

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



Asynchronous Data Replication over a LAN

	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 LAN		✓		✓		✓		✓			

- **ASYNCHRONOUS DATA REPLICATION over a LAN** enables **asynchronous** file and folder copy from one storage system to another over Local Area Network:
 - With asynchronous replication a point-in-time – 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. Replication provides maximal availability in case one system or unit fails or in case of a site disaster.

Asynchronous Data Replication over a LAN

REPLICATION BETWEEN TWO SYSTEMS WITHIN ONE LAN

■ Recommended Resources

- Key Hardware (two systems)
 - ✓ x86 compatible,
 - ✓ RAID Controller,
 - ✓ HDD's,
 - ✓ Network Interface Cards.
- Software
 - ✓ Open-E DSS (recommended) or Open-E NAS-R3, 2 units.

■ Benefits

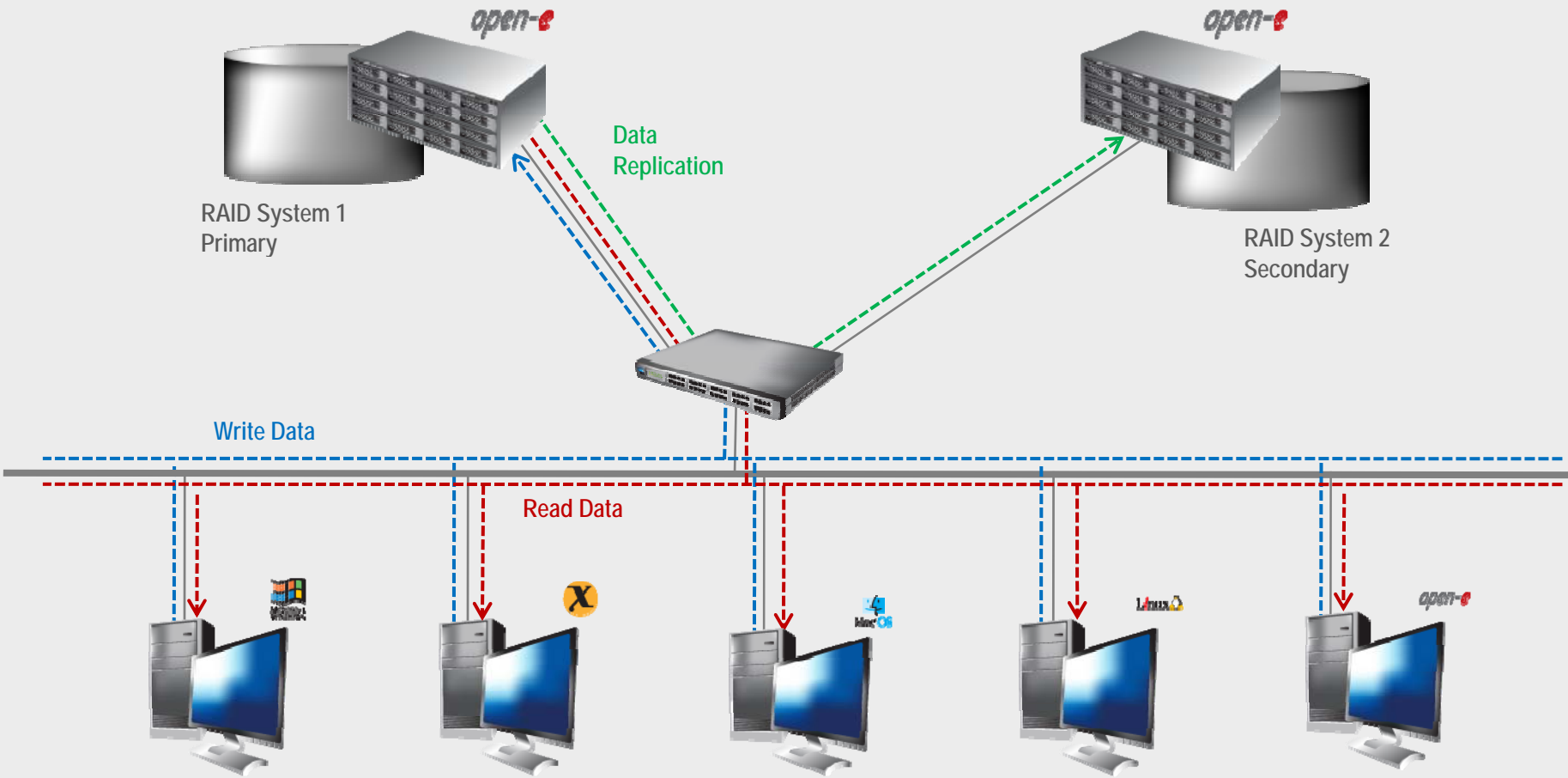
- Data Redundancy over a LAN,
- Enables continuous data access.

■ Disadvantages

- High cost of solution,
- Natural disasters can destroy local systems.

Asynchronous Data Replication over a LAN

- Data is written and read to System 1
- Data is continuously replicated to System 2



Asynchronous Data Replication over a LAN

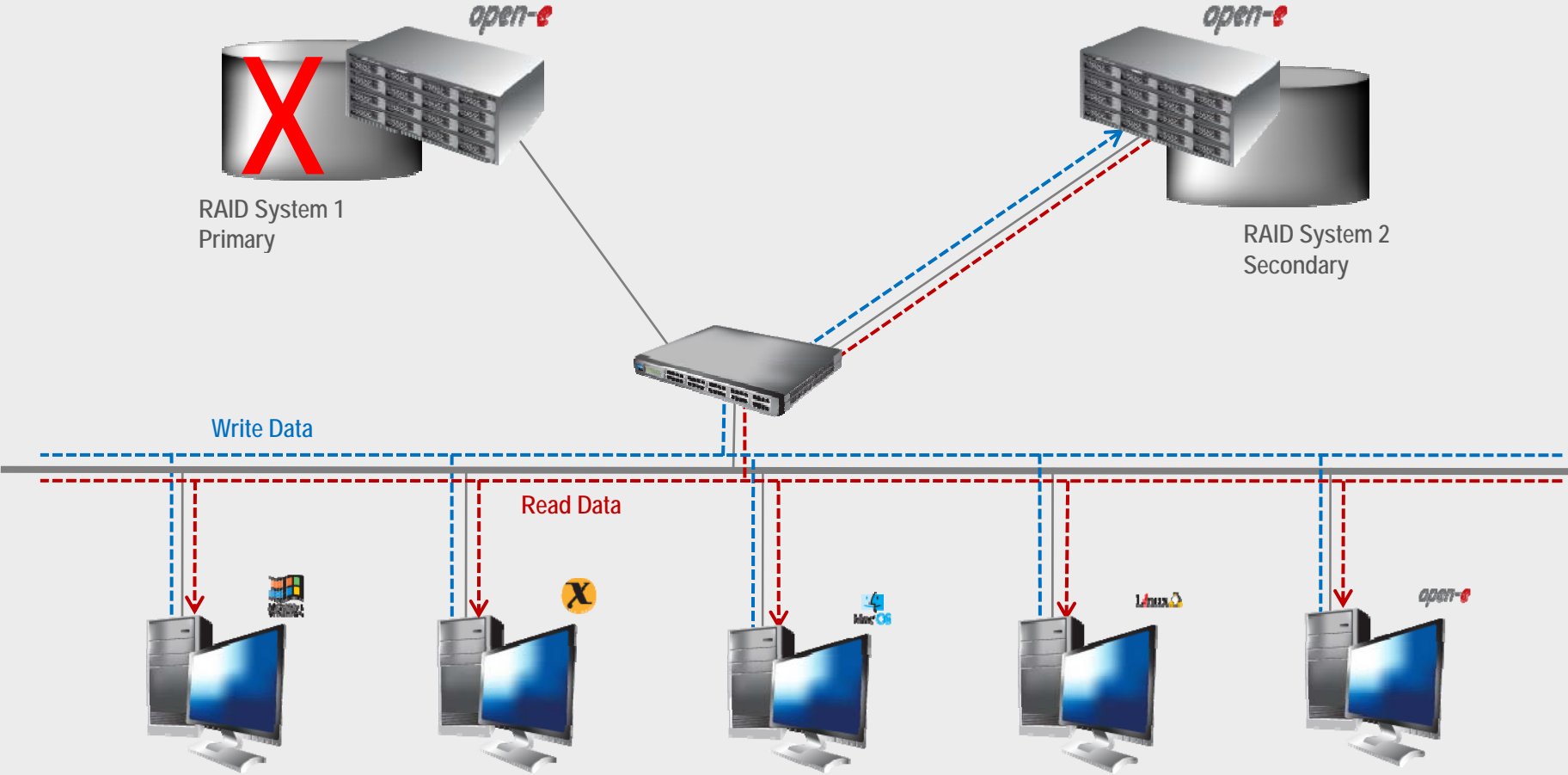
open-e

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



Asynchronous Data Replication over a LAN

- After switching, replicated volume is available on System 2



TO SET UP DATA REPLICATION, PERFORM THE FOLLOWING STEPS:

1. Hardware configuration
2. Configure the destination node
3. Configure the source node
4. Configure Schedule replication
5. Checking status data replication

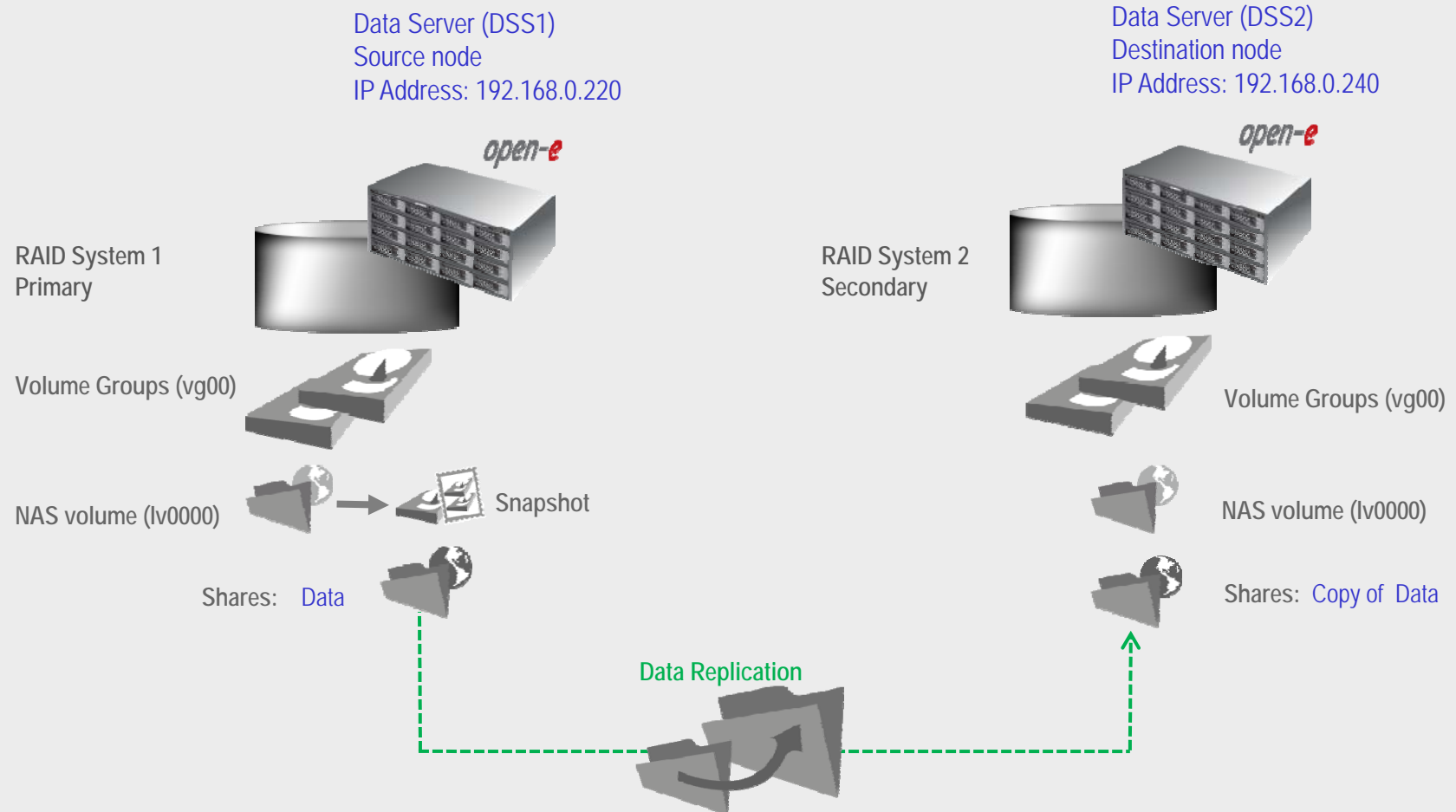
Setting up Asynchronous Data Replication over a LAN



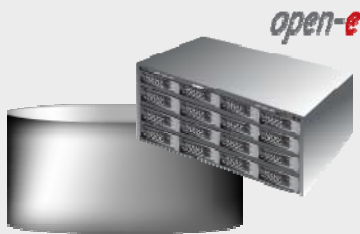
1. Hardware Configuration

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 Local Area Network. An example configuration is shown below:



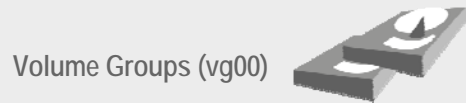
Setting up Asynchronous Data Replication over a LAN



Data Server (DSS2)
Destination node
IP Address: 192.168.0.240

2. Configure the Destination Node

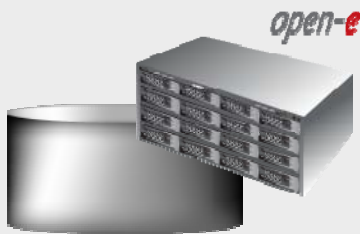
Under the „CONFIGURATION“ tab, select „volume manager“.



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

The screenshot shows the open-e DSS web interface. The main navigation bar includes 'logout', 'DSS', 'DATA STORAGE SERVER', and 'open-e'. Below this are tabs for 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. Under the 'CONFIGURATION' tab, there are sub-tabs for 'volume manager', 'NAS settings', 'NAS resources', 'iSCSI target manager', and 'FC target manager'. The 'volume manager' sub-tab is active, showing a 'Vol. groups' section with a search icon and a '+' icon. Below this is a 'Vol. replication' section. On the right side, there are sections for 'Unit rescan', 'Unit manager', and 'Drive identifier'. The 'Unit manager' section contains a table with columns 'Unit', 'Size (GB)', 'Serial number', and 'Status'. The table has one row: 'Unit MD0' with size '74.62', serial number 'N/A', and status 'available'. Below the table, there is an 'Action:' dropdown menu set to 'new volume_group' and a 'Name:' text input field containing 'vg00'. An 'apply' button is located below these fields. The 'Drive identifier' section contains a table with columns 'Unit', 'Serial number', and 'Status', with one row: 'Unit H0' with serial number 'S01JJ50Y893447' and status 'available'. 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 LAN



Data Server (DSS2)
Destination node
IP Address: 192.168.0.240

2. Configure the Destination Node

Volume Groups (vg00)



NAS volume (lv0000)



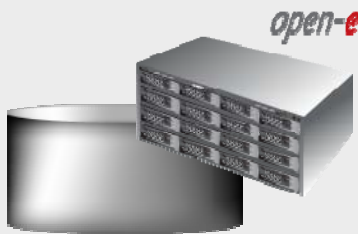
Select the appropriate volume group (vg00) from the list on the left and create a **new NAS volume** of the required size. This logical volume will be the destination of the replication process.

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

The screenshot shows the 'DSS DATA STORAGE SERVER' web interface. The 'CONFIGURATION' tab is active, and the 'volume manager' sub-tab is selected. On the left, the 'Vol. groups' list shows 'vg00' selected. Below it, the 'Vol. replication' section is visible. The main area displays the configuration for 'Volume group: vg00'. A table lists logical volumes, including 'lv0000' with a size of 40.00 GB. Below the table, the 'Action:' dropdown is set to 'new NAS volume'. There is an unchecked checkbox for 'Use volume replication'. At the bottom, a slider shows the current size (0 GB) and a target size (29.56 GB). An 'add:' field is set to '0.00' GB. An 'apply' button is located at the bottom right of the configuration area.

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						29.56

Setting up Asynchronous Data Replication over a LAN



Data Server (DSS2)
Destination node
IP Address: 192.168.0.240

2. 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.

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

SETUP **CONFIGURATION** MAINTENANCE STATUS HELP

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

? NDMP data server
 Enable NDMP data server
apply

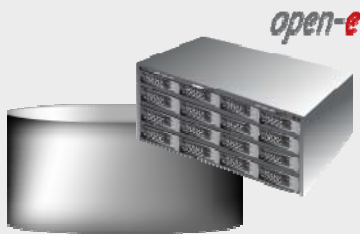
? Data replication agent
 Enable Data replication Agent
apply

? Antivirus setup
 Use antivirus
 Use quarantine

Event Viewer: [icon]

Data Storage Server. All rights reserved

Setting up Asynchronous Data Replication over a LAN



Data Server (DSS2)
Destination node
IP Address: 192.168.0.240

2. Configure the Destination Node

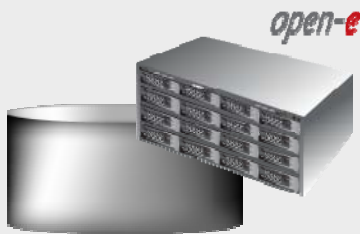
Under the „CONFIGURATION“ tab, select „NAS resources“ menu.

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 LAN



Data Server (DSS2)
Destination node
IP Address: 192.168.0.240

2. 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.

The screenshot shows the DSS web interface with the following elements:

- Navigation tabs: SETUP, CONFIGURATION, MAINTENANCE, STATUS, HELP
- Sub-navigation tabs: volume manager, NAS settings, NAS resources, iSCSI target manager, FC target manager
- Left sidebar: Shares (1. Copy of Data), Users (1. john), Groups (1. users)
- Main content area: Share: Copy of Data, Data replication agent settings (Use data replication checked), Login name, Password, Confirm password, Allow access IP, apply button, Remove share, remove button
- Footer: Data Storage Server. All rights reserved

Shares: Copy of Data



Data Replication

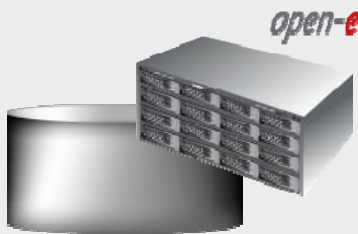


NOTE:

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.**

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

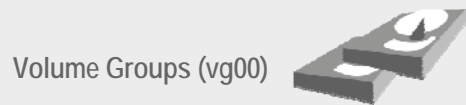
Setting up Asynchronous Data Replication over a LAN



Data Server (DSS1)
Destination node
IP Address: 192.168.0.220

3. Configure the Source Node

Under the „CONFIGURATION“ tab, select „volume manager“.



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

The screenshot shows the DSS web interface with the following elements:

- Navigation tabs: **SETUP**, **CONFIGURATION** (selected), **MAINTENANCE**, **STATUS**, **HELP**.
- Sub-tabs under CONFIGURATION: **volume manager** (selected), **NAS settings**, **NAS resources**, **iSCSI target manager**, **FC target manager**.
- Left sidebar: **Vol. groups** and **Vol. replication**.
- Main content area: **Unit rescan** (with **rescan** button), **Unit manager** section containing a table of units and an action form.

Unit	Size (GB)	Serial number	Status
<input type="checkbox"/> Unit MD0	466.59	N/A	available

Action: **new volume_group**
Name:

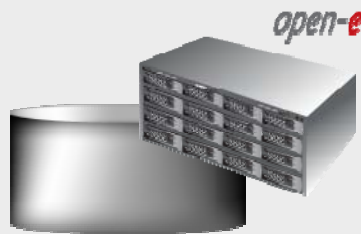
apply

Unit	Serial number	Status
<input type="checkbox"/> Unit S000	Y636PANE	

Event Viewer:

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Setting up Asynchronous Data Replication over a LAN



Data Server (DSS1)
Destination node
IP Address: 192.168.0.220

3. 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.

The screenshot shows the DSS web interface with the following elements:

- Navigation tabs: SETUP, CONFIGURATION, MAINTENANCE, STATUS, HELP
- Sub-navigation tabs: volume manager, NAS settings, NAS resources, iSCSI target manager, FC target manager
- Left sidebar: Vol. groups (vg00), Vol. replication
- Main content area: Volume group: vg00, Volume manager table, Action: new NAS volume, Use volume replication, WORM, add: 0.00 GB, apply button

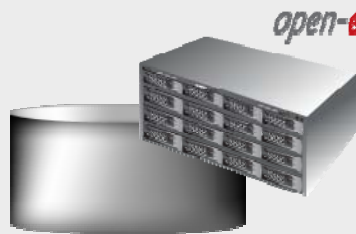
Logical Volume	Type	Snap.	Rep.	Init.	Blocksize (bytes)	Size (GB)
lv0000					N/A	40.00
System volumes						Size (GB)
Reserved Pool						4.00
Reserved for snapshots						0.00
Reserved for system						1.00
Reserved for replication						0.00
Free						421.53

Setting up Asynchronous Data Replication over a LAN



Data Server (DSS1)
Destination node
IP Address: 192.168.0.220

3. 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.

The screenshot shows the DSS web interface with the following components:

- Navigation tabs: SETUP, CONFIGURATION, MAINTENANCE, STATUS, HELP
- Sub-navigation tabs: volume manager, NAS settings, NAS resources, iSCSI target manager, FC target manager
- Current page: Vol. groups (vg00)
- Table of Logical Volumes:

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

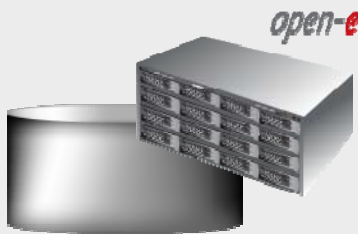
System volumes	Size (GB)
Reserved Pool	4.00
Reserved for snapshots	4.00
Reserved for system	1.00
Reserved for replication	0.00
Free	416.72

Action: new snapshot
Assign to volume: Just create snapshot volume

add: 0.00 GB

apply

Setting up Asynchronous Data Replication over a LAN



Data Server (DSS1)
Destination node
IP Address: 192.168.0.220

3. Configure the Source Node

NAS volume
(lv0000)



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

The screenshot shows the DSS web interface with the following elements:

- Navigation tabs: SETUP, CONFIGURATION, MAINTENANCE, STATUS, HELP
- Sub-navigation tabs: volume manager, NAS settings, NAS resources, iSCSI target manager, FC target manager
- Left sidebar: Vol. groups (vg00), Vol. replication
- Main content area: Volume group: vg00 configuration page

The configuration page for 'Volume group: vg00' includes:

- Action: new NAS volume
- Options: Use volume replication, WORM
- Progress bar: 0 to 417.53
- add: 0.00 GB
- apply button

Below the configuration is a 'Snapshot definition' table:

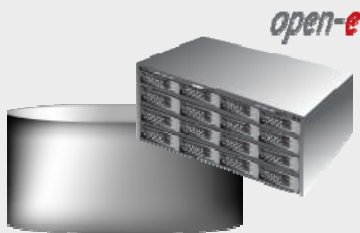
Name	LV	Status
→ snap00000	lv0000	unused

At the bottom of the table, there is an 'apply' button. A blue arrow points from the text box to this button.

Event Viewer: [icon]

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Setting up Asynchronous Data Replication over a LAN



Data Server (DSS1)
Destination node
IP Address: 192.168.0.220

3. 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

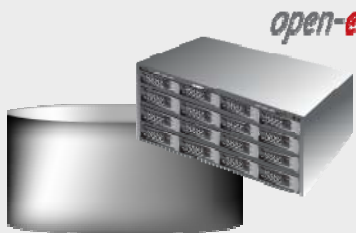


To create a share, enter the share name in field Name. In this example a new share named **Data** has been created.

The screenshot shows the DSS web interface with the following elements:

- Logout button and DSS DATA STORAGE SERVER header.
- Navigation tabs: SETUP, CONFIGURATION (selected), MAINTENANCE, STATUS, HELP.
- Sub-navigation tabs: volume manager, NAS settings (selected), NAS resources (selected), iSCSI target manager, FC target manager.
- Left sidebar: Shares (selected), Users, Groups.
- Main content area: 'Create new share' form with fields for Name (Data), Comment, Default path (/lv0000/Data), and Specified path (/). An apply button is present.
- Bottom: ACL (Access control list) section and a footer: Data Storage Server. All rights reserved.

Setting up Asynchronous Data Replication over a LAN

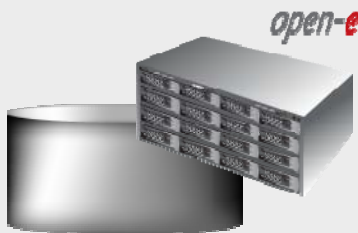


Data Server (DSS1)
Destination node
IP Address: 192.168.0.220

3. 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.


Setting up Asynchronous Data Replication over a LAN



Data Server (DSS1)
Destination node
IP Address: 192.168.0.220

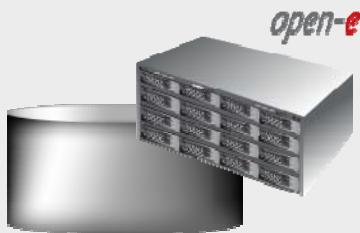
3. Configure the Source Node

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, 192.168.0.240) 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 will appear. Click on the **apply** button.

The screenshot shows the DSS (Data Storage Server) web interface. The main navigation bar includes 'logout', 'DSS', 'DATA STORAGE SERVER', and 'open-e'. Below this are tabs for 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. Under 'MAINTENANCE', there are sub-tabs: 'shutdown', 'connections', 'snapshot', 'backup', 'restore', 'antivirus', 'miscellaneous', and 'software update'. The 'Data replication' section is active, showing a 'Create new data replication task' form. The form fields are: Task name (Replication_D01), Source share (Data), Snapshot (snap00000), Destination IP (192.168.0.240), Destination share (Copy of Data), Destination agent login, and Destination agent password. There 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 form is a 'Data replication tasks' section with an 'Info' icon and the text 'No tasks have been found.' At the bottom of the interface, there is an 'Event Viewer' field and a footer that reads 'Data Storage Server. All rights reserved.'

Setting up Asynchronous Data Replication over a LAN



Data Server (DSS1)
Destination node
IP Address: 192.168.0.220

3. 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.

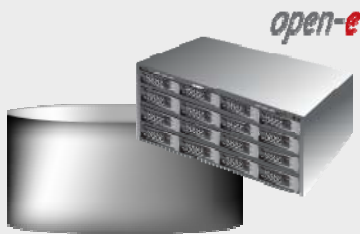
The screenshot shows the DSS WEB console interface. The main menu includes SETUP, CONFIGURATION, MAINTENANCE, STATUS, and HELP. Under MAINTENANCE, there are sub-menus for shutdown, connections, snapshot, backup, restore, antivirus, miscellaneous, and software update. The 'Data replication' section is active, showing a list of tasks with 'Replication_D01' selected. The configuration details for 'Replication_D01' are displayed in a table:

Attribute	Value
Destination IP:	192.168.0.240
Source share:	Data
Snapshot:	snap00000
Destination share:	Copy of Data
Log replication errors:	Yes
Use ACL:	Yes
Don't delete files:	No

Below the table, there is a section for 'Create schedule for data replication task' with fields for Comment, Select time (Interval), and Interval (10 min. time period). An 'apply' button is located at the bottom right of the configuration area.

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

Setting up Asynchronous Data Replication over a LAN



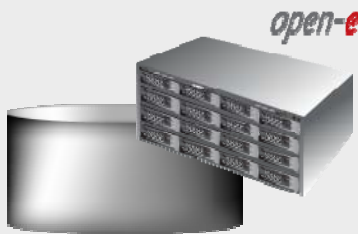
Data Server (DSS1)
Destination node
IP Address: 192.168.0.220

4. 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.

The screenshot shows the DSS (Data Storage Server) web interface. The main navigation bar includes 'logout', 'DSS', 'DATA STORAGE SERVER', and the 'open-e' logo. Below this are tabs for 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. Under 'MAINTENANCE', there are sub-tabs: 'shutdown', 'connections', 'snapshot', 'backup', 'restore', 'antivirus', 'miscellaneous', and 'software update'. The 'backup' tab is active, and the 'Data replication' section is selected. A tree view on the left shows 'Replication_D01' selected. The main content area displays the configuration for 'Data replication task: Replication_D01'. It features a 'Create schedule for data replication task' section with a 'Comment:' text box, a 'Select time:' dropdown menu set to 'Interval', and an 'Interval:' dropdown menu set to '10 min. time period'. An 'apply' button is located below these fields. Below the 'Create schedule' section is a 'Schedule for data replication task' section with an 'Info' icon and the text 'No schedules found.'. At the bottom of the configuration area is a 'Remove data replication task' section with a 'remove' button. The footer of the interface includes 'Event Viewer:' and 'Data Storage Server. All rights reserved.'

Setting up Asynchronous Data Replication over a LAN



Data Server (DSS1)
Destination node
IP Address: 192.168.0.220

5. 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 web interface with the 'Data replication tasks' section expanded. The interface includes a navigation menu with 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. Under 'MAINTENANCE', there are sub-menus for 'shutdown', 'connections', 'snapshot', 'backup', 'restore', 'antivirus', 'miscellaneous', and 'software update'. The 'Data replication' section is active, showing a tree view with 'Replication_D01'. To the right, there are checkboxes for 'Log replication errors' (checked), 'Use ACL' (checked), and 'Don't delete files' (unchecked). An 'apply' button is visible. Below this, the 'Data replication tasks' section shows a table with one task: 'Replication_D01', which started on 2009-03-29 at 23:30:40. The task details are as follows:

Name	Start time	Action
Replication_D01	2009-03-29 23:30:40	[Start] [Stop] [Delete]

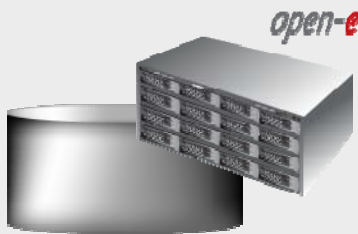
Task details:

- Destination IP: 192.168.0.240
- 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

Event Viewer: [View]

Data Storage Server. All rights reserved

Setting up Asynchronous Data Replication over a LAN



Data Server (DSS1)
Destination node
IP Address: 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 expanded, showing 'Data Replication' selected. The main content area displays 'Tasks: Data Replication' with a table of running tasks and a tasks log.

Name	Type	Start time
Replication_D01	Data replication	2009-03-29 23:30:40

Time	Name	Type	Status	Action
2009-03-29 23:31:09	Replication_D01	Data replication	OK	Started
2009-03-29 23:29:44	Replication_D01	Data replication	OK	Finished
Files overall:		431		
Files transferred:		26		
Preparing time:		4.79 sec		
Sent:		267.71 MB		
Transfer:		14.90 MB/s		
2009-03-29 23:29:23	Replication_D01	Data replication	OK	Started

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

Thank you!