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1. Install JovianDSS on physical server

Download and extract the ISO file with your favorite uncompressing/extracting software (for example: 7zip or WinZip® programs) to an empty USB Flash Drive.
The ISO can be obtained from here:
https://www.open-e.com/download/open-e-jovian-data-storage-software/

After extracting the ISO file on your USB Flash Drive, the root directory must contain ONLY the following directories: bxxxx, boot, and file mmenu_upd.sh where the xxxx is the software build number.

- To make your USB Flash Drive bootable, enter the "boot" directory and run the "bootinst.exe" (For Windows) or "bootinst.sh" (For Linux). Follow the prompt then remove the USB Flash Drive.
- You can now boot your storage server installer with USB Flash Drive.

NOTE   **The prepared USB Flash Drive will run the software installer by default. If you desire to test or for non-mission critical or non-production usage, the USB Flash Drive can boot Open-E JovianDSS instead of running the software installer. To make this default change, run the "config.exe" from the boot directory and select "r" to remove the default boot of the software installer.**

1.1. Booting Open-E JovianDSS Installer

General Hardware requirements
- The minimum size for the JovianDSS boot medium is 16GB. Since software version 1.0 up28, the installer creates up to 128GB boot medium partition size if bigger than16GB boot disk is present. A recommended JovianDSS boot medium uses an HDD or SSD device. The USB Flash Drive can be used as a JovianDSS boot medium for testing purposes or non-mission critical applications.
- Single node supports SATA hard disk drives, but SAS disks are recommended for performance.
- HA shared-storage cluster setup requires SAS-hard disks.
- Minimum of 8GB RAM plus 1GB per 1TB of pool space.
- Mirrored "Write Log" is recommended.
- Uninterruptible Power Supply (UPS) is strongly recommended.

Plug your installer media (USB Flash Drive) into the storage appliance.

The first boot menu will show the software version. You can press enter or it will skip and continue automatically within 5 seconds.
The second menu allows you to select to boot Open-E JovianDSS or to install the software on a writable boot media in your system using the interactive installer utility. Select "Run software installer" to install Open-E JovianDSS on a writable boot media in your system.

Please follow the instructions while running the installer. The installer optionally can install the system on a single disk or on mirrored disks (RAID1). If single disk is selected, it is still creating

degraded RAID1 on the single disk but system will not create error events about degraded RAID1. It will be possible to add a second disk and get redundant RAID1 anytime in the future. Once the boot media become redundant RAID1 the system will generate errors events if any disk of the mirror is failed.
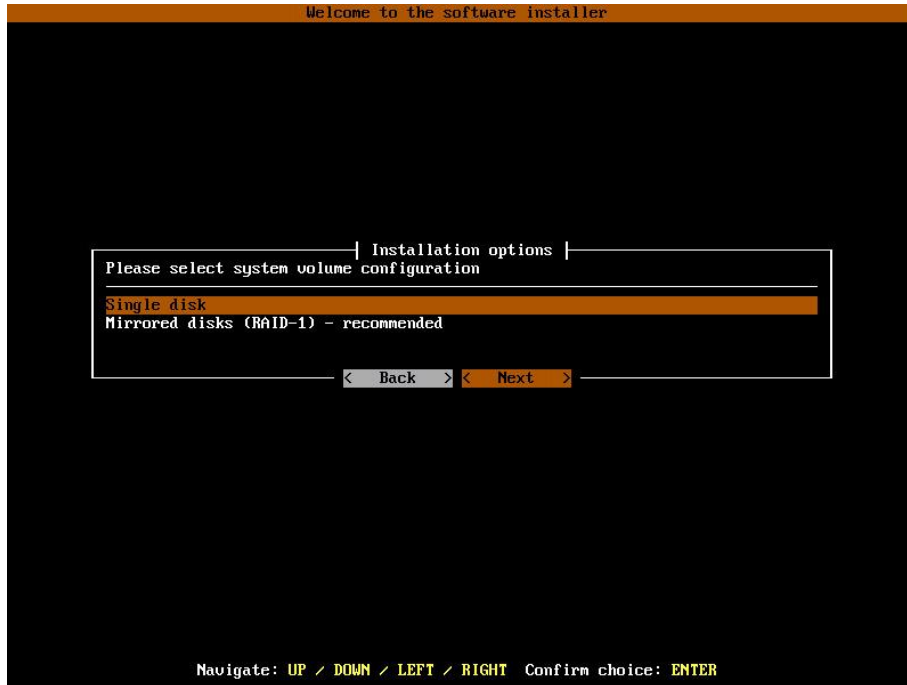
Finally, reboot your storage server from the new boot media (set your BIOS boot options back from USB to the medium where you installed the software).

NOTES: **Open-E JovianDSS can be used for evaluation up to 60 days with the trial product key. The Trial Key can be downloaded after registration from:**
https://www.open-e.com/partner-portal/partner-area/warehouse/jovian/
When you decide to purchase the full version, you can continue to use the software and all your data and settings will remain intact.
In order to convert the trial version to the full version, please enter your Open-E JovianDSS product key and storage capacity key in the WebGUI menu "about" section.

During boot-up, you have an option to run a memory test on the system by choosing "Run Memtest utility" in the first menu.

1.2. Initialize hardware

Before using Open-E JovianDSS you should have the hard disk drives connected to the SATA and SAS ports on the motherboard or SAS HBA, and the LAN Card and other NICs already in your server.

Connect the keyboard and monitor (they will be needed for setup only). Later you can run the server in "headless mode" (without keyboard and monitor).

NOTE: **Please check the motherboard BIOS if the "headless mode" is enabled. In some cases, systems will not boot if the keyboard is not connected. You'll find more about the headless mode in the motherboard's BIOS manual.**

www.open-e.com

# 2. Install JovianDSS as virtual machine

- In ESX host menu, select: New Virtual Machine and in the wizard click on "Next" button.
- Enter the VM name. In this example we have: JovianDSS TEST
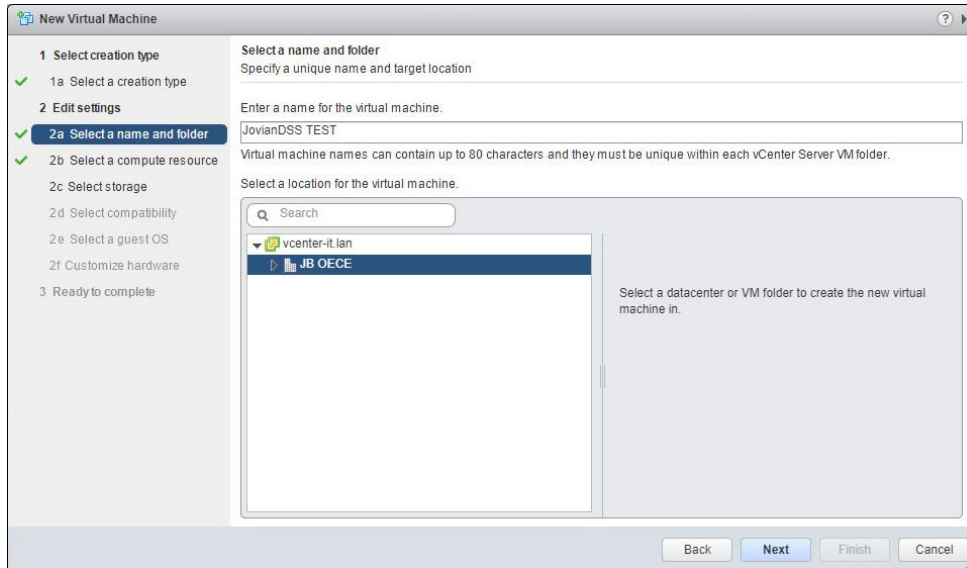
- Next, select destination host and next select the datastore for the VM.
- Next, confirm the compatibility with ESXi 6.0 or later.
- In guest OS step, please select Linux and Debian 7 (64bit)
- In the customize step (screenshot below), please use 2 CPU, enter 12 GB or more for Memory and 16GB or more for New Hard disk.
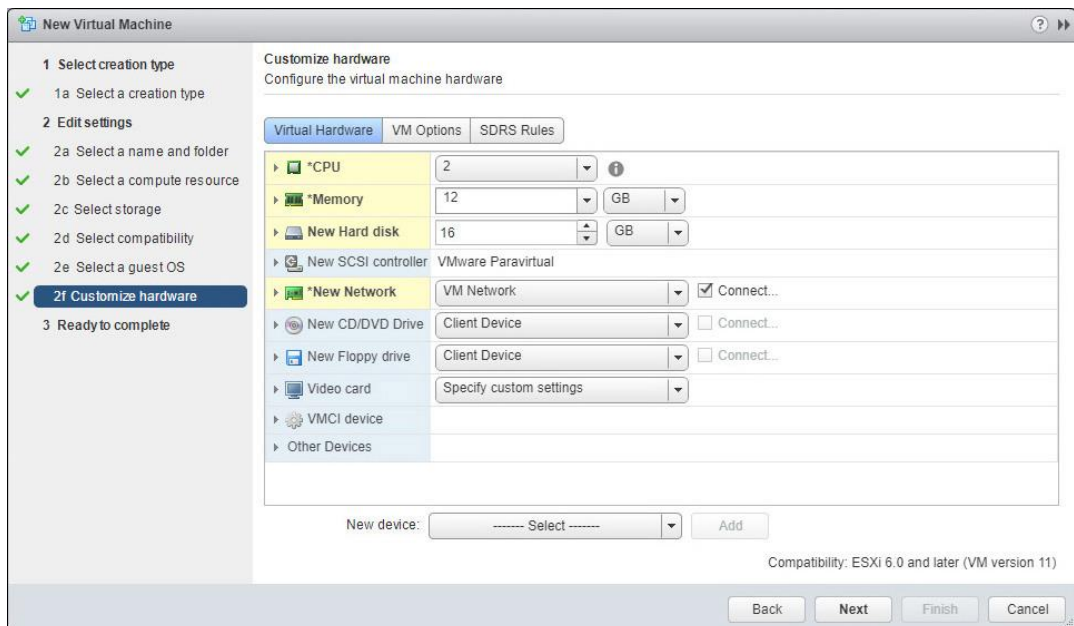
- In VM Options -> Advanced -> Configuration Parameters, click on Edit Configuration
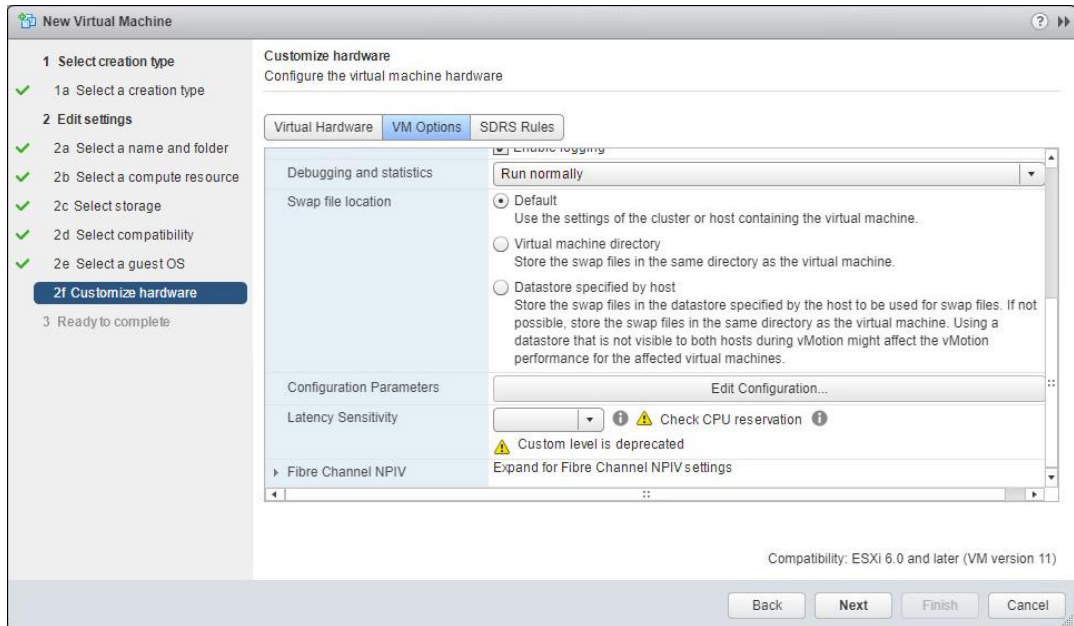
- Add Name: disk.EnableUUID   and Value: TRUE
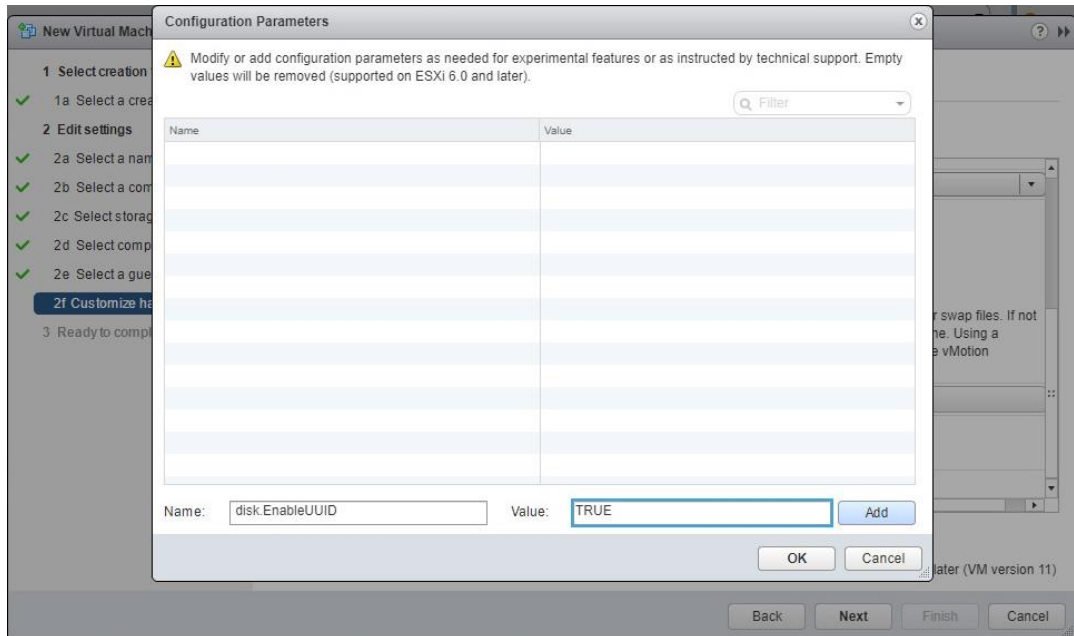
- Click on Add. Next click OK and click on the Next button. Next it move to: Ready to complete section.

- Click on the Finish button.
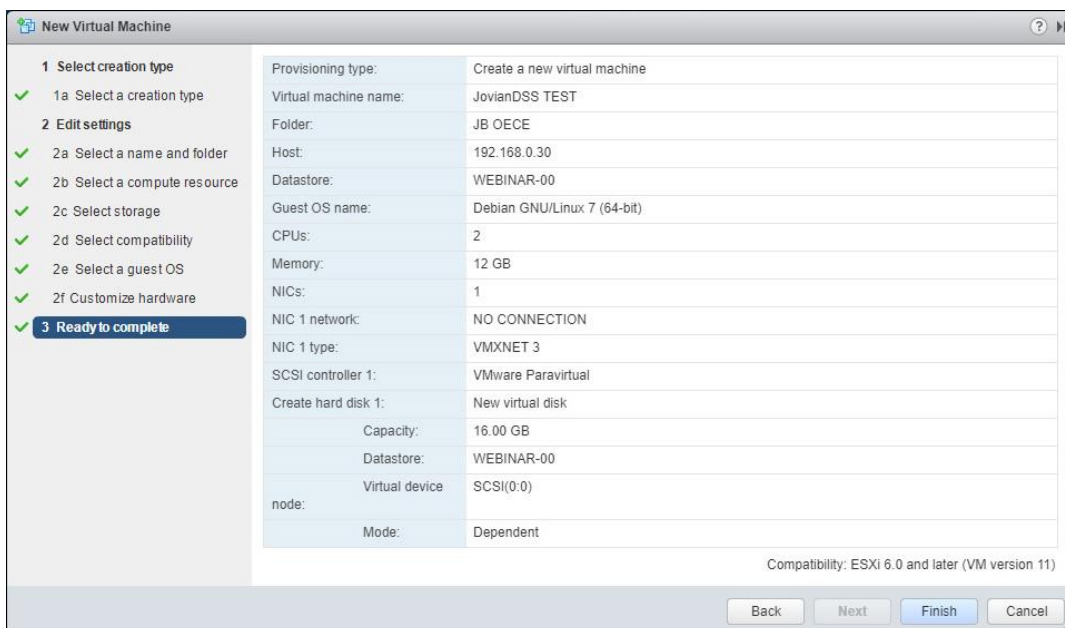
- Next, select Edit Settings at just created JovianDSS TEST Virtual Machine.
- Browse and select JovianDSS ISO image downloaded from the **WEB**.
- Next, enable the check-box "Connect At Power On" and click on OK button.
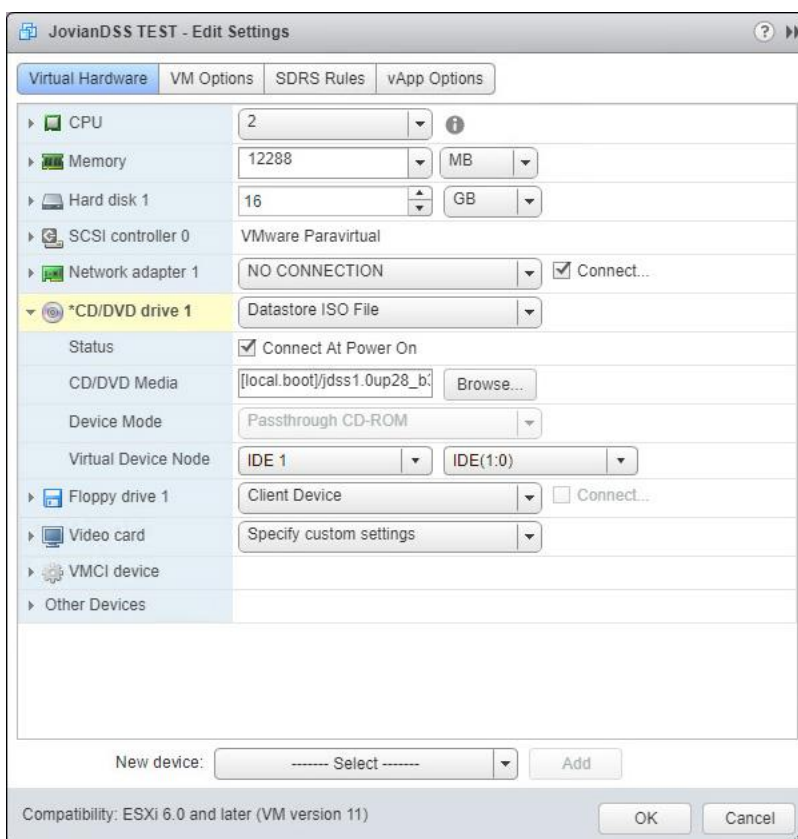
- Next, power on the JovianDSS TEST VM and please follow the instructions while running the installer.

- Next steps are exactly the same as described in the **Booting Open-E JovianDSS installer** section.
- Once the JovianDSS TEST VM is up and running, you need to add drives for data storage as during the virtual machine creation only single boot-disk was configured.
- In Virtual machine Edit Settings, click on New device –> Select, select New Hard Disk and click on Add button.
- Here 4 disks are inserted. To confirm it, click on OK button.
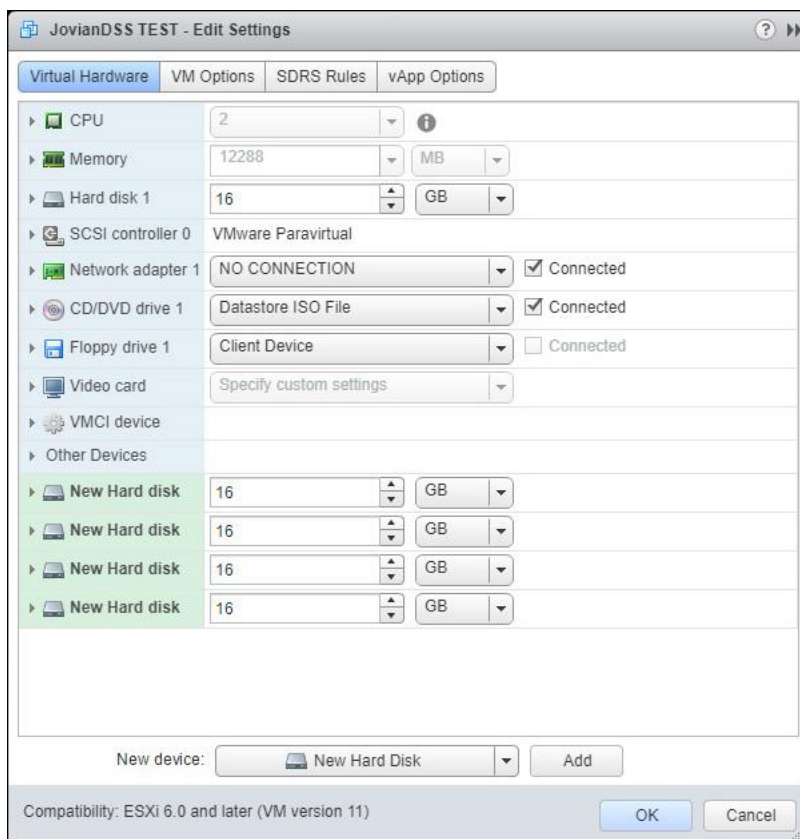
- Now the JovianDSS TEST must be ready for pool create.

3. Storage Configuration

3.1. Preparing for the WebGUI administration

After the boot process has finished, Open-E JovianDSS will show you information about all its network settings. The standard IP Address setting for Open-E JovianDSS is: IP address 192.168.0.220 and Netmask 255.255.255.0. This setting can be changed manually by entering the following key sequence: left "**Ctrl**" + left "**Alt**" + "**N**".

3.2. Entering the product key and logging into Open-E JovianDSS

Connect to Open-E JovianDSS via the network using any standard browser, and type the IP address to the URL entry line:
https://192.168.0.220
Next, a window for entering the product key will appear. If you already have one, please enter it and click the apply button. Log into Open-E JovianDSS by using the default password: "*admin*". Now you will be able to set all server parameters to get started.

NOTE: **Be aware that the password is case-sensitive.**

3.3. Create zpools

* To create a new zpool, please go to the "Storage" menu then Click the "Add zpool" button in the upper right corner to run the "Zpool wizard".

- After starting the "Zpool wizard" all available disks will be listed.
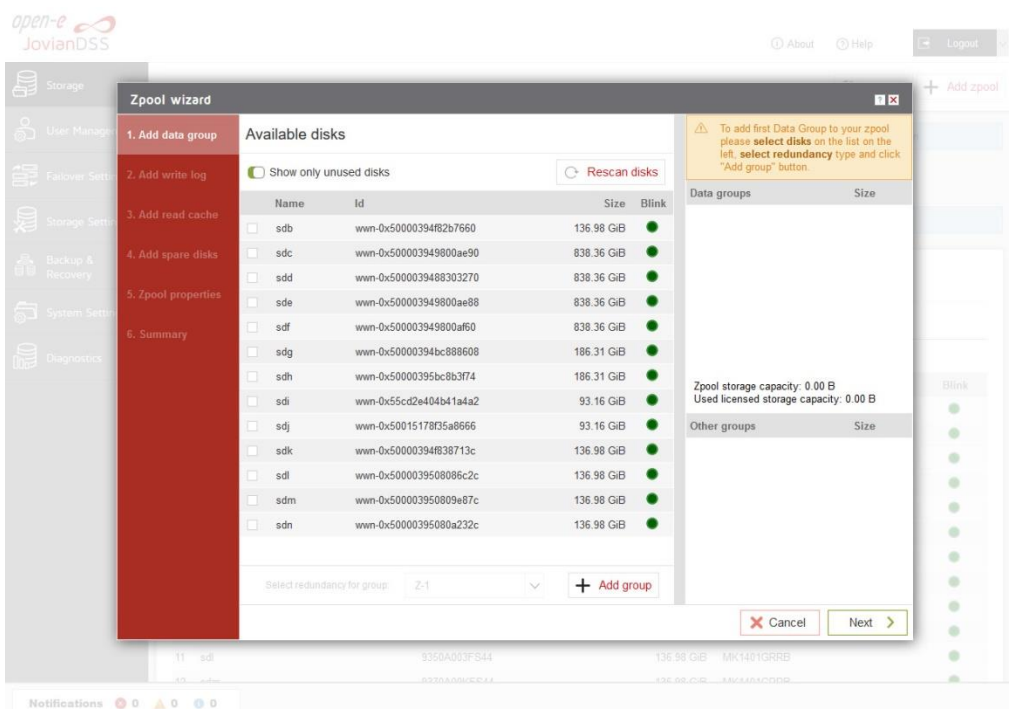
- Next, select the disks and redundancy level and click on the "Add group" button.
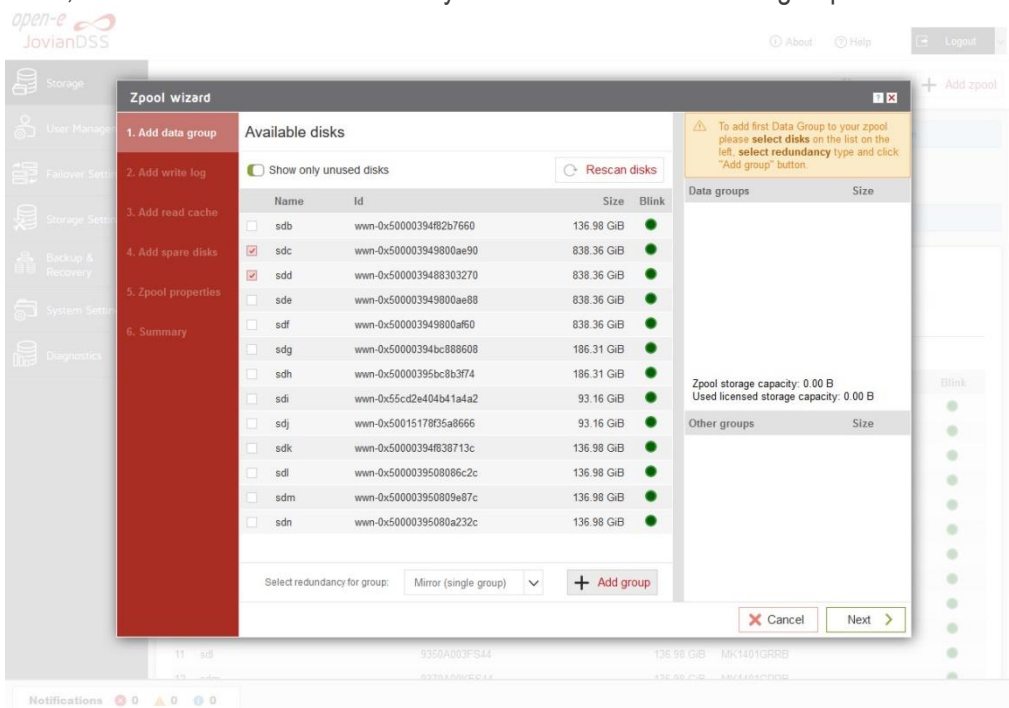
- The created group will be displayed in the "Configuration preview" window on the right side.
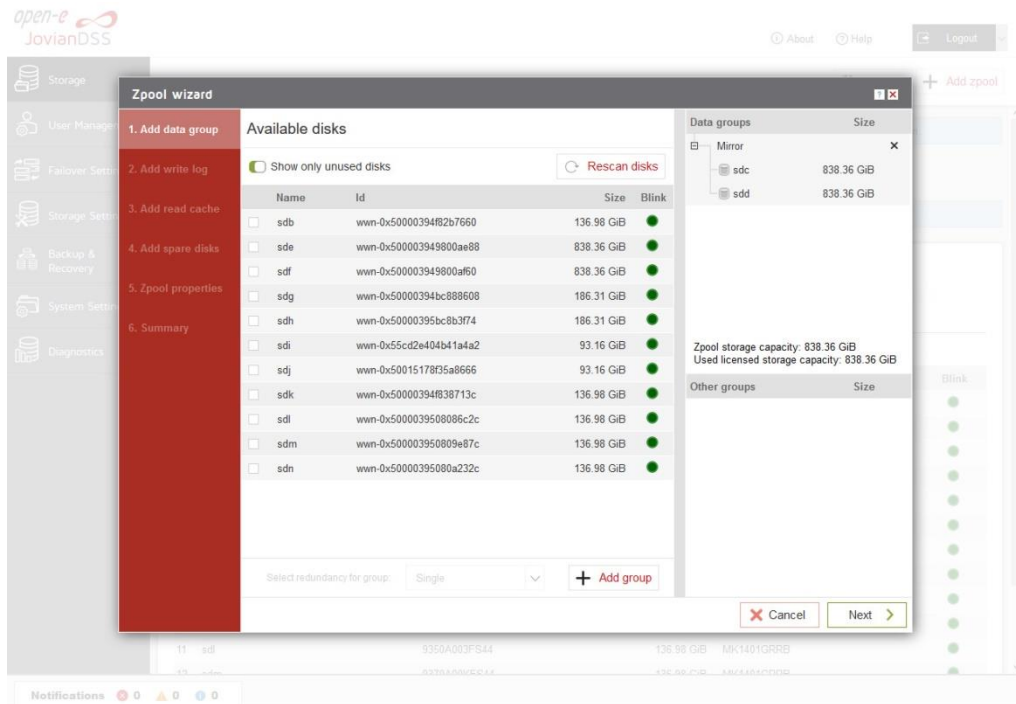
- In this example we have 2 mirror groups added.
- The created 2 mirror groups will be displayed in the "Configuration preview" on the right side. After adding all groups click the "Next" button.
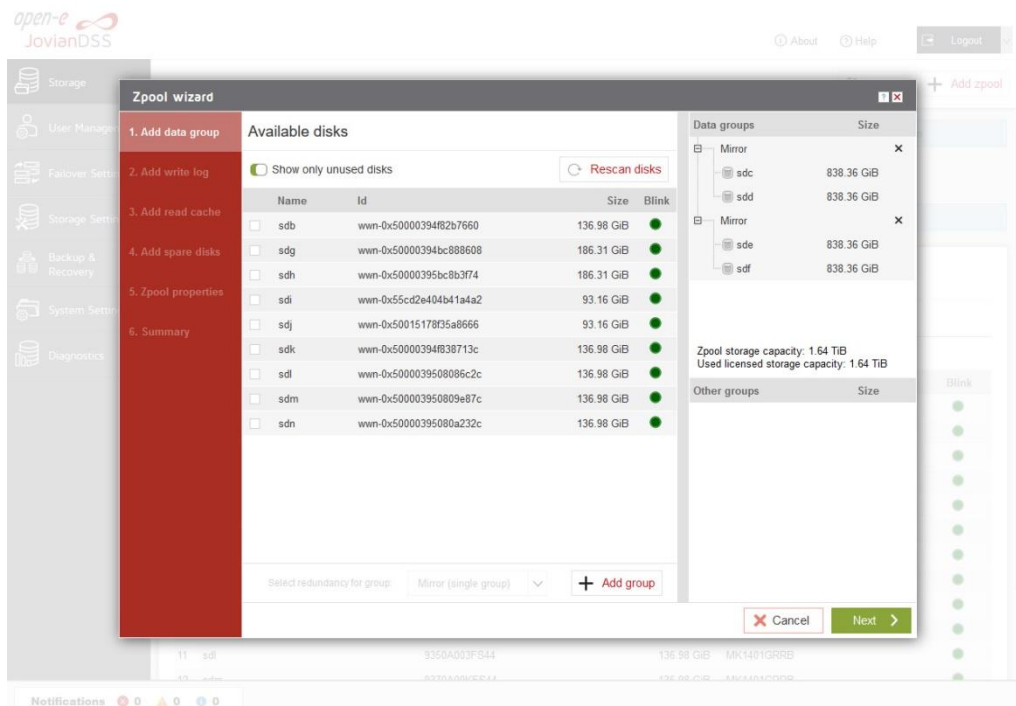
- In the next step you can create a write log (ZIL on SLOG).
  NOTE: Mirrored and fast SSD disks are strongly recommended for the random writes IOPS.
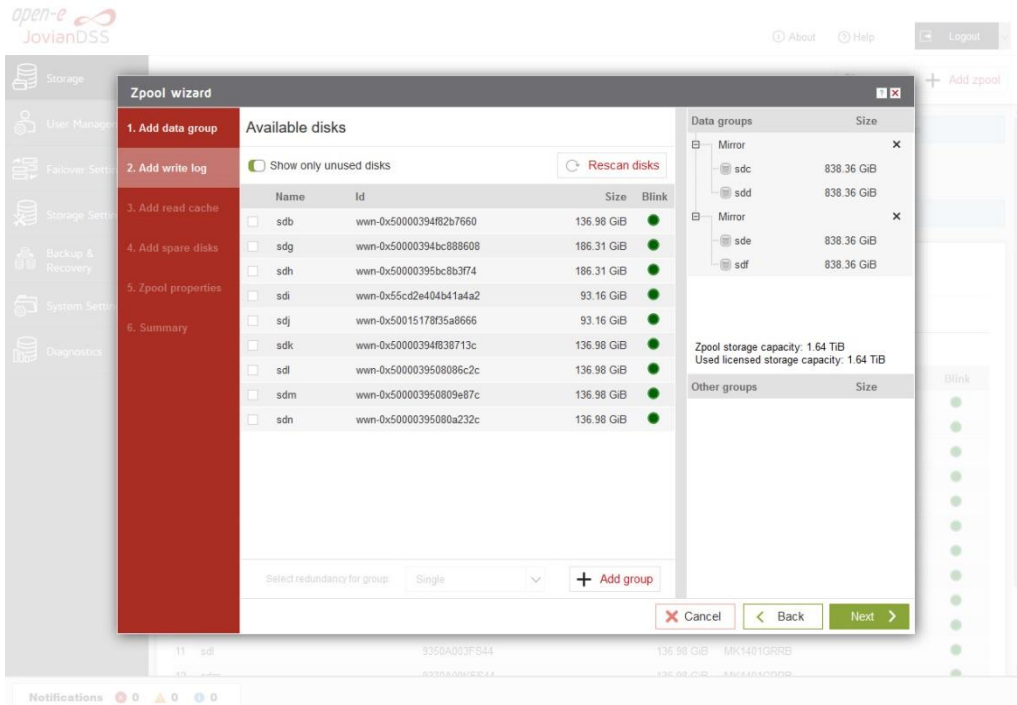
- Select the fastest disks from the list on the left and create a mirror set for the redundancy level, then click the "Add group", and then the "Next" button.
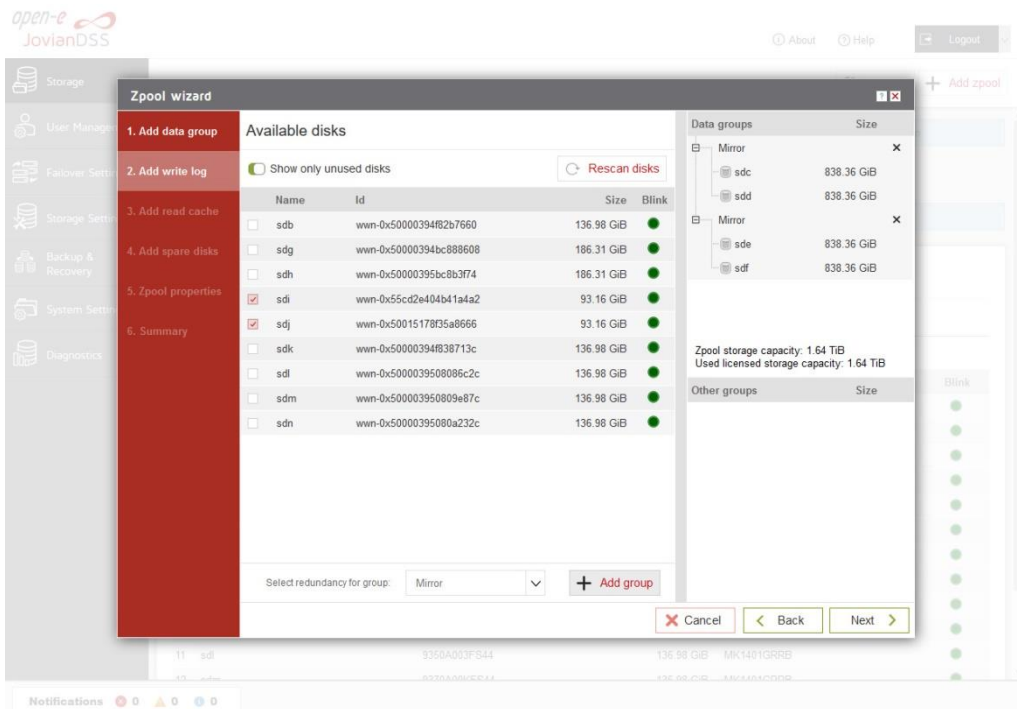
- The created "write log" will be displayed in the "Configuration preview" on the right side.
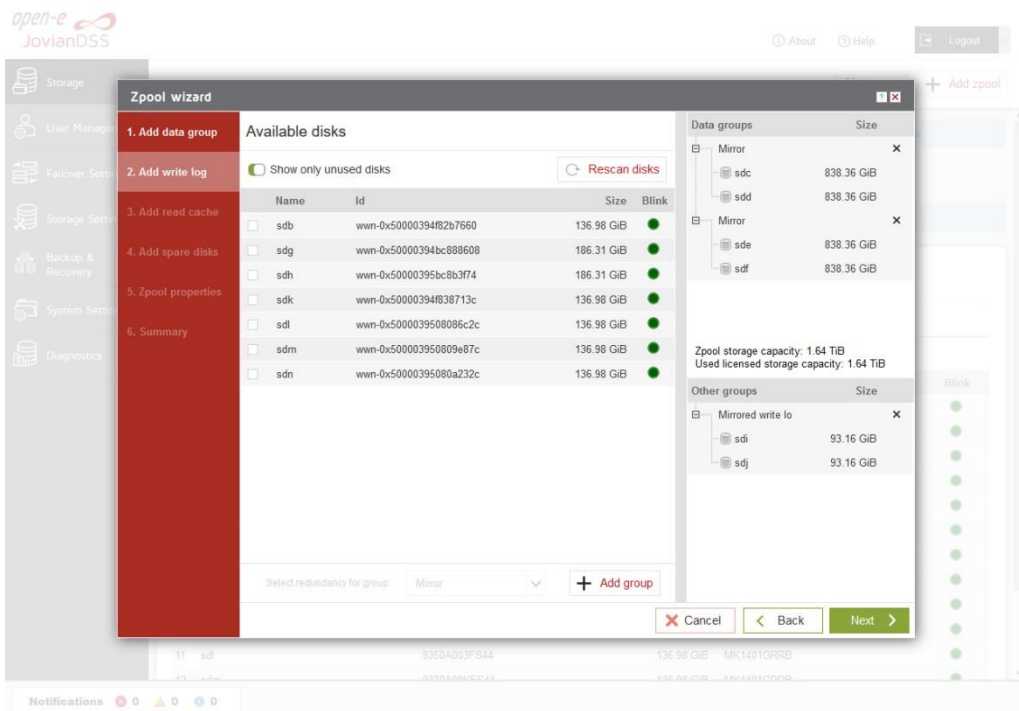
- In the next step you will want to create the read cache. Select the disks from the list on the left and select redundancy "Read Cache", type and click "Add group", and then the "Next" button.
  NOTE: For fast random read IOPS it is recommended to use SSD disks.
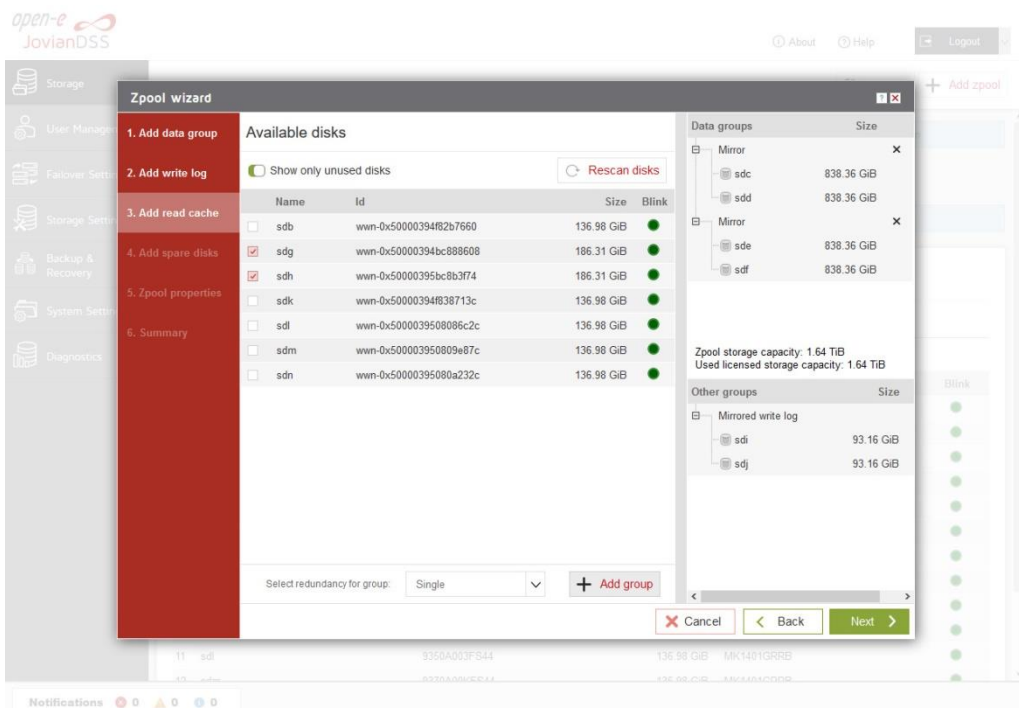
- The created "read cache" will be displayed in the "Configuration preview" on the right side.
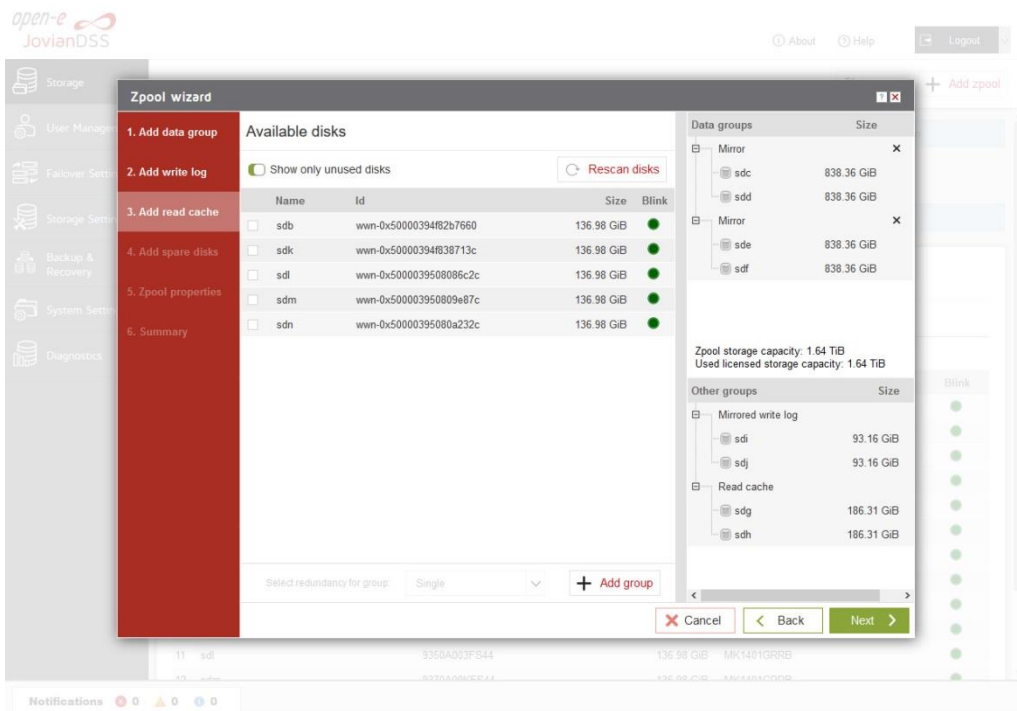
- In the "Add spare disks" please select the disk from the available disks" list, click "Add group", and the "Next" button.
  NOTE: "Spare disks" are optional. If no disks are tagged as spare disk, it is still possible to replace a faulty disk with any unassigned disk. You can skip this step clicking "Next".
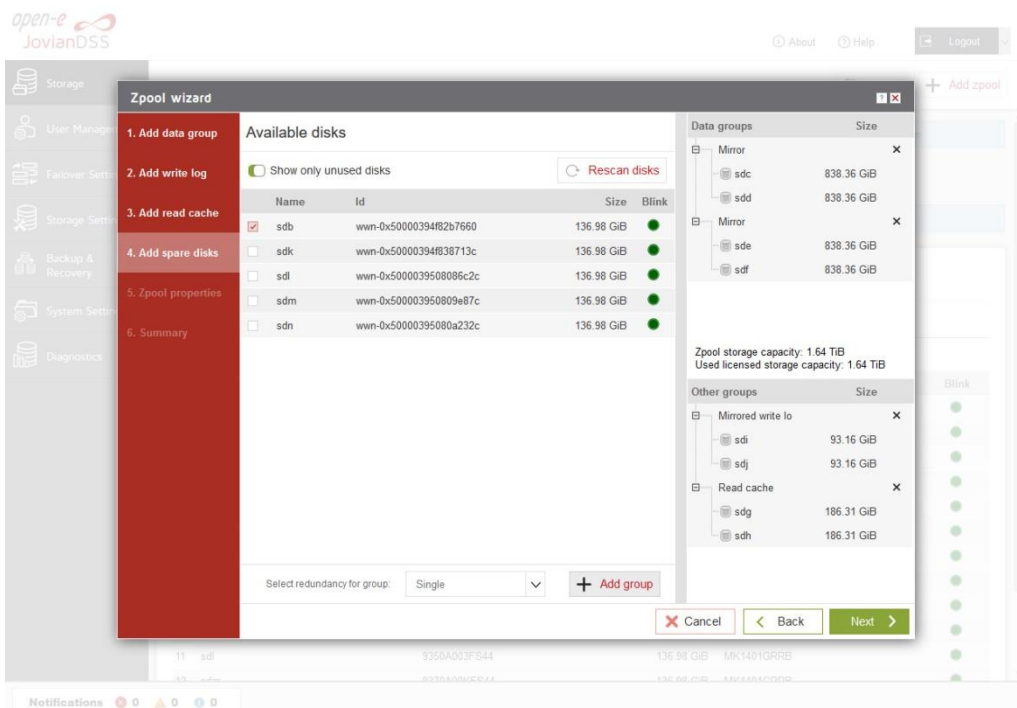
- The created "spare disks" will be displayed in the "Configuration preview" on the right side. Now click the "Next" button.
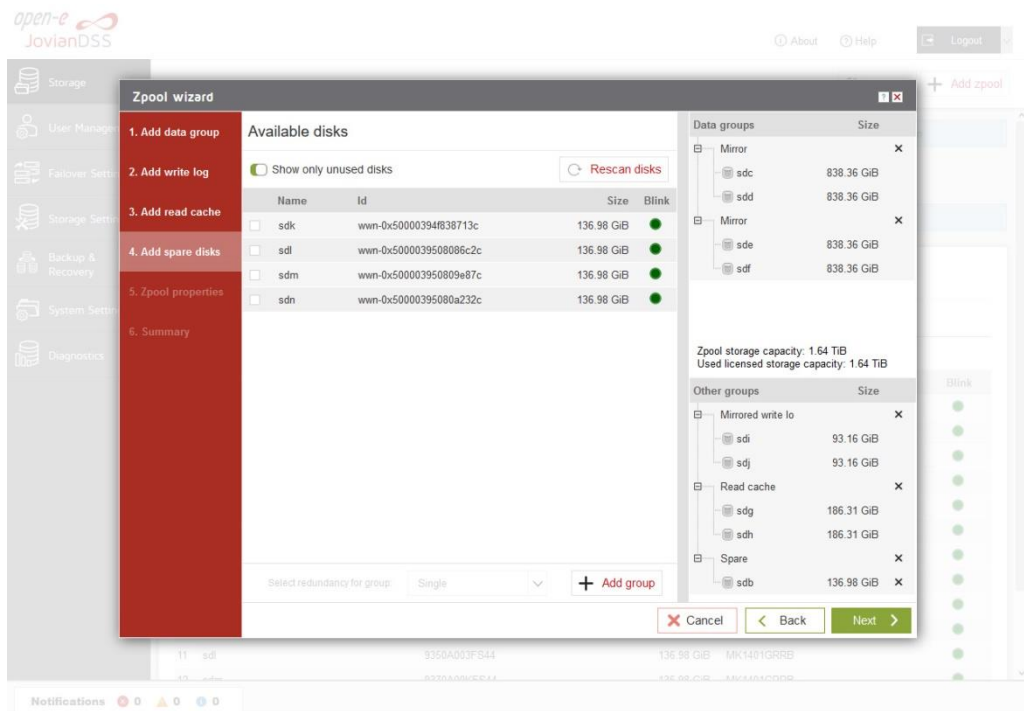
- In the next step, enter the zpool name and click the "Next" button.
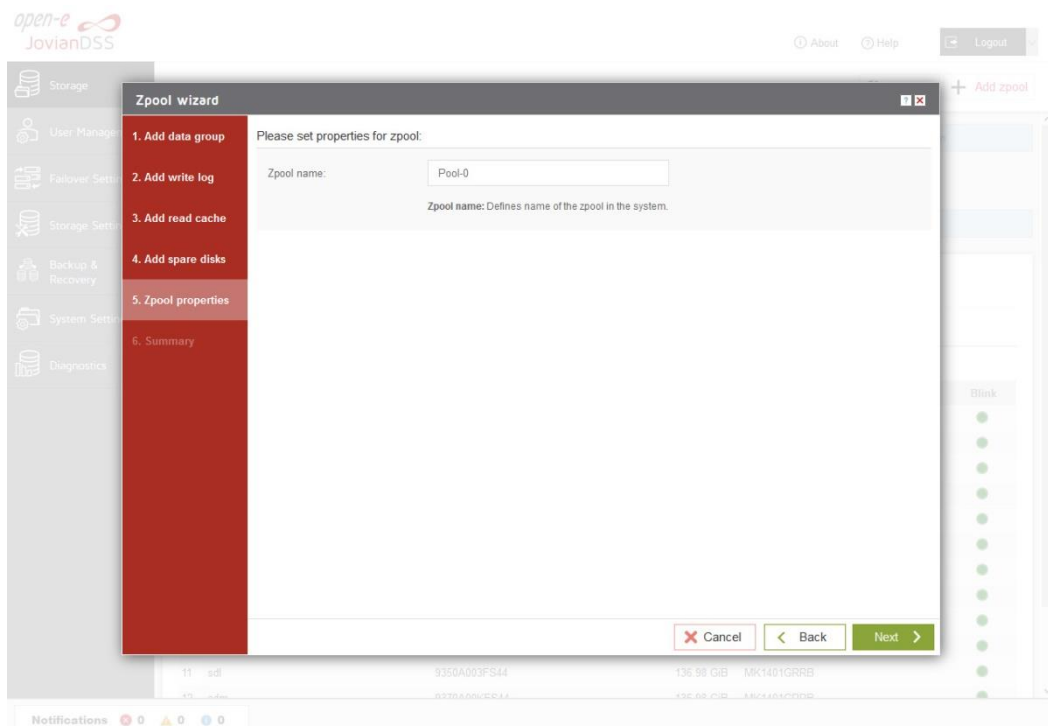
- In "Summary" you are able to see an overview of the zpool configuration. If the settings need to be modified, click the "Back" button and make the required changes. If it is correct click the "Add zpool".
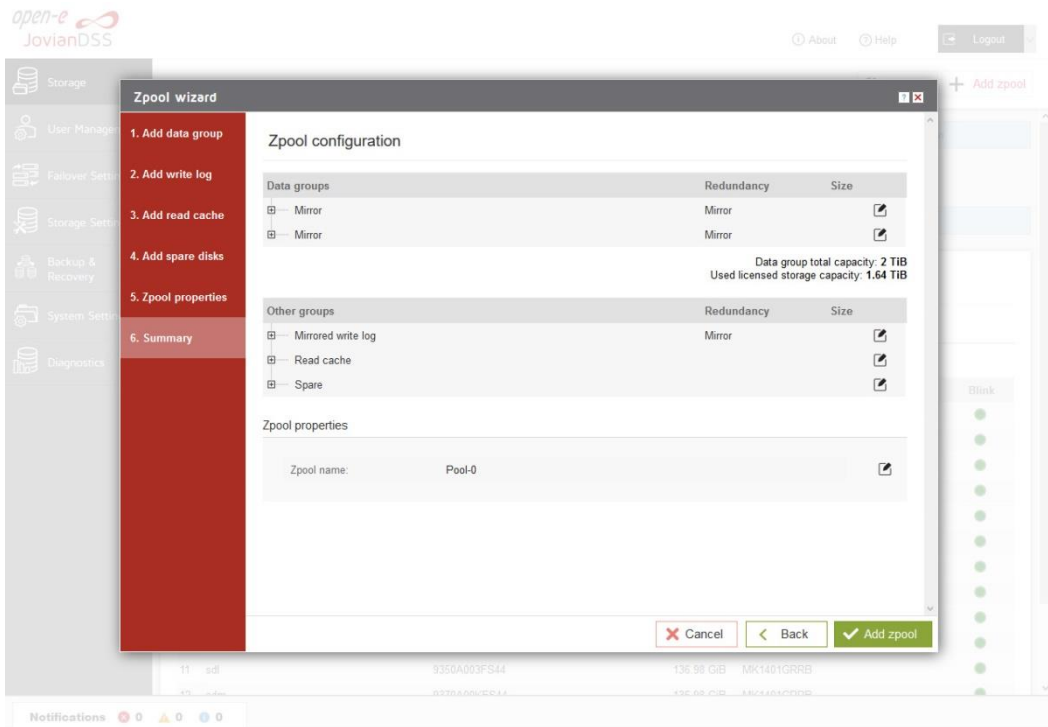
- At this point you have configured a new zpool (you can add more zpools if required).
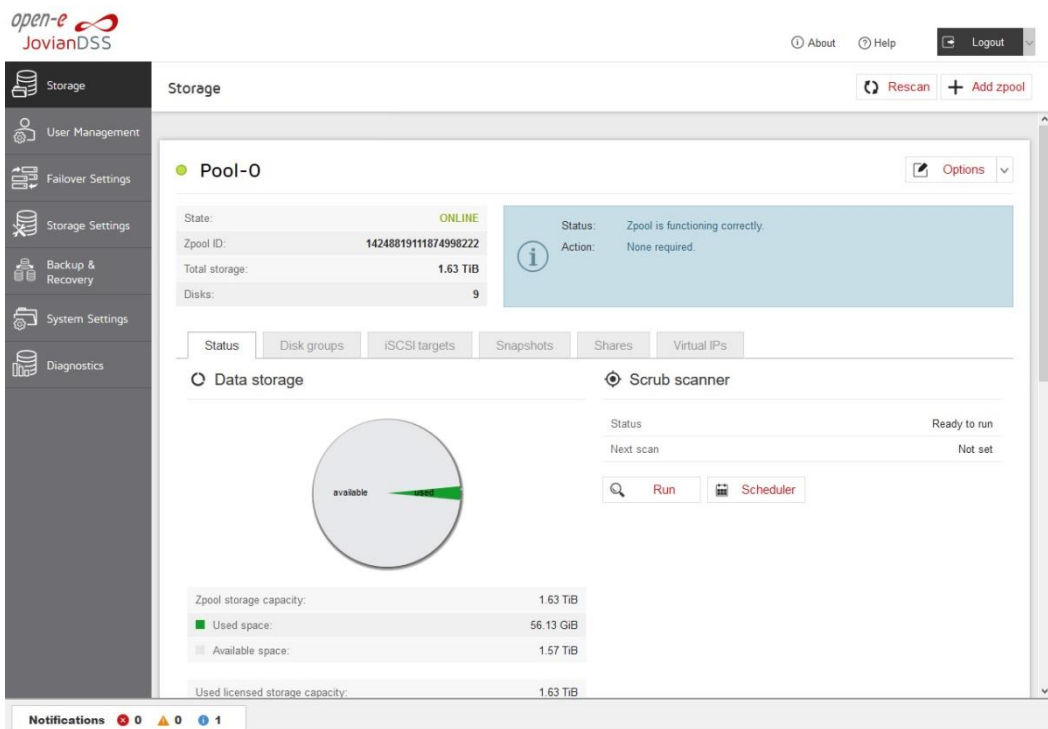
3.4. Creating iSCSI targets

- After creating a zpool, the GUI shows pool status of just created zpool. In order to access pool **setup menu,** click on down arrow button in the middle bottom of the pool status section.
- Next, select "iSCSI targets" and click the "Add new target" button.
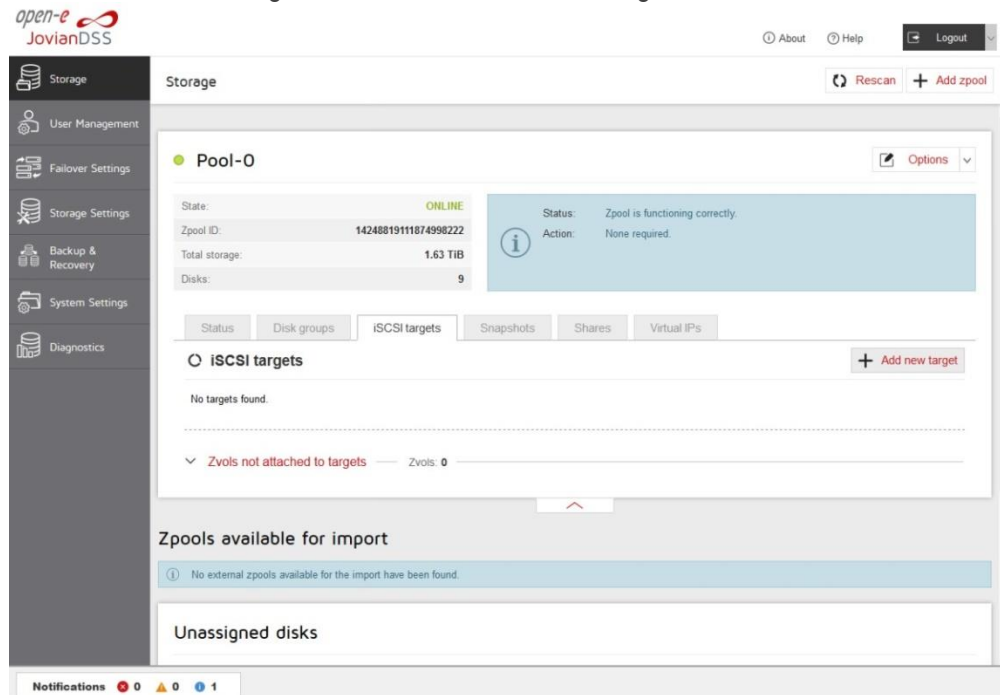
- In the "Target Wizard", you can enter a new "Target name". If the default target name is OK, click the "Next" button only.
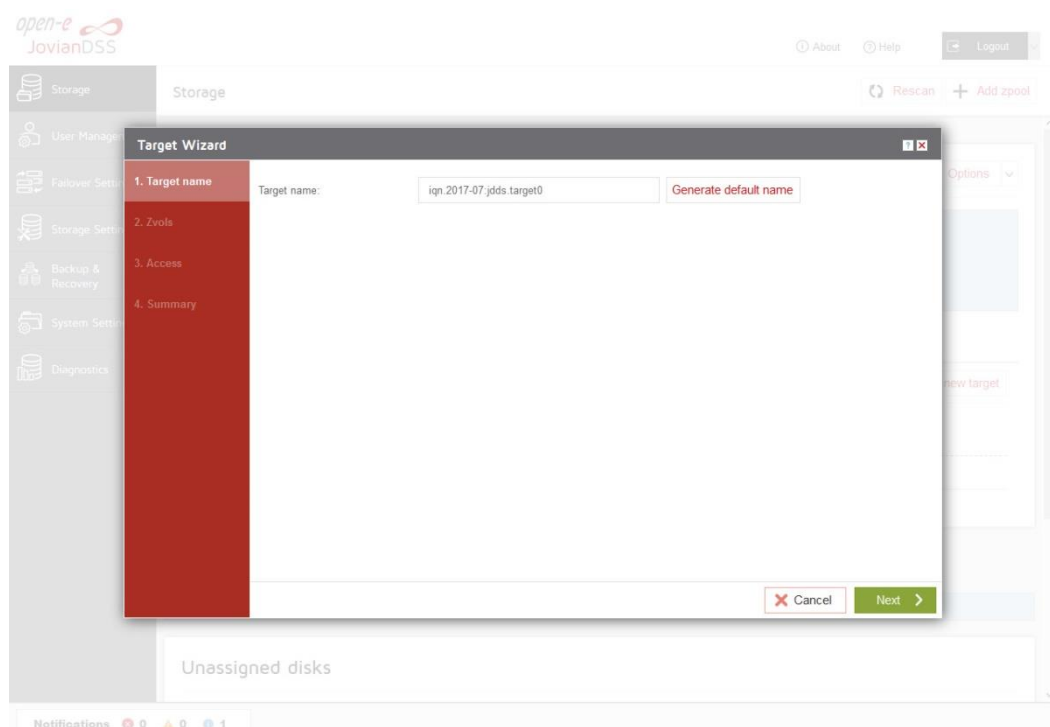
- In the Zvols step, click "Add new zvol". iSCSI Volumes are called zvols.
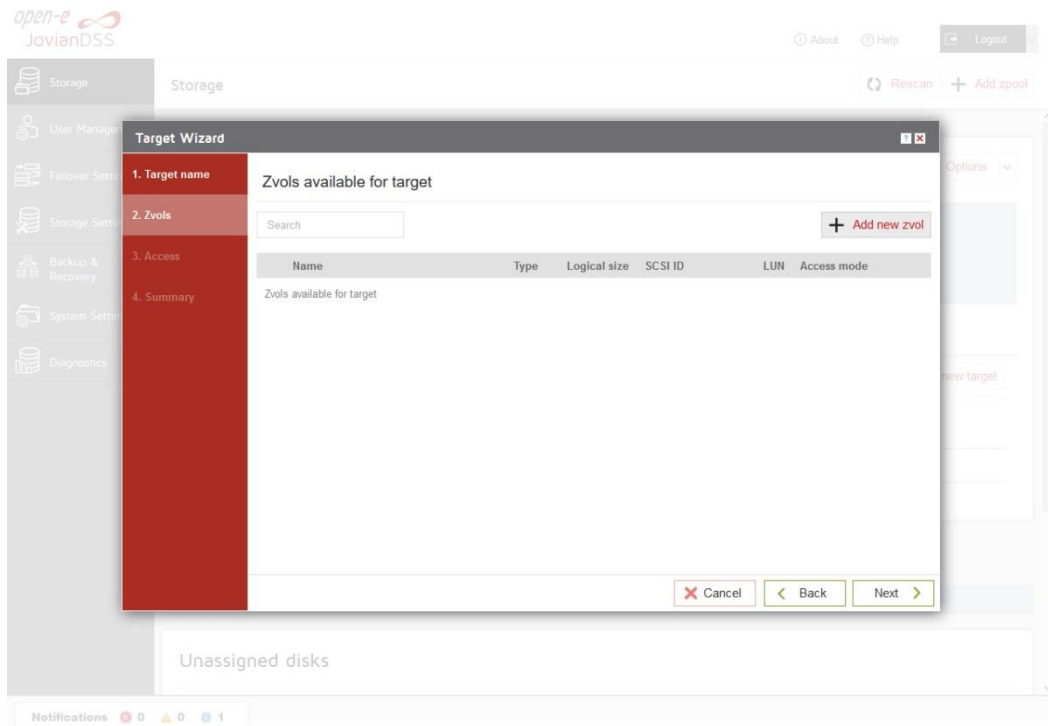
- In "Zvol properties" enter the name of a new Zvol and the appropriate size and click "Add" button.
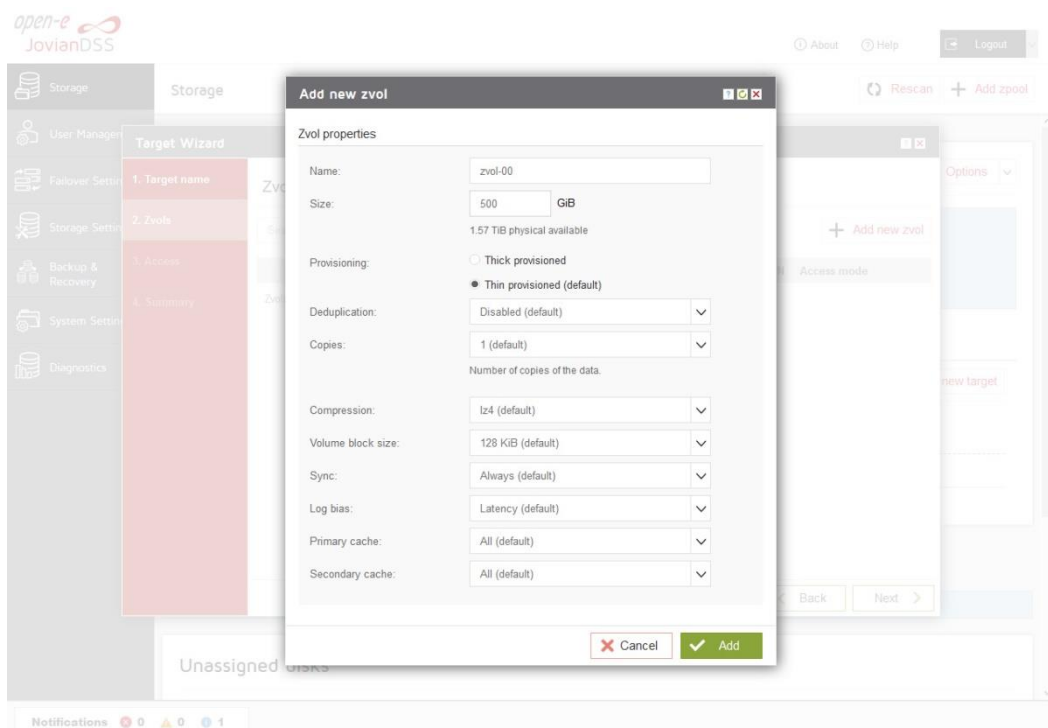
- After creating the new Zvols, click the "Next" button.
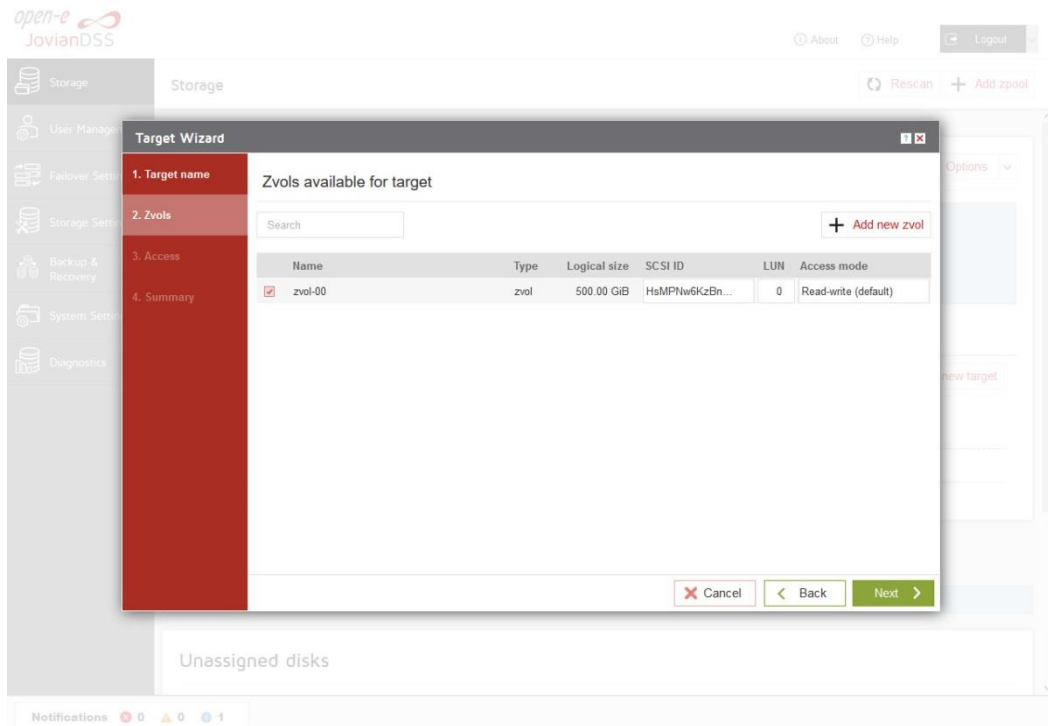
- In the "Access" step, you can change the security options of the targets. After making these changes click the "Next" button.
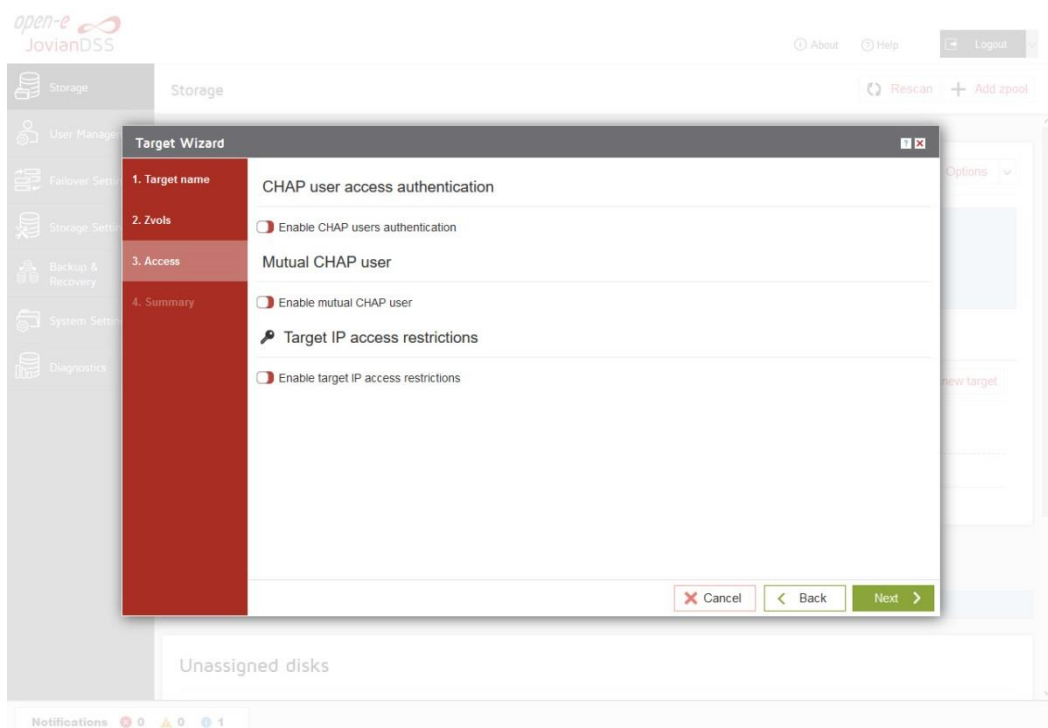
- In "Summary" you are able to see an overview of the configuration of the target. If the settings need to be modified, click the "Back" button and make the required changes. If it is correct, click "Add".
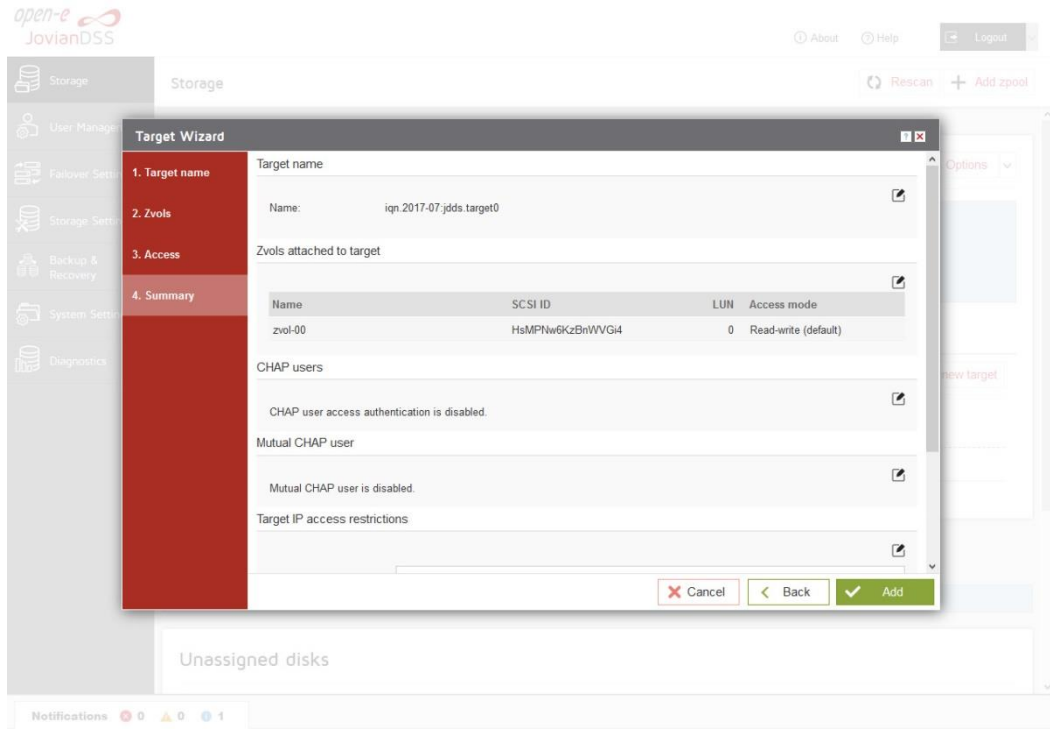
- After completion of the "Target wizard" return to the "Storage". Below you will see the "iSCSI targets" you are able to see and overview of the configuration targets.
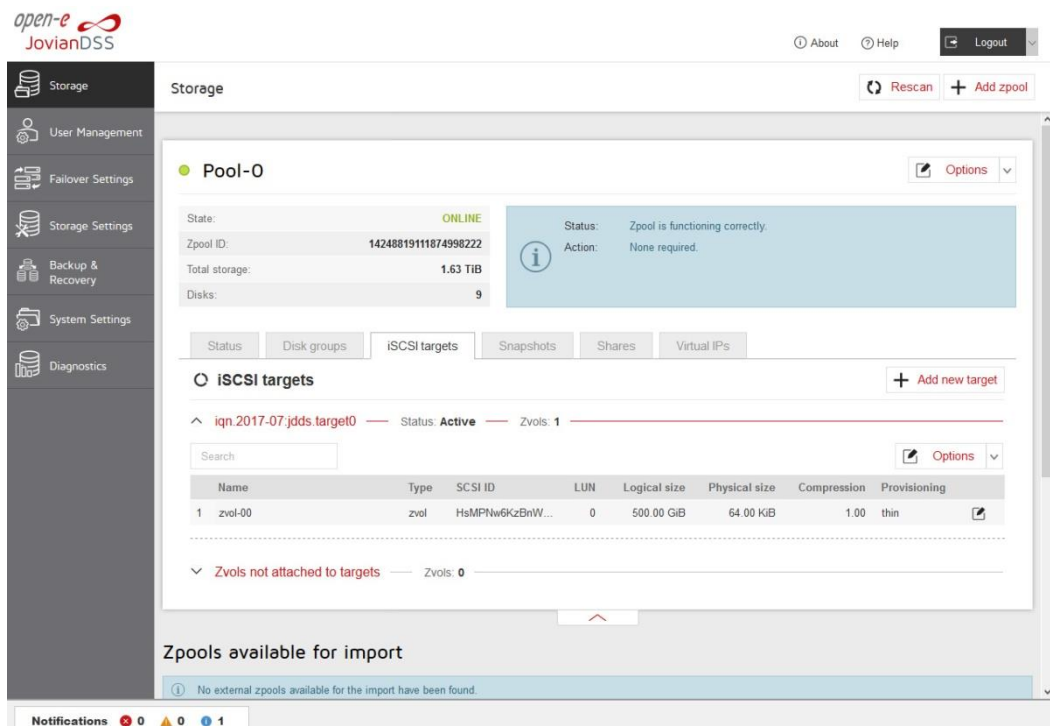
3.5. Exploring targets

It is now time for you to connect with your iSCSI initiator and use your targets.

Example (Microsoft Windows environment).

Run the Microsoft iSCSI Initiator and follow the instructions:

- Start the software, add the targets in the "Discovery" menu and enter the IP Address of Open-E JovianDSS and Port (default 3260).
- From the "Targets" menu "Log on" to a target.
- Now access the Windows "Computer Management" feature and start the Disk Manager function, where you will be able to partition and format the new iSCSI drives for your operating system.

3.6. Creating Fibre Channel targets

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

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

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

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

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

- execute:
  esxcli storage core claimrule load

- check if new rule is listed in:
  esxcli storage nmp satp rule list

- reboot the VMware server

- check if correct plugin is used for SCST devices:
  esxcli storage nmp satp rule list | grep SCST
  The Storage Array Type should be set to VMW_SATP_DEFAULT_AP

Setting Fibre Channel target as single node for ESX:

- Go to menu Storage Settings. In the Options drop-down menu select Properties and enter Alias name. In this example aliases are dd-40 and dd-41.
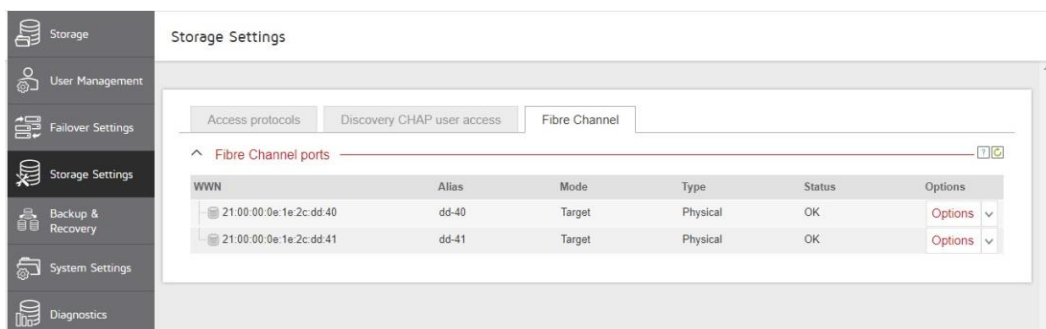
- From Storage Adapters in VMware please select the text, and then use the pop-up menu to copy the selected text to the clipboard.
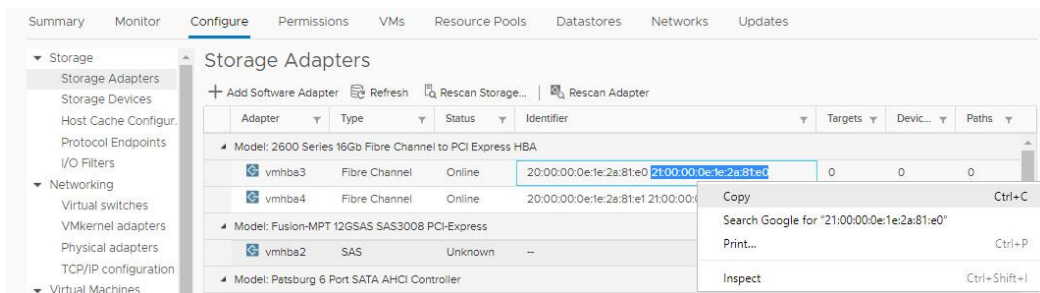
- In Add Initiator please paste the previously saved text from the clipboard into the Initiator WWN field, and enter the Alias initiator. Next, click the Apply button.
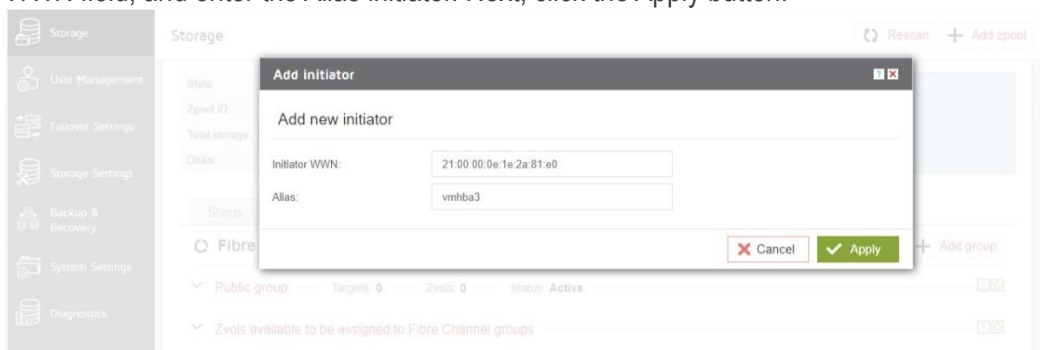
- Initiators have been added.
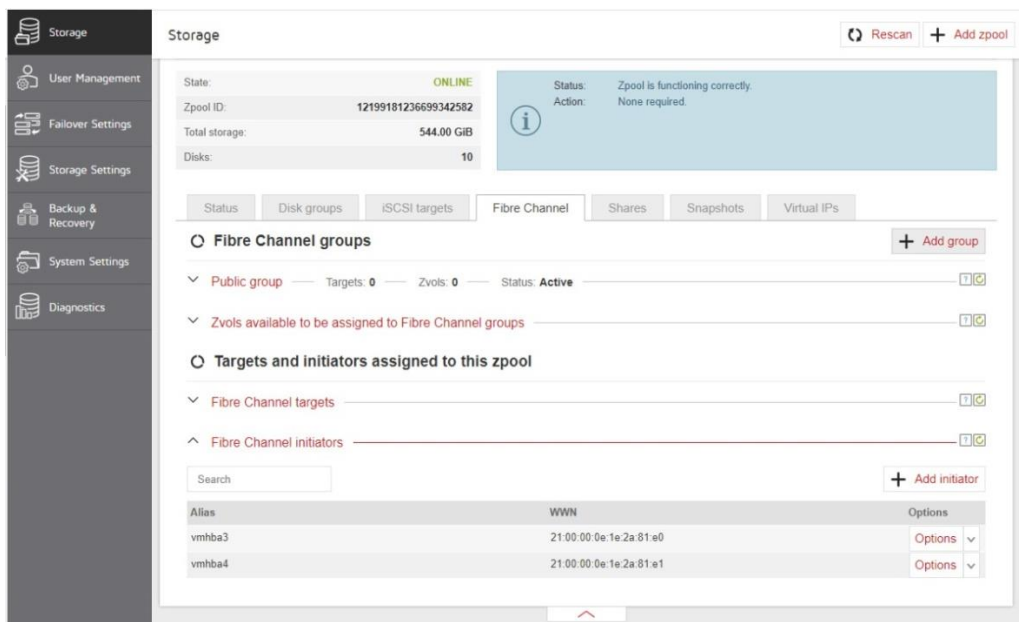
- In Add Fibre Channel group wizard, in Properties step, please enter the name of Group alias. To confirm this name, click the Next button.
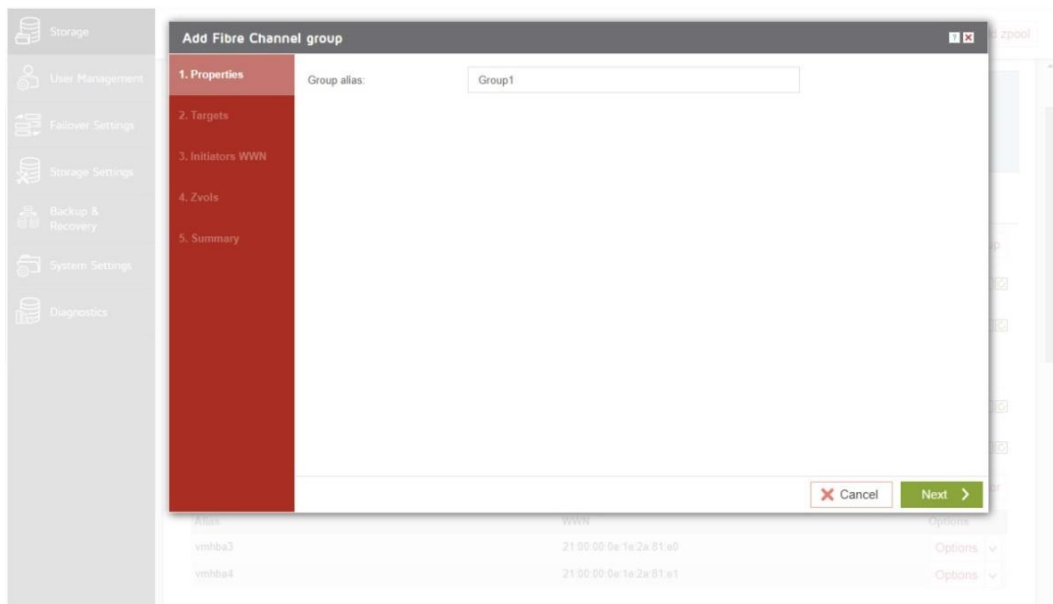
- In the Targets step please Select proper WWNs and click the Next button.
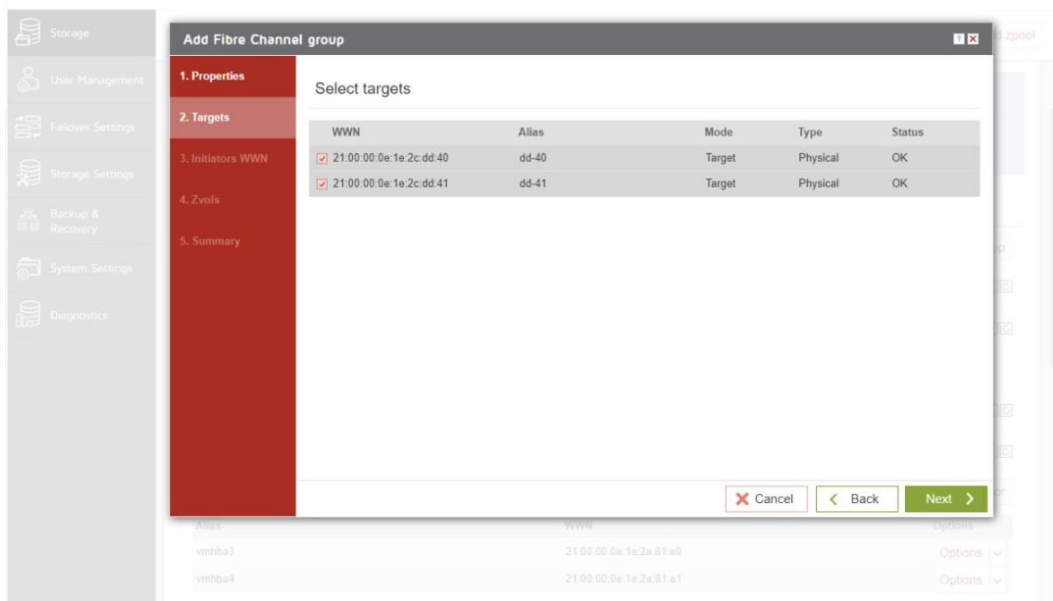
- In the Initiators WWN step please select proper Aliases and click the Next button.
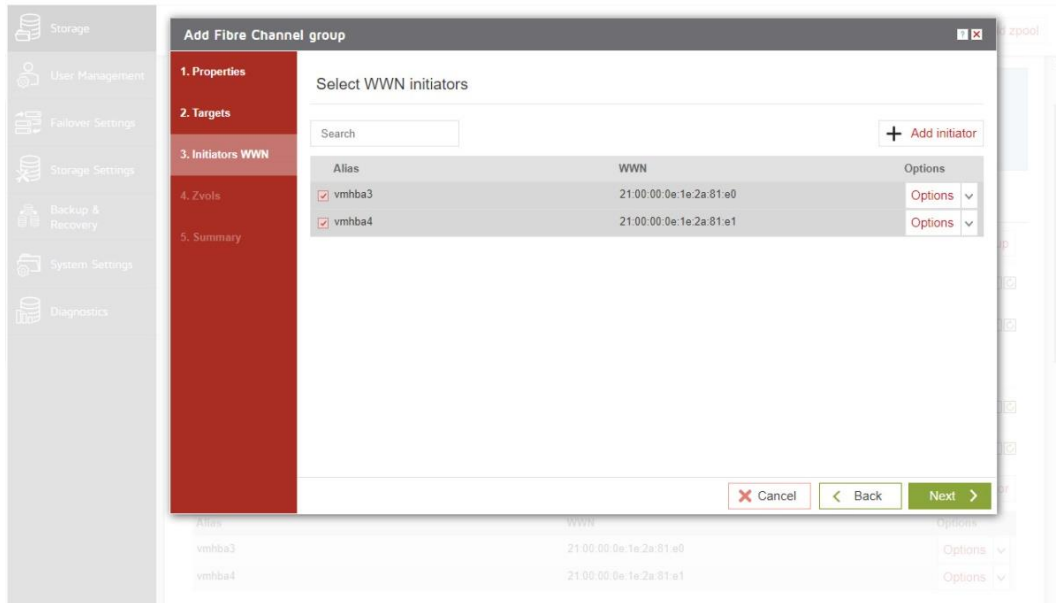
- In Zvols step please click the Add zvol button.
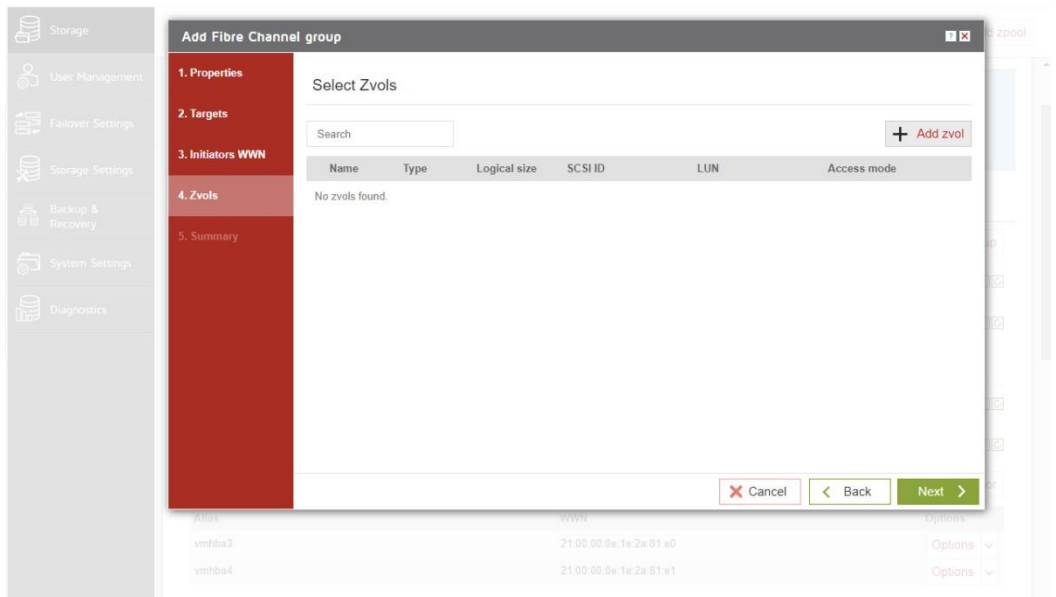
- In Add new zvol, enter the name of a new Zvol and the appropriate size and click Add button.
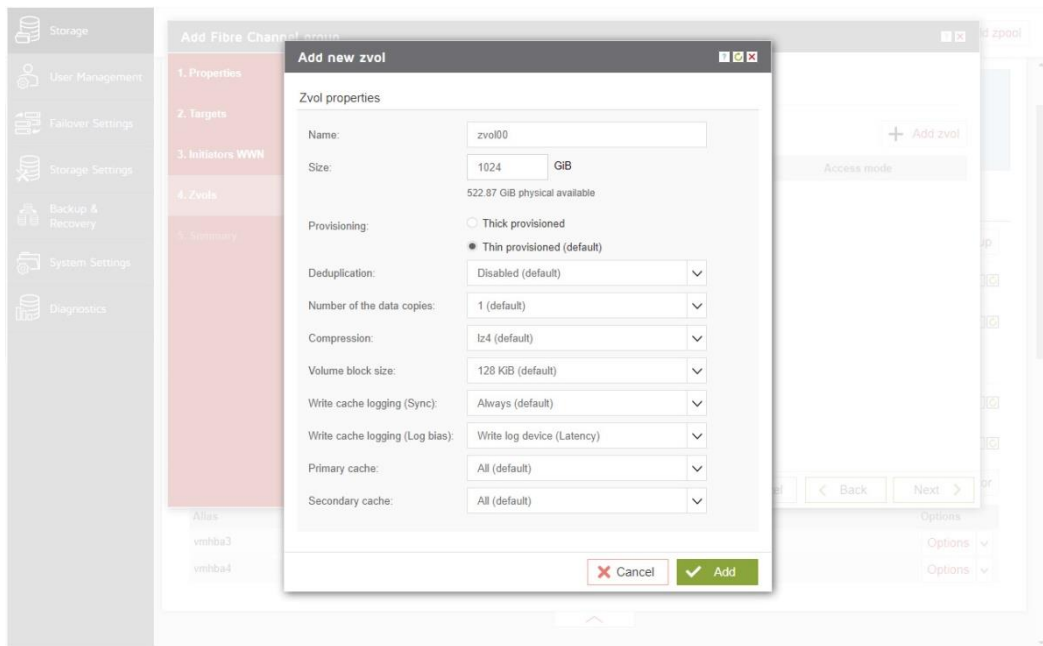
- After creating new Zvols click the Next button.
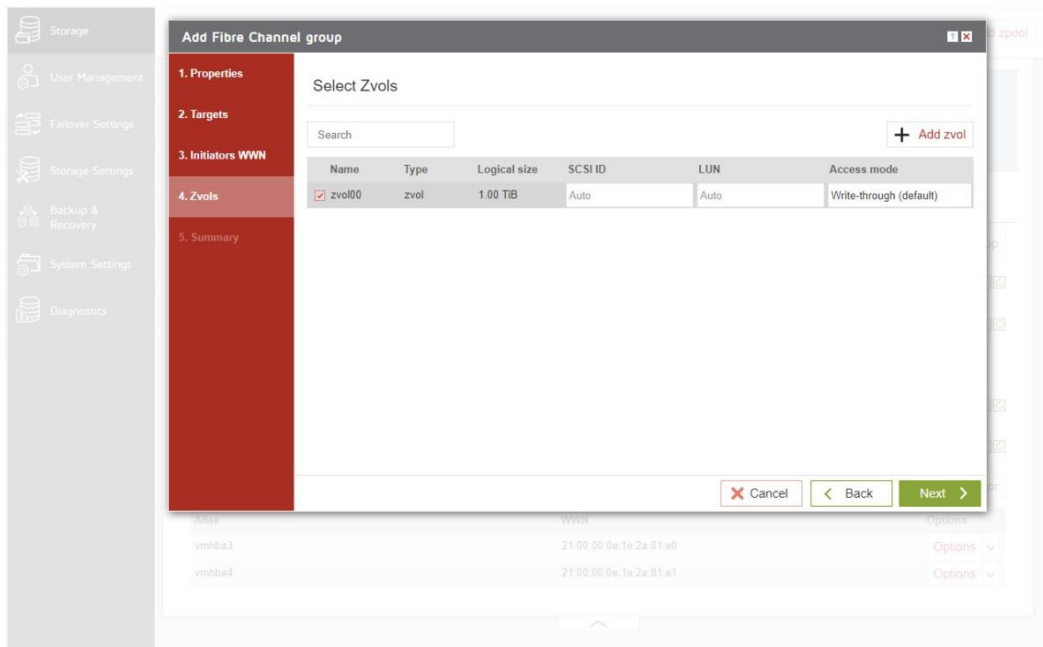
- In Summary you are able to see an overview of the configuration of the Fibre Channel Group. If the settings need to be modified, click the Back button and make the required changes. If it is correct, click Add.
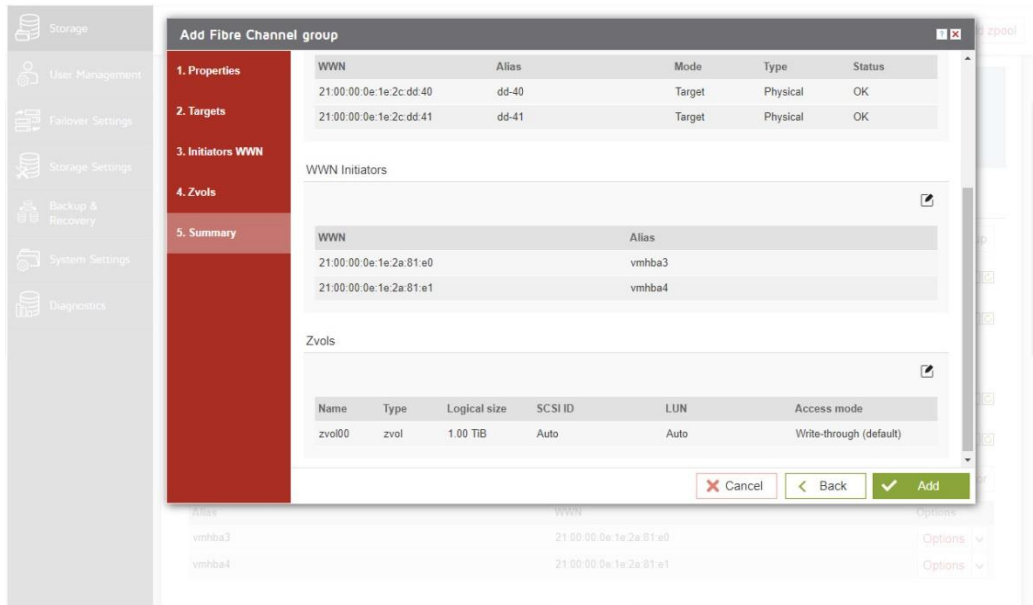
- In Storage Adapters, you can check the connection of both remote ports for rescan.
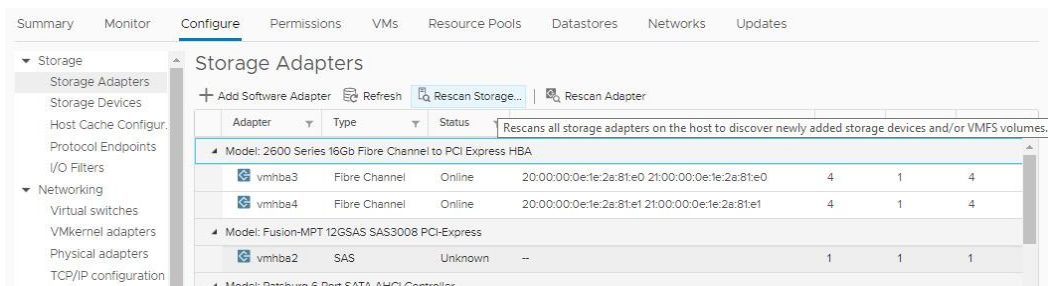
- After the rescan, the new device (SCST_FIO) is listed below.
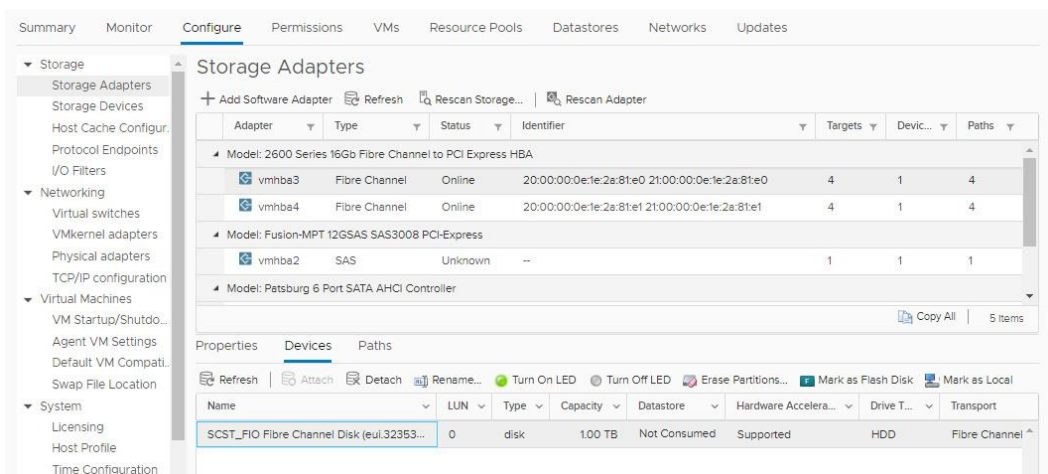
- Next, go to Storage Devices and please click Edit Multipath.
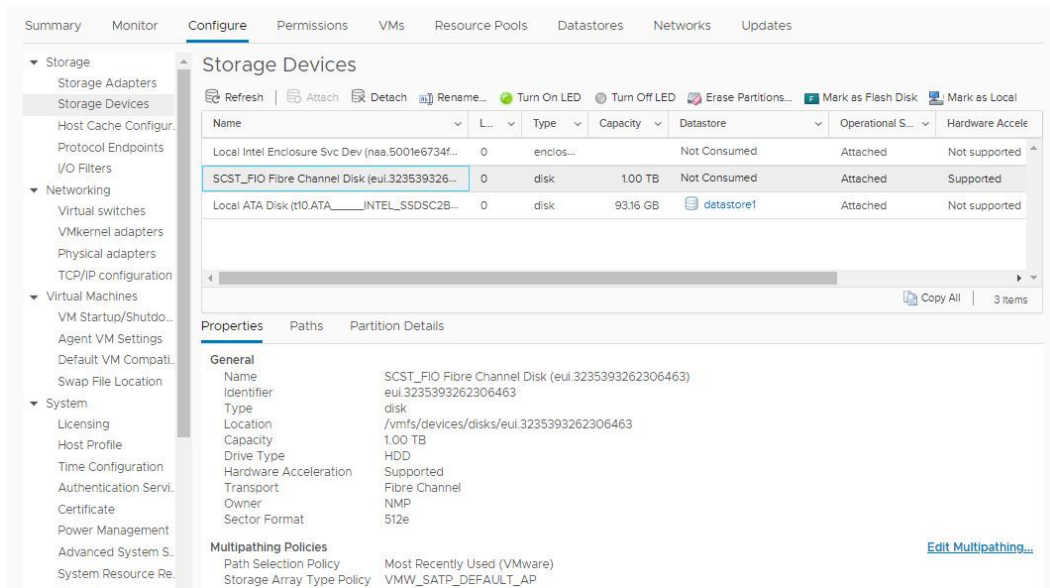
- In Edit Multipathing Policies select Round Robin (VMware) and click the OK button.
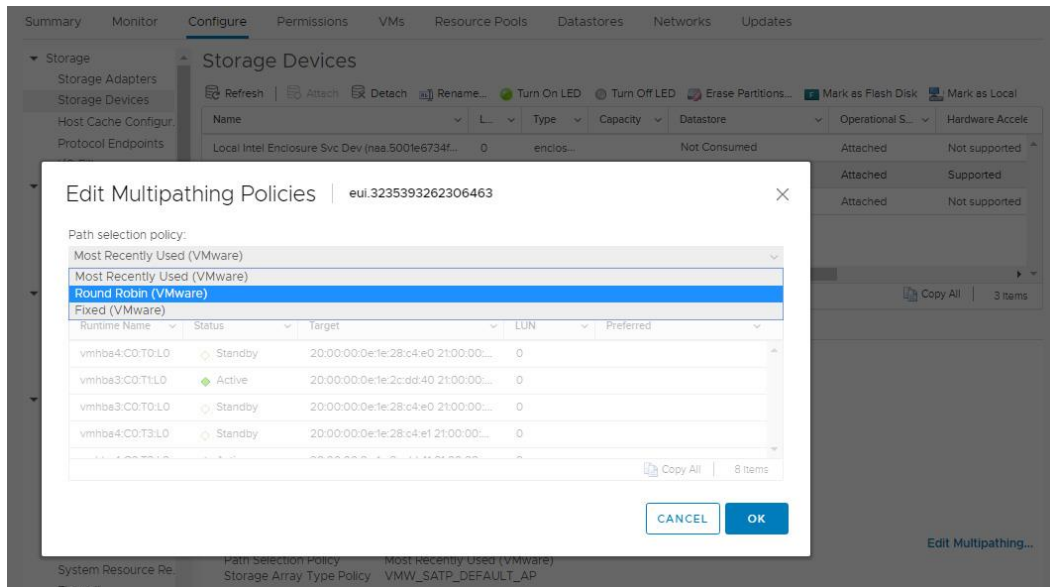
Now, the FC target configuration is completed.

3.7. Creating SMB shares

- In the Pool menu select the "Shares" tab. Click on the "Add dataset" button in order to create a new NAS-volume. NAS-volumes are called "datasets".

- In the "Add new dataset" window, enter the dataset (volume) name and click on "Apply" button.

- Next select the created dataset. Next click on "Option" button and from drop-down menu click on the "Add share" button.
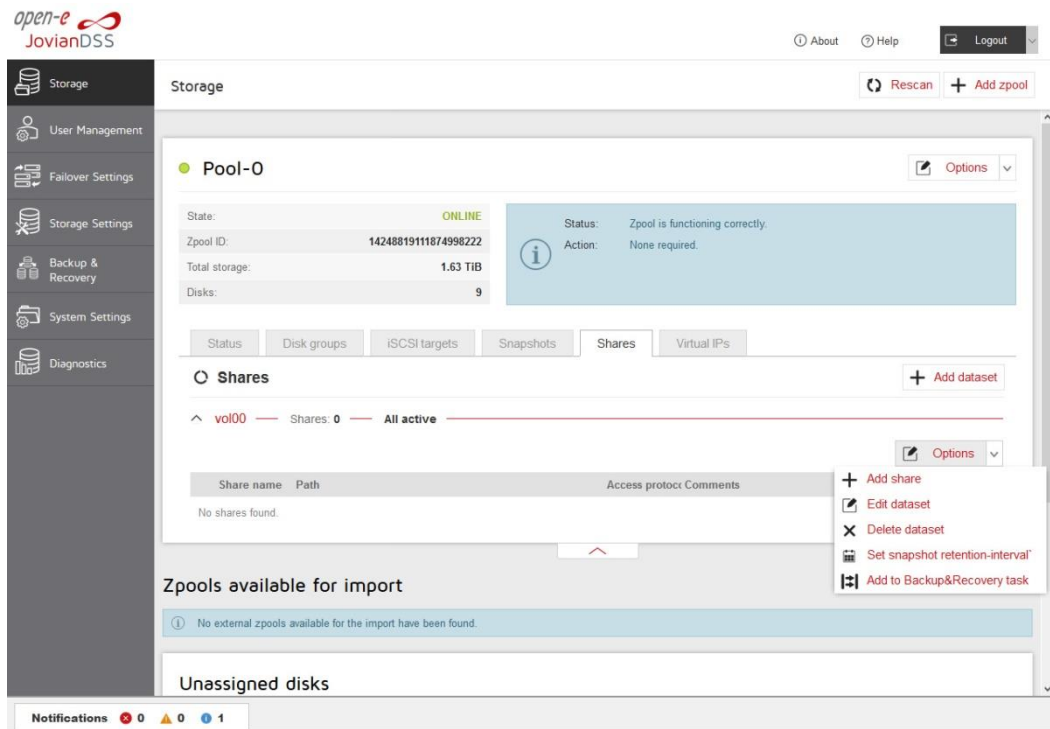
- In the "Share wizard" as a first step, enter the share name. Optionally you can enter the subdirectory name in the dataset. If the subdirectory is not entered, the share will be pointed directly to the dataset. The comment field is also optional. Continue with "Next".
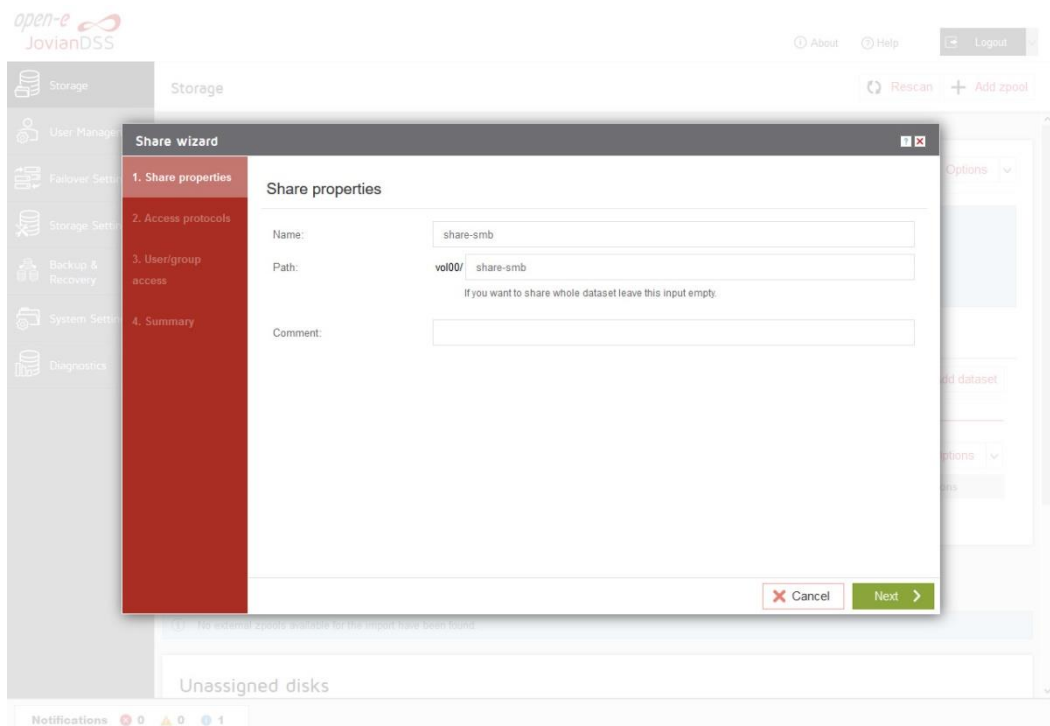
- In order to create the share, confirm with "Yes".
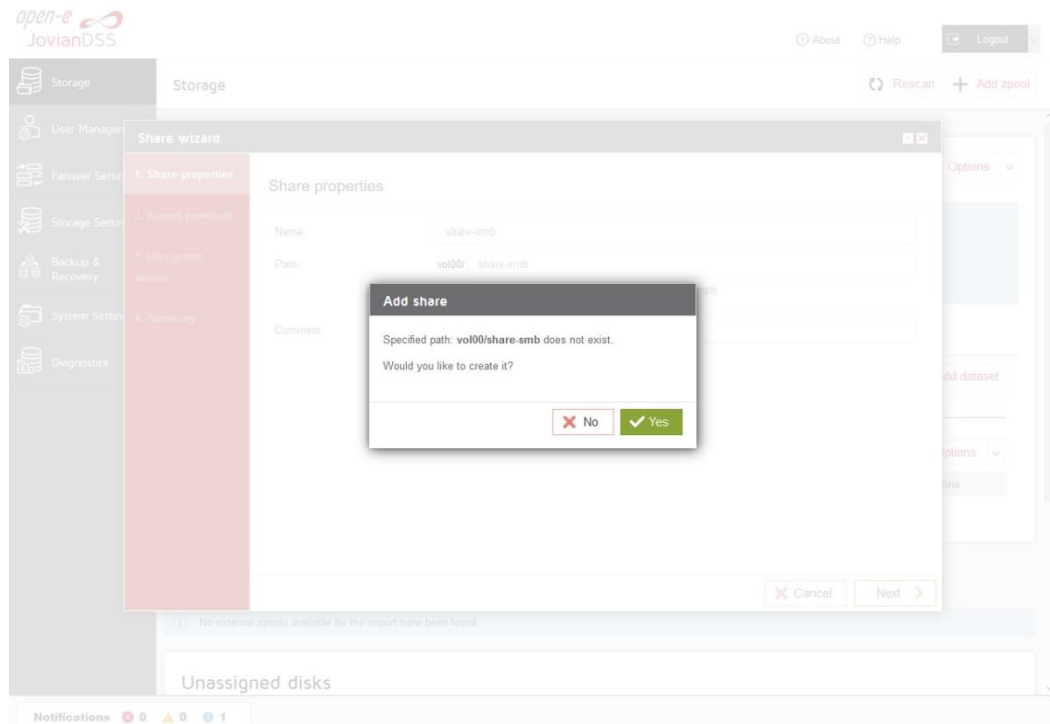
- In "Access protocols" step, check the "Enable SMB service".
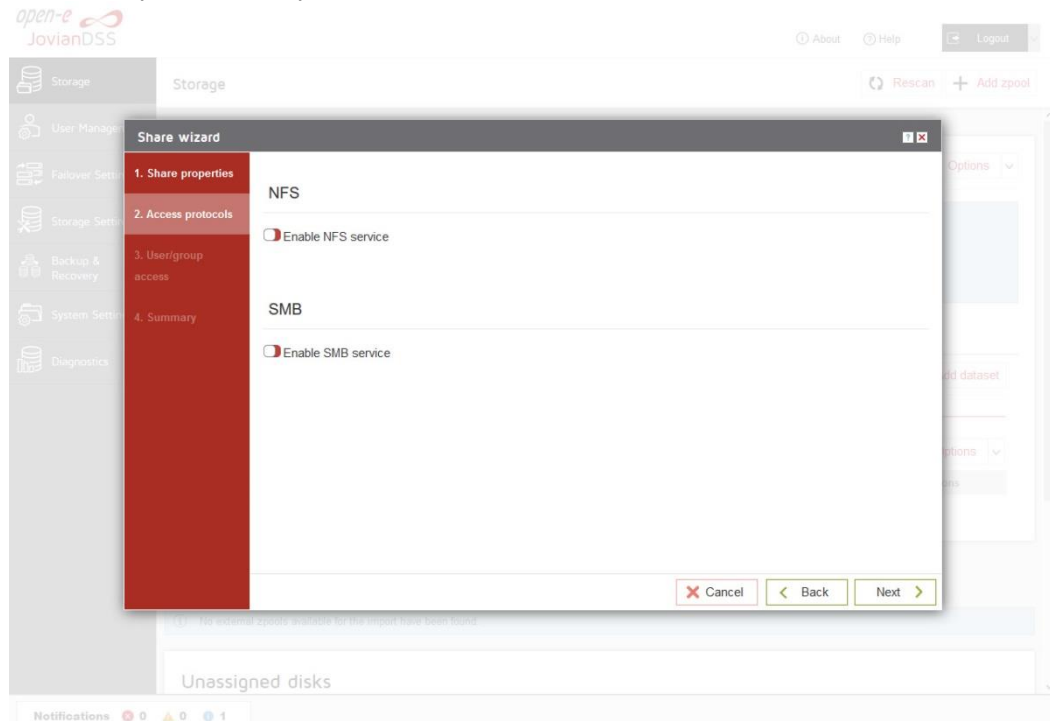
- Confirm with the "Yes" button and continue with "Next".
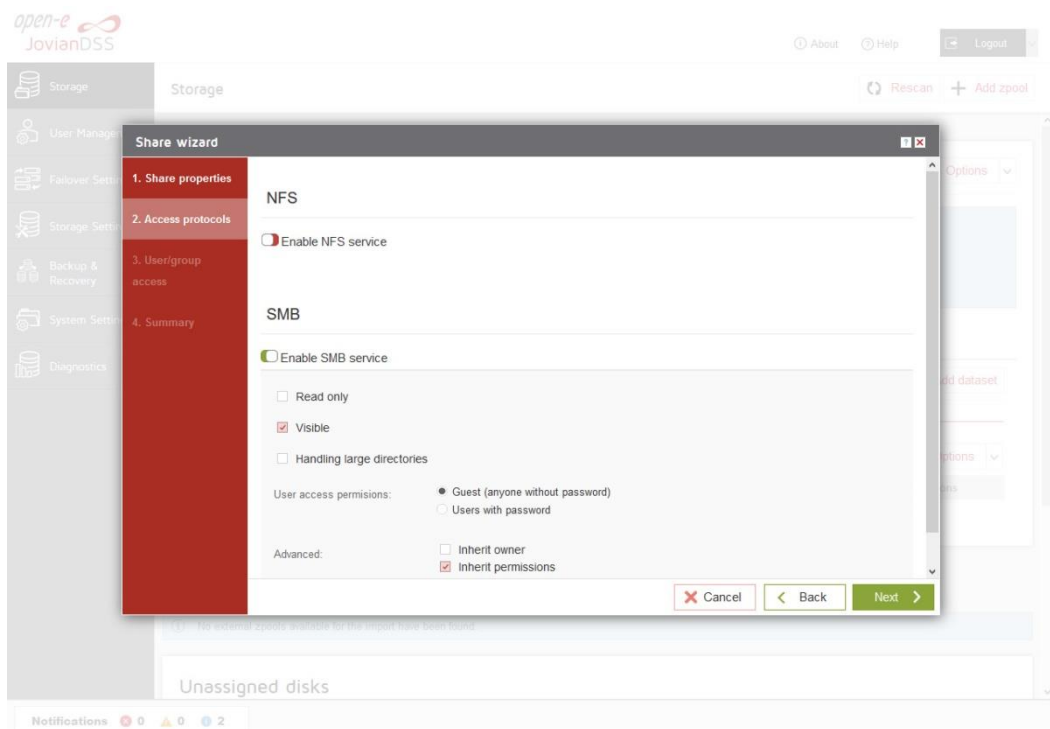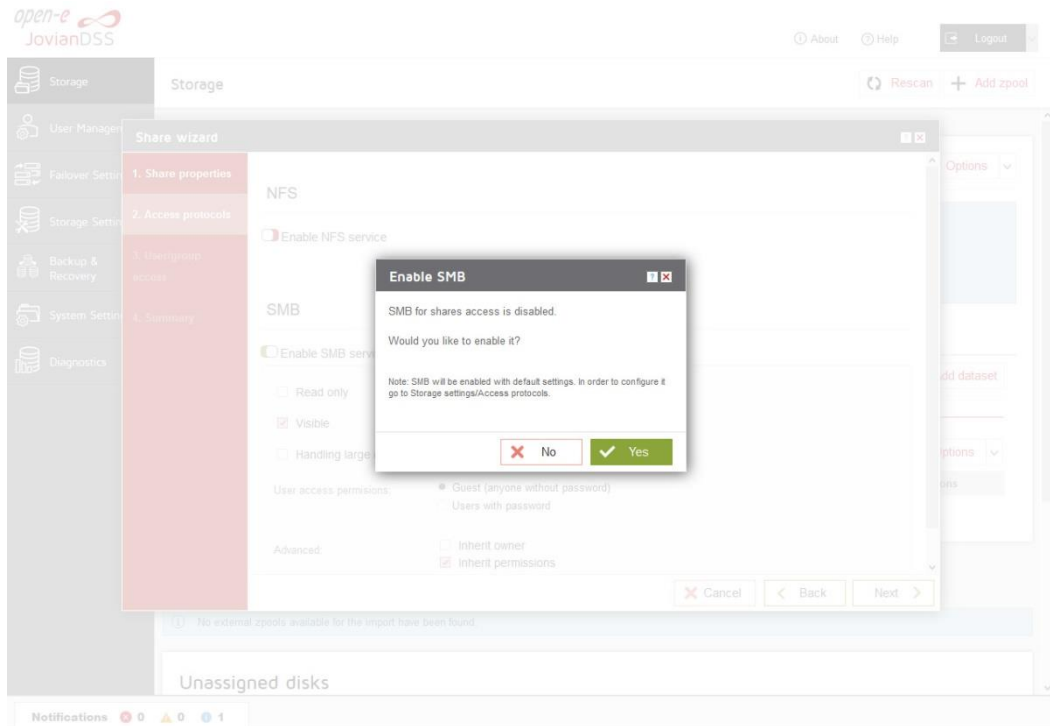
- In the "Users/groups access" step continue with the "Next" button.
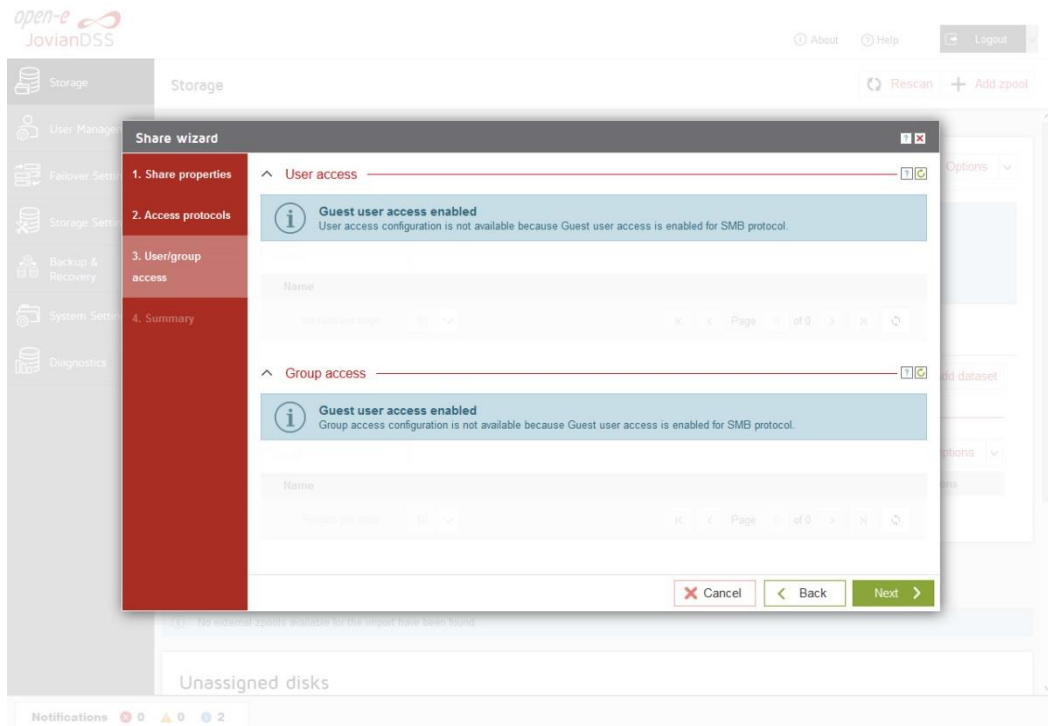
- In the "Summary" step click the "Add" button. Now the SMB share is ready to use.
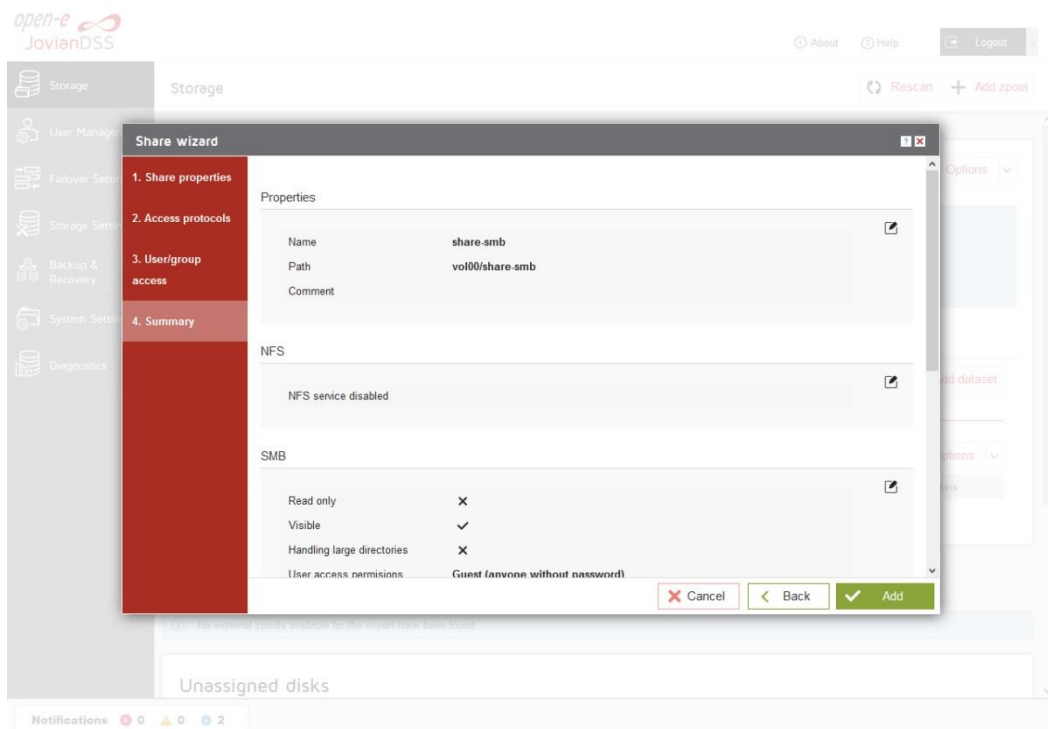
- In order to change the SMB share settings, click on the "Options" drop-down menu of share-smb and select "Protocols".

3.8. Using local Users and Groups with build-in Lightweight Directory Access Protocol (LDAP)

- In order to enabling local Users and Groups, please go to "User Management" menu and in Lightweight Directory Access Protocol (LDAP) please click on "Enable protocol"
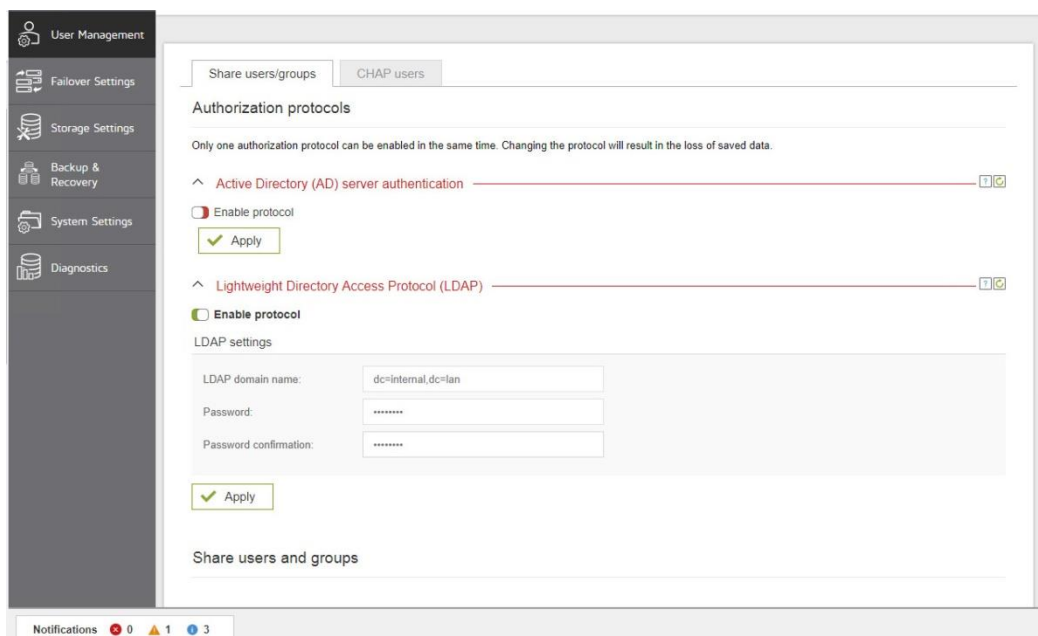
- Next, confirm this action by clicking the "Yes" button.
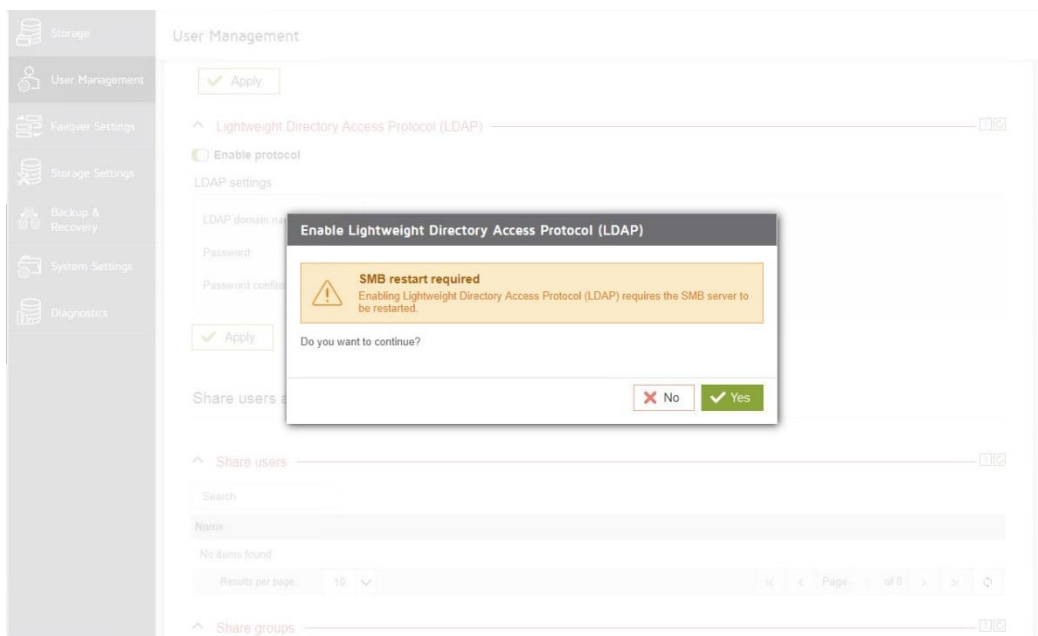
- Next, in "Share users" click on the "Add user" button in order to create a new user. Please enter name of new user and password, then click Apply button.
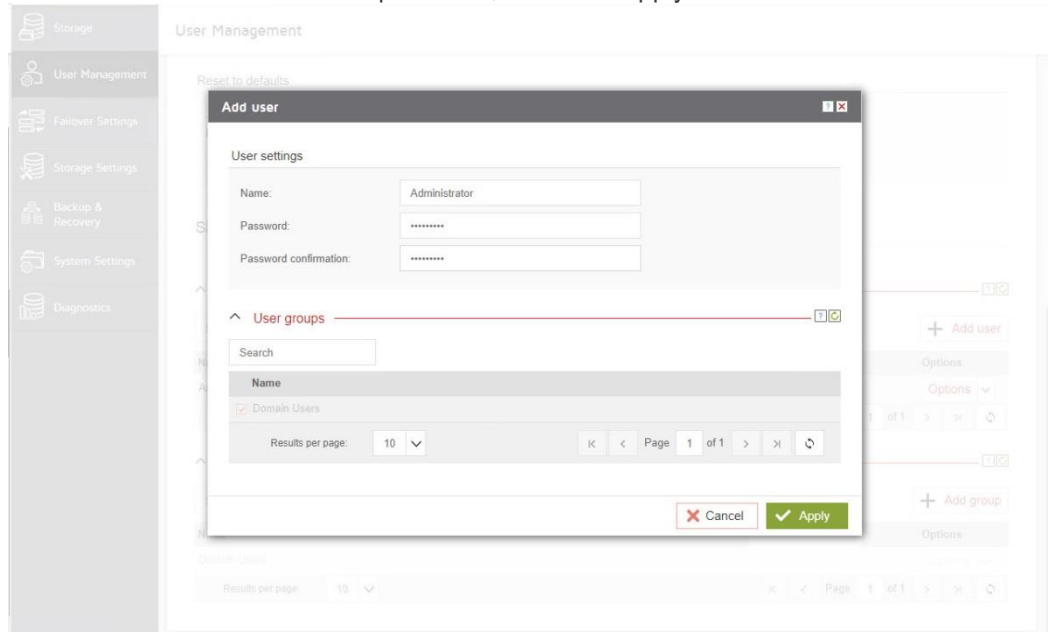
- After this action new user is already added.
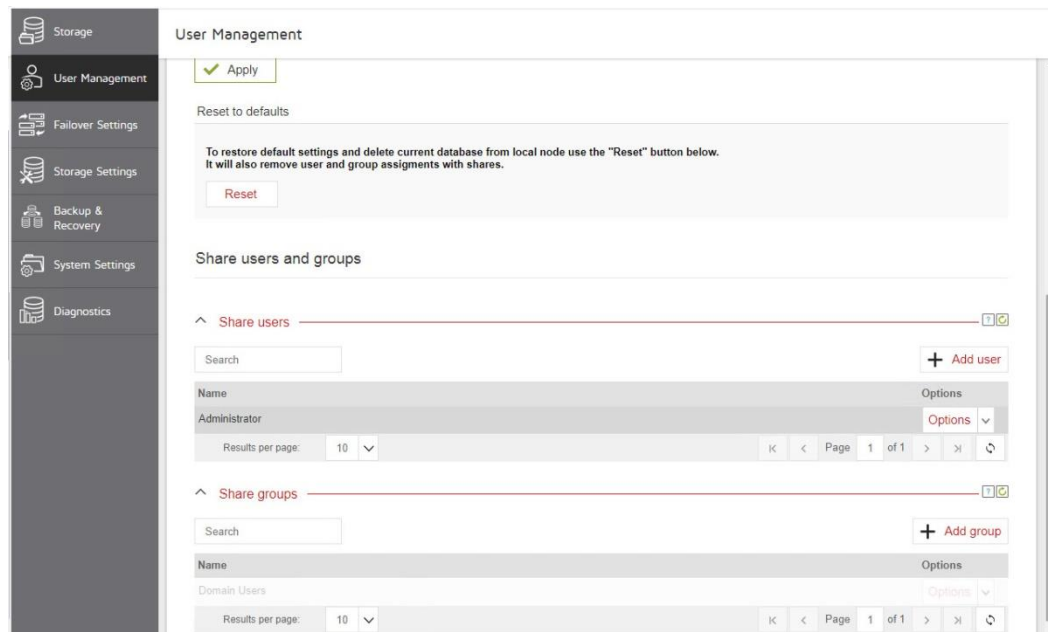
- In the Pool menu select the "Shares" tab. On the required share, (in this example" data") click on the "Option" button.
  NOTE: How to create a new share is described in subsection 3.7 "Creating SMB shares" in this document.
- Next click on "Option" button and from drop-down menu and next click on the "Protocols" button.

- In "Edit share protocols, please click "Enable SMB service", and in User access permissions, change option "Guest (anyone without password) to "Users with password". Next, click Apply button.

- Again in "Option" drop-down menu, please select "User/group access"
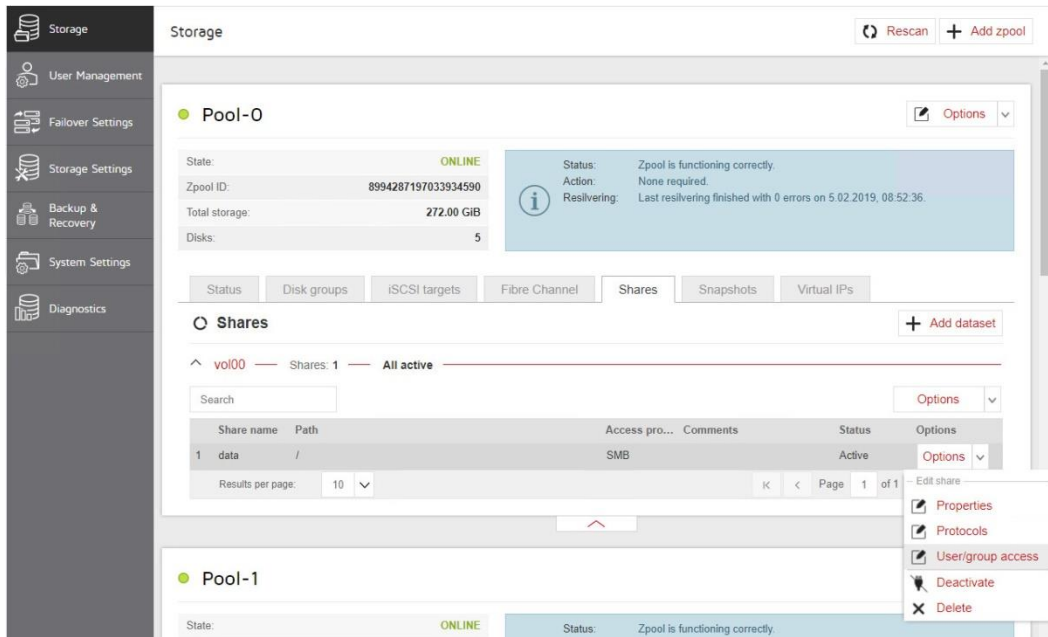
- In "User access" ", please check the box with user name (in this example Administrator), and click Apply button.
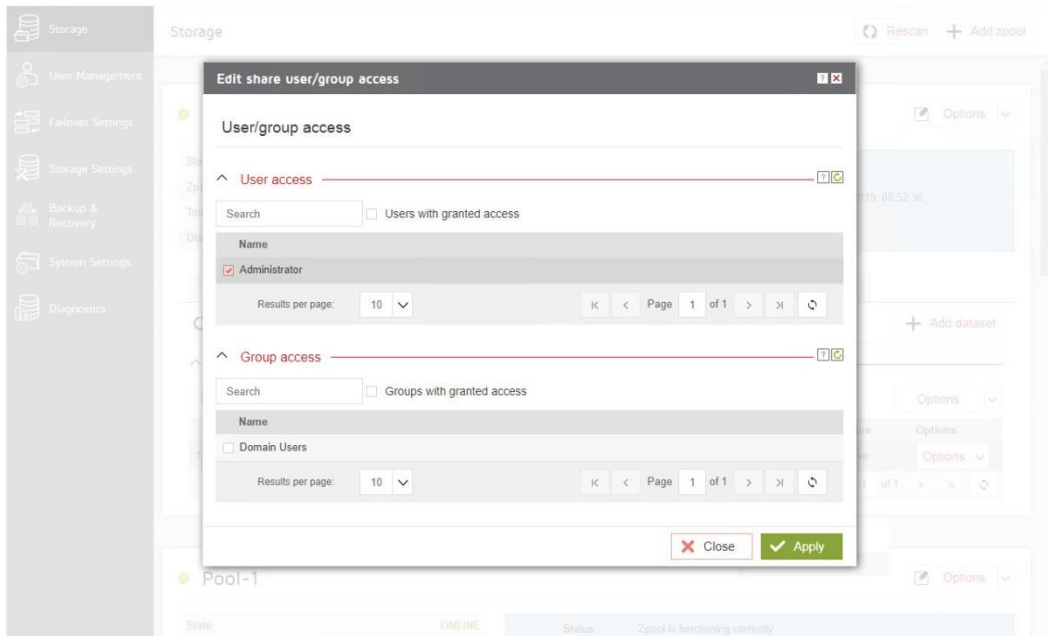
- In "File explorer" in Windows system, please open Share folder window.
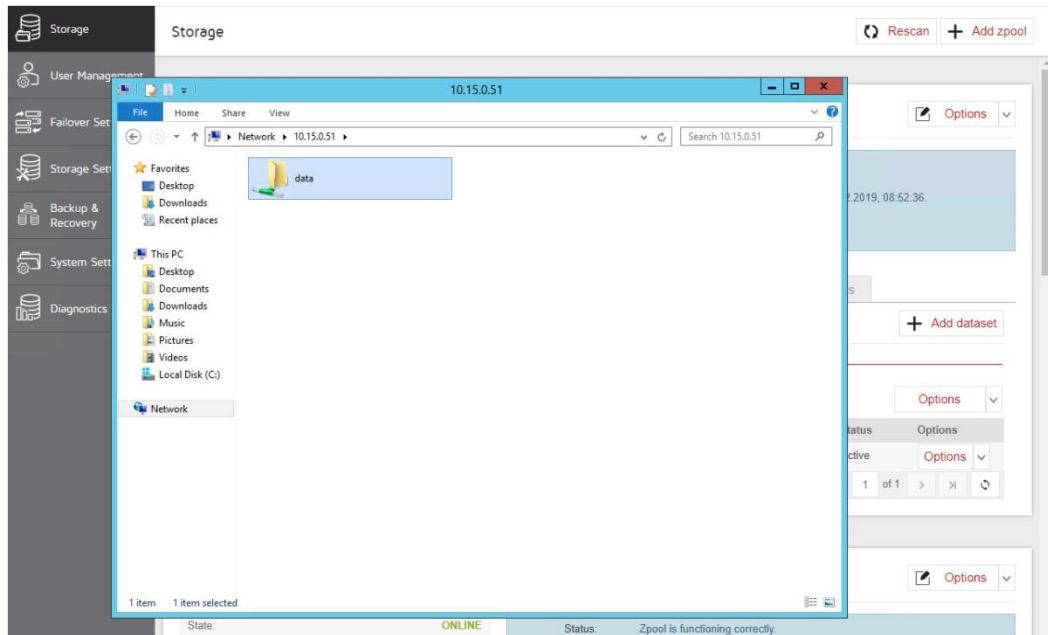
- Next, please check if there is access to the share (e.g. by creating a new folder)
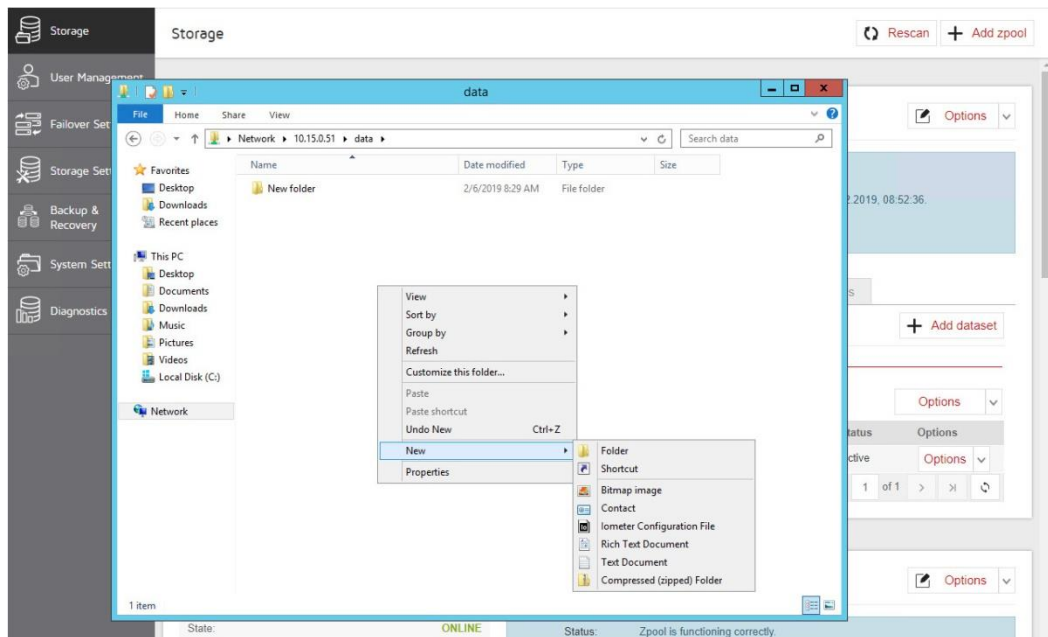
- Then, go back to the "Pool" menu in "Storage". Click on "Shares" tab.

- In "Options" drop-down menu, select "Users/group access", and in "User access" uncheck the check the box with "Administrator" user, and confirm by clicking the Apply button.

- Next, go back to the Windows system and check if you still have access to Share data. As shown below, access to the share "data" is disabled because the Windows Security prompts for user credentials.
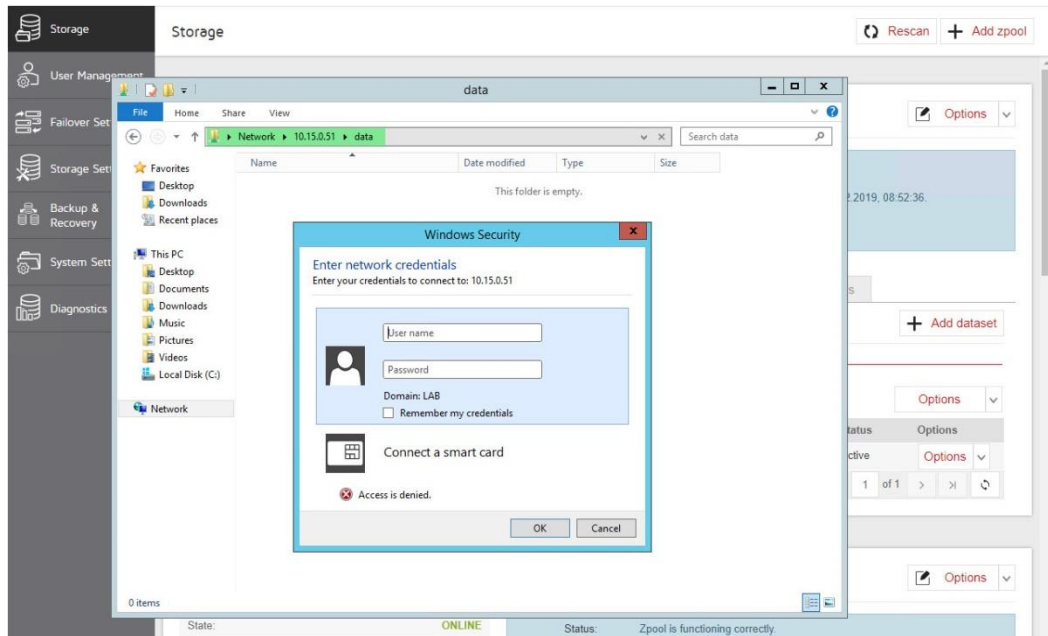
3.9. Auto-Snapshots and Access to Previous versions

Use Windows Previous Versions to go back in time and access or restore previous versions of files and folders. Windows allows restoring previous versions of a file that was modified or even deleted. Anyone who has ever changed a file and realizes that the previous content was better as it was before, will appreciate the value of being able to retrieve a previous version of a file. Previous versions need auto-snapshot. The auto-snapshot can be set via the GUI.

- To create new auto-snapshots plan, please go to the "Backup & Recovery" menu then Click the "Add replication task" button in the bottom right corner to run the "Backup task wizard".
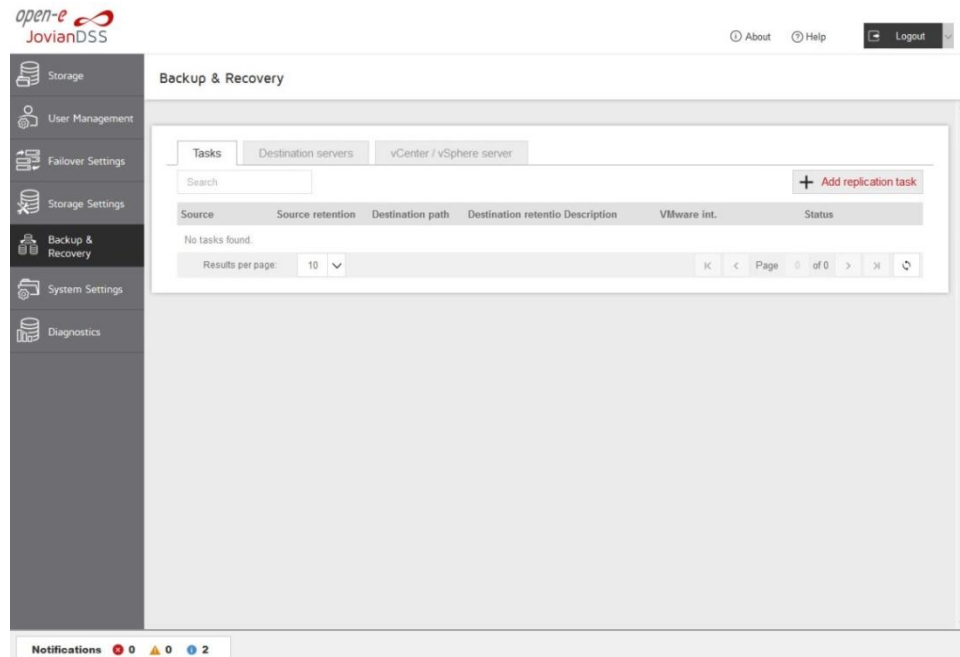
- After starting the "Backup task wizard" will be listed default "Retention-Interval plan for source".
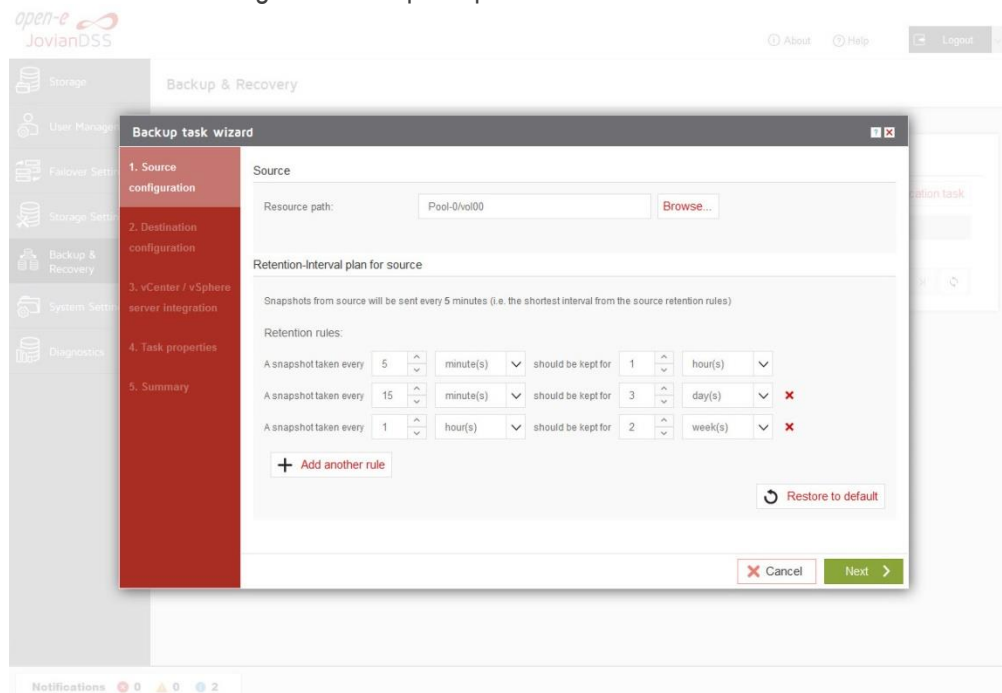
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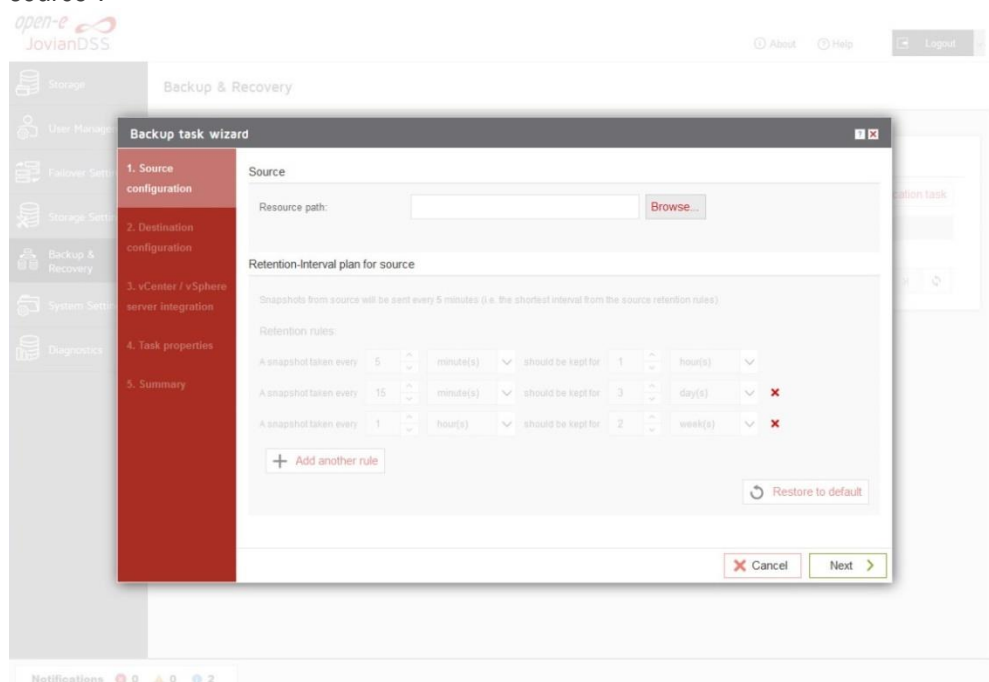
- In the "Source configuration" click "Browse".
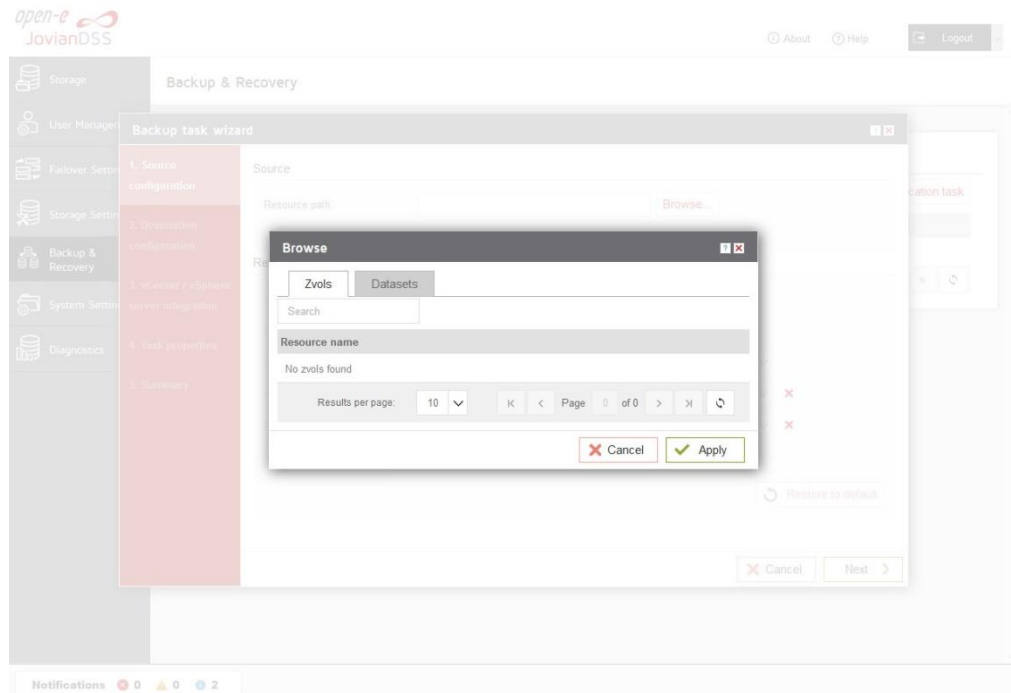
- In the "Browse" please select "Datasets" tab, and choose a resource name. Next click on "Apply" button.
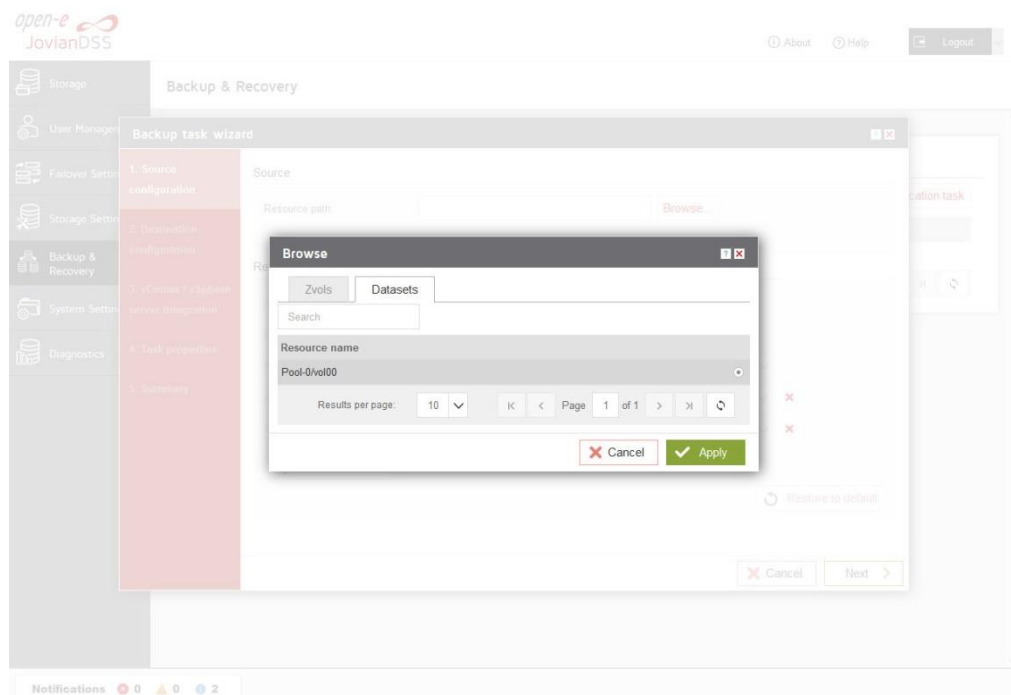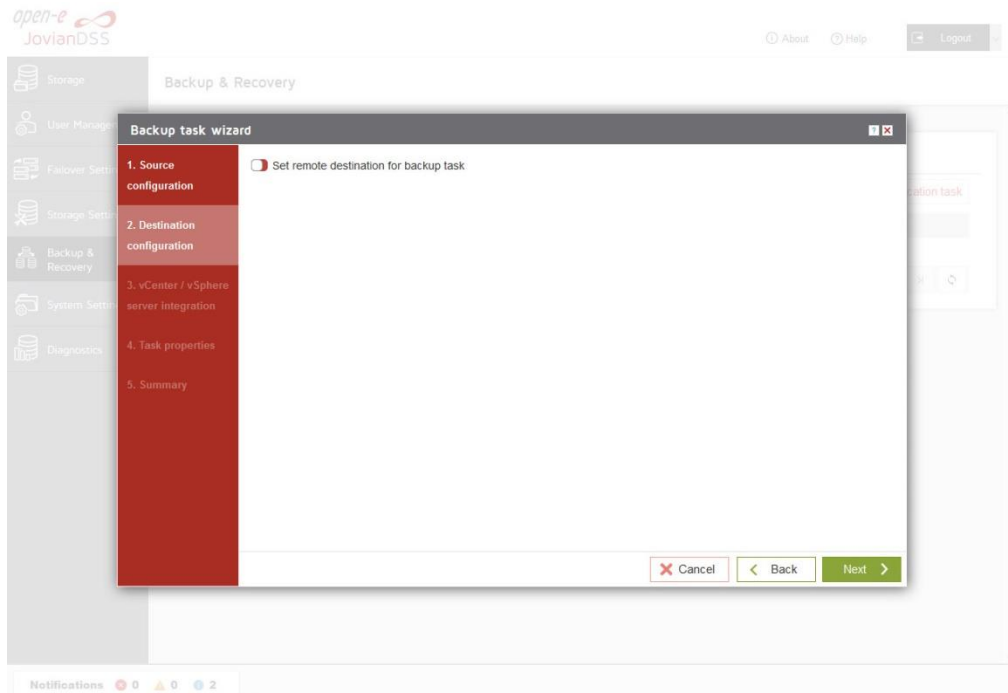
- After the end selecting "Resource path" please click on "Next" button.

- In "Destination configuration" please disable "Set remote destination for backup task" option.
  NOTE: If backup need to be configured, you can just continue with the wizard and provide destination volume accordingly.
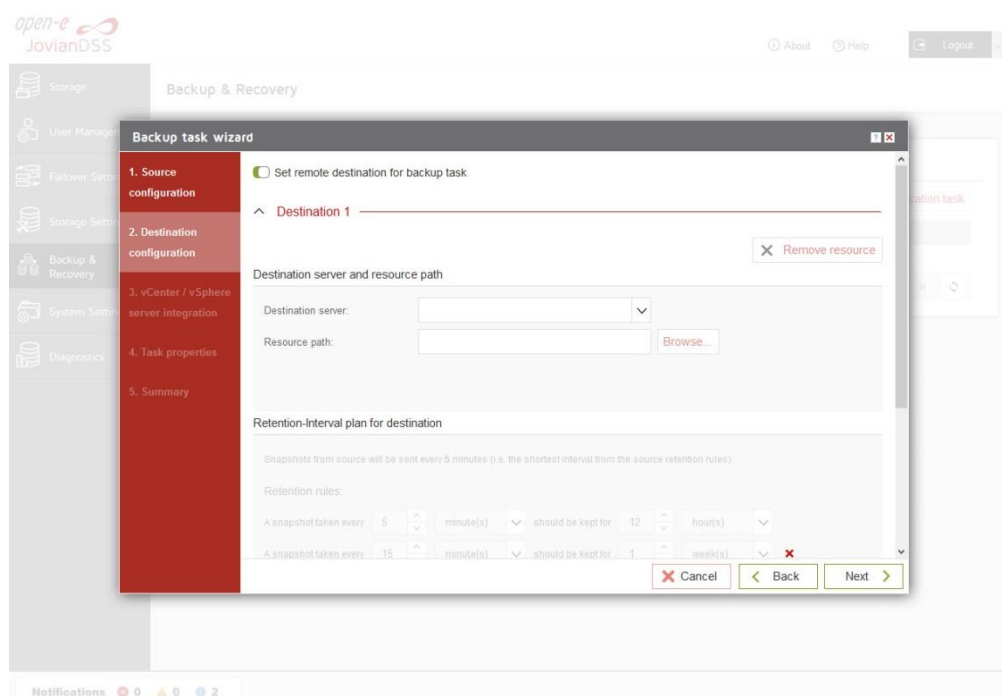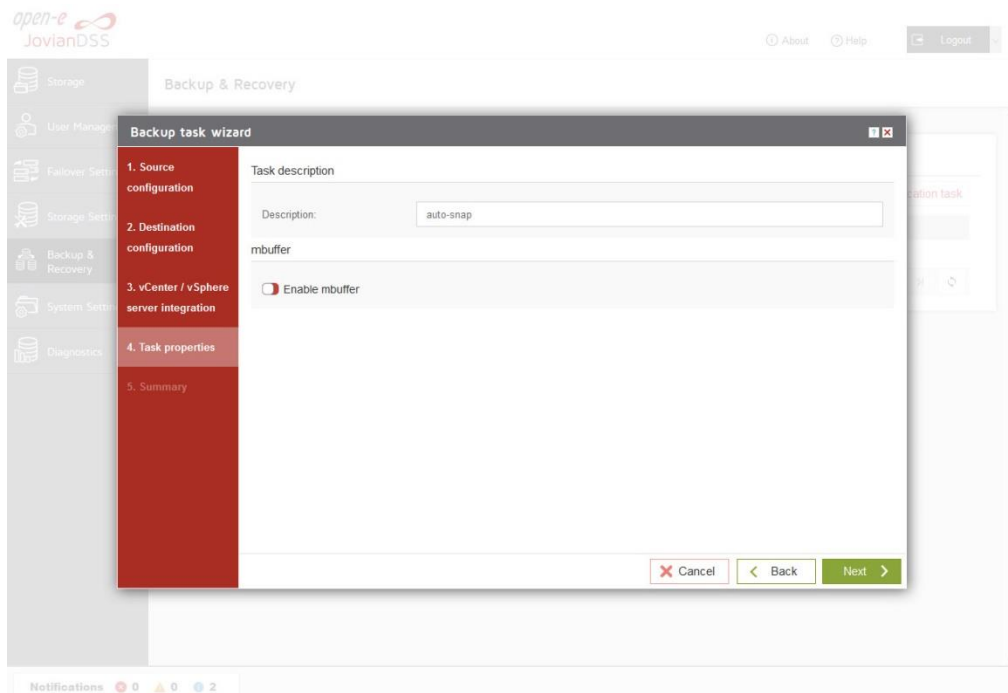
- Next, please click on "Next" button.

- In "vCenter / vSphere server integration" please click on "Next" button
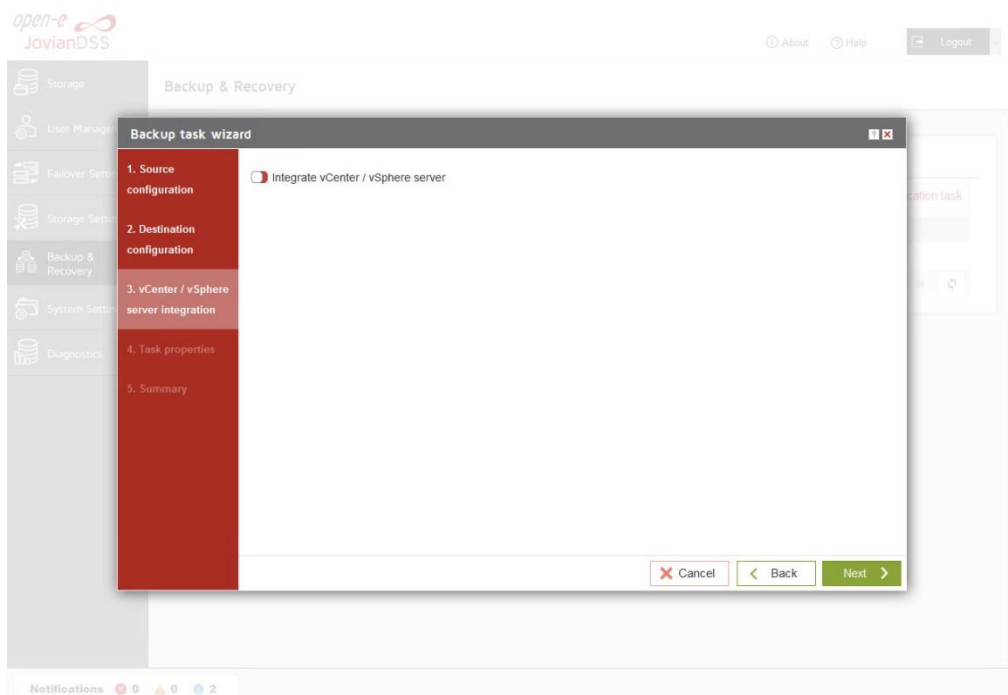
- In "Task properties" please enter task description, and click on "Next" button.



- Next, in "Summary" please click on the "Add" button
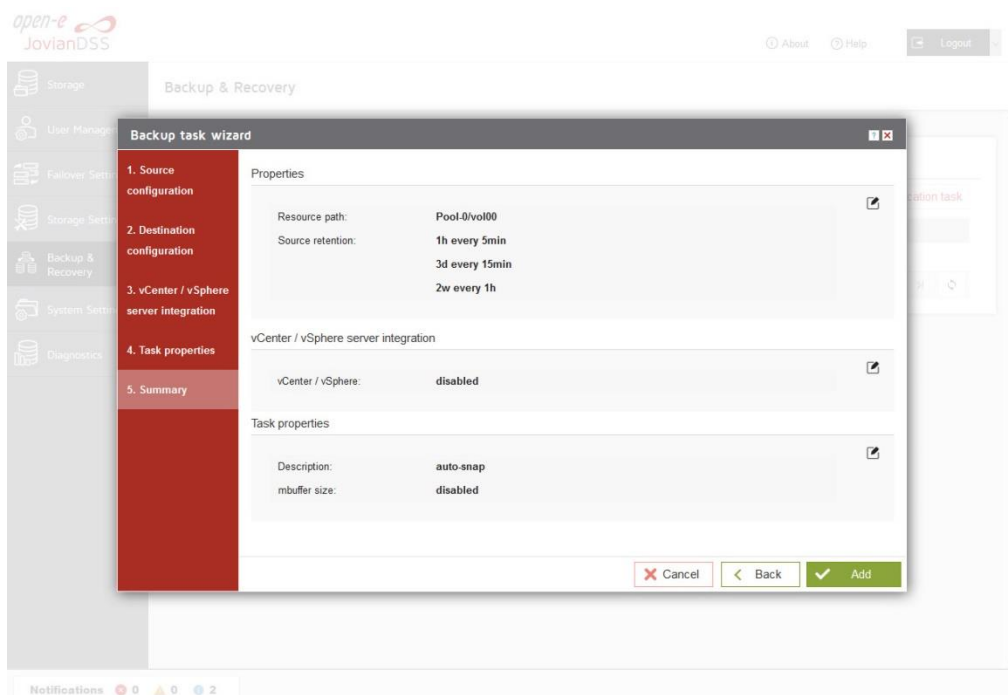
- After completion of the "Backup task wizard" return to the "Backup & Recovery". Below you will see the "Task" you are able to see that is "Enabled".
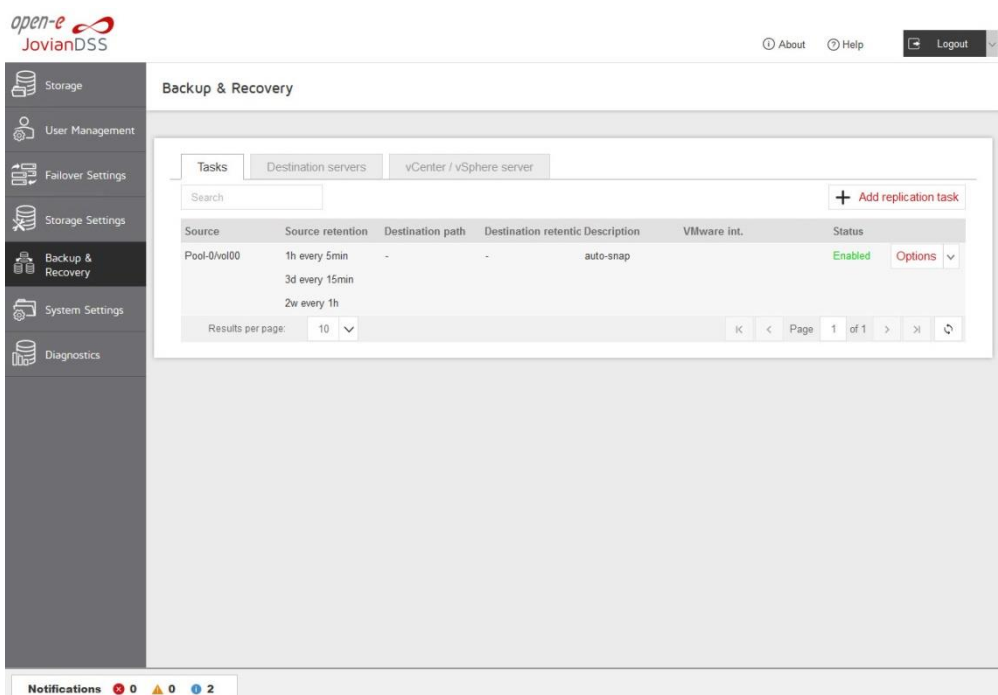

- Next, go to the "Storage" menu. Now auto-snapshots are created accordingly to a provided retention-interval plan and can be viewed in pool-menu in "Snapshots" tab.
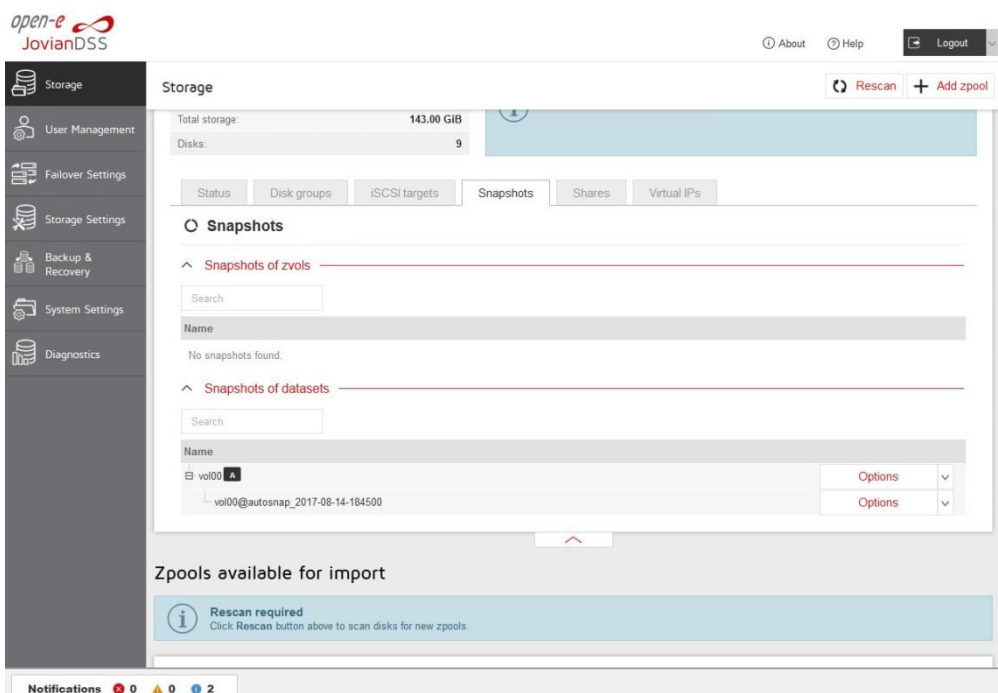
- In the event of a file being renamed or deleted, you can view the previous version of the containing folder. Just right-click on some white space in the folder and select the "Properties" option. You can also right-click on the folder itself and select the "Properties" option as shown on the screenshot below.
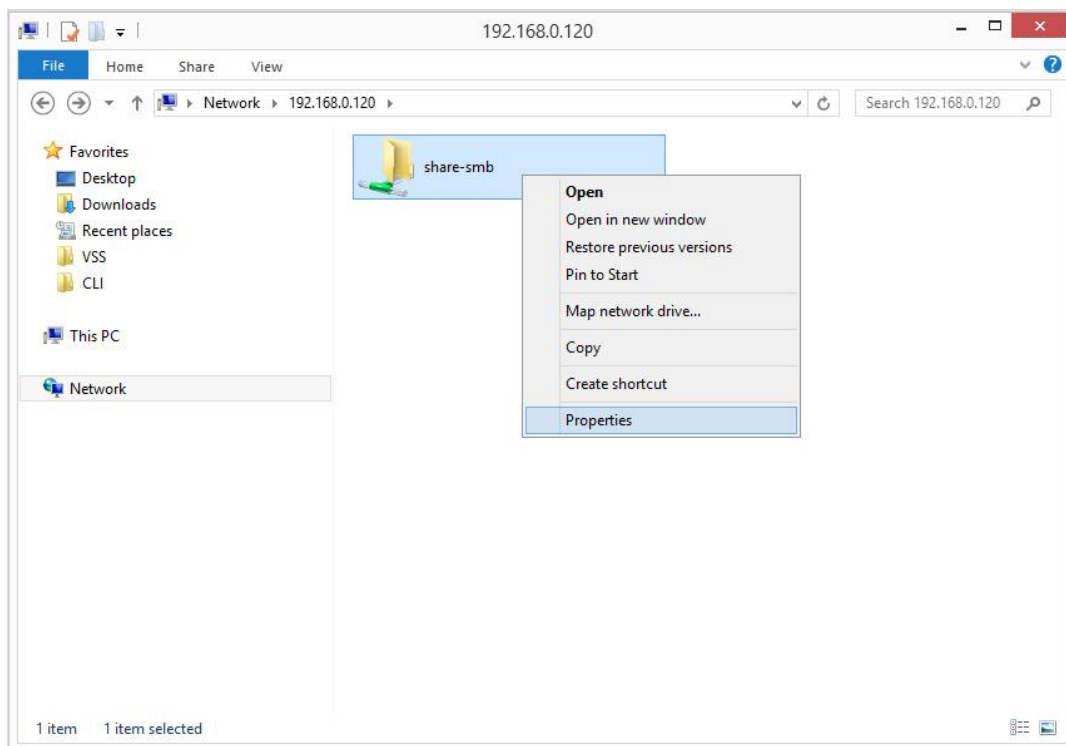
- In the "Previous Versions" tab, all auto-snapshots are listed.
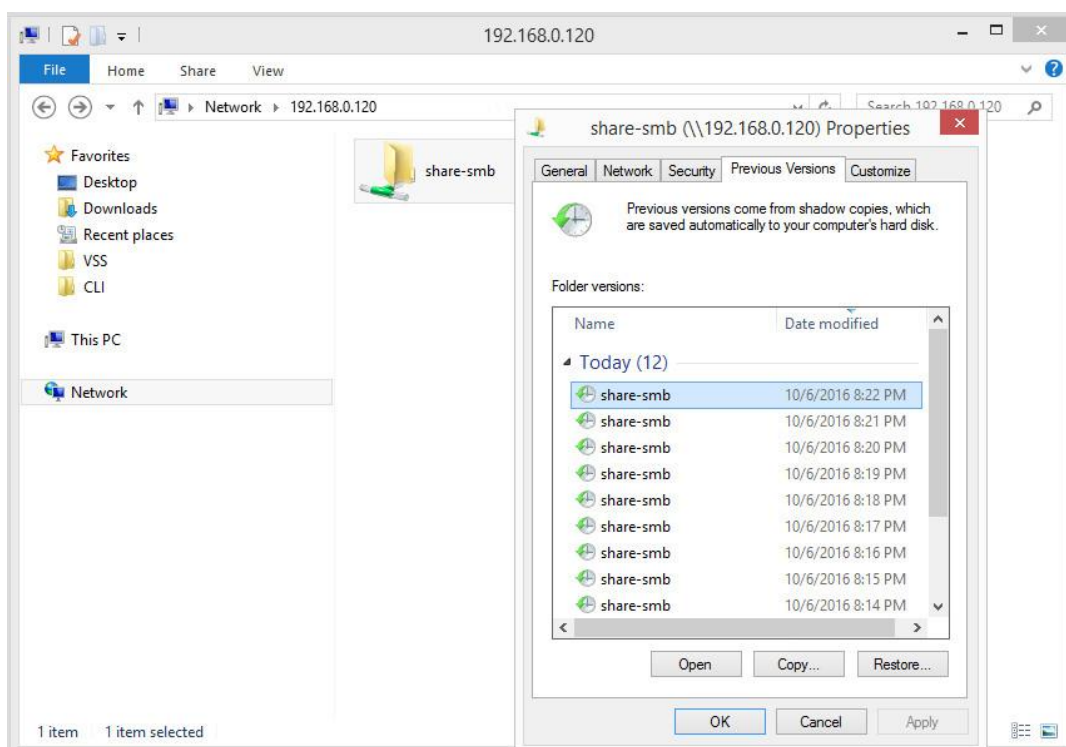
- By double-clicking on a folder in the list, it will show the contents of the folder at the time the snapshot was made.
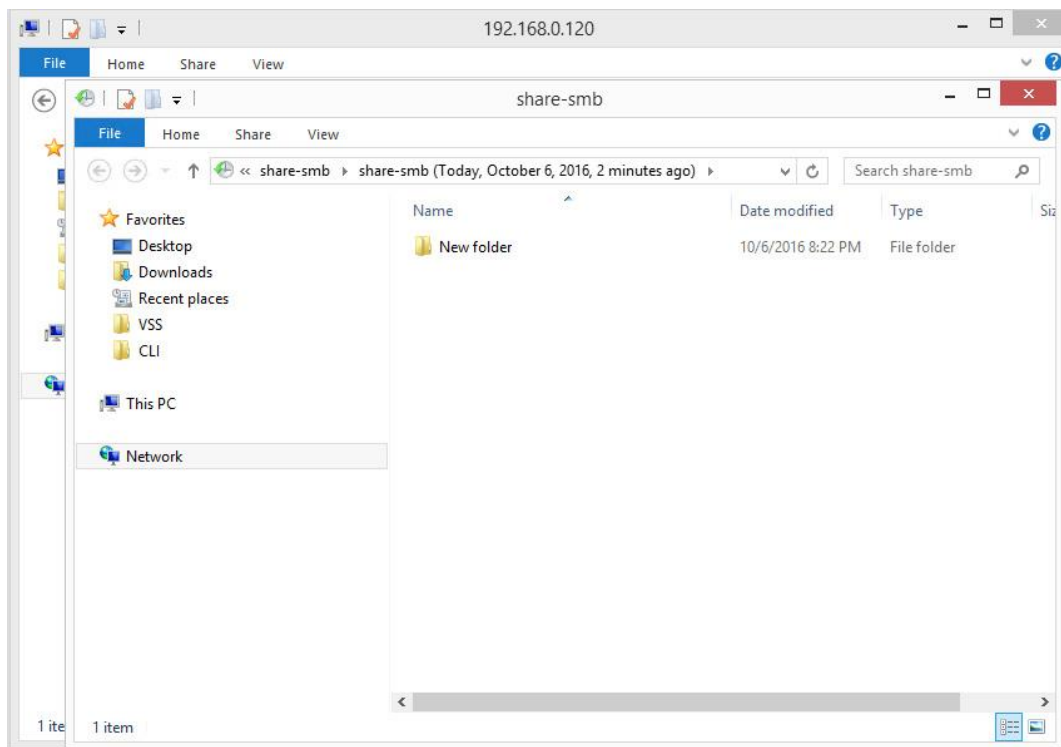
3.10. Creating NFS shares

- In the Pool menu select "Shares" tab. Click on the "Add dataset" button in order to create new NAS-volume.

- In the "Add new dataset" window enter the dataset name and click on "Apply" button.

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- Next, select the created dataset and click on the "Add share" button. Enter the share name. Optionally you can enter the subdirectory name in the dataset. If the subdirectory is not entered the share will be pointed directly to the dataset. In order create share click "Next" and confirm this action by clicking the "Yes" button.
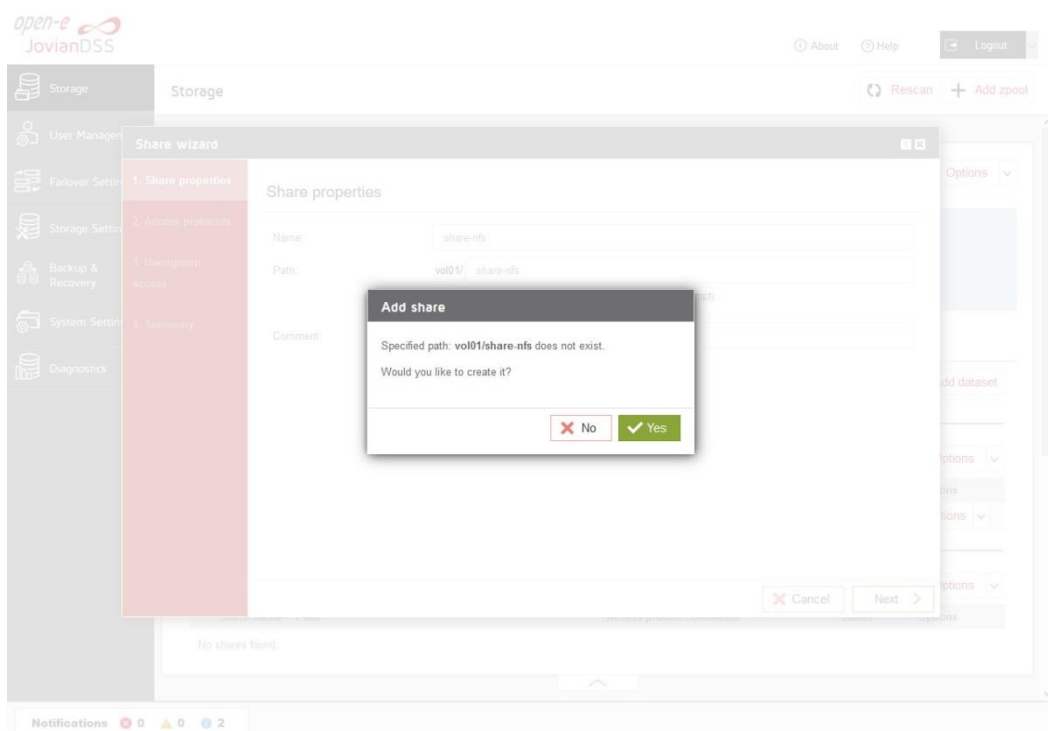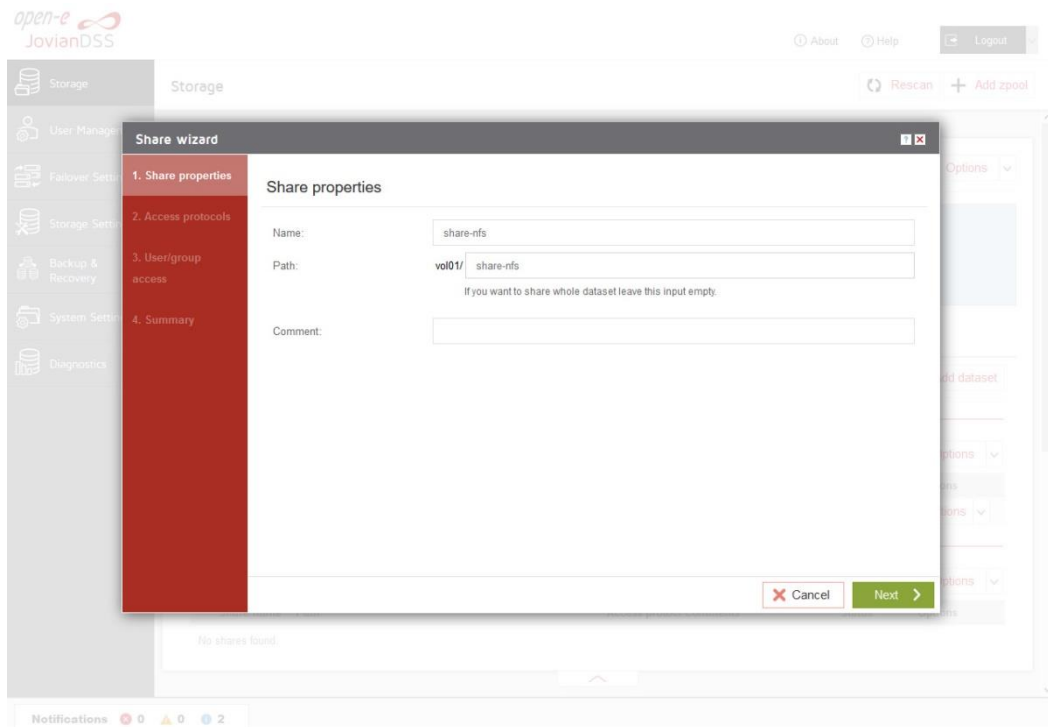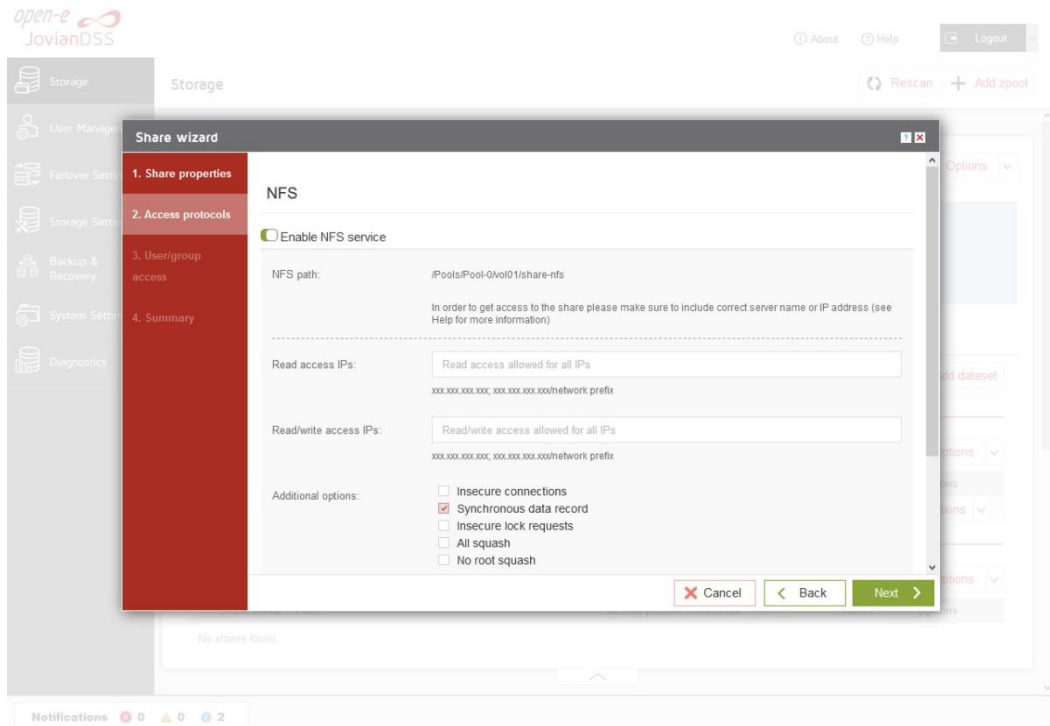
- In the "Access protocols" step, click on "Enable NFS service" confirm this action by clicking the "Yes" button and continue with "Next" button.
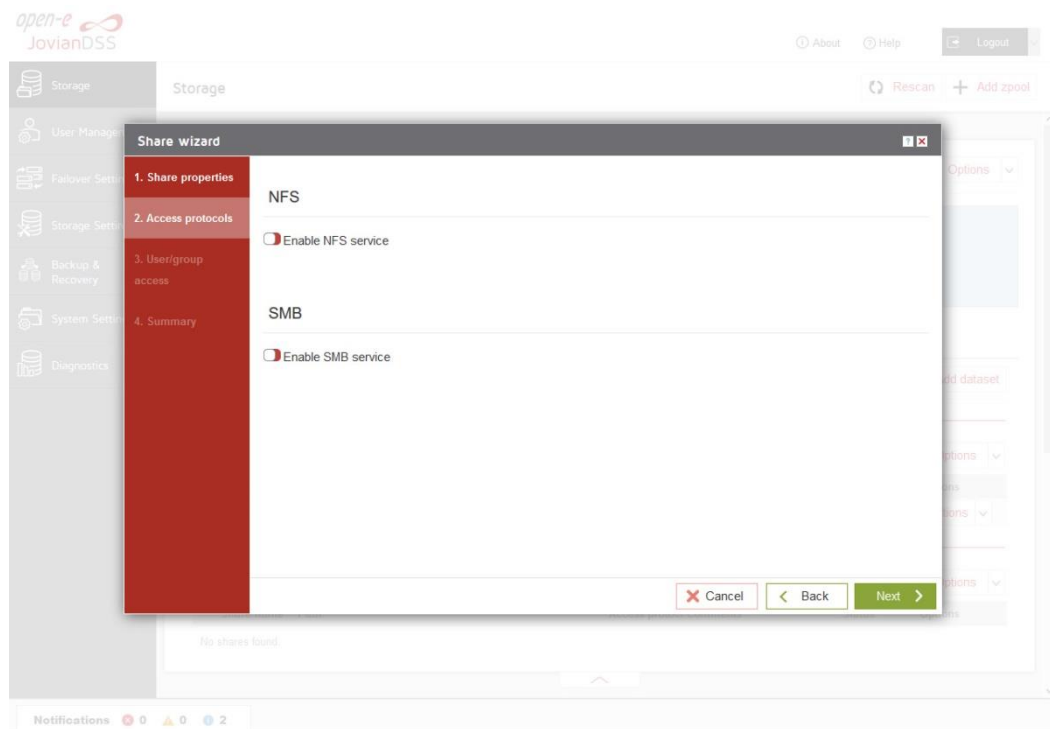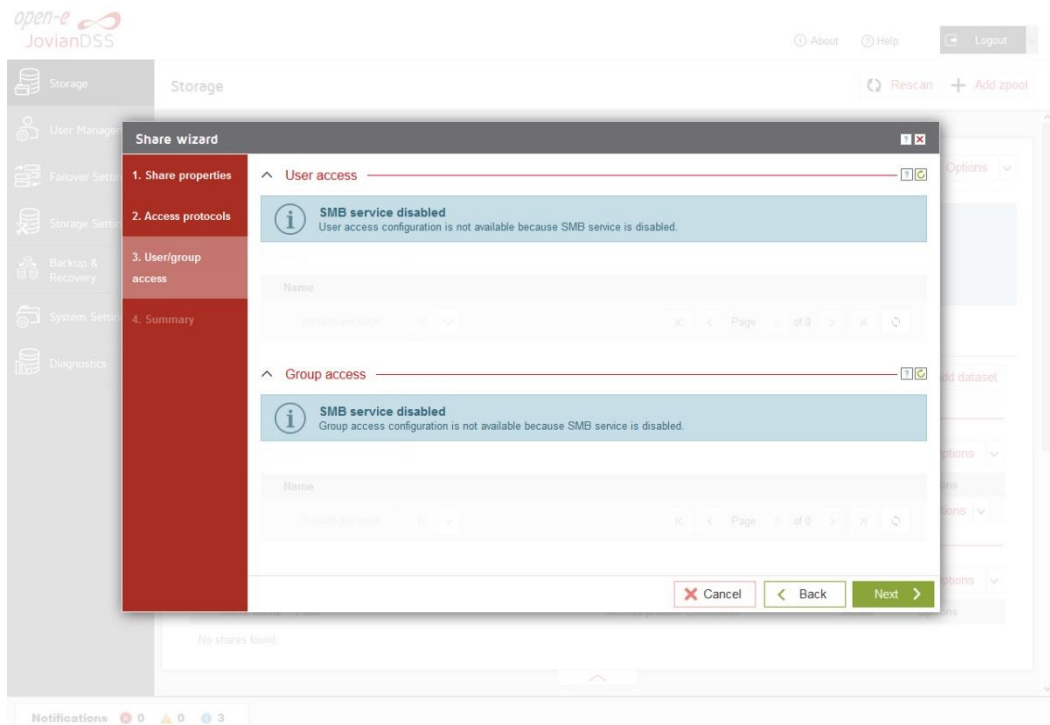

- Confirm this action by clicking the "Yes" button and continue with "Next" button.
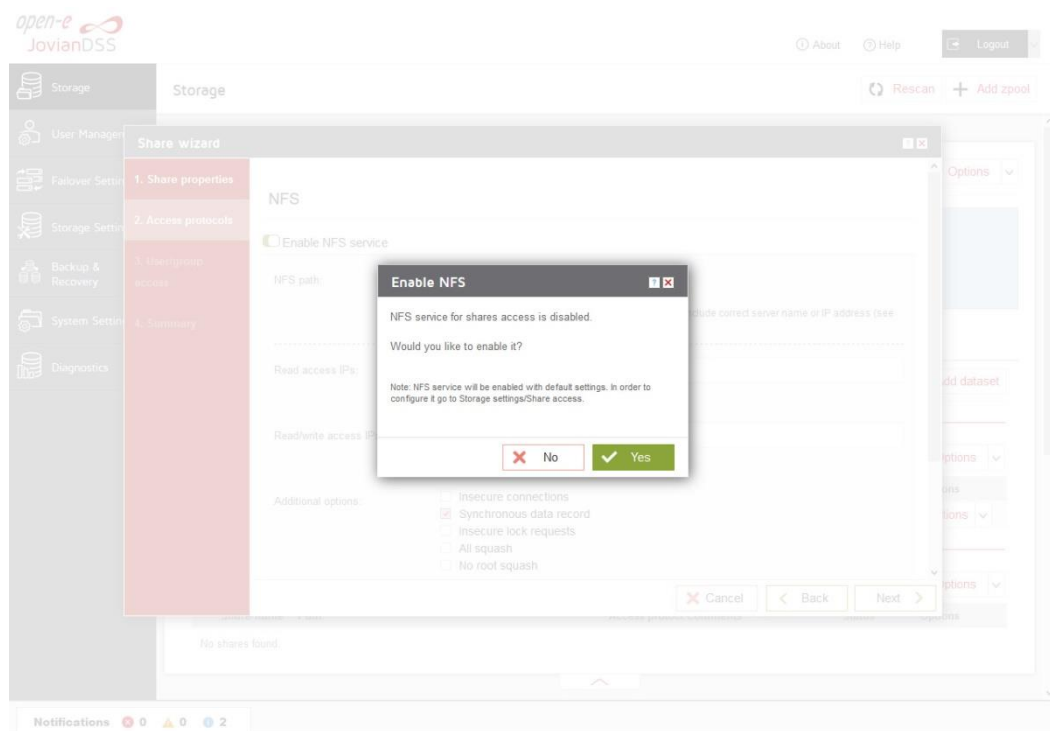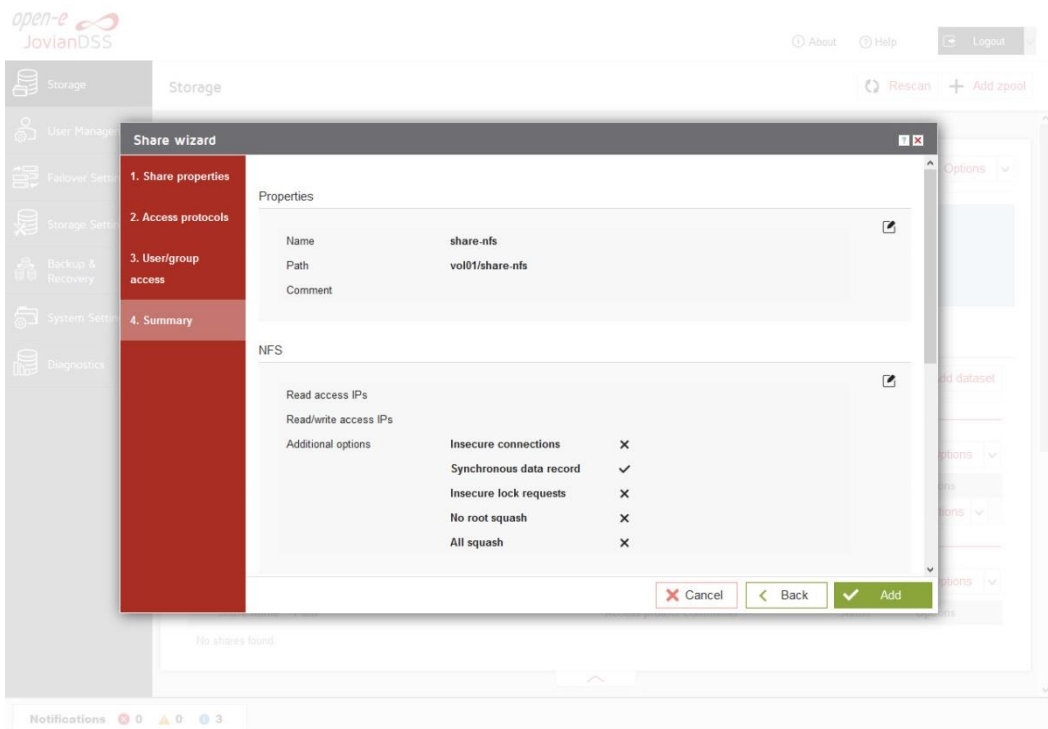
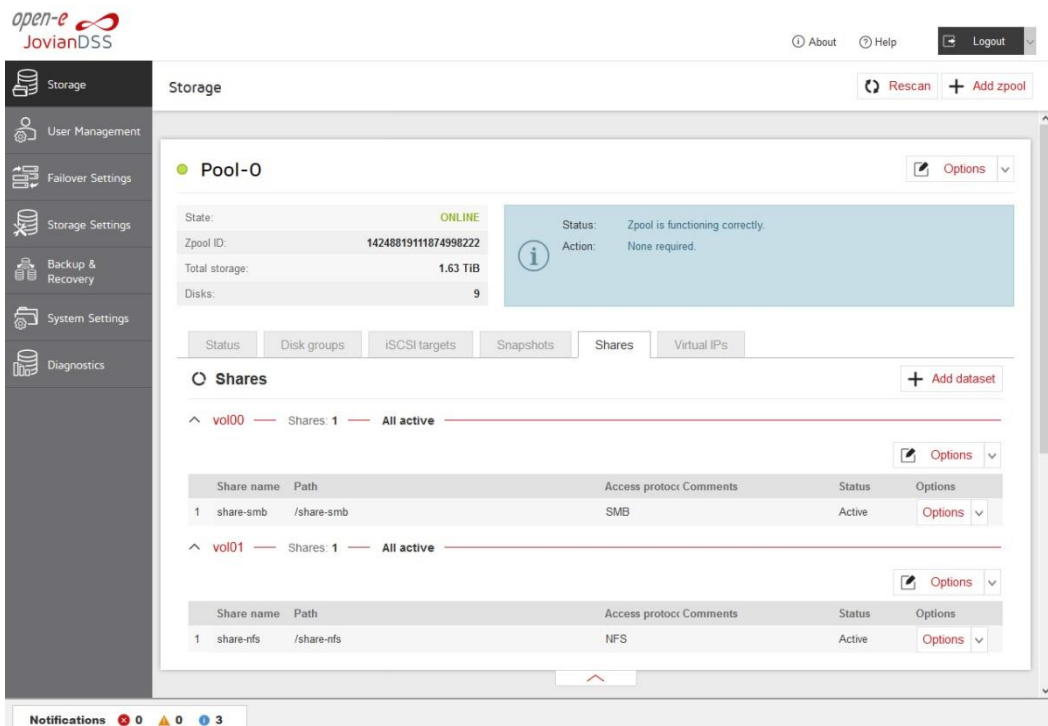- In the "Users/groups access" step, continue with "Next" button.

- In the "Summary" step, to complete click the "Add" button. Now the NFS share is ready to mount.

- In order to change the NFS share settings, click on the share "Options" drop-down menu. In order to change the dataset setting, click on the "Edit dataset" in dataset "Options" drop-down menu.

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