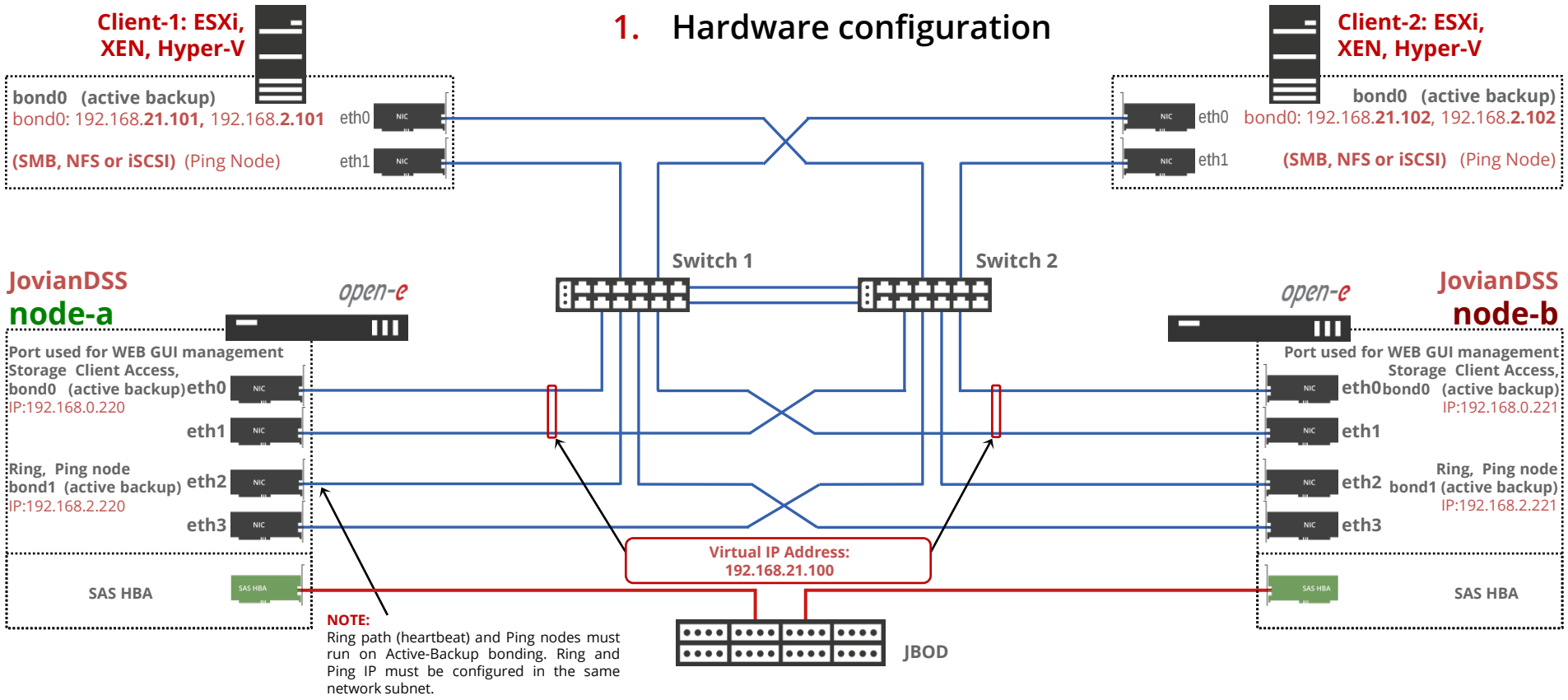
The HA cluster management software enables you to quickly access all features related to your cluster setup.
Whether for initial configuration or re-configuration after a failover – everything is in one place and guarantees ease of use for the storage administrator.

Data can be simultaneously accessed via SMB, NFS or iSCSI and via one more Virtual IP addresses. Independent VIP feature create a connection to the data which is independent of the physical network path.
High availability is achieved by detecting hardware failures and automatically moving the VIP from the primary to the secondary node without the client servers noticing a timeout.

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

1. Hardware configuration
2. Create new Pool
    - 2.1. Add write log (SLOG for ZIL)
    - 2.2. Add Read Cache
    - 2.3. Add Spare Disk
3. Create iSCSI Target
4. Network Configuration
    - 4.1. Create Bonds
    - 4.2. Select Default gateway
    - 4.3. Enter DNS
5. Time and date settings
6. Nodes Binding
7. Ping Nodes
8. Critical I/O handling setup
9. Start the Cluster Service
10. Enter Virtual IP
11. System Monitoring Setup
12. Failover test

1. Hardware configuration



NOTE:
Every cluster node must have set unique hostname. If more clusters are running in the same network, it is recommended to use following host names:

- First cluster hostnames: node-a-00 node-b-00
- Second cluster hostnames : node-a-01 node-b-01
- Third cluster hostnames : node-a-02 node-b-02

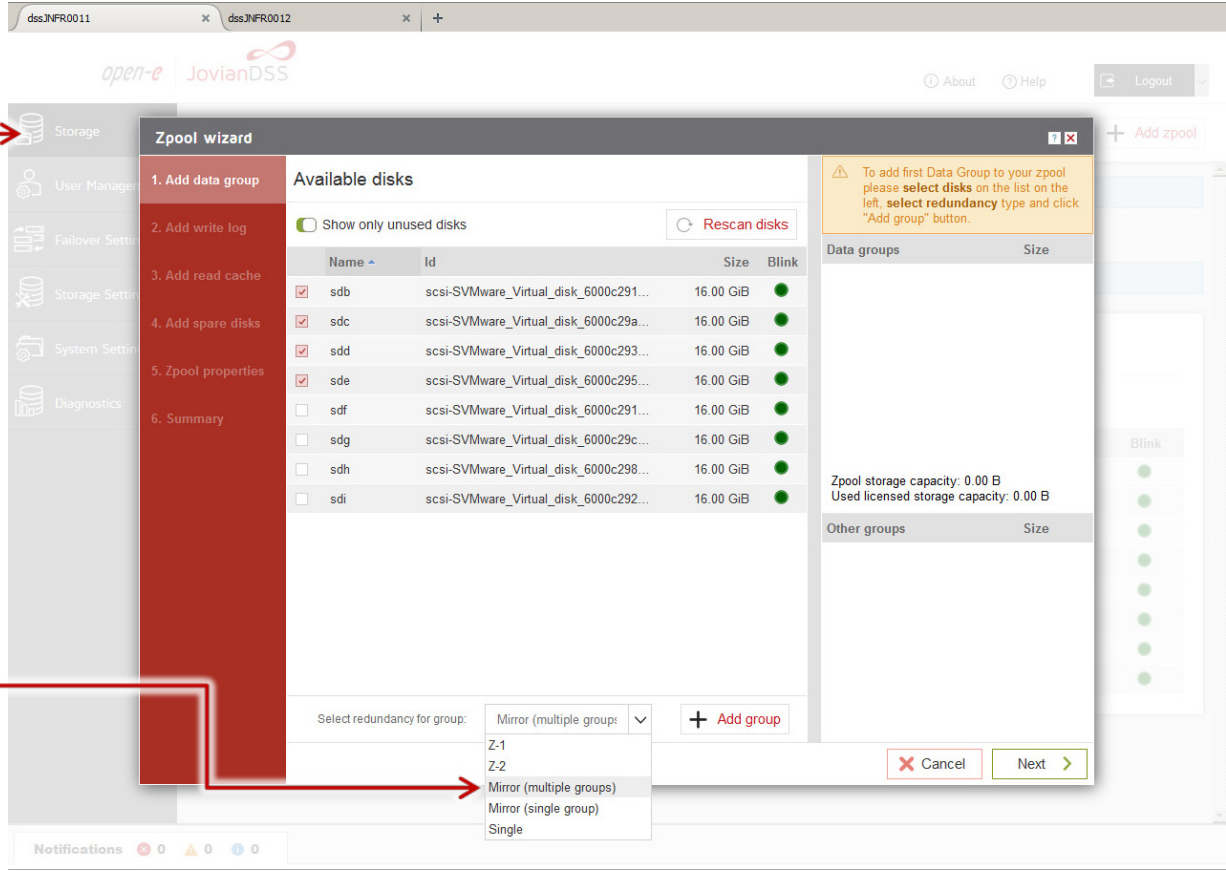
And so on

If both cluster nodes are using same kind of 1Gbit and 10Gbit Ethernet ports but the port number sequence is different, it is possible to re-assign Ethernet port number sequence on console tools using hot-key: ctrl-alt-t and selecting function: Add-ons->NICs management.

2. Create new Pool

JovianDSS: **node-a**
IP Address: 192.168.0.220

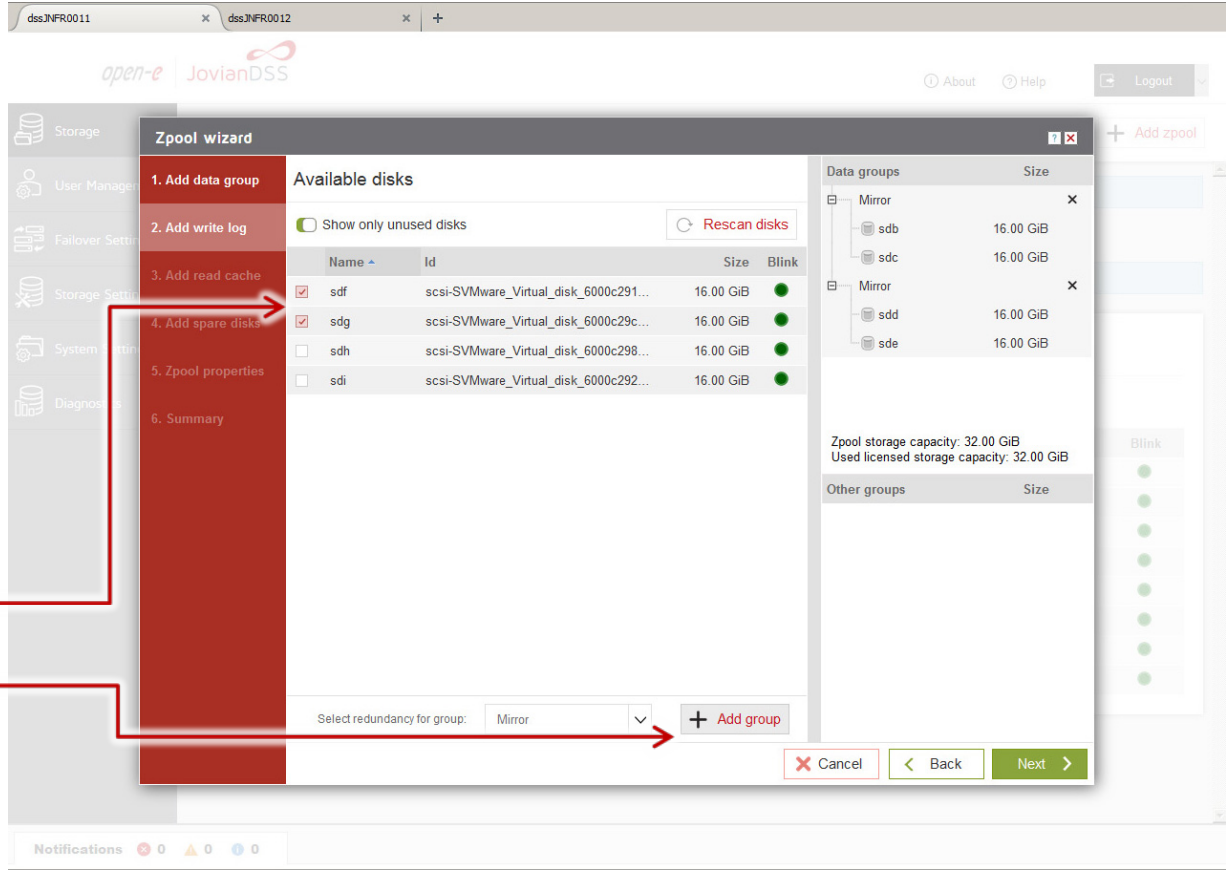
Go to menu Storage and click on **Add zpool button**. Add data groups by selecting the required amount of disks and select Mirror(multiple groups) from the pull-down menu and click on Add group button, then click on the **Next** button.



2.1. Add write log (SLOG for ZIL)

JovianDSS: **node-a**
IP Address: 192.168.0.220

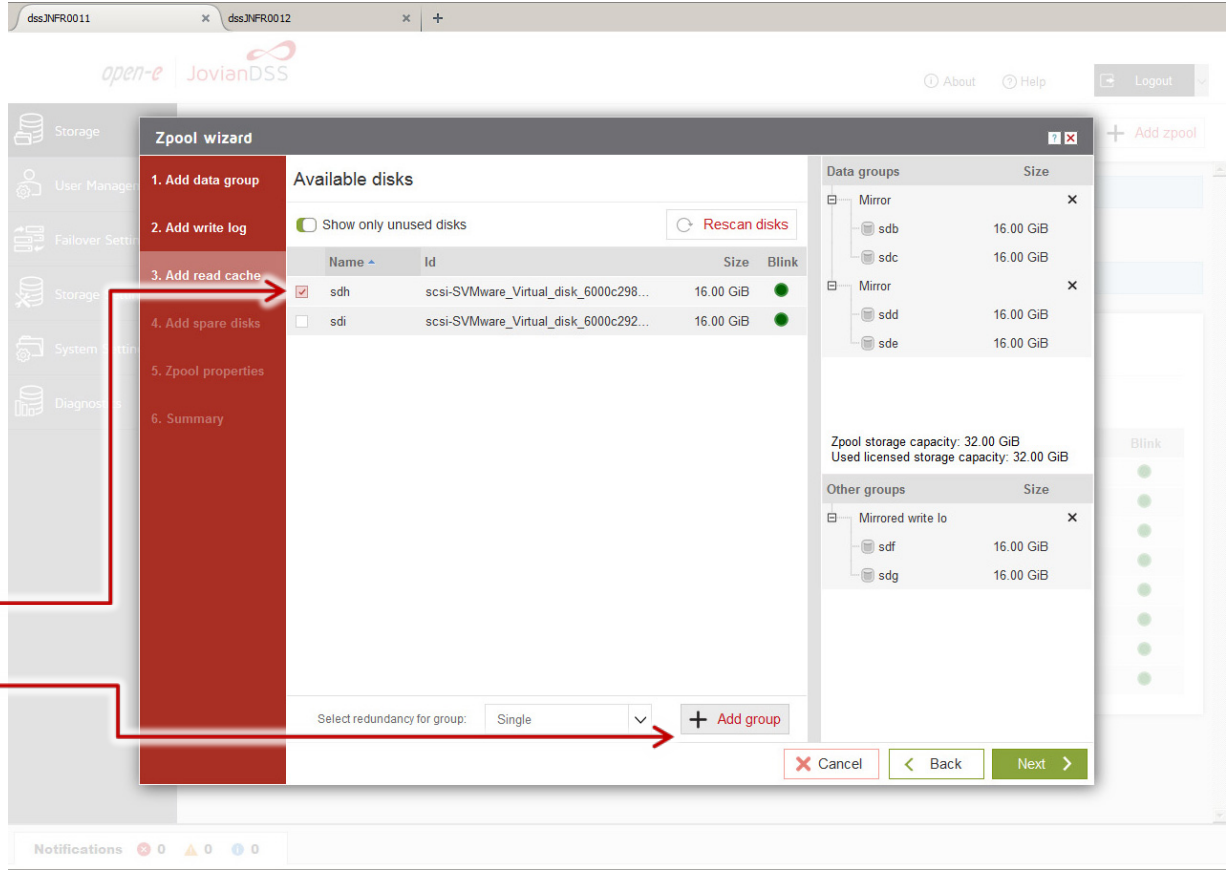
Select 2 disks for the write log and click on **Add group** button then click on the **Next** button.



2.2. Add Read Cache

JovianDSS: **node-a**
IP Address: 192.168.0.220

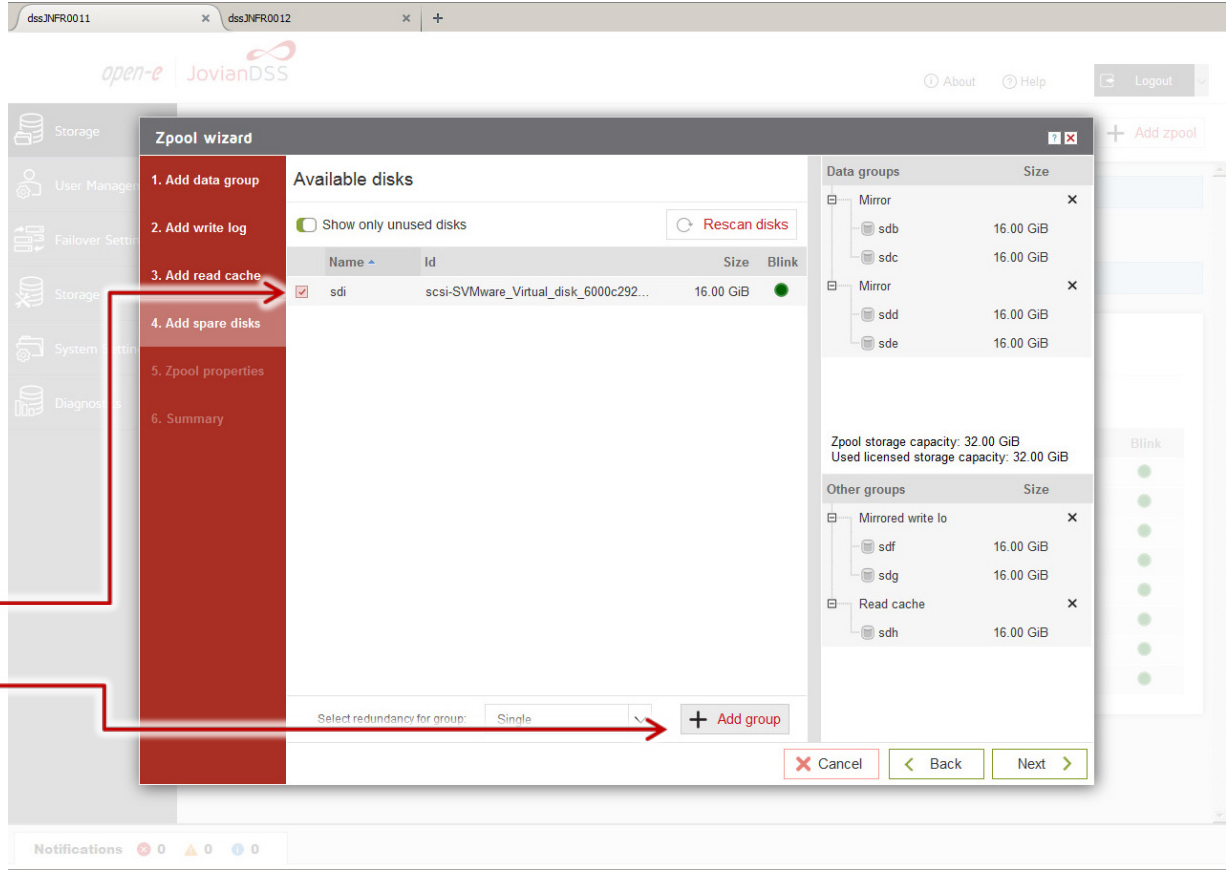
Select disk (or disks) for level-2 read cache and click on the **Add group** button then click on the **Next** button.



2.3. Add Spare Disk

JovianDSS: **node-a**
IP Address: 192.168.0.220

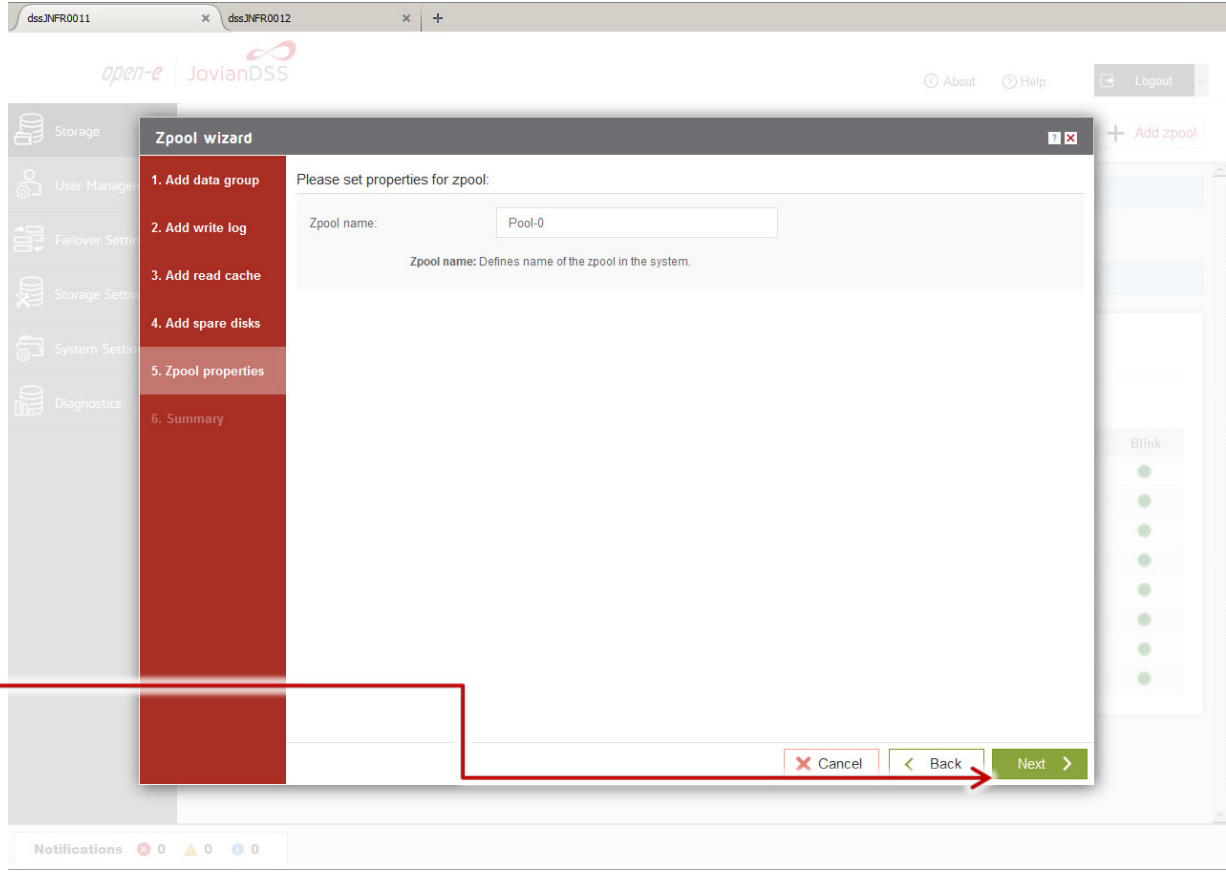
Select spare disk (or disks) and click on the **Add group** button then click on the **Next** button.



2. Create new Poool

JovianDSS: **node-a**
IP Address: 192.168.0.220

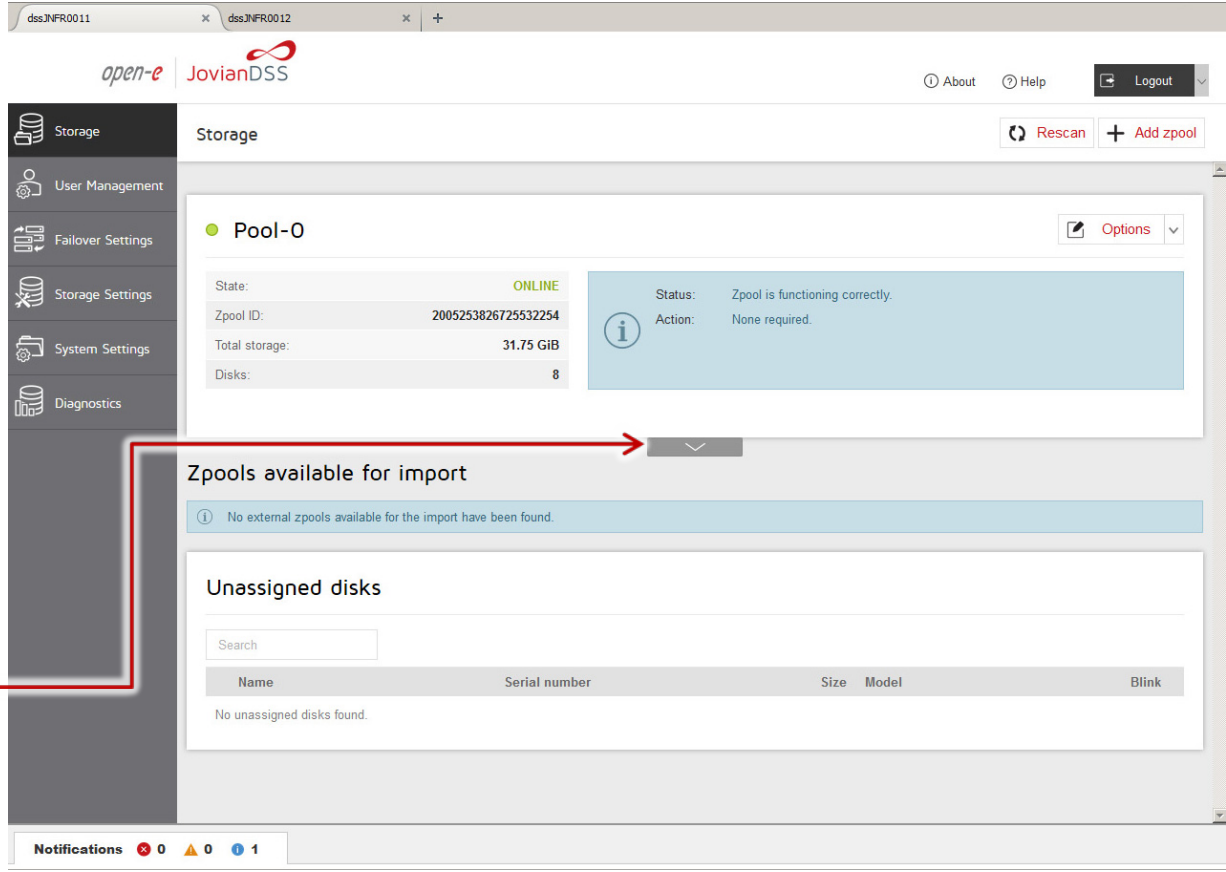
To confirm the pool name click on the **Next** button then click on the next screen and click on the **Add pool** button.



3. Create iSCSI Target

JovianDSS: **node-a**
IP Address: 192.168.0.220

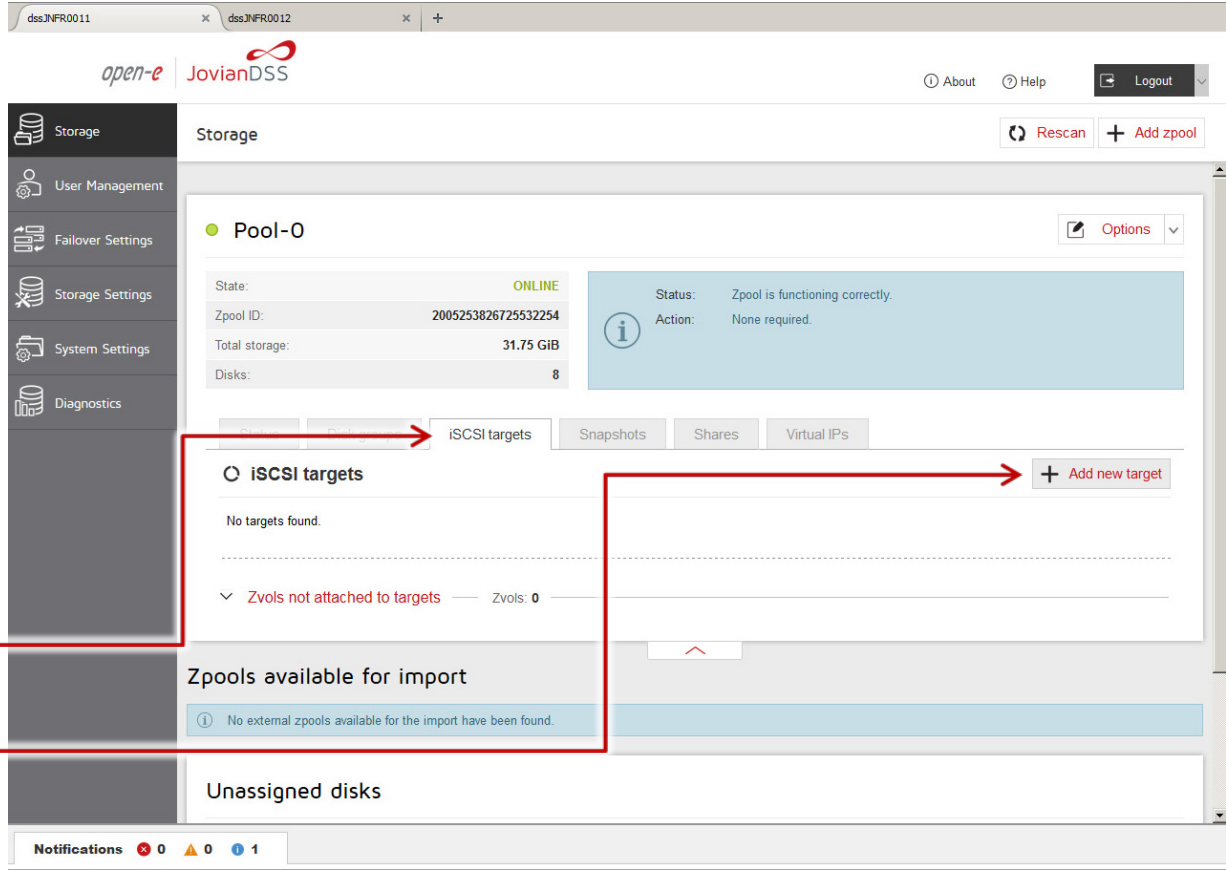
The Pool menu can be open by clicking the **down arrow - icon** button.



3. Create iSCSI Target

JovianDSS: **node-a**
IP Address: 192.168.0.220

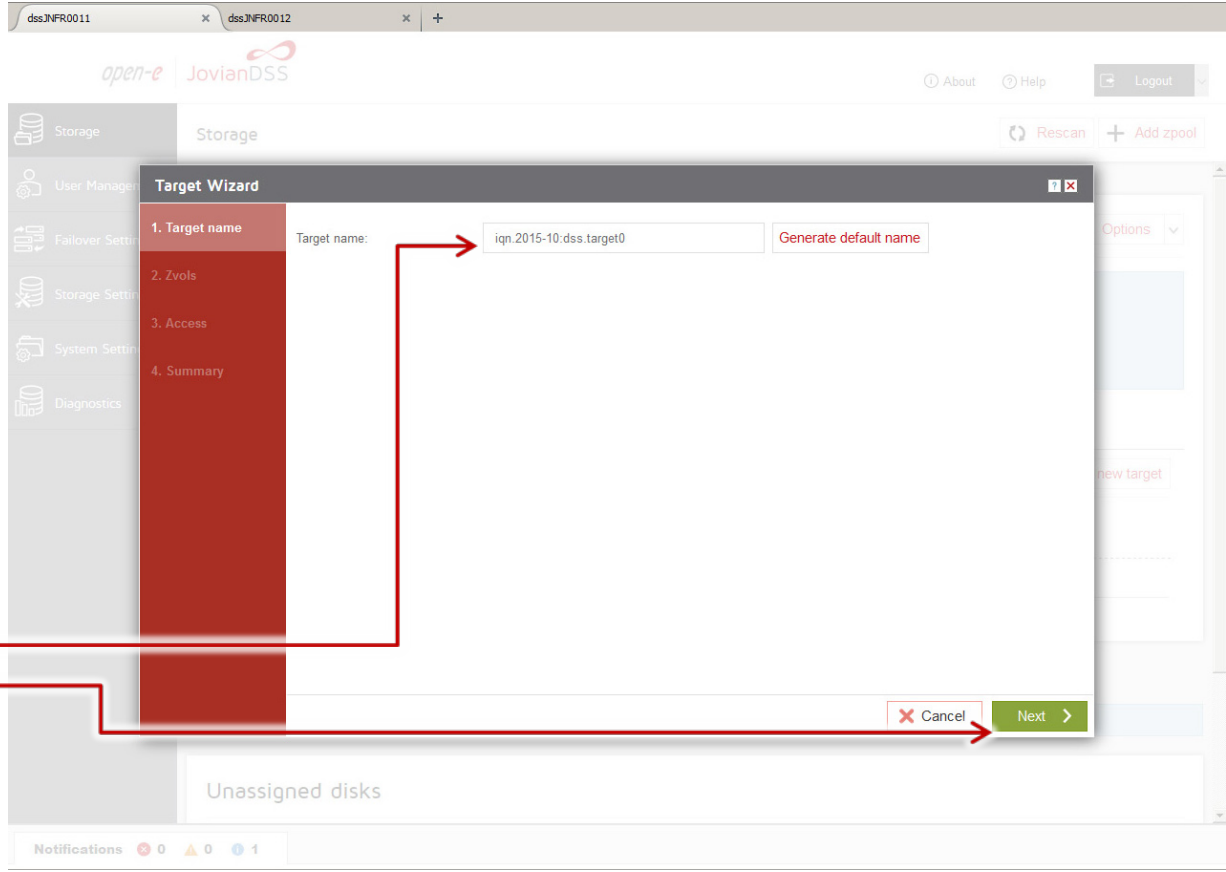
In the pool menu select **iSCSI targets** and click on the **Add new target** button.



3. Create iSCSI Target

JovianDSS: **node-a**
IP Address: 192.168.0.220

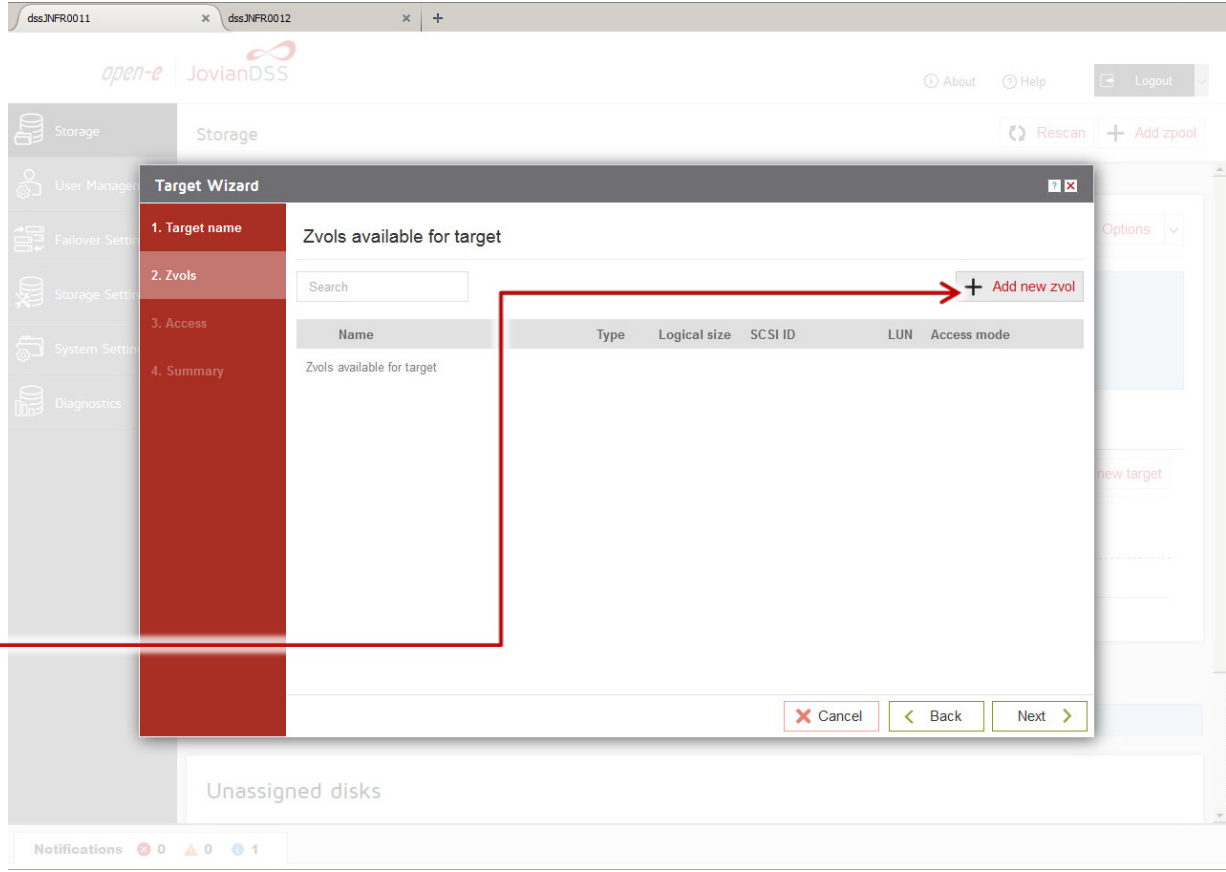
To confirm default iSCSI target name click the **Next** button.



3. Create iSCSI Target

JovianDSS: **node-a**
IP Address: 192.168.0.220

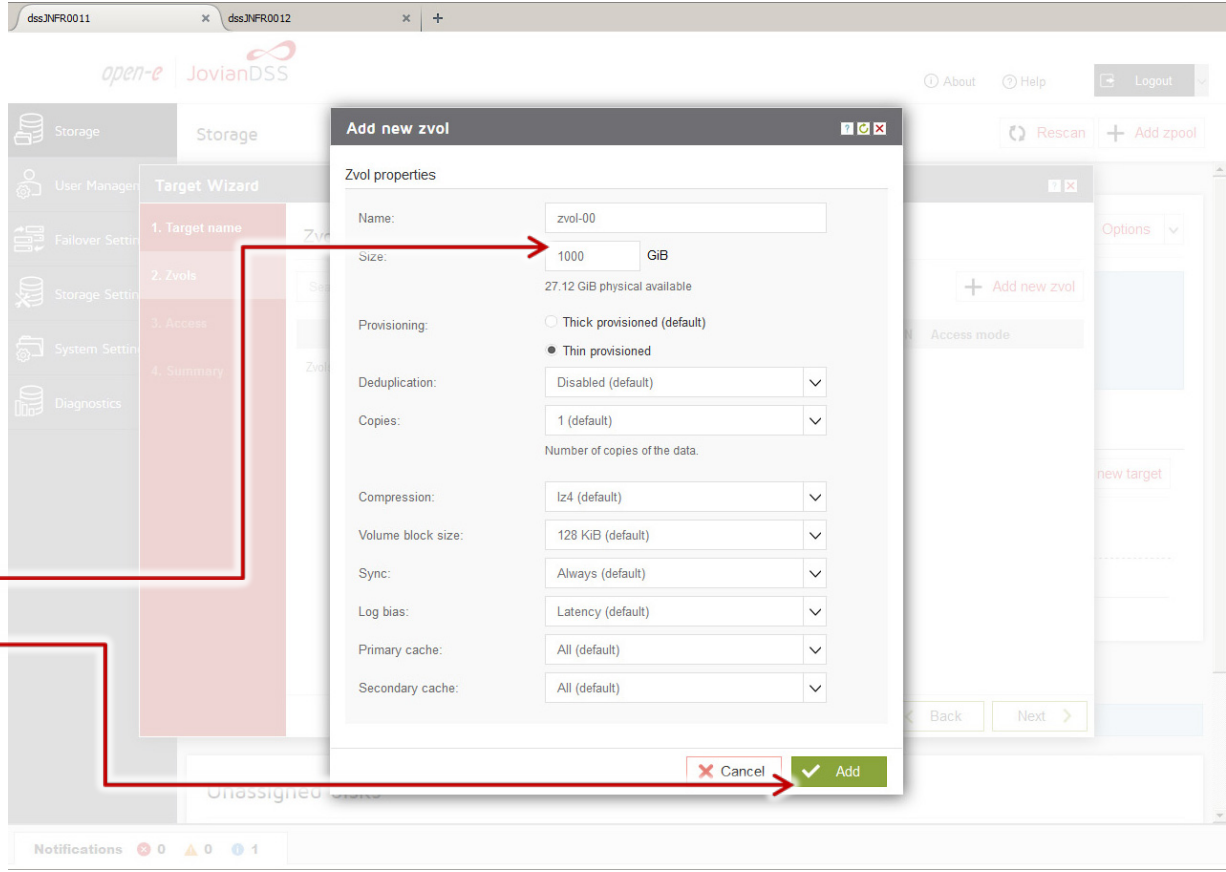
In order to create a new volume assigned to the target click on the Add new zvol button.



3. Create iSCSI Target

JovianDSS: **node-a**
IP Address: 192.168.0.220

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

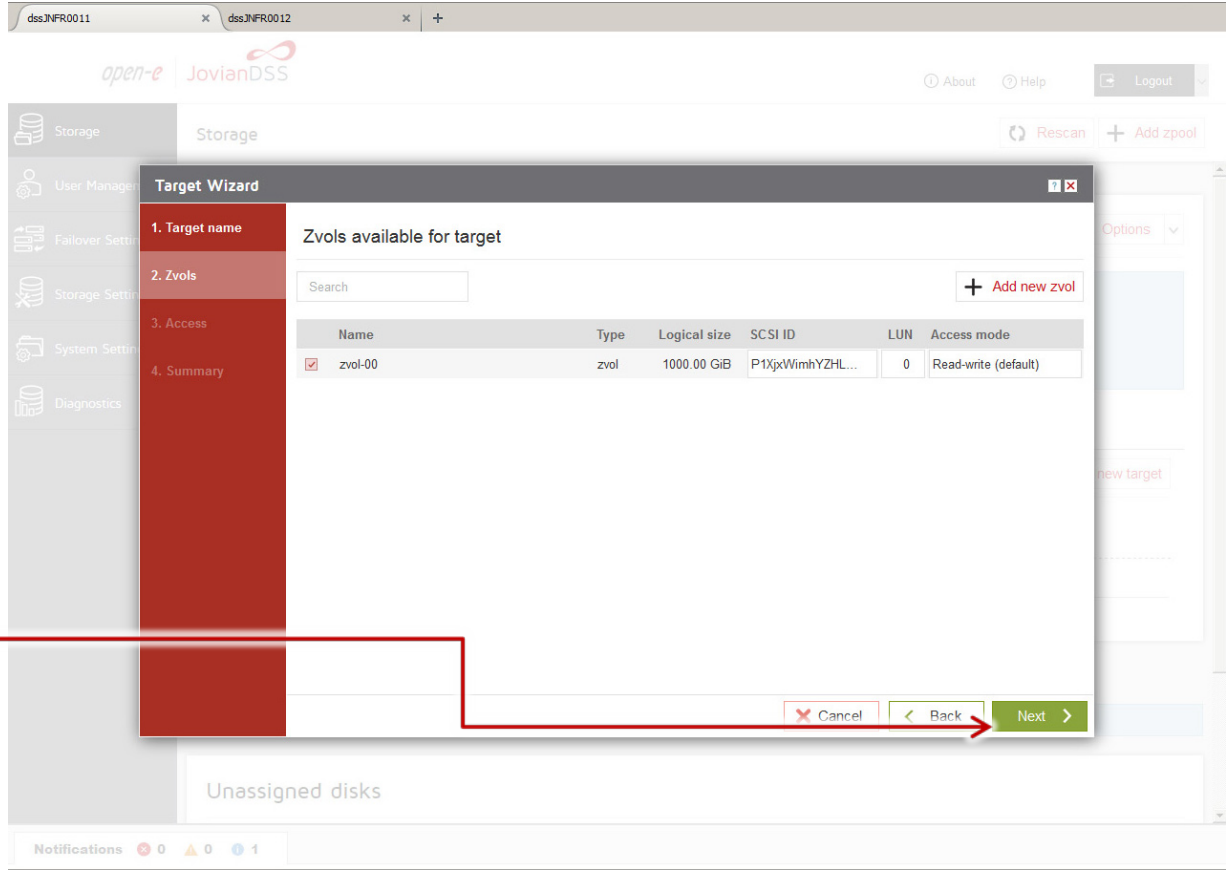


3. Create iSCSI Target

JovianDSS: **node-a**
IP Address: 192.168.0.220

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.

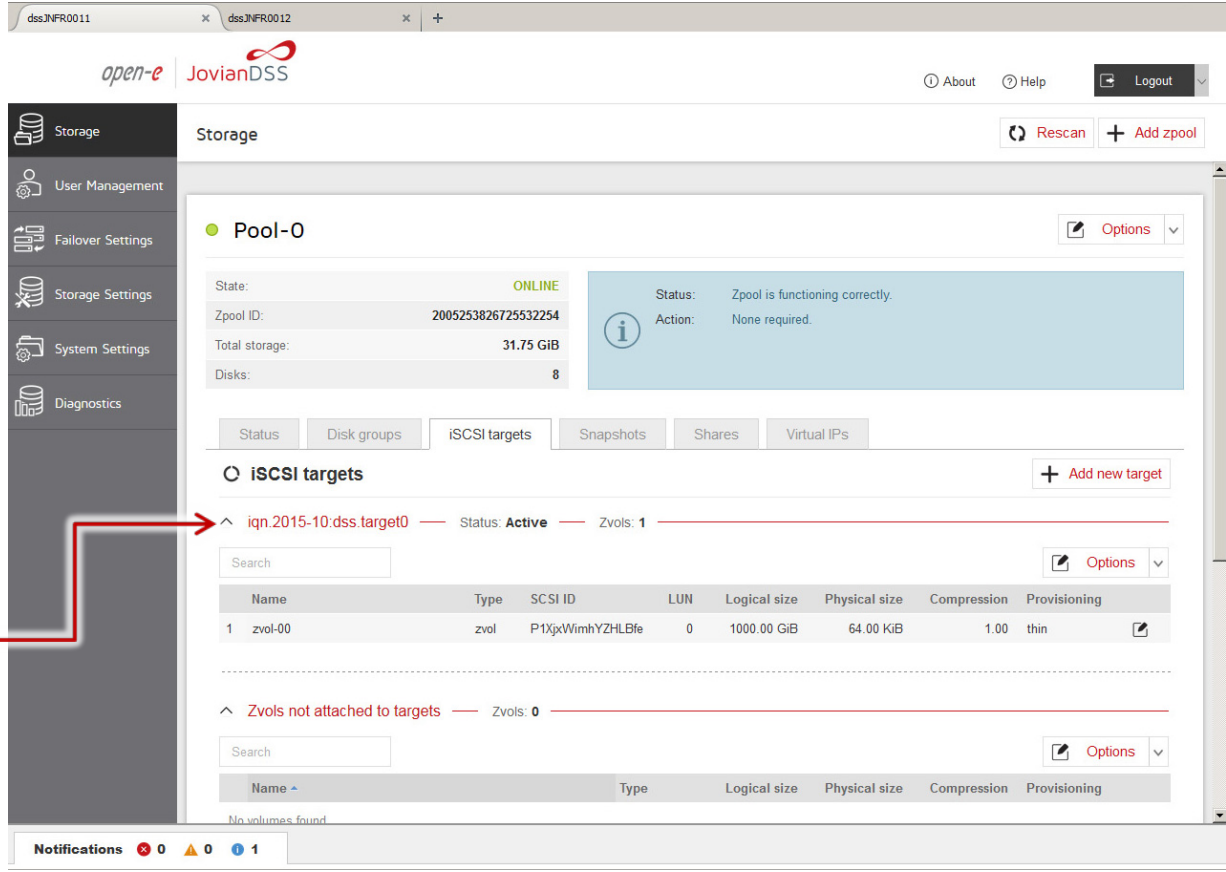


3. Create iSCSI Target

JovianDSS: **node-a**
IP Address: 192.168.0.220

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

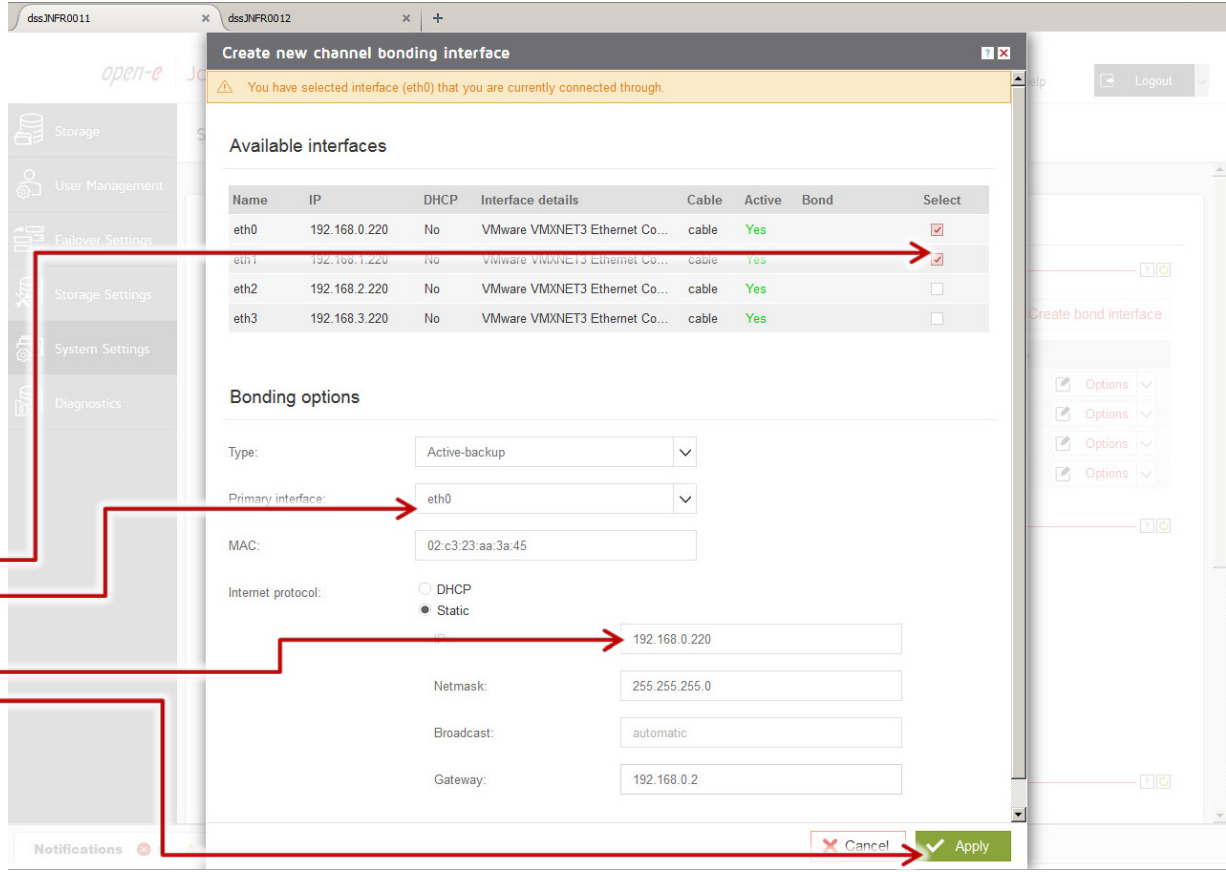
Optionally, also an SMB, NFS share can be created, but it is not shown in this document.



4. Network Configuration

JovianDSS: **node-a**
IP Address: 192.168.0.220

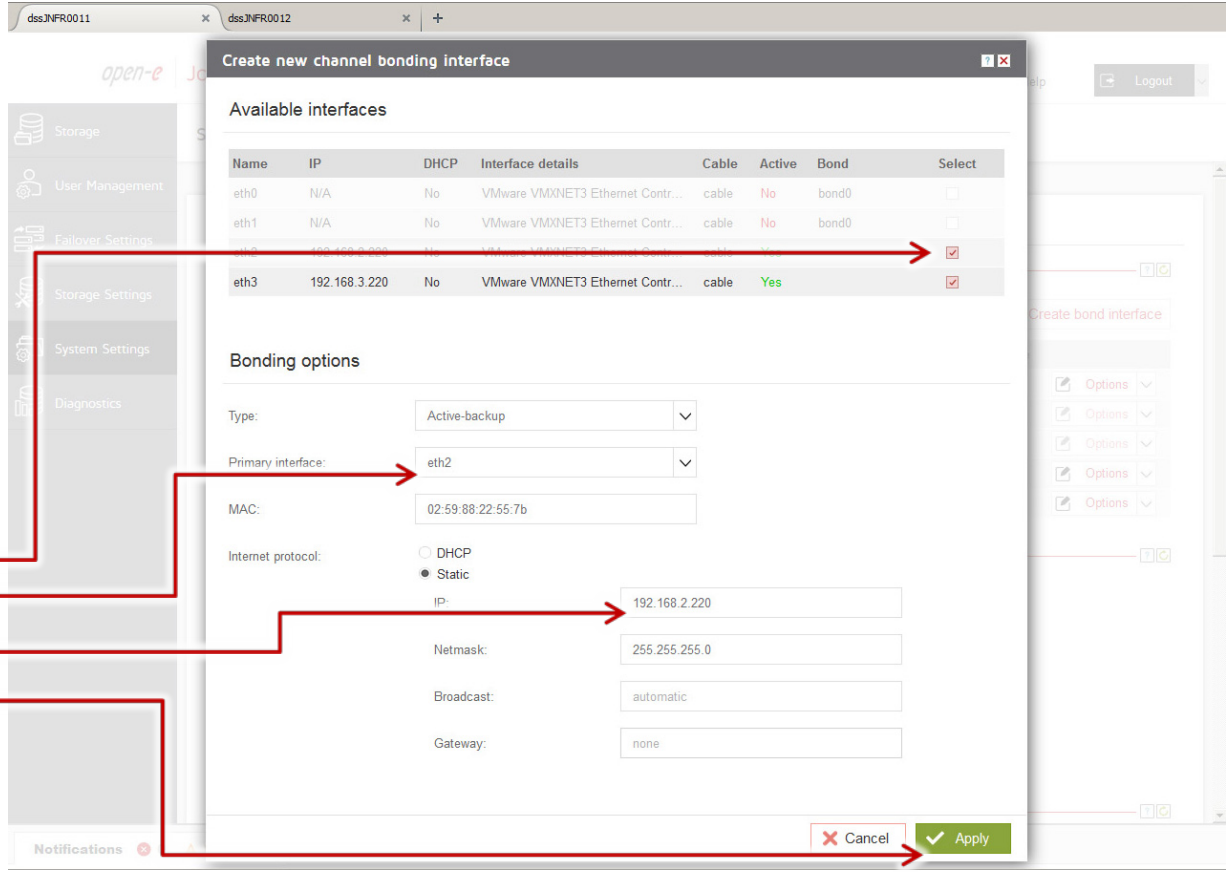
Select **System Settings** from main menu and next select **Network** tab. Click on the **Create Bond interface** button. Enter all required details of the Bond and click on the **Apply** button.



4.1. Network Configuration. Create Bonds.

JovianDSS: **node-a**
IP Address: 192.168.0.220

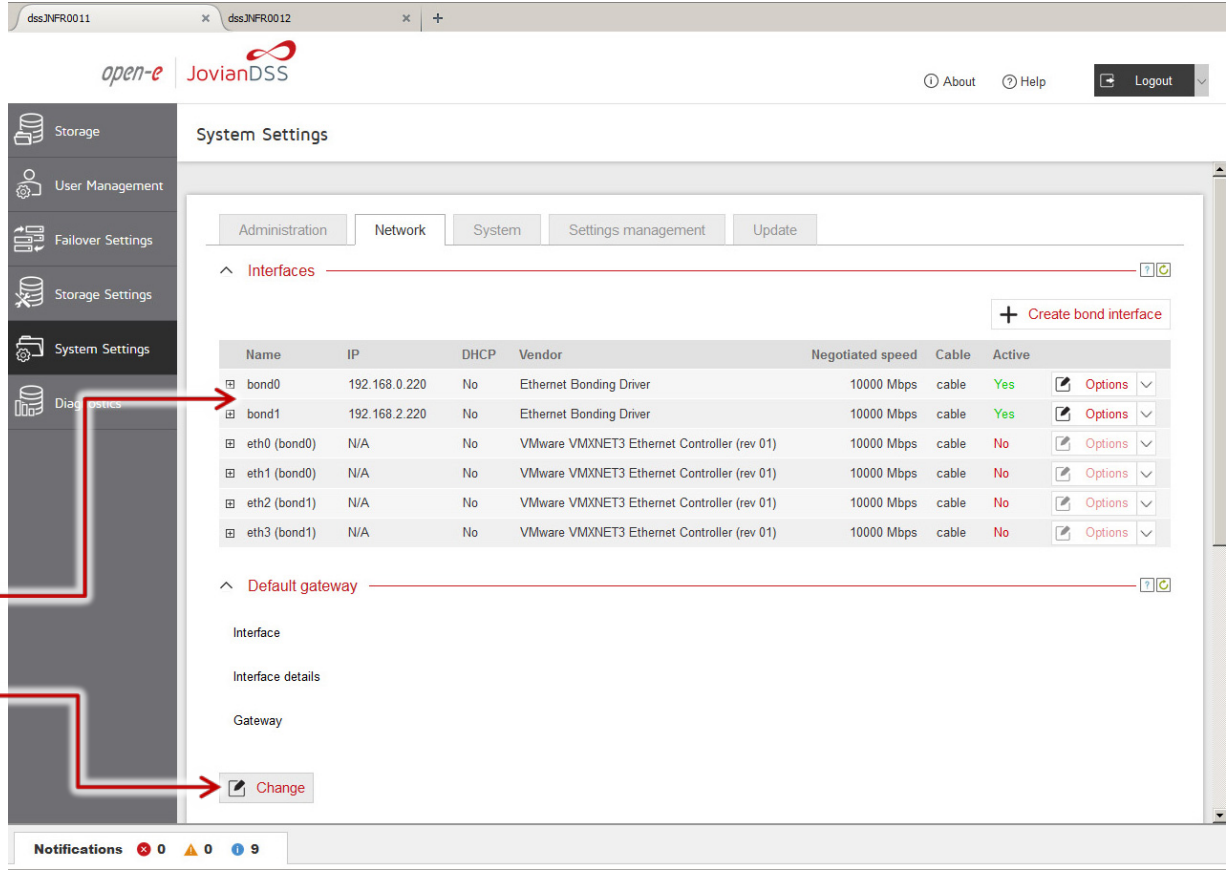
Next, please repeat the same steps for the second Bond.



4.2. Network Configuration. Select Default gateway

JovianDSS: **node-a**
IP Address: 192.168.0.220

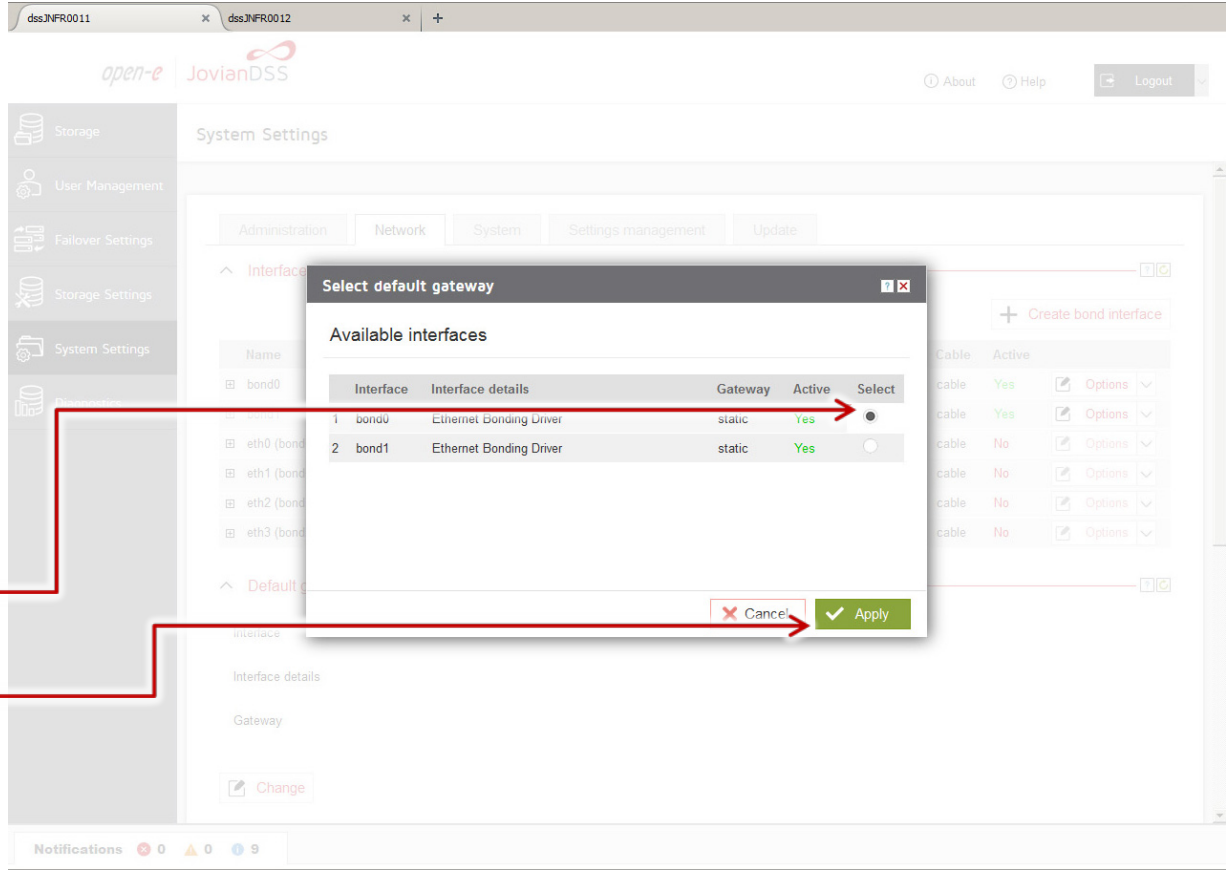
Both Bonds are created properly. Overview is shown in the Interfaces field. Next, in the Default gateway field, click on the **Change** button.



4.2. Network Configuration. Select Default gateway

JovianDSS: **node-a**
IP Address: 192.168.0.220

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

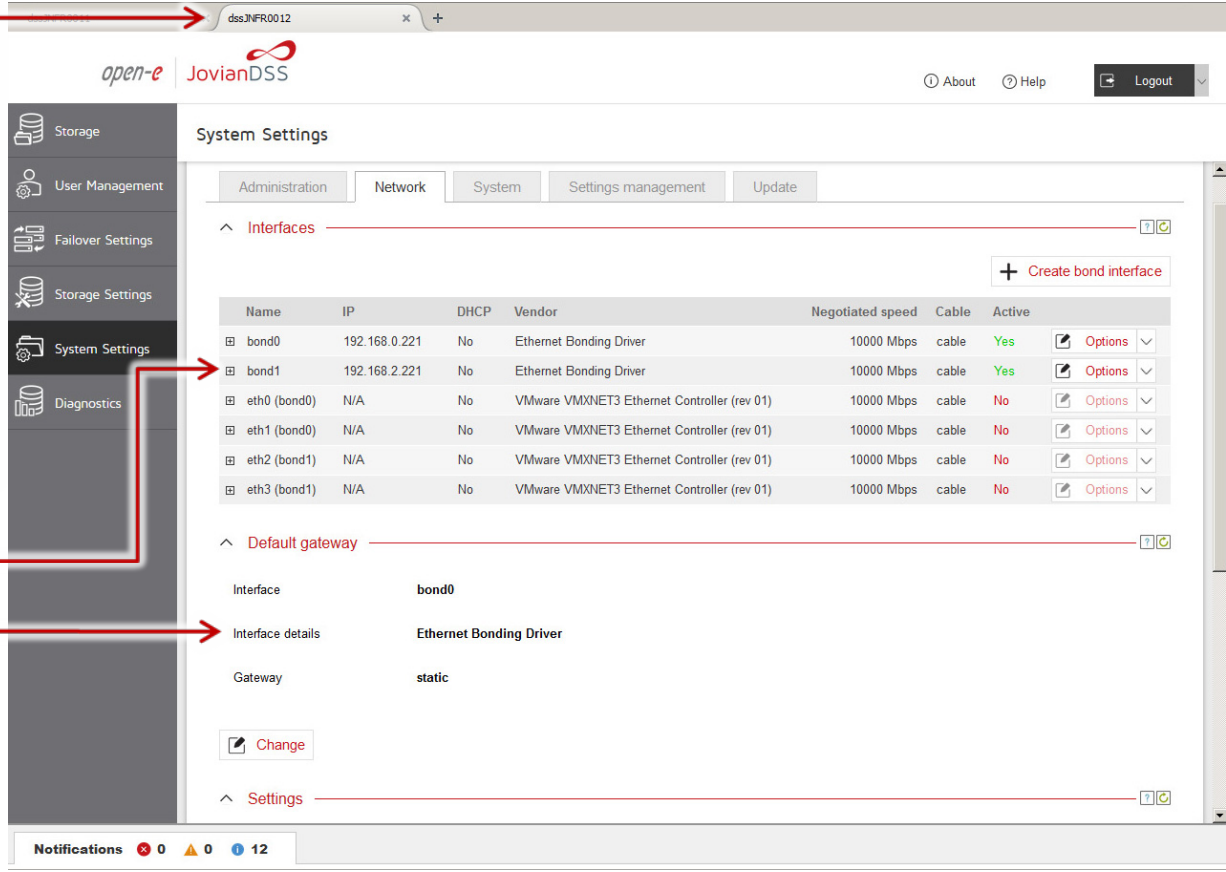


4. Network Configuration (second cluster node)

JovianDSS: **node-b**
IP Address: 192.168.0.221

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.

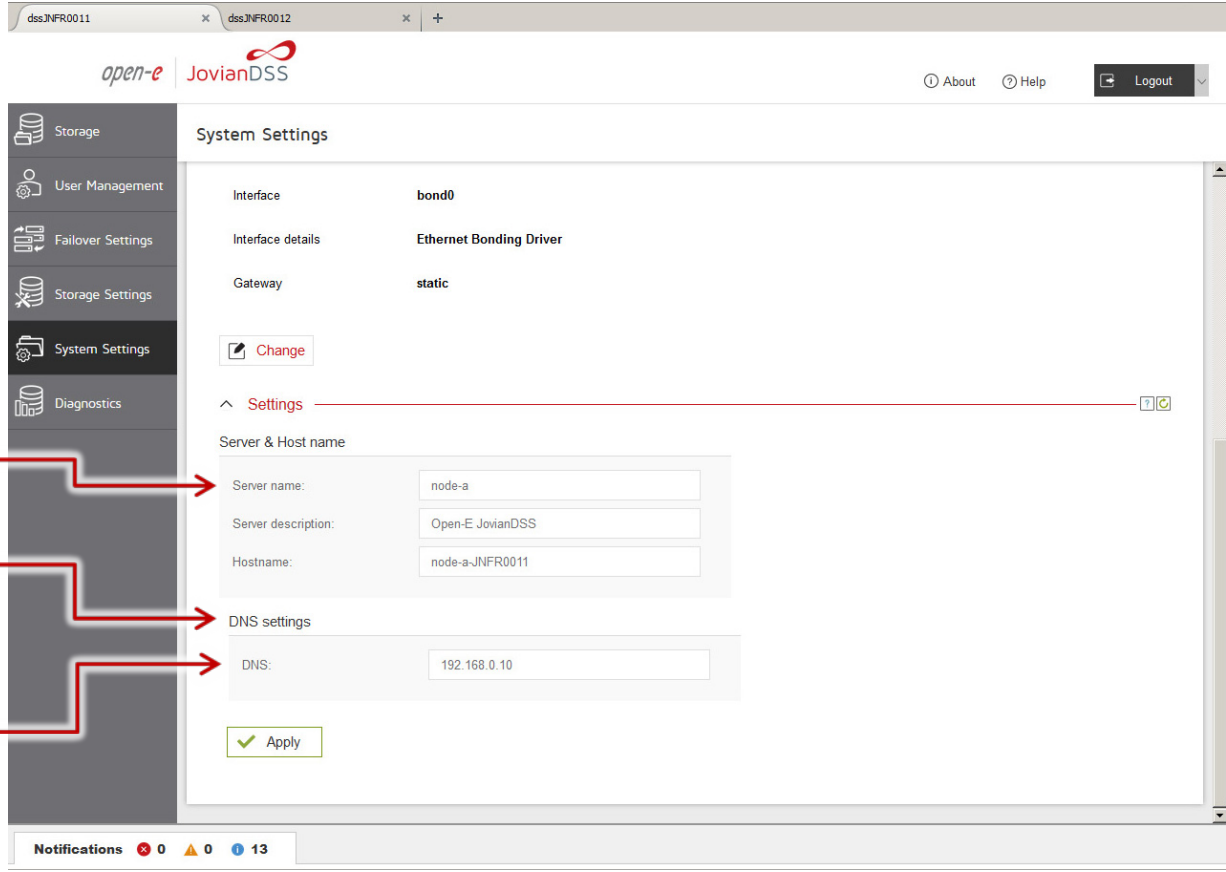


4.3. Network Configuration. Enter DNS IP

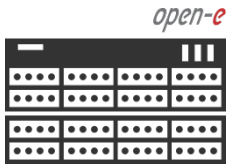
JovianDSS: **node-a**
IP Address: 192.168.0.220

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.

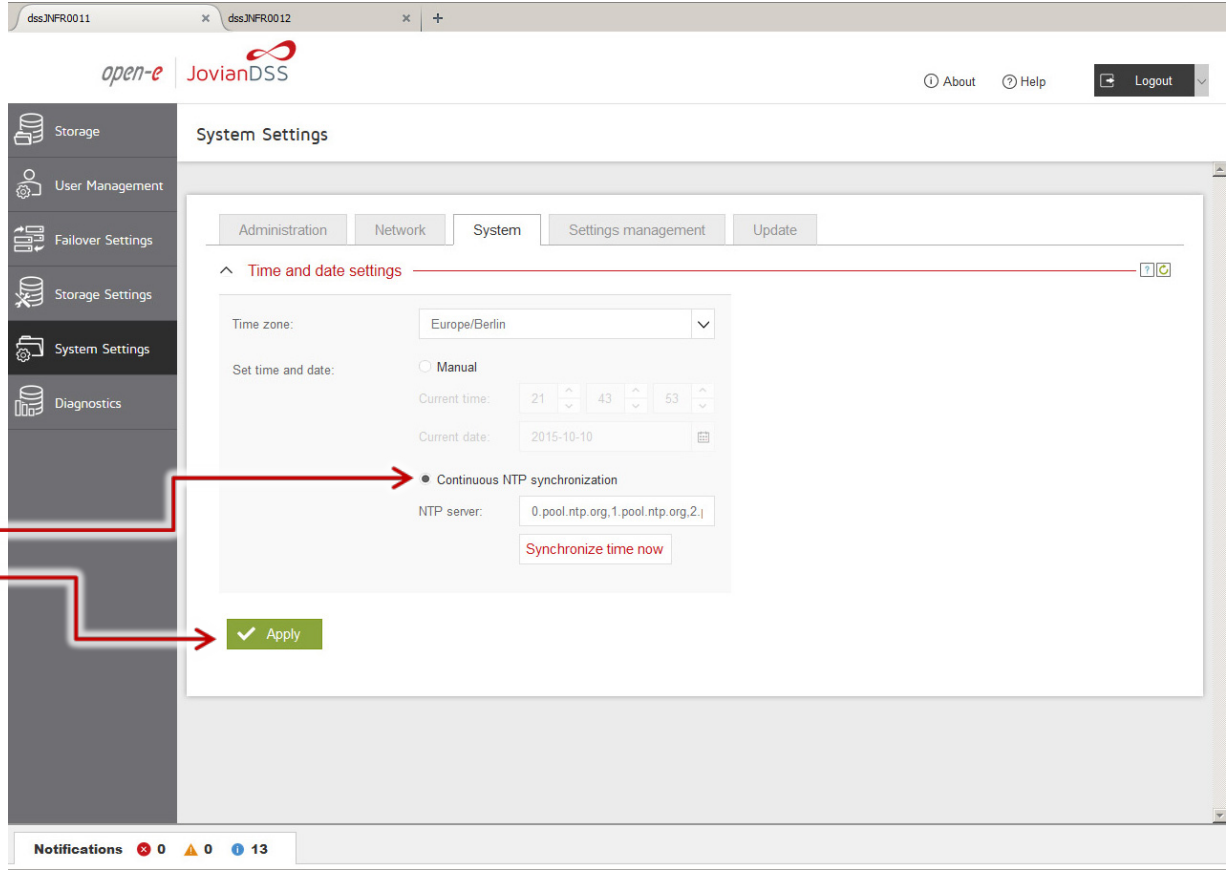


5. Time and date settings



JovianDSS: **node-a**
IP Address: 192.168.0.220

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

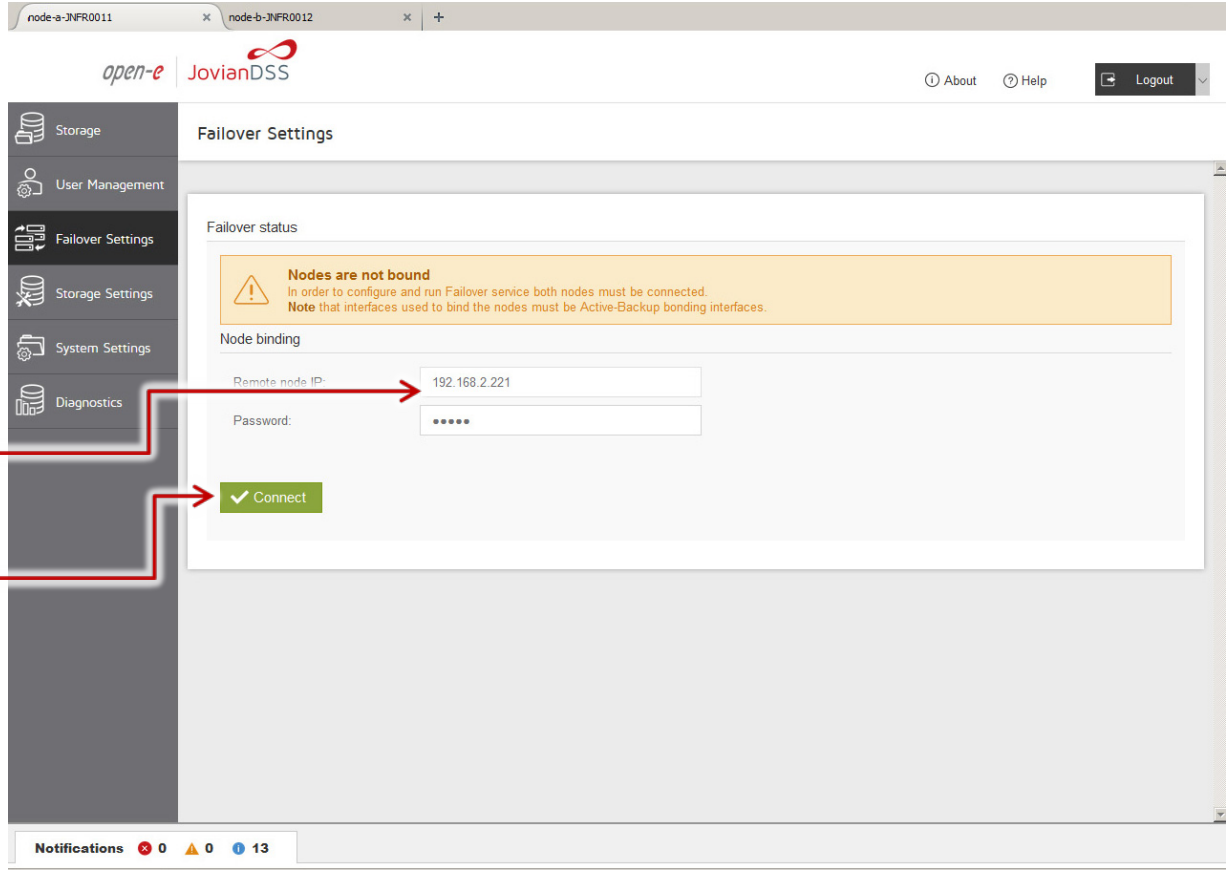


6. Nodes Binding

JovianDSS: **node-a**
IP Address: 192.168.0.220

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.

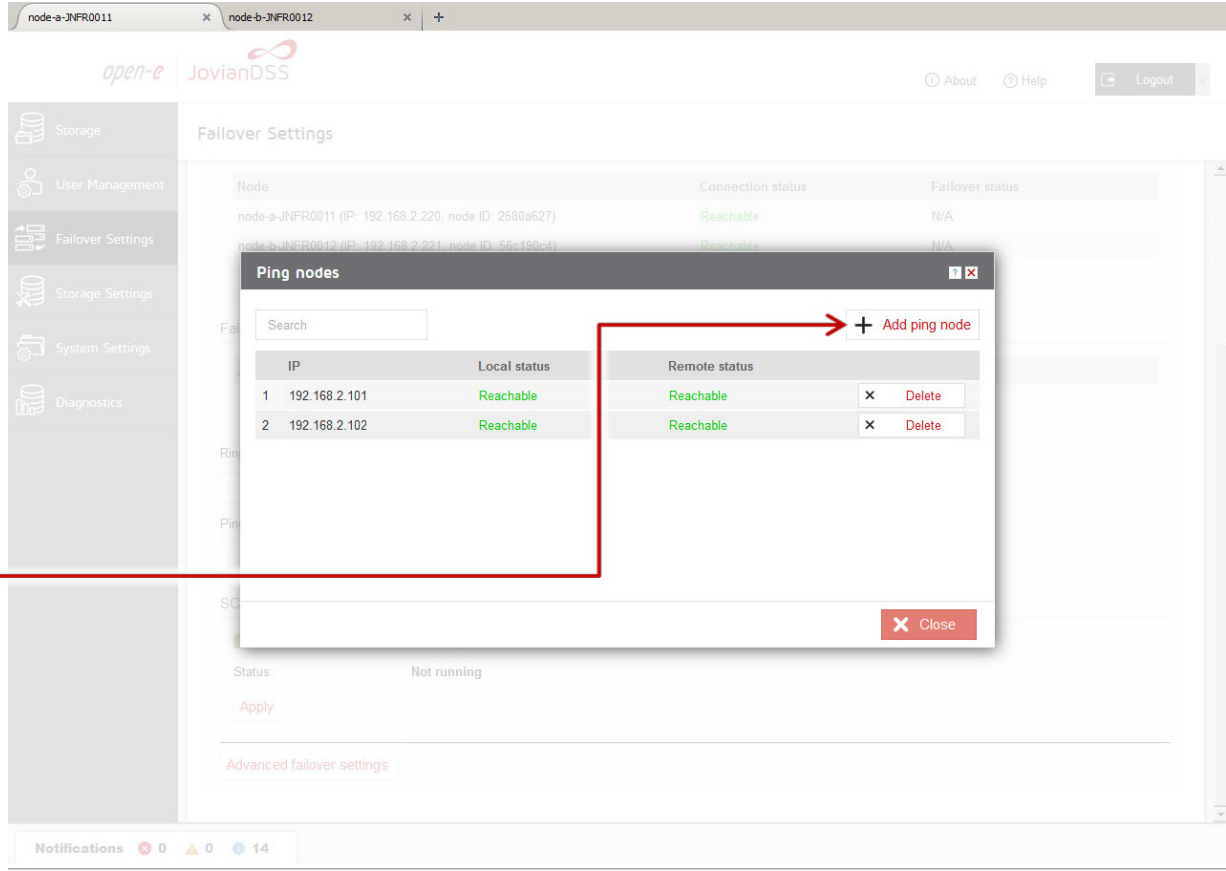


7. Ping Nodes

JovianDSS: **node-a**
IP Address: 192.168.0.220

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

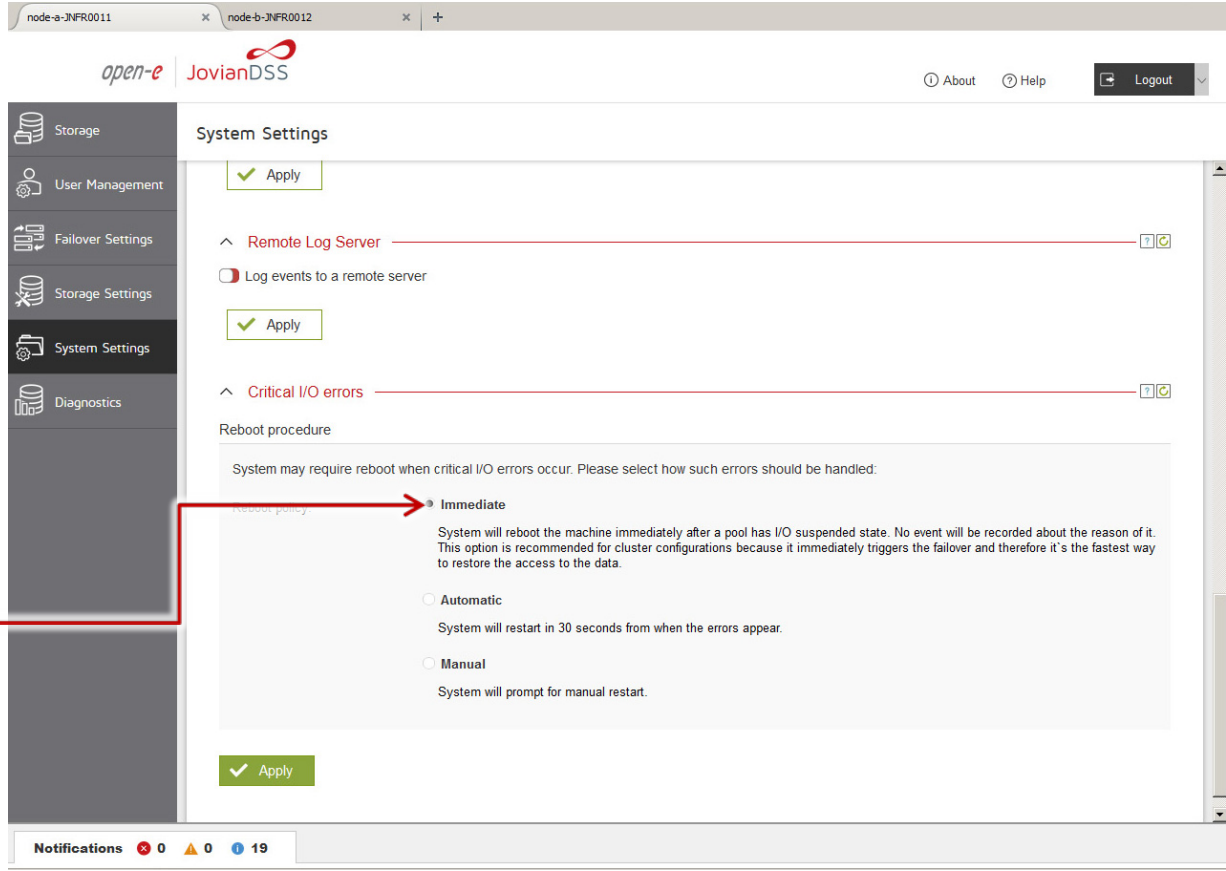
Ping nodes IP addresses must be reachable from Ring interfaces. So the ping node must use the same network subnet as ring interfaces.



8. Critical I/O handling setup

JovianDSS: **node-a**
IP Address: 192.168.0.220

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

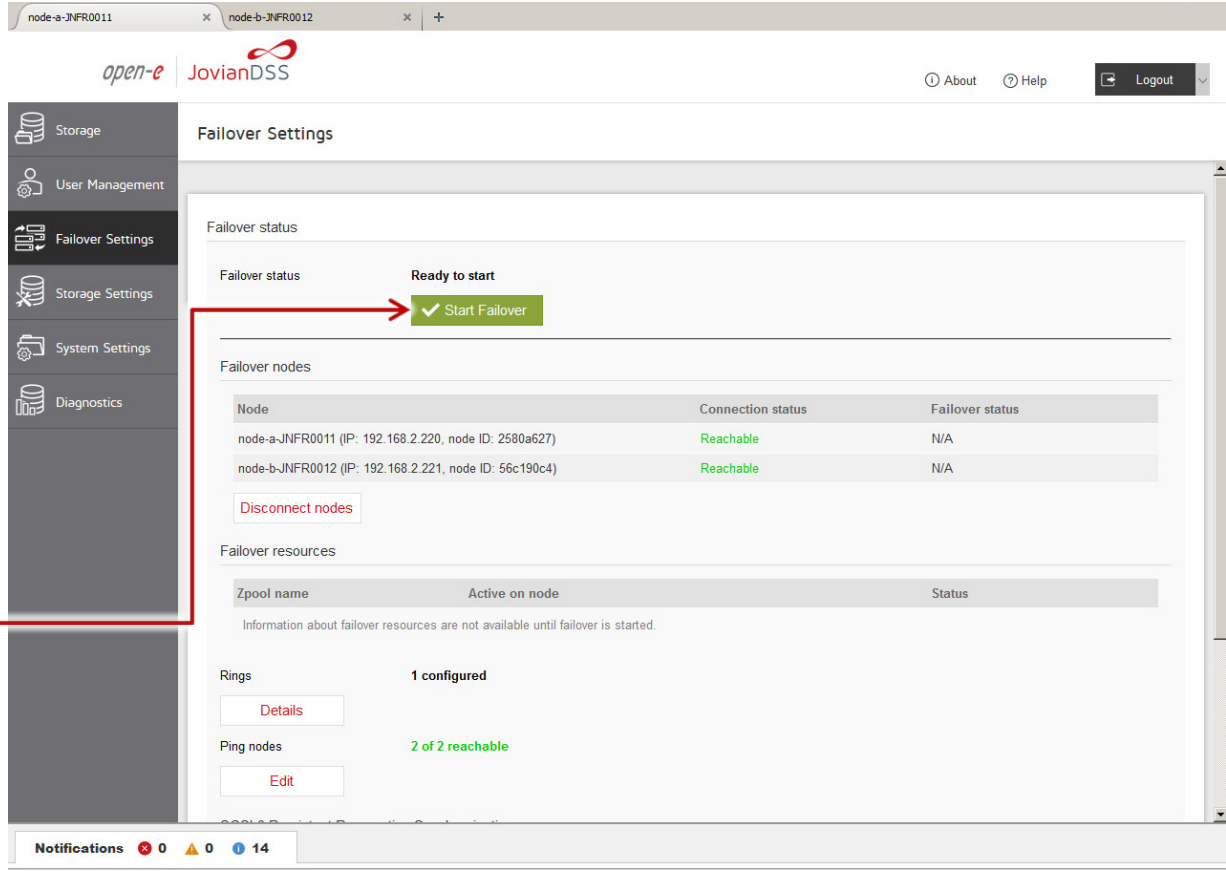


9. Start the Cluster Service

JovianDSS: **node-a**
IP Address: 192.168.0.220

Now, all required settings are completed.

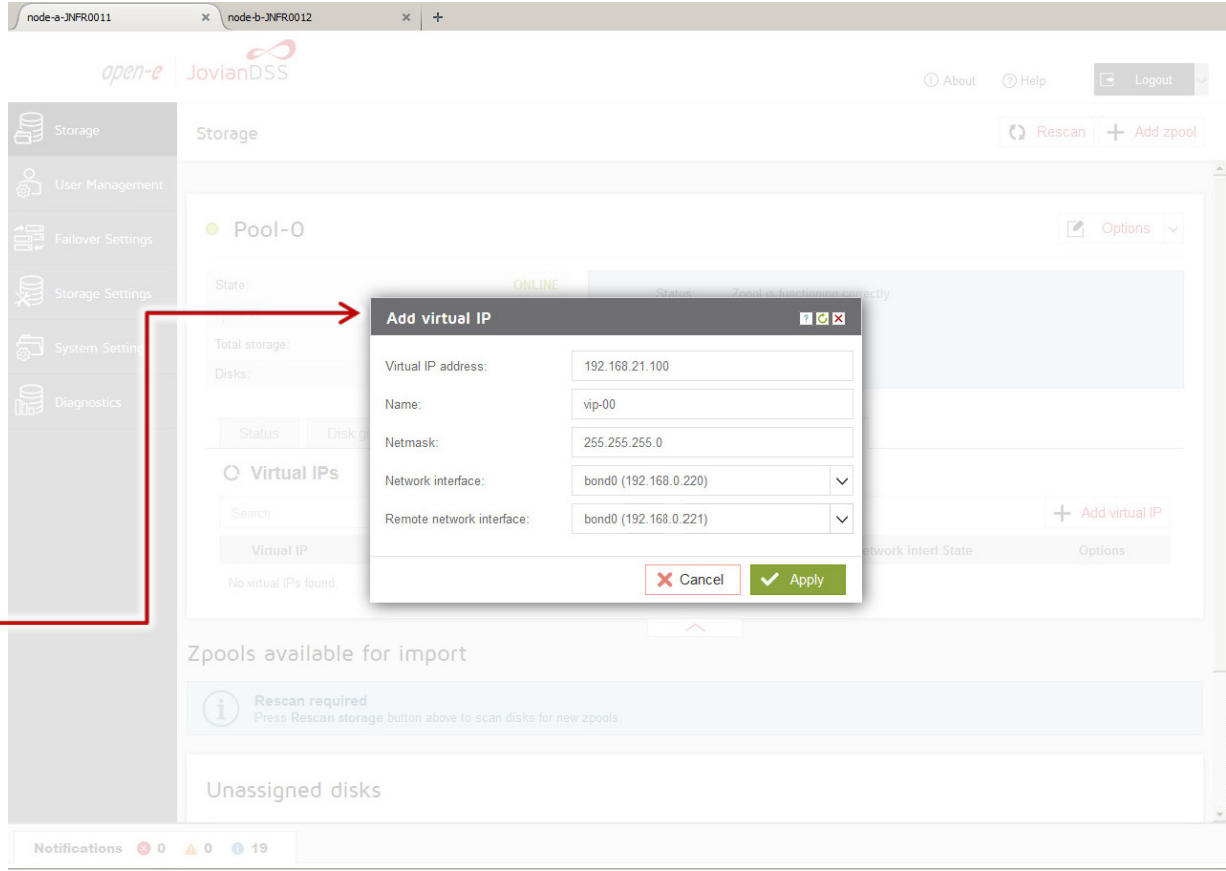
Click on **the Start Failover** button in order to start the HA-cluster service.



10. Enter the Virtual IP

JovianDSS: **node-a**
IP Address: 192.168.0.220

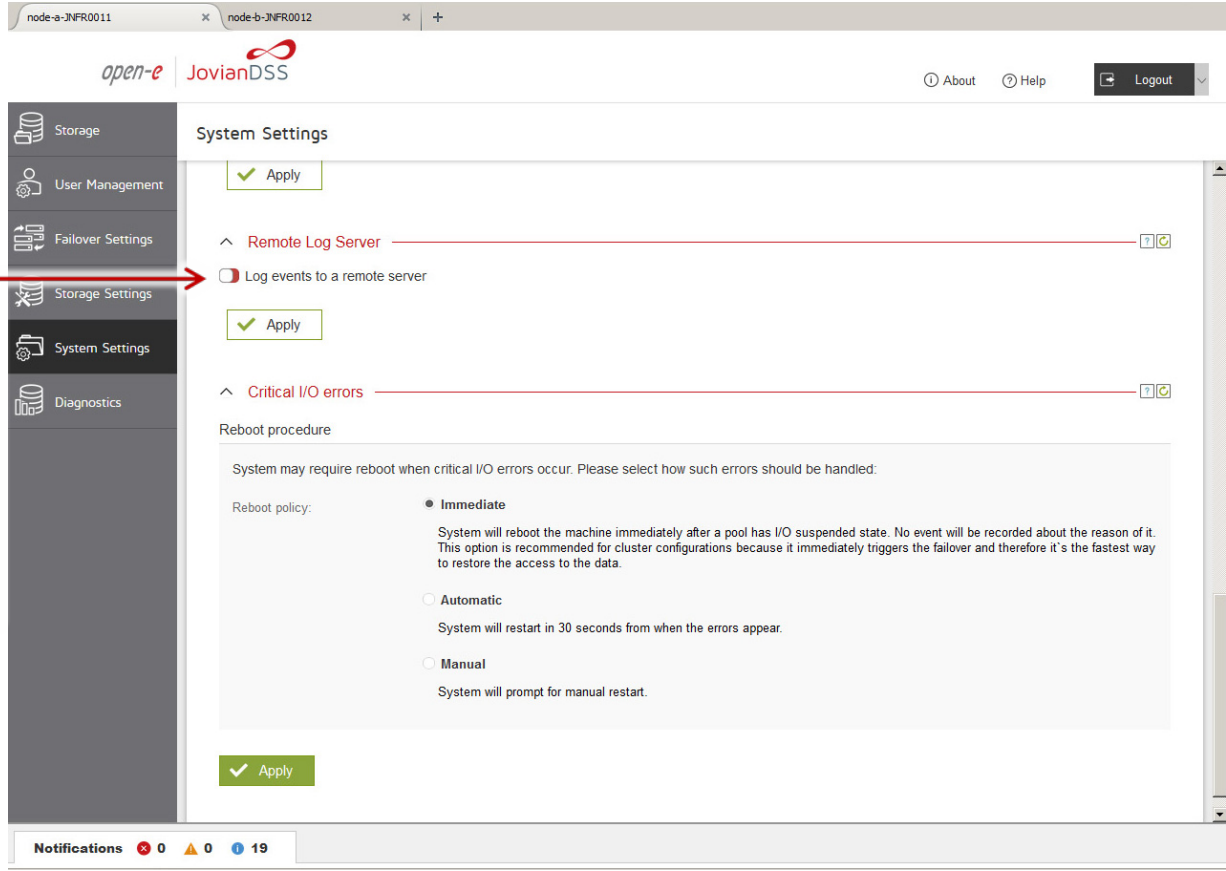
In main menu **Storage**, select **Virtual IPs** tab then click on the **Add virtual IP** button and enter the virtual IP address and assign it to the required interfaces.



11. System Monitoring Setup

JovianDSS: **node-a**
IP Address: 192.168.0.220

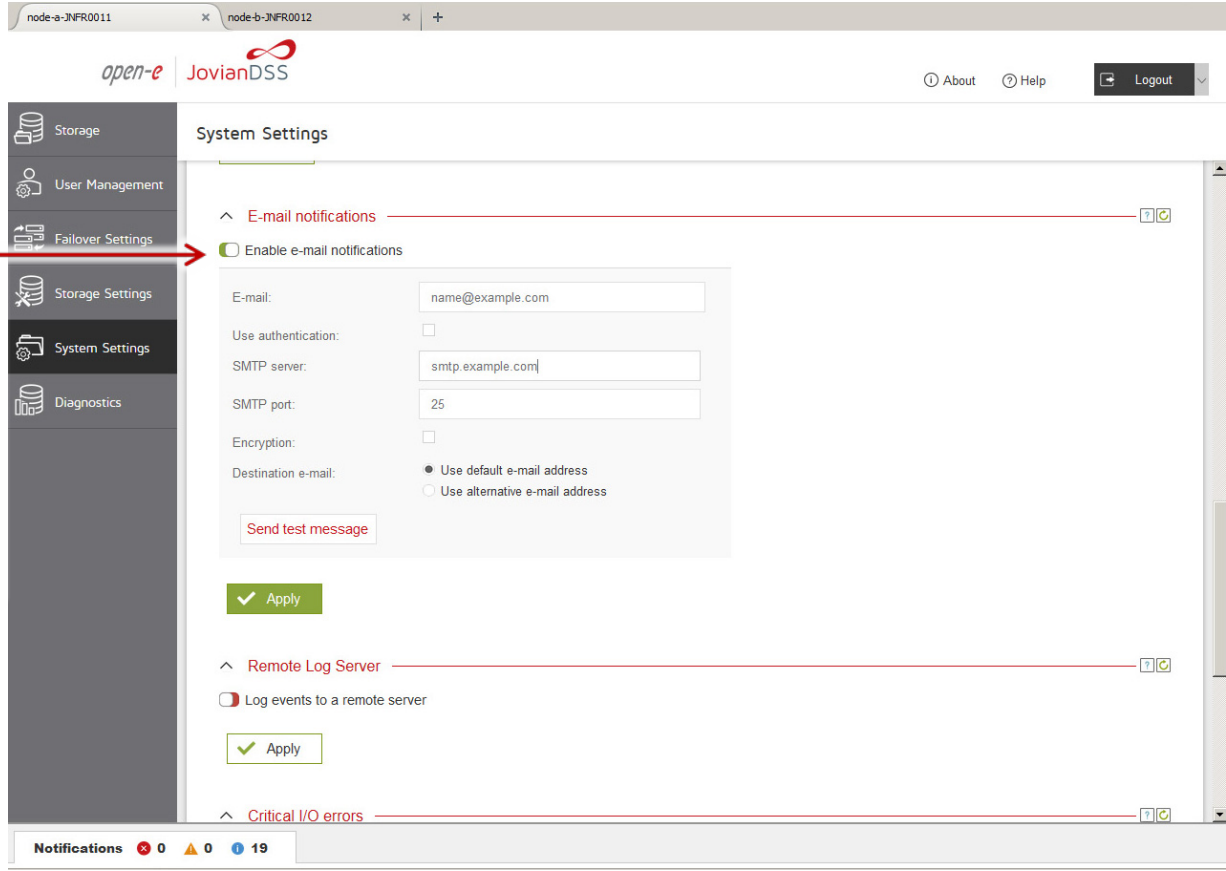
It is recommended to setup the system monitoring with **Remote Log Server** or SNMP.



11. System Monitoring Setup

JovianDSS: **node-a**
IP Address: 192.168.0.220

Setup proper E-mail notifications.

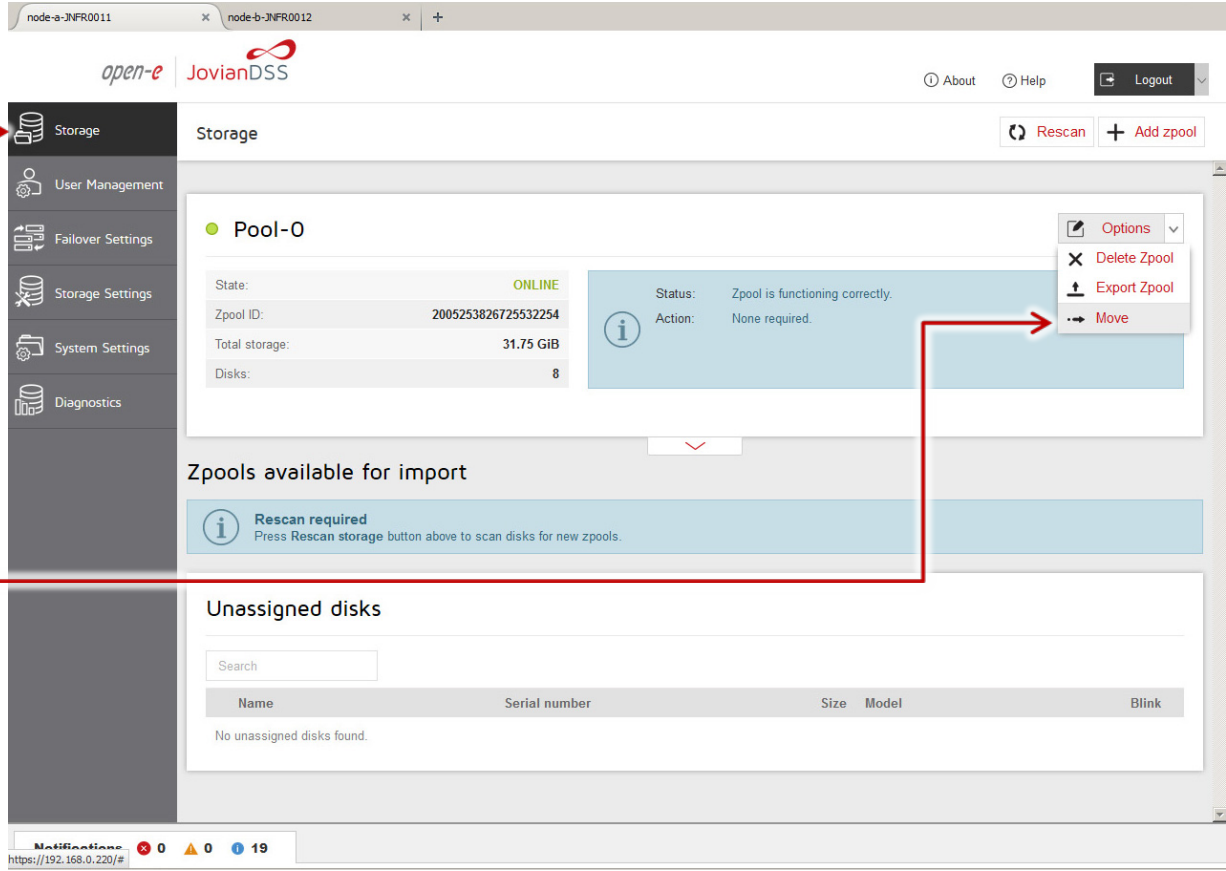


12. Failover test

JovianDSS: **node-a**
IP Address: 192.168.0.220

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

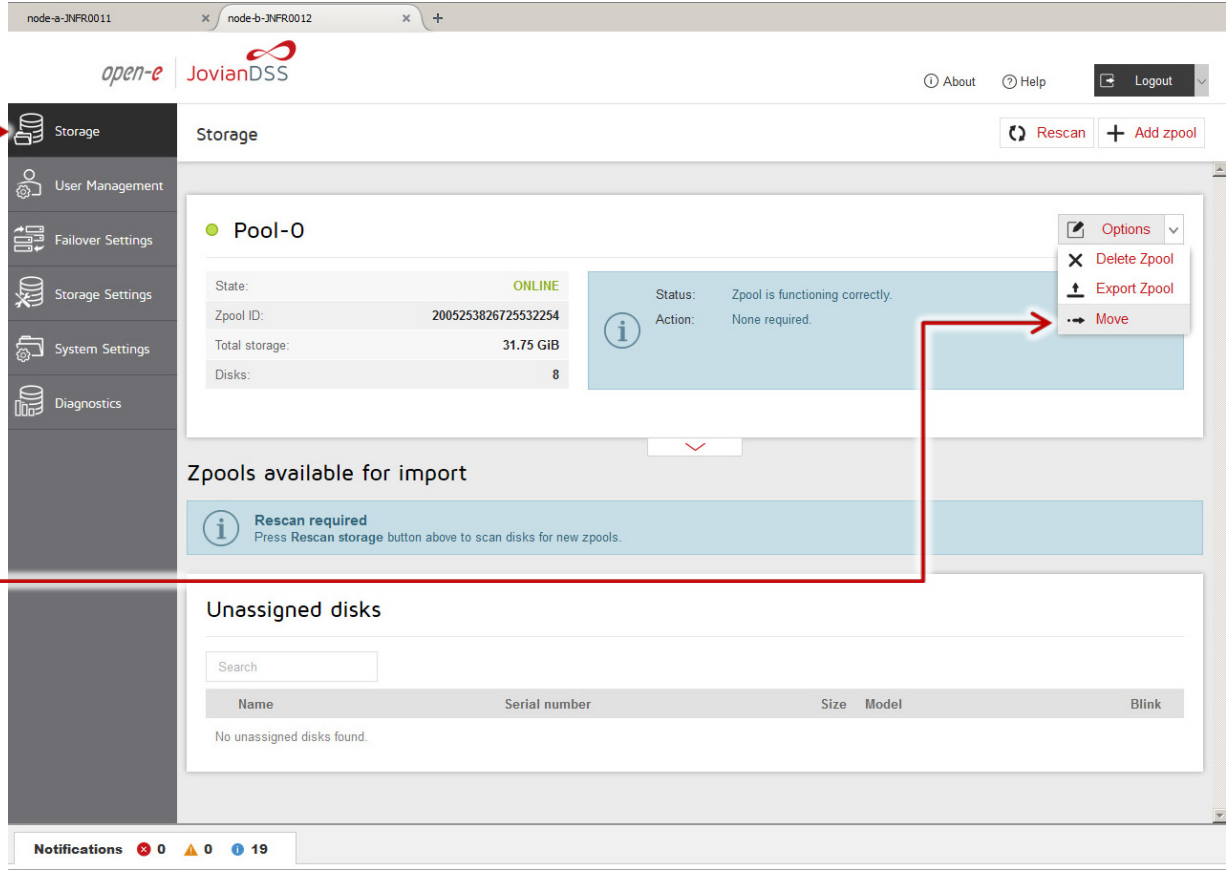
The pool will be exported on the current node and will be imported on the second node.



12. Failover test

JovianDSS: **node-b**
IP Address: 192.168.0.221

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.



NOTE:

The step-by-step guide is based on configuration from page 4, use single bonding for storage access. This will work with SMB, NFS or iSCSI.

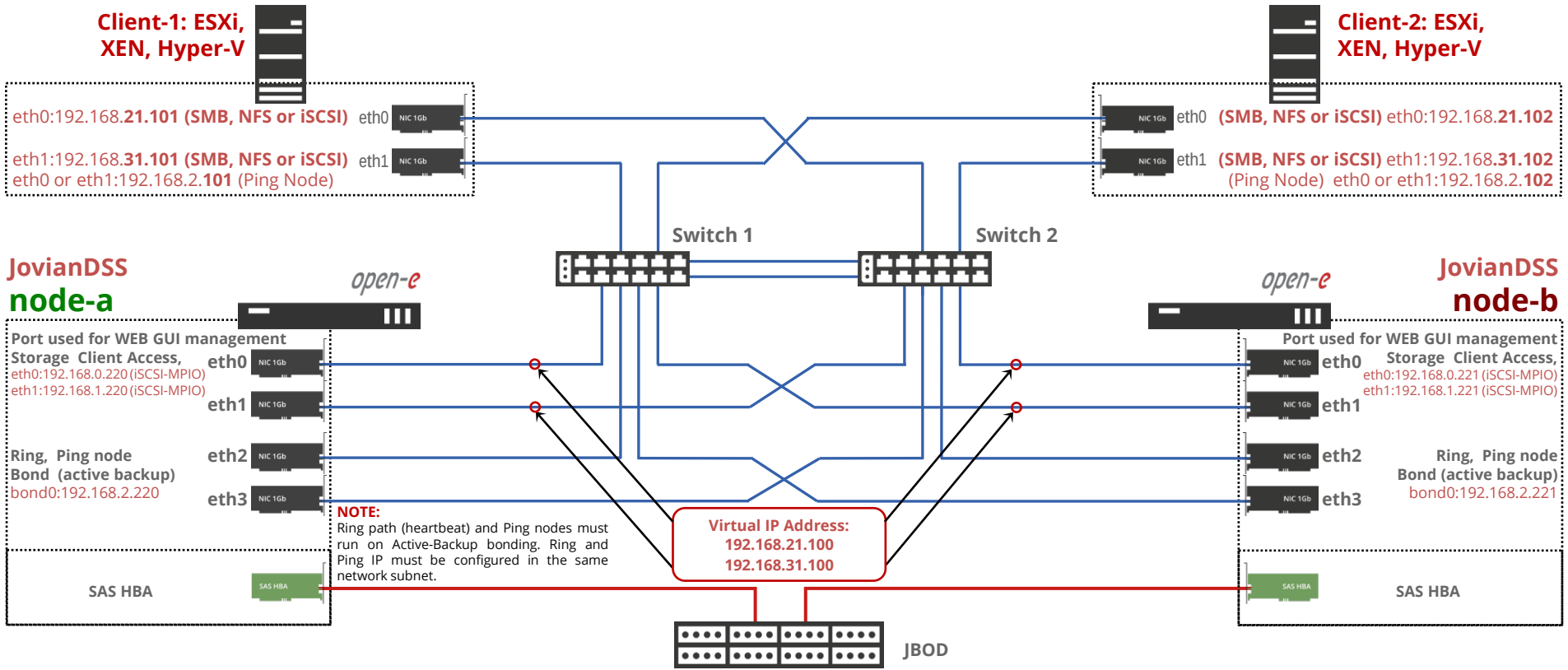
Next on page 35 will show setup with two storage access paths and two virtual IPs. This setup can be used for iSCSI Initiators with multipath. It can be used also without multipath, just to separate load on 2 separate network paths.

On page 36 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/SMB/NFS environments.

Page 36 additionally shows 2 optional JBODs, which can be mirrored with mirrored disk groups in order to eliminate a JBOD as single point of failure.

On page 37 both JBODs are connected with double SAS paths for multipath.

Open-E JovianDSS High-Availability Cluster



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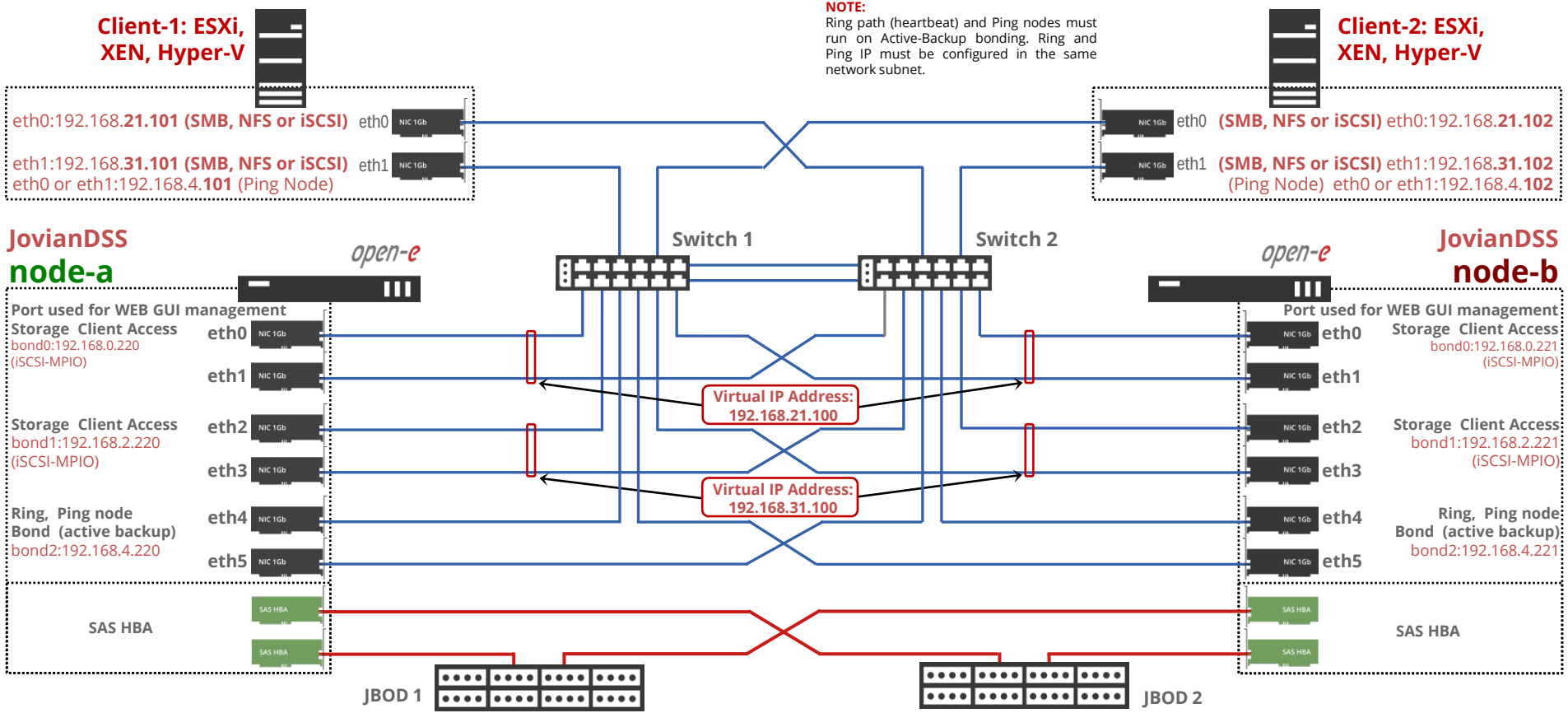
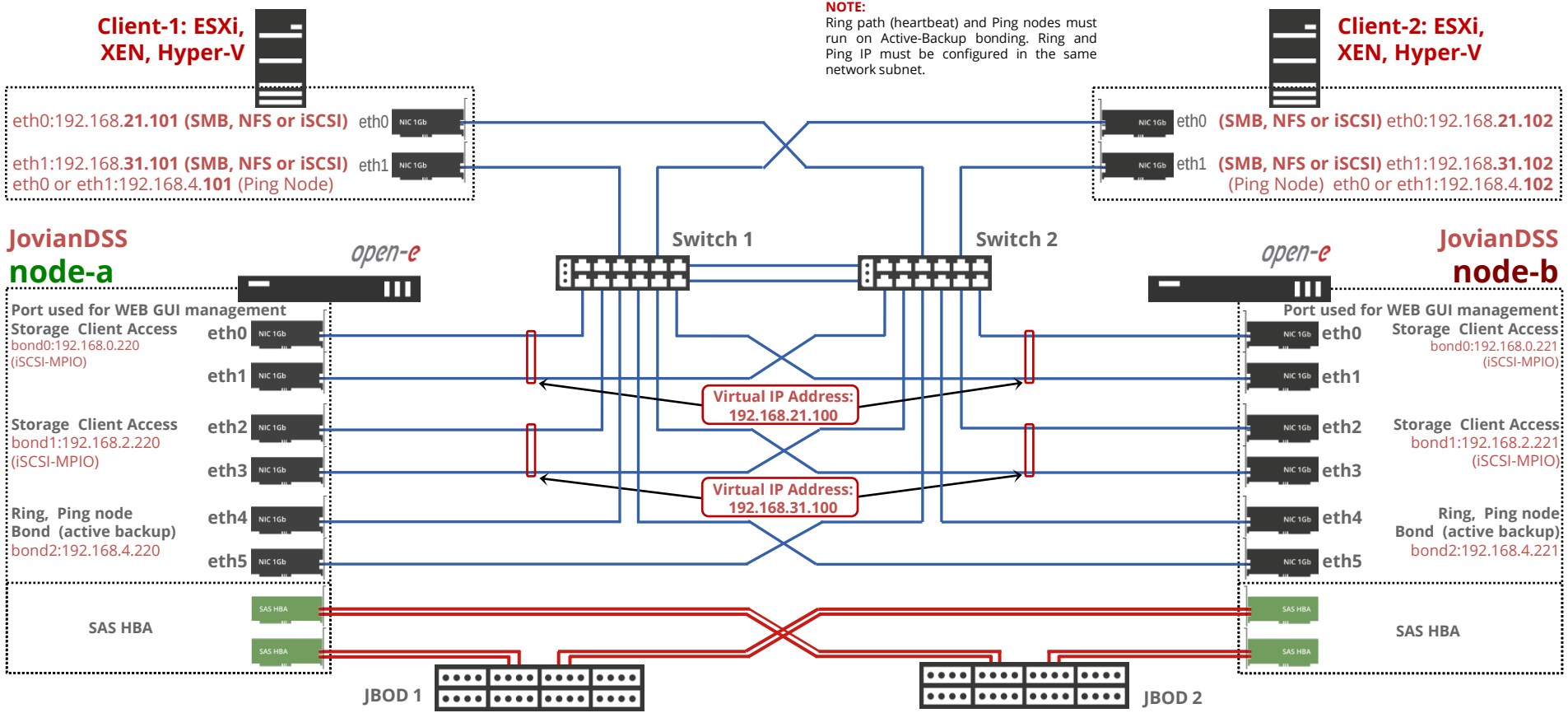


Open-E JovianDSS High-Availability Cluster



Thank You!