Step-by-Step Guide to Asynchronous Data Replication (File Based) over a WAN Supported by Open-E® DSS™

December 2008

Asynchronous **Data Replication** over a WAN

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	Replication Mode		Source/Destination			Data Transfer		Volume Type			
	Synchronous	Asynchronous	w/ System	LAN	WAN	File based	Block based	NAS	iSCSI		FC
									File-IO	Block-IO	
Data Replication over a LAN		✓			✓	✓		✓			

- **ASYNCHRONOUS DATA REPLICATION over a WAN** enables **asynchronous** file and folder copy from one storage system to another over the Wide Area Network:
  - With Asynchronous Replication, a point-in-time or snapshot copy of data on the source is made and copied from the source to the target storage system.
  - Once the target system has the snapshot copy of the data, the source storage system creates a delta set of all of the changes since the snapshot was created (this delta set doesn't include every write or change, just the last set of changes prior to the snapshot).
  - For maximum flexibility, you can run a data replication task in two directions: one system can be both the source and the destination at the same time, allowing cross data backups on several systems. Replication can be used in disaster recovery or for disk-to-disk backup.

Asynchronous **Data Replication** over a WAN

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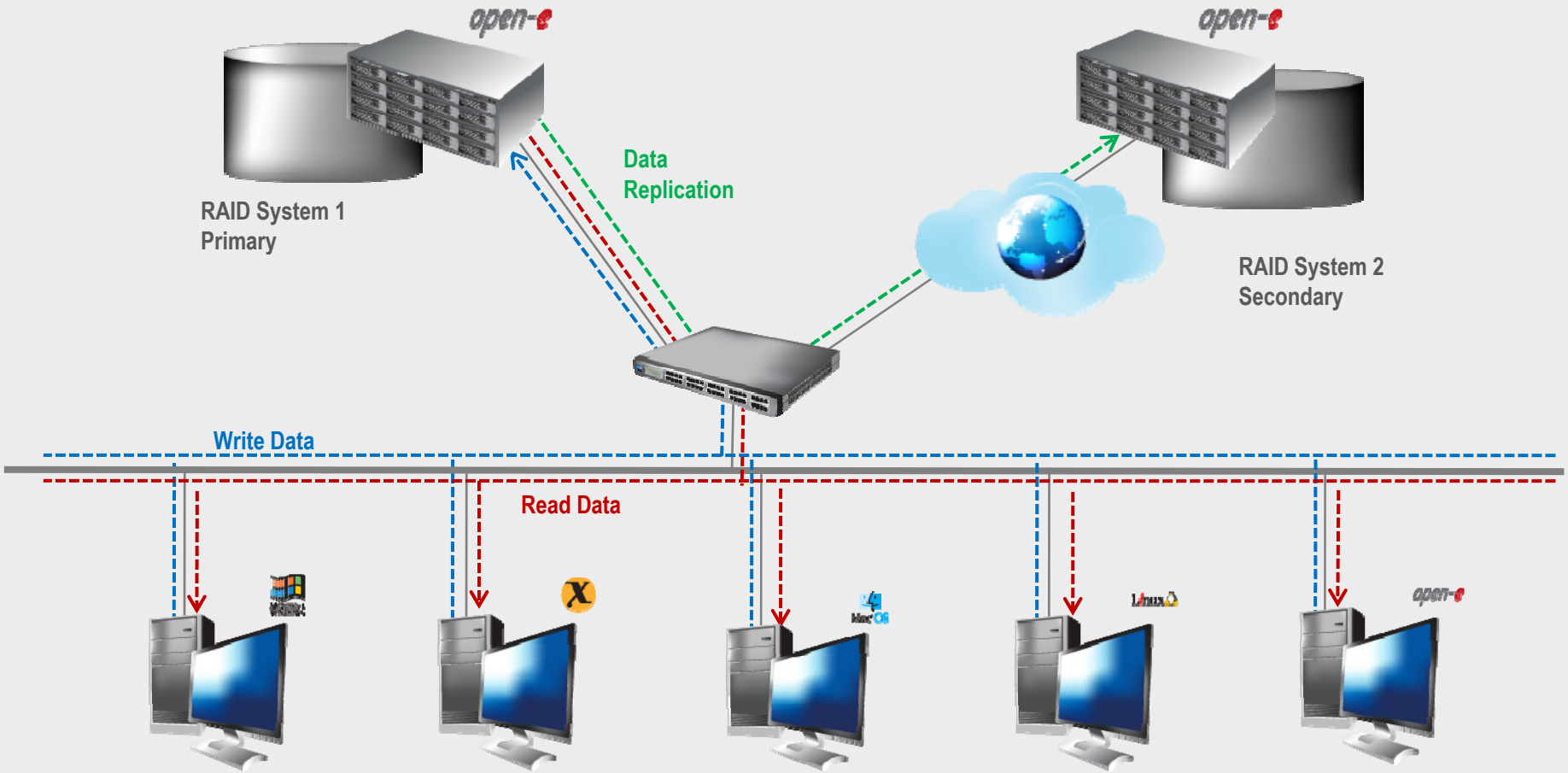
REPLICATION BETWEEN TWO SYSTEMS OVER A WAN

- **Recommended Resources**
  - Key Hardware (two system)
    - ✓ x86 compatible
    - ✓ RAID Controller
    - ✓ HDD‘s
    - ✓ Network Interface Cards
  - Software:
    - ✓ Open-E DSS (recommended) or Open-E NAS-R3, 2 units
- **Benefits**
  - Data redundancy
  - Maximum data safety
- **Disadvantages**
  - High cost of WAN solution

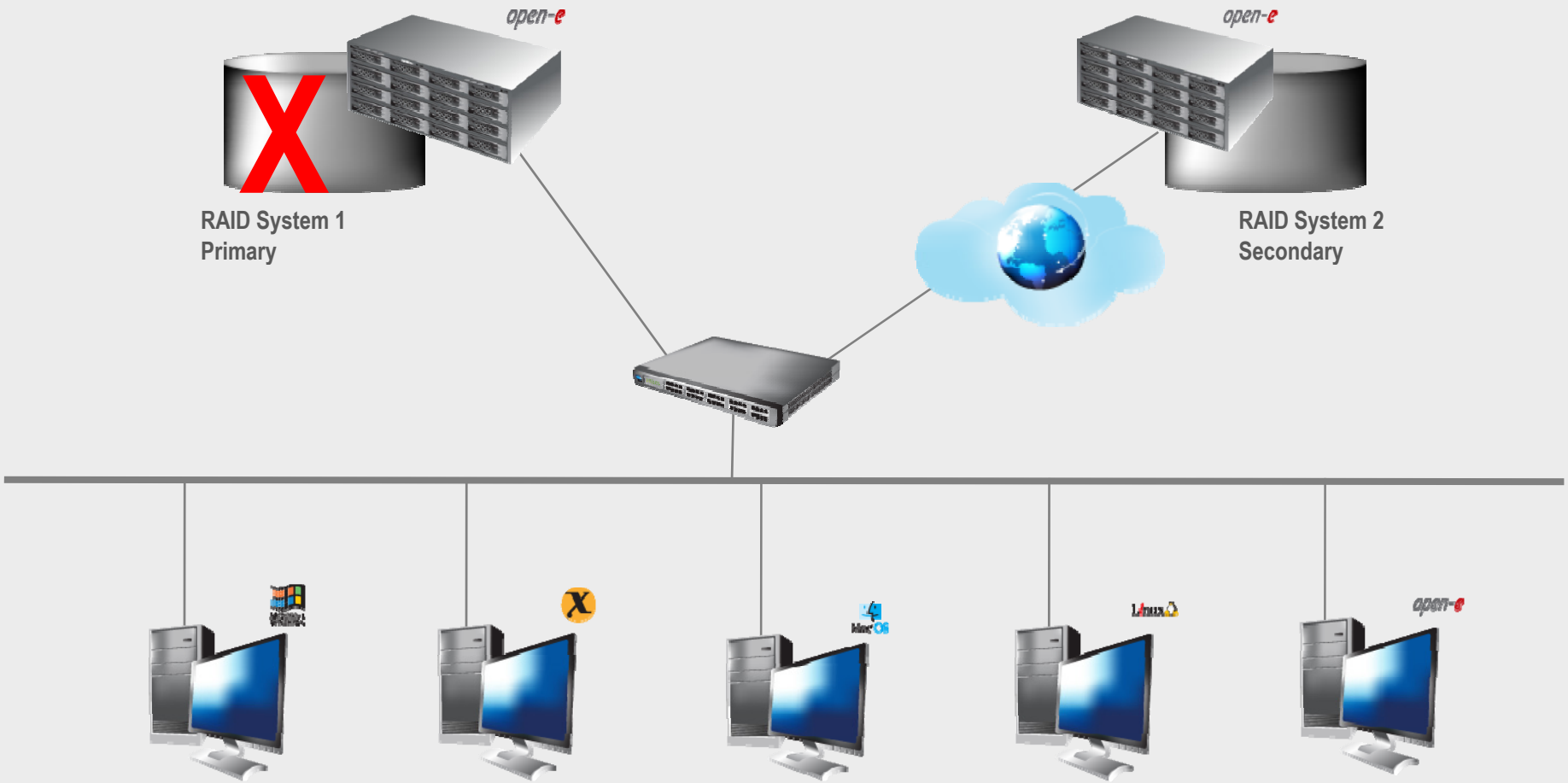
Asynchronous **Data Replication** over a WAN

- Data is written and read in System 1
- Periodically data is replicated to System 2 via Internet connection.



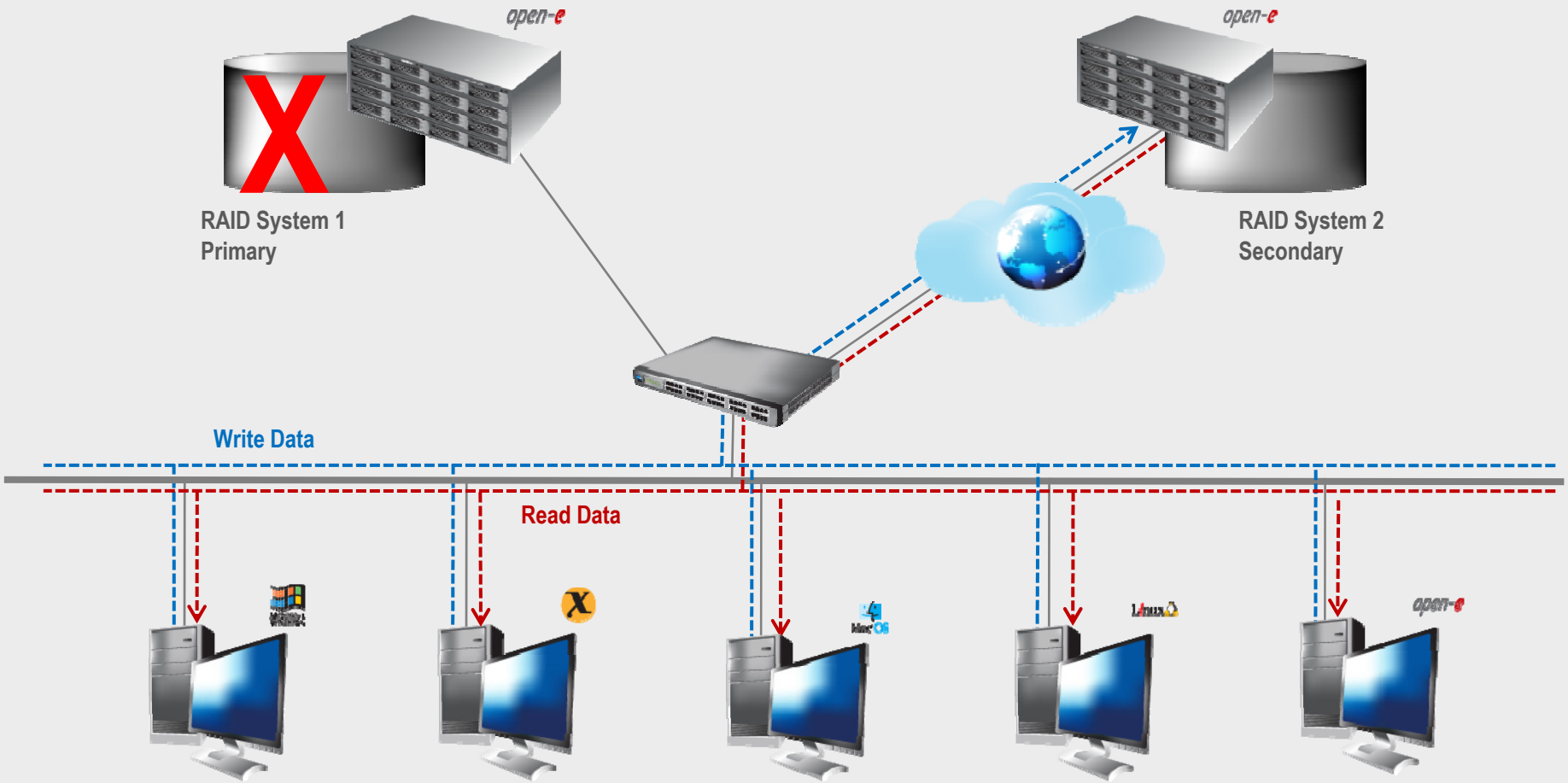
Asynchronous **Data Replication** over a WAN

- In the event of a raid array error or disk drive error on System 1, the server will send an e-mail notification to the administrator
- In the event of a loss of system 1 users will be notified
- Administrator then switches users to System 2 over the WAN



Asynchronous **Data Replication** over a WAN

- After switching, replicated data is available on System 2



Setting up Asynchronous **Data Replication** over a WAN

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TO SET UP DATA REPLICATION, PERFORM THE FOLLOWING STEPS:

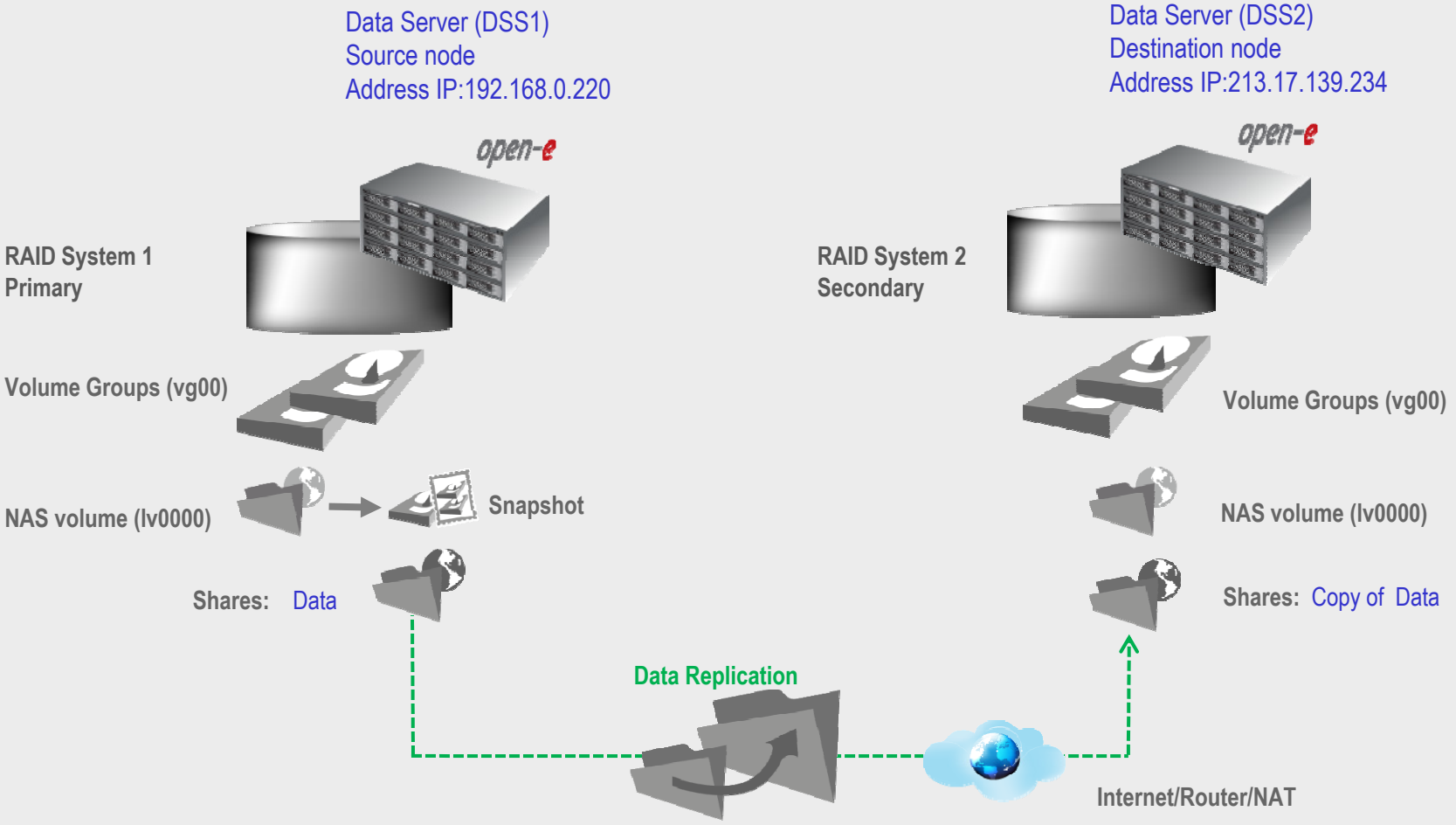
1. Hardware configuration
2. Configure DSS1 and DSS2 on the WAN
3. Configure the destination node
4. Configure the source node
5. Schedule replication

Setting up Asynchronous **Data Replication** over a WAN

1. Hardware Configuration

Hardware Requirements

To run the data replication of Open-E DSS (or NAS R-3), a minimum of two systems are required. Logical volumes working in slave mode must have snapshots created and enabled. Both servers are working in the Wide Area Network. An example configuration is shown below:

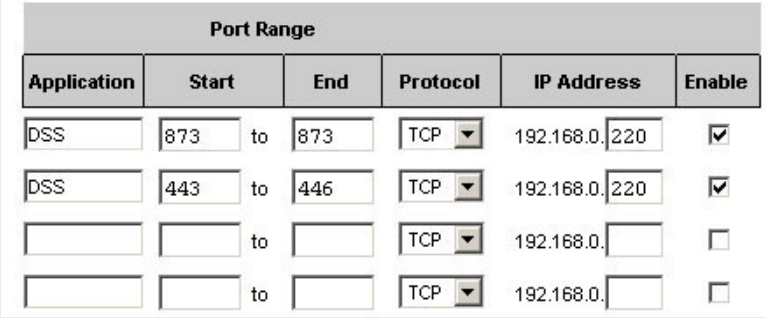


Setting up Asynchronous **Data Replication** over a WAN

2. Configure DSS1 and DSS2 on the WAN

BELOW YOU CAN FIND OF SETTING THE DSS1 AND DSS2 ON THE WAN:

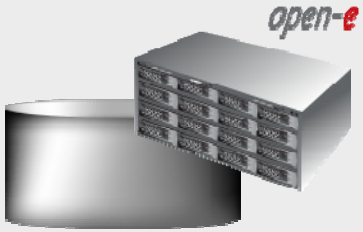
- DSS 1 - machine behind the NAT with local IP address,
- Forwarding port 873 to local ip from DSS 1 in your router (eg. below screenshot)



Port Range					
Application	Start	End	Protocol	IP Address	Enable
DSS	873	to 873	TCP	192.168.0. 220	☑
DSS	443	to 446	TCP	192.168.0. 220	☑
		to	TCP	192.168.0.	☐
		to	TCP	192.168.0.	☐

- DSS 2 – Data Storage System with external internet IP address router/firewall

Setting up Asynchronous **Data Replication** over a WAN



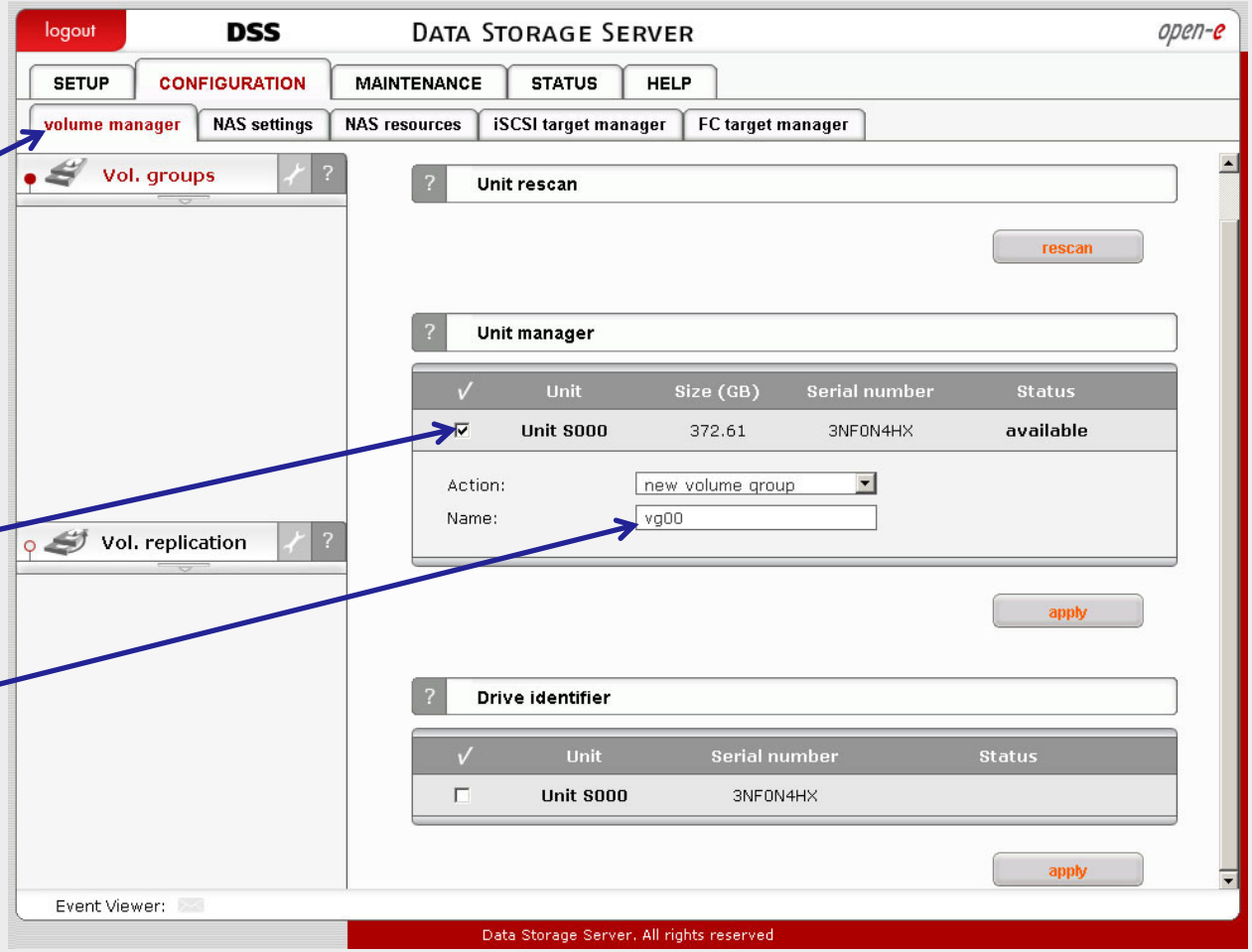
Data Server (DSS2)
Destination node
Address IP:213.17.139.234

3. Configure the Destination Node

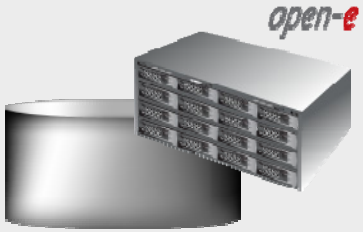
Under the „**CONFIGURATION**" tab, select „**volume manager**".

Volume Groups (vg00)

Add the selected physical units (**Unit S000**) to create a new volume group (in this case, **vg00**) and click **apply** button.



Setting up Asynchronous **Data Replication** over a WAN



Data Server (DSS2)
Destination node
Address IP:213.17.139.234

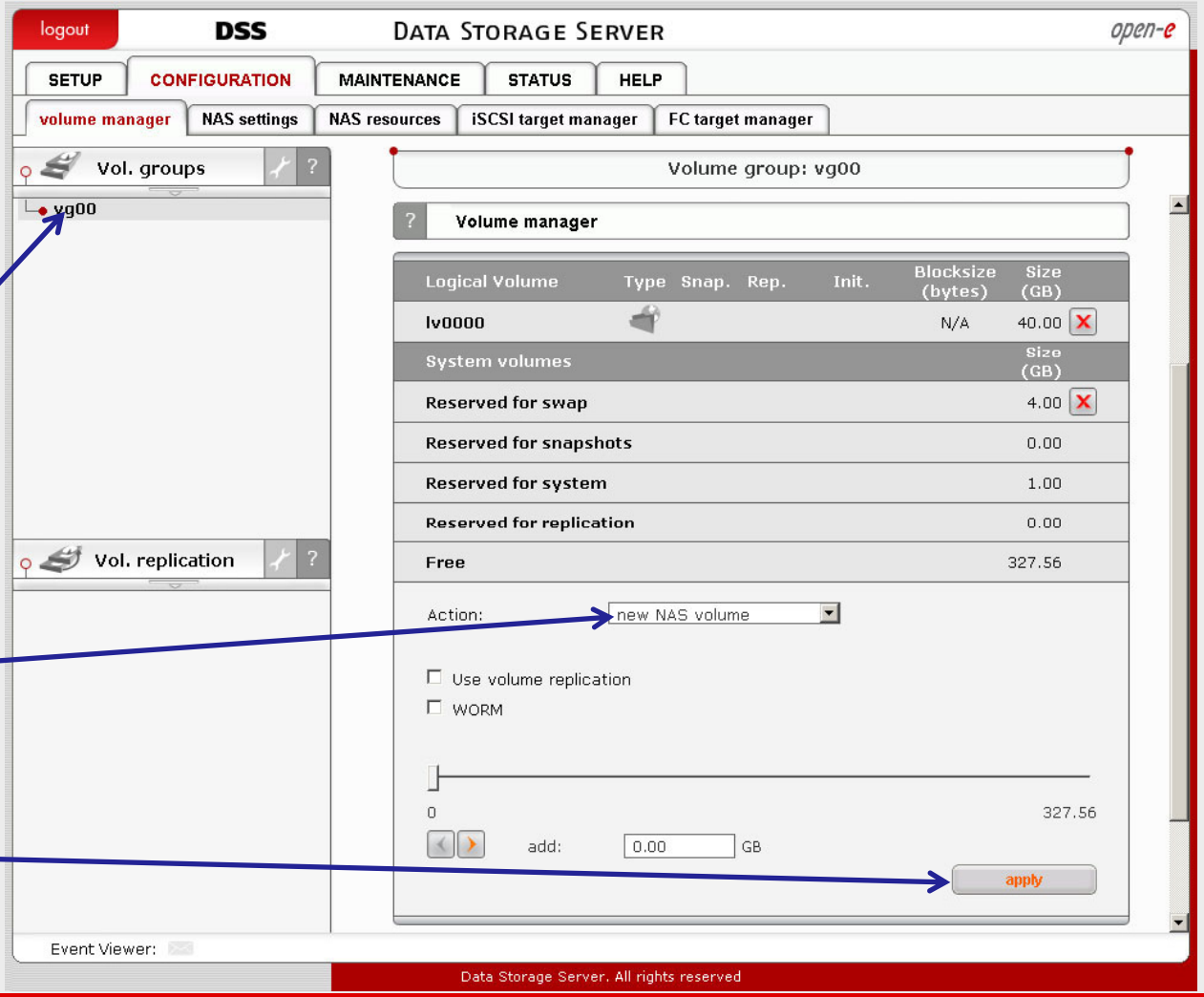
3. Configure the Destination Node

Volume Groups (vg00)

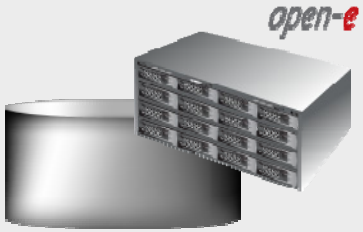
NAS volume (lv0000)

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

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



Setting up Asynchronous **Data Replication** over a WAN



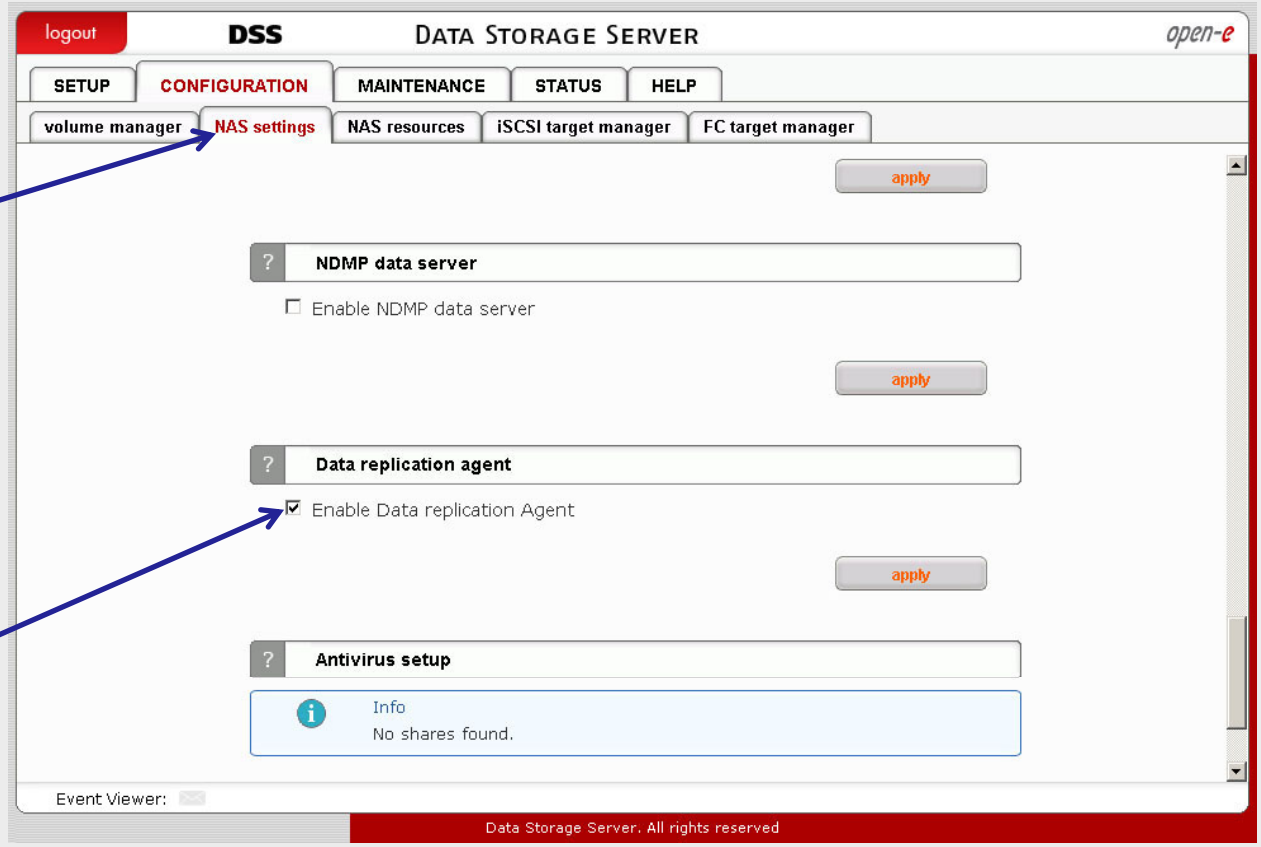
Data Server (DSS2)
Destination node
Address IP:213.17.139.234

3. Configure the Destination Node

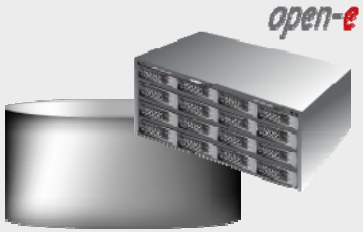
Under the „**CONFIGURATION**" tab, select „**NAS settings**" menu.

Data Replication

Check the **Enable Data replication Agent** box, and click the **apply** button



Setting up Asynchronous **Data Replication** over a WAN



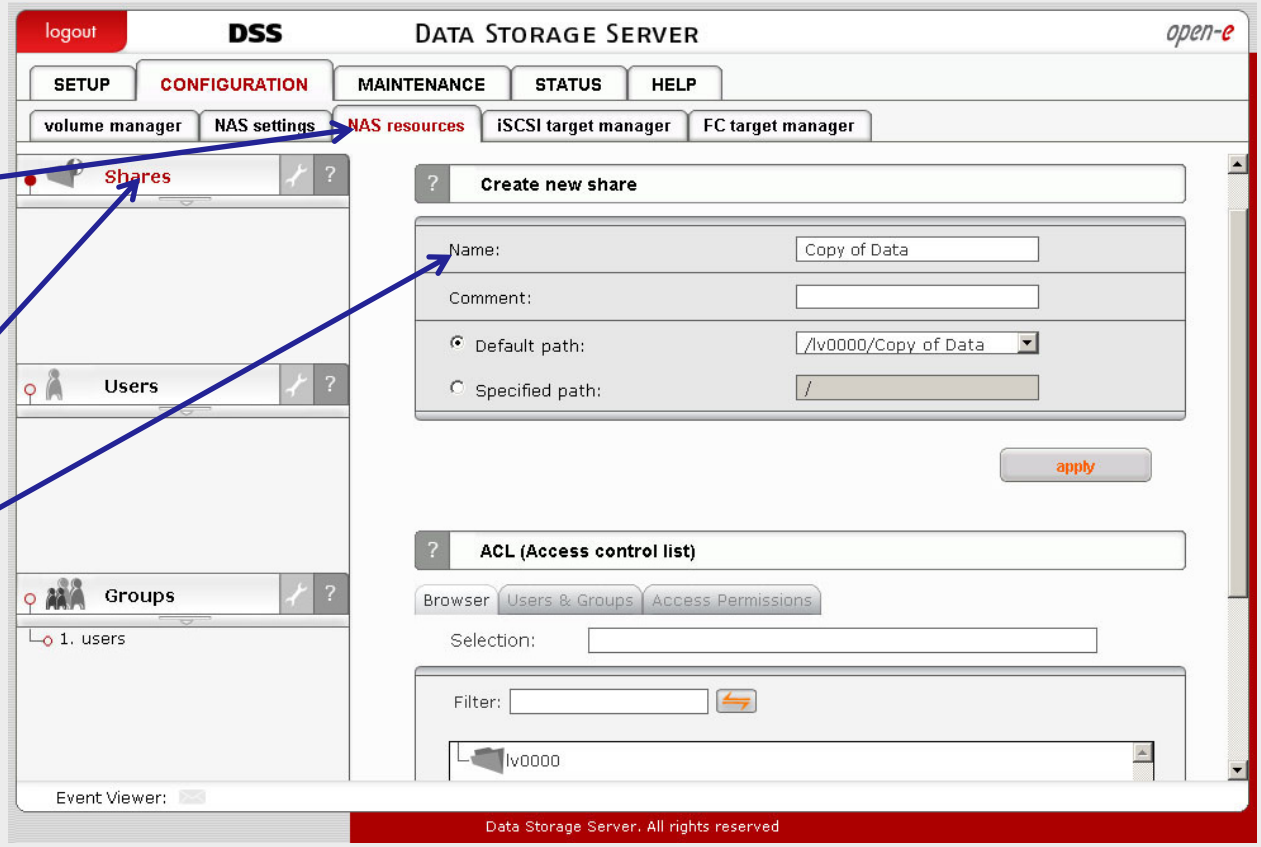
Data Server (DSS2)
Destination node
Address IP:213.17.139.234

3. Configure the Destination Node

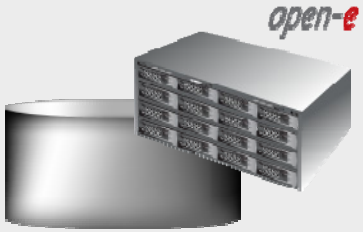
Under the „**CONFIGURATION**" tab, select „**NAS settings**" menu.

Shares: Copy of Data

A tree listing of NAS shared volumes (**Shares**) will appear on the left side of the DSS console. In the example, a shared volume named **Copy of Data** has been created.



Setting up Asynchronous **Data Replication** over a WAN

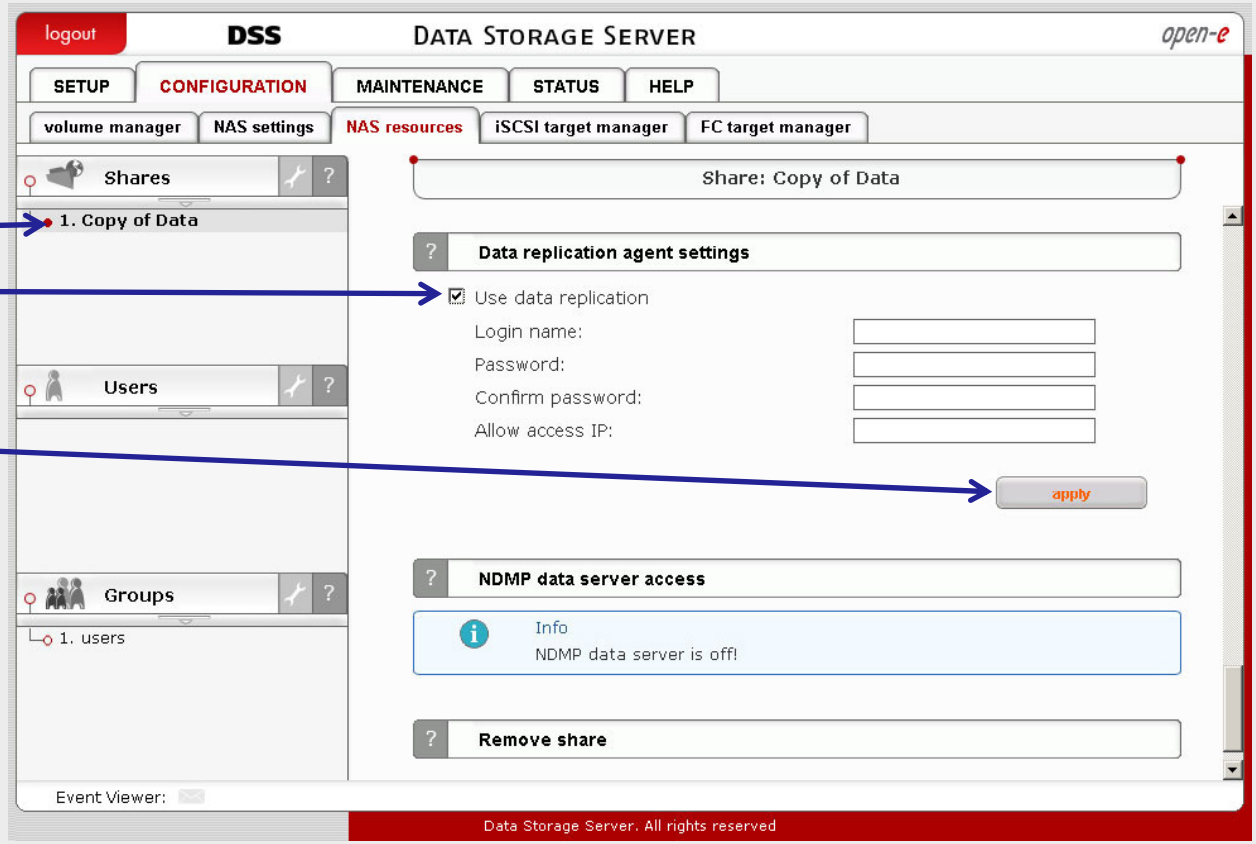


Data Server (DSS2)
Destination node
Address IP:213.17.139.234

3. Configure the Destination Node

After creating the new shared volume, configure it:

- Click on the share name (**Copy of Data**),
- Check the box **Use data replication** within **Data replication agent settings** function.
- Click on the **apply** button.

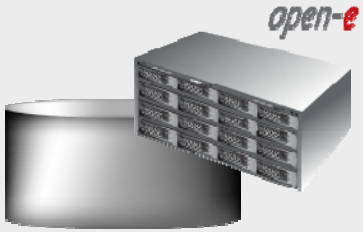


Shares: Copy of Data

Data Replication

The configuration of the Destination Node (storage server) is now complete.

Setting up Asynchronous **Data Replication** over a WAN



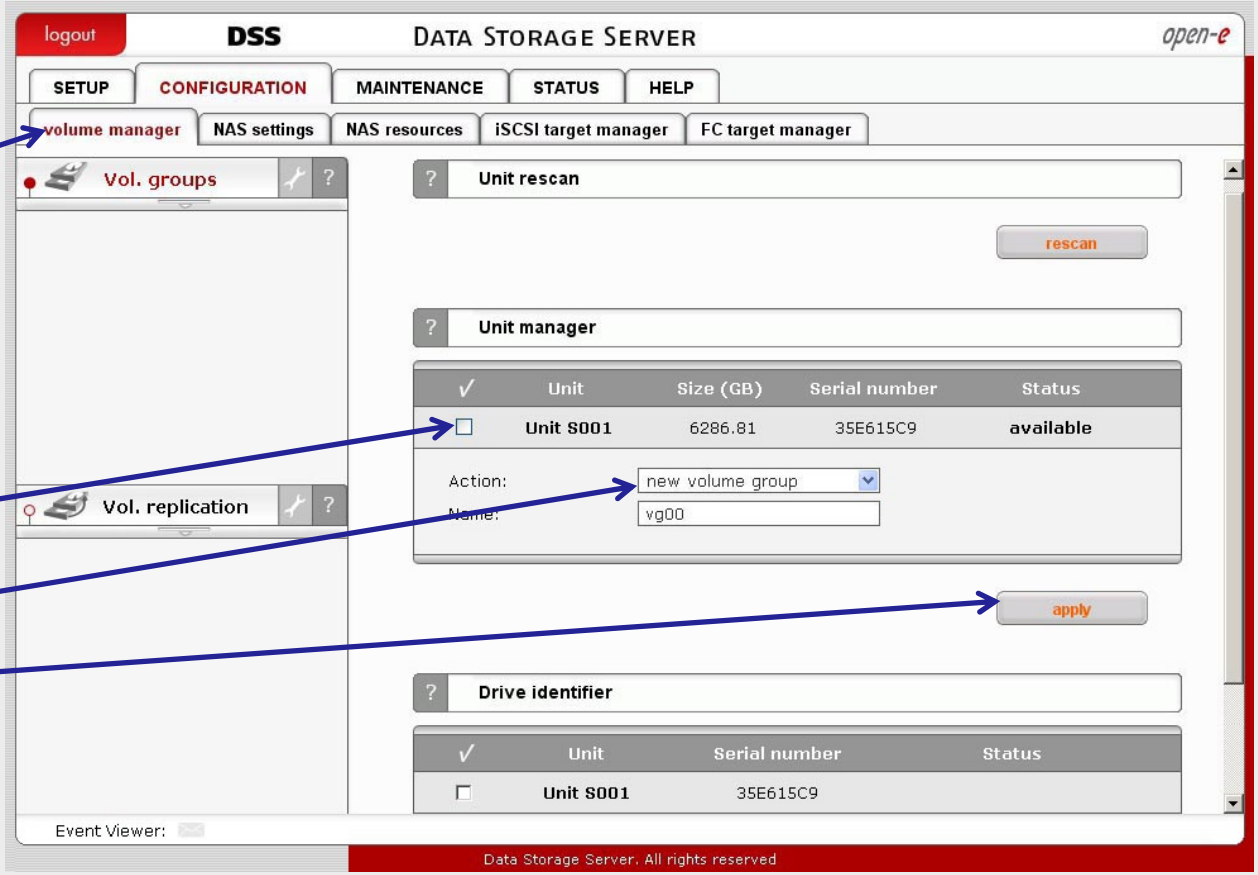
Data Server (DSS1)
Source node
Address IP:192.168.0.220

4. Configure the Source Node

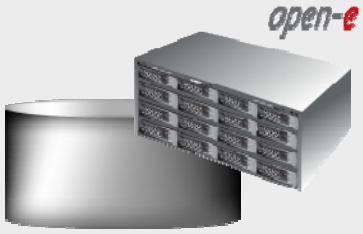
Under the „**CONFIGURATION**" tab, select „**volume manager**".

Volume Groups (vg00)

Add the selected physical units (**Unit MD0**) to create a new volume group (in this case, **vg00**) and click **apply** button.



Setting up Asynchronous **Data Replication** over a WAN



Data Server (DSS1)
Source node
Address IP:192.168.0.220

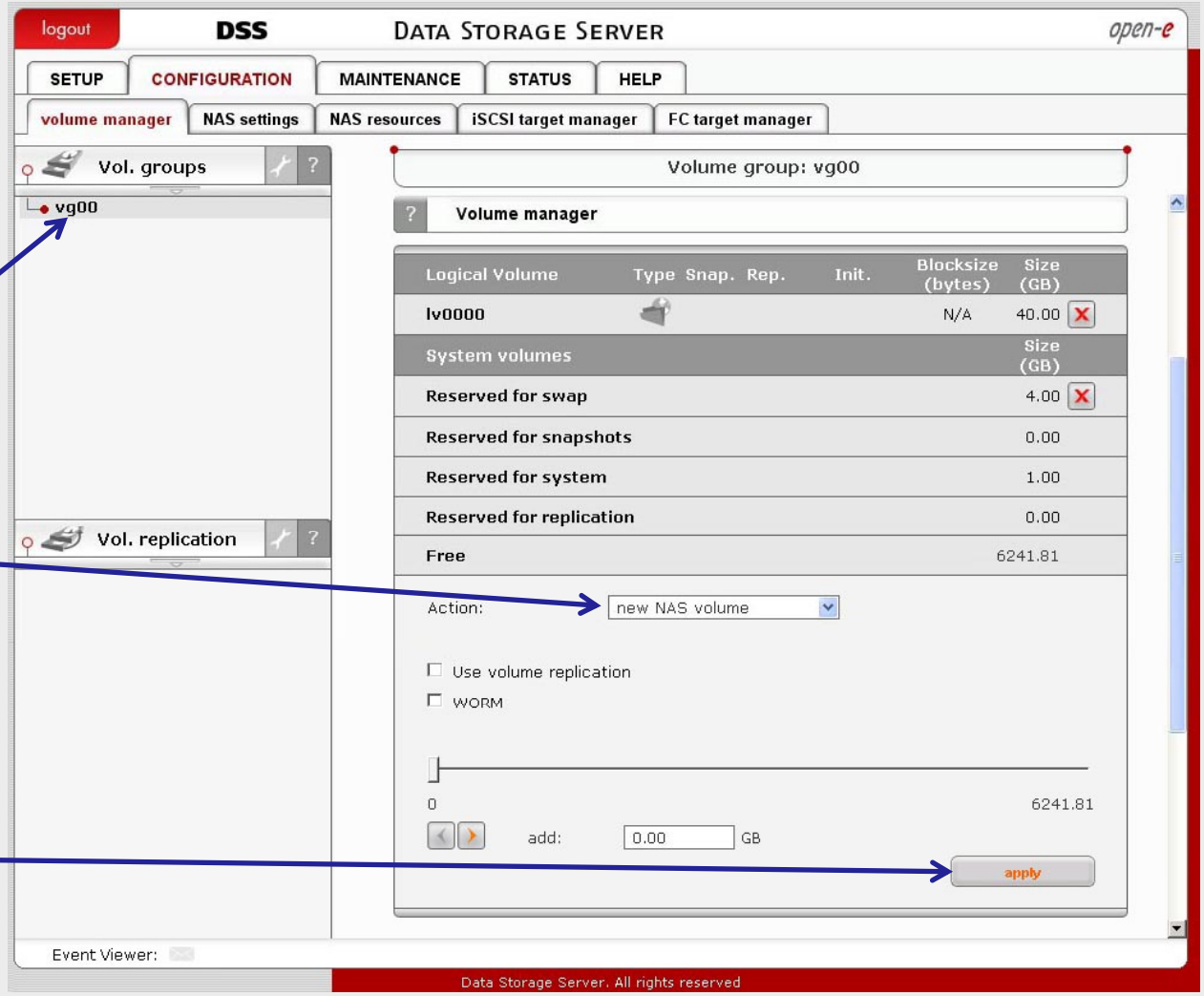
4. Configure the Source Node

Volume Groups (vg00)

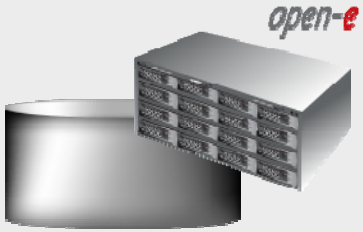
NAS volume (lv0000)

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

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



Setting up Asynchronous **Data Replication** over a WAN



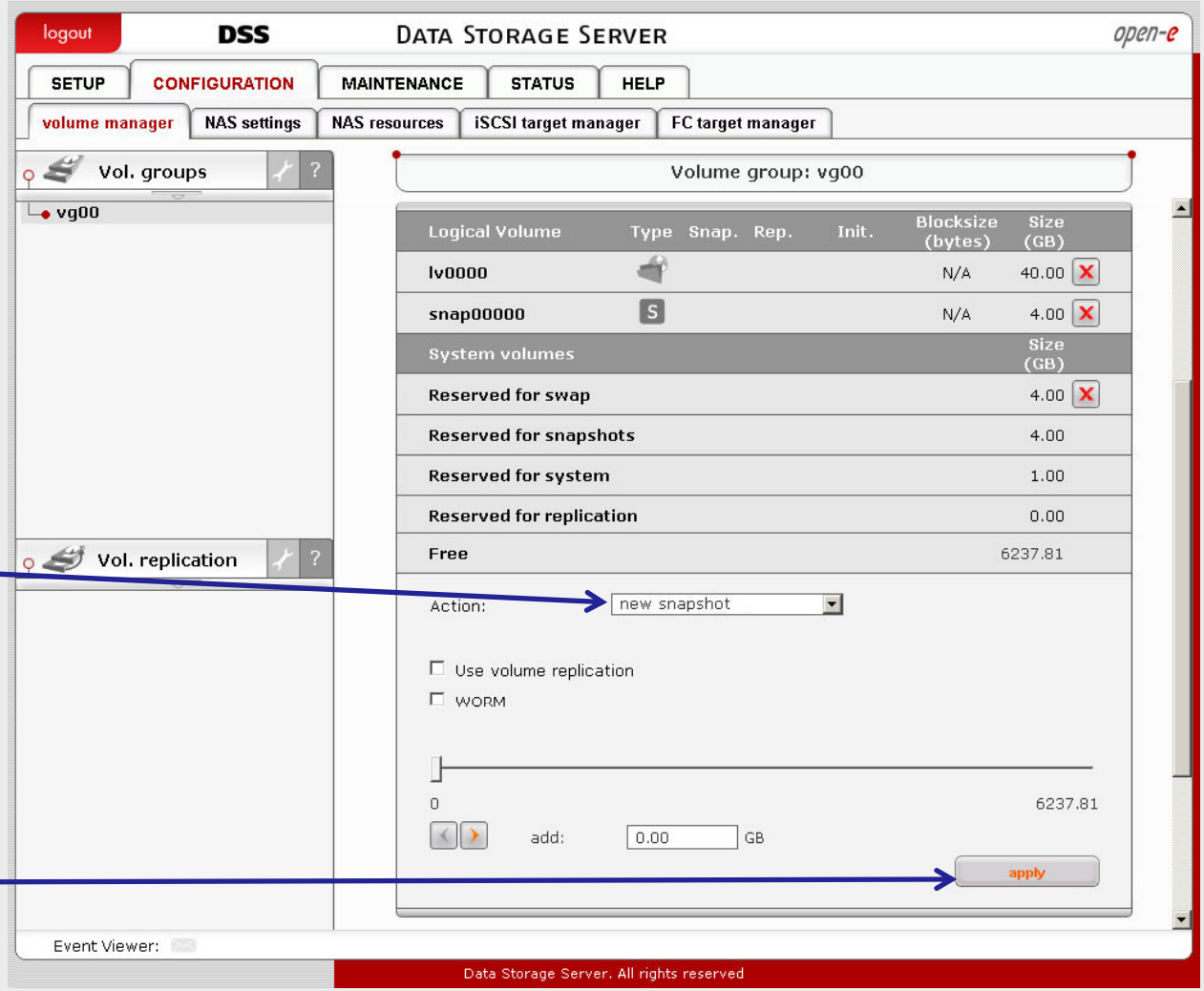
Data Server (DSS1)
Source node
Address IP:192.168.0.220

4. Configure the Source Node

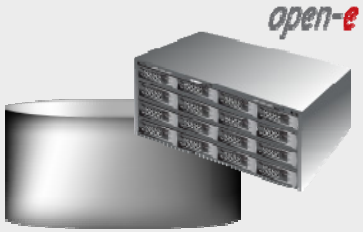
Snapshot 

To run the replication process, you must first define a **new snapshot** in **Volume manager** function to be taken of the volume to be replicated.

After assigning an appropriate amount of space for the **snapshot**, click the **apply** button.



Setting up Asynchronous **Data Replication** over a WAN



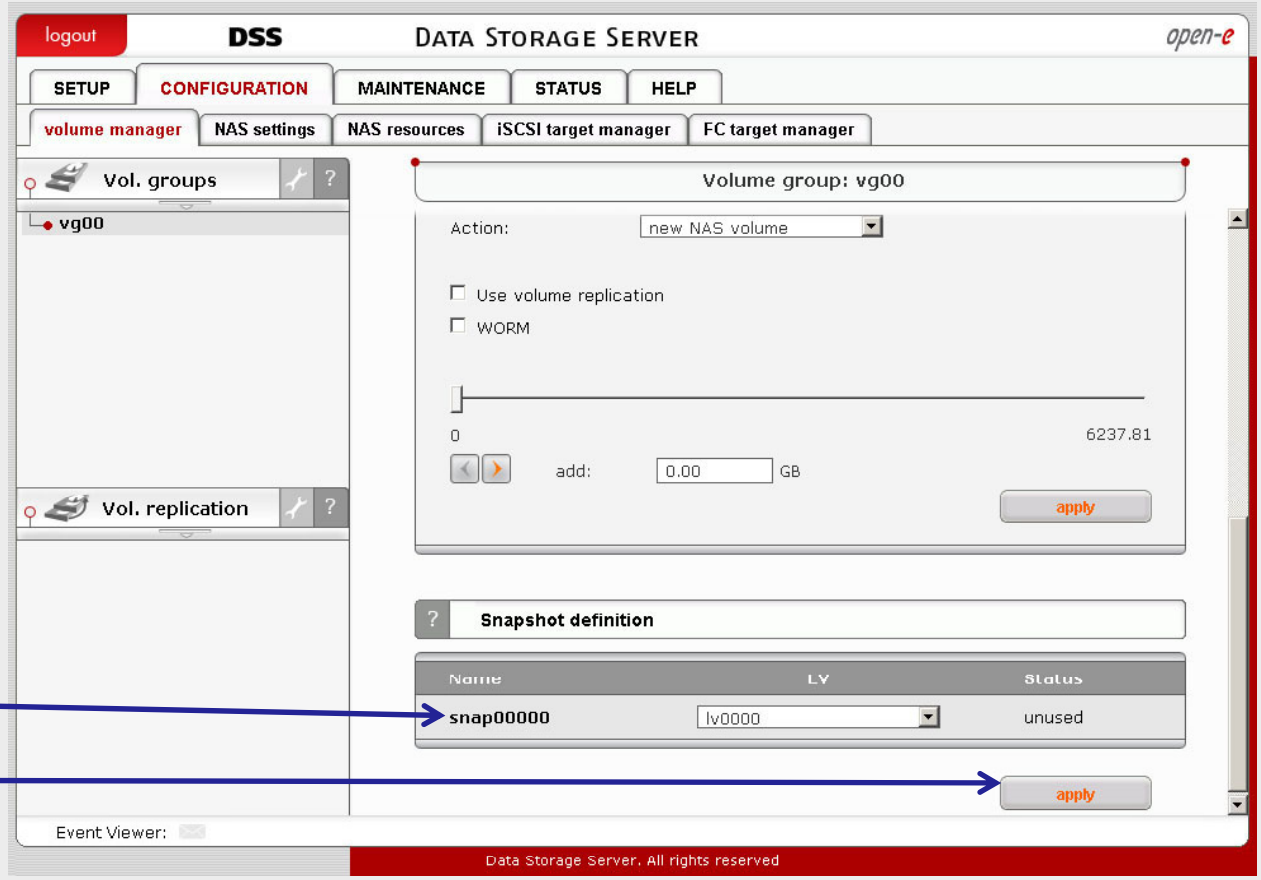
Data Server (DSS1)
Source node
Address IP:192.168.0.220

4. Configure the Source Node

NAS volume
(lv0000)

Snapshot

Assign the snapshot (**snap00000**) to the logical volume to be replicated (in this example: **lv0000**) and click the **apply** button.



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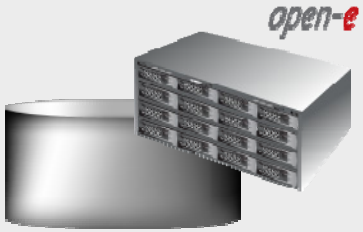


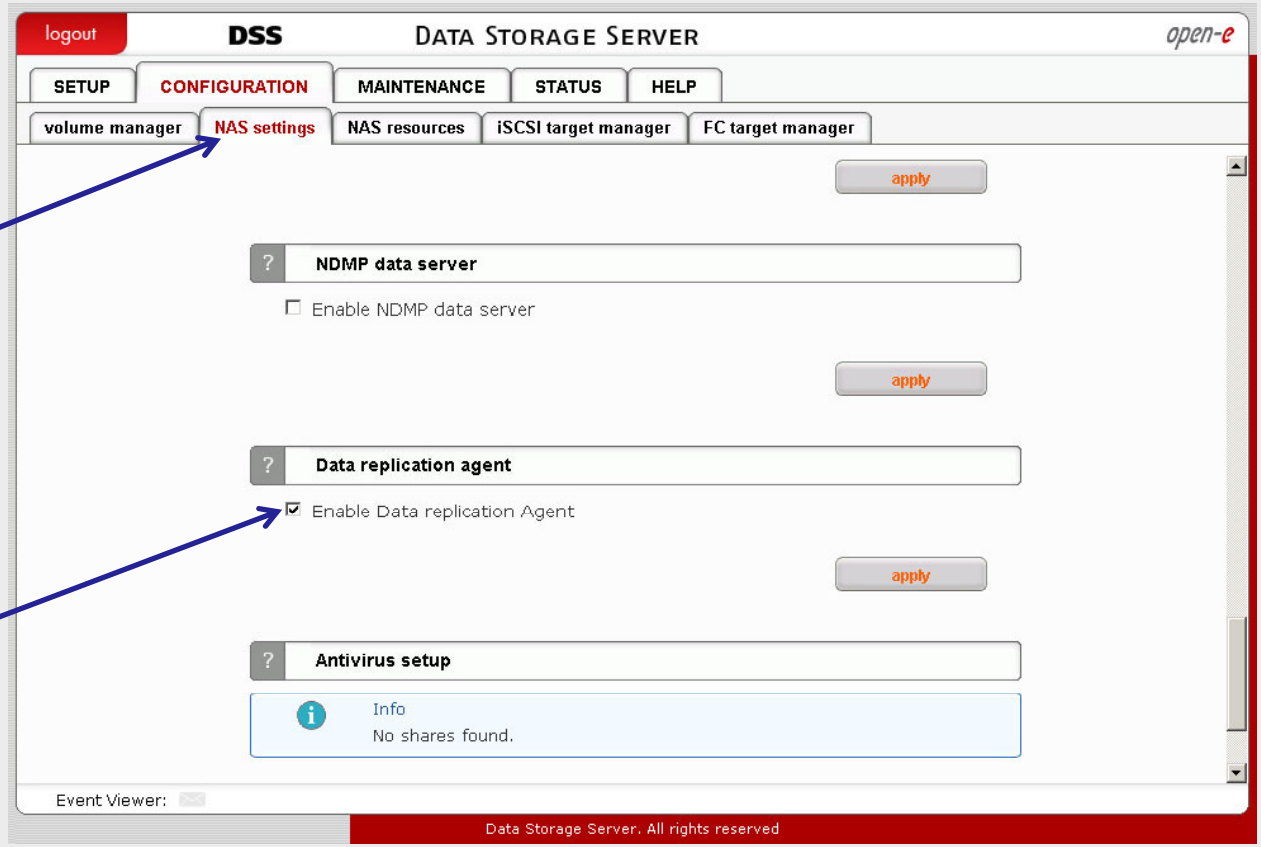
Data Server (DSS1)
Source node
Address IP:192.168.0.220

4. Configure the Source Node

Under the „**CONFIGURATION**" tab, select „**NAS settings**" menu.

Data Replication

Check the **Enable Data replication Agent** box, and click the **apply** button



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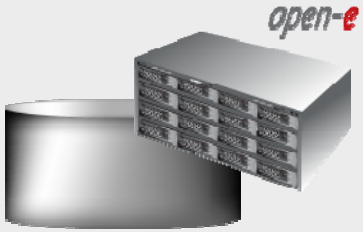


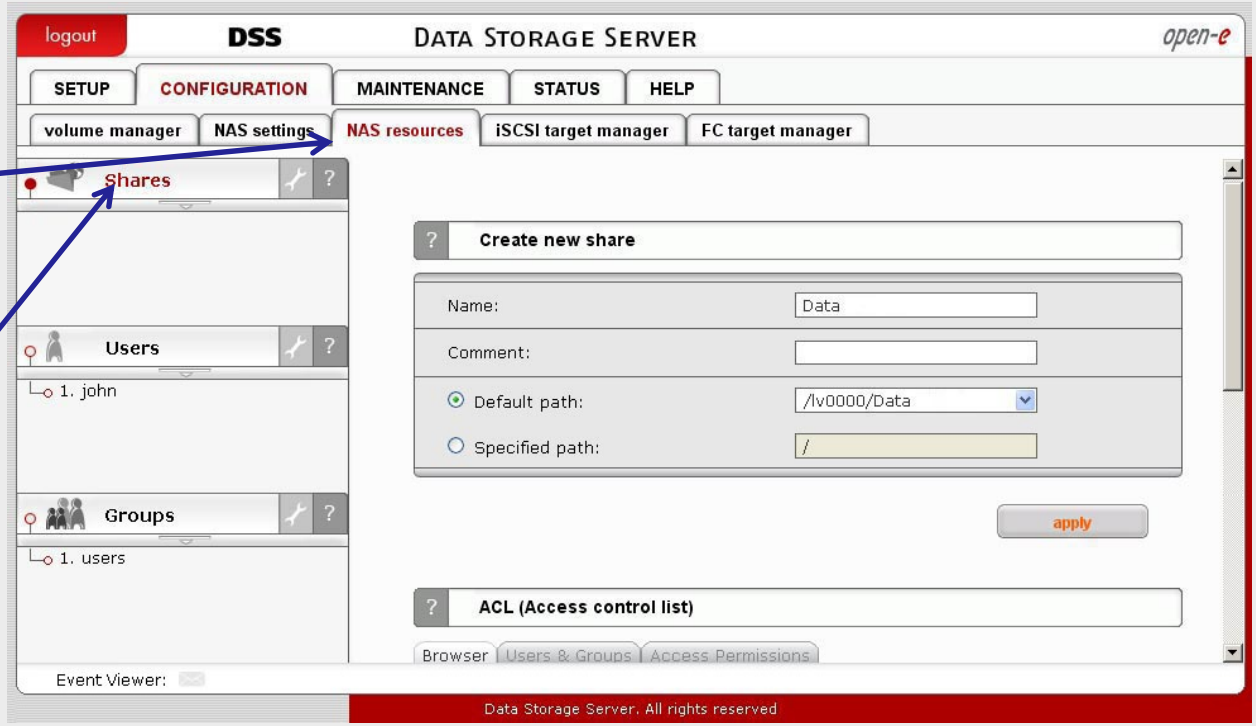
Data Server (DSS1)
Source node
Address IP:192.168.0.220

4. Configure the Source Node

Under the „**CONFIGURATION**" tab, select „**NAS resources**" menu, to see a tree listing all the NAS shared volumes (**Shares**).

Shares: Data

To create a share, enter the share name in field **Name**. In this example a new share named **Data** has been created



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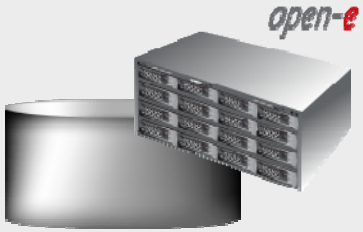
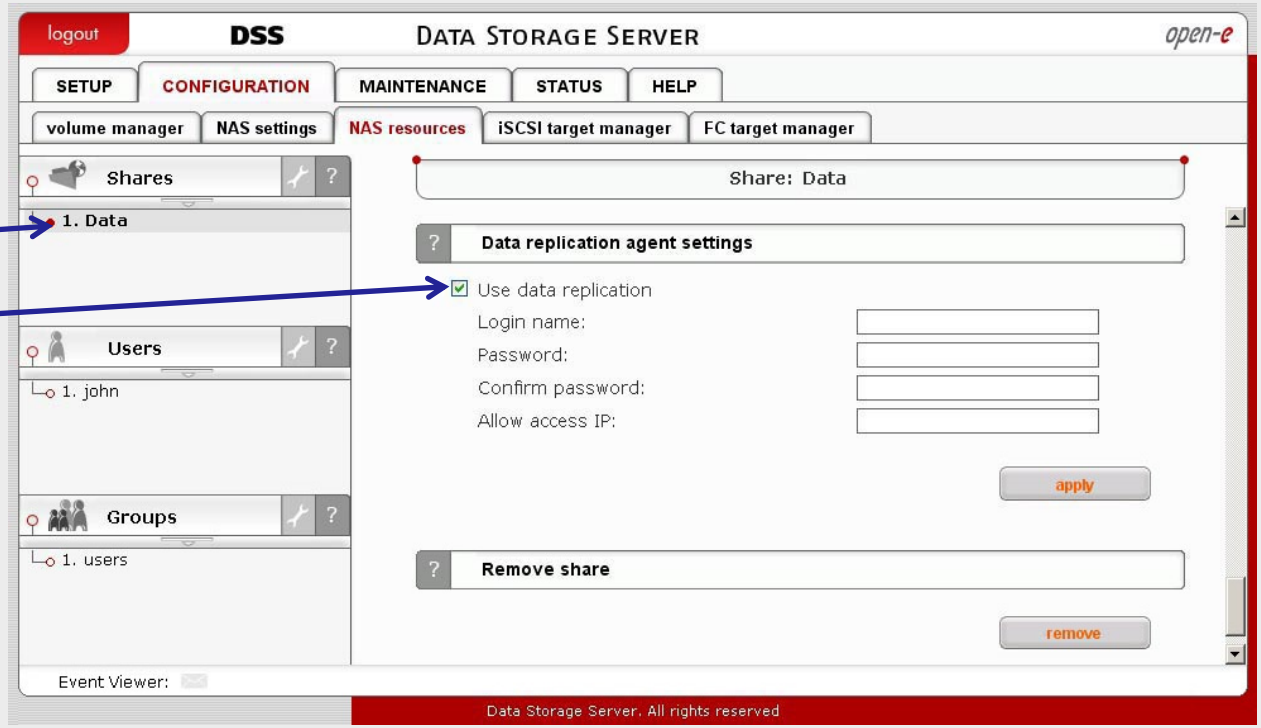


Data Server (DSS1)
Source node
Address IP:192.168.0.220

4. Configure the Source Node

After creating the new shared volume, configure it:

- Click on its name (**Data**),
- Check the box **Use data replication**, within the **Data replication agent settings** function.
- Click on the **apply** button

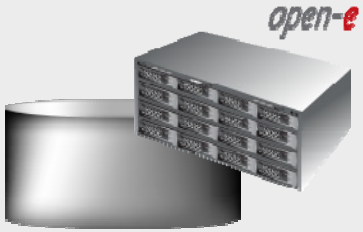


Shares: Data

Data Replication

NOTE:
It is strongly recommended to protect the replication protocol with a user name and password, along with a list of allowed IP address. This will prevent local network users from accessing this share. **The user name and password must be the same as on the destination node.**

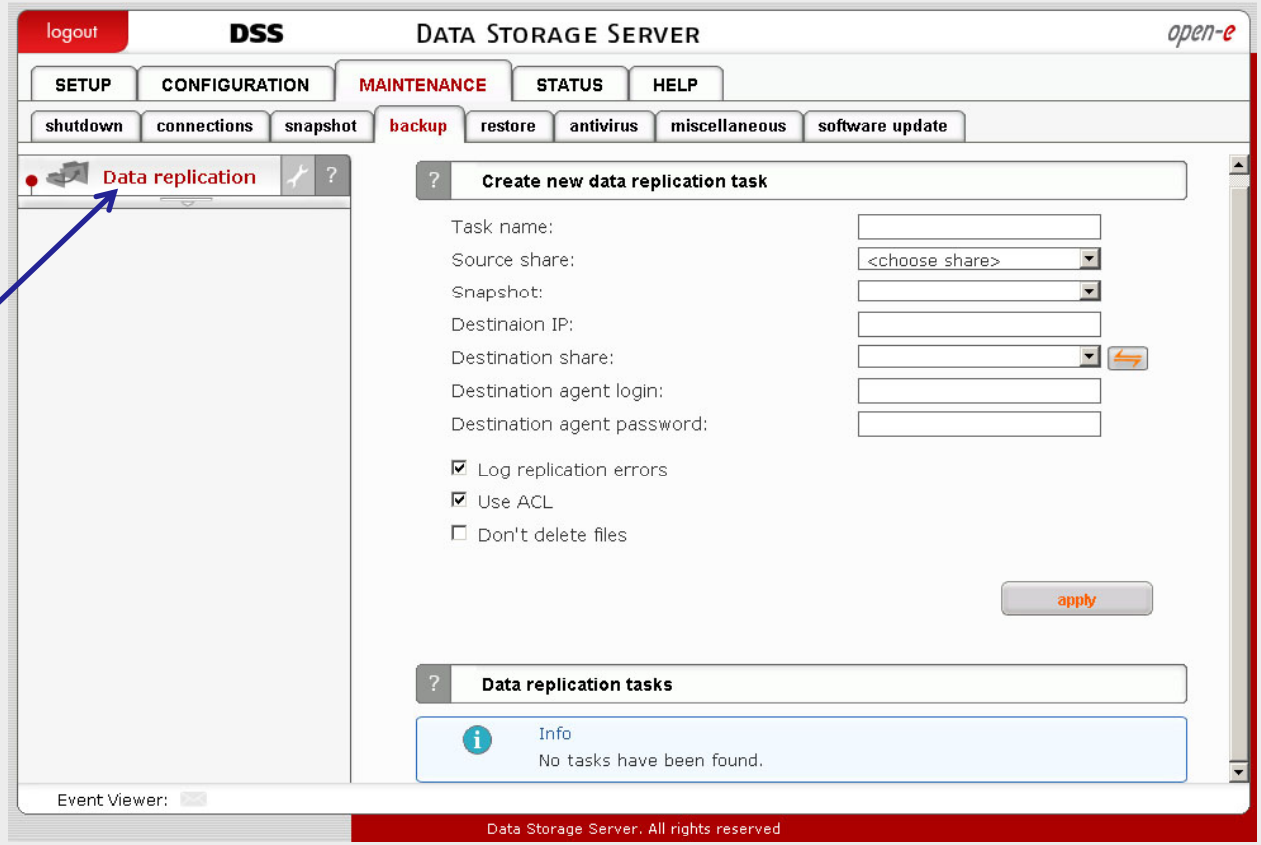
Setting up Asynchronous **Data Replication** over a WAN



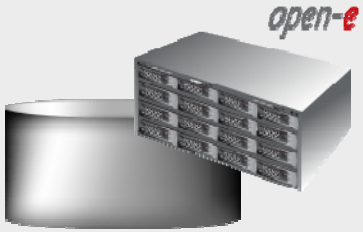
Data Server (DSS1)
Source node
Address IP:192.168.0.220

4. Configure the Source Node

After the share to be replicated has been configured, go to the „**MAINTENANCE**" tab and select „**backup**" to choose the **Data Replication** function.



Setting up Asynchronous **Data Replication** over a WAN

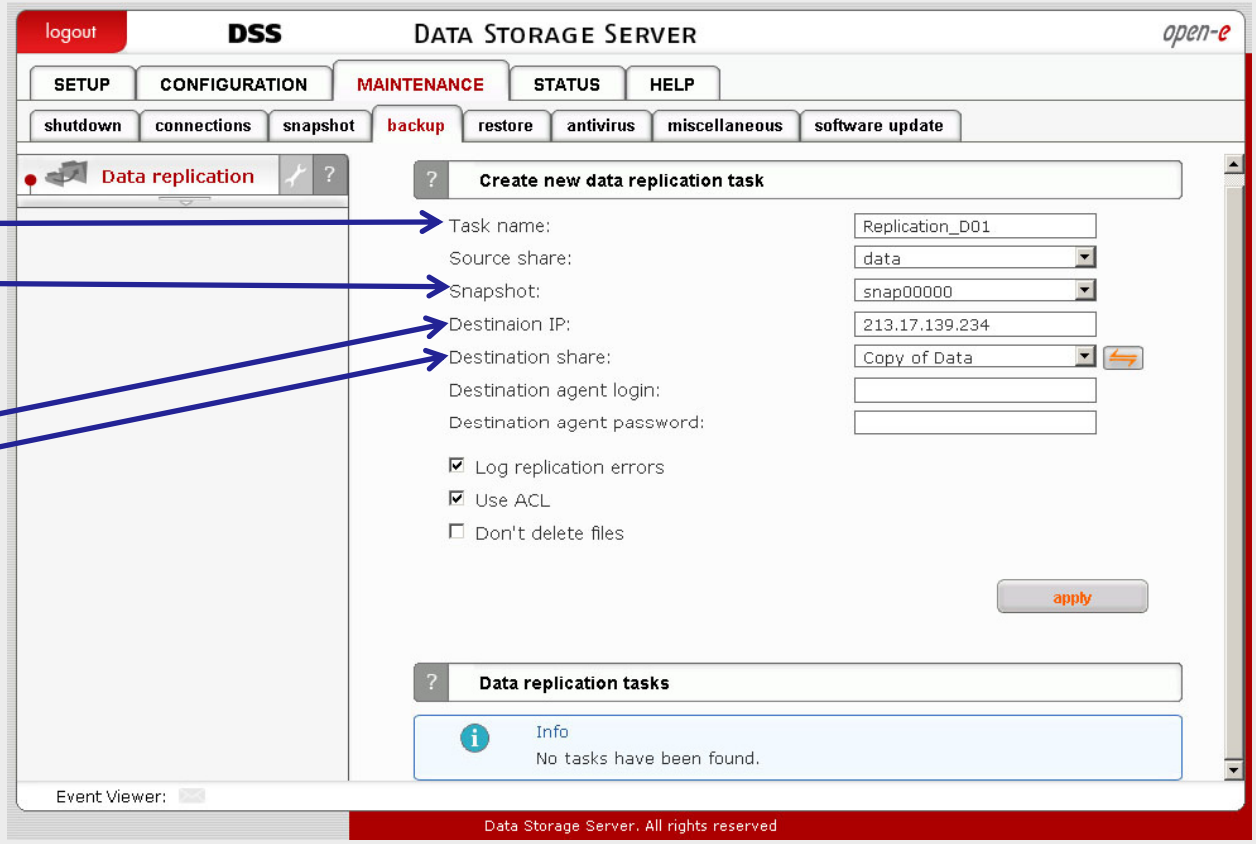


Data Server (DSS1)
Source node
Address IP:192.168.0.220

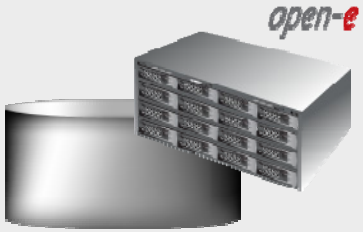
4. Configure the Source Node

Select the source share to be replicated. **Under Create new data replication task** function, enter a name for the task and select the **Source share** to be replicated. At this point, a snapshot (**snap00000**) of the source share will automatically be assigned.

In the **Destination IP** field, enter the IP address of the destination server (in this example, 213.17.139.234) and the user name/password (if applicable) for the destination. Next, configure the **Destination share** field by clicking on the button. In this example, the **Copy of Data** share is appear. Click on the **apply** button.



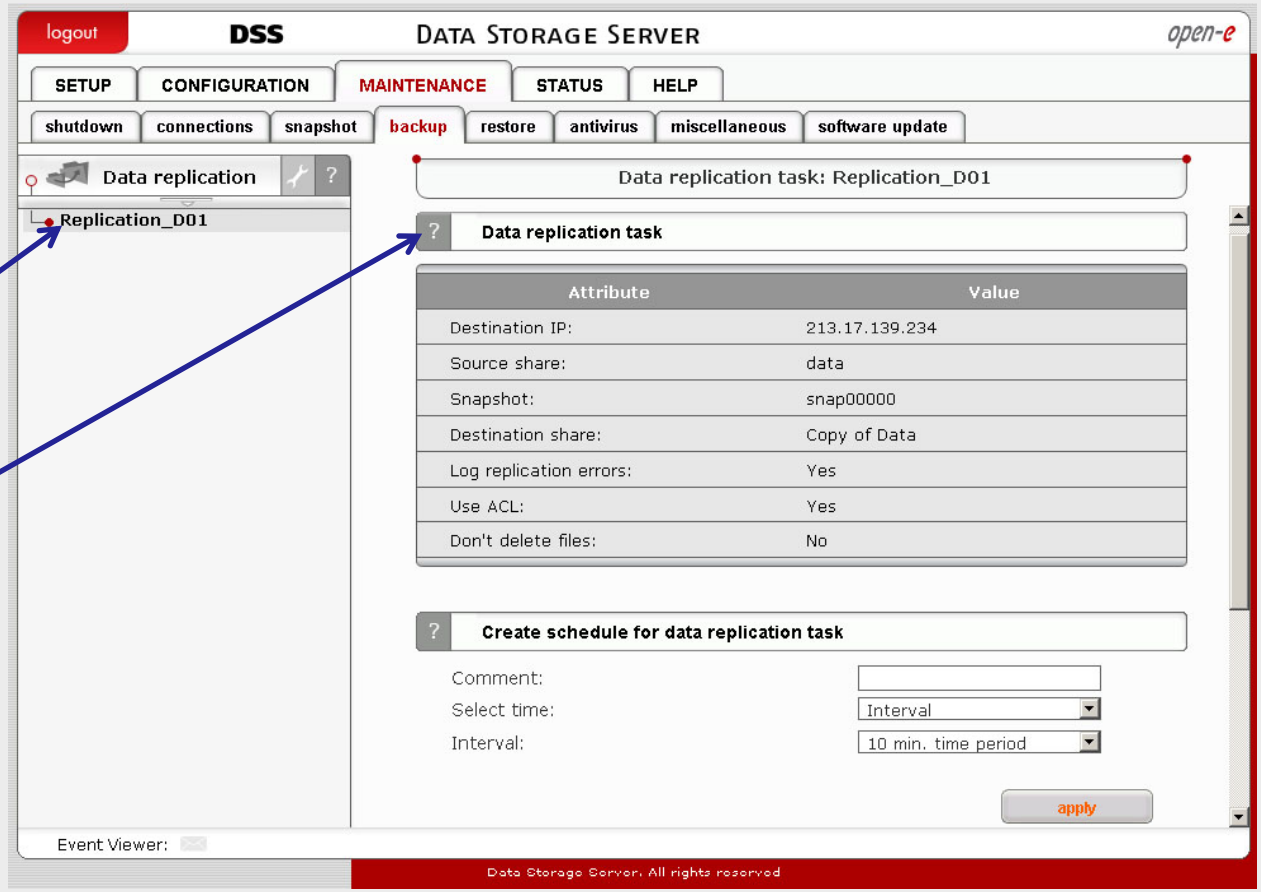
Setting up Asynchronous **Data Replication** over a WAN



Data Server (DSS1)
Source node
Address IP:192.168.0.220

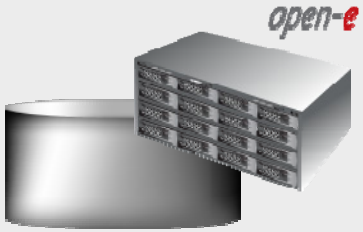
4. Configure the Source Node

After the DSS WEB console, has been reloaded, the new task should appear (**Replication_D01**).
Obtain additional information about a selected replication task by accessing the **Data replication task** function



The configuration of the Source Node (storage server) is now complete.

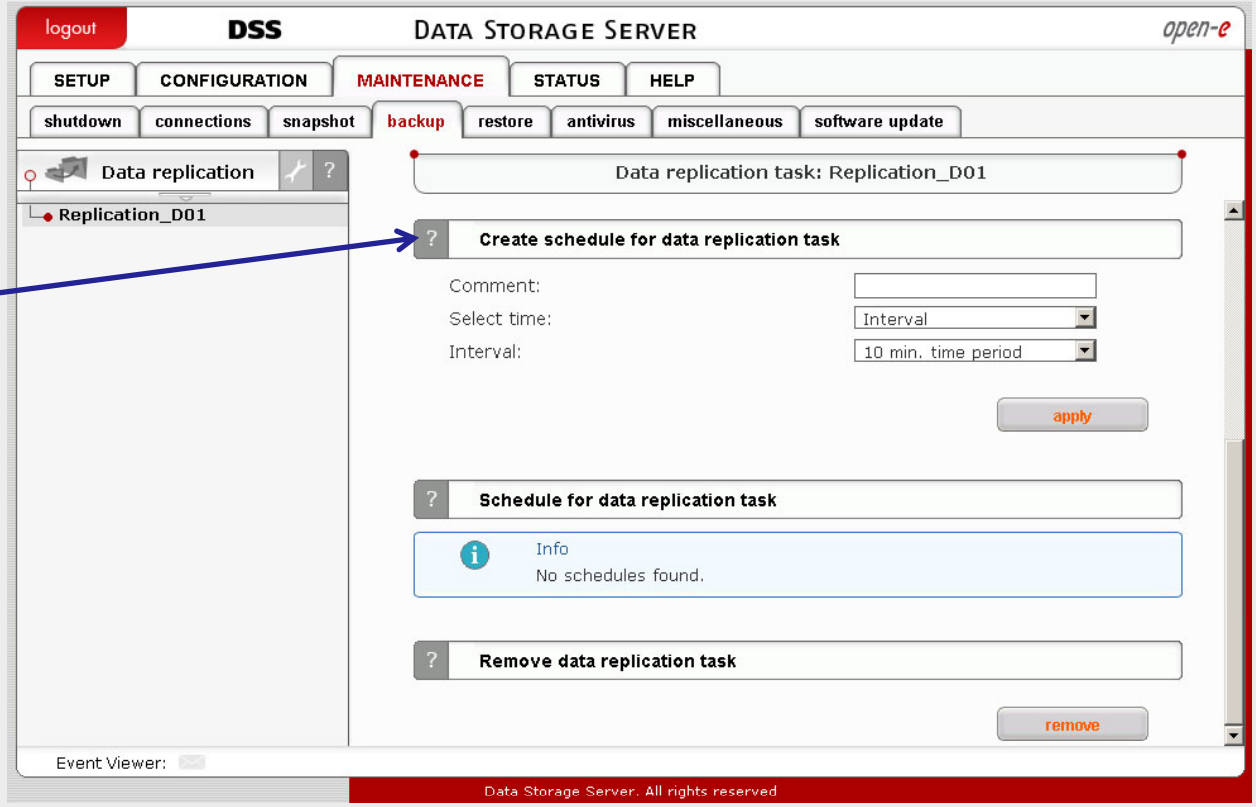
Setting up Asynchronous **Data Replication** over a WAN



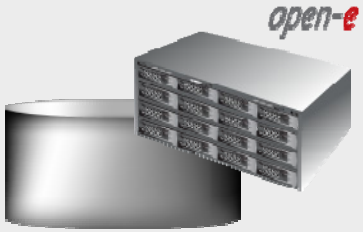
Data Server (DSS1)
Source node
Address IP:192.168.0.220

5. Configure Schedule replication

Using the **Create schedule for data replication task** function, set the desired replication schedules or explicitly start, stop and delete data replication tasks, as desired.



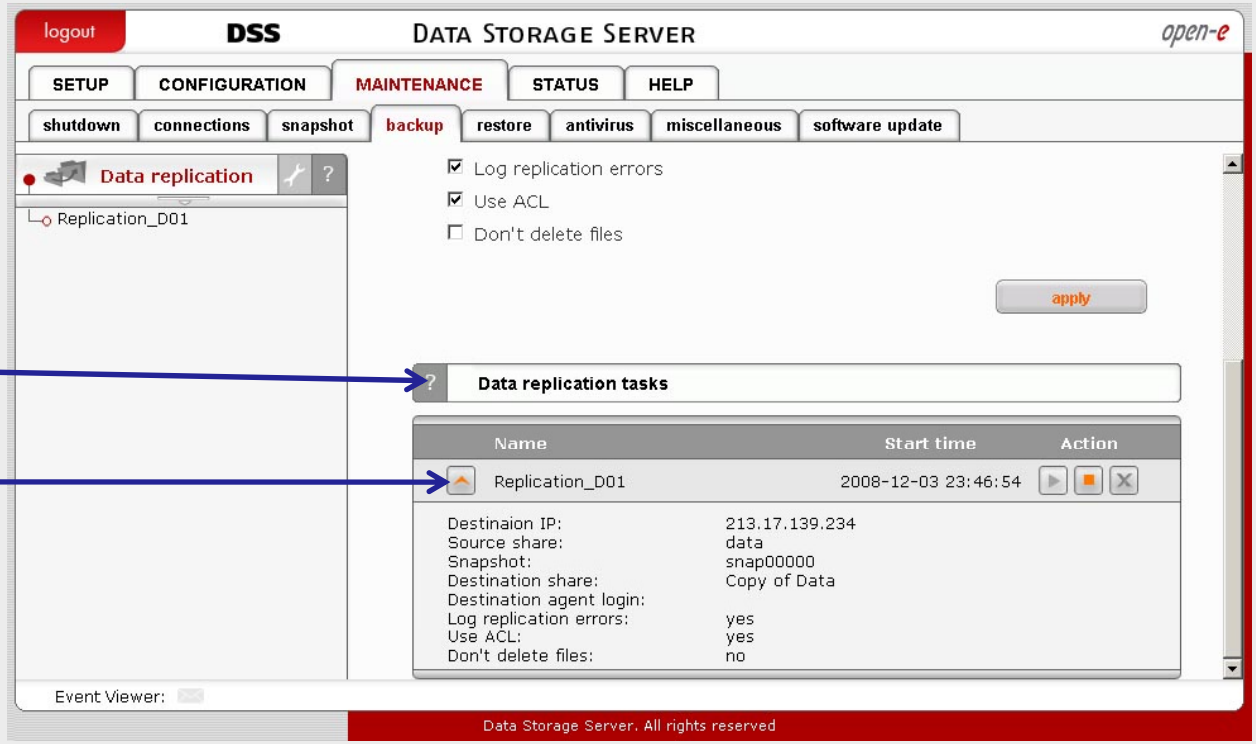
Setting up Asynchronous **Data Replication** over a WAN



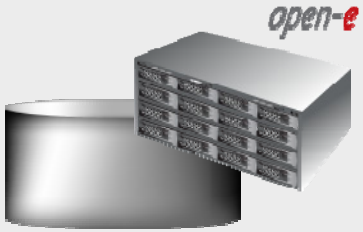
Data Server (DSS1)
Source node
Address IP:192.168.0.220

6. Checking status data replication

In **Data replication tasks** function set the desired data replication to start, stop and delete tasks.



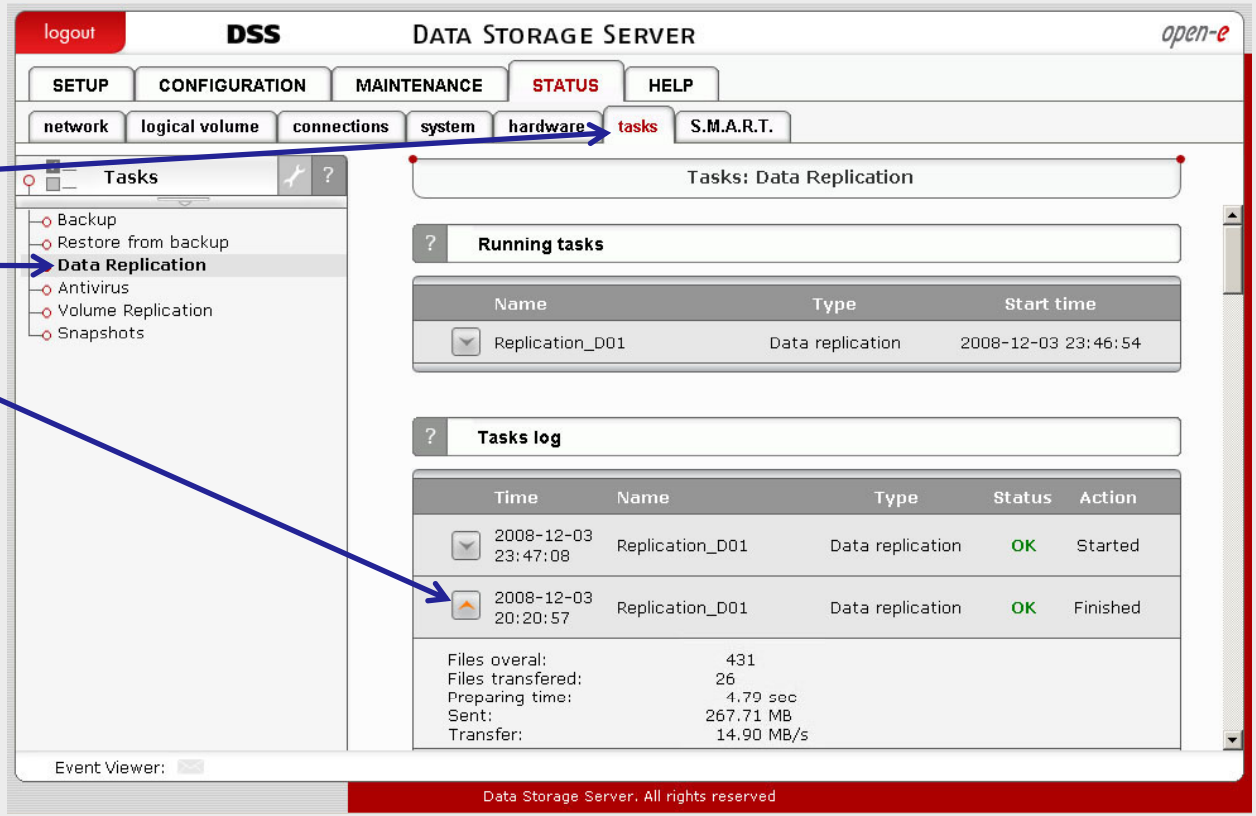
Setting up Asynchronous **Data Replication** over a WAN



Data Server (DSS1)
Source node
Address
IP:192.168.0.220

5. Checking status data replication

To obtain detailed information about the progress of data replication tasks, under the „**STATUS**" tab, select „**tasks**" menu.
Next click **Data Replication** tasks and select the Tasks



The configuration of the source and destination nodes for asynchronous data replication is now complete.

Thank You!