

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



Asynchronous Data Replication over a WAN

	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	
Asynchronous Data Replication over a WAN		✓			✓	✓		✓			

- **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 to the target storage system.
 - 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

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

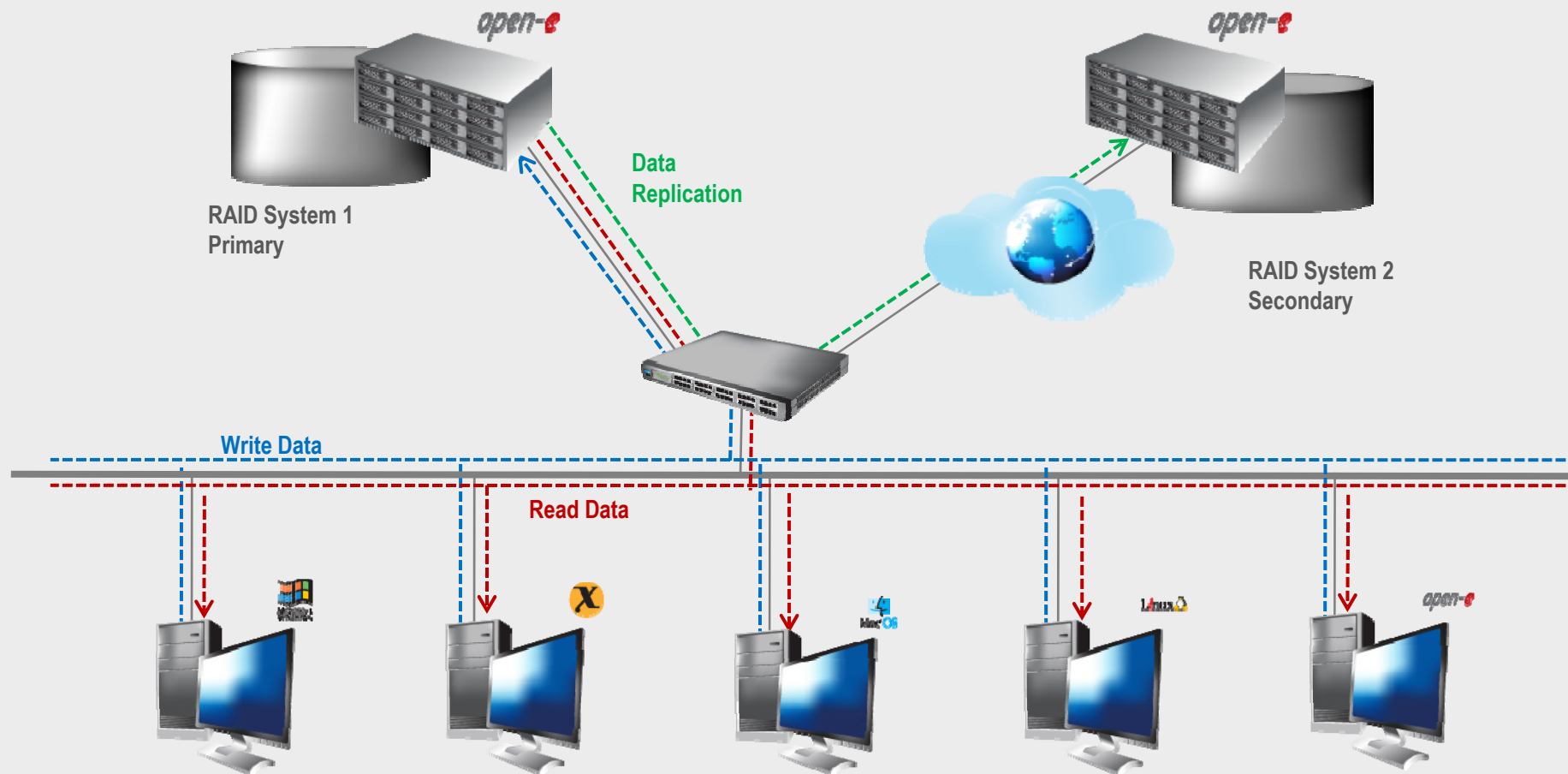
■ **Disadvantages**

- High cost of WAN solution

Asynchronous Data Replication over a WAN

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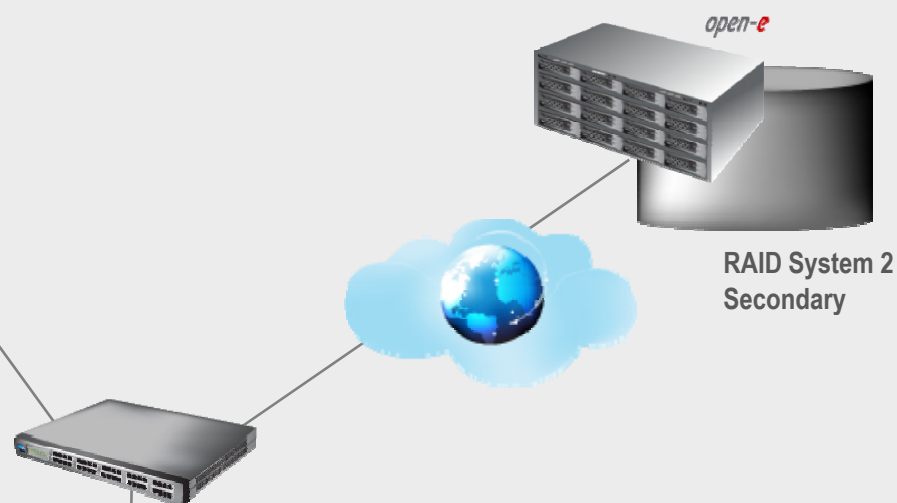
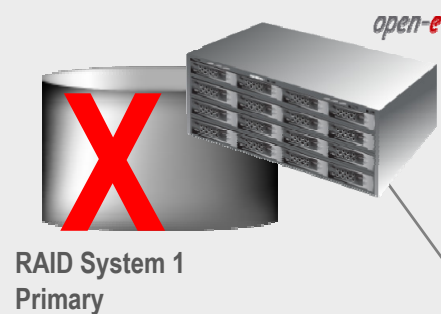
- Data is written and read in System 1
- Periodically data is replicated to System 2 via Internet connection.



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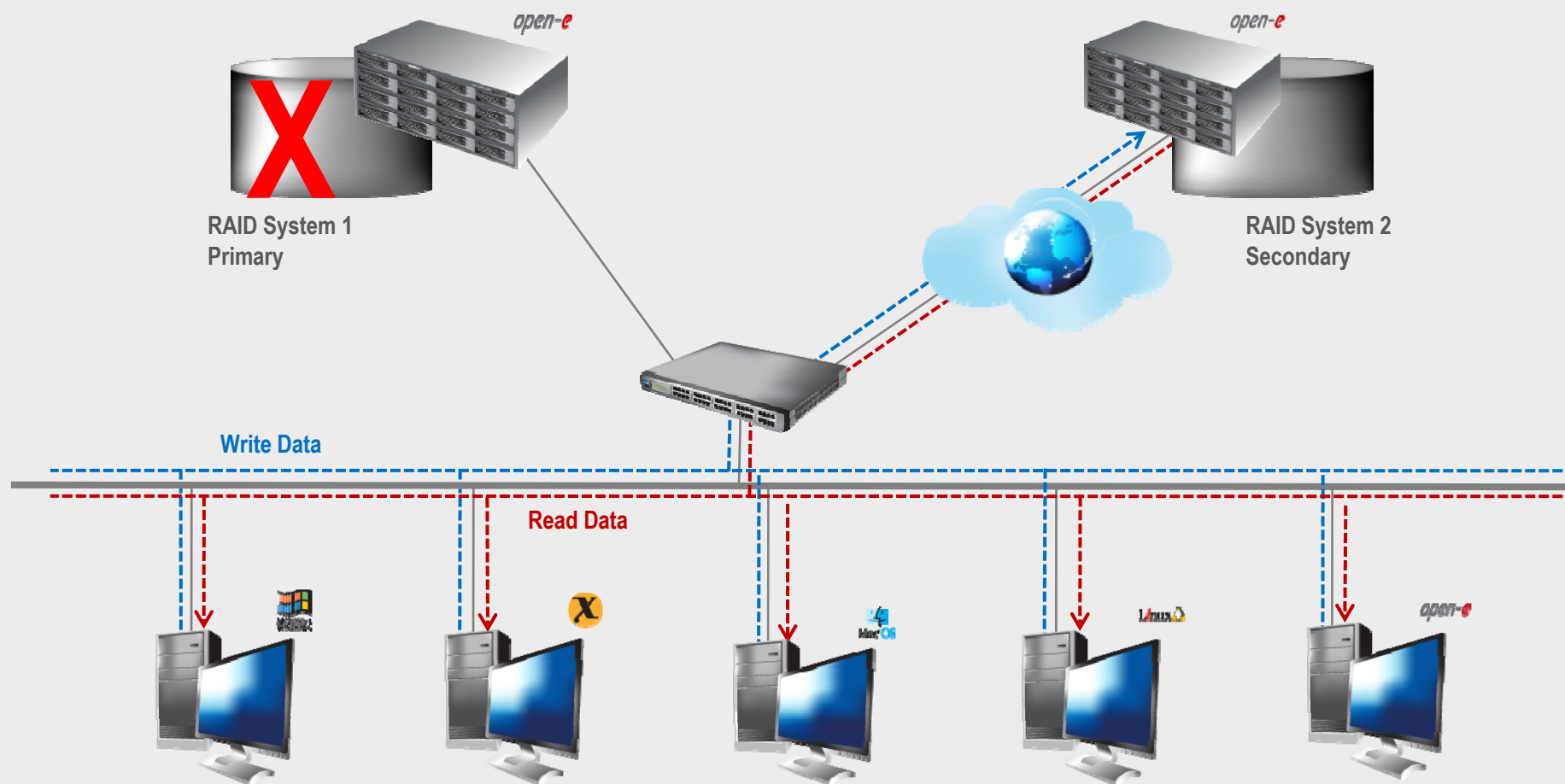
- In the event of a raid array error or disk drive error on System 1, the server will send an e-mail notification to the administrator
- In the event of a loss of system 1 users will be notified
- Administrator then switches users to System 2 over the WAN



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- After switching, replicated data is available on System 2



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



TO SET UP DATA REPLICATION, PERFORM THE FOLLOWING STEPS:

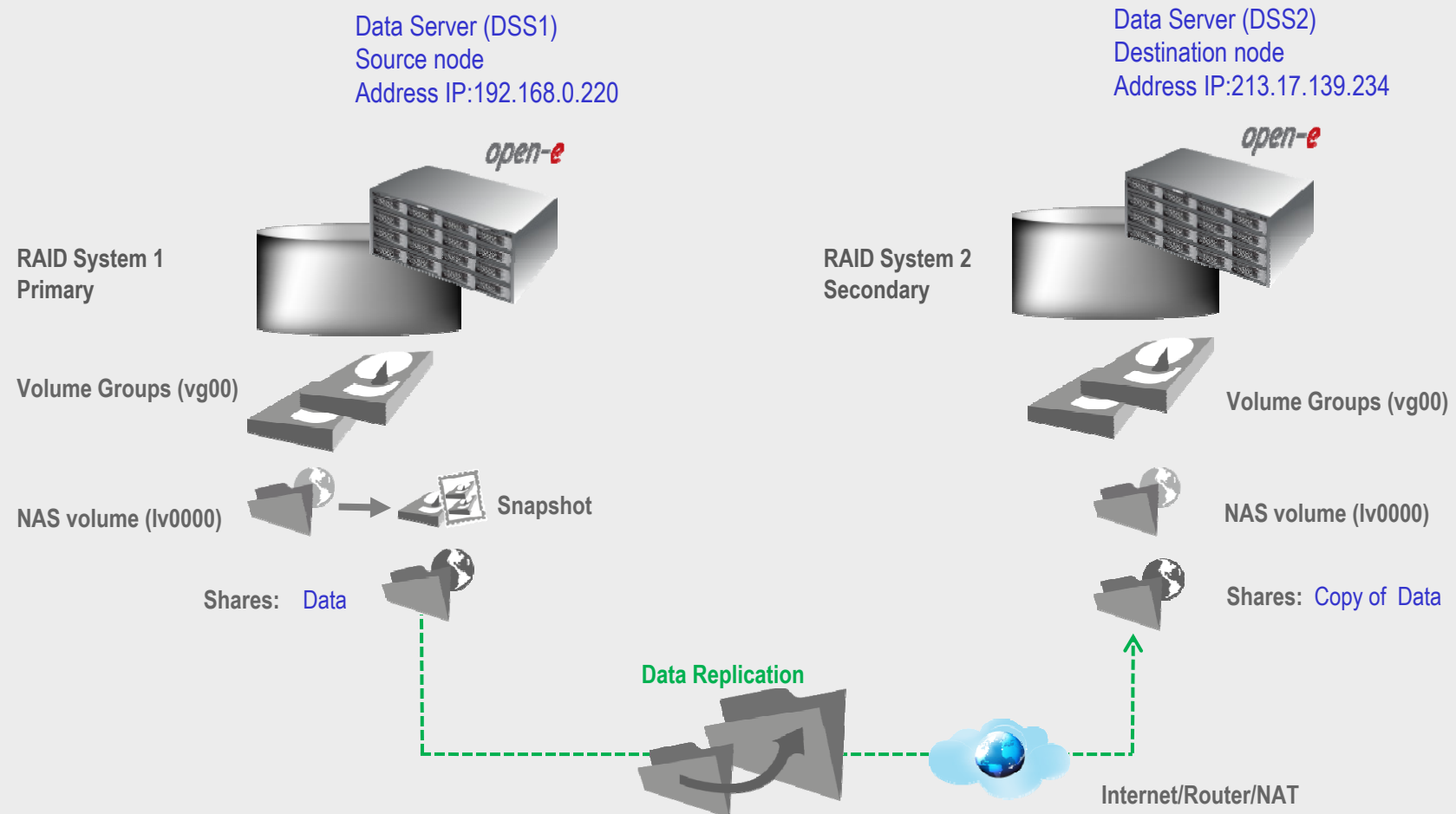
1. Hardware configuration
2. Configure DSS1 and DSS2 on the WAN
3. Configure the destination node
4. Configure the source node
5. Schedule replication

Setting up Asynchronous Data Replication over a WAN *open-e*

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:



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2. Configure DSS1 and DSS2 on the WAN

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

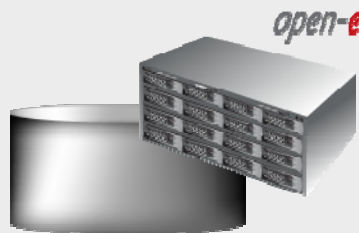
- DSS 1 - machine behind the NAT with local IP address,
- Forwarding port 873 to local ip from DSS 1 in your router (eg. below screenshot)

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

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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.

logout DSS DATA STORAGE SERVER open-e

SETUP CONFIGURATION MAINTENANCE STATUS HELP

volume manager NAS settings NAS resources iSCSI target manager FC target manager

Vol. groups ?

Unit rescan

rescan

Unit manager

✓	Unit	Size (GB)	Serial number	Status
✓	Unit S000	372.61	3NF0N4HX	available

Action: new volume group

Name: vg00

apply

Vol. replication ?

Drive identifier

✓	Unit	Serial number	Status
☐	Unit S000	3NF0N4HX	

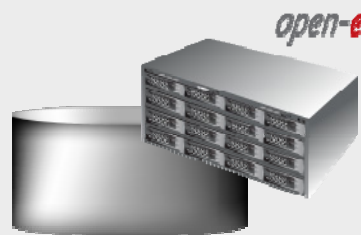
apply

Event Viewer: [icon]

Data Storage Server. All rights reserved

Setting up Asynchronous Data Replication over a WAN

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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

The screenshot shows the open-e DSS web interface. The top navigation bar includes 'logout', 'DSS', 'DATA STORAGE SERVER', and the 'open-e' logo. Below this is a sub-navigation bar with 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. The 'CONFIGURATION' tab is active, and within it, the 'volume manager' sub-tab is selected. On the left sidebar, 'Vol. groups' is expanded, showing 'vg00' selected. Below it, 'Vol. replication' is also visible. The main content area is titled 'Volume group: vg00' and contains a 'Volume manager' section. This section includes a table with columns: Logical Volume, Type, Snap., Rep., Init., Blocksize (bytes), and Size (GB). The table lists 'lv0000' with a size of 40.00 GB and 'Reserved Pool' with a size of 4.00 GB. Below the table, there are checkboxes for 'Use volume replication' and 'WORM'. A slider bar is used to assign space, with '0' and '327.56' GB markers. An 'add:' button is next to a text input field showing '0.00' GB. At the bottom right, there is an 'apply' button. A blue arrow points from the 'vg00' selection in the sidebar to the 'new NAS volume' dropdown menu. Another blue arrow points from the 'apply' button to the text box below the screenshot.

Logical Volume	Type	Snap.	Rep.	Init.	Blocksize (bytes)	Size (GB)
lv0000					N/A	40.00
System volumes						Size (GB)
Reserved Pool						4.00
Reserved for snapshots						0.00
Reserved for system						1.00
Reserved for replication						0.00
Free						327.56

Action: new NAS volume

☐ Use volume replication
☐ WORM

0 327.56

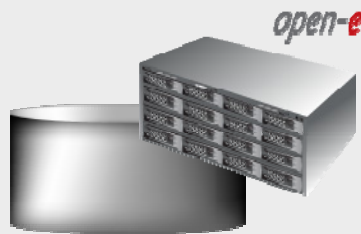
add: 0.00 GB

apply

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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

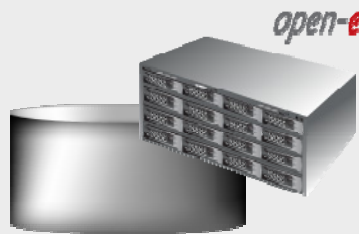


Check the **Enable Data replication Agent** box, and click the **apply** button

The screenshot shows the open-e Data Storage Server (DSS) web interface. The top navigation bar includes 'logout', 'DSS', and 'DATA STORAGE SERVER'. Below this, there are tabs for 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. Under the 'CONFIGURATION' tab, there are sub-tabs: 'volume manager', 'NAS settings' (which is highlighted), 'NAS resources', 'iSCSI target manager', and 'FC target manager'. The 'NAS settings' section contains three main configuration areas: 'NDMP data server', 'Data replication agent', and 'Antivirus setup'. The 'Data replication agent' section has a checkbox labeled 'Enable Data replication Agent' which is checked. There are 'apply' buttons next to each of these sections. At the bottom, there is an 'Event Viewer' section and a footer that says 'Data Storage Server. All rights reserved'.

Setting up Asynchronous Data Replication over a WAN

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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

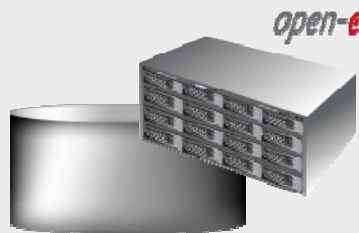


A tree listing of NAS shared volumes (**Shares**) will appear on the left side of the DSS console. In the example, a shared volume named **Copy of Data** has been created.

The screenshot displays the DSS (Data Storage Server) web interface. The top navigation bar includes tabs for 'logout', 'DSS', and 'DATA STORAGE SERVER'. Below this, there are sub-tabs: 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. The 'CONFIGURATION' tab is active, and within it, 'NAS settings' is selected. The left sidebar shows a tree view of NAS shared volumes, with 'Copy of Data' listed under 'Shares'. The main content area shows the 'Create new share' form, where 'Name' is set to 'Copy of Data', 'Comment' is empty, 'Default path' is '/lv0000/Copy of Data', and 'Specified path' is '/'. The 'ACL (Access control list)' section is also visible, showing a list of users and groups. The bottom status bar reads 'Data Storage Server. All rights reserved'.

Setting up Asynchronous Data Replication over a WAN

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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

logout DSS DATA STORAGE SERVER open-e

SETUP CONFIGURATION MAINTENANCE STATUS HELP

volume manager NAS settings NAS resources iSCSI target manager FC target manager

Shares

1. Copy of Data

Users

Groups

1. users

Share: Copy of Data

Data replication agent settings

☒ Use data replication

Login name:

Password:

Confirm password:

Allow access IP:

apply

NDMP data server access

Info
NDMP data server is off!

Remove share

Event Viewer:

Data Storage Server. All rights reserved

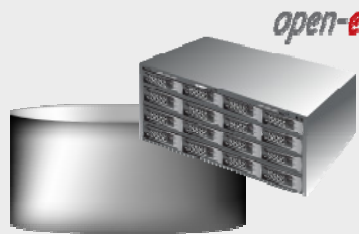
NOTE:

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.**

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

Setting up Asynchronous Data Replication over a WAN

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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 „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.

logout **DSS** DATA STORAGE SERVER open-e

SETUP **CONFIGURATION** MAINTENANCE STATUS HELP

volume manager NAS settings NAS resources iSCSI target manager FC target manager

Vol. groups

Unit rescan

rescan

Unit manager

Unit	Size (GB)	Serial number	Status
☐ Unit S001	6286.81	35E615C9	available

Action: new volume_group

Name: vg00

apply

Drive identifier

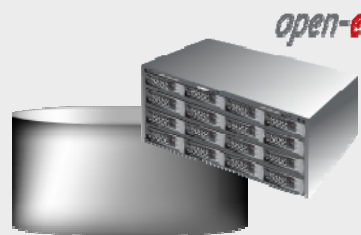
Unit	Serial number	Status
☐ Unit S001	35E615C9	

Event Viewer: [icon]

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Setting up Asynchronous Data Replication over a WAN

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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

logout **DSS** DATA STORAGE SERVER open-e

SETUP CONFIGURATION MAINTENANCE STATUS HELP

volume manager NAS settings NAS resources iSCSI target manager FC target manager

Vol. groups ?

vg00

Vol. replication ?

Volume group: vg00

Volume manager

Logical Volume	Type	Snap.	Rep.	Init.	Blocksize (bytes)	Size (GB)
lv0000					N/A	40.00
System volumes						
Reserved Pool						4.00
Reserved for snapshots						0.00
Reserved for system						1.00
Reserved for replication						0.00
Free						6241.81

Action: new NAS volume

☐ Use volume replication

☐ WORM

add: 0.00 GB

apply

Event Viewer: [icon]

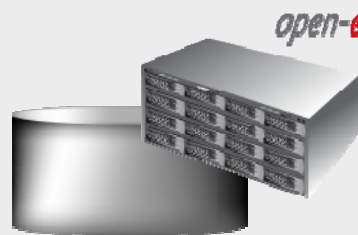
Data Storage Server. All rights reserved

Setting up Asynchronous Data Replication over a WAN

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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. Snapshot size should be large enough to accommodate the changes you anticipate, 10% to 15% of the logical volume is sometimes recommend.

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

logout **DSS** DATA STORAGE SERVER open-e

SETUP **CONFIGURATION** MAINTENANCE STATUS HELP

volume manager NAS settings NAS resources iSCSI target manager FC target manager

Vol. groups ?

vg00

Vol. replication ?

Volume group: vg00

Volume manager

Logical Volume	Type	Snap.	Rep.	Init.	Blocksize (bytes)	Size (GB)
lv0000					N/A	40.00
snap00000	S				N/A	4.00

System volumes Size (GB)

Reserved Pool	4.00
Reserved for snapshots	4.00
Reserved for system	1.00
Reserved for replication	0.00
Free	6237.81

Action: new snapshot

Assign to volume: Just create snapshot volume

0 6237.81

add: 0.00 GB

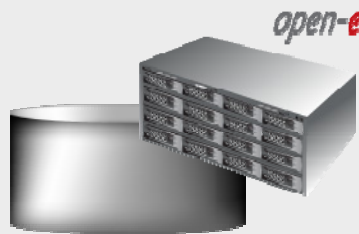
apply

Event Viewer:

Data Storage Server. All rights reserved

Setting up Asynchronous Data Replication over a WAN

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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.

logout **DSS** DATA STORAGE SERVER open-e

SETUP CONFIGURATION MAINTENANCE STATUS HELP

volume manager NAS settings NAS resources iSCSI target manager FC target manager

Vol. groups ?

vg00

Vol. replication ?

Volume group: vg00

Action: new NAS volume

☐ Use volume replication

☐ WORM

0 6237.81

add: 0.00 GB

apply

Snapshot definition

Name	LV	Status
snap00000	lv0000	unused

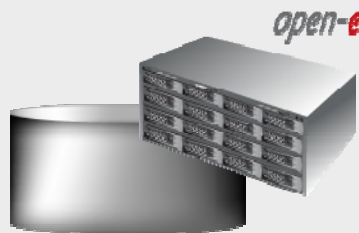
apply

Event Viewer: [x]

Data Storage Server. All rights reserved

Setting up Asynchronous Data Replication over a WAN

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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**).

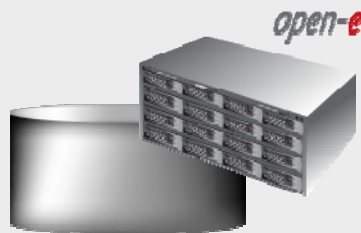
Shares: **Data**

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

The screenshot shows the open-e Data Storage Server (DSS) web interface. The top navigation bar includes 'logout', 'DSS', and 'DATA STORAGE SERVER'. The 'CONFIGURATION' tab is selected, and the 'NAS resources' sub-tab is active. The left sidebar displays a tree view with 'Shares' expanded, showing a list of shares including 'Data'. The main content area features a 'Create new share' form with the following fields: 'Name' (Data), 'Comment', 'Default path' (set to /lv0000/Data), and 'Specified path' (set to /). An 'apply' button is located below the form. Below the form is the 'ACL (Access control list)' section. The footer of the interface reads 'Data Storage Server. All rights reserved'.

Setting up Asynchronous Data Replication over a WAN

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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.

logout **DSS** DATA STORAGE SERVER open-e

SETUP CONFIGURATION **MAINTENANCE** STATUS HELP

shutdown connections snapshot **backup** restore antivirus miscellaneous software update

Data replication

Create new data replication task

Task name:

Source share:

Snapshot:

Destination IP:

Destination share:

Destination agent login:

Destination agent password:

☒ Log replication errors

☒ Use ACL

☐ Don't delete files

apply

Data replication tasks

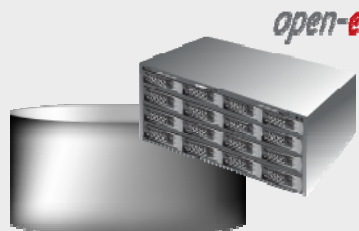
Info
No tasks have been found.

Event Viewer:

Data Storage Server. All rights reserved

Setting up Asynchronous Data Replication over a WAN

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Data Server (DSS1)
Source node
Address IP:192.168.0.220

4. Configure the Source Node

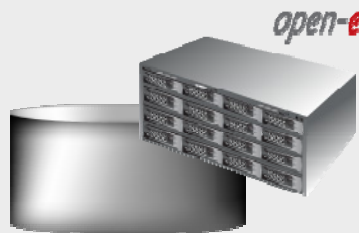
Select the source share to be replicated. Under **Create new data replication task** function, enter a name for the task and select the **Source share** to be replicated. At this point, a snapshot (**snap00000**) of the source share will automatically be assigned.

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.

The screenshot shows the 'DATA STORAGE SERVER' web interface. The 'MAINTENANCE' tab is selected, and the 'Data replication' sub-tab is active. The 'Create new data replication task' form is displayed with the following values: Task name: Replication_D01, Source share: data, Snapshot: snap00000, Destination IP: 213.17.139.234, Destination share: Copy of Data (selected via a share icon button). The 'apply' button is highlighted in orange. Below the form, the 'Data replication tasks' section shows a message: 'No tasks have been found.'

Setting up Asynchronous Data Replication over a WAN

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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 screenshot shows the DSS (Data Storage Server) web console interface. The top navigation bar includes tabs for SETUP, CONFIGURATION, MAINTENANCE, STATUS, and HELP. Below this, there are sub-tabs for shutdown, connections, snapshot, backup, restore, antivirus, miscellaneous, and software update. The 'Data replication' section is active, showing a list of tasks with 'Replication_D01' selected. A blue arrow points from the text box to this task. Another blue arrow points from the text box to the 'Data replication task' configuration panel on the right. This panel displays a table of attributes and values for the selected task, and a section for creating a schedule.

Attribute	Value
Destination IP:	213.17.139.234
Source share:	data
Snapshot:	snap00000
Destination share:	Copy of Data
Log replication errors:	Yes
Use ACL:	Yes
Don't delete files:	No

Create schedule for data replication task

Comment:

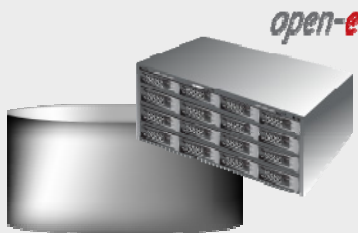
Select time:

Interval:

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

Setting up Asynchronous Data Replication over a WAN

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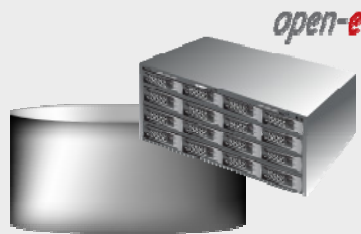
Data Server (DSS1)
Source node
Address IP:192.168.0.220

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

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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.

The screenshot shows the DSS (Data Storage Server) web interface. The top navigation bar includes 'logout', 'DSS', 'DATA STORAGE SERVER', and the 'open-e' logo. Below this is a secondary navigation bar with tabs: 'SETUP', 'CONFIGURATION', 'MAINTENANCE' (selected), 'STATUS', and 'HELP'. Under 'MAINTENANCE', there are sub-tabs: 'shutdown', 'connections', 'snapshot', 'backup' (selected), 'restore', 'antivirus', 'miscellaneous', and 'software update'. The main content area is titled 'Data replication' and shows a tree view with 'Replication_D01' selected. To the right of the tree view are checkboxes for 'Log replication errors' (checked), 'Use ACL' (checked), and 'Don't delete files' (unchecked). An 'apply' button is at the bottom right. Below the tree view, there is a section titled 'Data replication tasks' which contains a table with the following data:

Name	Start time	Action
Replication_D01	2009-03-12 23:46:54	[Play] [Stop] [Delete]

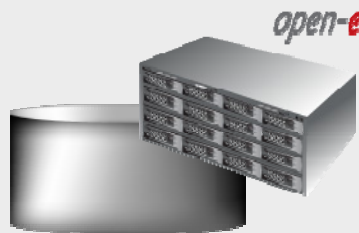
Below the table, there are details for the selected task:

- Destination IP: 213.17.139.234
- Source share: data
- Snapshot: snap00000
- Destination share: Copy of Data
- Destination agent login:
- Log replication errors: yes
- Use ACL: yes
- Don't delete files: no

At the bottom of the interface, there is an 'Event Viewer' section and a footer that reads 'Data Storage Server. All rights reserved'.

Setting up Asynchronous Data Replication over a WAN

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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 screenshot shows the DSS web interface with the 'STATUS' tab selected. The 'tasks' menu is highlighted in the left sidebar, and the 'Data Replication' task is selected. The main panel displays the 'Running tasks' and 'Tasks log' sections.

Running tasks

Name	Type	Start time
Replication_D01	Data replication	2009-03-12 23:46:54

Tasks log

Time	Name	Type	Status	Action
2009-03-12 23:47:08	Replication_D01	Data replication	OK	Started
2009-03-12 20:20:57	Replication_D01	Data replication	OK	Finished

Files overall: 431
Files transfered: 26
Preparing time: 4.79 sec
Sent: 267.71 MB
Transfer: 14.90 MB/s

Event Viewer: [icon]

Data Storage Server. All rights reserved

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

Thank You!