open-e

How-To Guide

Cloud Data Protection Service by MSP

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The Cloud Data Protection Service is a solution for MSPs, System Builders and suppliers of MSPs. It is aimed at any kind of SMB and SME customers, and allowing them to take full advantage of copying data to private clouds and retrieving them when it's required – without dedicated and costly IT staff.

The concept is simple: The MSP deploys a set of powerful servers powered by Open-E DSS V7 Data Storage Software as a cluster with an additional failover feature pack. This ensures that in case of a hardware failure one node can take over the tasks of the other without interruption. Single servers installed on the customers' premises securely transmit data to the MSP cluster on a regular basis (e.g. hourly) where it is continuously saved and backed up. Customers also have the option to configure additional local backups which adds another layer of security and convenience.

For data recovery, the Cloud Data Protection Service offers customers several options as well. If local backups have been configured, MSP engineers can assist in recovering the files remotely by using an encrypted connection. If anything prevents that from happening, the MSP can also restore the lost files by sending copies via the internet or – in case of a hardware failure or a slow internet connection – the data can be transported physically, on a disk or a replacement server, to the customer's location.

With this how-to guide we would like to assist you with the initial setup and configuration of the cluster with Active-Active NFS Failover.

1.1. Terminology used in the document

CDPS (Cloud Data Protection Service)
Cloud Data Protection Service offers MSP partners the opportunity to keep their customer's data safe in the fastest, most reliable and cost-effective way.

MSP (Managed Service Provider)
An Open-E Partner company which provides Customers with Cloud Data Protection Service.

MSP nodes
MSP's data servers which store data backups from Customer nodes.

VPN/Monitoring node
MSP's server running VPN software responsible for creating VPN tunel, and OMD software responsible for monitoring services on MSP and Customer nodes.

Customer node
Customer's server from which data is backed up to MSP nodes.

VPN
A virtual private network in a public network used for encrypted connection and data transmission between Customer nodes and MSP nodes.

OpenVPN
Virtual private network software that facilitates the encrypted connection and secure data transfer between Customer nodes and MSP nodes.

VIP (Virtual IP address)
An IP address that does not correspond to physical network interface, thus it eliminates a host's dependency upon individual network interfaces.

Host binding
Functionality that allows connecting two servers to exchange data between each other. In Cloud Data Protection Service it is used for volume replication between MSP nodes.

Failover
Functionality which allows a secondary server to take over the work of the primary one as soon as primary becomes unavailable through either failure or a downtime.

Auxiliary paths
Interfaces on which the failover sends a UDP unicast traffic. The auxiliary path will be used to send periodic „heartbeat" packages to the remote node with the interval equal to keep-alive time, which is set in Failover trigger policy section.

2. Solution diagram / network topology

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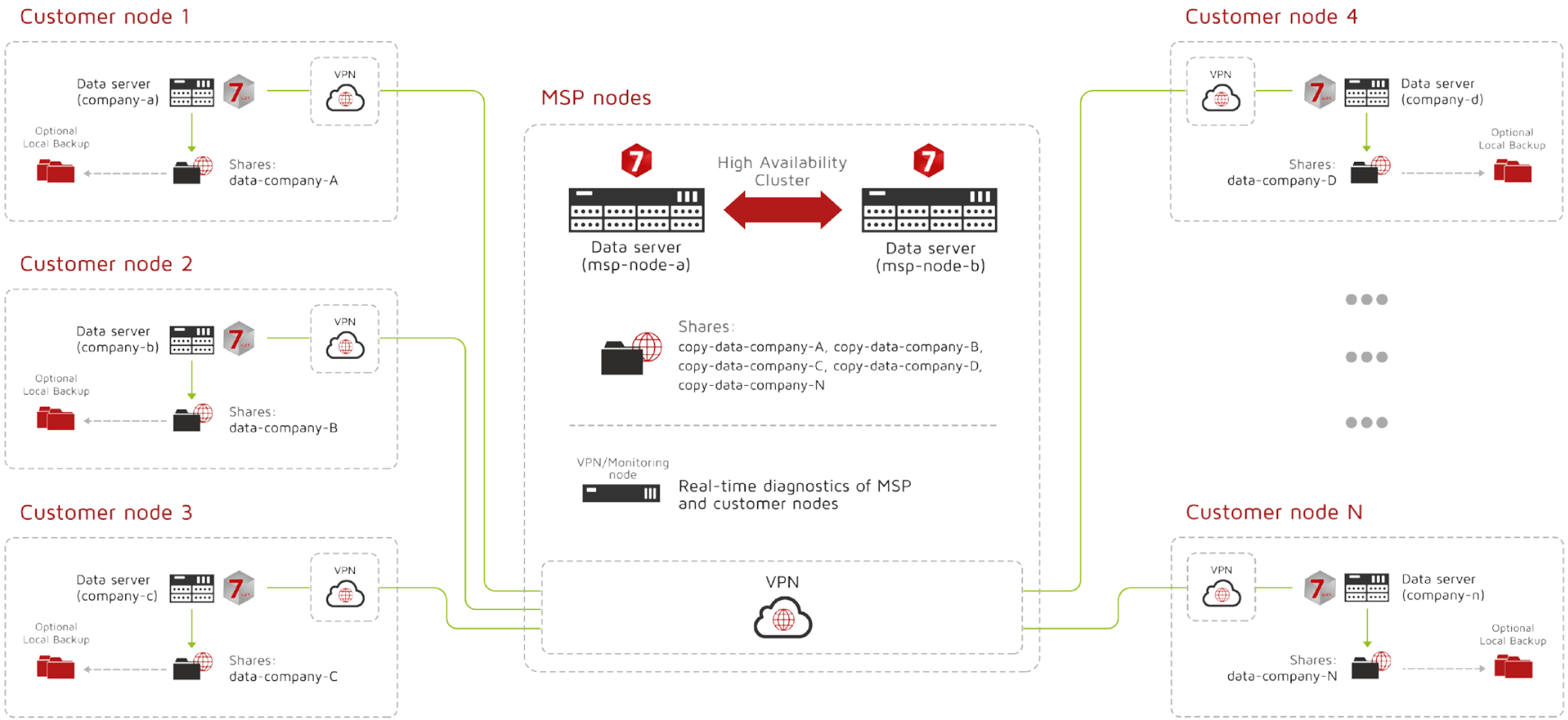

3. Network configuration scheme

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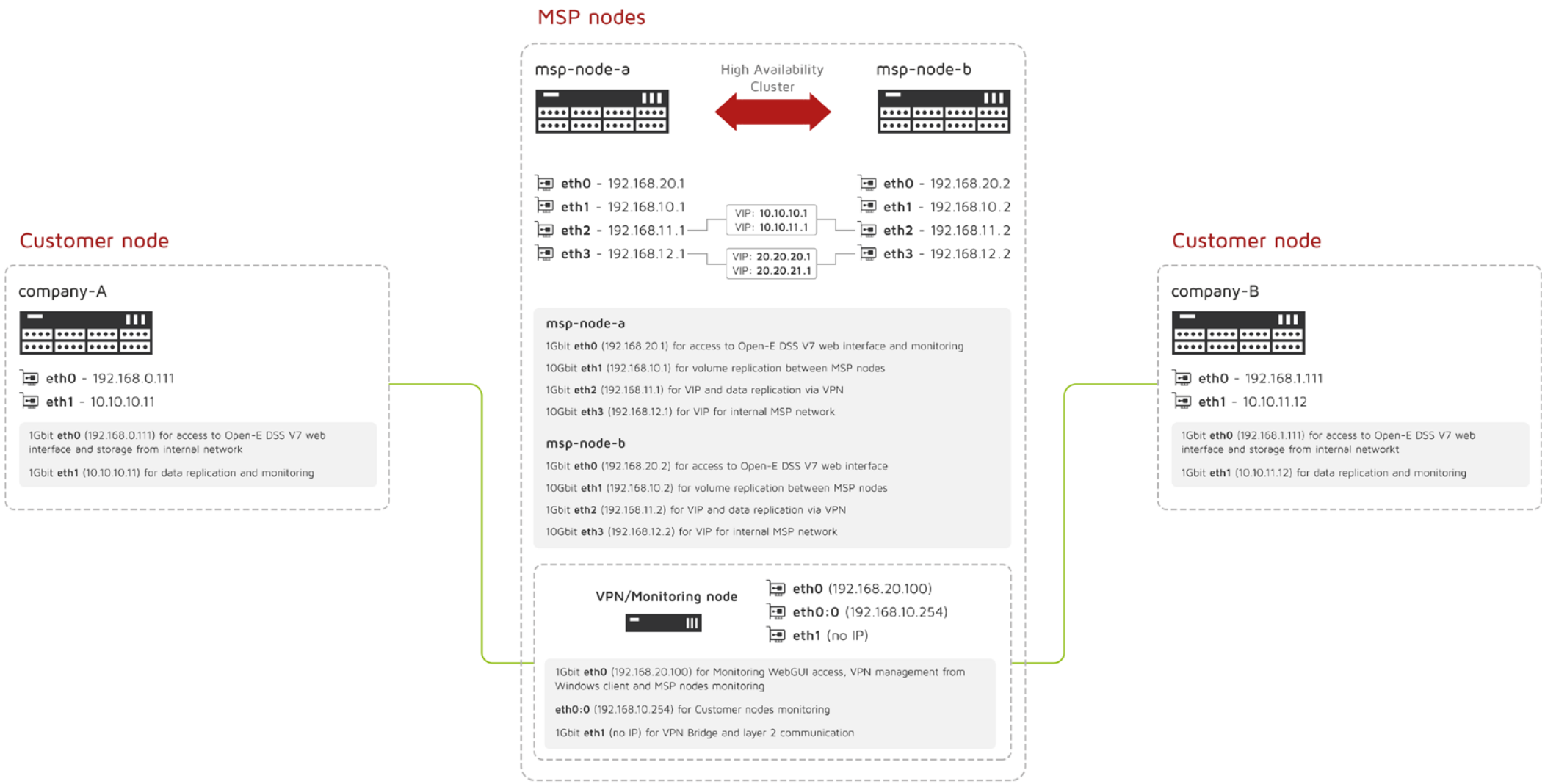


4. Minimum hardware requirements

4. Minimum hardware requirements

4.1. MSP nodes

Hardware specification	
Processor	Intel® Xeon® processors of the E5-2600 v2 family or better
RAM	16GB DDR3 base memory and 350MB additionally for each Customer node
Hard disk drive	2x RAID 5 (alternatively, RAID 6 or RAID 10) disk arrays, 8 hard drives each
Ethernet	2 x 10GbE 2 x 1GbE

Note: Although running MSP Server with minimum hardware requirements allow to fully utilize all CDPS functionalities, we recommend **Fujitsu PRIMERGY SX350 S8** which is tested by Open-E and proved to be highly reliable and efficient when used for CDPS service.

4.2. Customer node

Hardware specification	
Processor	Intel® Core™ i3-4330 CPU family or better
RAM	8GB DDR3 1600 MHz
Hard disk drive	RAID 5 disk array with Open-E DSS V7 installed or software RAID with Open-E DSS V7 installed on dedicated HDD, SSD or SATA DOM
RAID Controller	RAID Controller 4i (optionally)
Ethernet	1 x 10GbE (Optionally, only for systems with hardware RAID controller) 2 x 1GbE

Note: Although running MSP Server with minimum hardware requirements allow to fully utilize all CDPS functionalities, we recommend **Fujitsu PRIMERGY TX1310M1** which is tested by Open-E and proved to be highly reliable and efficient when used for CDPS service.

4.3. VPN/Monitoring node

Server	
PC running Ubuntu 14.04 LTS with the following hardware	
Hardware specification	
Processor	6-core with Hyper-Threading 3.0 GHz or better
RAM	16GB with ECC support
Hard disk drive	2-disk RAID 1 array
Ethernet	2 x 1GbE network interface

Note: Although our recommendations don't indicate a specific server or vendor, please make sure your monitoring server is able to work 24/7, and is reliable enough to handle that kind of load.

4.4. Network / routers

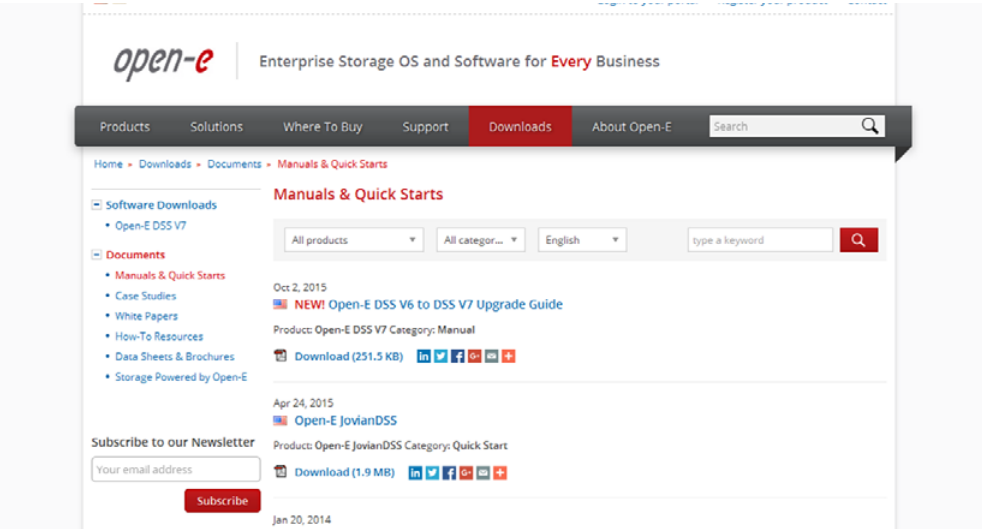
In this manual **ASUS RT-AC68U** (firmware 3.0.0.4.378_9135) is used to set up an encrypted connection between MSP and Customer nodes. Although it is not required, we recommend to use a router of similar specification with build-in OpenVPN support.

5. Configuration how-to’s

5. Configuration how-to's

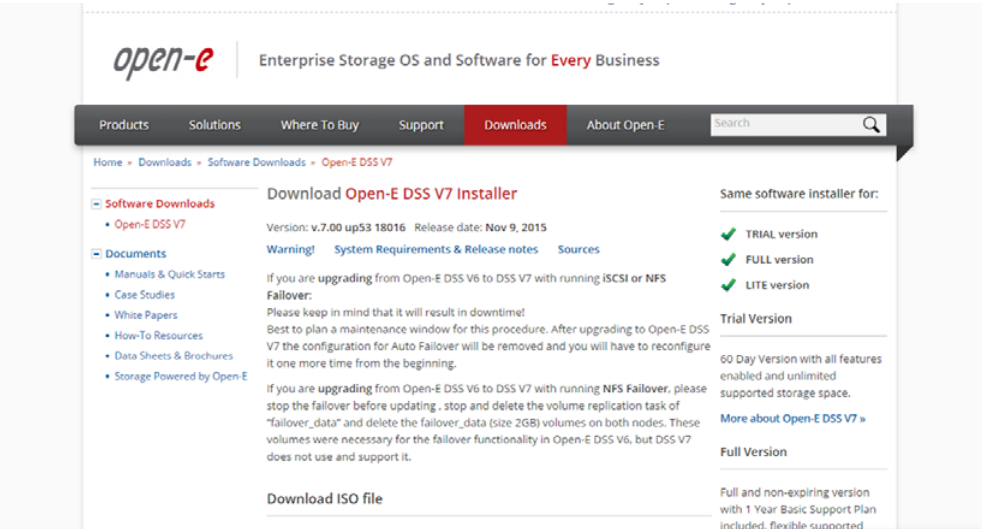
In this chapter, you will learn how to configure Cloud Data Protection Service by MSP, according to Solution diagram introduced in Chapter 2 of this manual. You will be given instructions on how to set up:

- MSP nodes
- Customer node
- VPN/Monitoring node
- Encrypted connection between MSP nodes and Customer node



Please note that each MSP node as well as Customer node is running on Open-E DSS V7. As this manual will not guide you through DSS V7 installation process, we encourage you to follow:

- **DSS V7 Manual** available on http://www.open-e.com/download/manuals-and-quickstarts/?preview=manualopen-e-dss-v7-en
- **DSS V7 Quick Start** available on http://www.open-e.com/download/manuals-and-quickstarts/?preview=open-e-dss-v7



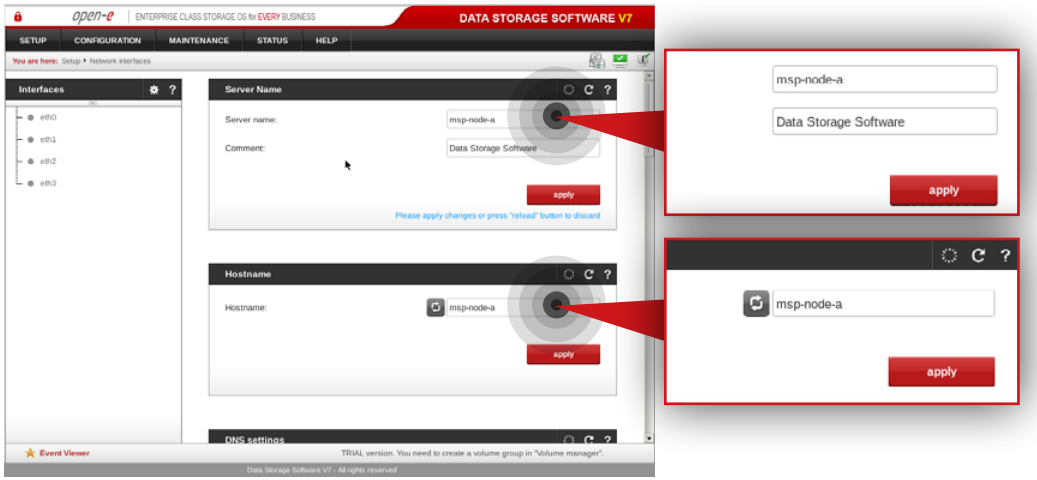
It is highly recommended to install the latest version of Open-E DSS V7 software which can be found on http://www.open-e.com/download/open-e-data-storage-software-v7/

Prerequisites

Please complete the following prerequisites.

- Two servers meet the hardware requirements for MSP nodes introduced in Chapter **4 – Minimum hardware requirements**
- Open-E DSS V7 up54 build 18432 installed on both servers

If all the prerequisites have been met, you're now ready to start MSP nodes configuration.

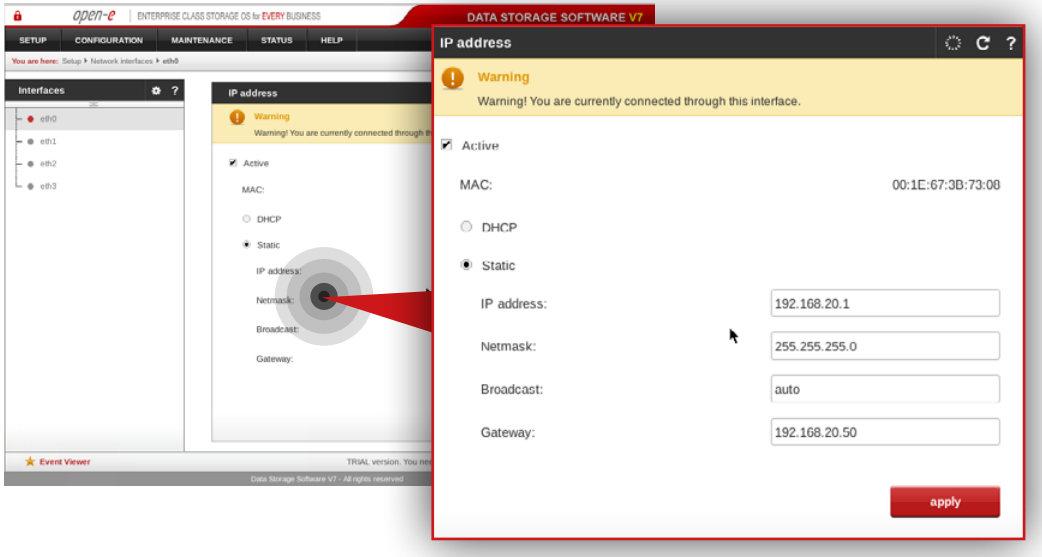


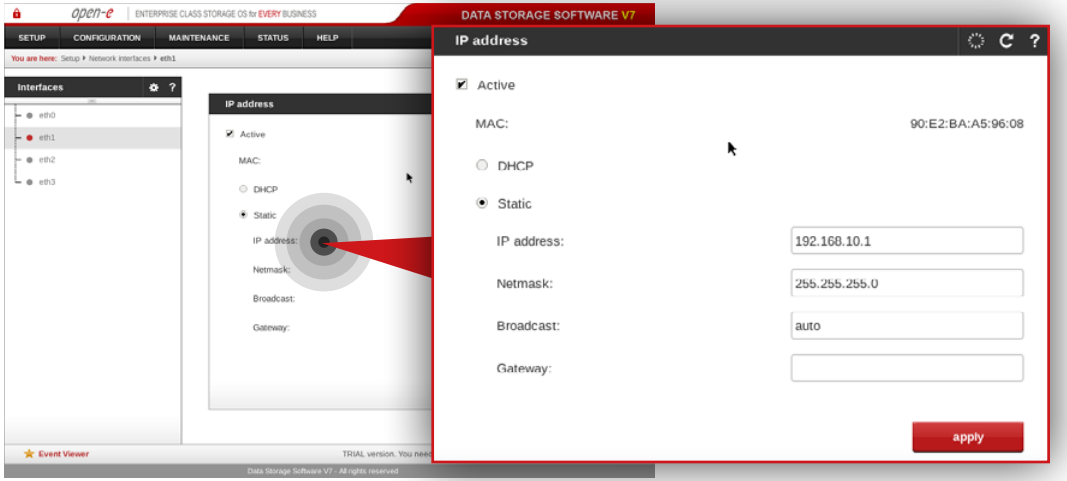
5.2.1. MSP first node configuration

Step 1.

Go to **Setup » Network interfaces** and change the server name and hostname to **msp-node-a**. Click **apply** to confirm the changes.

Note: Changing the hostname requires a reboot of the system.





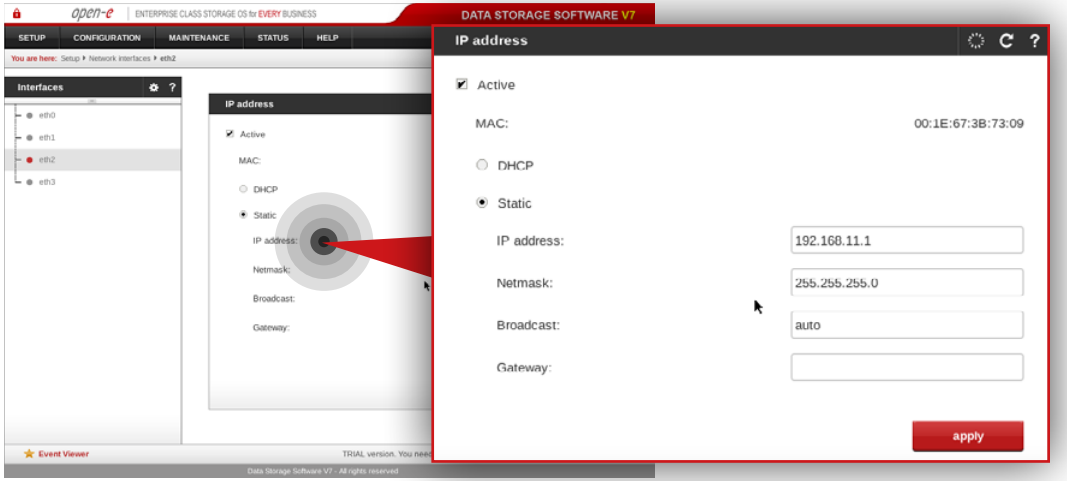
Step 2.

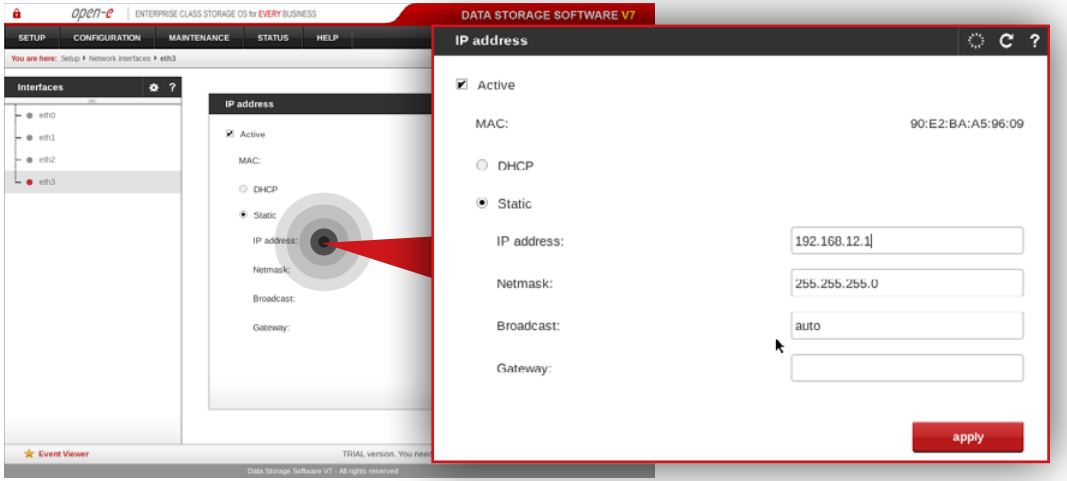
Go to **Setup » Network interfaces** and configure Ethernet ports. Click **apply** to confirm the changes.

In this example **we recommend** configuring four Ethernet ports as follow:

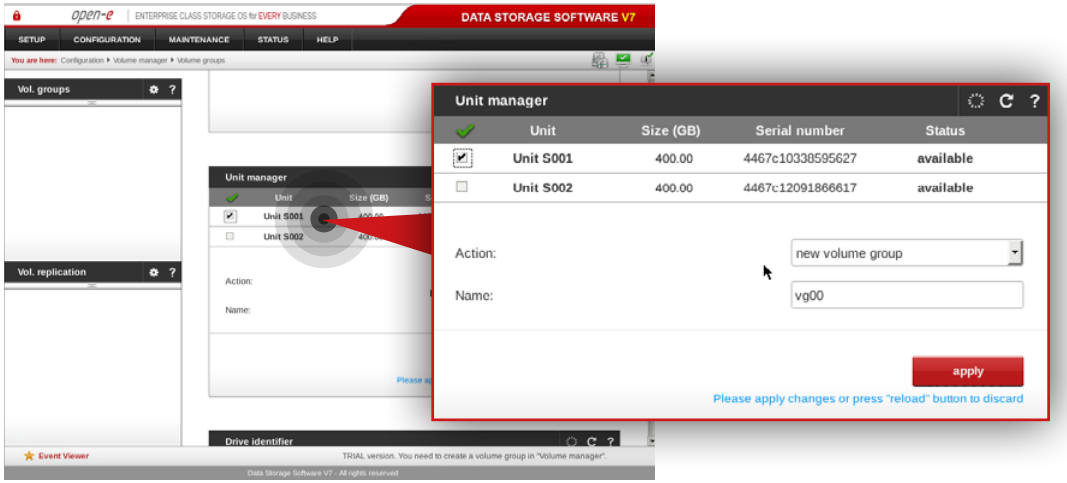
- 1Gbit **eth0** (192.168.20.1) for access to Open-E DSS V7 web interface
- 10Gbit **eth1** (192.168.10.1) for volume replication between MSP nodes
- 1Gbit **eth2** (192.168.11.1) for VIP and data replication via VPN
- 10Gbit **eth3** (192.168.12.1) for VIP for internal MSP network

Note: Changing network interface IP address will restart the network configuration on this node.





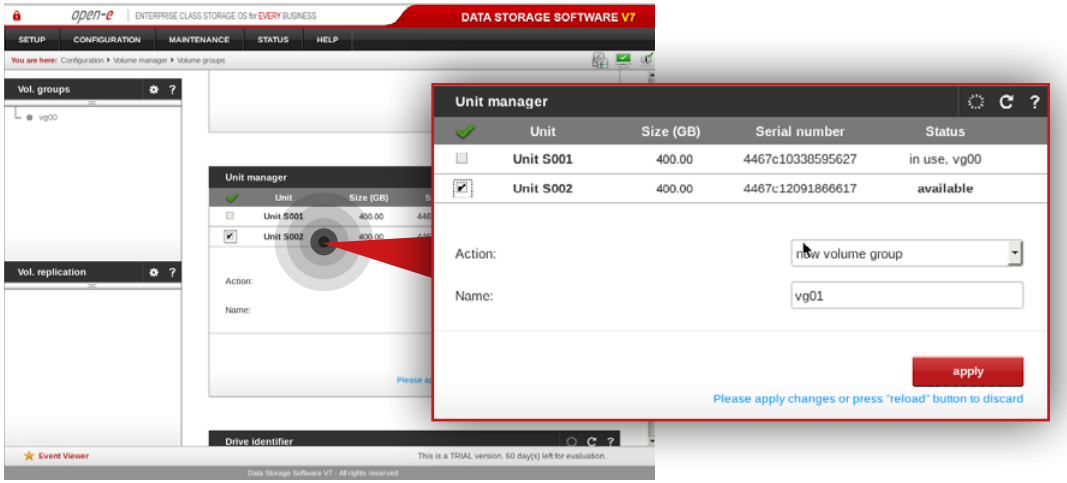
Note: The IP addresses used in this example are for the purpose of this manual only. You should configure your Ethernet ports according to your network topology.



Step 3.

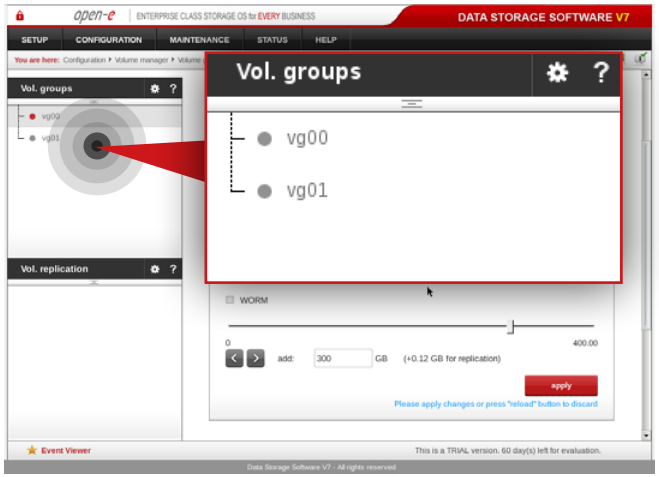
Go to **Configuration » Volume manager » Volume groups**.

a. From the Unit manager, select a disk to create the volume group.
b. Enter a name for the volume group (in this example, the volume name is **vg00**).
c. Click the **apply** button.

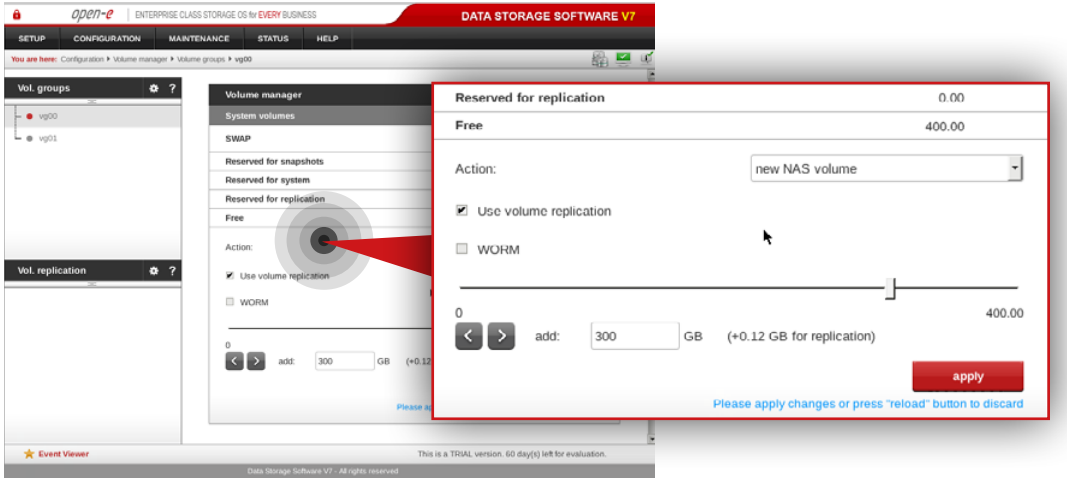


Step 4.

Repeat the previous step in order to create the second volume group (in this example, the volume name is **vg01**).



After volume groups are created you can see them listed in the volume groups menu on the left side.

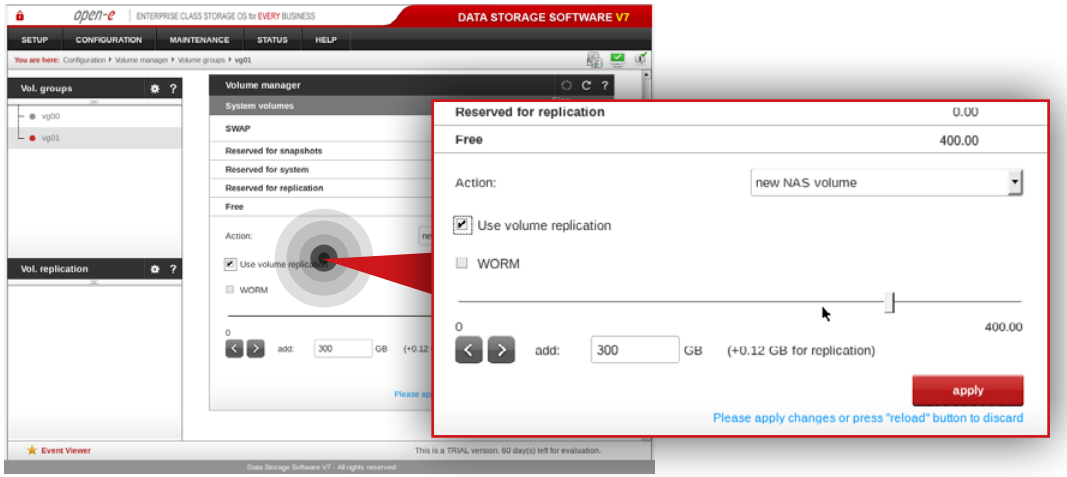


Step 5.

Select **vg00** from the list on the left side. Next, create new NAS volume of size that is appropriate for the data set (in this example, the volume name is **lv0000**).

a. Make sure that **Use volume replication** option is checked.
b. Set a size for the volume.
c. Click **apply** button.

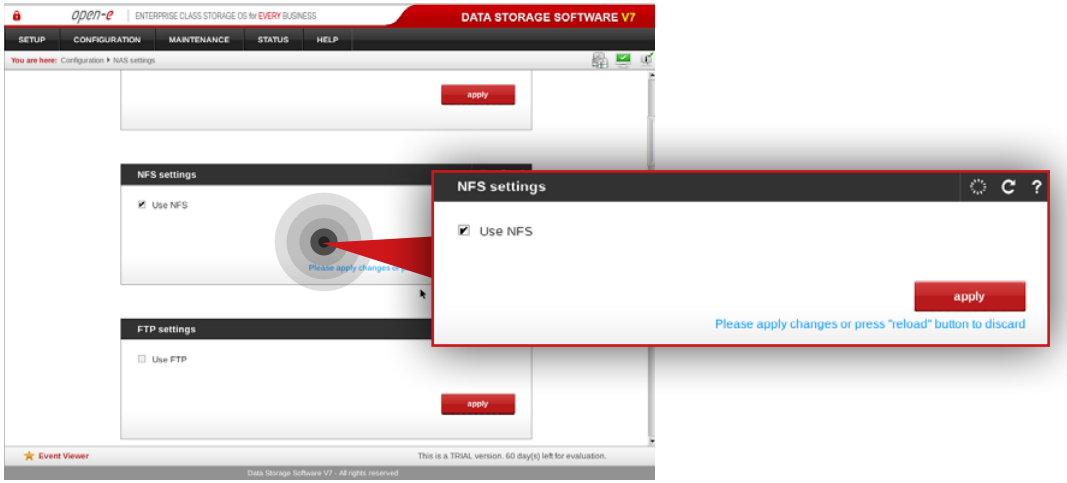
Please note that the size of the volume in this example is for only this manual. Your volumes size should be always tailored to the size of data set.



Step 6.

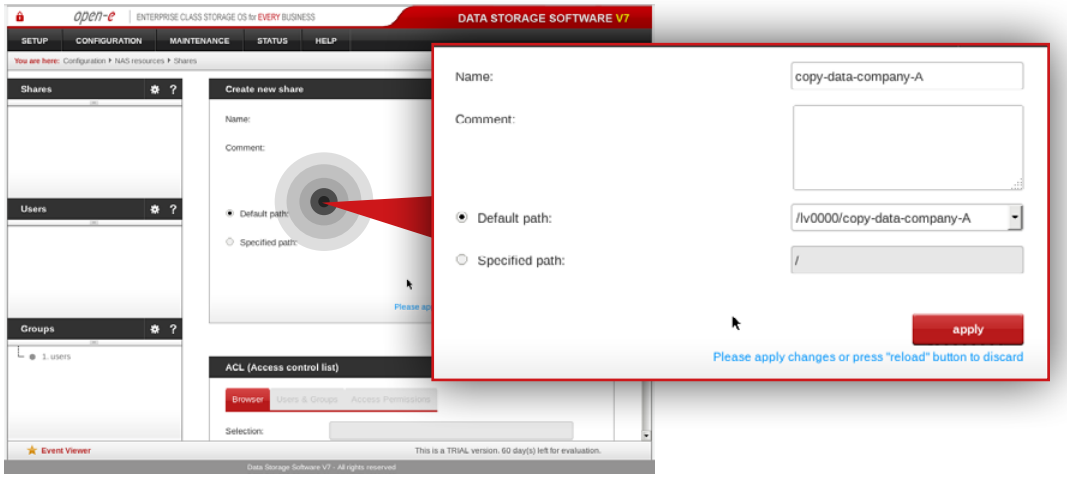
Select **vg01** from the list on the left side. Next, create new NAS volume of size that is appropriate for the data set (in this example, the volume name is **lv0100**).

a. Make sure that **Use Volume replication** option is checked.
b. Set a size for the volume.
c. Click **apply** button.



Step 7.

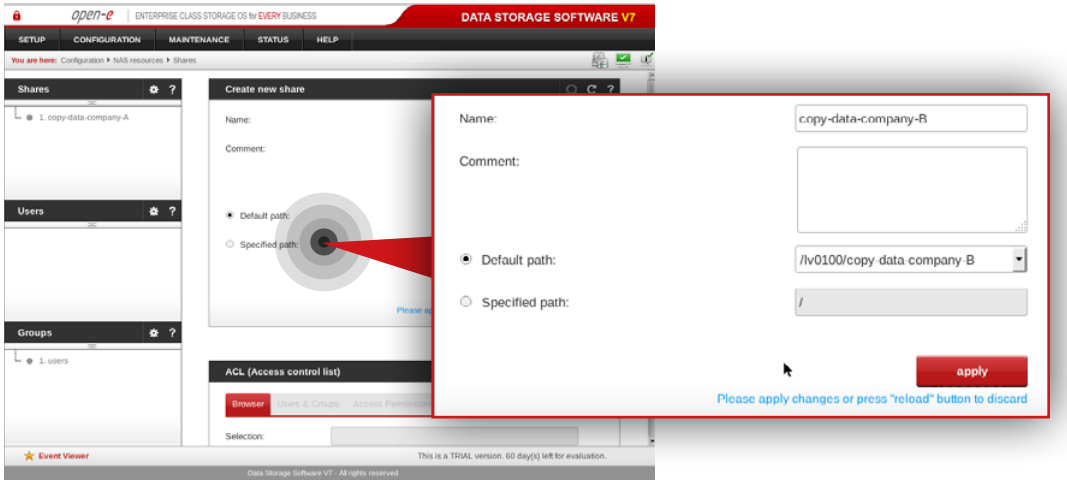
Go to **Configuration » NAS settings** and check **Use NFS** option in NFS settings box. Click **apply** button.



Step 8.

Go to **Configuration » NAS resources » Shares** and create a share for data to be replicated from a Customer node.

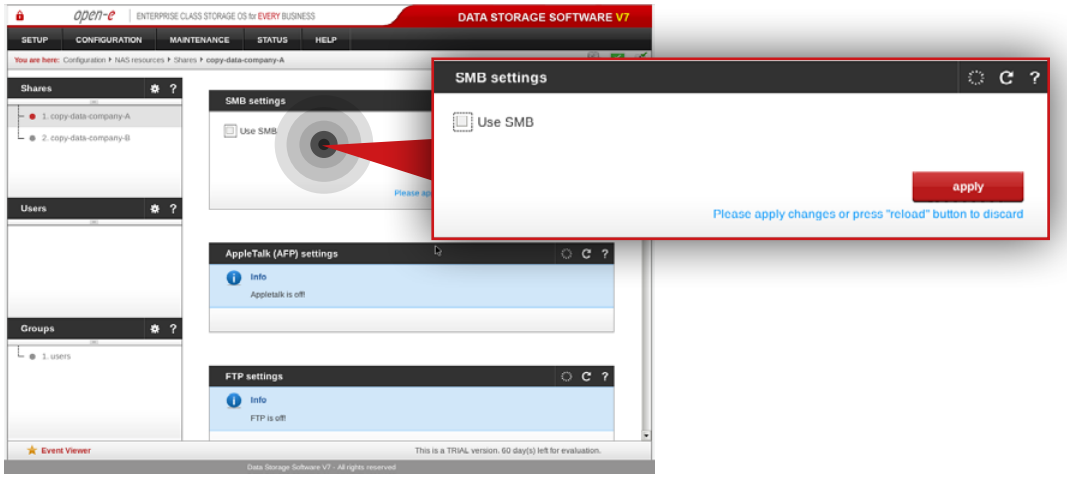
a. Enter a name for the share (in this example, the share name is **copy-data-company-A**).
b. Select **lv0000** as a default path for the share.
c. Click **apply** button.



Step 9.

Create a share for data to be replicated from another Customer node (**Note:** This step is required only in case you have more than one Customer node from which data will be replicated).

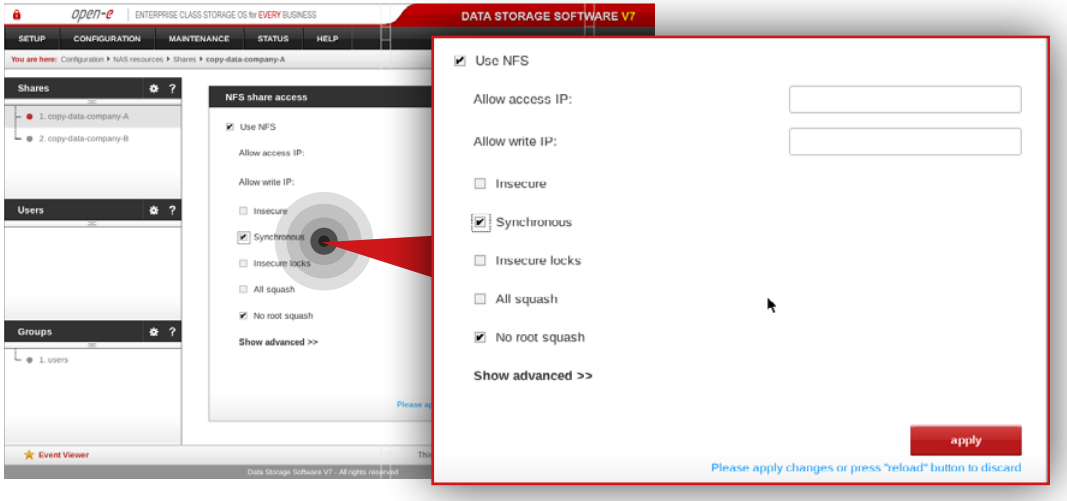
a. Enter a name for the share (in this example, the share name is **copy-data-company-B**).
b. Select **lv0100** as a default path for the share.
c. Click **apply** button.



Step 10.

Select a **copy-data-company-A** share from the list on the left side.

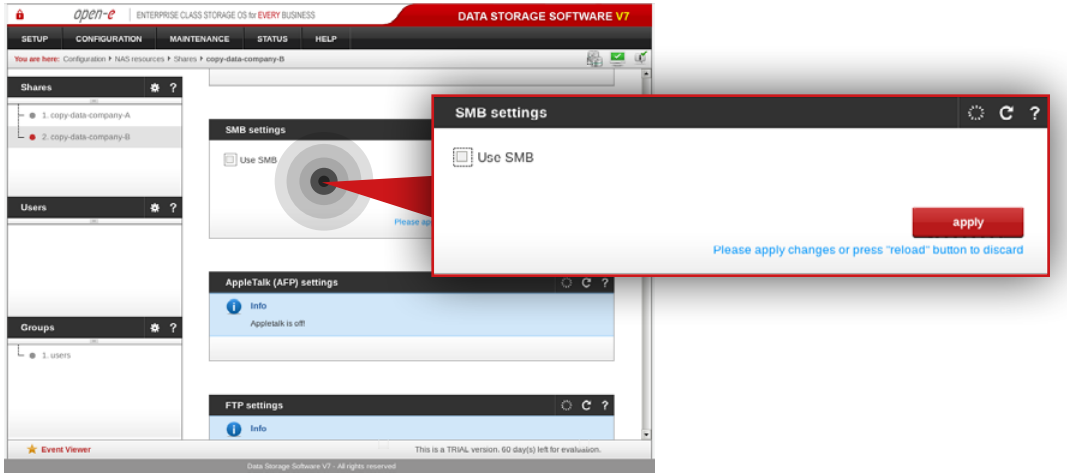
a. Navigate to SMB settings.
b. Uncheck **Use SMB** option.
c. Click **apply** button.



Step 11.

Next, navigate to the NFS share access box.

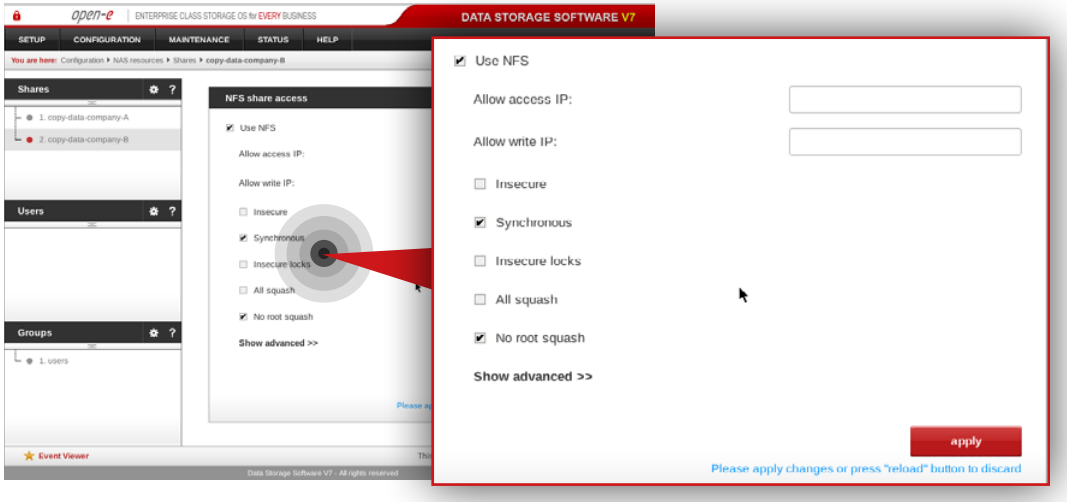
a. Check **Use NFS** option.
b. Make sure **Synchronous** option is checked.
c. Click **apply** button.



Step 12.

Select **copy-data-company-B** from the menu on the left side.

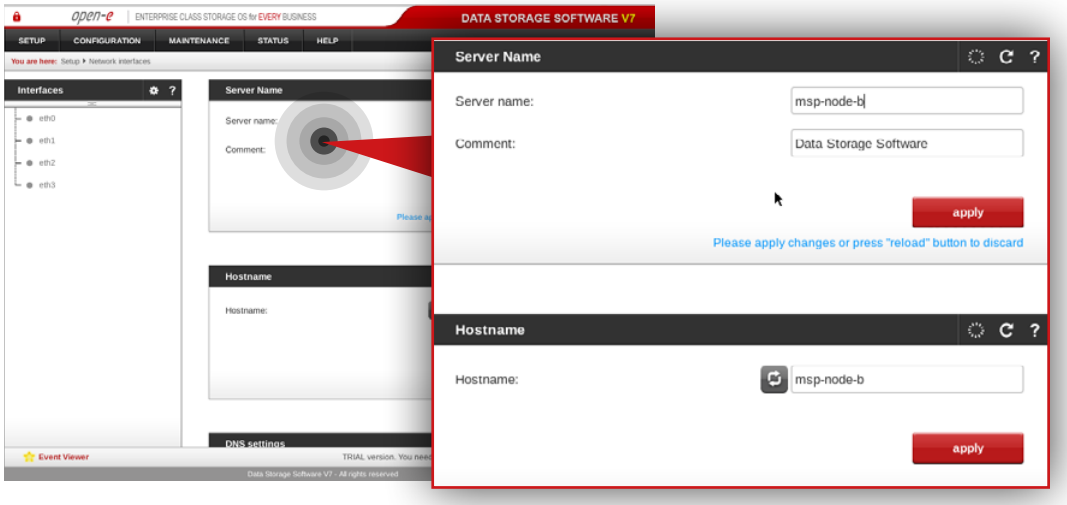
a. Navigate to SMB settings.
b. Uncheck **Use SMB** option.
c. Click **apply** button.

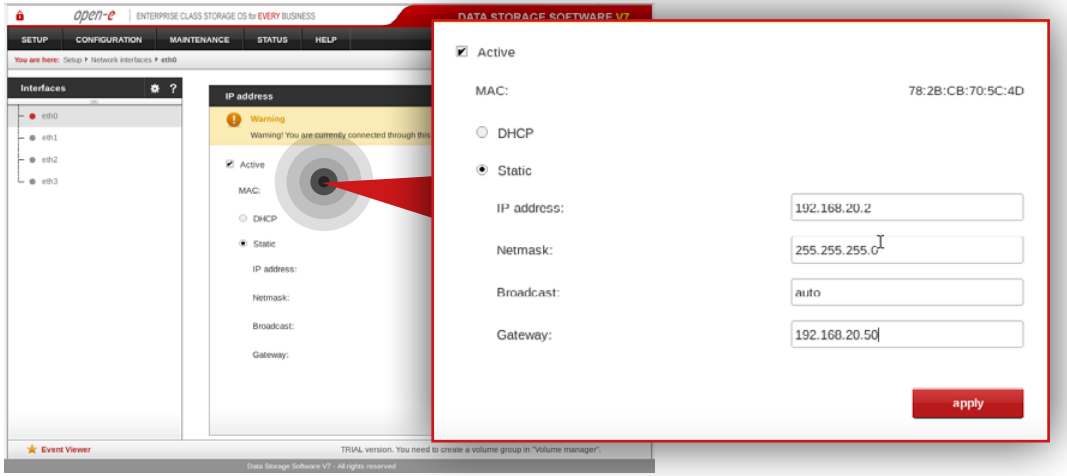


Step 13.

Next, Navigate to NFS share access box.

a. Check **Use NFS** option
b. Make sure **Synchronous** option is checked
c. Click **apply** button





5.2.2. MSP second node configuration

Step 1.

Go to **Setup » Network interfaces** and change server name and hostname to **msp-node-b**. Click **apply** to confirm the changes.

Note: Changing the hostname requires a system reboot.

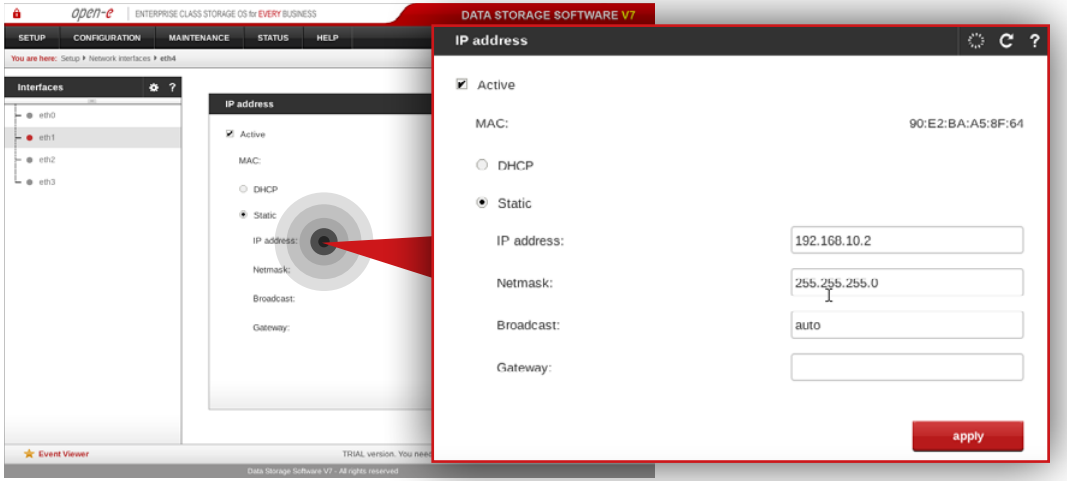
Step 2.

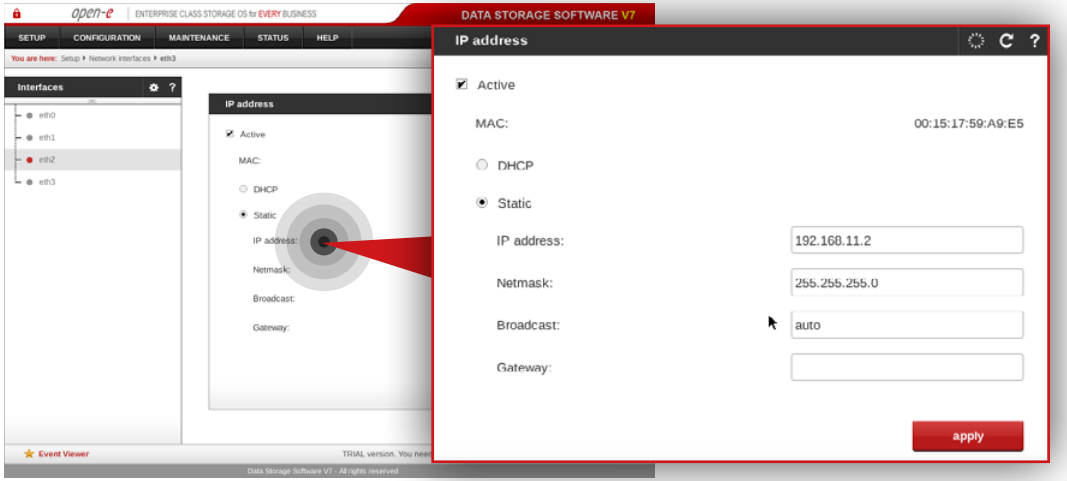
Go to **Setup » Network interfaces** and configure Ethernet ports. Click **apply** to confirm the changes.

In this example we recommend configuring four Ethernet ports as follow:

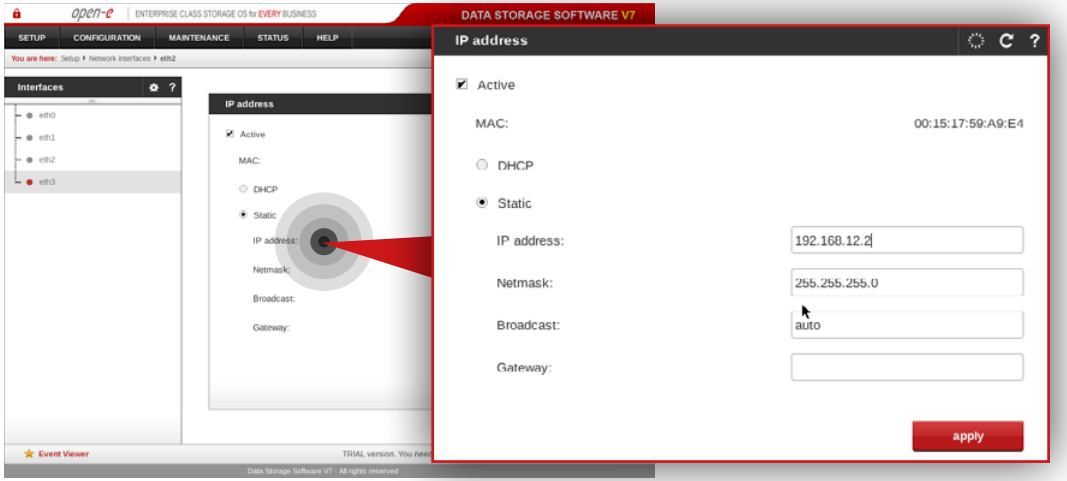
- 1Gbit **eth0** (192.168.20.2) for access to Open-E DSS V7 web interface
- 10Gbit **eth1** (192.168.10.2) for volume replication between MSP nodes
- 1Gbit **eth2** (192.168.11.2) for VIP and data replication via VPN
- 10Gbit **eth3** (192.168.12.2) for VIP for internal MSP network

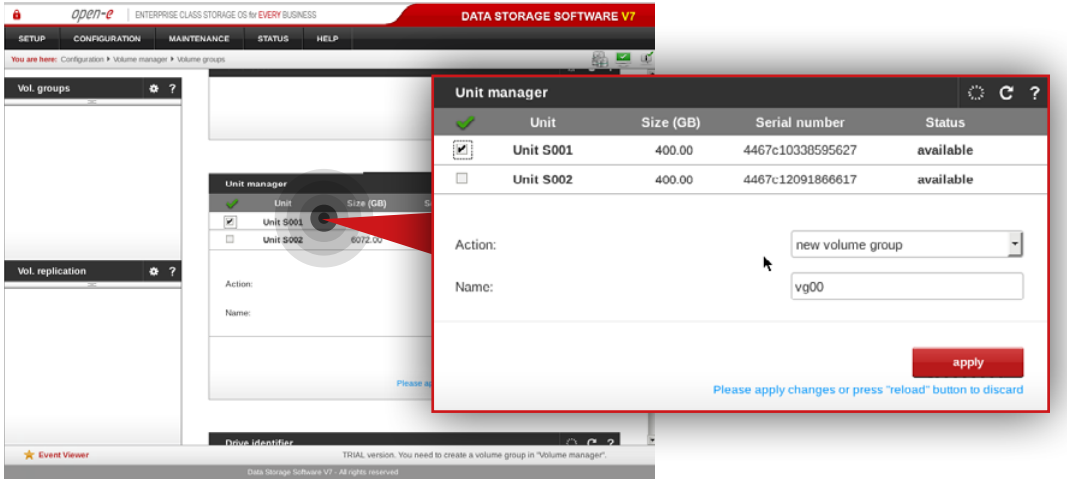
Note: Changing network interface IP address will restart the network configuration on this node.





Note: The IP addresses used in this example are for the purpose of this manual only. You should configure your Ethernet ports according to your network topology.

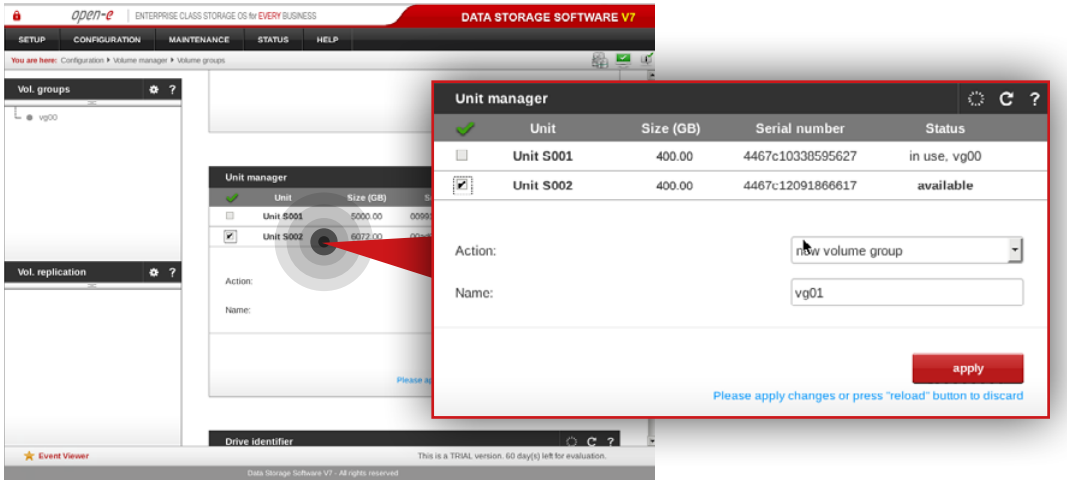




Step 3.

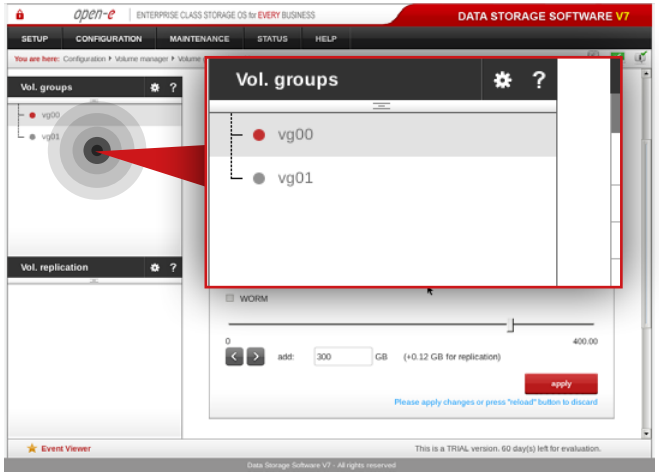
Go to **Configuration » Volume manager » Volume groups**.

a. From the Unit manager, select a disk to create the volume group.
b. Enter a name for the volume group (in this example, the volume name is **vg00**).
c. Click **apply** button.

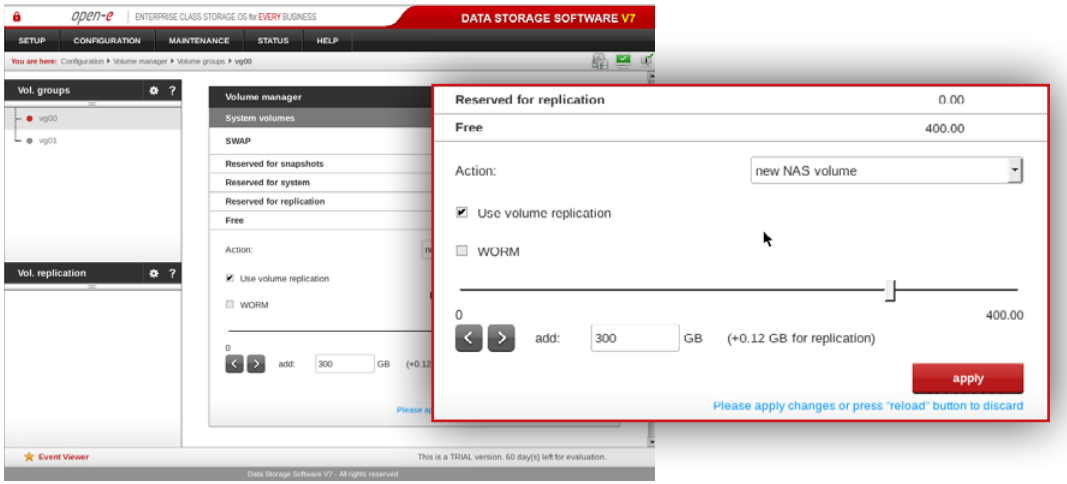


Step 4.

Repeat the previous step in order to create the second volume group (in this example, the volume name is **vg01**).



After volume groups are created you can see them listed in the volume groups menu on the left side.

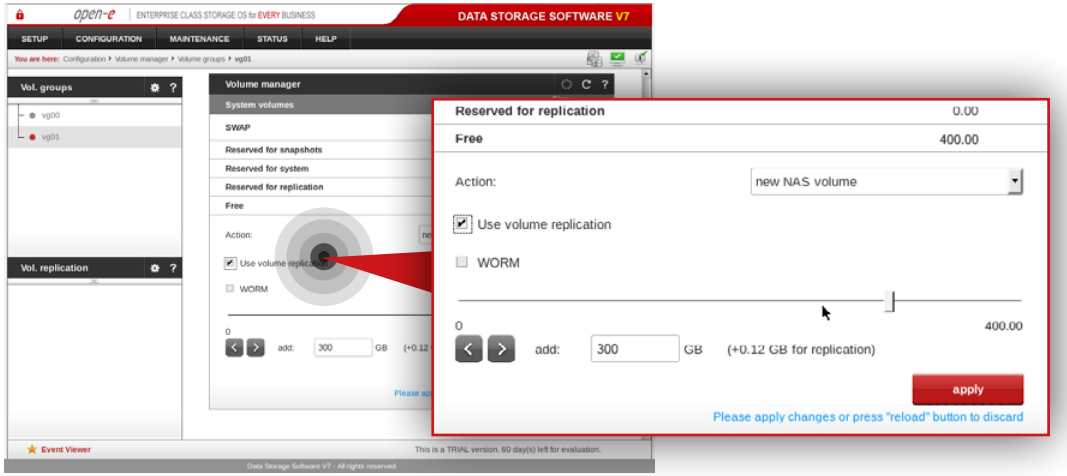


Step 5.

Select **vg00** from the list on the left side. Next, create new NAS volume of size that is appropriate for the data set (in this example, the volume name is **lv0000**).

a. Make sure that **Use Volume replication** option is checked.
b. Set a size for the volume.
c. Click **apply** button.

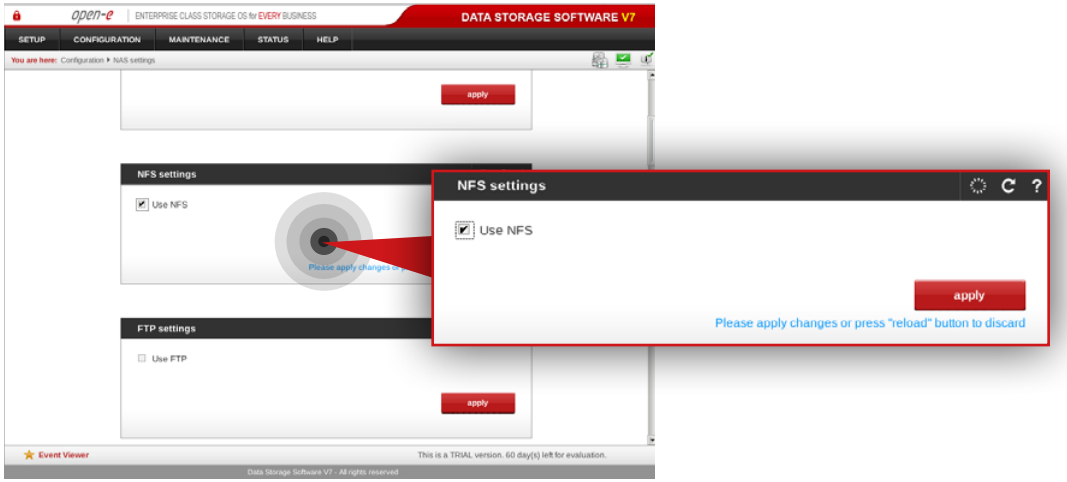
Please note that the size of the volume in this example is for purpose of this manual. Your volumes size should be always tailored to the size of data set.



Step 6.

Select **vg01** from the list on the left side. Next, create new NAS volume of size that is appropriate for the data set (in this example, the volume name is **lv0100**).

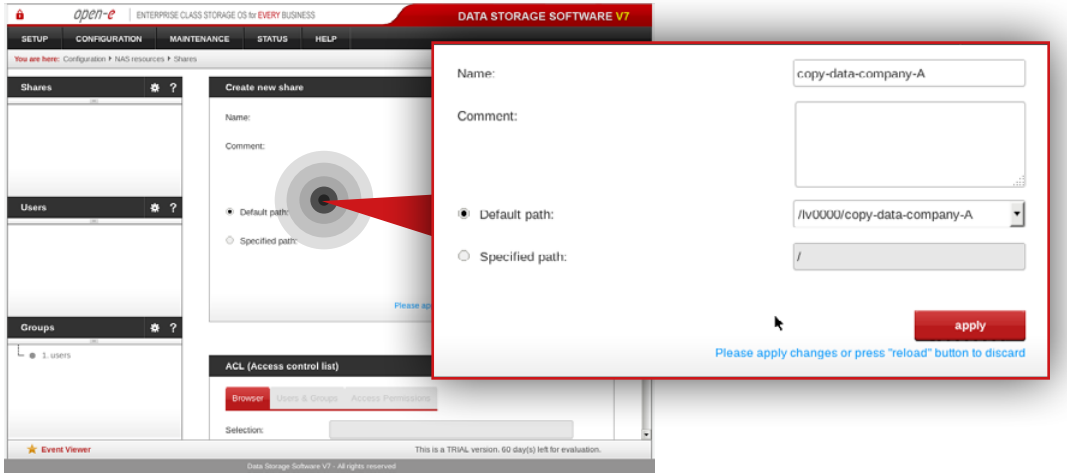
a. Make sure that **Use Volume replication** option is checked.
b. Set a size for the volume.
c. Click **apply** button.



Step 7.

Go to **Configuration » NAS settings**.

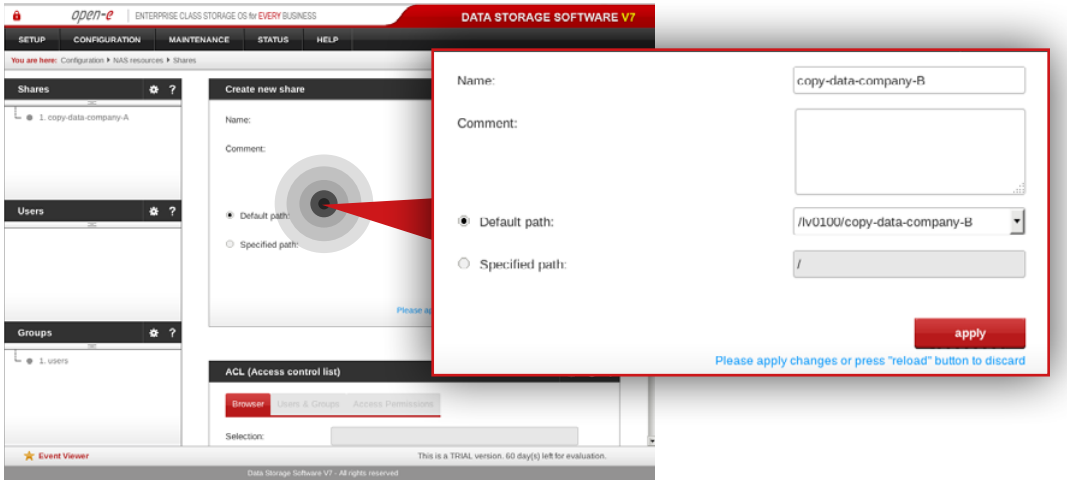
a. Check **Use NFS** option in NFS settings box.
b. Click **apply** button.



Step 8.

Go to **Configuration » NAS resources » Shares** and create a share for data to be replicated from the Customer node.

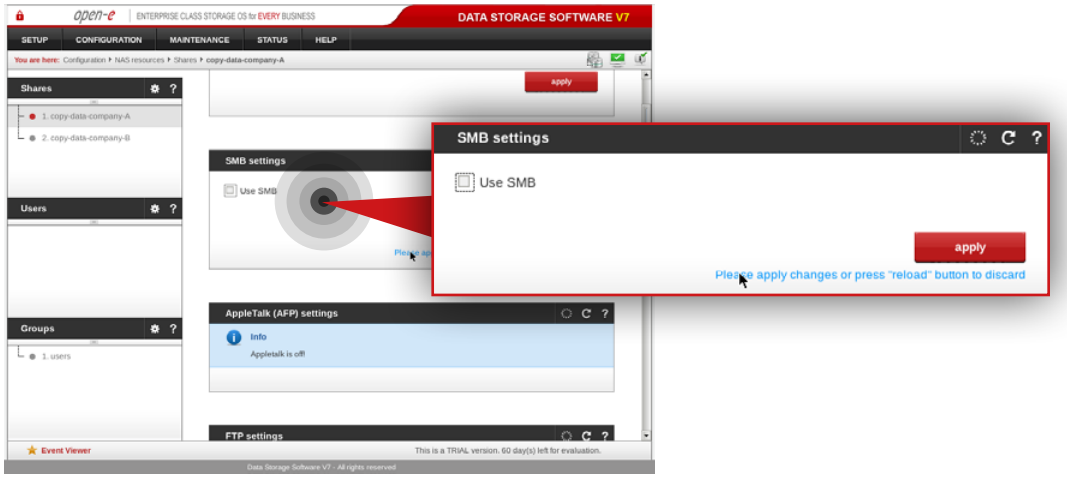
a. Enter a name for the share (in this example, the share name is **copy-data-company-A**).
b. Select **lv0000** as a default path for the share.
c. Click **apply** button.



Step 9.

Create a share for the data to be replicated from the another Customer node (**Note:** This step is required only in case you have more than one Customer node from which data will be replicated).

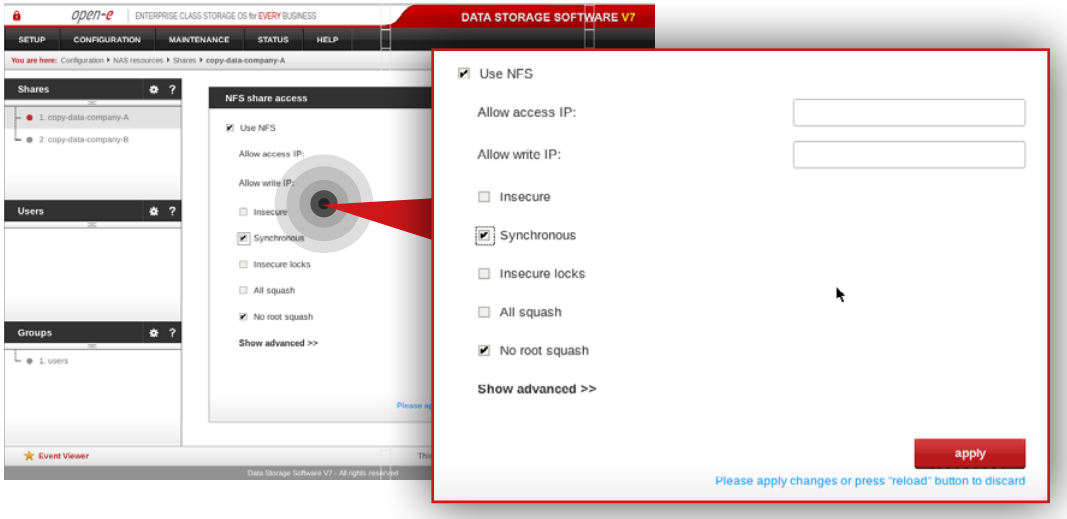
a. Enter a name for the share (in this example, the share name is **copy-data-company-B**).
b. Select **lv0100** as a default path for the share.
c. Click **apply** button.



Step 10.

Select **copy-data-company-A** share from the list on the left side.

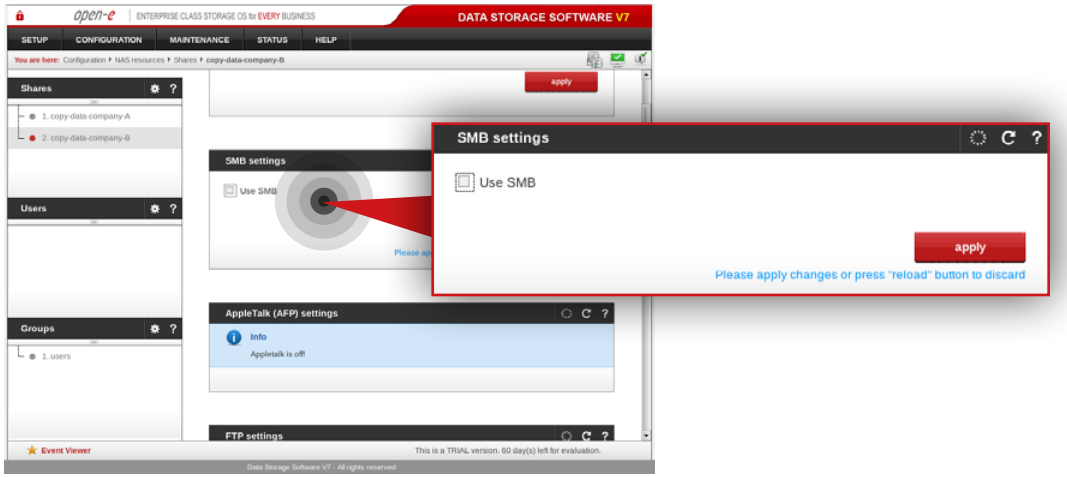
a. Navigate to SMB settings.
b. Uncheck **Use SMB** option.
c. Click **apply** button.



Step 11.

Next, navigate to NFS share access box.

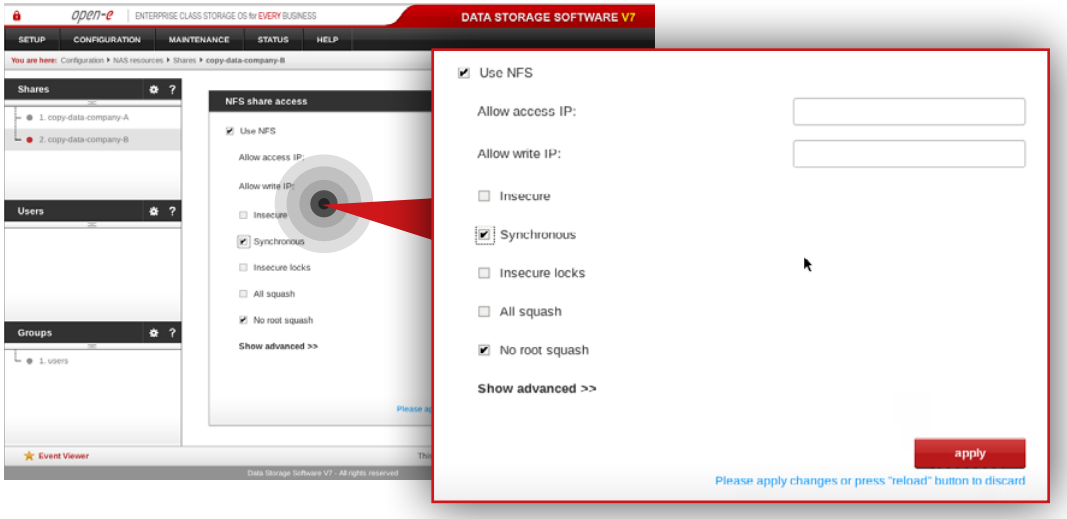
a. Check **Use NFS** option.
b. Make sure **Synchronous** option is checked.
c. Click **apply** button.



Step 12.

Select **copy-data-company-B** from the menu on the left side.

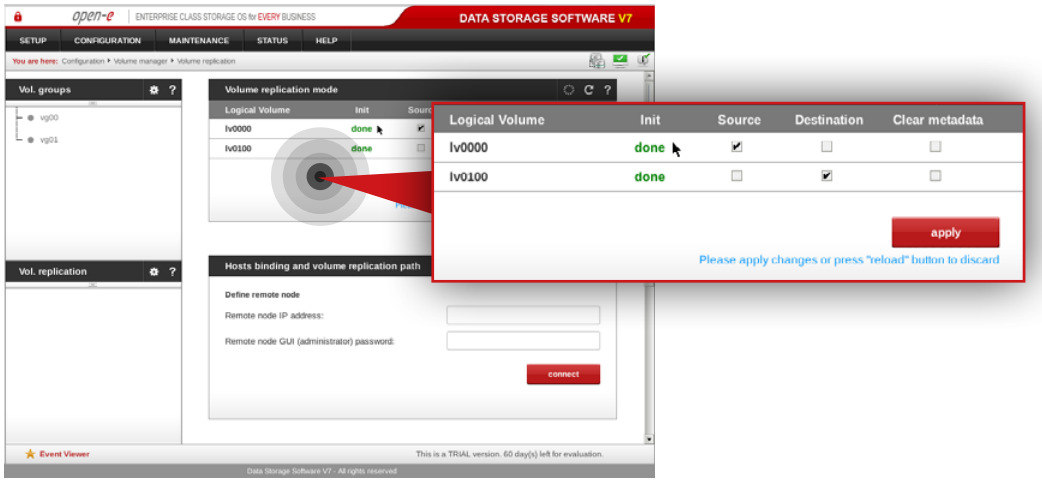
a. Navigate to SMB settings.
b. Uncheck **Use SMB** option.
c. Click **apply** button.



Step 13.

Next, Navigate to NFS share access box.

a. Check **Use NFS** option.
b. Make sure **Synchronous** option is checked.
c. Click **apply** button.

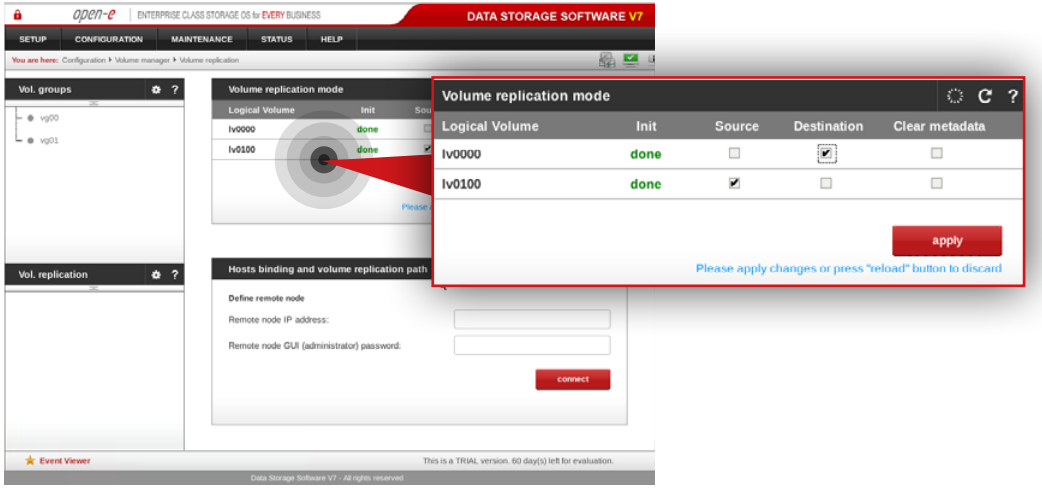


5.2.3. Setting up volume replication between MSP nodes

Step 1.

On the **msp-node-a**, go to **Configuration » Volume manager » Volume replication**.

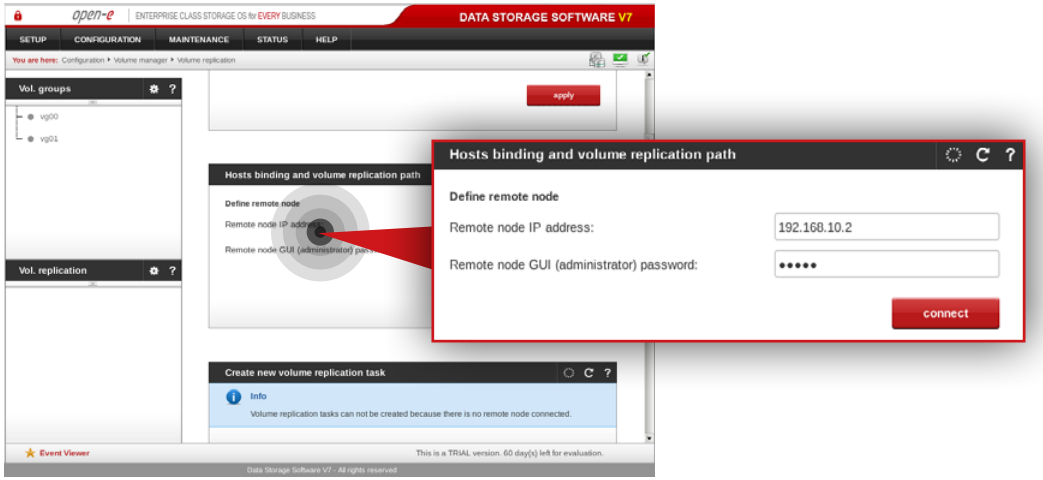
a. Set a **source** Volume replication mode for **lv0000** and **destination** volume replication mode for **lv0100**.
b. Click **apply** button.



Step 2.

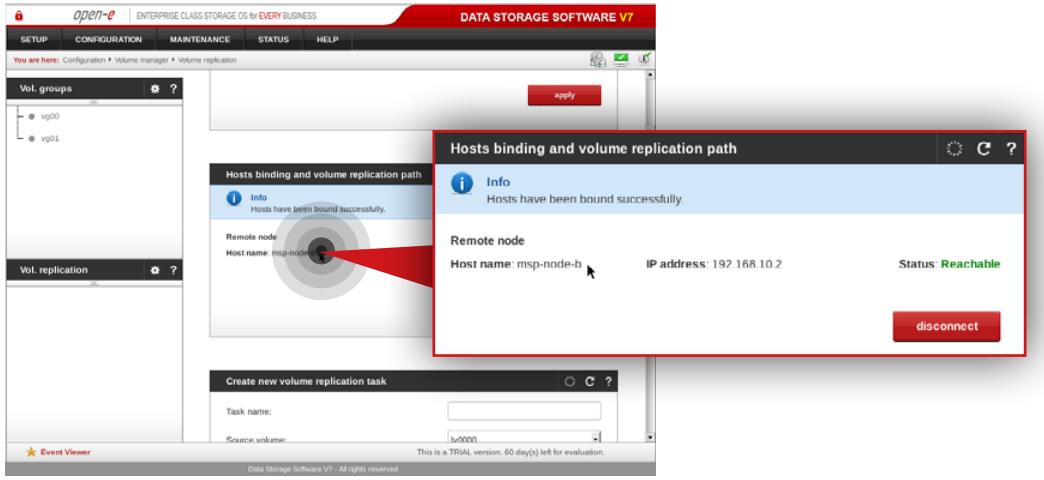
On **msp-node-b**, go to **Configuration » Volume manager » Volume replication.**

a. Set **source** volume replication mode for **lv0100** and **destination** volume replication mode for **lv0000**.
b. Click **apply** button.

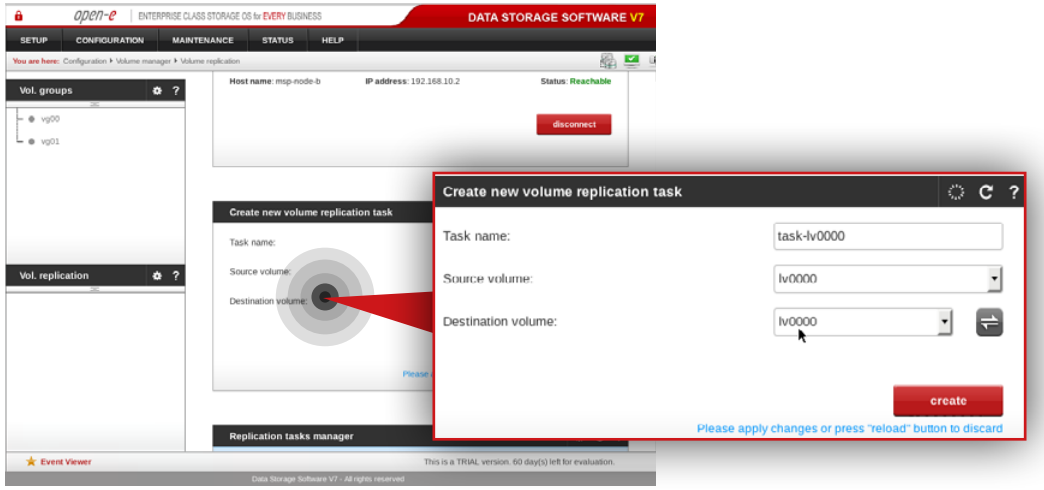


Step 3.

Go back to **msp-node-a** and configure host binding and volume replication path between MSP nodes (in this example **msp-node-a** is bound with **msp-node-b**).



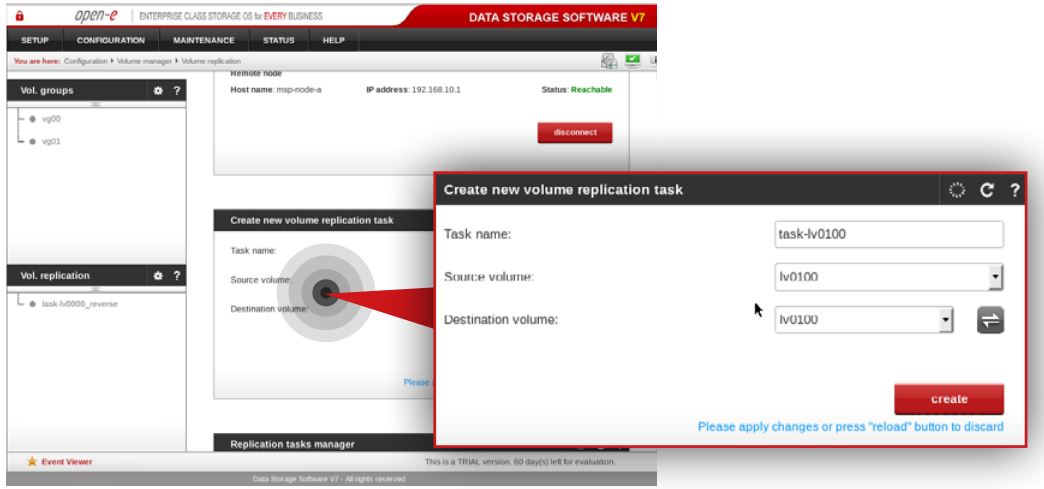
After both nodes are bound, you will see binding status like on the screenshot on the left.



Step 4.

On **msp-node-a** navigate to Create new volume replication task box and create new volume replication task.

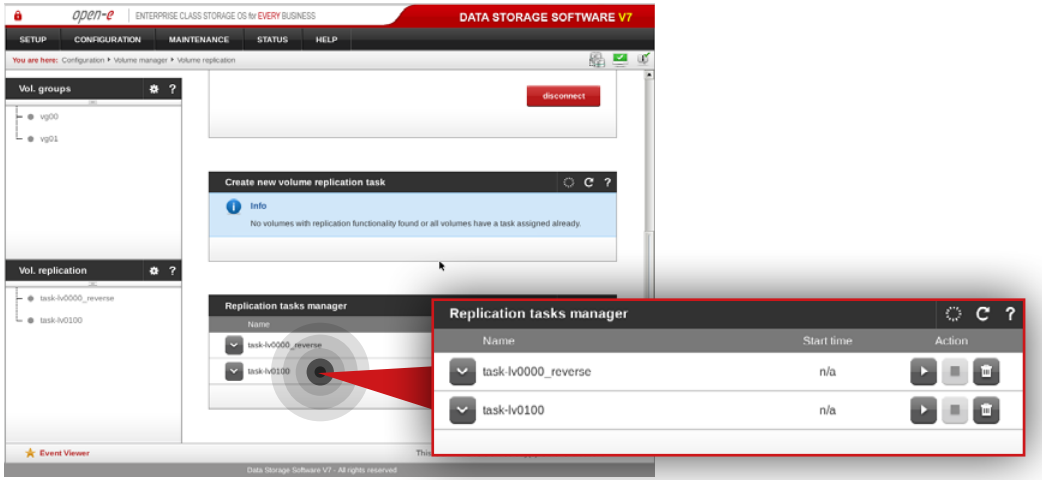
a. Enter task name (in this example, the task name is **task-lv0000**).
b. Select source volume (in this example, source volume is **lv0000**).
c. Select destination volume on MSP second node (in this example, destination volume is **lv0000**).
d. Click **create** button.



Step 5.

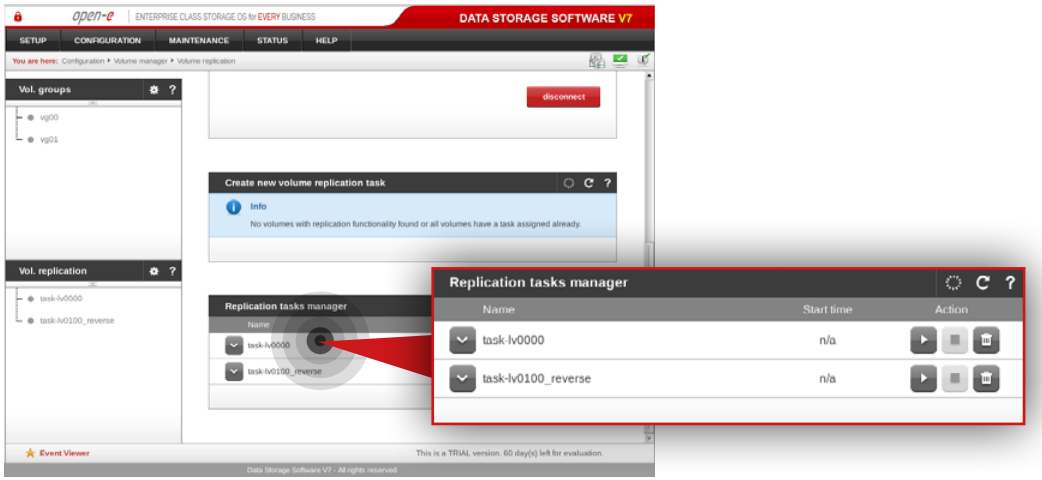
On **msp-node-b** navigate to Create new volume replication task and create new volume replication task.

a. Enter task name (in this example, the task name is **task-lv0100**).
b. Select source volume (in this example, source volume is **lv0100**).
c. Select destination volume on MSP second node (in this example, destination volume is **lv0100**).
d. Click **create** button.



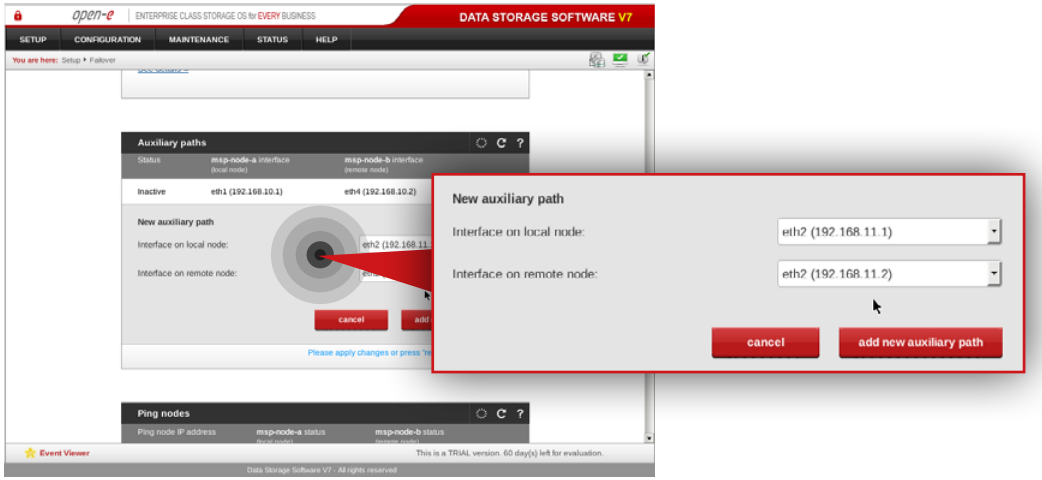
Step 6.

Next, run replication task **task-lv0100**.



Step 7.

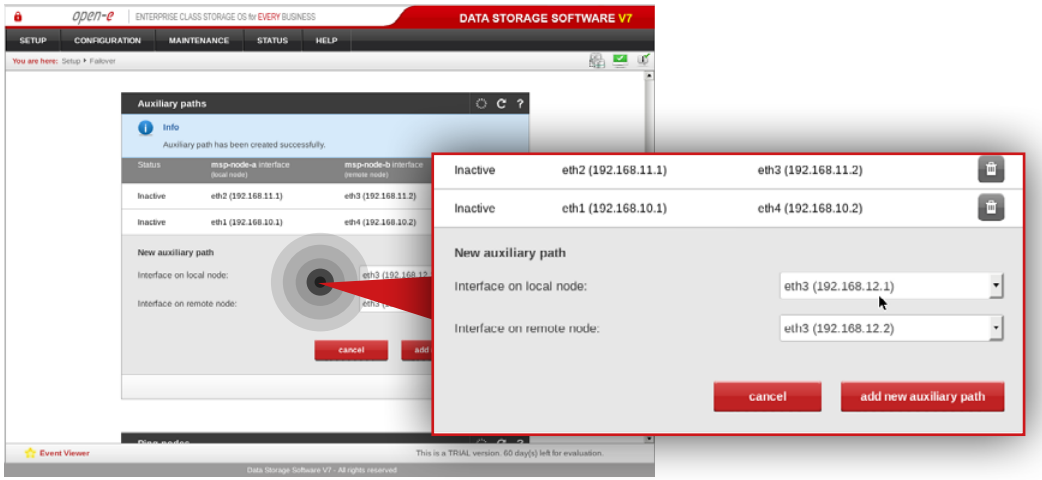
Go to the **msp-node-a** and run replication task **task-lv0000**.



5.2.4. Setting up and running Failover service

Step 1.

On **msp-node-a** go to **Setup » Failover.**

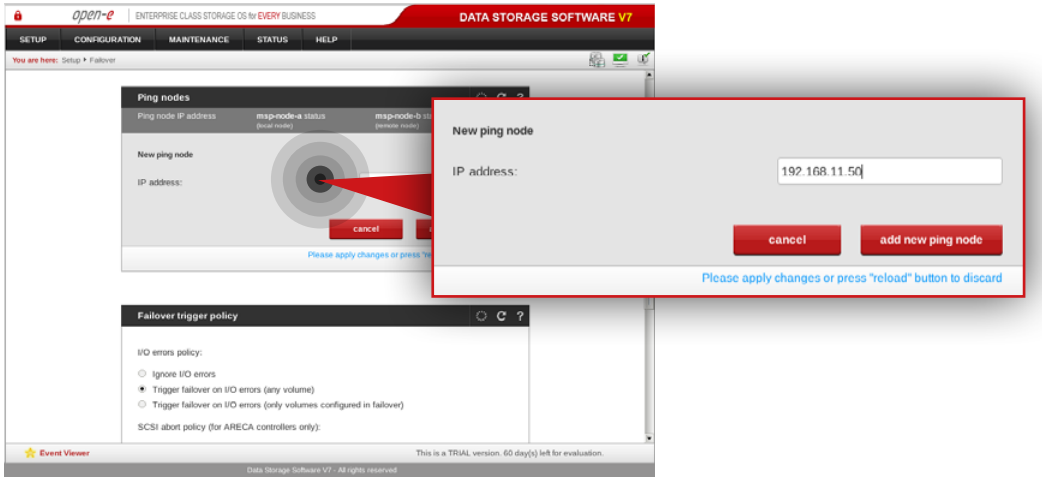


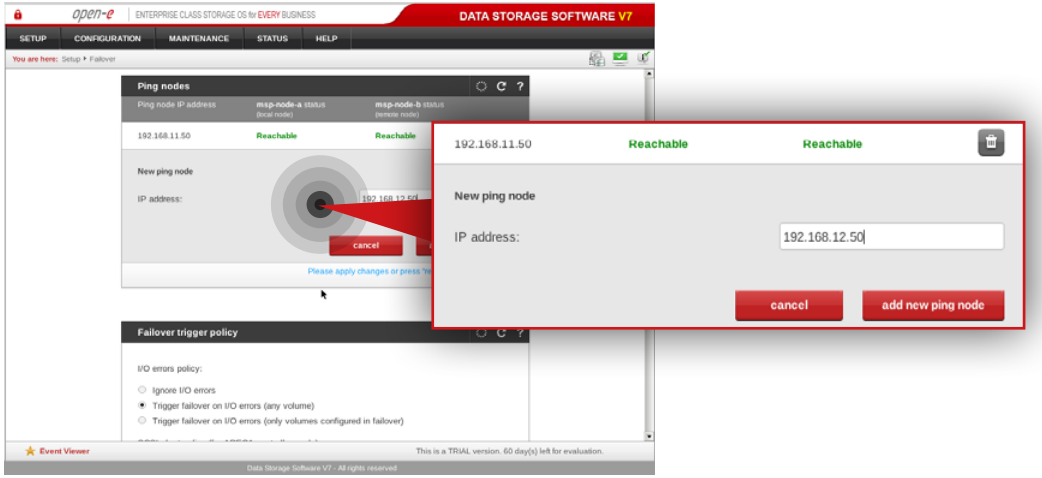
Step 2.

Add two auxiliary paths.

Note: The interface on both local and remote node has to be on the same network subnet.

a. Select interface on local and remote node for the first new auxiliary path (in this example eth2 on local node and eth2 on remote node).
b. Click **add new auxiliary** path button.
c. Select interface on local and remote node for the second new auxiliary path (in this example eth3 on local node and eth3 on remote node).
d. Click **add new auxiliary path** button.

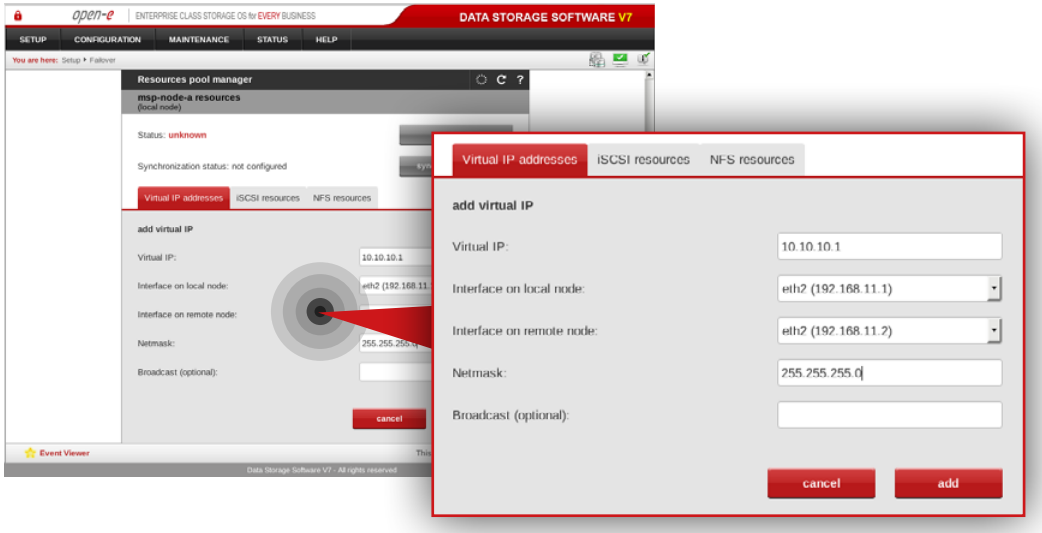




Step 3.

Add two ping nodes.

a. Add first ping node (in this example, the ping node is **192.168.11.50**).
b. Click **add new ping node** button.
c. Add second ping node (in this example, the ping node is **192.168.12.50**).
d. Click **add new ping node** button.



Step 4.

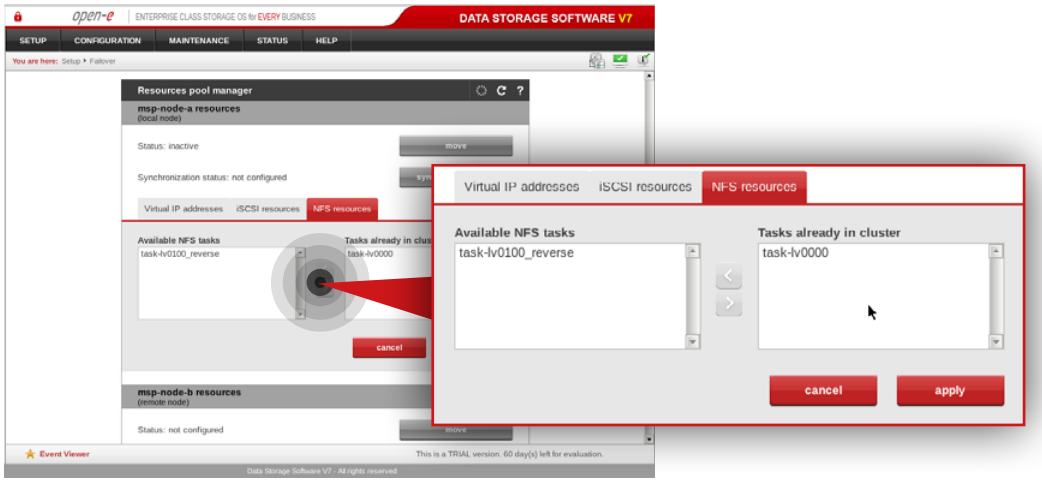
Go to the **Resources Pool Manager** and add a virtual IP address in **msp-node-a-resources** section.

a. Enter virtual IP address appropriate for your network configuration (in this example virtual IP address is **10.10.10.1**).
b. Select interface on local node for virtual IP address (in this example, eth2 192.168.11.1).
c. Select interface on remote node for virtual IP address (in this example, eth2 192.168.11.2).
d. Enter netmask (in this example, netmask is 255.255.255.0).
e. Click **add** button.

Step 5.

Next, Add another virtual IP address in **msp-node-a-resources** section.

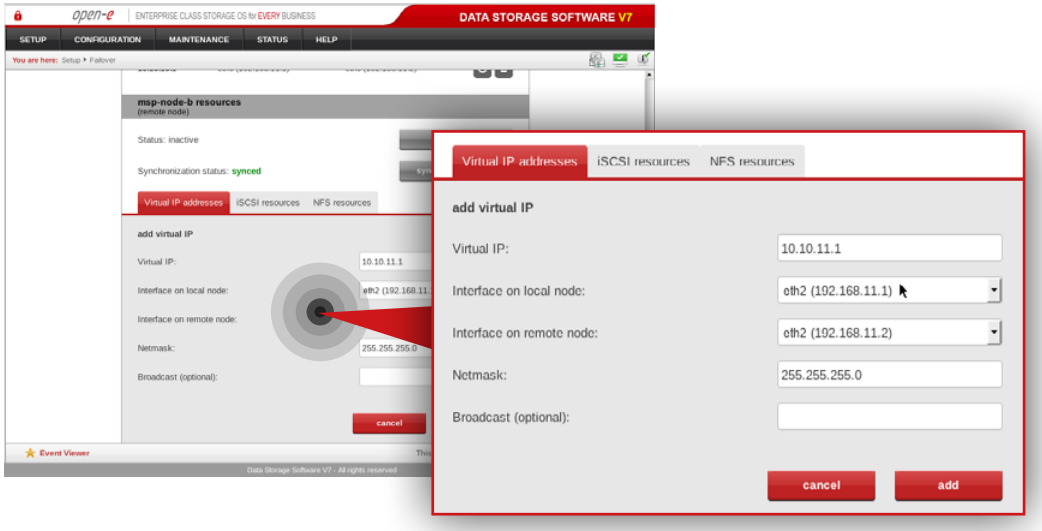
a. Enter virtual IP address appropriate for your network configuration (in this example virtual IP address is **20.20.20.1**).
b. Select interface on local node for virtual IP address (in this example, eth3 192.168.12.1).
c. Select interface on remote node for virtual IP address (in this example, eth3 192.168.12.2).
d. Enter netmask (in this example, netmask is 255.255.255.0).
e. Click **add** button.



Step 6.

Next, navigate to **NFS resources tab** in **msp-node-a-resources** section.

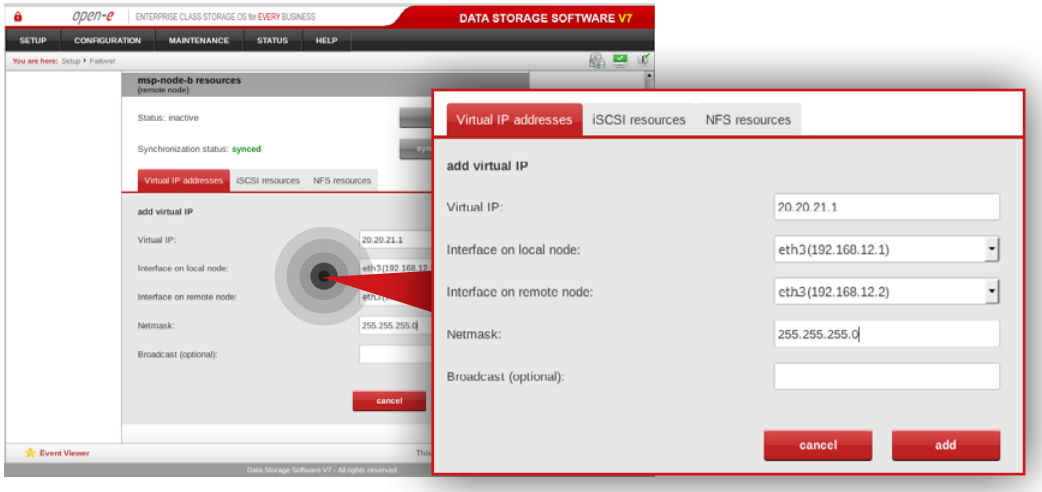
a. Move **task-lv0000** from Available NFS tasks to Tasks already in cluster.
b. Click **apply** button.



Step 7.

Navigate to the **Resources Pool Manager** and add a virtual IP address in **msp-node-b-resources** section.

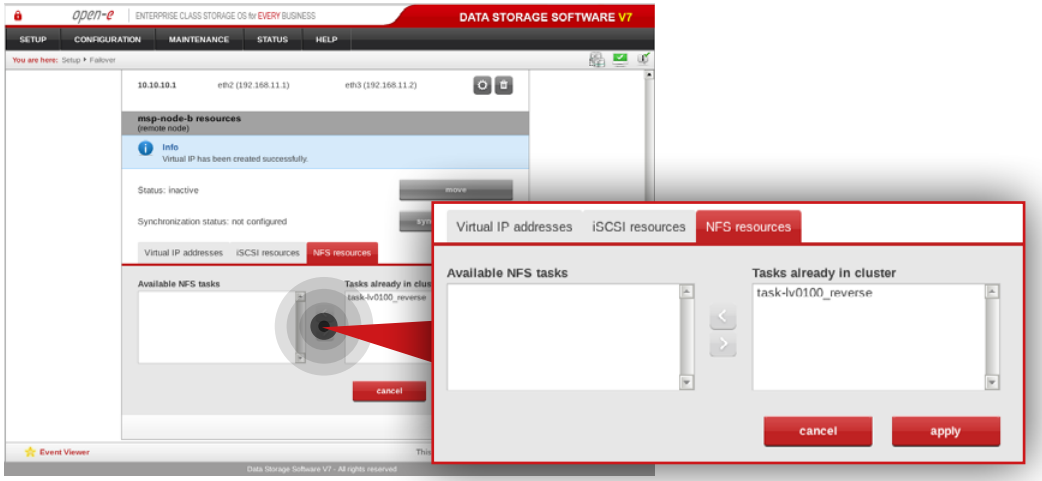
a. Enter virtual IP address appropriate for your network configuration (in this example virtual IP address is **10.10.11.1**).
b. Select interface on local node for virtual IP address (in this example, eth2 192.168.12.1).
c. Select interface on remote node for virtual IP address (in this example, eth2 192.168.12.2).
d. Enter netmask (in this example, netmask is 255.255.255.0).
e. Click **add** button.



Step 8.

Next, Add another virtual IP address in **msp-node-b-resources** section.

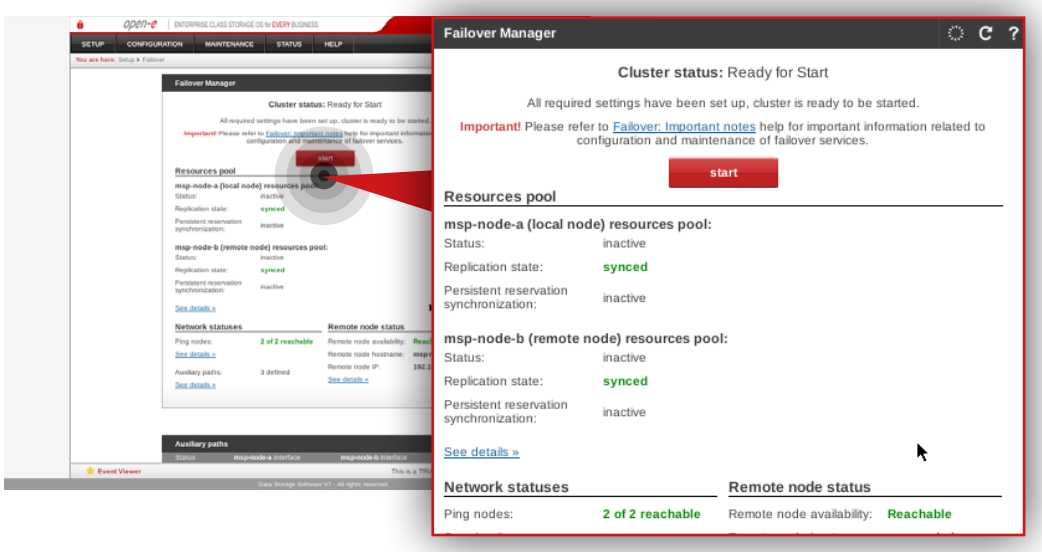
a. Enter virtual IP address appropriate for your network configuration (in this example virtual IP address is 20.20.21.1).
b. Select interface on local node for virtual IP address (in this example, eth3 192.168.12.1).
c. Select interface on remote node for virtual IP address (in this example, eth3 192.168.12.2).
d. Enter netmask (in this example, netmask is 255.255.255.0).
e. Click **add** button.



Step 9.

Navigate to **NFS resources tab**.

a. Move **task-lv0100_reverse** from Available NFS tasks to Tasks already in cluster.
b. Click **apply** button.



Step 10.

Go to **Failover manager** and click **start** button in order to run the Failover service.

MSP node and Customer node monitoring is carried out by the VPN/Monitoring node (see Chapter **2 - Solution diagram / network topology**). The VPN/Monitoring node is a single node running Ubuntu Server 14.04 LTS with OMD (Open Monitoring Distribution) software installed.

Note that the following steps describe how to set up a monitoring for MSP node. If you want to set up monitoring for Customer node, first you have to configure an encrypted connection between MSP and Customer according to Chapter **5.5 - Setting up encrypted connection between MSP and Customer nodes**.

Prerequisites
Please complete the following prerequisites.

- Server meets requirements for VPN/Monitoring node introduced in Chapter **4 – Minimum hardware requirements**
- Ubuntu Server 14.04 LTS installed on the server
- Ubuntu standard user account with sudo privileges
- MSP nodes configured according to procedure introduced in Chapter **5.2 – Detailed procedure of setting up MSP nodes**

If all the prerequisites have been met, you're now ready to start VPN/Monitoring node configuration.

The following steps show how to configure monitored node (in this example, the monitored node is MSP node), install OMD package on VPN/Monitoring node and finally, access and use the monitoring interface.

5.3.1. Installing and configuring OMD on MSP VPN/Monitoring node

In order to install OMD package on MSP VPN/Monitoring node please follow the steps below:

Step 1.

From a root level (use "sudo -i" in order to login as root), update repositories index and upgrade system software using the following commands:

```
apt-get update
```

```
apt-get upgrade
```

Step 2.

In order to install the OMD package , go to **https://labs.consol.de/repo/stable/** and choose the relevant version of the repository (in our case it will be "Ubuntu Trusty 14.04").

Step 3.

Install the relevant GPG key in Ubuntu.

```
gpg --keyserver keys.gnupg.net --recv-keys F8C1CA08A57B9ED7
```

```
gpg --armor --export F8C1CA08A57B9ED7 | apt-key add -
```

Step 4.

Next, enable the stable release repository (in our case, it is the one dedicated to Ubuntu Trusty 14.04):

```
echo 'deb http://labs.consol.de/repo/stable/ubuntu trusty main' >> /etc/apt/sources.list
```

Step 5.

Run apt-get update to refresh our distribution repositories.

```
apt-get update
```

Step 6.

Install the OMD.

```
apt-get install omd
```

Step 7.

Create a new site (in this example it is “dssmonitor”).

```
omd create dssmonitor
```

What you get is:

- a site directory with preconfigured configuration files
- a new user “dssmonitor” and a new group “dssmonitor” (identical with the name of your site). The new user is also a member of the group omd, which is created during installation

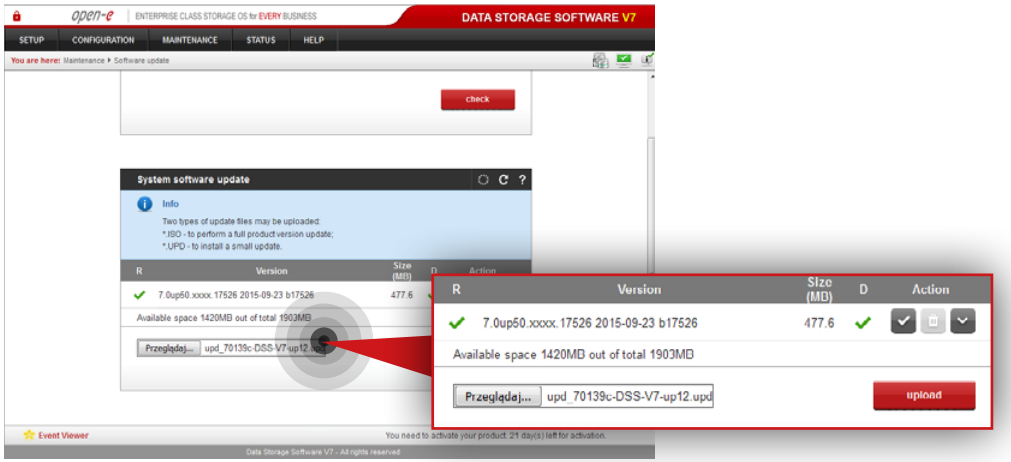
5.3.2. Configuring monitored node

Applying the small update to monitored node

Note: Applying small update is not required if you are using Open-E DSS V7 version v7.0up53 or above.

Click: http://kb.open-e.com/How-can-I-obtain-and-apply-a-small-update-to-my--Open-E-software_63.html, to find out how to obtain small updates. Please note, it is always best to confirm it with our technical support, before installing any updates to your system.

Go to the node you want to monitor (in our example, the node is **msp-node-a**) and perform the following steps:



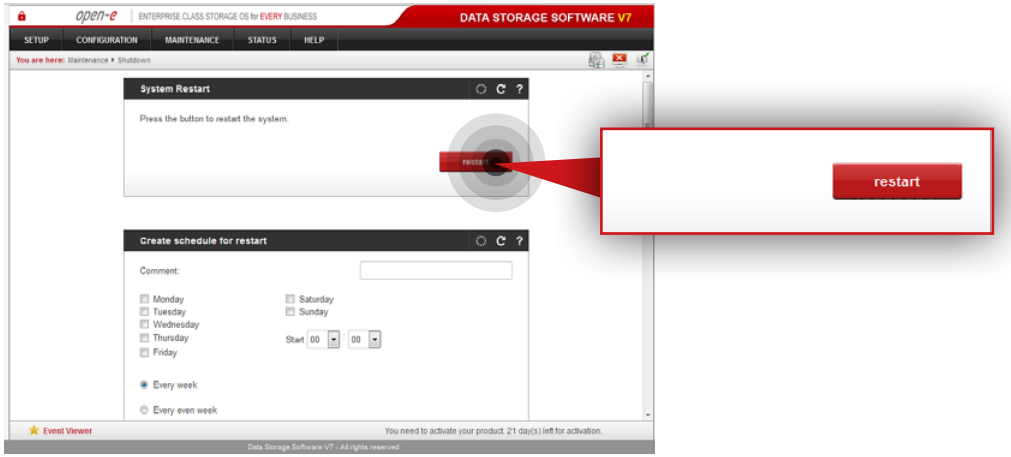
Step 1.

Go to **Maintenance » Software update** and navigate to System software update.

Step 2.

Click **Choose File** to pick the small update *upd_70139-DSS-V7.upd*, then click on **upload** and **accept**.

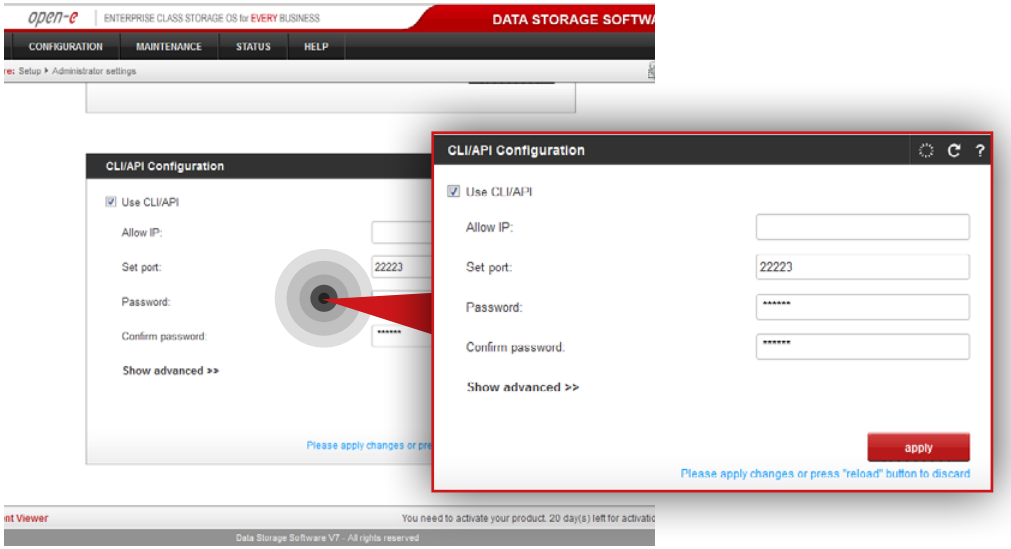
You will then need to manually restart the system.

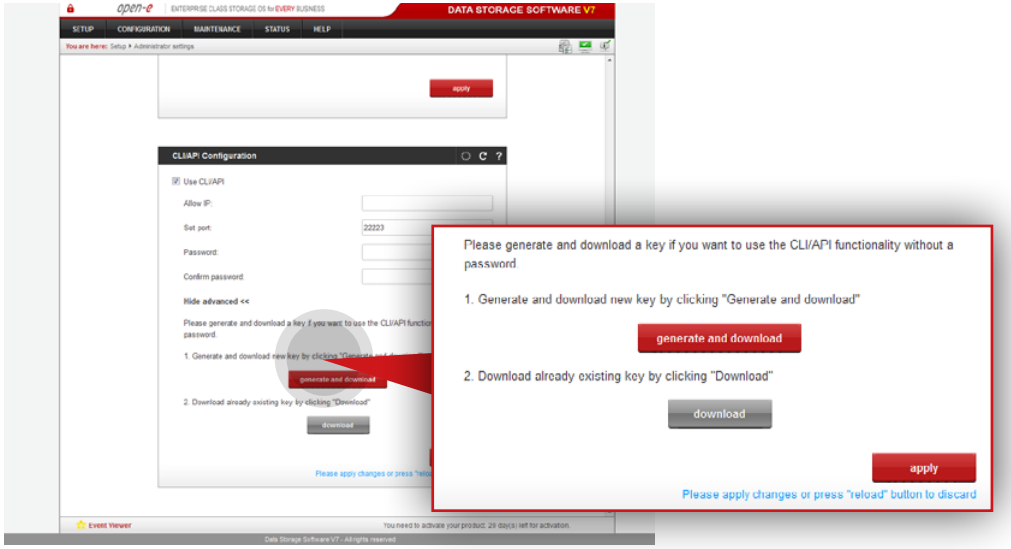


Step 3.

Go to **Maintenance » Shutdown » System Restart** and click the **restart** button in order to reboot the server.

After installation, the small update will be visible in the System software update menu (it can be removed by clicking on the trash bin).





Enabling API on monitored node

Go to a node you want to monitor (in our example, the node is MSP primary node) and perform the following steps:

Step 4.

Go to **Setup » Administrator settings** then navigate to **CLI/API Configuration**.

Step 5.

Enable CLI/API, then specify port – 22223 and password.

Step 6.

Click **apply** button.

Step 7.

In order to use the CLI/API functionality without password, you need to generate ssh key. You can do it by expanding **show advanced** menu and clicking on the **generate and download** button.

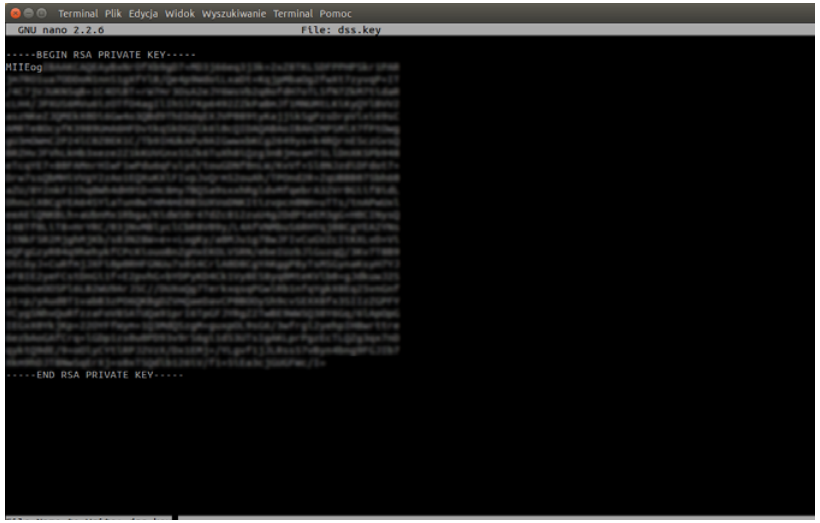
5.3.3. Adding a monitored node to OMD

Step 1.

On the VPN/Monitoring node, create a file with an ssh key (downloaded while enabling CLI/API functionality on monitored node) in the omd directory.

```
cd /omd
nano dss.key
```

Note: We use a **nano** editor to create and edit the key file (in this example, the key file name is dss.key).



Next, copy the ssh key from the downloaded file and paste it to the **dss.key** file.

After the ssh key is copied, use **Ctrl+O**. Next, click Enter to save the dss.key file and then **Ctrl+X** to close nano editor.

Tip: in order to check whether the dss.key file was created type ls. You should see the dss.key listed under the omd directory.

Step 2.

The important part is to ensure the correct ownership is set (our OMD user) and access permission (read and execute for owner only) for our ssh key.
To change the owner of our ssh key file, we use the following command:

```
chown dssmonitor /omd/dss.key
```

Step 3.

To change access permission, so only the owner has read and execute rights, we use:

```
chmod 500 /omd/dss.key
```

Step 4.

Then, we log to OMD as dssmonitor using "su" command:

```
su dssmonitor
```

Step 5.

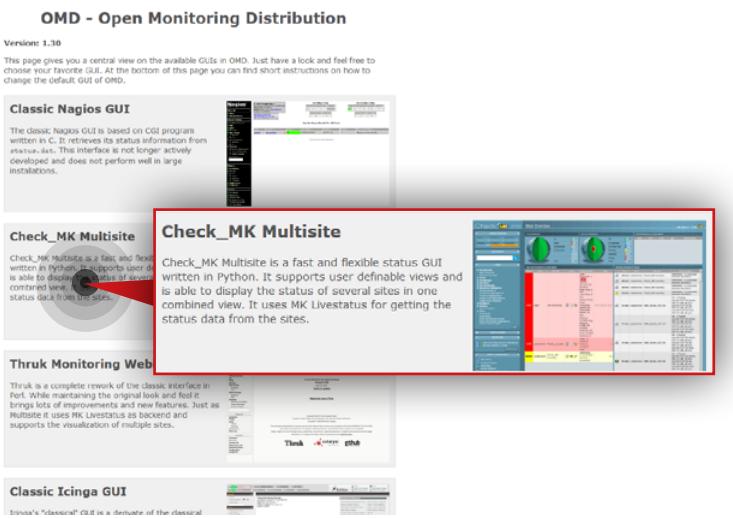
In order to add monitored server (192.168.20.1) to Check_MK list of known hosts, run the following ssh command (type **yes** and press **Enter** when asked):

```
ssh -p 22223 -i /omd/dss.key -l api 192.168.20.1 check_mk_agent
```

Step 6.

Log out from dssmonitor account (Ctrl + D). From root level (use "sudo -i" in order to login as root), start the omd on newly created site.

```
omd start dssmonitor
```

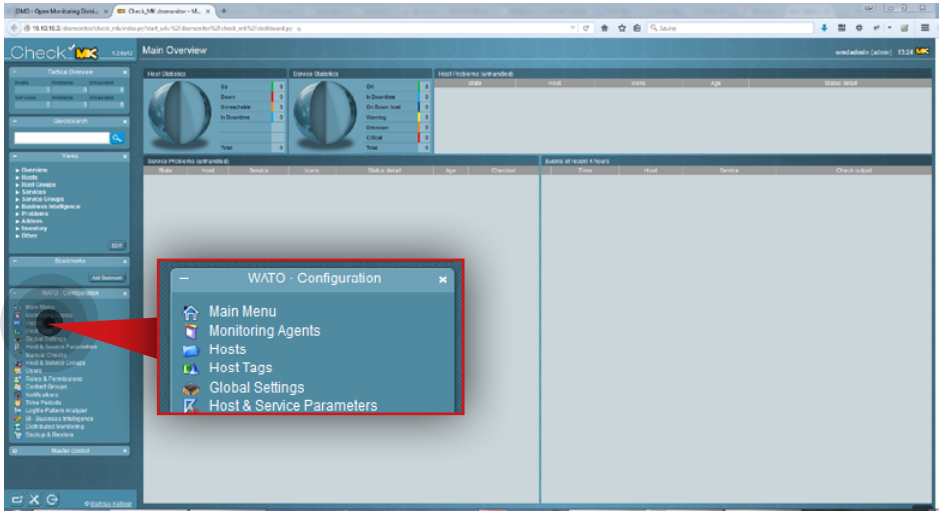


Step 7.

Go to your internet browser and log in to the OMD web interface by typing ***monitoring_server_ip_address/dssmonitor/*** (in this example, the VPN/Monitoring node ip address is 192.168.20.100).
Use **omdadmin** as username and **omd** as your password.

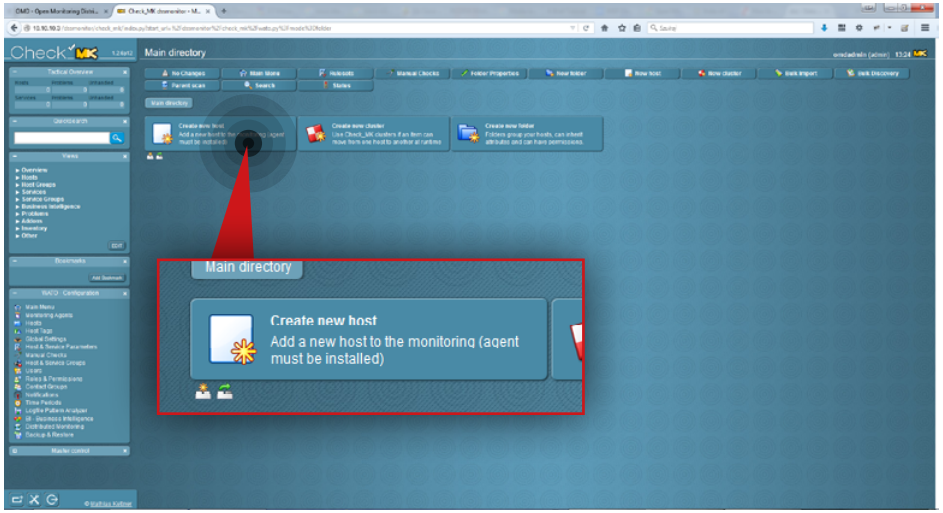
Step 8.

From the available web interfaces, choose **Check_MK Multisite**.



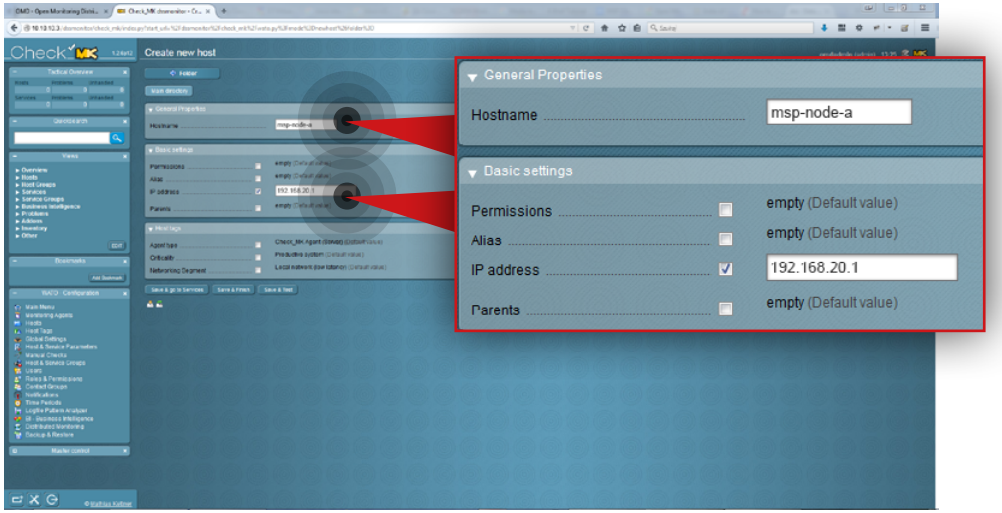
Step 9.

Go to **Hosts** in the WATO Configuration section on the left side.



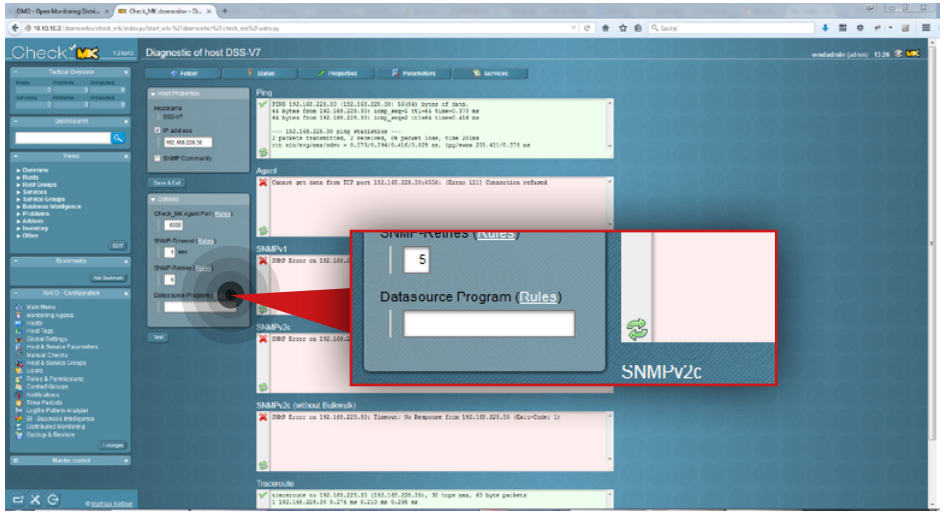
Step 10.

In order to create a new host (server to be monitored) click the **Create new host** button.



Step 11.

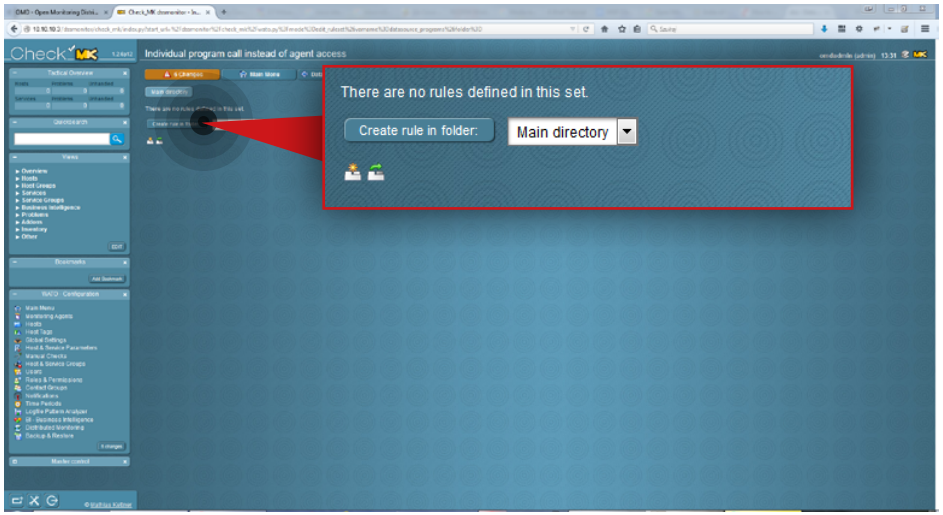
a. Enter a name for the host (in this example, the hostname is **msp-node-a**).
b. Enter host IP address (in this example, IP address is **192.168.20.1**).
c. Make sure that Agent type is Check_MK Agent (Server).
d. Click the **Save&Test** button.



Step 12.

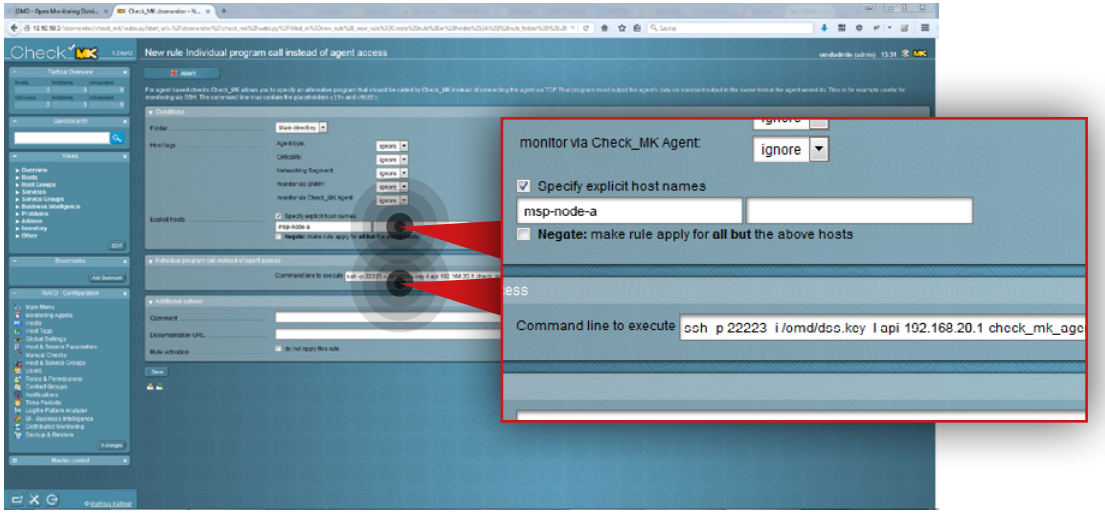
Go to **Datasource Program rules** by clicking the **Rules** link in the Options panel on the left side.

If you don't see a screen like the one on the left, click **Hosts** in **WATO Configuration** section on the left side. Next, click the relevant **hostname** and then the **Diagnostic** button.



Step 13.

Click **Create rule in folder** button.

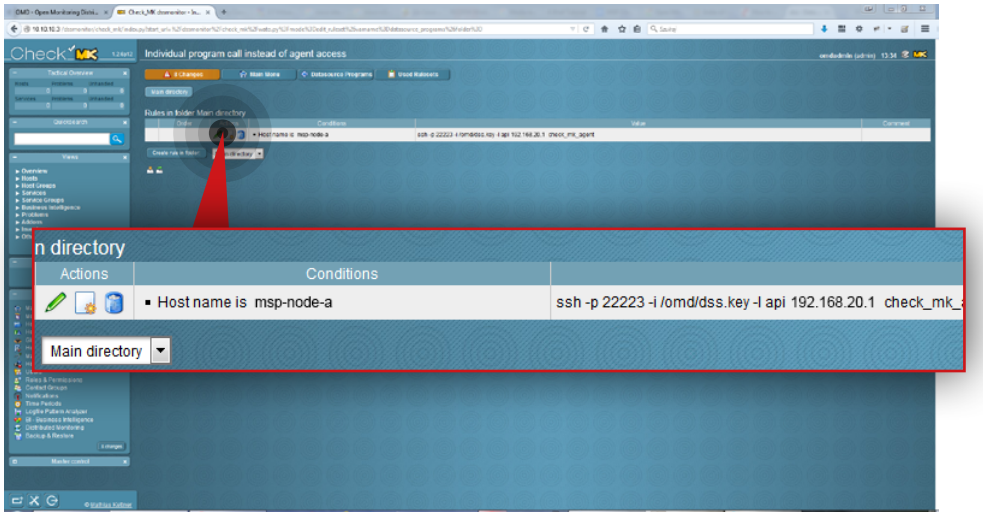


Step 14.

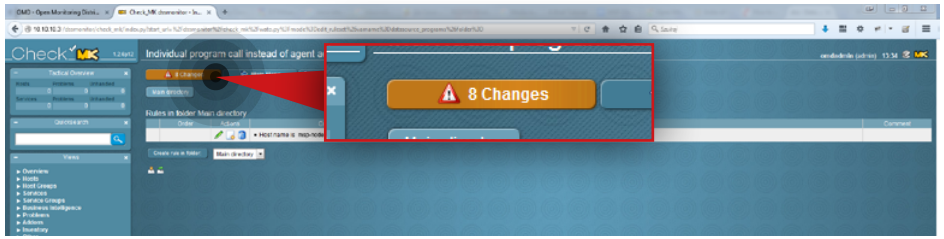
In **Conditions** section mark the **Specify explicit host names** checkbox and enter a name for the host you want to create the rule for (in this example, the hostname is a **msp-node-a**).

Next, enter the command for the rule to execute (in this example, the command is as follow:
ssh -p 22223 -i /omd/dss.key -l api 192.168.20.1 check_mk_agent).

Click **Save** button.

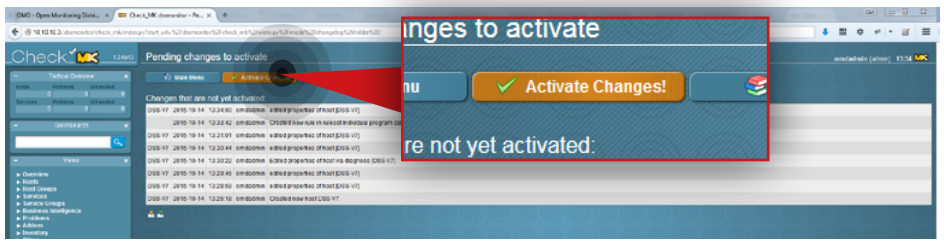


After the rule is created you will see it listed in a **Rules in folder Main directory** table.

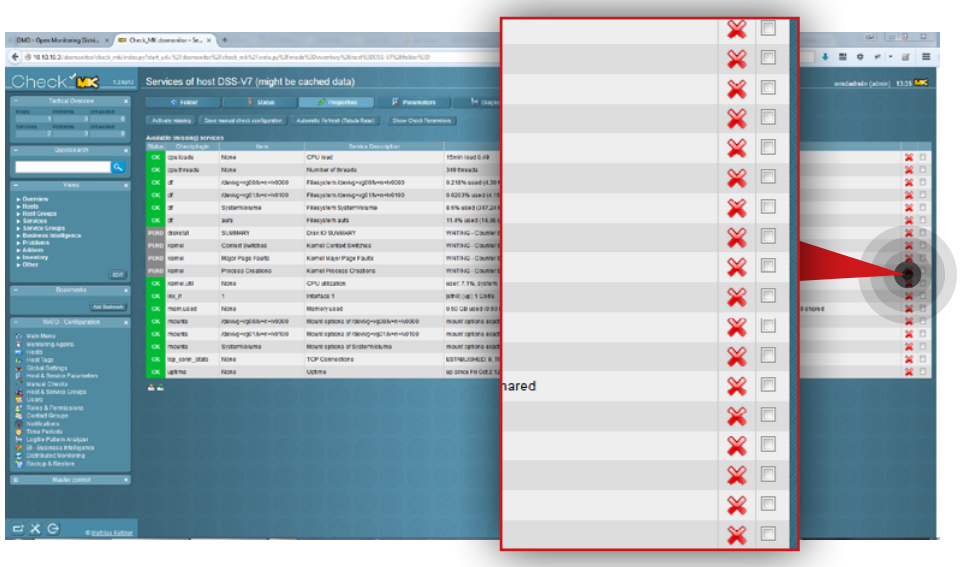


Step 15.

Activate the changes in the configuration. Click the **Changes** button at the top.

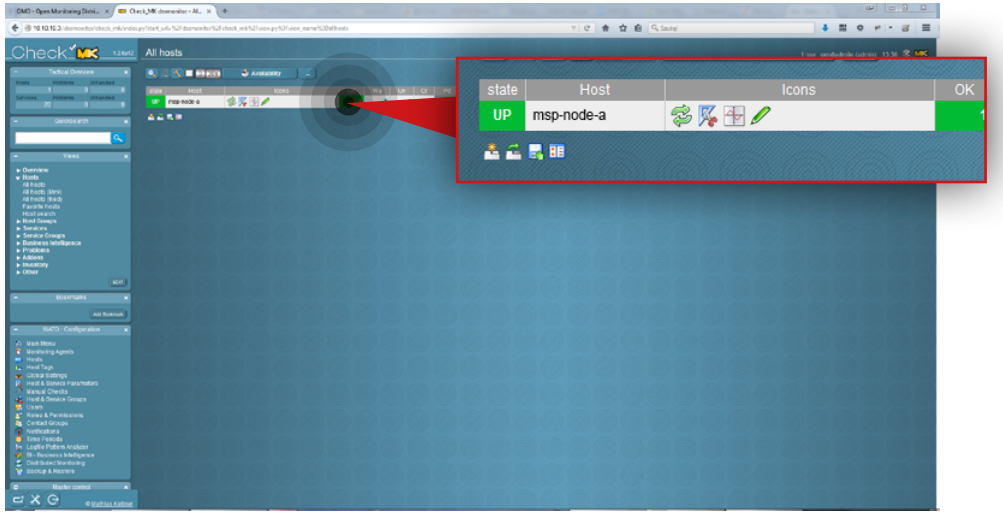


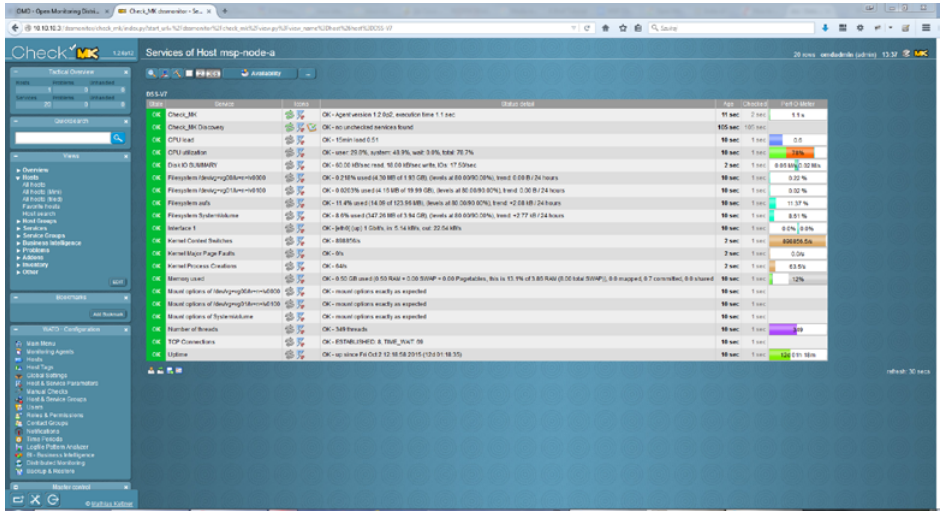
Click **Activate changes** button.



Step 16.

Click the **Hosts** in the **WATO Configuration** section on the left side. Next, click the relevant hostname and then click the **Services** button. Enable services you want to monitor by marking the respective checkboxes. In order to select all services at once, click the **Activate Missing** button above the services list.





5.3.4. Monitoring a node

Step 1.

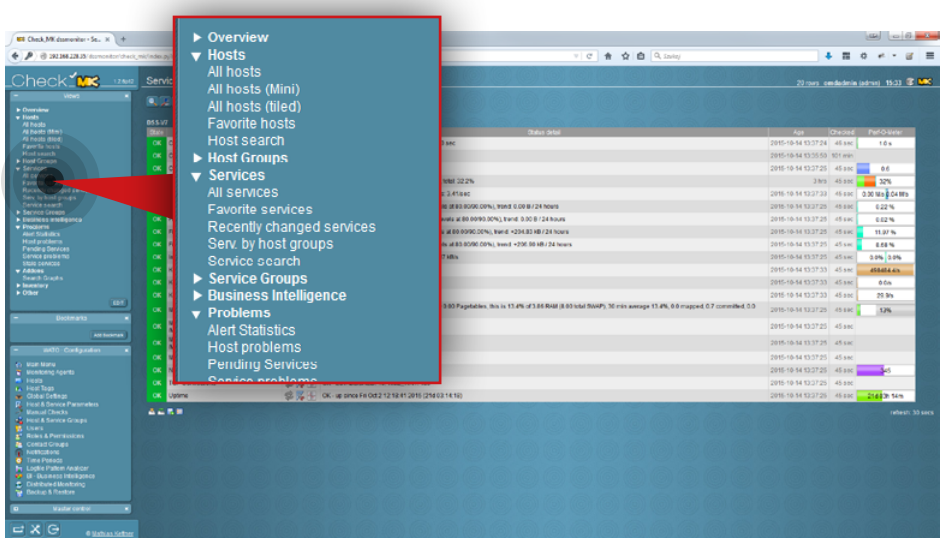
Go to **Hosts » All Hosts** in **Views** section on the left side.

Step 2.

Select host you want to monitor (in this example, the host is **msp-node-a**).

You will then see the statuses of all available services (that are being monitored by the tool). Wait until all statuses are up-to-date. If you want to refresh a particular status immediately use refresh  icon:

In order to monitor both replication and backup tasks running we highly recommend configuring email notifications in Open-E DSS V7. In order to configure email notifications, go to Open-E DSS V7 web interface, navigate to **Setup » Administrator settings** and enable the **Send errors** option in the E-mail notification box.



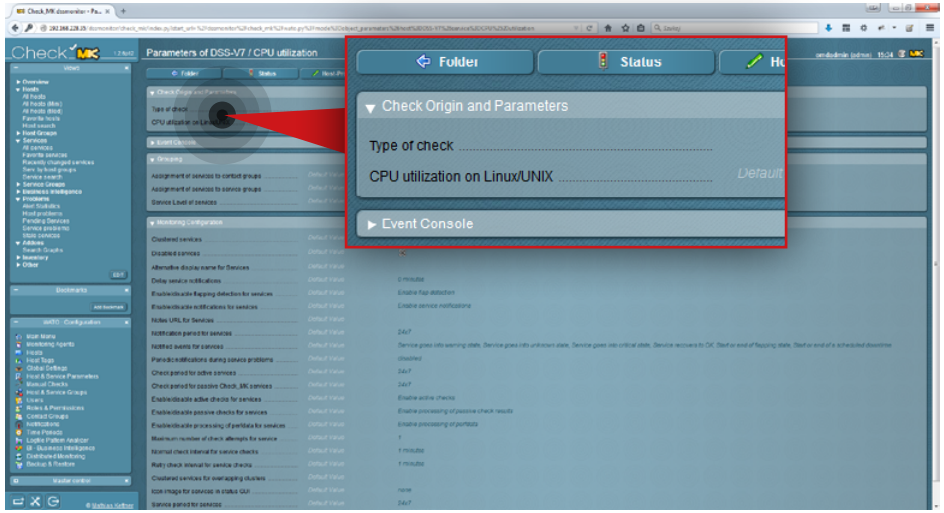
5.3.5. Setting up warning and critical levels for monitored parameters

Step 1.

Go to **Services » All services** in the **Views** section on the left side.

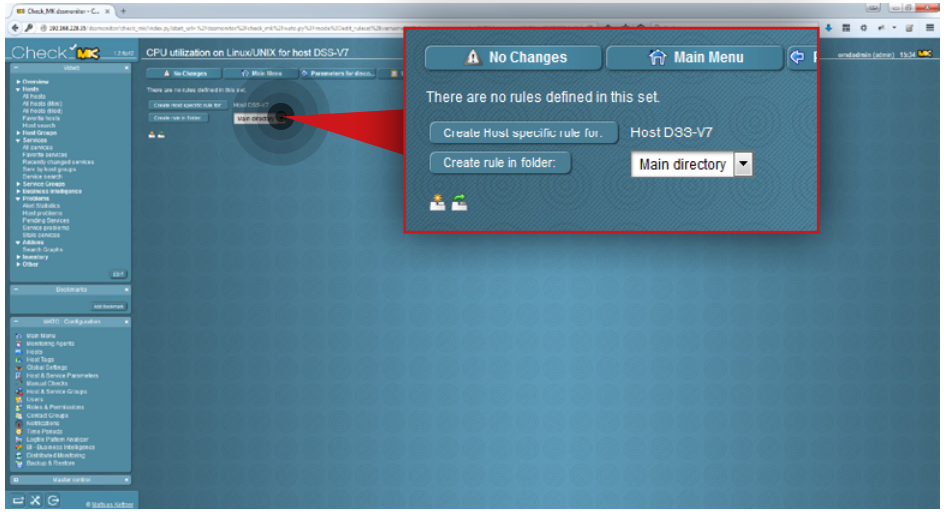
Step 2.

Click the icon  to edit parameters for the selected service (in this example, we will set edit parameters for **CPU utilization**).



Step 3.

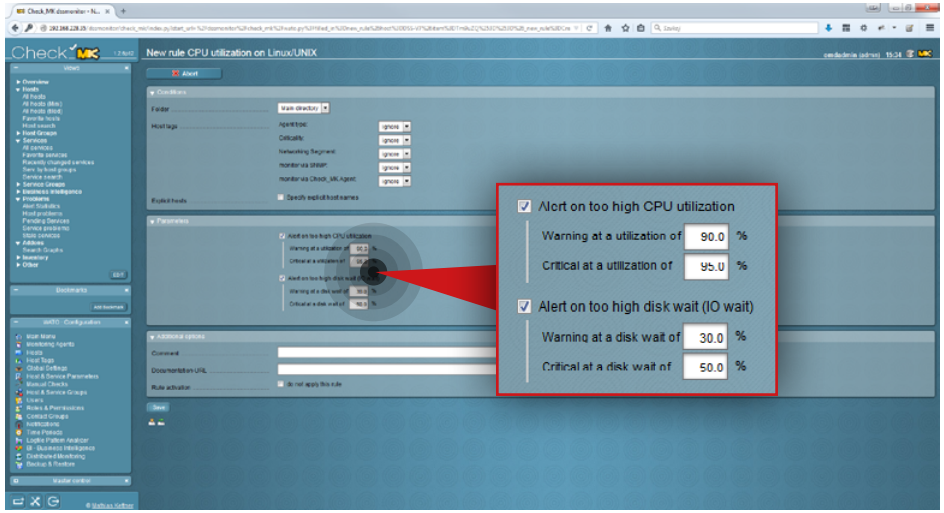
Click **CPU utilization on Linux/UNIX**.



Step 4.

Create a rule for CPU utilization on Linux/UNIX. From this screen you can create a rule for a single host (**Create host specific rule for**) or for all monitored hosts (**Create rule in folder**). In this example we create a rule for all hosts.

1. Select a directory for the rule (in this example, directory in **Main directory**).
2. Click **Create rule in folder** button.



Step 5.

Set the levels for parameters.

1. Navigate to the **Parameters** box.
2. Select which parameters you want to monitor.
3. Set the levels for your selected parameters.
4. Click the **Save** button.

Step 6.

Activate the changes made in your configuration.
Click the **Changes** button at the top and then click **Activate changes**.
From now on, Check_MK will monitor all selected parameters according to the set levels.

Parameters recommended to be checked on DSS V7 nodes			
Monitored parameter	**Description**	**Warning**	**Critical**
CPU utilization	Percentage of CPU used with graphs	70%	90%
CPU load	Linux 'load average' parameter, last 1, 5, 15 minutes (with graphs)	2 per core	3 per core
Memory	Percentage of RAM used with graphs	80%	90%
Disk (partition) and shares usage	Separate monitoring for each disk (partition) including swap utilization as well as all shares available with graphs for each one monitored	80%	90%
Disk IO summary	Disk IO in MB/s with graphs (warning and critical depend on system, adjust after observing it's normal behaviour)	n/a	n/a
RAID status	RAID controller status information (warning and critical depend on controller type and plugin used)	n/a	n/a
RAID BBU Status	RAID Backup Battery Unit status (Operation mode, Charged percent)	< 100%	< 95%
Network utilization	Each network interface utilization with graphs	70%	90%
CPU cores temperature	Each CPU core temperature with graphs (exact warning and critical values depend on server). Values for Intel E5-2630 v2.	60 C	74 C
TCP connections	With graphs	400	800
Uptime	With graphs	n/a	n/a
Replication to MSP	Replication to MSP server status (small update required)	n/a	n/a

5.3.6. Both Provider and Client side monitoring parameters

5.3.7. Configuring OMD email notifications

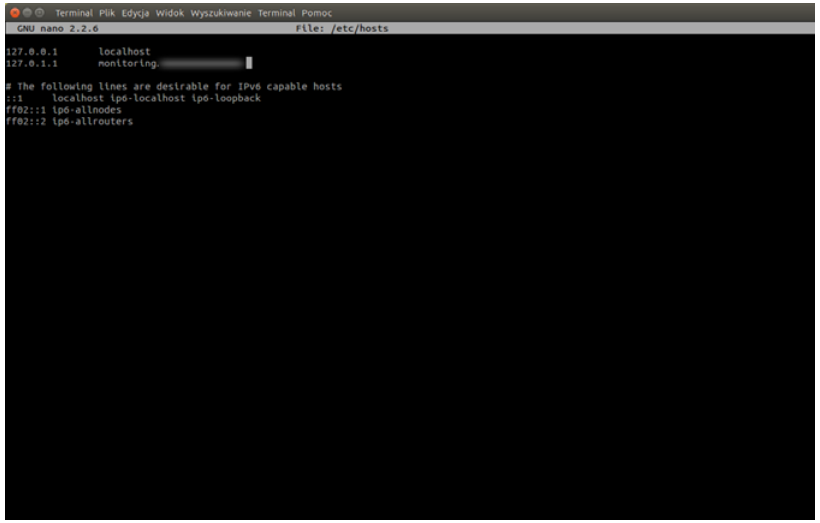
The following steps 1-4 are not mandatory, however, we recommend to change the hostname as most of email providers block emails from host domain names that don't match the IP address used to send a message. If you don't want to change the hostname, proceed to step 5.

Step 1.

From the root level (use "sudo -i" in order to login as root), edit ***/etc/hosts*** file.

```
nano /etc/hosts
```

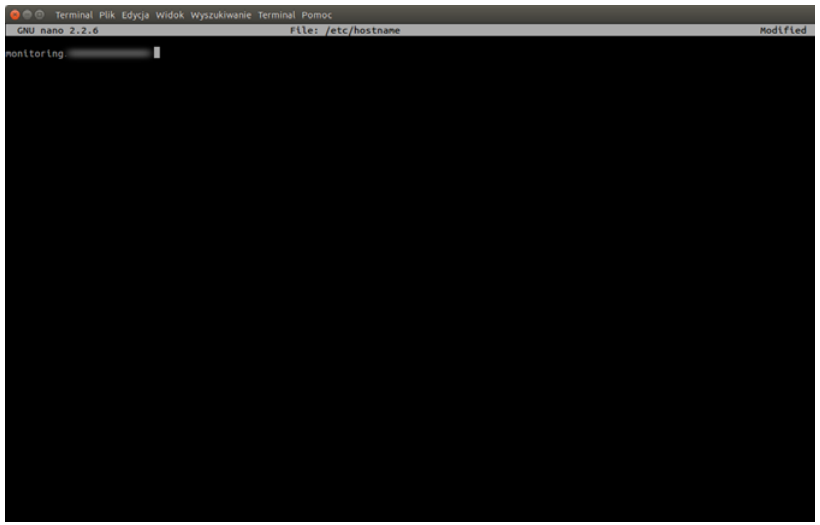
Note: We use a nano editor to edit the file.



Step 2.

Change the Ubuntu default hostname to Fully Qualified Domain Name (FQDN) pointing to the WAN IP address of the router which the mailserver is using. It's necessary to avoid mail being rejected by some mail servers.

Use **Ctrl+O** and click **Enter** to save the file. Then **Ctrl+X** to close the nano editor.



Step 3.

Edit ***/etc/hostname*** and change the Ubuntu default hostname to Fully Qualified Domain Name (FQDN) entered in the previous step.

```
nano /etc/hostname
```

Use **Ctrl+O** and click **Enter** to save the file. Then **Ctrl+X** to close nano editor.

Step 4.

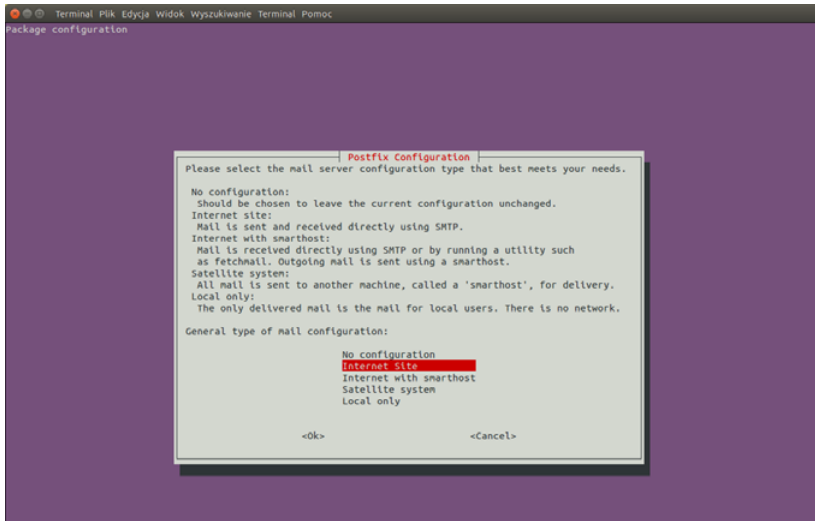
Reboot the system.

```
reboot
```

Step 5.

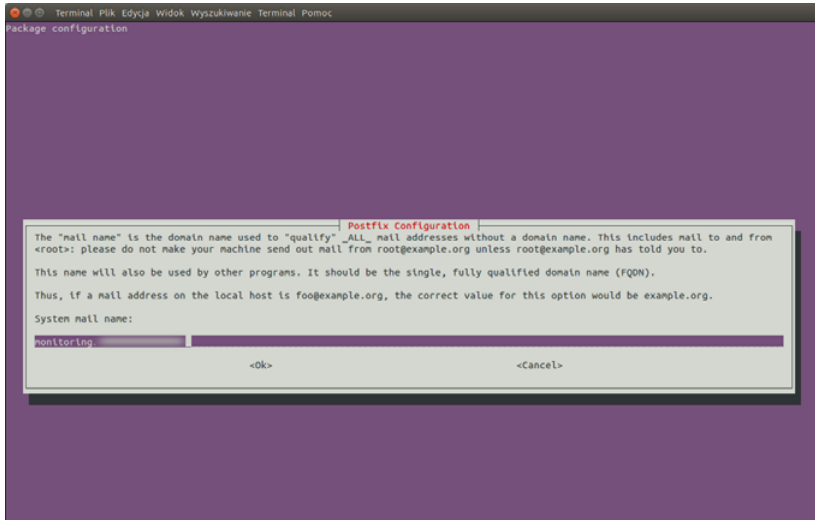
Install a software for handling emails (in this example, **mailutils** package is used). Installing mailtuils will cause Postfix to be installed, as well as a few other programs needed for Postfix to work.

```
apt-get install mailutils
```



Step 6.

Near the end of the installation process, you will be asked to select the mail server configuration type. Select **Internet Site**.



Step 7.

Accept the System mail name unless you didn't specify it in the previous steps.

Step 8.

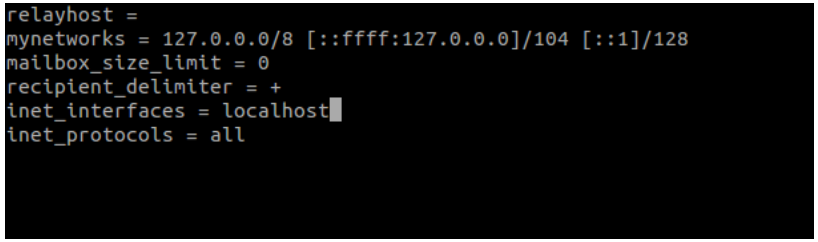
Edit the Postfix configuration file.

```
nano /etc/postfix/main.cf
```

Step 9.

Scroll down and change the line **inet_interfaces = all** to **inet_interfaces = localhost**.

The edited section of the file should now read as shown below. Use **Ctrl+O** and click **Enter** to save the file. Then **Ctrl+X** to close the nano editor.



Step 10.

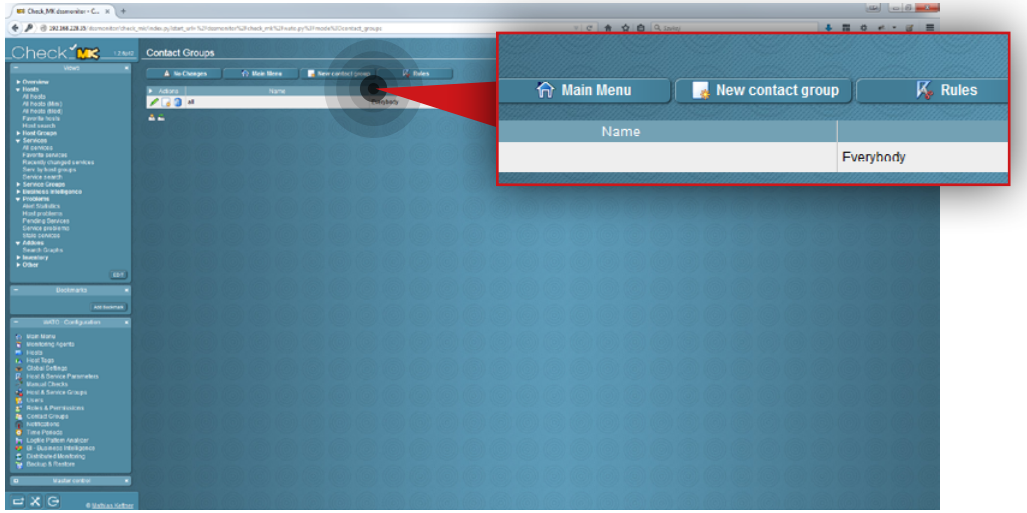
Restart Postfix.

```
service postfix restart
```

Step 11.

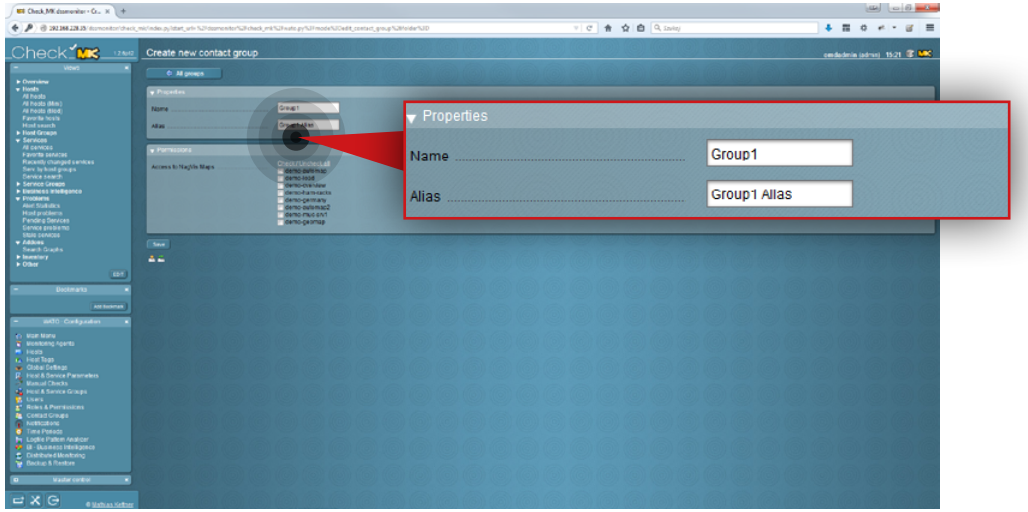
Check whether Postfix can send emails to any external email account. To send a test email, type:

```
echo "Mailbody" | mail -s "Test email subject" test@example.com
```



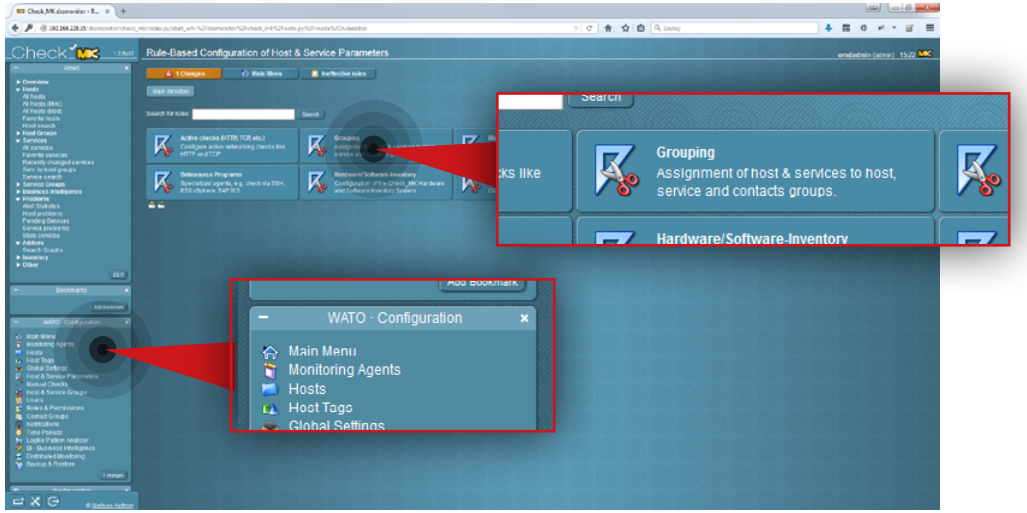
Step 12.

Go to the Check_MK web interface and navigate to **Contact Groups** in the **WATO Configuration** section on the left side. Then, click the **New contact group** button.



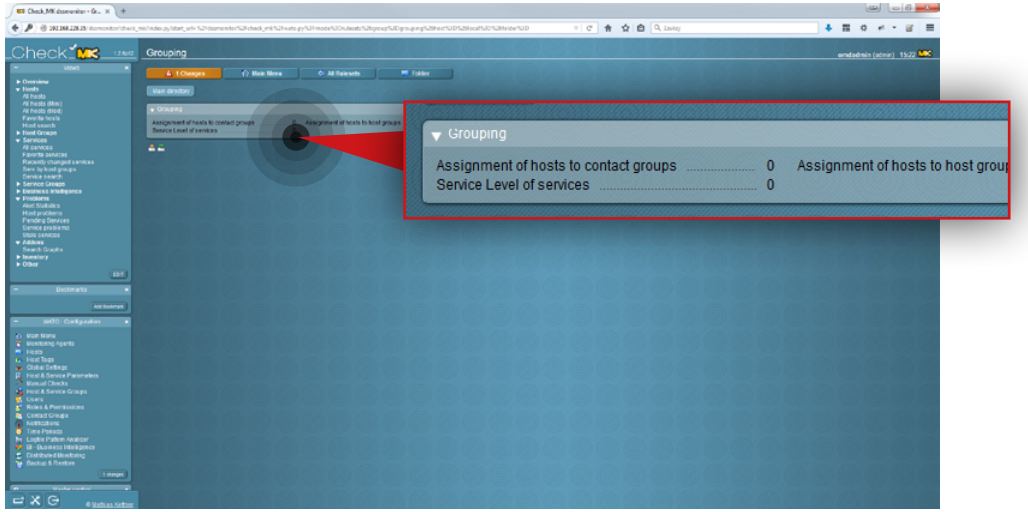
Step 13.

Navigate to the **Properties** box and specify **name** and **alias** for the group (in this example the group name is **Group 1** and the alias is **Group 1 alias**).



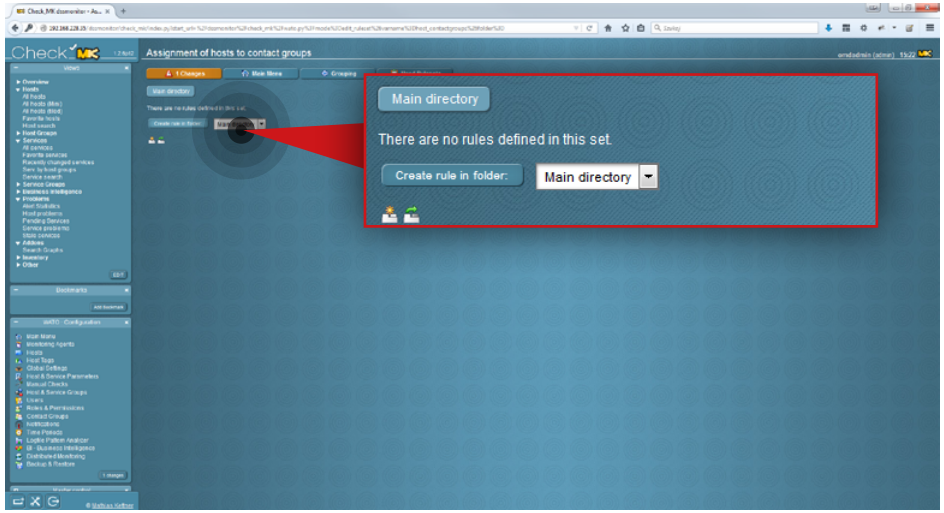
Step 14.

After the group is created, go to **Host&Service Parameters** in the **WATO Configuration** section on the left side and click the **Grouping** button.



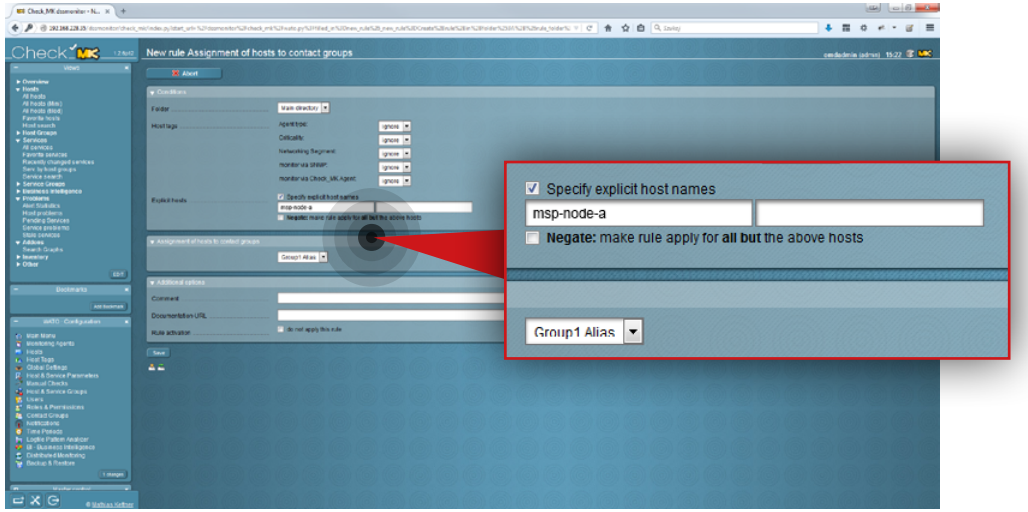
Step 15.

Click the **Assigment of hosts to contact groups**.



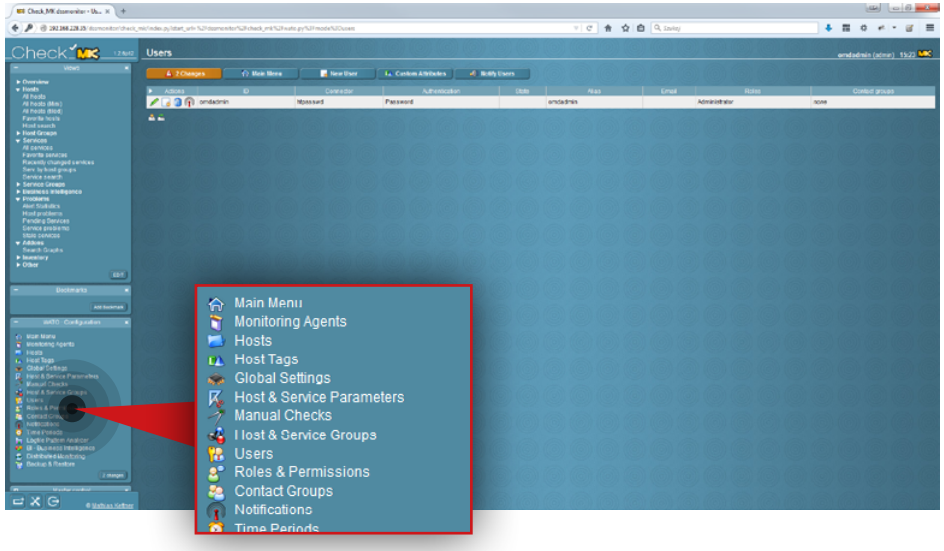
Step 16.

Click **Create rule in folder** button.



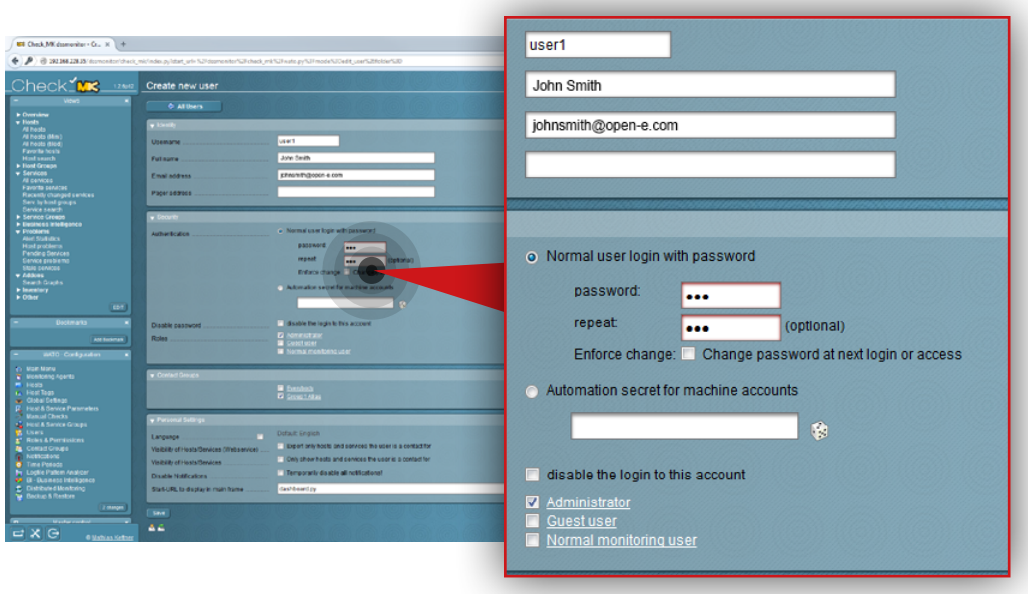
Step 17.

Specify the host name for the rule and assign a host to the contact group (in this example the hostname is **msp-node-a** and the contact group is **Group 1 Alias**).



Step 18.

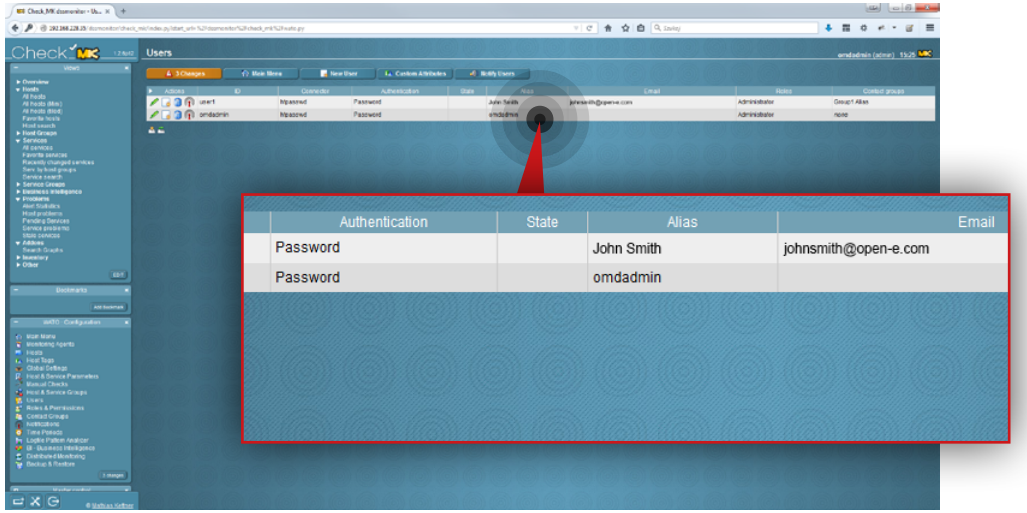
Go to **Users** in the **WATO Configuration** section on the left side.



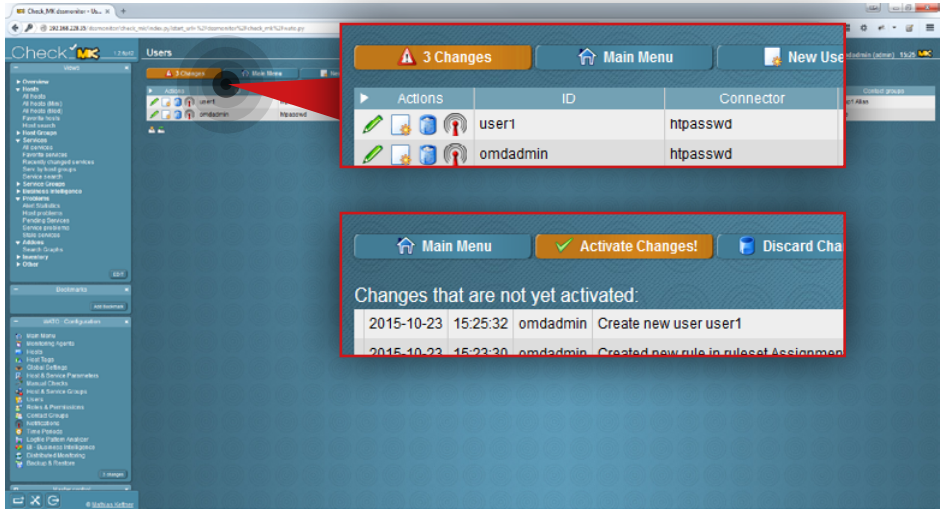
Step 19.

Create a new user:

a. Enter a username (in this example the username is **user1**).
b. Enter full name for the user (in this example, it is John Smith).
c. Enter a user email address (in this example, email is johnsmith@open-e.com).
d. Select the type of authentication (in this example, **Normal user login with password** is selected) and set a password.
e. Select a role for the user (in this example, **Administrator** is selected).
f. Assign the user to a contact group (in this example a user is assigned to **Group1 Alias**).
g. Click the **Save** button.



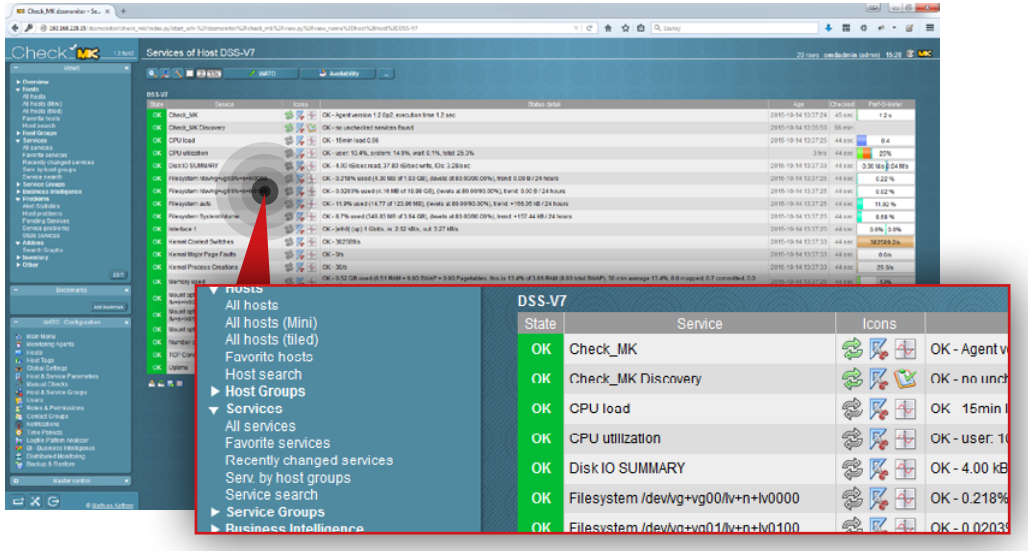
After the user is added, you will see it listed on the Users list.



Step 20.

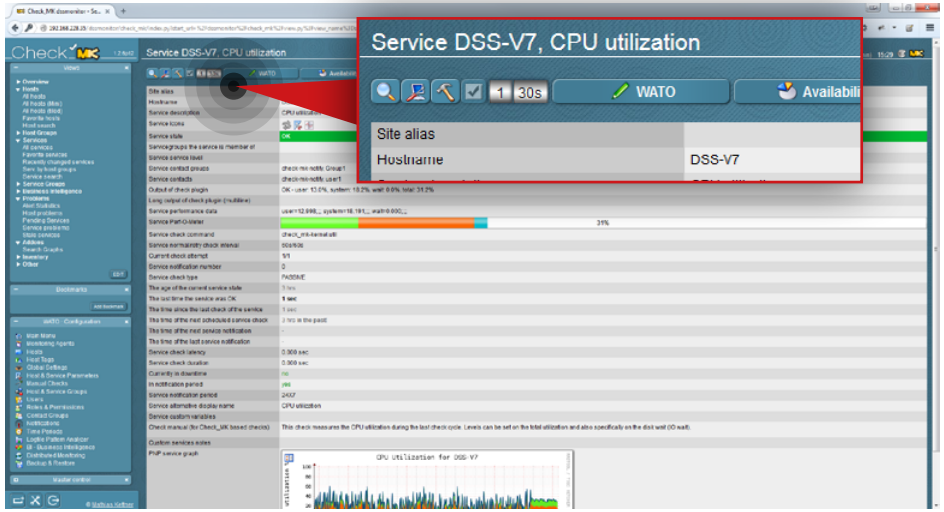
Activate the changes made in the configuration. Click the **Changes** button at the top.

Then click the **Activate changes** button.



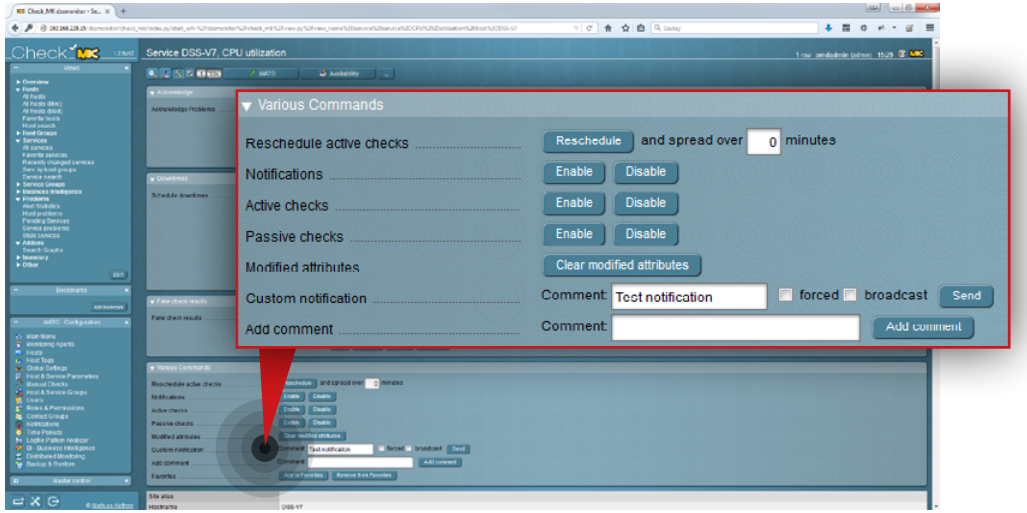
Step 21.

Go to **All services** in the **Views** section on the left side and select a service you want to send with notifications (in this example, the service is **CPU utilization**).



Step 22.

Click the hammer icon on the top.



Step 23.

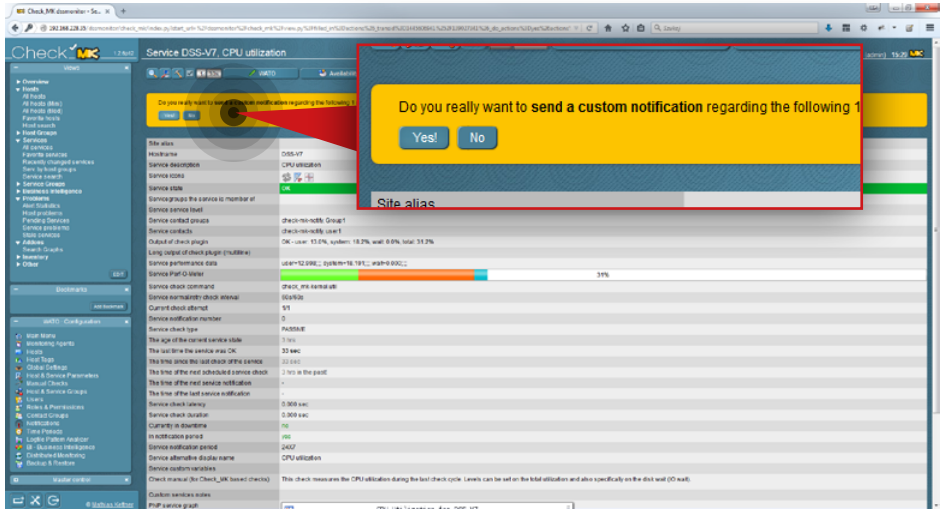
Scroll down to the **Various Commands** section:

a. Enter a comment for Custom notification (in this example, the comment is **Test notification**).

b. Click **Send** button.

Step 24.

Confirm that you want to send a test notification.



Step 25.

Check the Check_MK log files in order to verify if email notifications are being delivered. To do so, execute the following commands:

```
tail /omd/sites/dssmonitor/var/log/notify.log
```

```
tail /omd/sites/dssmonitor/var/log/nagios.log
```

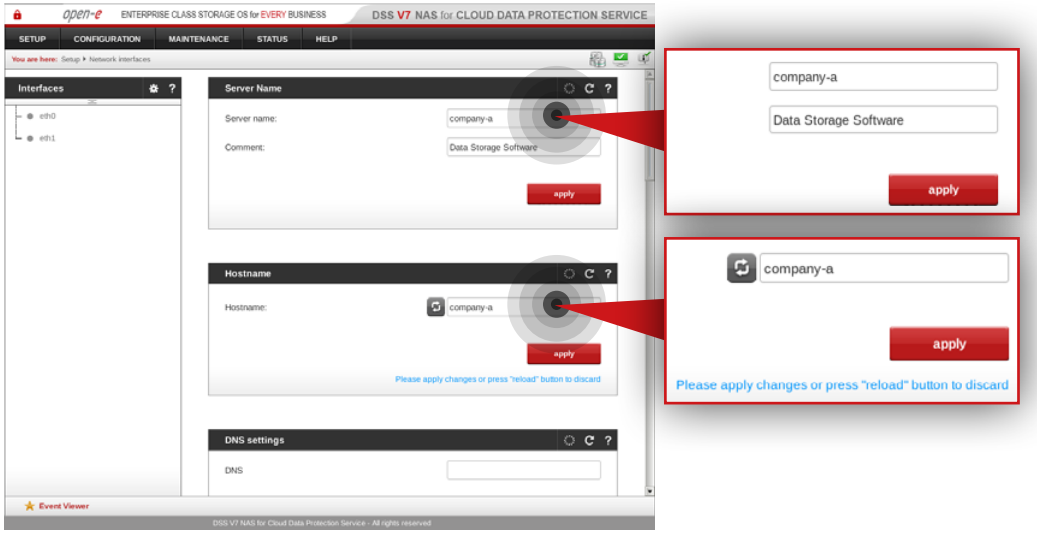
If the log files don't record that a test notification was sent, check your mailserver configuration.

5.4. Detailed procedure of setting up Customer node

Prerequisites
Please complete the following prerequisites.

- Server meets requirements for Customer node introduced in Chapter **4 – Minimum hardware requirements**
- Open-E DSS V7 NAS for CDPS installed on the node
- MSP nodes configured according to procedure introduced in Chapter **5.2 – Detailed procedure of setting up MSP nodes**

If all the prerequisites have been met, you're now ready to start the Customer node configuration.

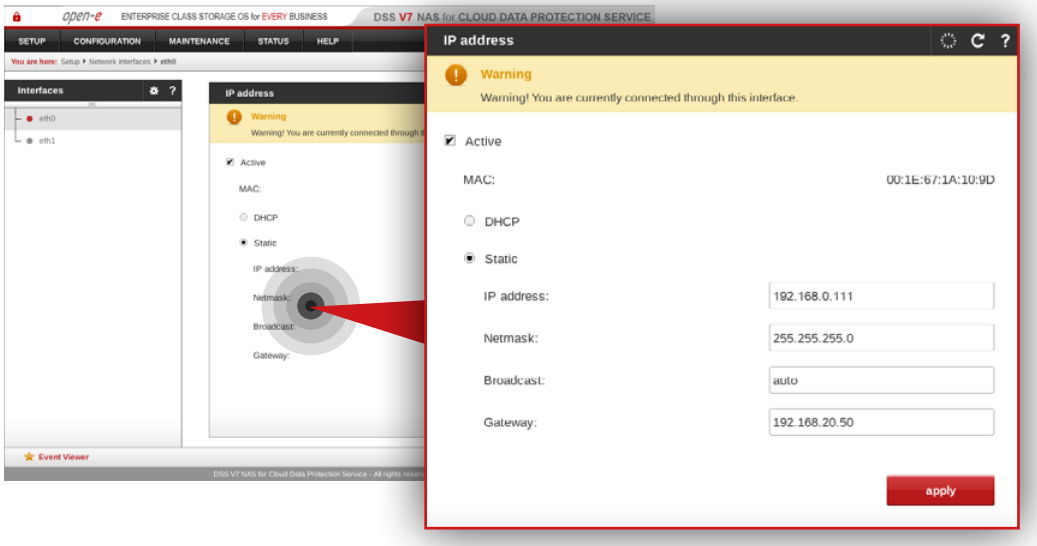


Step 1.

Go to **Setup » Network interfaces** and change server name and hostname to **company-a**.

Click **apply** to confirm the changes.

Note: Changing the hostname requires the system to reboot.



Step 2.

Go to **Setup » Network interfaces** and configure the Ethernet ports. Click **apply** to confirm the changes.

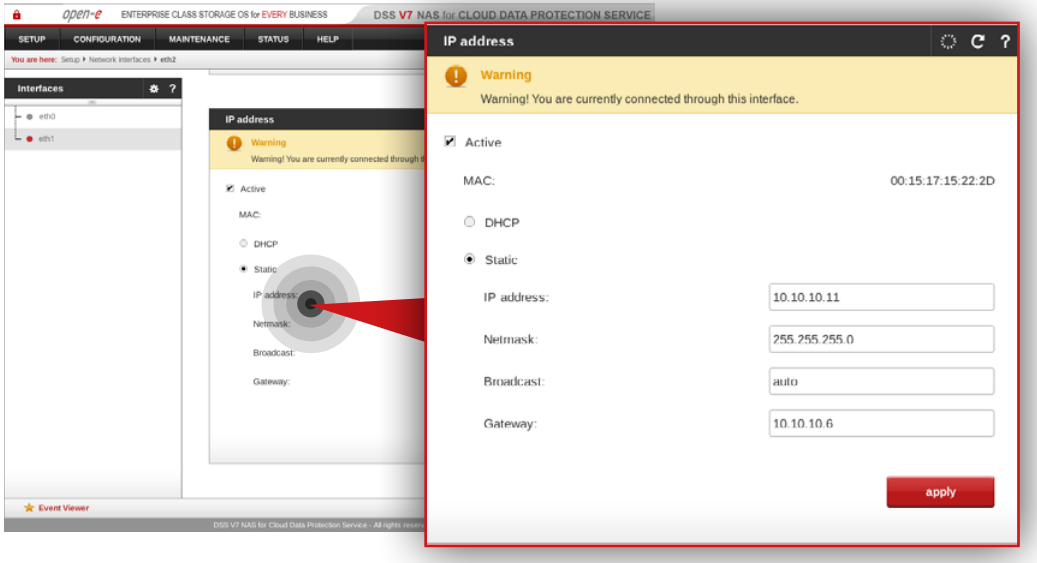
It is recommended to configure two interfaces:

- 1Gbit interface for access to the Open-E DSS V7 web interface
- 1Gbit interfaces for data replication

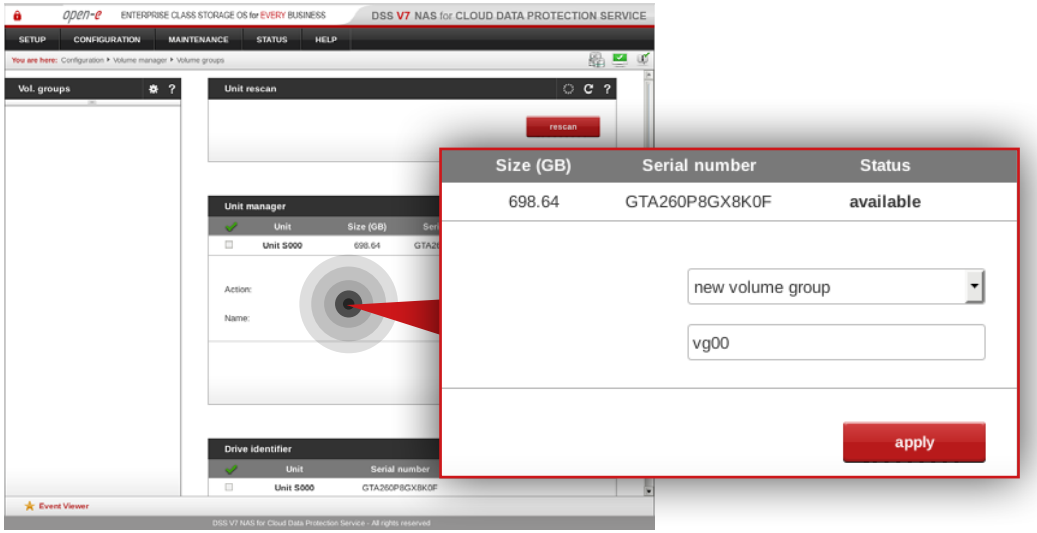
In this example interfaces are used as follows:

- eth0 is used for web access to Open-E DSS V7
- eth1 is used for data replication

Note: Changing the network interface IP address will restart the network configuration on this node.



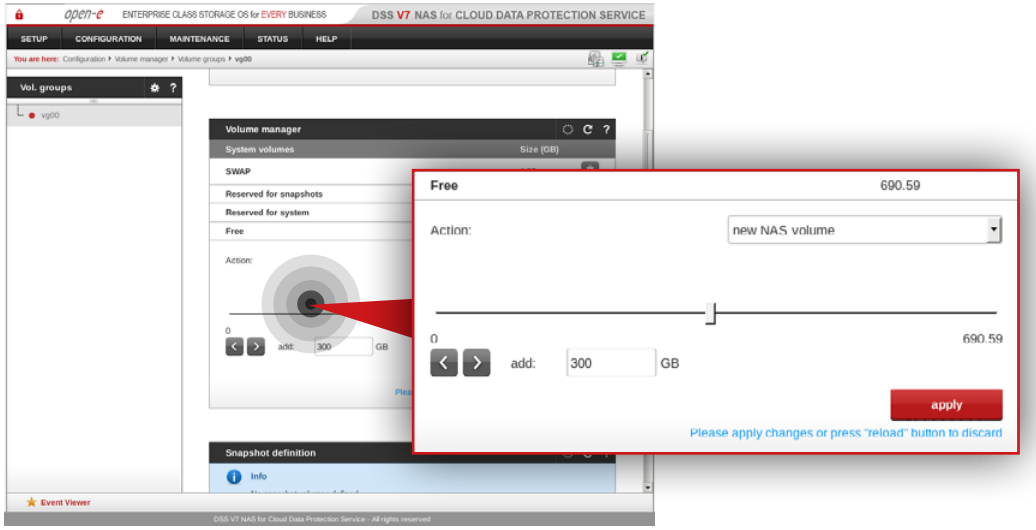
Note: The IP addresses used in this example are for the purpose of this manual only. You should configure your Ethernet ports according to your network topology.



Step 3.

Go to **Configuration » Volume manager » Volume groups**.

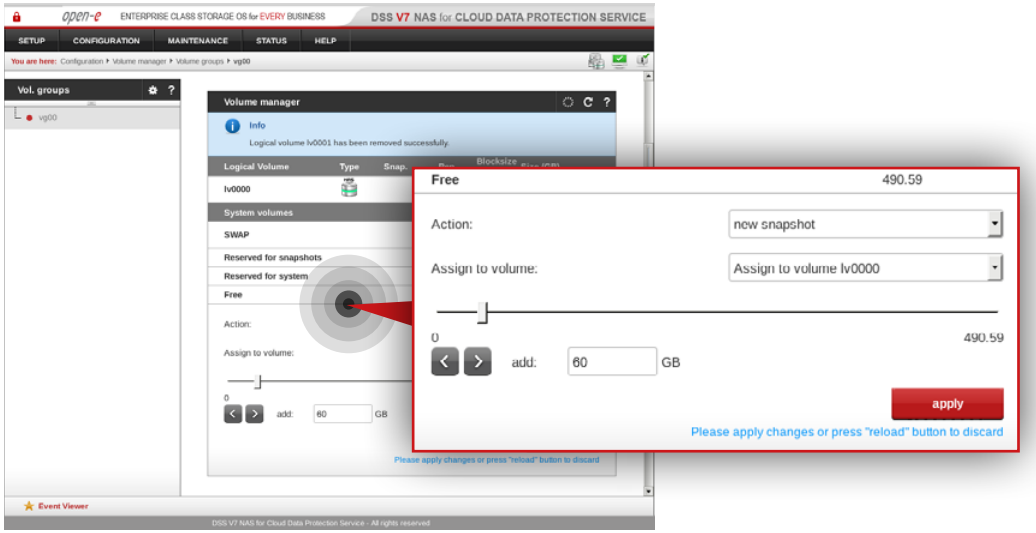
a. To create a volume group, select a disk from the Unit manager.
b. Enter a name for the volume group (in this example, the volume name is **vg00**).
c. Click **apply** button.



Step 4.

Select vg00 from the menu on the left side.

a. Create new NAS volume (in this example, the volume name is **lv0000**).
b. Click **apply** button.

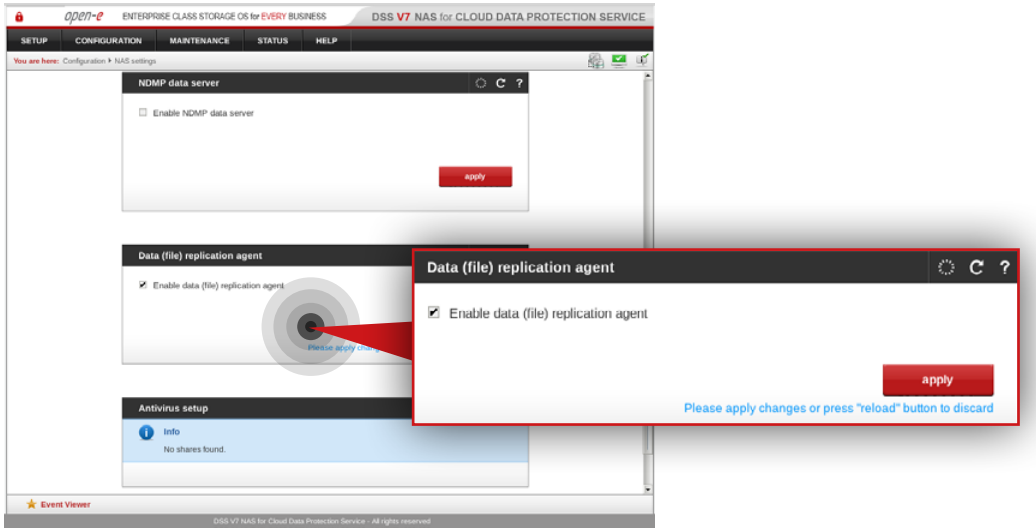


Step 5.

Create snapshots assigned to the NAS volume lv0000 created in step 5.

It is recommended to create snapshots of a size that is at least 20% of the NAS volume size to which it is assigned.

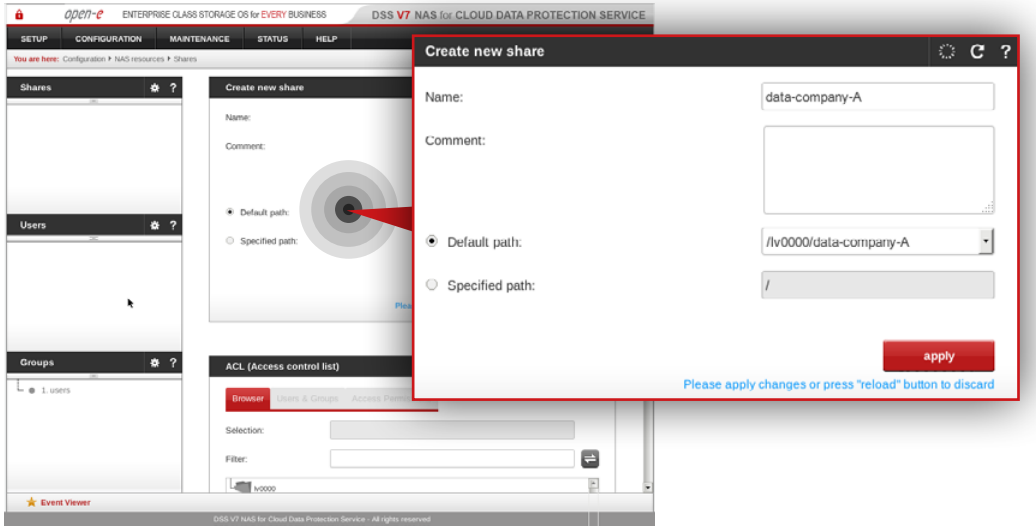
It is highly recommended to monitor snapshot use. If the snapshot capacity is exceeded the system may become unstable.



Step 6.

Go to **Configuration » NAS settings**.

a. Check the **Enable Data (file) replication agent**.
b. Click **apply** button.



Step 7.

Go to **Configuration » NAS resources » Shares** and create a share for data that will be replicated from the Customer node to the MSP node.

a. Enter a name for the share (in this example, the share name is **data-company-A**).
b. Select **lv0000** as a default path for the share.
c. Click **apply** button.

Note: There is an option to configure a local backup for the Customer node. For more details proceed to Chapter **5.7 - Optional procedure for setting up local backup for Customer node**.

Prerequisites
Please complete the following prerequisites.

- MSP VPN/Monitoring node configured according to procedure introduced in Chapter **5.2 – Detailed procedure of setting up MSP nodes**
- Customer node configured according to procedure introduced in Chapter **5.4 – Detailed procedure of setting up Customer node**
- Router meets requirements introduced in Chapter **4 – Minimum hardware requirements** or a router of your choice with built-in OpenVPN support.
- A computer running Windows to configure VPN software

If all the prerequisites have been met, you're now ready to start the configuration.
The following step shows how to configure the VPN software used for the encrypted connection between MSP and Customer node. SoftEther VPN is an easy-to-use multi-protocol VPN software running on Windows, Linux, Mac, FreeBSD and Solaris. Learn more on **www.softether.org**.

5.5.1. MSP VPN/Monitoring node configuration

The following steps show how to configure the SoftEther VPN Server software on the MSP VPN/Monitoring node.

Step 1.

Go to **http://www.softether-download.com/** and search for the SoftEther VPN Server version dedicated for your CPU and operating system combination.

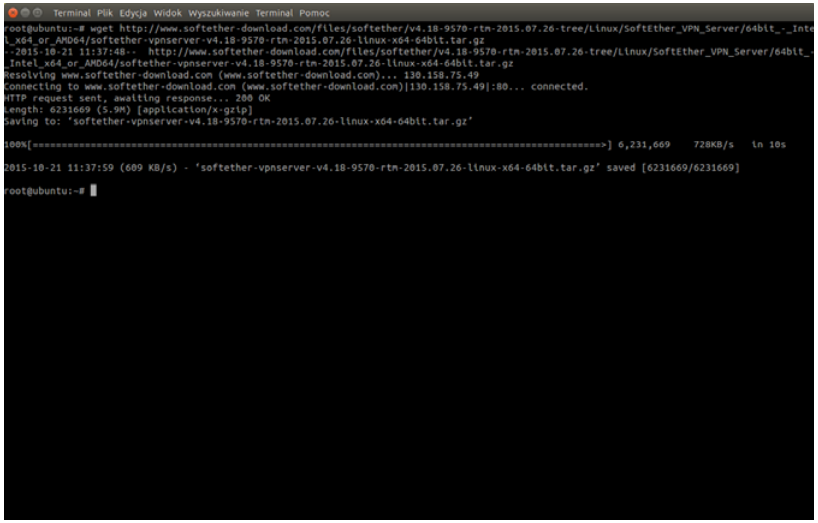
a. Select **SoftEther VPN Server** as a component to download.
b. Select your platform (in this example, **Linux** is selected).
c. Select your CPU (in this example, **Intel x64/AMD64 (64bit)** is selected).
d. Search for the **latest "rtm" version** (in this example, **SoftEther VPN Server (Ver 4.18, Build 9570, rtm)** is used.

Step 2.

From root level (use "sudo -i" in order to login as root) download SoftEther VPN Server.

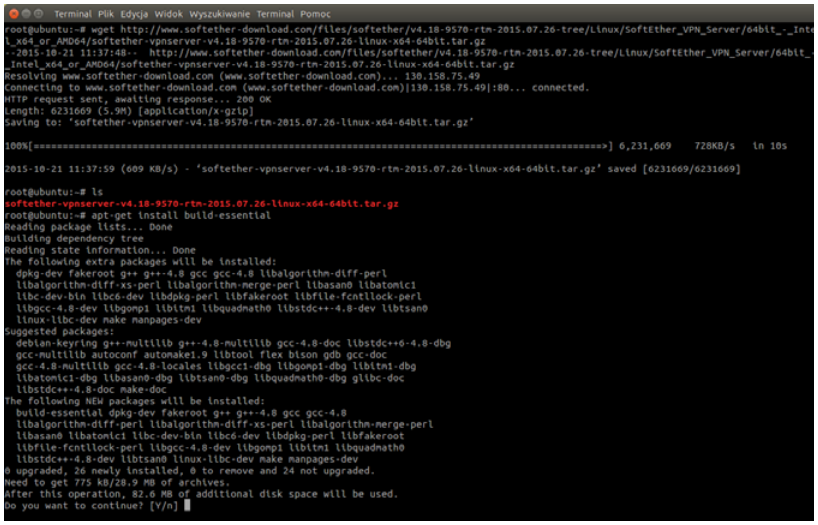
```
wget http://www.softether-download.com/files/softether/v4.18-9570-rtm-2015.07.26-tree/Linux/SoftEther_VPN_Server/64bit_-_Intel_\
x64_or_AMD64/softether-vpnserver-v4.18-9570-rtm-2015.07.26-linux-x64-64bit.tar.gz
```

Note: The file name to download may be different, depending on your operating system and CPU combination.



After the download is completed, the output should be as shown on the left side.

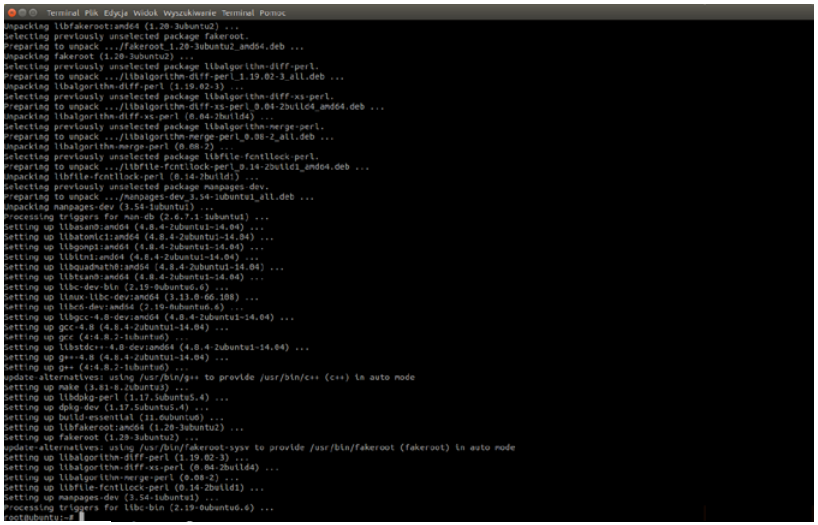
Tip: In order to check whether the software was downloaded type "**ls**". You should see ***SoftEther_VPN_Server/64bit_-_Intel_x64_or_AMD64/softether-vpnserver-v4.18-9570-rtm-2015.07.26-linux-x64-64bit.tar.gz*** listed in the root directory.



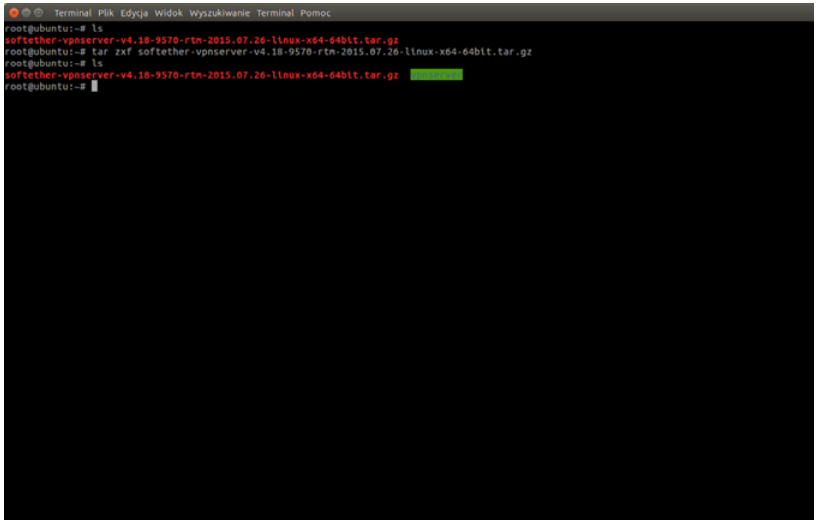
Step 3.

Install the software essential to compile SoftEther VPN Server.

```
apt-get install build-essential
```



When the system asks if you want to continue, type "**Y**" and press **Enter**. Installation starts.

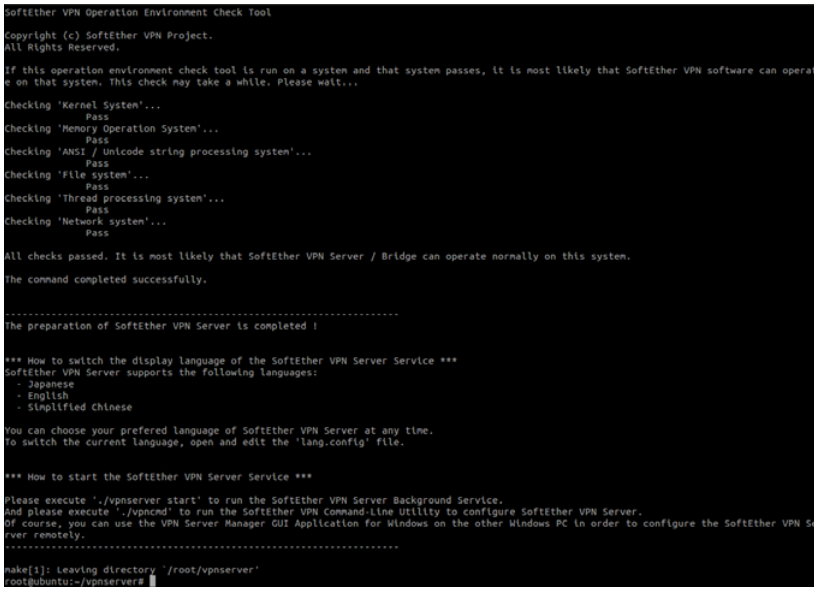


Step 4.

Extract the package with the SoftEther VPN software.

```
tar zxf softether-vpnserver-v4.18-9570-rtm-2015.07.\
26-linux-x64-64bit.tar.gz
```

Type ls in order to check if the package was extracted and the vpnserver directory was created.



Step 5.

Go to the vpnserver directory and compile the software.

```
cd vpnserver
make
```

After the software is compiled, the output should be as on the left.

```
#!/bin/sh
# chkconfig: 2345 99 01
# description: SoftEther VPN Server
DAEMON=/root/vpnserver/vpnserver
LOCK=/var/lock/vpnserver
test -x $DAEMON || exit 0
case "$1" in
start)
$DAEMON start
touch $LOCK
;;
stop)
$DAEMON stop
rm $LOCK
;;
restart)
$DAEMON stop
sleep 3
$DAEMON start
;;
*)
echo "Usage: $0 {start|stop|restart}"
exit 1
esac
exit 0
```

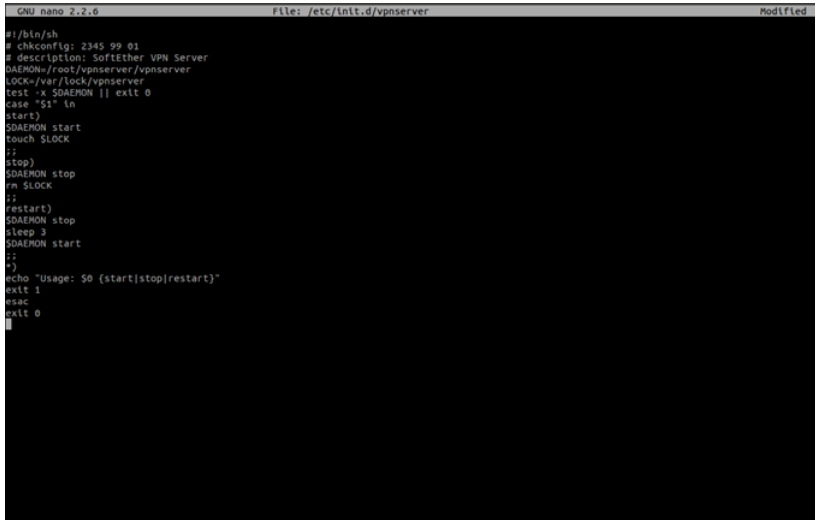
Step 6.

Make a startup script for the SoftEther VPN software.

```
nano /etc/init.d/vpnserver
```

Note: We use nano editor to edit the file.

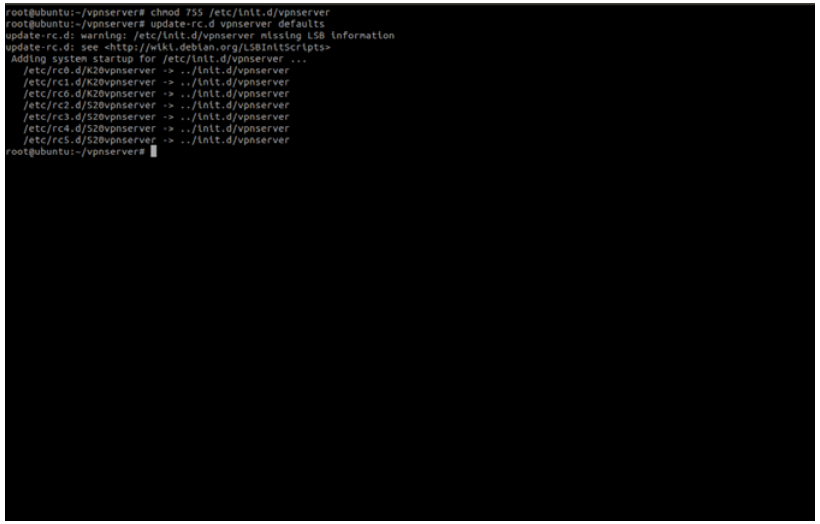
Paste the code from the left into the ***/etc/init.d/vpnserver*** file.



After editing, the ***/etc/init.d/vpnserver*** file should look like on the screenshot.

Use **Ctrl+O** and click **Enter** to save the file. Then **Ctrl+X** to close nano editor.

Note: In this example we installed VPN server in the /root directory. If you installed the software in a different location you have to change **DAEMON=/root/vpnserver/vpnserver** accordingly.



Step 7.

Set permissions for the file created in the previous step and add script to startup.

```
chmod 755 /etc/init.d/vpnserver
update-rc.d vpnserver defaults
```

Step 8.

Setup the network interface dedicated to the VPN bridge (eth1 in this example) and the VPN subnet (eth0:0 in this example) by editing the ***/etc/network/interfaces*** file.

```
nano /etc/network/interfaces
```

Note: We use nano editor to edit the configuration file.

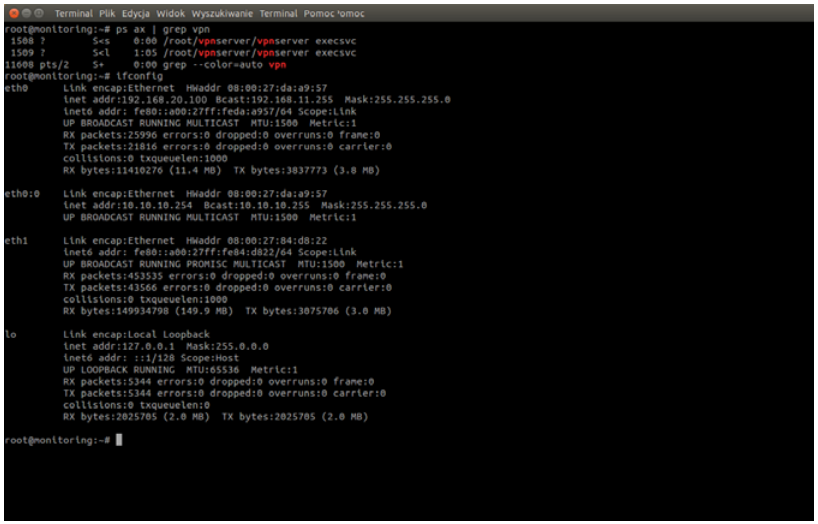
Scroll down and add the following:

```
# Network interface for SoftEther VPN bridge
auto eth1
iface eth1 inet manual
    pre-up ifconfig eth1 up
    pre-down ifconfig eth1 down

# Network interface for VPN subnet
auto eth0:0
iface eth0:0 inet static
    address 10.10.10.254
    netmask 255.255.255.0
```

Note: The eth0:0 IP address and netmask should be appropriate for your network configuration. It may be necessary to add more IP addresses in order to connect to all client nodes in different VPN subnets (for example eth0:1 with 10.10.11.254 address to connect to 10.10.11.12 client).

Use **Ctrl+O** and click **Enter** to save the file. Then **Ctrl+X** to close nano editor.



Step 9.

Reboot the system.

Step 10.

Check if SoftEther VPN Server is running and interfaces are up.

```
ps ax | grep vpn
ifconfig
```

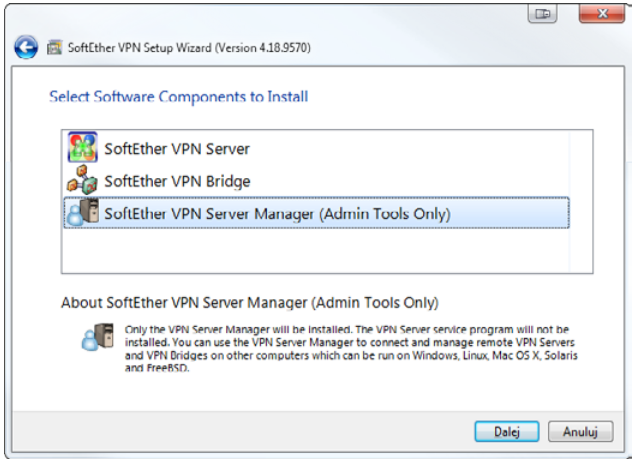
Tip: If the VPN server is not running you may try to start it manually.

Manual startup via start script:

```
/etc/init.d/vpnserver start
```

Manual startup using server binary:

```
/root/vpnserver/vpnserver start
```



5.5.2. Windows client configuration

The following steps show how to configure the Windows SoftEtherVPN Manager tool on a Windows client machine.

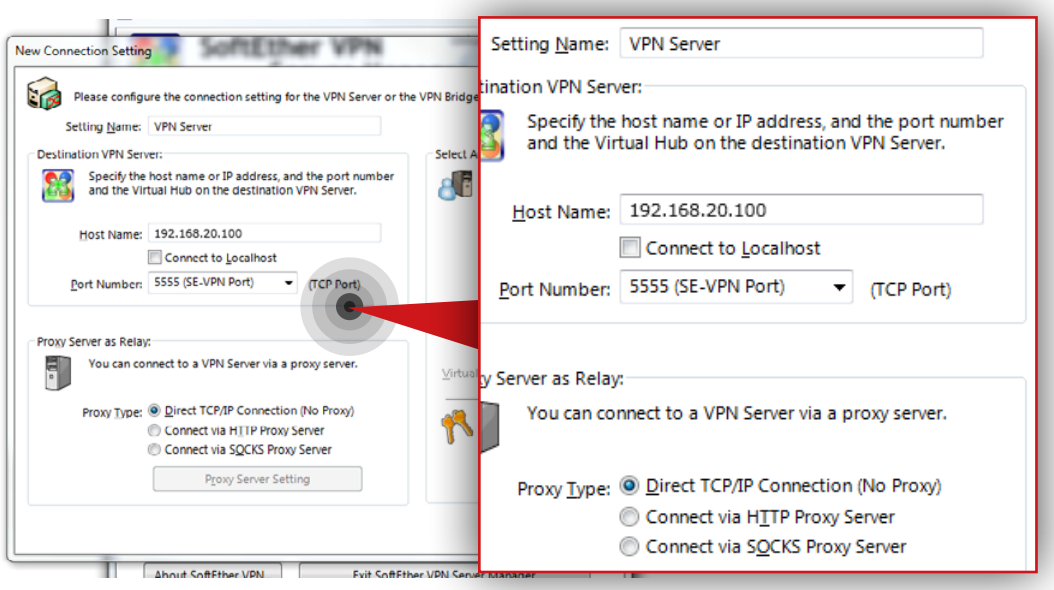
Step 1.

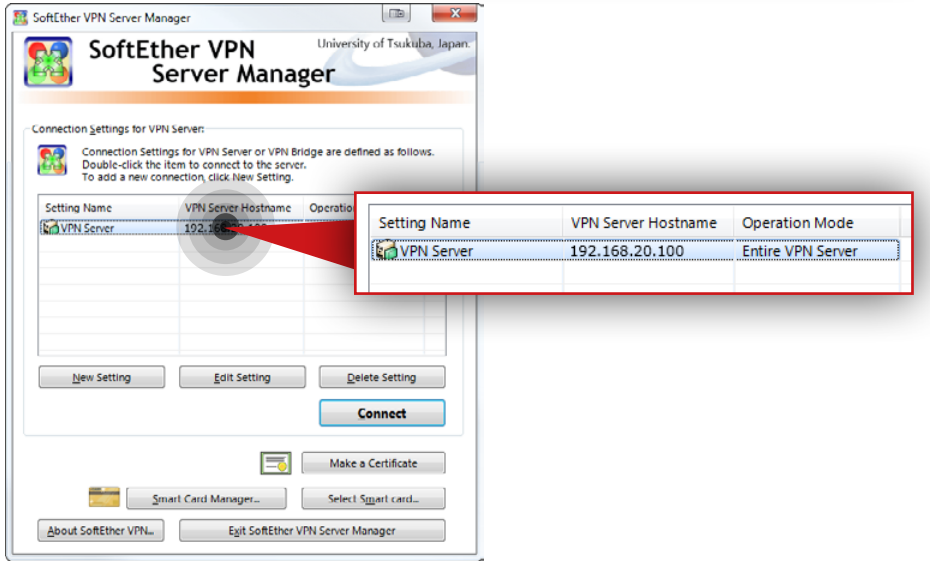
Go to **https://www.softether.org/5-download** and download the software.

Step 2.

Install the software on the Windows client. When asked for software components to install, select **SoftEther VPN Server Manager (Admin Tools Only)**.

After the installation is completed you will see the SoftEther VPN Server Manager home screen.



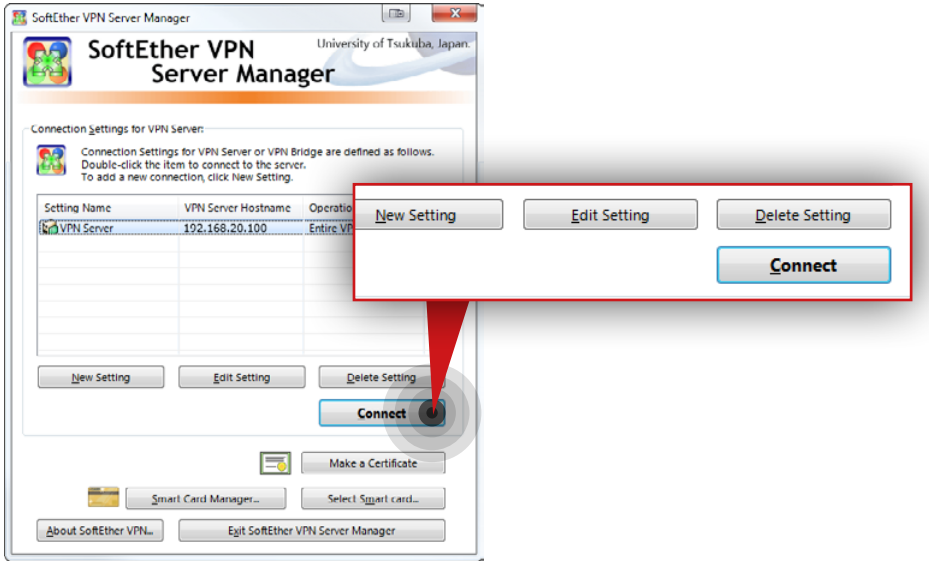


Step 3.

Click **New settings** and configure a new connection to the **VPN server**.

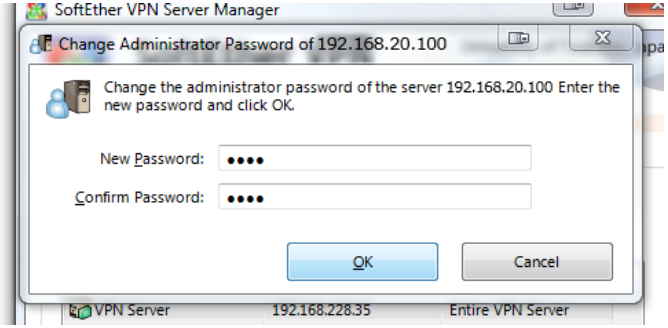
a. Set a name for the connection (in this example, the name is **VPN Server**).
b. Enter the VPN/Monitoring node hostname or IP address (in this example we use **192.168.20.100**).
c. Set a port number (we recommend **5555** for the initial configuration).
d. Make sure that **Direct TCP/IP Connection** is checked in the Proxy Server as Relay settings.
e. Make sure that **Server Admin Mode** is checked in the Administration mode settings.
f. Click **OK**.

After a new connection is added to the VPN server, you will see it listed on the connections list of the home screen.



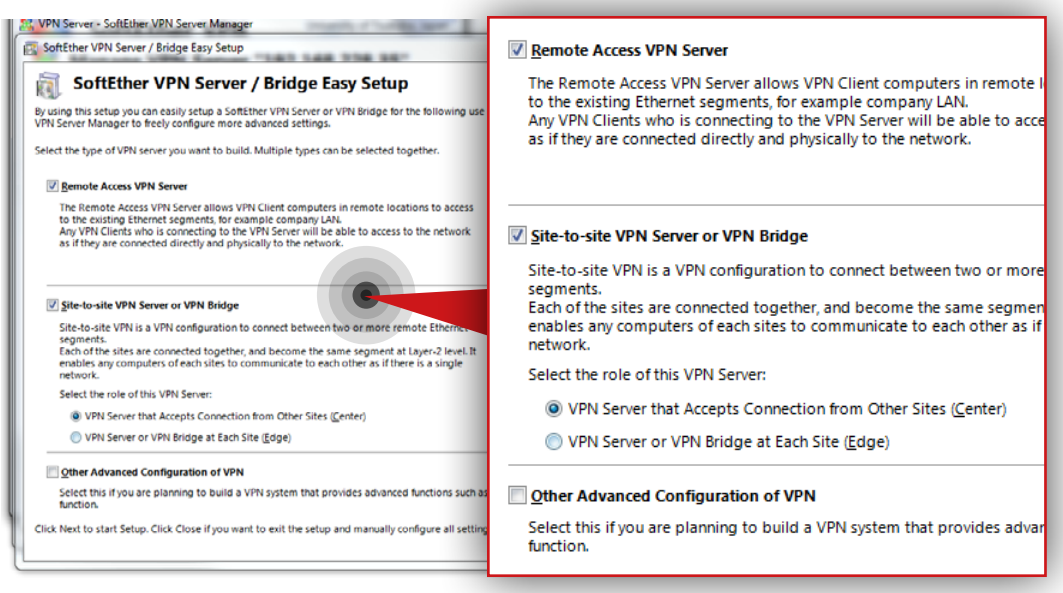
Step 4.

Click the **Connect** button and connect to the VPN server.



Step 5.

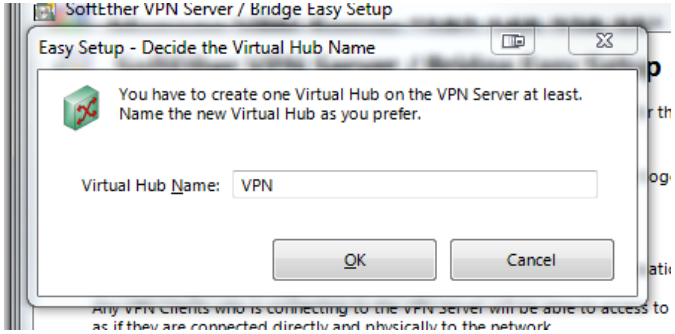
Set an administrator password for the VPN server connection and click **OK** button.



Step 6.

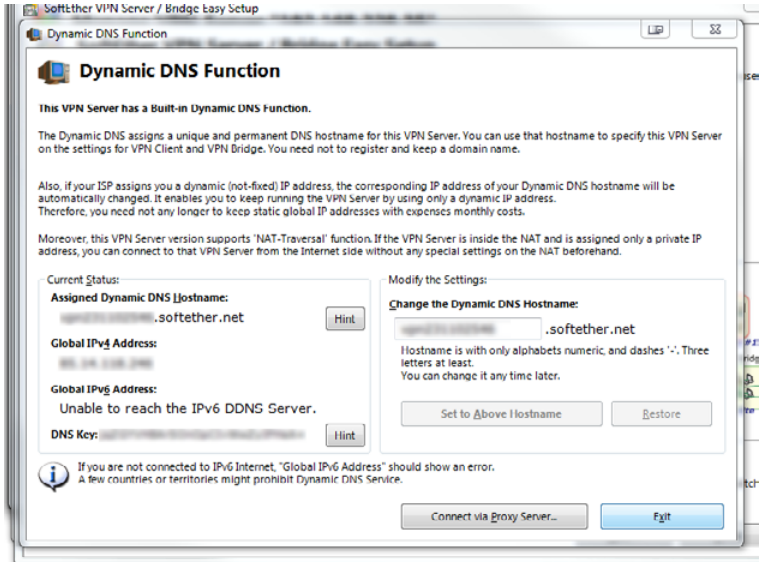
After the password to the VPN server is set, you will be asked to select the type of VPN Server you want to build.

a. Make sure **Remote Access VPN Server** is checked.
b. Make sure **Site-to-site Server or VPN Bridge** is checked.
c. Make sure **VPN Server that Accepts Connection from Other Sites (Center)** is checked.
d. Click **Next**.



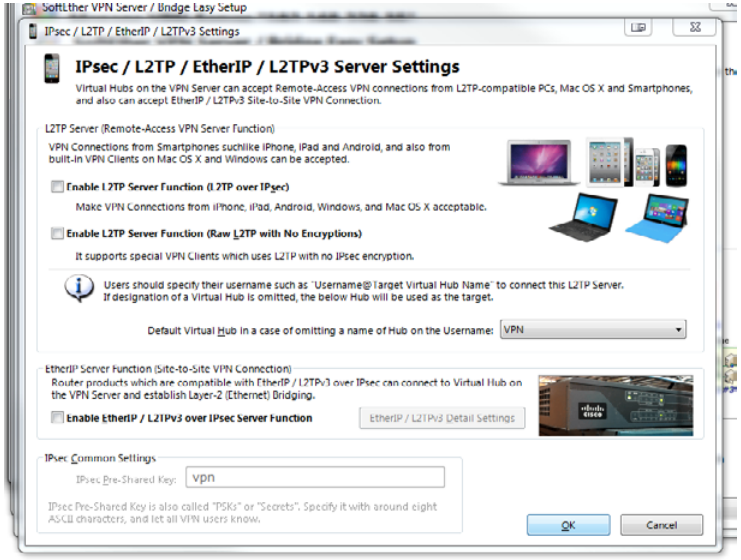
Step 7.

Next, you will be asked to set a name for the Virtual Hub (in this example, the Virtual Hub Name is **VPN**). Enter a name for the Virtual Hub and click **OK**.



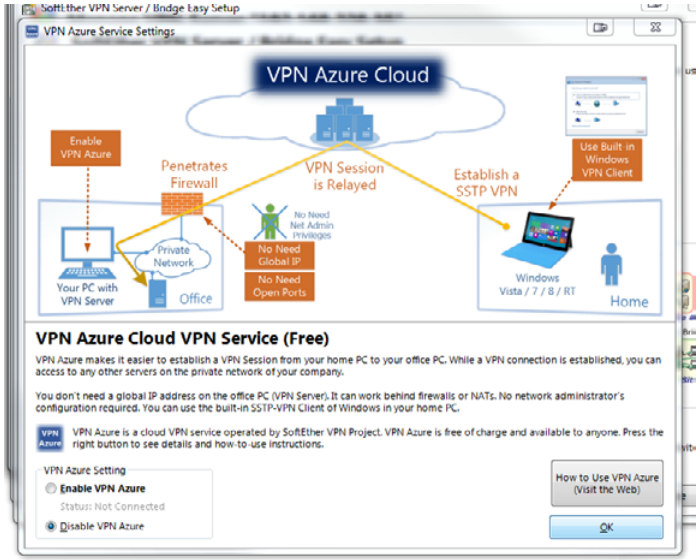
Step 8.

Next, configure the **Dynamic DNS Function** (in this example, the DNS configuration is shown on the screenshot on the left).



Step 9.

Next, you will be asked about additional protocols for VPN connections. In this example we don't use them, so make sure they are all disabled.

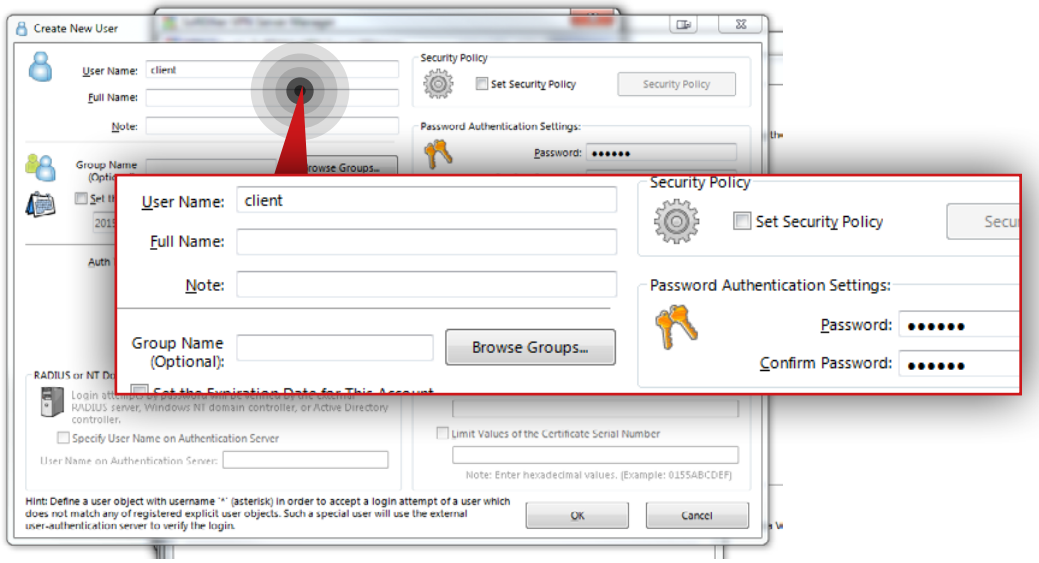


Step 10.

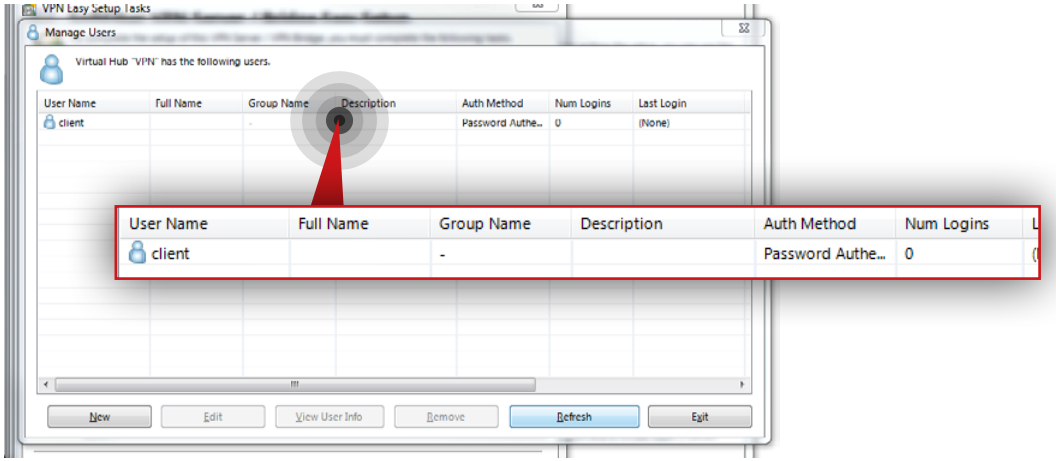
Next, you will be asked whether to enable VPN Azure Cloud (in this example we don't use this service, so make sure it is disabled). Click **OK**.

Step 11.

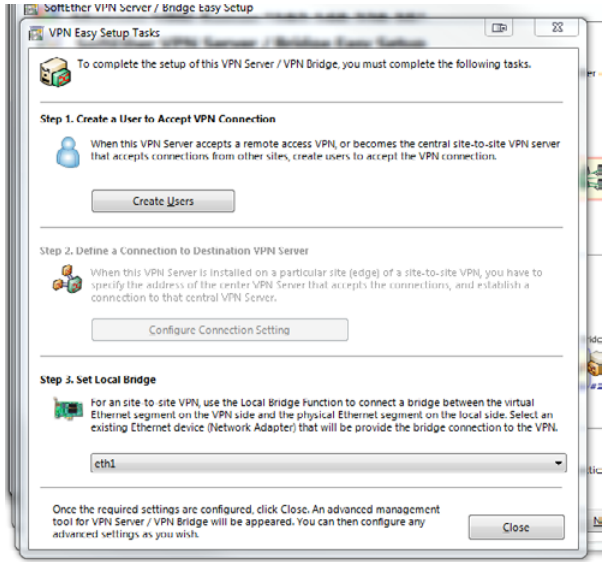
On the next screen, click **Create Users** and create a new user to accept VPN connections.



a. Set a name for the user (in this example, the user name is **client**).
b. Select **Password Authentication** as a Authentication type.
c. Set a password for authentication.
d. Click **OK.**

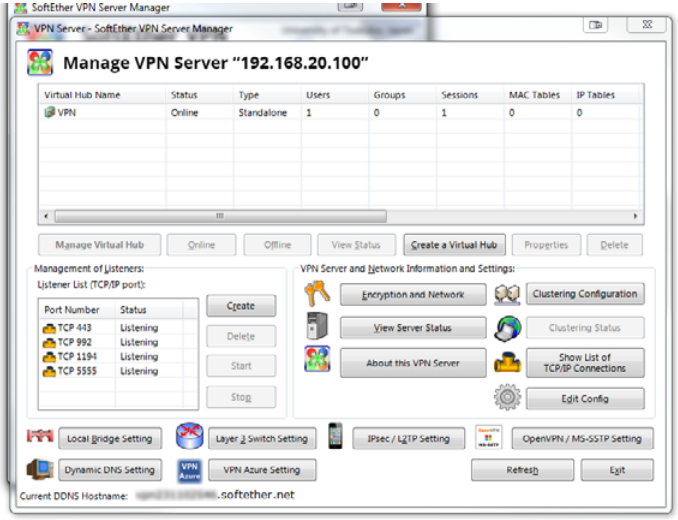


After the user is created you will see it listed in the Users list. Click **Exit** button.



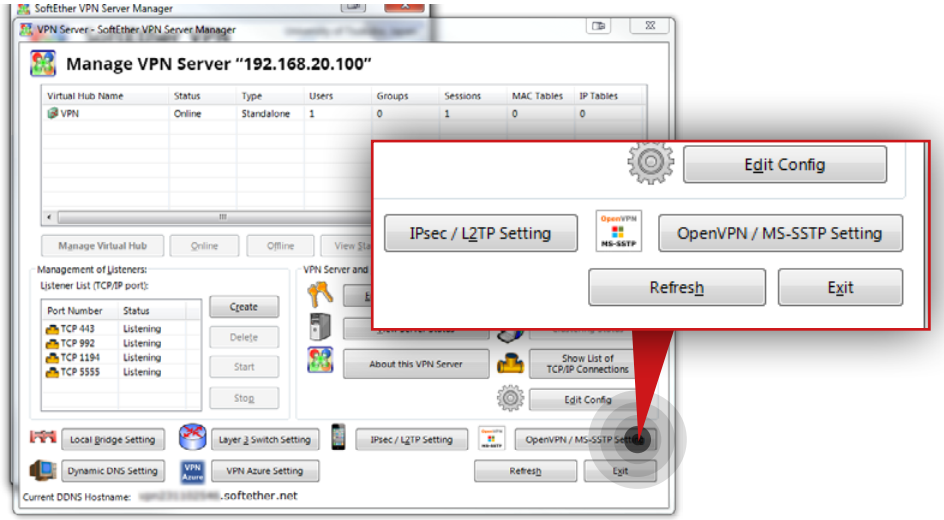
Step 12.

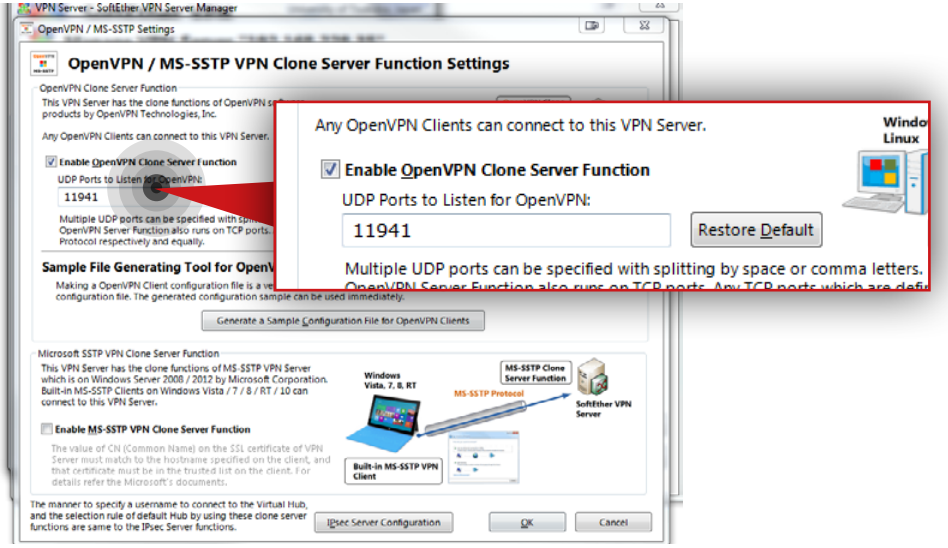
From the VPN Easy Setup Tasks window set local bridge (in this example, the selected network adapter is eth1).



Step 13.

Click **Close** button in order to close the VPN Easy Setup Task window. You should see the window from which you can manage the VPN server.

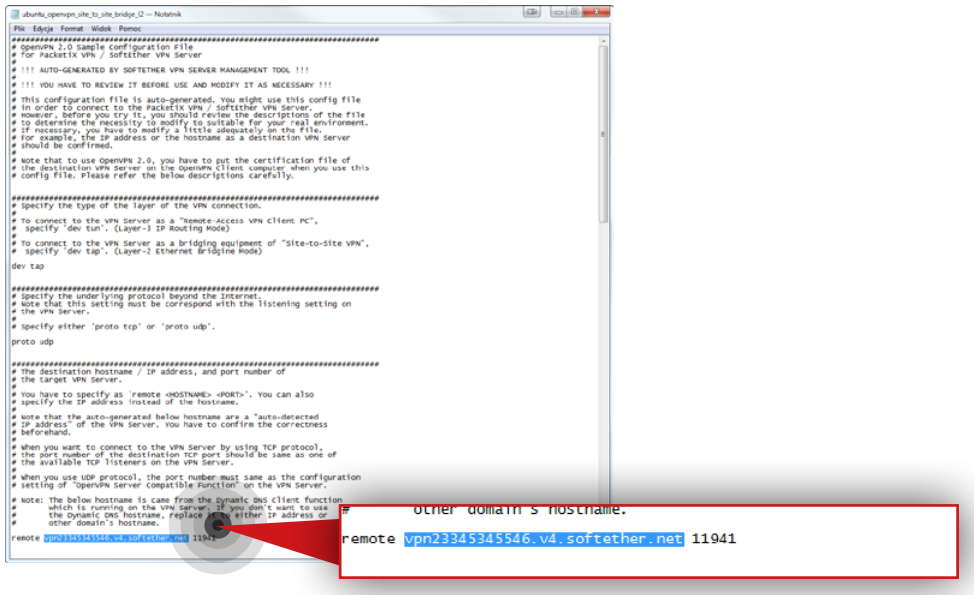




Step 14.

Click **OpenVPN / MS-SSTP Settings**, enable OpenVPN and generate a configuration file for VPN clients following the steps below:

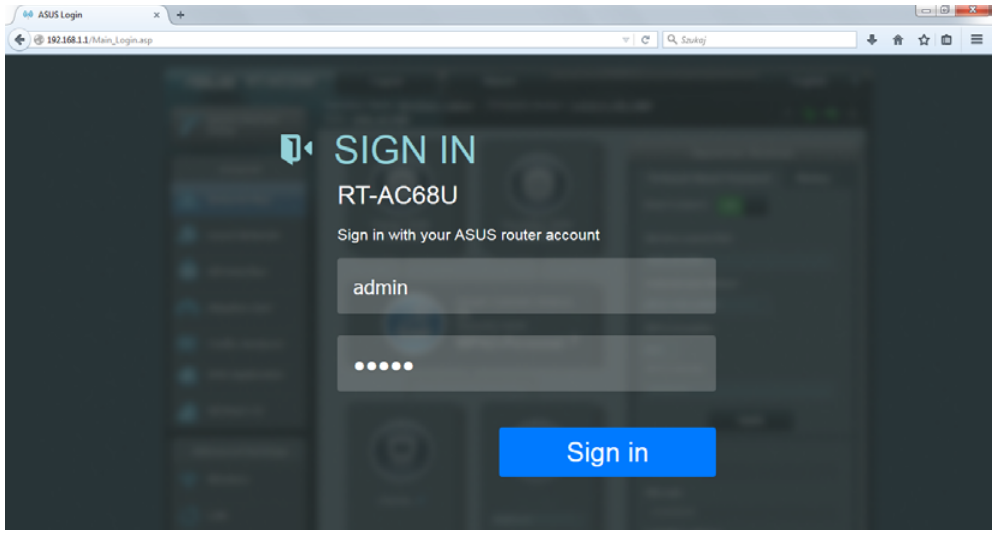
a. Make sure **Enable OpenVPN Clone Server Function** is checked.
b. Leave a default (**1194**) or set a different **UDP Ports to listen for OpenVPN** (in this example **11941** is set).
c. Click **Generate a Sample Configuration File for OpenVPN Clients**.
d. Save the configuration file.
e. Make sure **Enable MS-SSTP VPN CloneServer Function** is disabled.
f. Click **OK**.



Step 15.

Go to the package with the configuration file for OpenVPN clients downloaded in step 14, and edit **ubuntu_openvpn_site_to_site_bridge_l2** file. Change the auto-generated VPN Server Hostname to either WAN IP address or hostname of the router responsible for handling connections from the Customer node.

If you changed the default UDP Port number in the previous step, you have to change it in the configuration file as well.

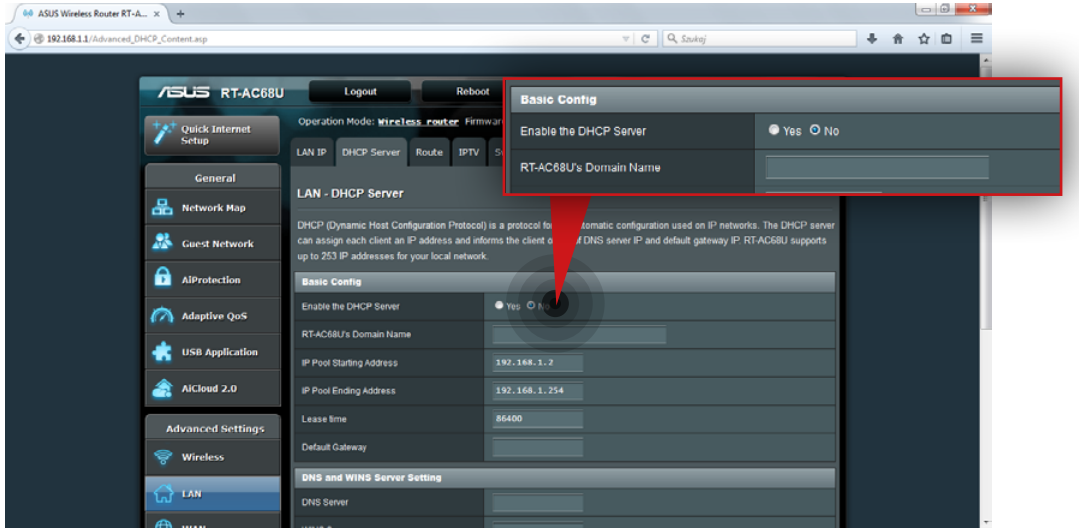


5.5.3. Customer router configuration for VPN connection between Customer node and MSP VPN/Monitoring node.

Step 1.

Go to your web browser and enter 192.168.1.1 to access the router web interface.

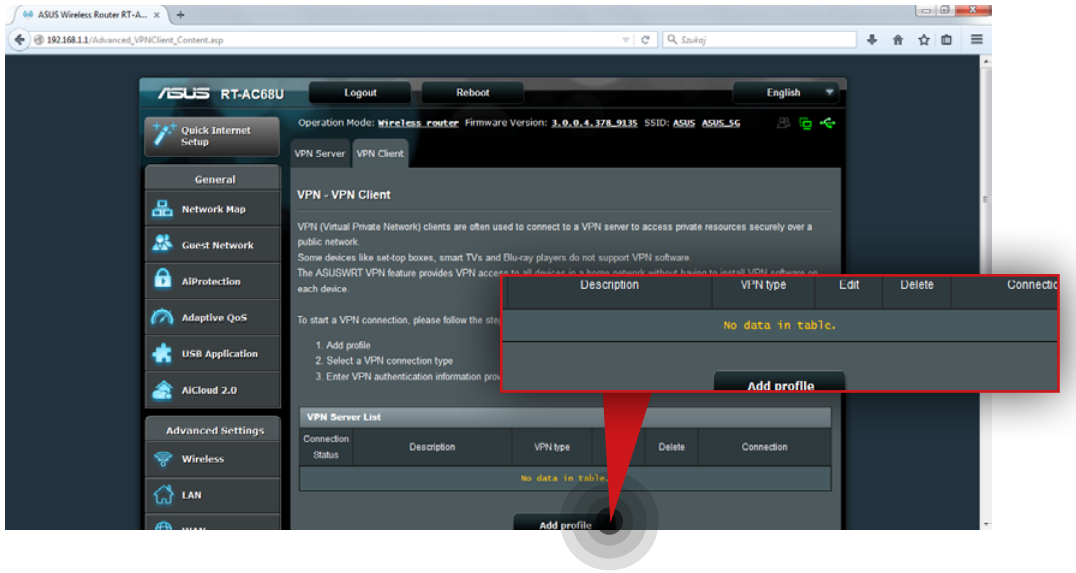
a. Login to the router's web-based management interface.
b. Click **Sign in.**



Step 2.

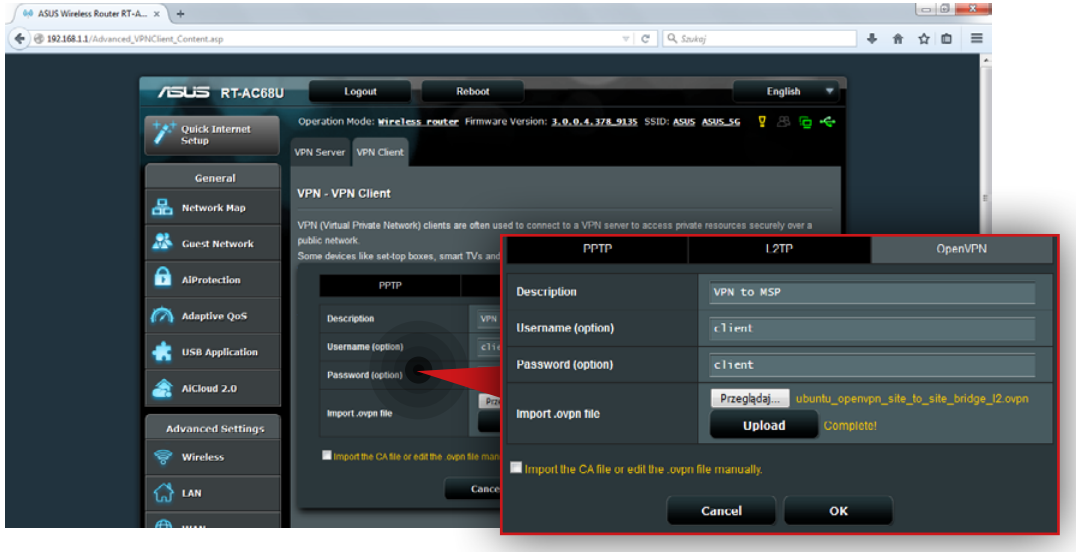
Go to **LAN » DHCP Server** and **disable** the DHCP Server.

Note: This step is crucial to avoid problems that may appear when using more than one DHCP server on the same subnet.

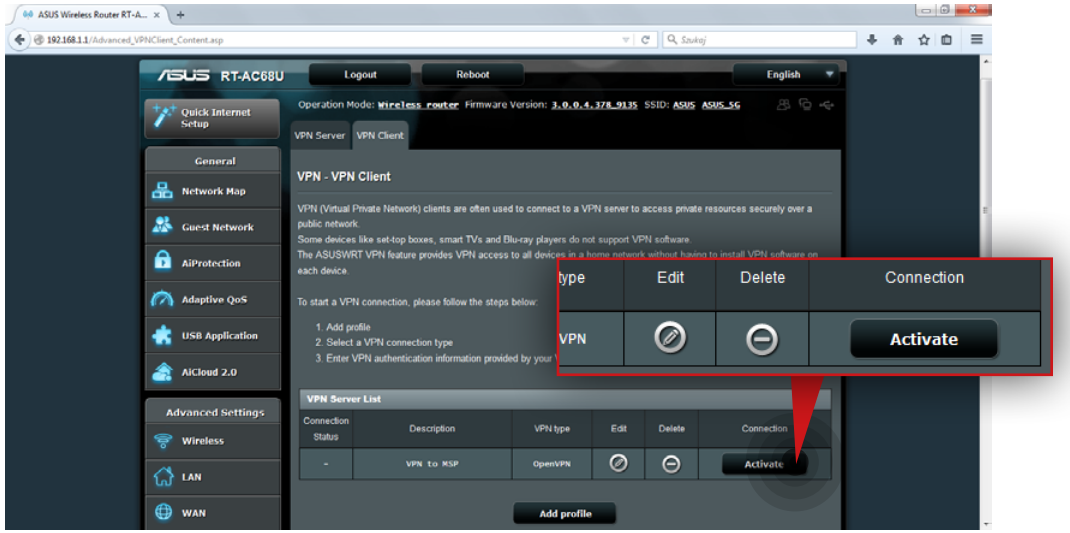


Step 3.

Go to **VPN » VPN Client** and add a new VPN profile.

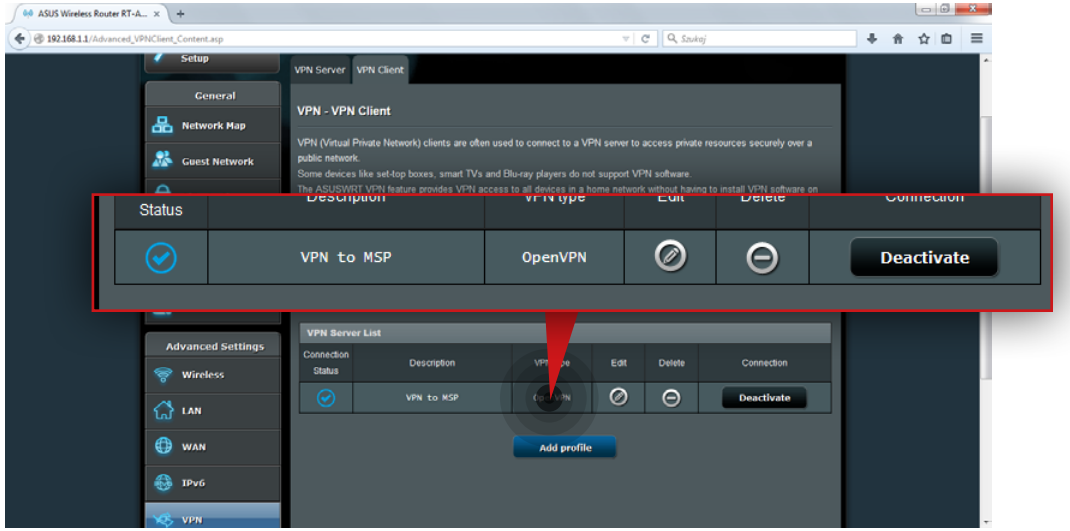


a. Click **Add profile** button.
b. Select OpenVPN.
c. Enter a description for the new profile (in this example, the description is **VPN to MSP**).
d. Enter the username (in this example, the username is **client**).
e. Enter password.
f. Upload the OpenVPN configuration file for VPN clients (**ubuntu_openvpn_site_to_site_bridge_l2**).
g. Click **OK**.

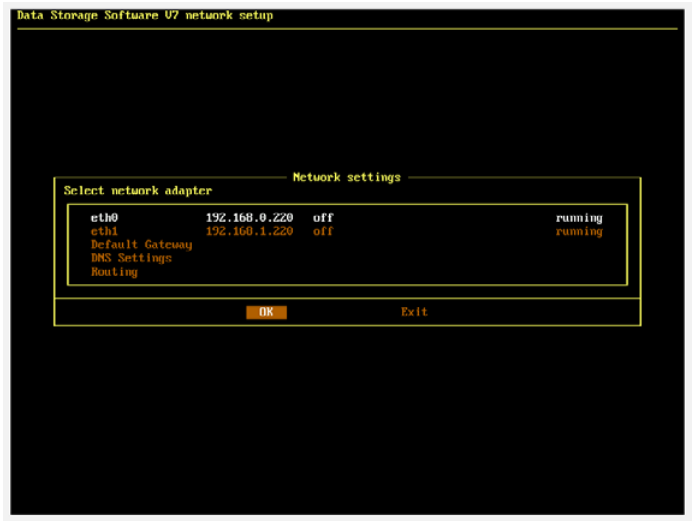


Step 4.

Activate the connection by clicking the **Activate** button on the VPN Server list.



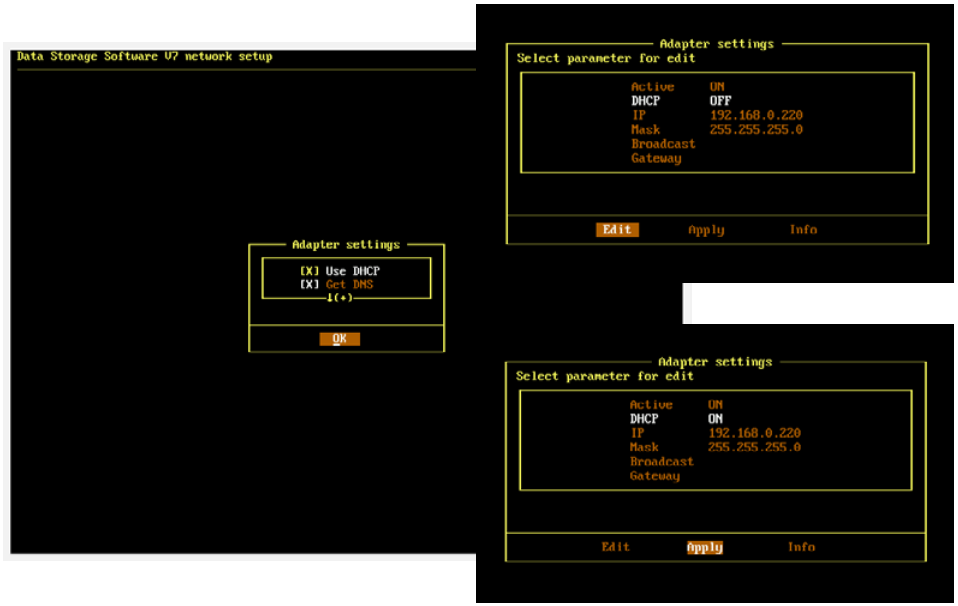
When the connection is active its status should be as on the lower screenshot.



5.5.4. Open-E DSS V7 configuration on Customer node

Step 1.

On the customer node, go to console and use **Ctrl+Shift+N** to access the network settings.



Step 2.

Activate DHCP for the Ethernet interface or enter a static IP address provided by MSP (in this example, DHCP is activated on eth0).

a. Select the interface and confirm with **OK.**
b. Select **DHCP** parameter and choose **Edit**.
c. Select **Use DHCP** and confirm with **OK**.
d. Confirm with **Apply** to save the changes.

Step 3.

Use **Ctrl+Shift+T** to access the Tools menu and check whether the **MSP cluster** and the **Customer node** can reach each other.

a. Select the ping option from the Tools menu.
b. Enter the MSP cluster IP address to ping MSP cluster (in this example, we ping **10.10.10.1**).

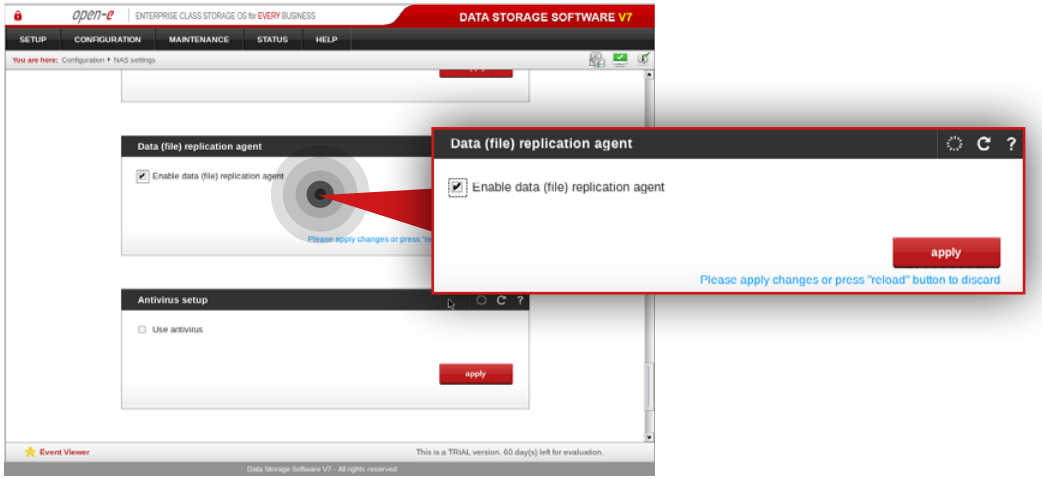
If the MSP cluster responds to the ping, the output should read as follows:

5.6. Setting up replication between Customer node and MSP node

Prerequisites
Please complete the following prerequisites.

- MSP nodes configured according to procedure introduced in Chapter **5.2 – Detailed procedure of setting up MSP nodes**
- Customer node configured according to procedure introduced in Chapter **5.4 – Detailed procedure for setting up Customer node**
- Encrypted connection between MSP and Customer nodes configured according to procedure introduced in Chapter **5.5 - Setting up an encrypted connection between MSP and Customer nodes**

If all the prerequisites have been met, you're now ready to start the Customer node configuration.

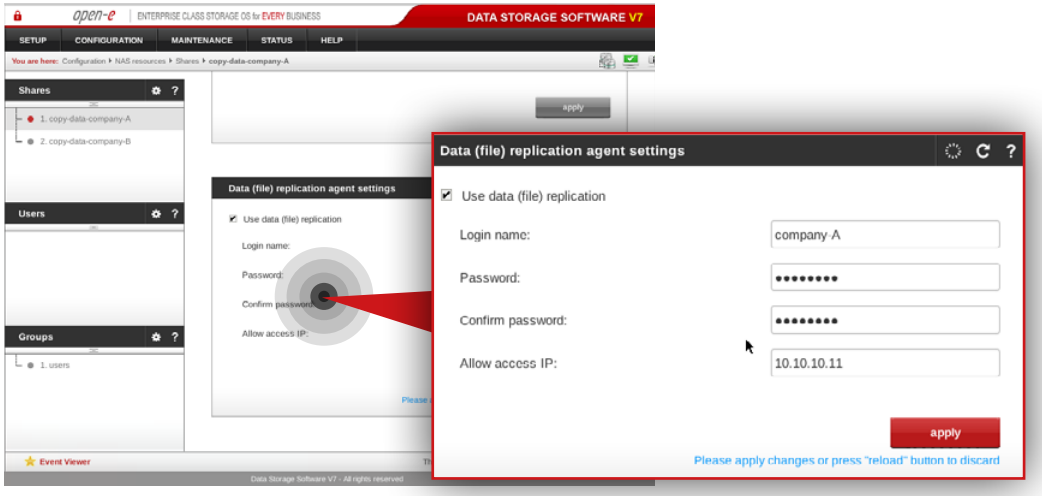


5.6.1. MSP node configuration

Step 1.

On **msp-node-a**, go to **Configuration » NAS settings.**

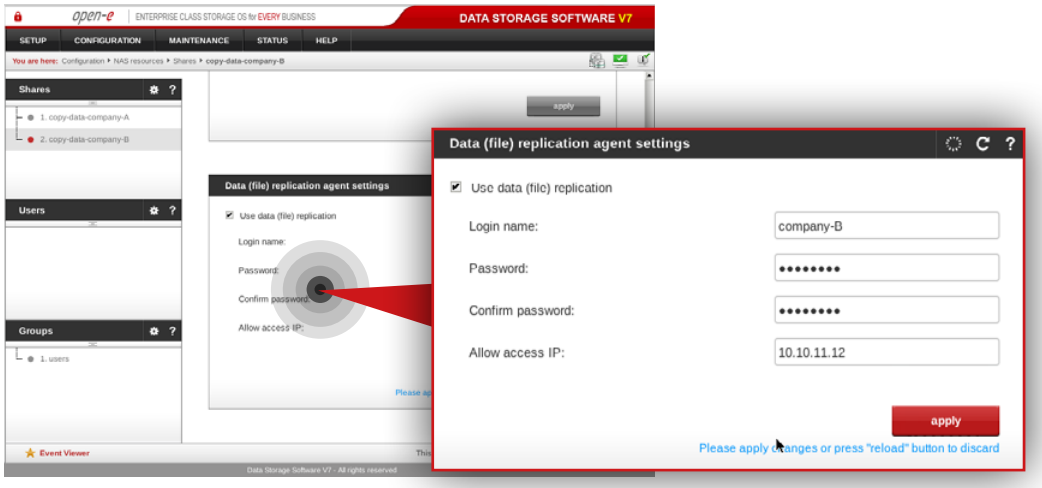
a. Navigate to the **Data (file) replication agent** and check **Enable data (file) replication agent.**
b. Click **apply** button.



Step 2.

Still on **msp-node-a**, go to **Configuration » NAS resources » Shares** and select **copy-data-company-A** share from the list on the left side.

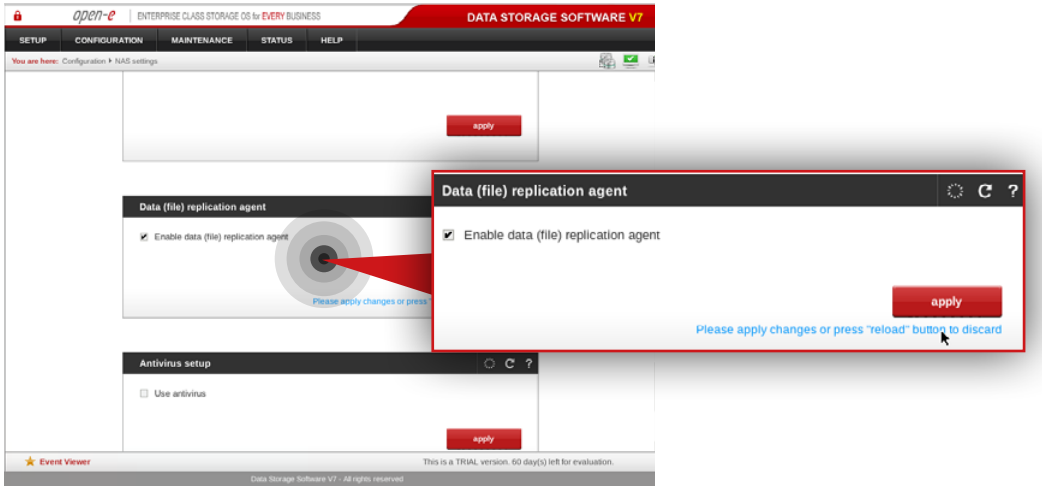
a. Navigate to the **Data (file) replication agent settings**.
b. Check **Use data (file) replication**.
c. Enter a login name for the data replication agent (in this example, the login name is **company-A**).
d. Set a password for the replication agent.
e. Enter the Customer node IP address allowed to replicate data to **msp-node-a** (in this example, IP address is **10.10.10.11**).
f. Click **apply** button.



Step 3.

Next, select **copy-data-company-B** share from the list on the left side.

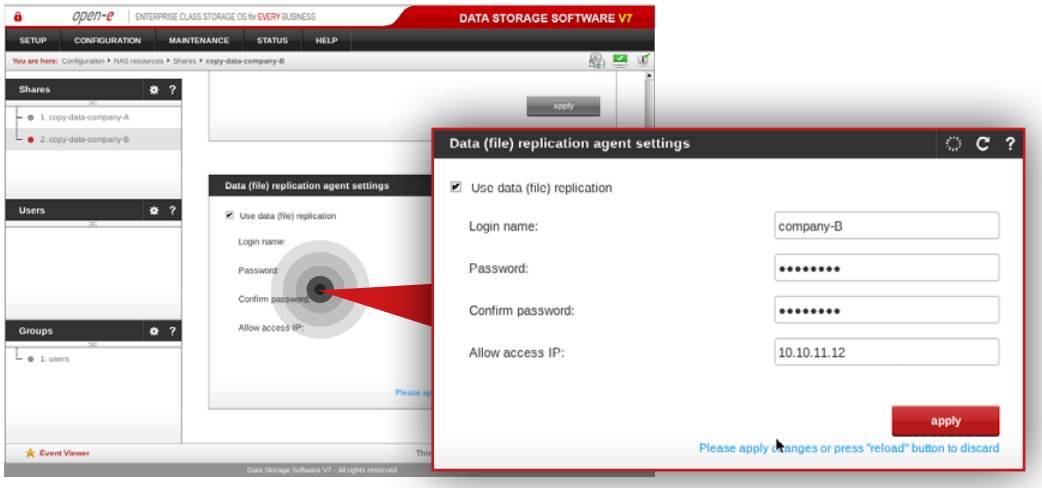
a. Navigate to the **Data (file) replication agent settings**.
b. Check **Use data (file) replication**.
c. Enter a login name for the data replication agent (in this example, the login name is **company-B**).
d. Set a password for the replication agent.
e. Enter the Customer node IP address allowed to replicate data to **msp-node-a** (in this example, IP address is **10.10.11.12**).
f. Click **apply** button.



Step 4.

On **msp-node-b**, go to **Configuration » NAS settings**.

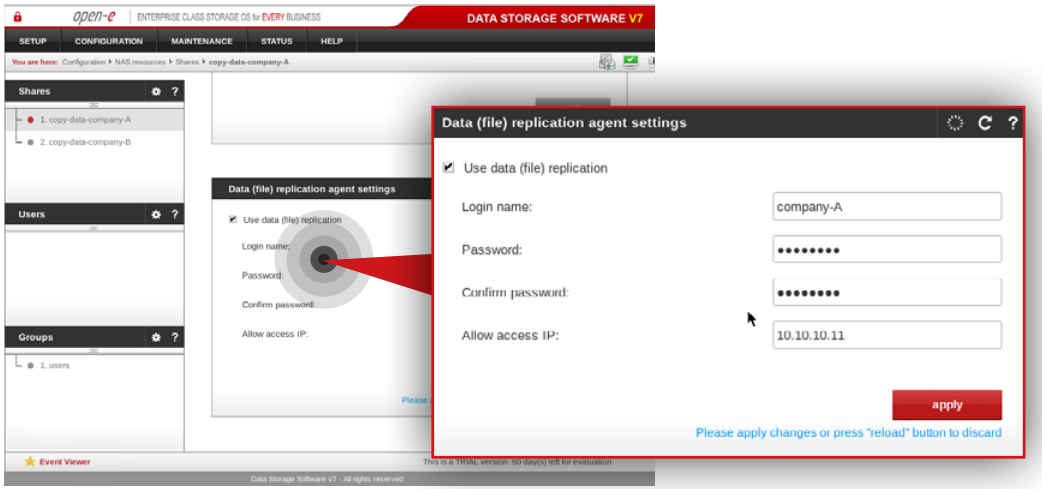
a. Navigate to **Data (file) replication agent** and check **Enable data (file) replication agent**.
b. Click **apply** button.



Step 5.

Still on **msp-node-b**, go to **Configuration » NAS resources » Shares** and select **copy-data-company-B** from the list on the left side.

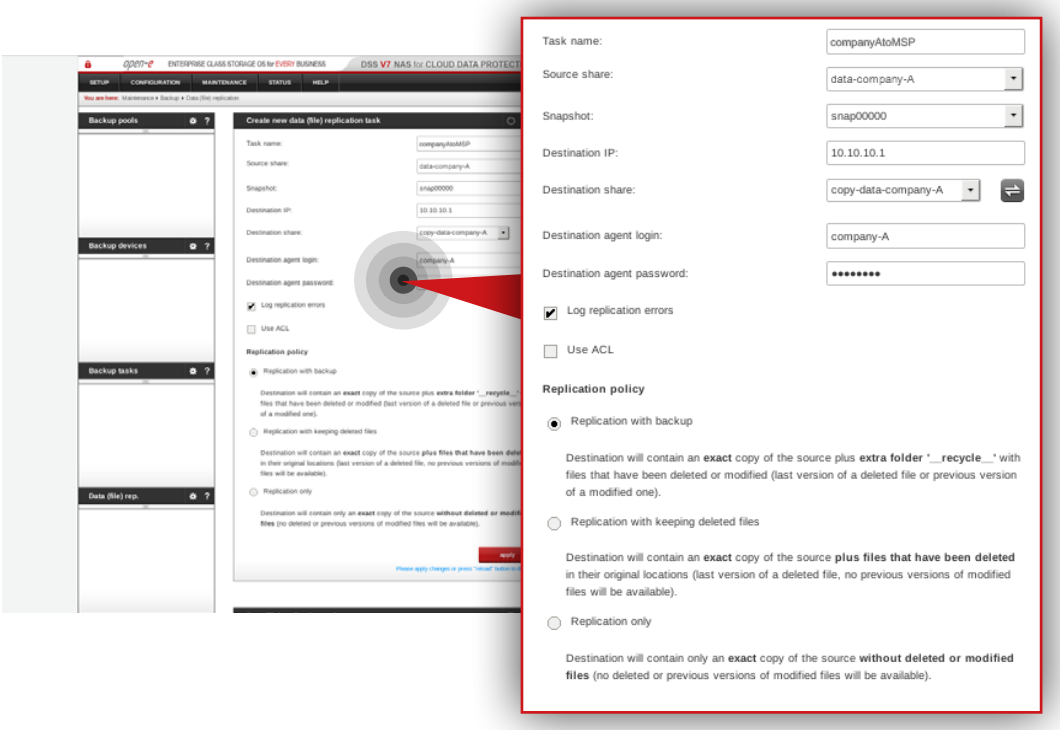
a. Navigate to **Data (file) replication agent settings**.
b. Check **Use data (file) replication.**
c. Enter a login name for the data replication agent (in this example, the login name is **company-B**).
d. Set a password for the replication agent.
e. Enter the Customer node IP address allowed to replicate data to **msp-node-b** (in this example, IP address is **10.10.11.12**).
f. Click **apply** button.



Step 6.

Next, select **copy-data-company-A** from the list on the left side.

a. Navigate to **Data (file) replication agent settings**.
b. Check **Use data (file) replication.**
c. Enter a login name for the data replication agent (in this example, the login name is **company-A**).
d. Set a password for the replication agent.
e. Enter the Customer node IP address allowed to replicate data to **msp-node-a** (in this example, IP address is **10.10.10.11**).
f. Click **apply** button.

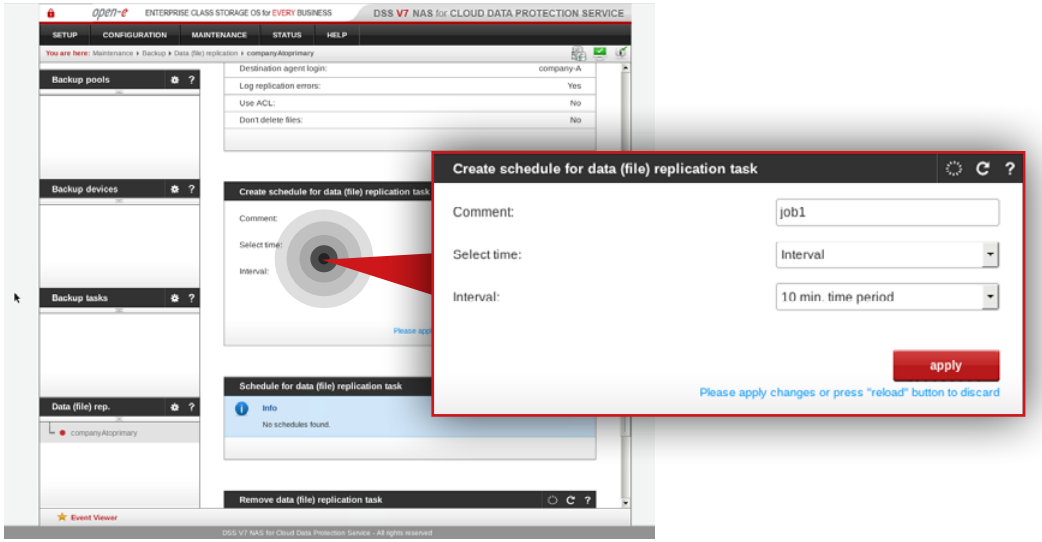


5.6.2. Customer node configuration

Step 1.

On Customer node, navigate to **Maintenance » Backup » Data (file) replication** and create a new replication task to replicate data from the Customer node to the MSP node.

a. Enter a name for the task (in this example, the task name is **companyAtoMSP**).
b. Select the source share containing data to be replicated (in this example, the source share is **data-company-A**).
c. Select a snapshot used for data replication (in this example, the snapshot is **snap00000**).
d. Specify the MSP node destination IP address (in this example IP address is: **10.10.10.1**).
e. Click refresh button ⇌ and select a destination share on the MSP node to which you want to replicate data (in this example the share name is **copy-data-company-A**).
f. Enter agent login and password.
g. Make sure "Log replication errors" is checked.
h. Select the desired replication policy.
i. Click **apply** button.



Step 2.

Select the task from the menu on the left side, configure the task schedule recurrence and click **apply** button.

Tip: If you want to check whether your task is running properly, go to **Status » Tasks** where all tasks statuses are listed.

Tip: You may also monitor the **Data (file) replication** tasks on MSP node via Check_MK. It requires installing a small update on the MSP node. You may obtain the update file here:
ftp://software:UuPpDdAaTtEe@ftp.open-e.com/In_Engineering_Phase/70473-DSS-V7_data_replication_check_mk/

For the Customer node you may obtain the update file here:
ftp://software:UuPpDdAaTtEe@ftp.open-e.com/SMALL_UPDATES/70473-DSS-V7-CDPS_data_replication_check_mk/

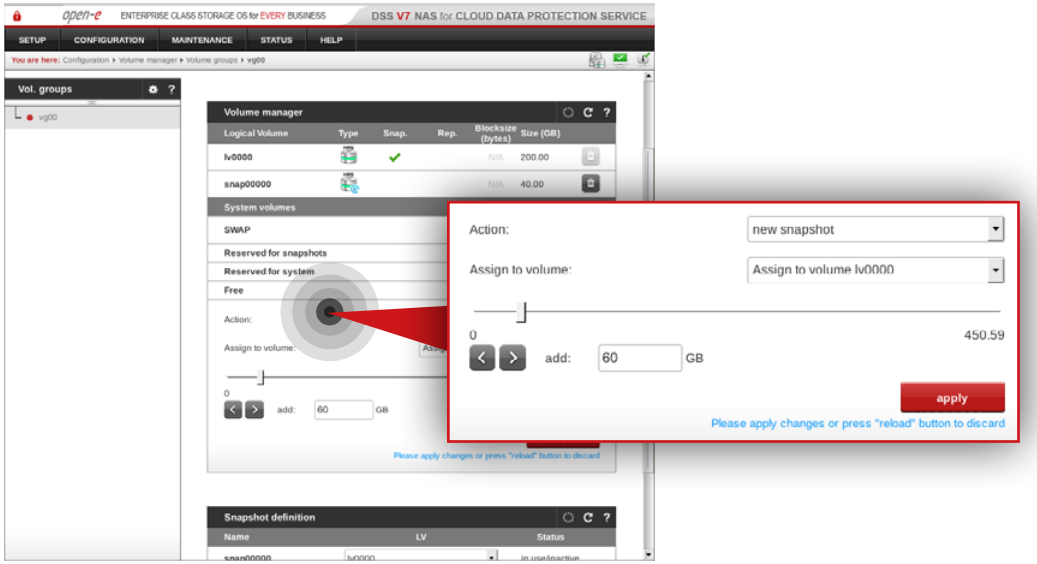
The procedure for applying a small update can be found in Chapter **5.3.2. - Applying the small update to monitored node**.

Prerequisites

Please complete the following prerequisites.

- Customer node configured according to procedure introduced in Chapter **5.4 – Detailed procedure for setting up Customer node**
- Open-E DSS V7 NAS for CDPS installed on the Customer node

If all the prerequisites have been met, you're now ready to start **Customer node configuration**.



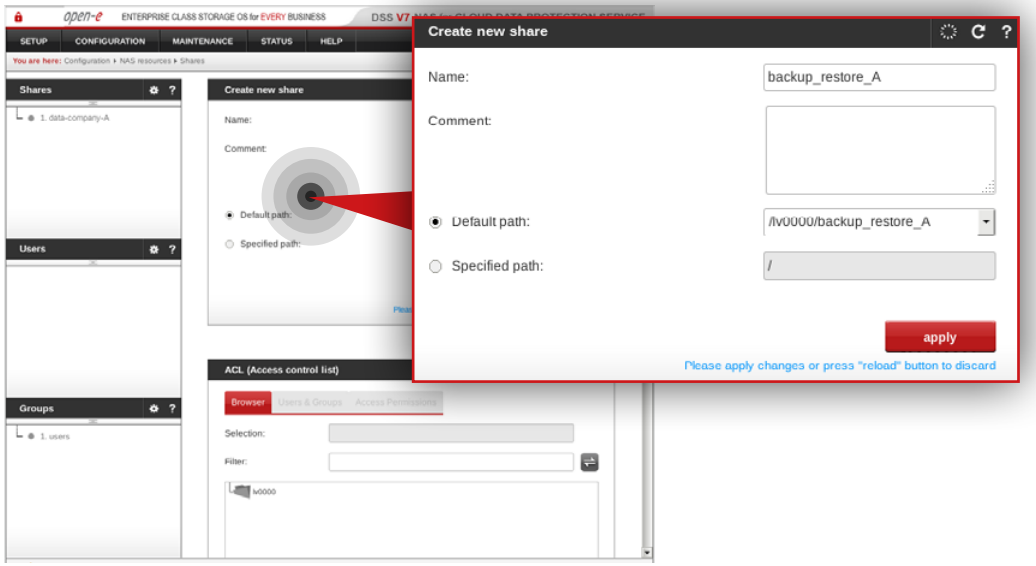
Step 1.

Go to **Configuration » Volume manager » Volume groups**.

a. Select vg00 from the list on the left side.
b. Create a snapshot assigned to the NAS volume lv0000 (in this example the snapshot name is snap0001).
c. Click **apply** button.

It is recommended to create snapshots of a size that is at least 20% of the NAS volume size to which it is assigned.

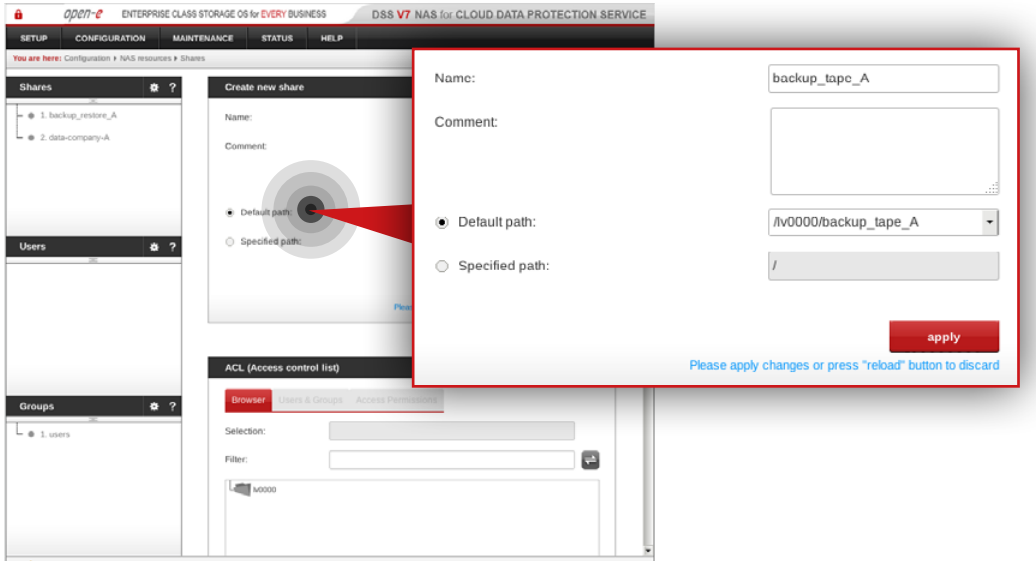
It is highly recommended to monitor snapshot use. If the snapshot capacity is exceeded the system may become unstable.



Step 2.

Create a share for data restored from the backup.

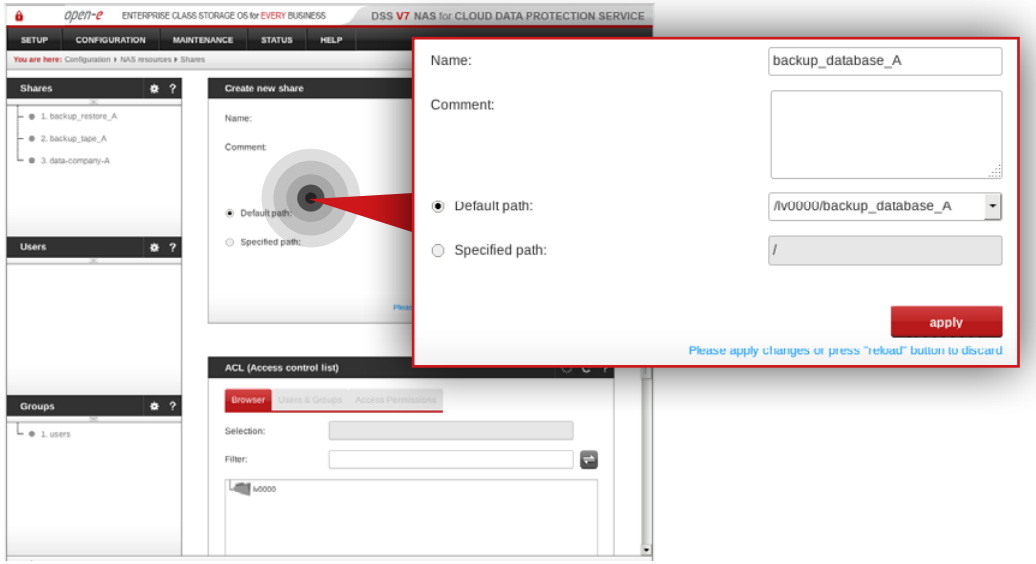
a. Enter a name for the share (in this example, the share name is **backup_restore_A**).
b. Select **lv0000** as a default path for the share.
c. Click **apply** button.



Step 3.

Create a share for the virtual backup device.

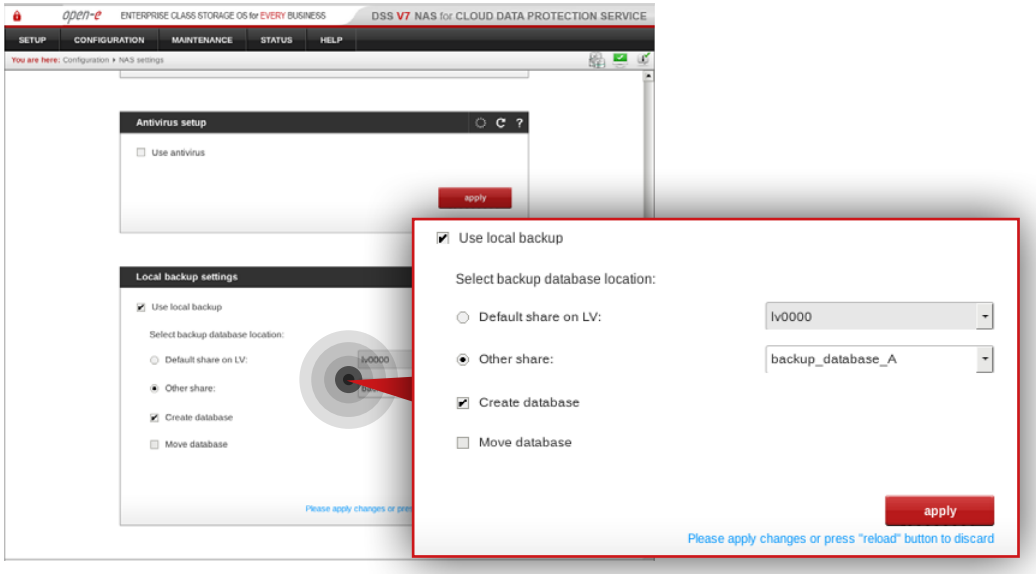
a. Enter a name for the share (in this example, the share name is **backup_tape_A**).
b. Select **lv0000** as a default path for the share.
c. Click **apply** button.



Step 4.

Go to **Configuration » NAS resources » Shares** and create a share for the backup database.

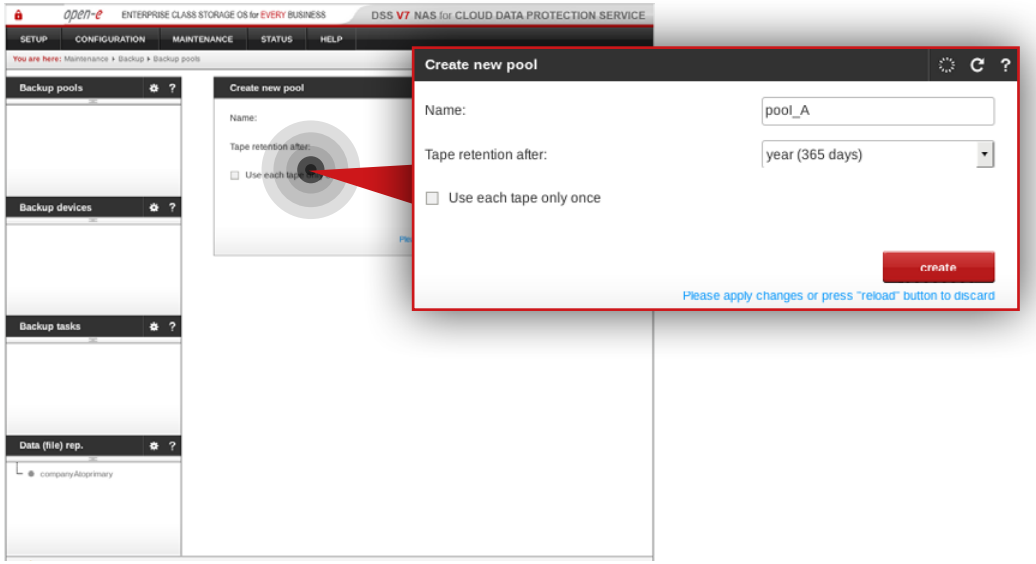
a. Enter a name for the share (in this example, the share name is **backup_database_A**).
b. Select **lv0000** as a default path for the share.
c. Click **apply** button.



Step 5.

Go to **Configuration » NAS settings** and enable local backup.

a. Select share for your backup database location (in this example, it is **backup_database_A**).
b. Make sure the "Create database" option is checked.
c. Click **apply** button.

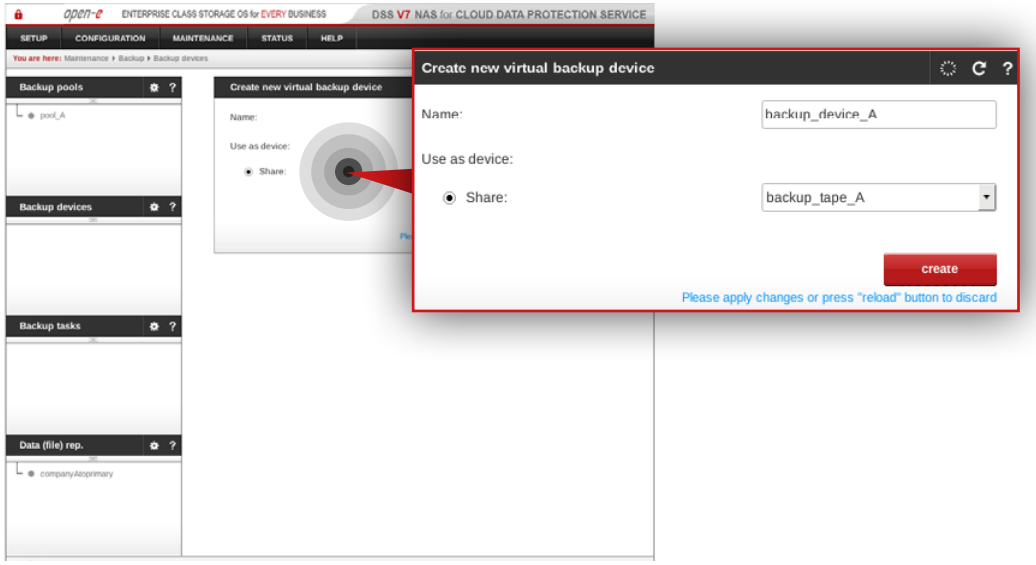


Step 6.

Go to **Maintenance » Backup » Backup pools** and create a new backup pool.

a. Enter a name for the pool (in this example, the backup pool name is **pool_A**).
b. Click **apply** button.

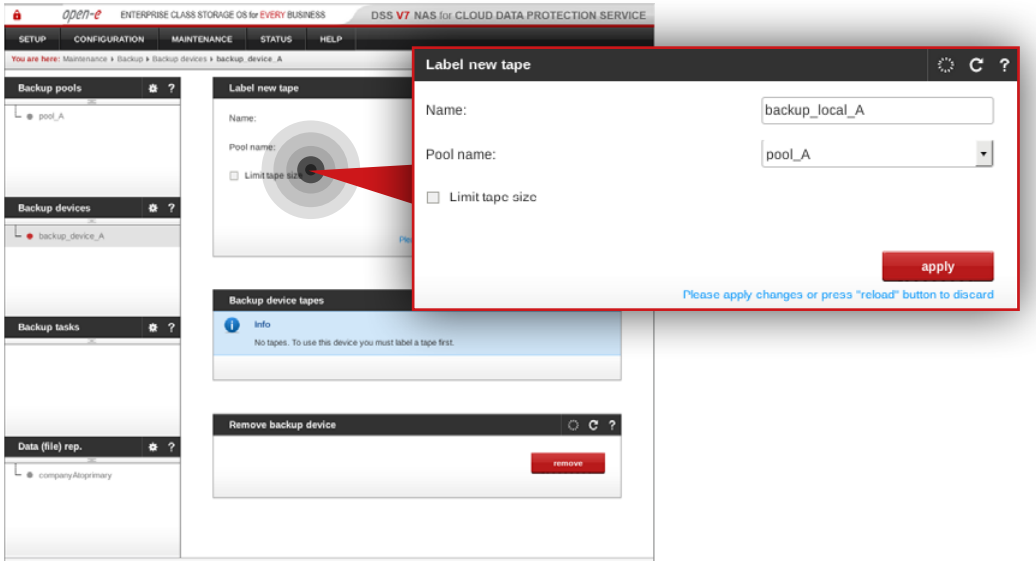
Note: You may configure tape retention. By default it is 365 days.



Step 7.

Go to **Maintenance » Backup » Backup devices**.

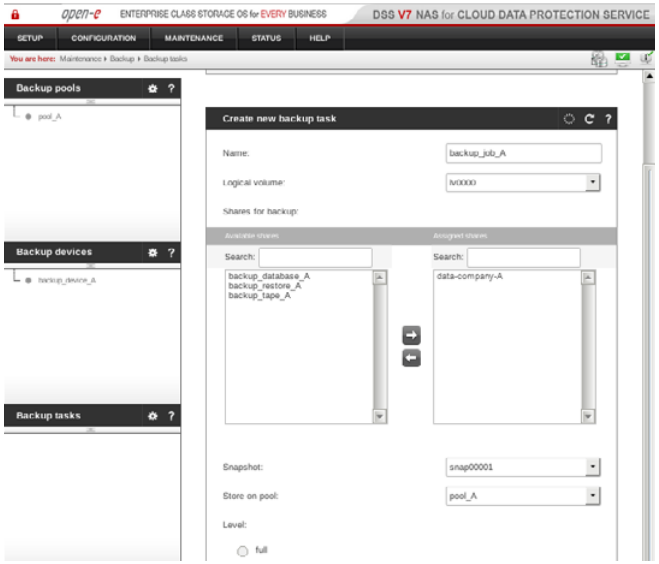
a. Set a name for your virtual backup device (in this example, the backup device name is **backup_device_A**).
b. Select the share you want to use as a virtual device (in this example, selected share is **backup_tape_A**).
c. Click **create** button.



Step 8.

Select the backup device (in this example, it is **backup_device_A**) from the menu on the left side.

a. Label a new tape (in this example, the tape label is **backup_local_A**).
b. As a pool name select the pool created in step 6 (in this example, the selected pool is **pool_A**).
c. Click **apply** button.

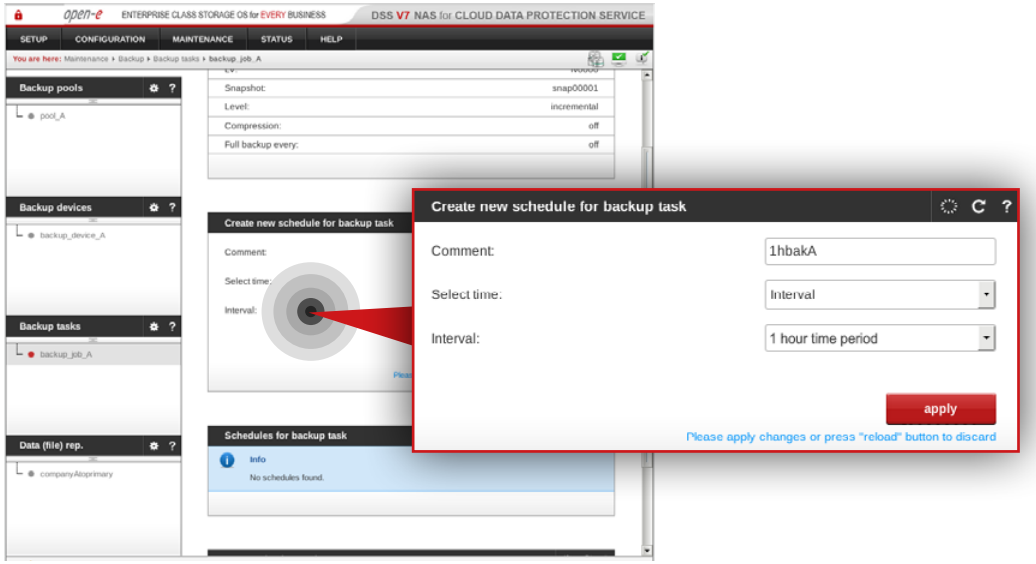


Step 9.

Go to **Maintenance » Backup » Backup task** and create a backup task for the local data backup.

a. Enter a name for the task (in this example, the task name is **backup_job_A**).
b. Select a logical volume (in this example, the volume is **lv0000**).
c. Select a share for backup (in this example, the share is **data-company-A**).
d. Select a snapshot (in this example, the snapshot is **snap00001**).
e. Select a pool to store data on (in this example, the pool is **pool_A**).
f. Make sure **incremental** is checked as a backup level (type).
g. Click **apply** button.

Note: A snapshot used for the local backup has to be different from the one used in the **Data (file) replication** task.

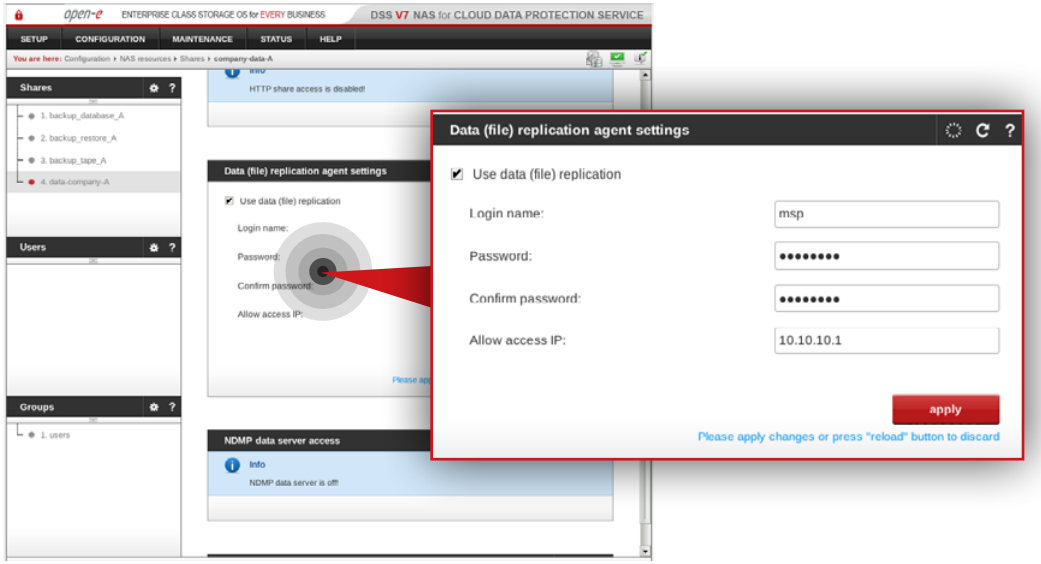


Step 10.

Select the backup task name from the list on the left side (in this example, the task name is **backup_job_A**).

a. Configure task schedule recurrence.
b. Add comment to help you identify the task (in this example, the comment is **1hbakA**).
c. Click **apply** button.

6. Disaster recovery & data restore

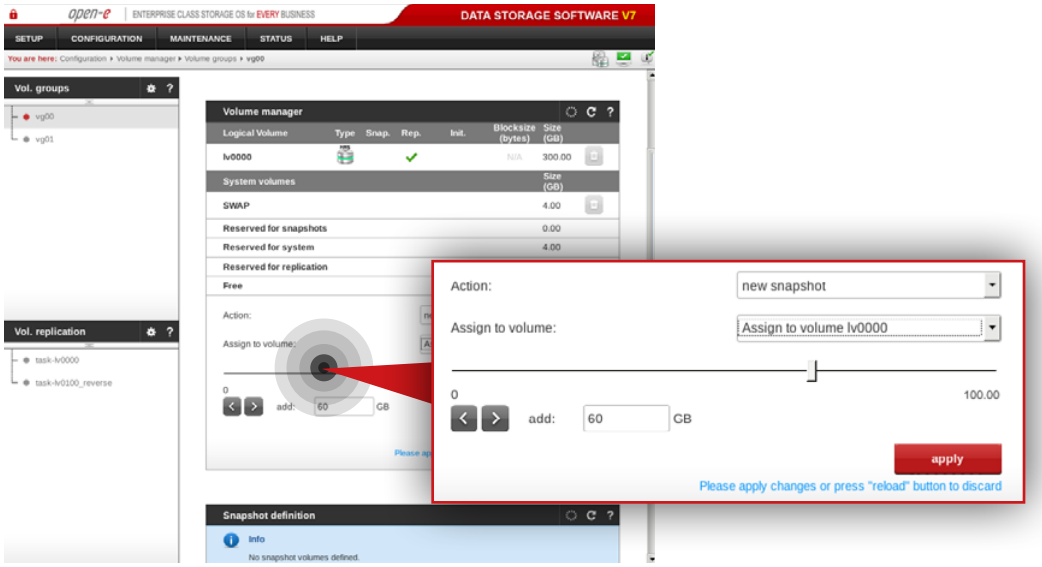


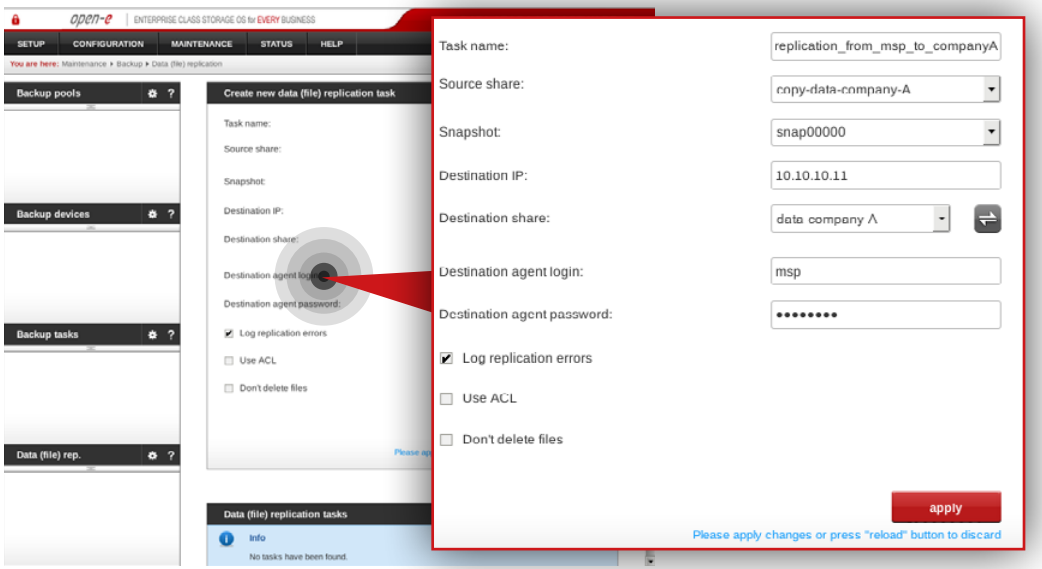
6.1.1. Without hardware replacement (remote)

Step 1.

On the Customer node, go to **Configuration » NAS resources » Shares**.

a. Select the **data-company-A** share from the list on the left side.
b. Navigate to the **Data (file) replication agent** and check **Use data (file) replication agent.**
c. Click **apply** button**.**
d. Enter the login name for the data replication agent (in this example, login name is msp).
e. Set a password for the replication agent.
f. Enter the MSP Virtual IP address allowed to replicate data to the Customer node (in this example, IP address is **10.10.10.1**).
g. Click **apply** button.





Step 2.

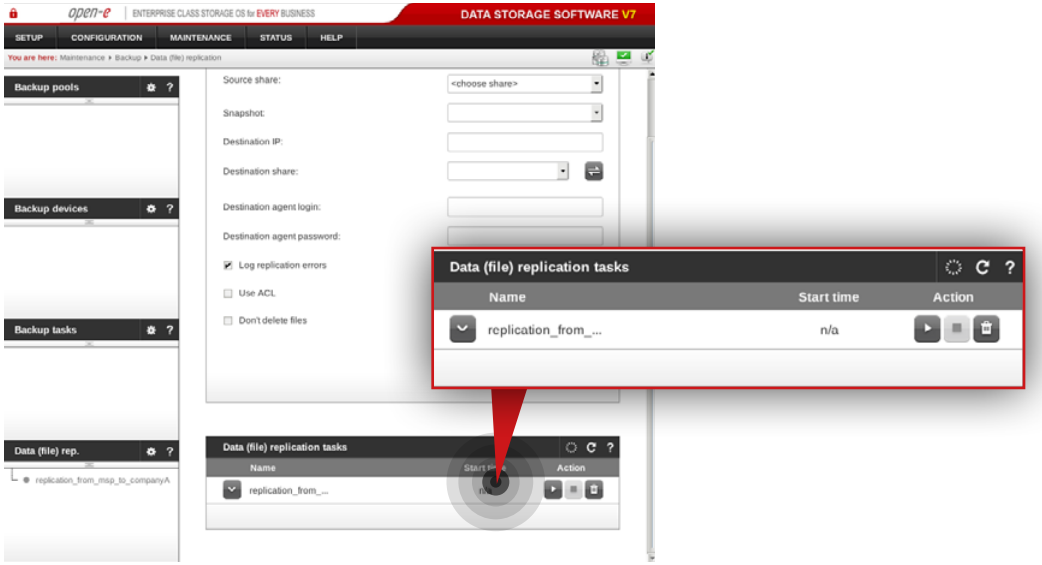
Go to the MSP node on which the resources (in this example, lv0000) are active on. Navigate to **Configuration » Volume manager » Volume groups**.

a. Select vg00 from the list on the left side.
b. Create the snapshot assigned to the logical volume where the Customer data copy is stored (in this example, lv0000).
c. Set a size for the snapshot.
d. Click **apply** button.

Step 3.

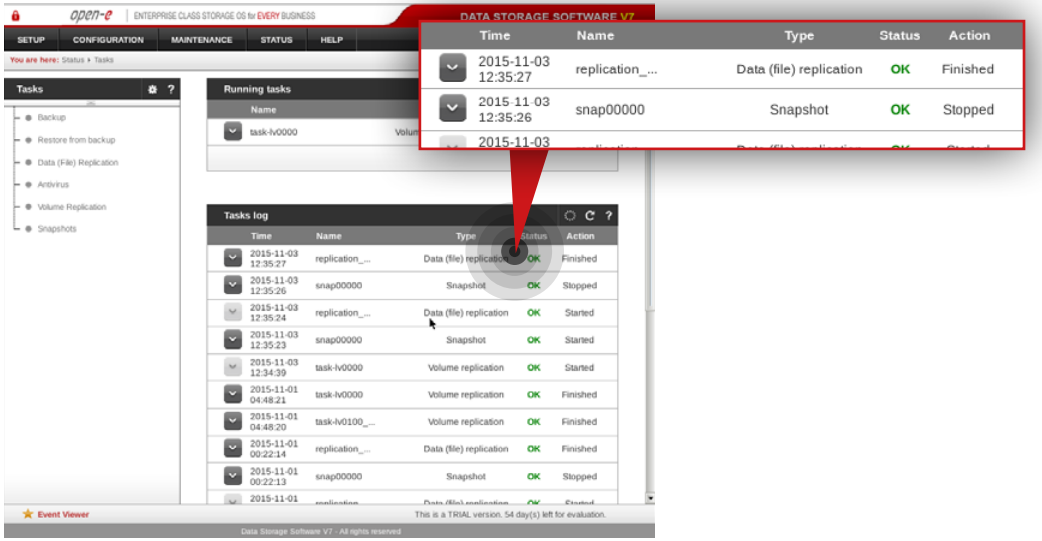
Still, on the **msp-node-a** go to **Maintenance » Backup » Data (file) replication** and create a new **Data (file) replication** task.

a. Enter a name for the task (in this example, the task name is **replication_from_msp_to_companyA**).
b. Select the source share which contains the restored data (in this example, the source share is **copy-data-company-A**).
c. Select a snapshot used for data replication (in this example, the snapshot is **snap00000**).
d. Specify the Customer node destination IP address (in this example IP address is: **10.10.10.11**).
e. Click refresh button and select the destination share on Customer node to which you want to replicate the data (in this example the share name is **data-company-A**).
f. Enter the agent login and password set in step 8 (in this example the login is **msp**).
g. Make sure “Log replication errors” is checked.
h. Click **apply** button.



Step 4.

Run the replication task **replication_from_msp_to_companyA**.



Step 5.

Go to **Status » Tasks** and check whether the task is finished. After the task is executed properly, data on the Customer node should be restored.

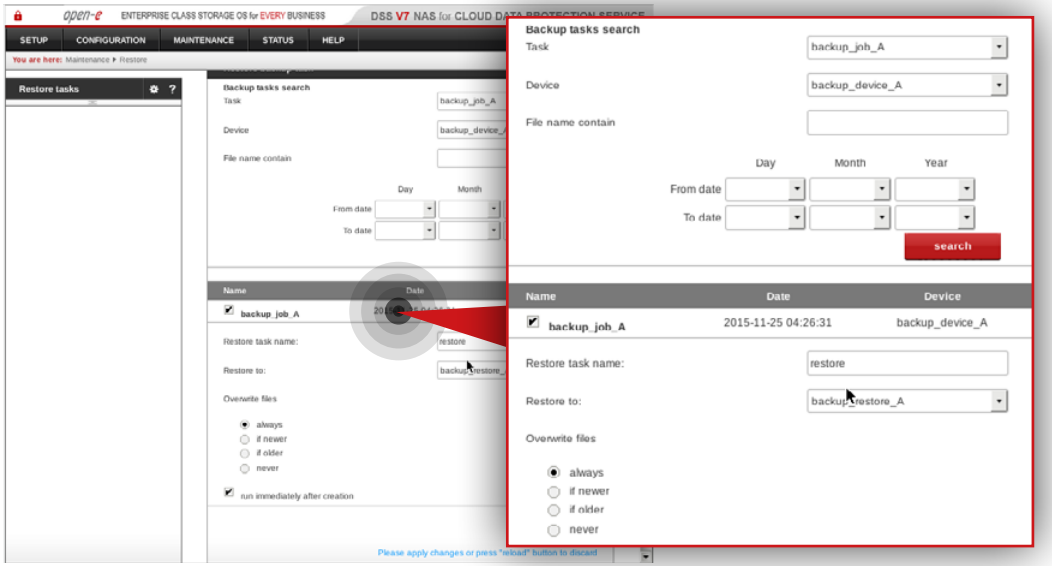
6.1.2. With hardware replacement (on-site)

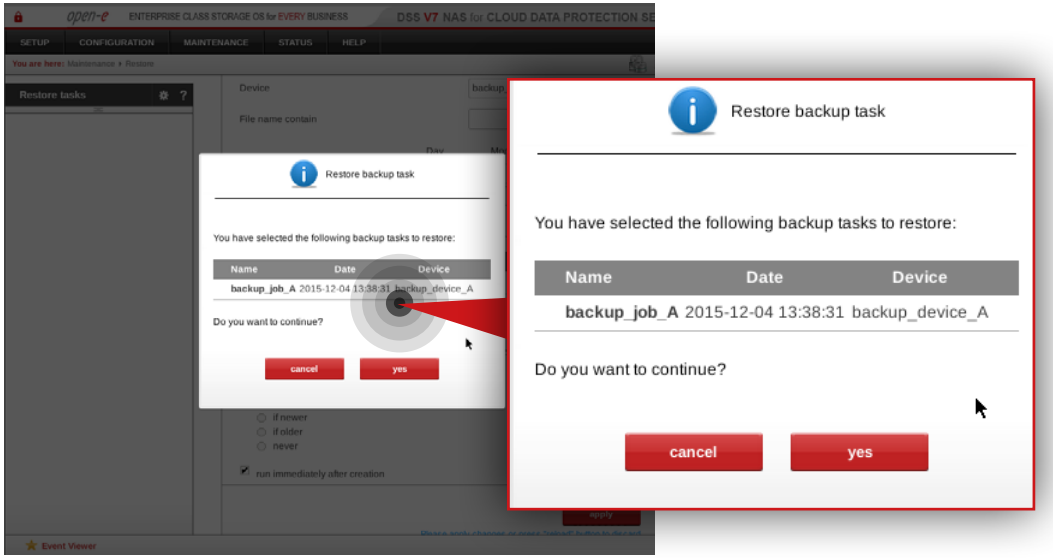
Step 1.

Configure the Customer node according to the procedure introduced in Chapter **5.4 – Detailed procedure of setting up Customer node**.

Step 2.

After the customer node is configured, follow steps 1 to 5 from Chapter **6.1 – Disaster recovery** in order to restore data on the Customer node.



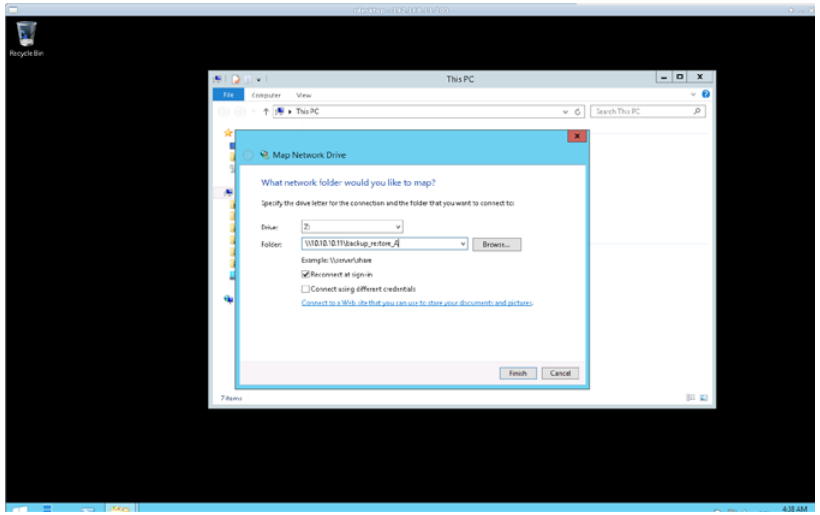


6.2.1. Restoring data set from end-user's local backup

Step 1.

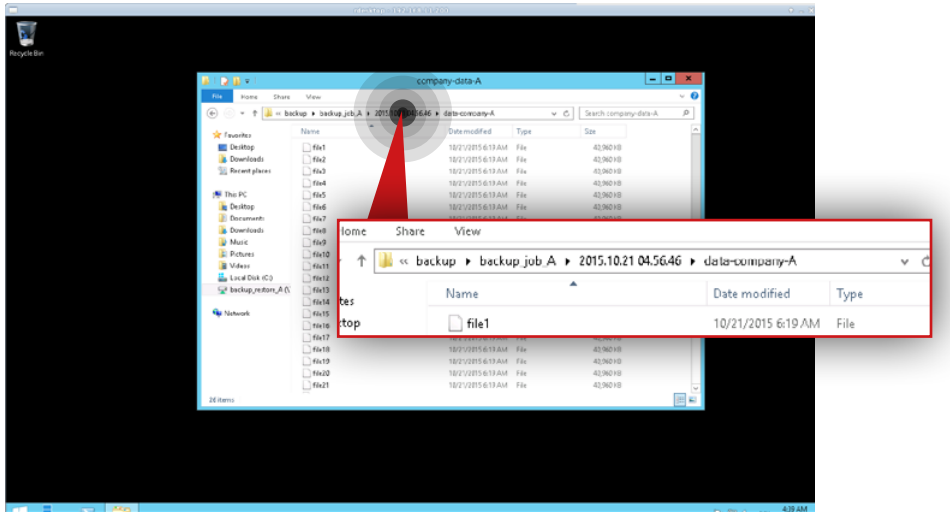
Go to **Customer node**, navigate to **Maintenance » Restore** and create restore task.

a. Find and select the backup you want to restore (in this example it is **backup_job_A**).
b. Select the appropriate backup device (in this example it is **backup_device_A**).
c. Enter a name for the restore task (in this example, the restore task name is **restore**).
d. Select a share to which you want to restore data (in this example, the share name is **backup_restore_A**).
e. Make sure **always** is checked as an option for overwriting files.
f. Make sure that "run immediately after creation" option is checked (if you want to restore data immediately).
g. Click **apply** button.
h. When the system asks whether to continue, click **yes**.



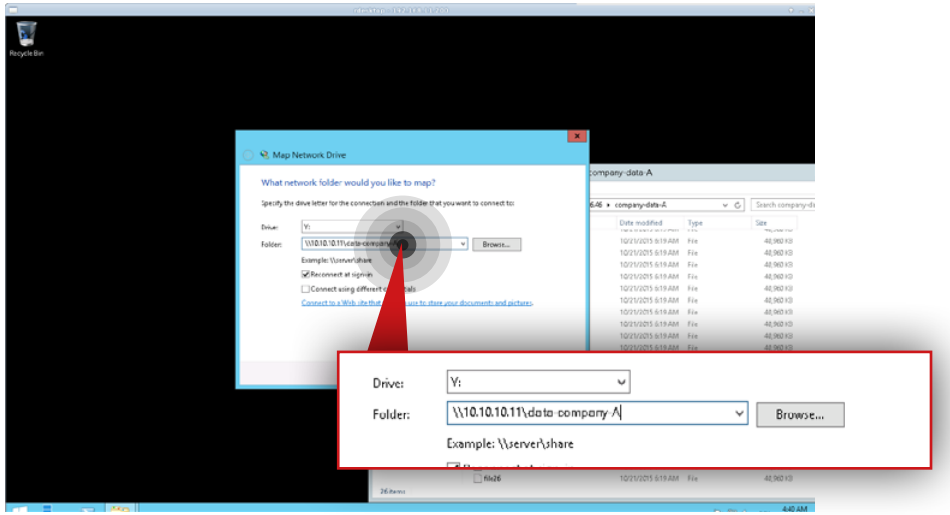
Step 2.

After the task is finished connect to the share which contains the restored data (in this example, the share is **backup_restore_A**).



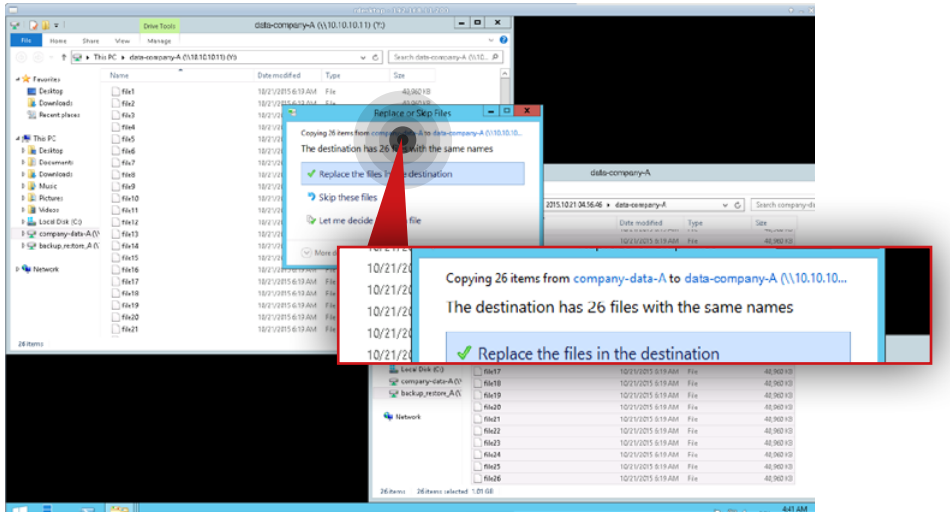
Step 3.

Go to **backup\backup_job_A** directory and find the data you want to restore (in this example we will restore data from the **\backup_restore_A\backup\backup_job_A\2015-10-21 04.56.465\data-company-A** directory).



Step 4.

Connect to the share which contains the customer data (in this example, the share name is **data-company-A**).



Step 5.

Move restored files to the share which contains the customer data (in this example, we copy data from **\\10.10.10.11\backup_restore_A\backup\backup_job_A\2015-10-21 04.56.465\data-company-A** to **\\10.10.10.11\data-company-A)**.

Note: In case you restore data from more than one backup you need to merge data from all backup folders (starting from the oldest one) to a single data set.

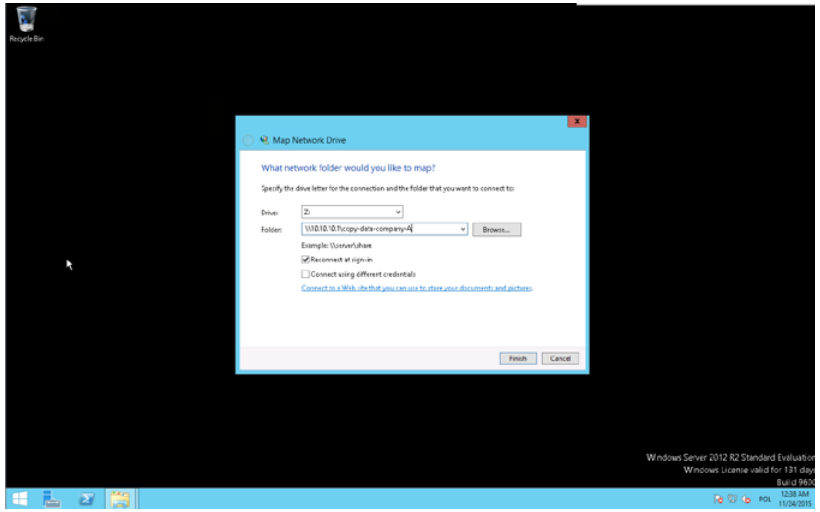
Step 6.

Remove the restore task created in step 1 (in this example, the task name is restore) as well as the folder to which the data was restored (in this example, the folder is **backup_job_A** in **\backup_restore_A\backup**).

6.2.2. Restoring a single file from MSP backup

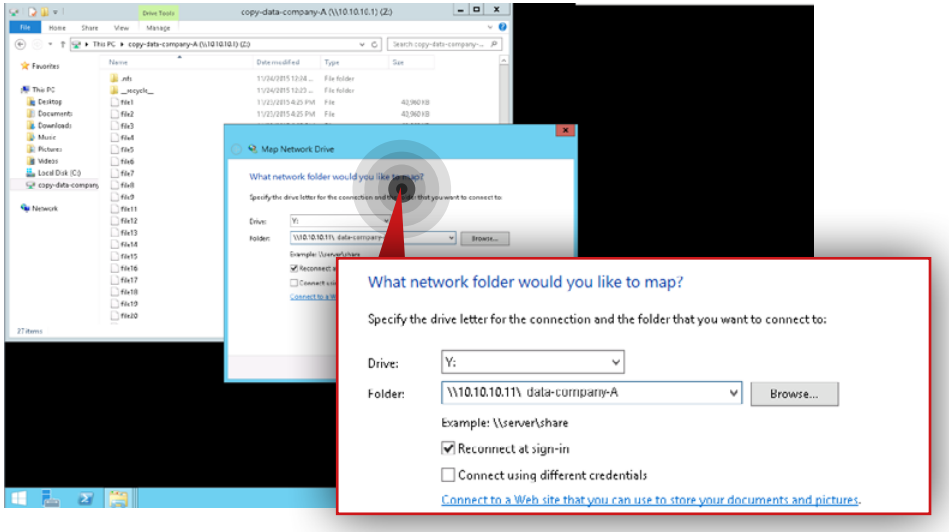
Note: In order to restore the file that has been modified or deleted on the Customer node, the replication policy for the replication task on the node has to be set to “Replication with backup”.

Note: The following procedure allows you to restore only the last version of a deleted file or previous version of a modified file, according to the “Replication with backup” policy.



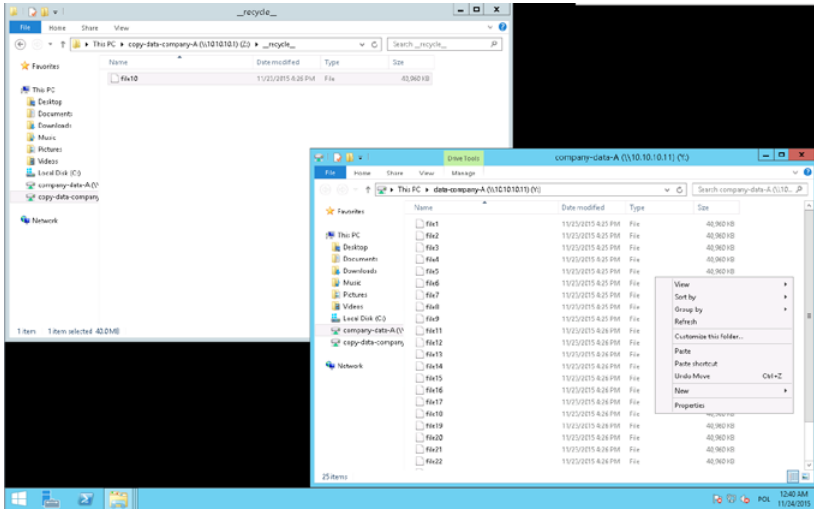
Step 1.

Connect to the share which contains the copy of Customer data on the MSP node (in this example, the share is **copy-data-company-A**).



Step 2.

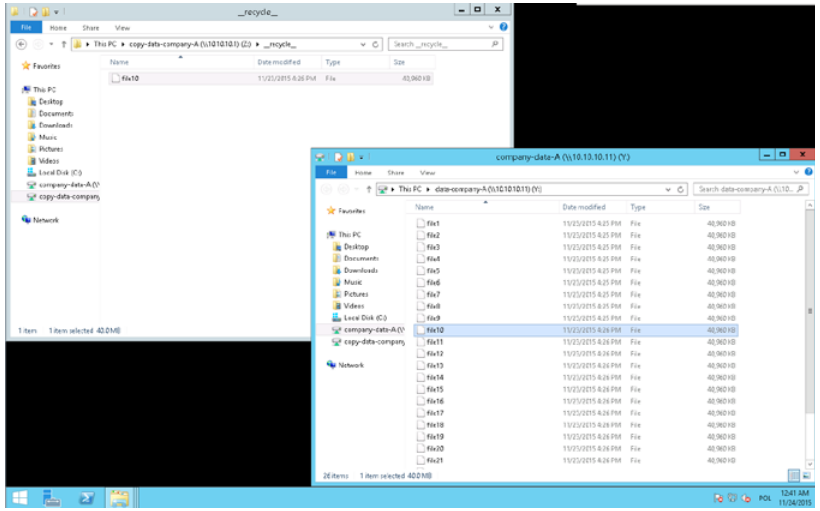
Next, connect to the share which contains the Customer data on the Customer node (in this example, share name is **data-company-A**).



Step 3.

Go to **copy-data-company-A__recycle__** and find the file you want to restore (in this example, the file is **file10**).

Note: In this example we will restore the file **file10** which was deleted from the Customer node.



Step 4.

Copy the file from **copy-data-company-A** on the MSP node to **data-company-A** on the Customer node.

High network interface usage

In case of such situations make sure that data replication tasks are balanced in your schedule. If there are many tasks at the same time, try to reorganize your schedule so replication tasks do not interfere with each other.
If there is a constant high usage, try to add more network interfaces and create bonding.

High load

If the system reports high load most of the time, consider upgrading your hardware. Monitor CPU usage and disks I/O. If the CPU usage falls within acceptable limits, try to upgrade your RAID configuration (better RAID controller, better or more drives in array).

Monitoring with graphs

Each service monitored should have graphs with different scopes, for example: last 4 hours, last 24 hours, last week, last month, last year. Monitoring configured with instructions from Chapter 5.3 does that by default. When using different monitoring solutions we highly recommend to implement graphs as they are a priceless source of information in case of troubles.

Slow replication rate

Make sure that the Internet connection between nodes works with good performance. Try to measure the connection speed between nodes to estimate the maximum performance that could be achieved. To do that, you can use iperf from some live system to exclude software problems or even connect a different machine to same link to exclude hardware issues. You can do a separate checks with and without a VPN tunnel to exclude the VPN software or VPN hardware from the factors slowing down the system.
You can also check system performance (load, CPU usage, disks I/O). If any of these parameters is high most of the time, please try to eliminate it.

Open-E software version

All configurations were conducted using Open-E DSS V7 up54 build 18432.

8. Open-E Technical Support – Contact information

You have issues with the setup or need help with configuring the cluster or a customer server? Depending on the support level you are using, please open a ticket for your registered Open-E DSS V7 licenses:	**https://www.open-e.com/partner-portal/technical-support/new/**
Your product isn't registered yet? Please follow the link to the registration form:	**https://www.open-e.com/partner-portal/partner-area/products/commercial/**
For more information on Open-E's support services, please read our Support Policy:	**http://www.open-e.com/support/general-information/**

If you have any additional questions please call +1 (678) 666 2880 for US / +49 (89) 800777 0 for Europe or send an e-mail to info@open-e.com