

**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**

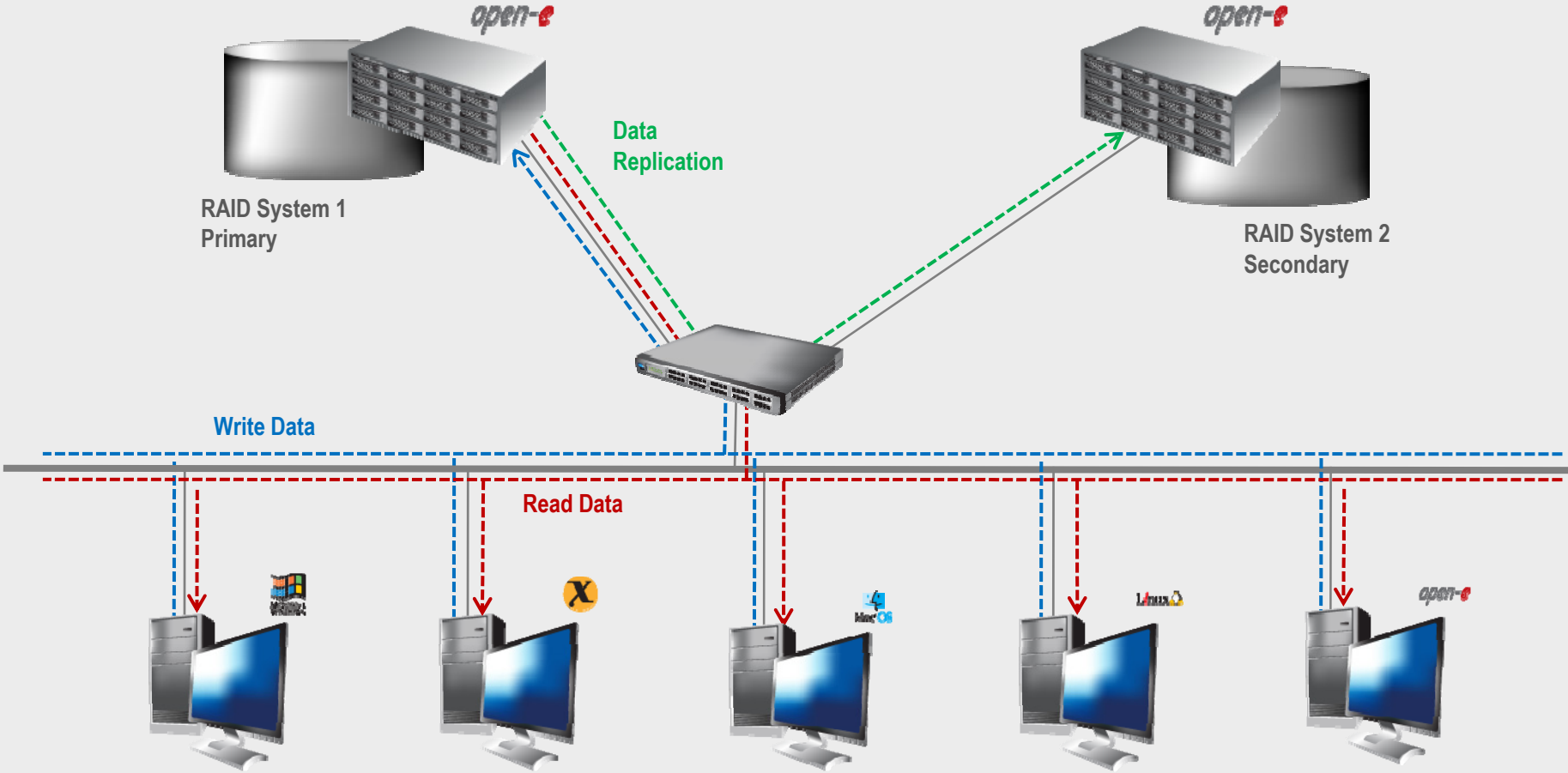
- Data Redundancy over a LAN,
- Enables continuous data access.

■ **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



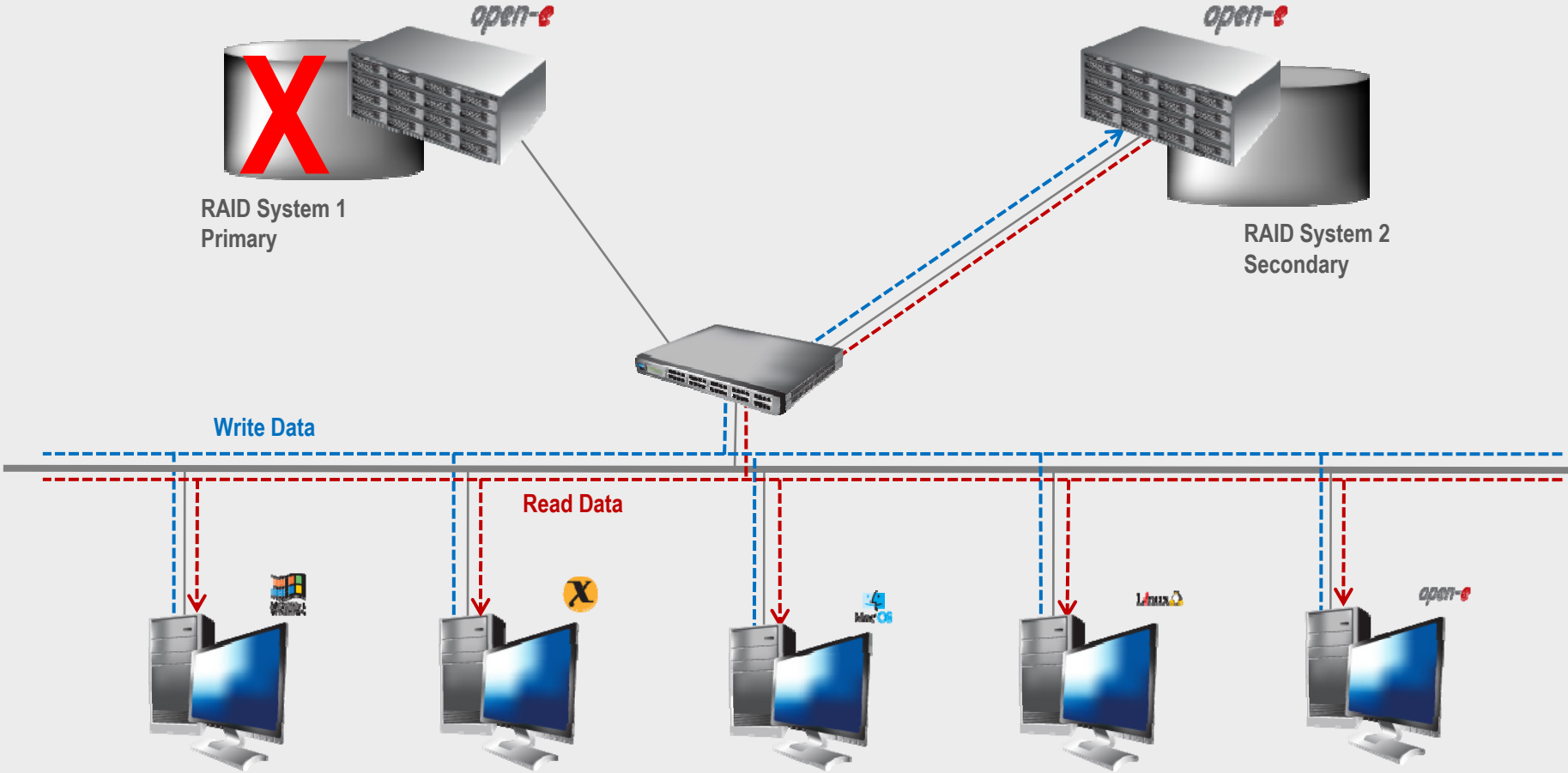
Asynchronous Data Replication over a LAN

- 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

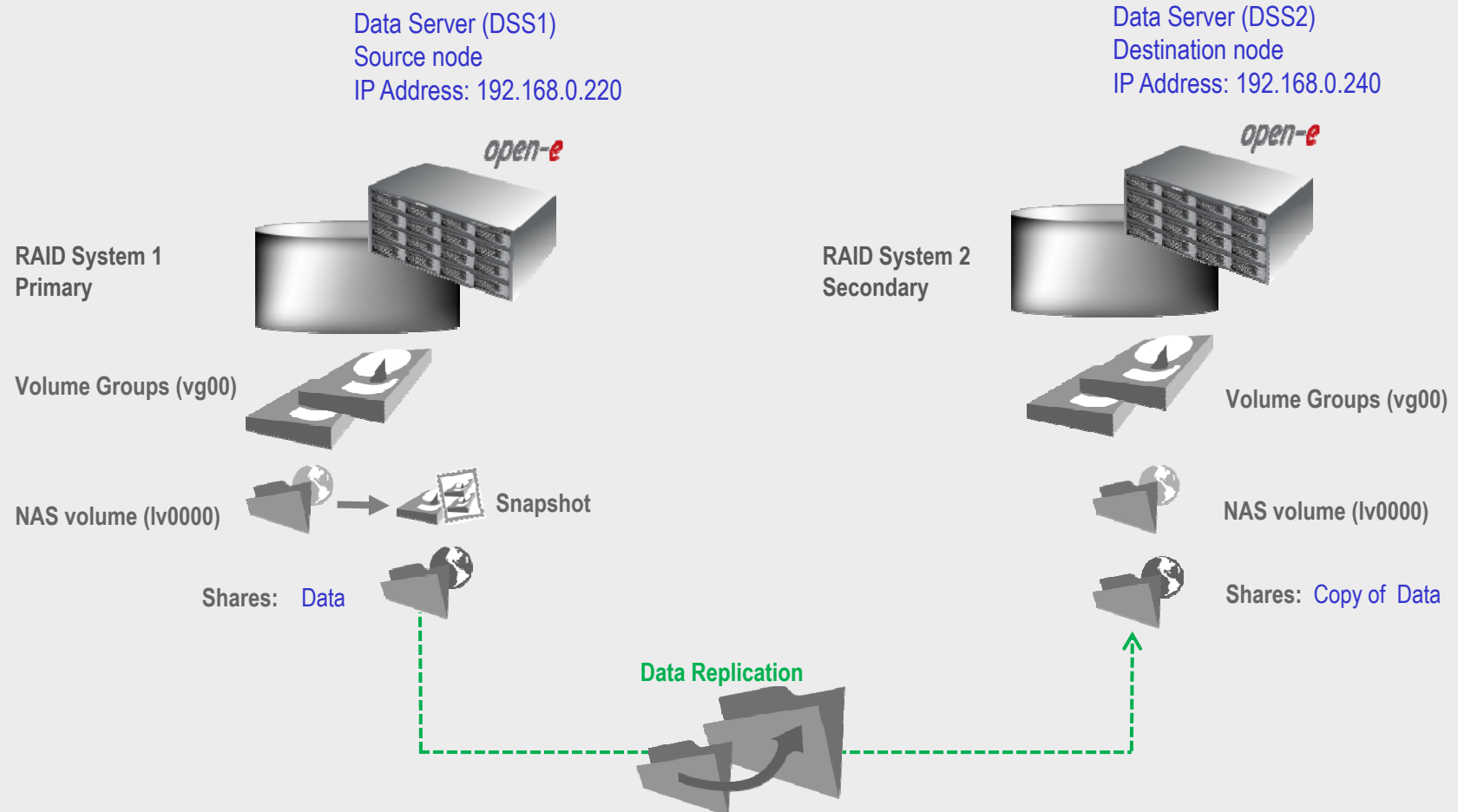
Setting up Asynchronous Data Replication over a LAN



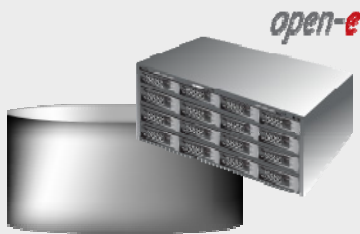
1. Hardware Configuration

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”.

Volume Groups (vg00)



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 'Vol. groups' and 'Vol. replication' sections. The 'Unit manager' section displays a table of units:

Unit	Size (GB)	Serial number	Status
<input type="checkbox"/> Unit MD0	74.62	N/A	available

Below the table, the 'Action' dropdown is set to 'new volume_group' and the 'Name' field contains 'vg00'. An 'apply' button is visible at the bottom of this section. The 'Drive identifier' section shows a table with one unit:

Unit	Serial number	Status
<input type="checkbox"/> Unit H0	S01JJ50Y893447	

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

Setting up Asynchronous Data Replication over a LAN



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.

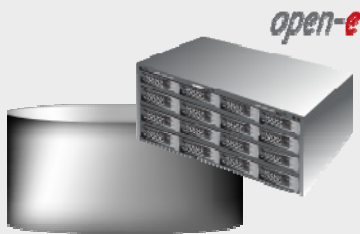
After assigning an appropriate amount of space for the NAS volume, click the **apple** button

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, under 'Vol. groups', the 'vg00' group is selected. Below it, the 'Vol. replication' section is visible. The main area shows the configuration for 'Volume group: vg00'. A table lists logical volumes:

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

Below the table, the 'Action:' dropdown is set to 'new NAS volume'. There is an unchecked checkbox for 'Use volume replication'. At the bottom, there is a slider for size, currently at 0, and an 'add:' field with '0.00' GB. An 'apply' button is at the bottom right.

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.

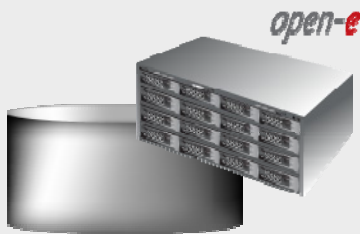
Data Replication



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

The screenshot shows the DSS (Data Storage Server) configuration 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', 'NAS resources', 'iSCSI target manager', and 'FC target manager'. The 'NAS settings' sub-tab is selected. The main content area shows three sections: 'NDMP data server' with an unchecked 'Enable NDMP data server' checkbox; 'Data replication agent' with a checked 'Enable Data replication Agent' checkbox; and 'Antivirus setup' with unchecked 'Use antivirus' and 'Use quarantine' checkboxes. Each section has an 'apply' button. At the bottom, 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 (DSS2)
Destination node
IP Address: 192.168.0.240

2. Configure the Destination Node

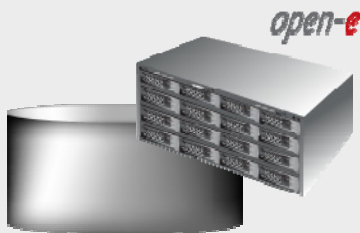
Under the „CONFIGURATION” tab, select „NAS settings” menu.

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 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 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 'NAS settings' sub-tab is active, and the 'Shares' menu item is selected. On the left side, a tree view shows 'Shares' with a sub-entry '1. john', 'Users' with '1. john', and 'Groups' with '1. users'. The main content area displays the 'Create new share' form with the following fields: 'Name' (Copy of Data), 'Comment' (empty), 'Default path' (selected, /lv0000/Copy of Data), and 'Specified path' (empty). An 'apply' button is at the bottom right. Below the form is the 'ACL (Access control list)' section with a 'Browser' button and 'Users & Groups' and 'Access Permissions' sub-sections. The footer of the interface 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

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



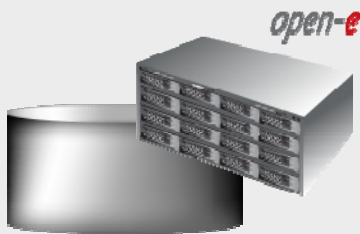
The screenshot shows the 'DATA STORAGE SERVER' web interface. The 'CONFIGURATION' tab is active, and the 'NAS resources' sub-tab is selected. The 'Shares' section shows a share named 'Copy of Data'. The 'Data replication agent settings' for this share are visible, with the 'Use data replication' checkbox checked. Below this, there are input fields for 'Login name', 'Password', 'Confirm password', and 'Allow access IP'. An 'apply' button is located at the bottom right of the settings section. A 'Remove share' section is also visible at the bottom.

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”.

Volume Groups (vg00)

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 (Data Storage Server) web interface. The main navigation tabs are 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 selected, showing a 'Vol. groups' section with a search icon and a '+' icon. Below this, there 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 the following data:

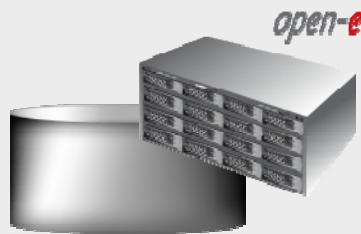
Unit	Size (GB)	Serial number	Status
Unit MD0	466.59	N/A	available

Below the table, there is an 'Action:' dropdown menu set to 'new volume_group' and a 'Name:' input field containing 'vg00'. An 'apply' button is located at the bottom right of this section. The 'Drive identifier' section shows a table with the following data:

Unit	Serial number	Status
Unit S000	Y636PANE	

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 (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 **apple** 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 selected), Vol. replication
- Main content area: Volume group: vg00, Volume manager table, Action: new NAS volume, checkboxes for Use volume replication and WORM, a slider for size, and an 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

Action: new NAS volume

Use volume replication

WORM

0 421.53

add: 0.00 GB

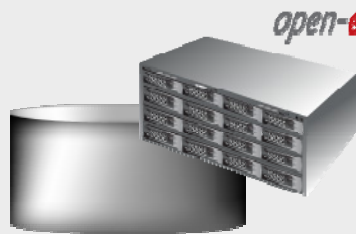
apply

Setting up Asynchronous Data Replication over a LAN



Data Server (DSS1)
Destination node
IP Address: 192.168.0.220

3. Configure the Source Node



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:

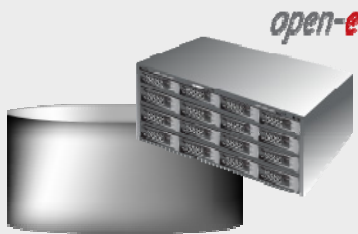
- Navigation tabs: SETUP, CONFIGURATION, MAINTENANCE, STATUS, HELP
- Sub-navigation tabs: volume manager, NAS settings, NAS resources, iSCSI target manager, FC target manager
- Current view: Vol. groups (vg00)
- Volume manager table:

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

Below the table, the 'new snapshot' action form is visible:

- Action: new snapshot
- Assign to volume: Just create snapshot volume
- add: 0.00 GB
- apply button

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)



Snapshot

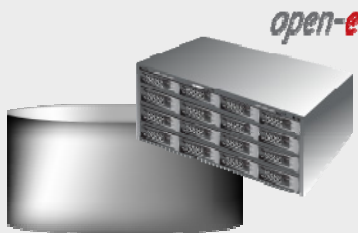
Assign the snapshot (snap00000) to the logical volume to be replicated (in this example: lv0000) and click the **apply** button.

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. Action: new NAS volume. Options: Use volume replication (unchecked), WORM (unchecked). A slider shows 0 to 417.53. An 'add:' field contains 0.00 GB. An 'apply' button is present.
- Snapshot definition table:

Name	LV	Status
→ snap00000	lv0000	unused
- Bottom right: An 'apply' button.
- 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

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

Shares: Data

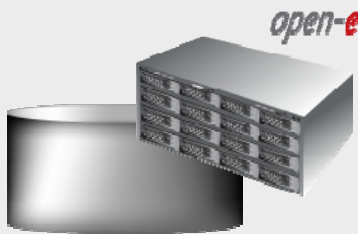


To create a share, enter the share name in field **Name**. In this example a new share named **Data** has been created.

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 menu: 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 at the bottom right.
- Below the form: 'ACL (Access control list)' section with a 'Browser' button and 'Users & Groups' and 'Access Permissions' sub-sections.
- 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.

The screenshot shows the DSS (Data Storage Server) web interface. The main navigation tabs are SETUP, CONFIGURATION, MAINTENANCE, STATUS, and HELP. Under MAINTENANCE, there are sub-tabs: shutdown, connections, snapshot, backup, restore, antivirus, miscellaneous, and software update. The 'backup' sub-tab is selected. On the left, there is a 'Data replication' section with a red dot icon and a question mark. The main content area is titled 'Create new data replication task' and contains the following fields:

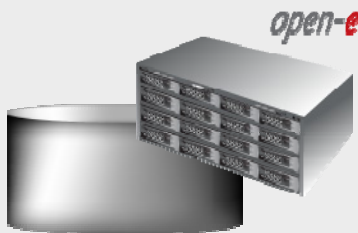
- Task name: [text input]
- Source share: [<choose share> dropdown]
- Snapshot: [dropdown]
- Destination IP: [text input]
- Destination share: [dropdown]
- Destination agent login: [text input]
- Destination agent password: [text input]

There are three checkboxes:

- Log replication errors
- Use ACL
- Don't delete files

An 'apply' button is located at the bottom right of the form. Below the form is a section titled 'Data replication tasks' which contains an information icon and the text 'No tasks have been found.'


Setting up Asynchronous Data Replication over a LAN



Data Server (DSS1)
Destination node
IP Address: 192.168.0.220

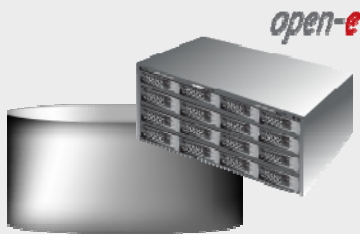
3. Configure the Source Node

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' 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.

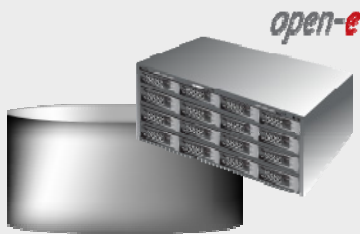
The screenshot shows the DSS WEB console interface. The main menu includes SETUP, CONFIGURATION, MAINTENANCE, STATUS, and HELP. Under MAINTENANCE, there are sub-menus for shutdown, connections, snapshot, backup, restore, antivirus, miscellaneous, and software update. The 'Data replication' section is 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



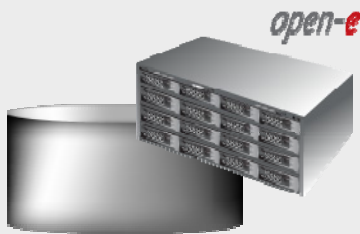
Data Server (DSS1)
Destination node
IP Address: 192.168.0.220

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 'open-e'. Below this is a secondary navigation bar with 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. Under 'MAINTENANCE', there are sub-menus: 'shutdown', 'connections', 'snapshot', 'backup', 'restore', 'antivirus', 'miscellaneous', and 'software update'. The 'backup' sub-menu is active, showing a tree view with 'Data replication' and 'Replication_D01'. The main content area is titled 'Data replication task: Replication_D01' and contains three sections: 'Create schedule for data replication task', 'Schedule for data replication task', and 'Remove data replication task'. The 'Create schedule' section has a 'Comment' field, a 'Select time' dropdown set to 'Interval', and an 'Interval' dropdown set to '10 min. time period'. An 'apply' button is below these fields. The 'Schedule for data replication task' section has an 'Info' icon and the text 'No schedules found.'. The 'Remove data replication task' section has a 'remove' button. At the bottom, 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

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 present. Below this, the 'Data replication tasks' section shows a table with the following data:

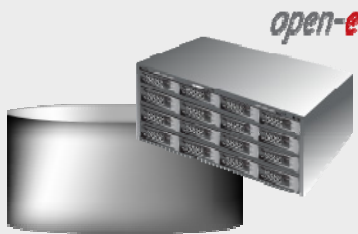
Name	Start time	Action
Replication_D01	2009-03-29 23:30:40	[Start] [Stop] [Delete]

Below the table, the configuration for 'Replication_D01' is displayed:

- 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

The footer of the interface 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

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 'tasks' menu selected. The 'Data Replication' task is highlighted in the left sidebar. The main content area displays a table of running tasks and a log of completed tasks.

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
2009-03-29 23:29:23	Replication_D01	Data replication	OK	Started

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

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

Thank you!