

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



Asynchronous Data Replication within a System

	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 within a system		✓	✓			✓		✓			

- ASYNCHRONOUS DATA REPLICATION within a System** enables **asynchronous** file and folder copy from one storage system to another.
 - 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.

Asynchronous **Data Replication** within a System

REPLICATION BETWEEN TWO RAID ARRAYs WITHIN ONE SYSTEM

■ **Recommended Resources**

- Key Hardware
 - ✓ x86 compatible
 - ✓ RAID Controller 1
 - ✓ RAID Controller 2
 - ✓ HDD's
 - ✓ Network Interface Cards
- Software
 - ✓ Open-E DSS (recommended) or Open-E NAS-R3

■ **Benefits**

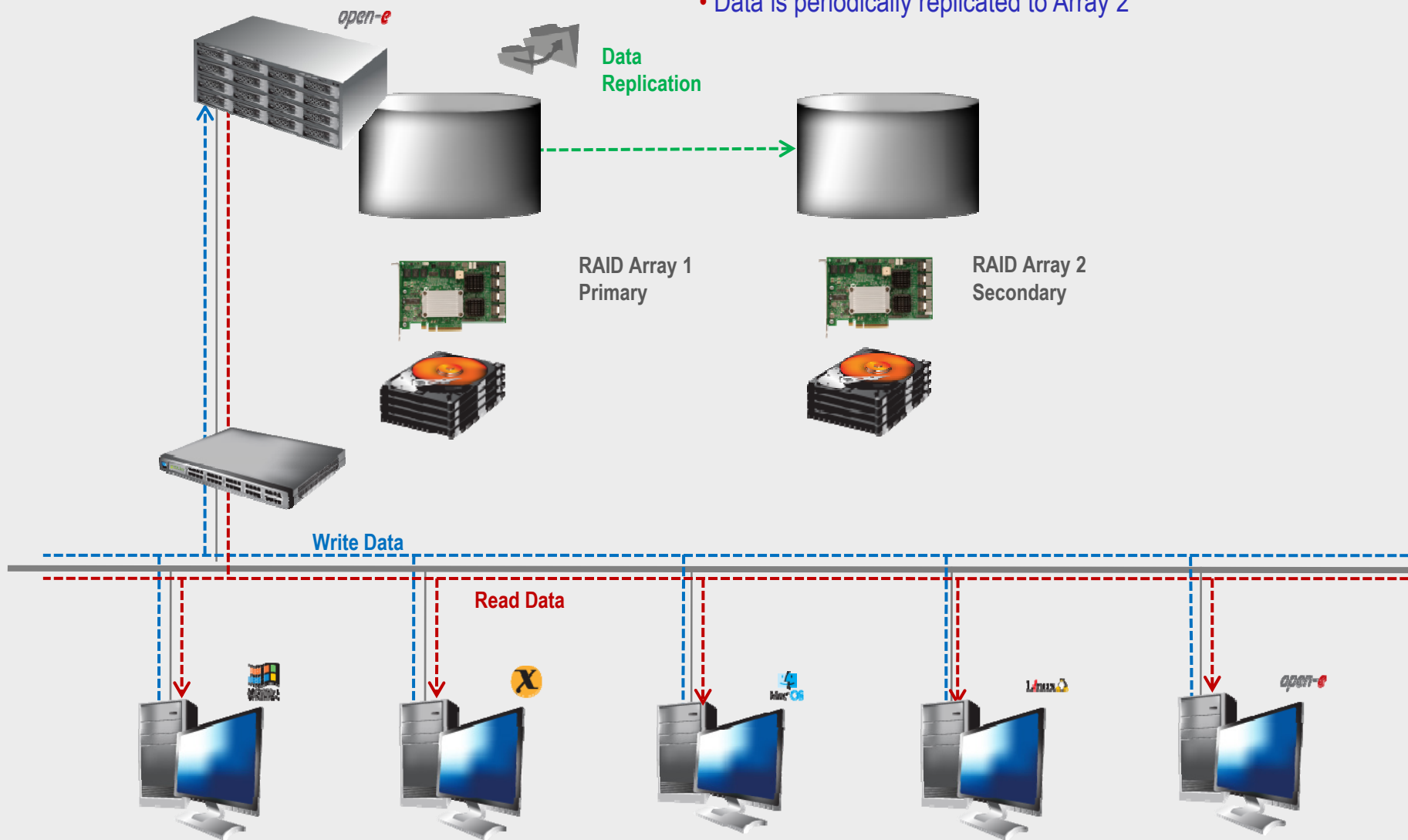
- Data redundancy over RAID Array
- Local data availability
- Low cost solution

■ **Disadvantages**

- In case of complete system failure, data will be lost or inaccessible

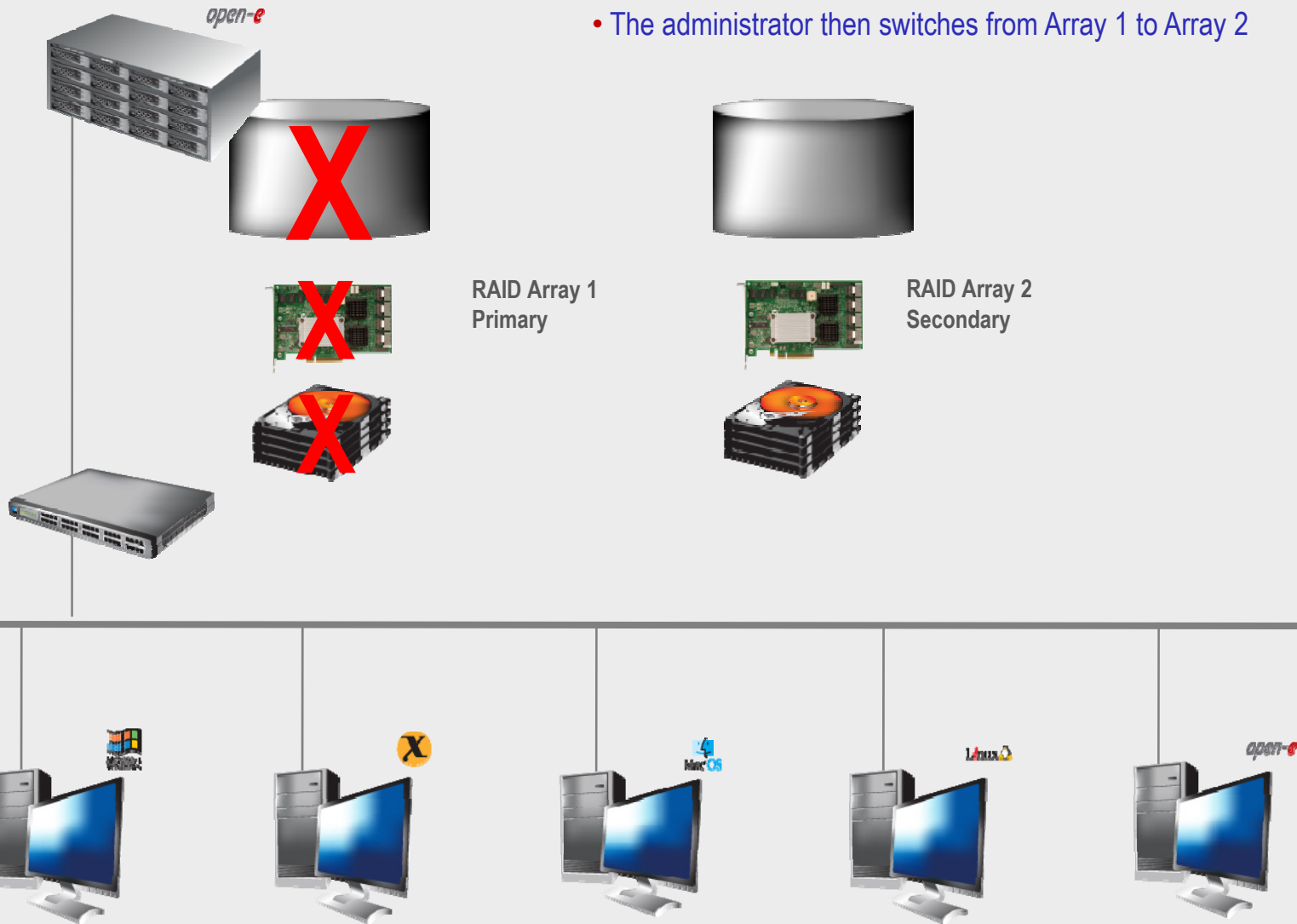
Asynchronous Data Replication within a System

- Data is written and read from Array 1
- Data is periodically replicated to Array 2



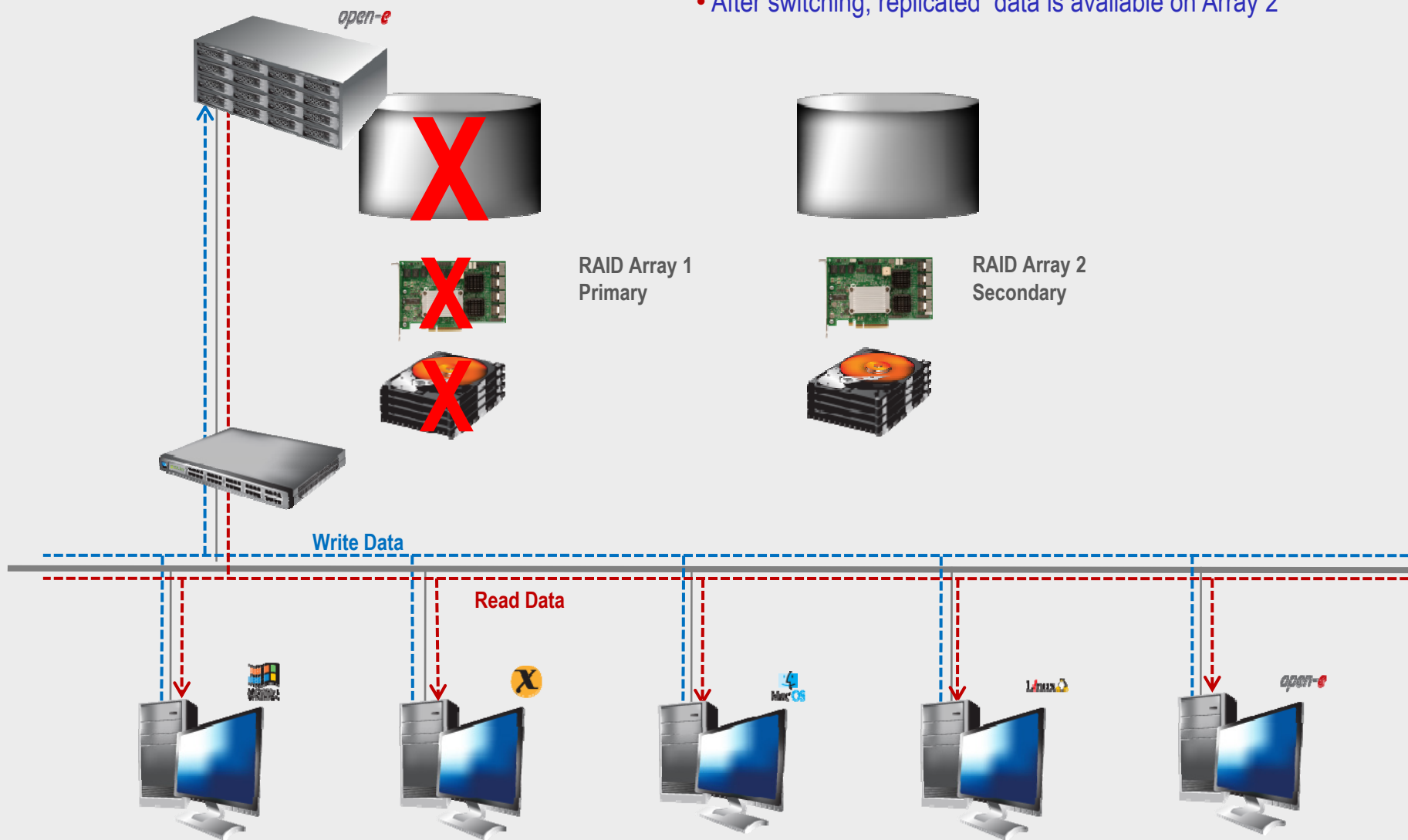
Asynchronous Data Replication within a System

- In case of raid array error or disk drive error on the Raid Array 1, the server will send an e-mail notification to the administrator and/or users
- The administrator then switches from Array 1 to Array 2



Asynchronous Data Replication within a System

- After switching, replicated data is available on Array 2



Setting up Asynchronous **Data Replication** within a System *open-e*

TO SET UP DATA REPLICATION, PERFORM THE FOLLOWING STEPS:

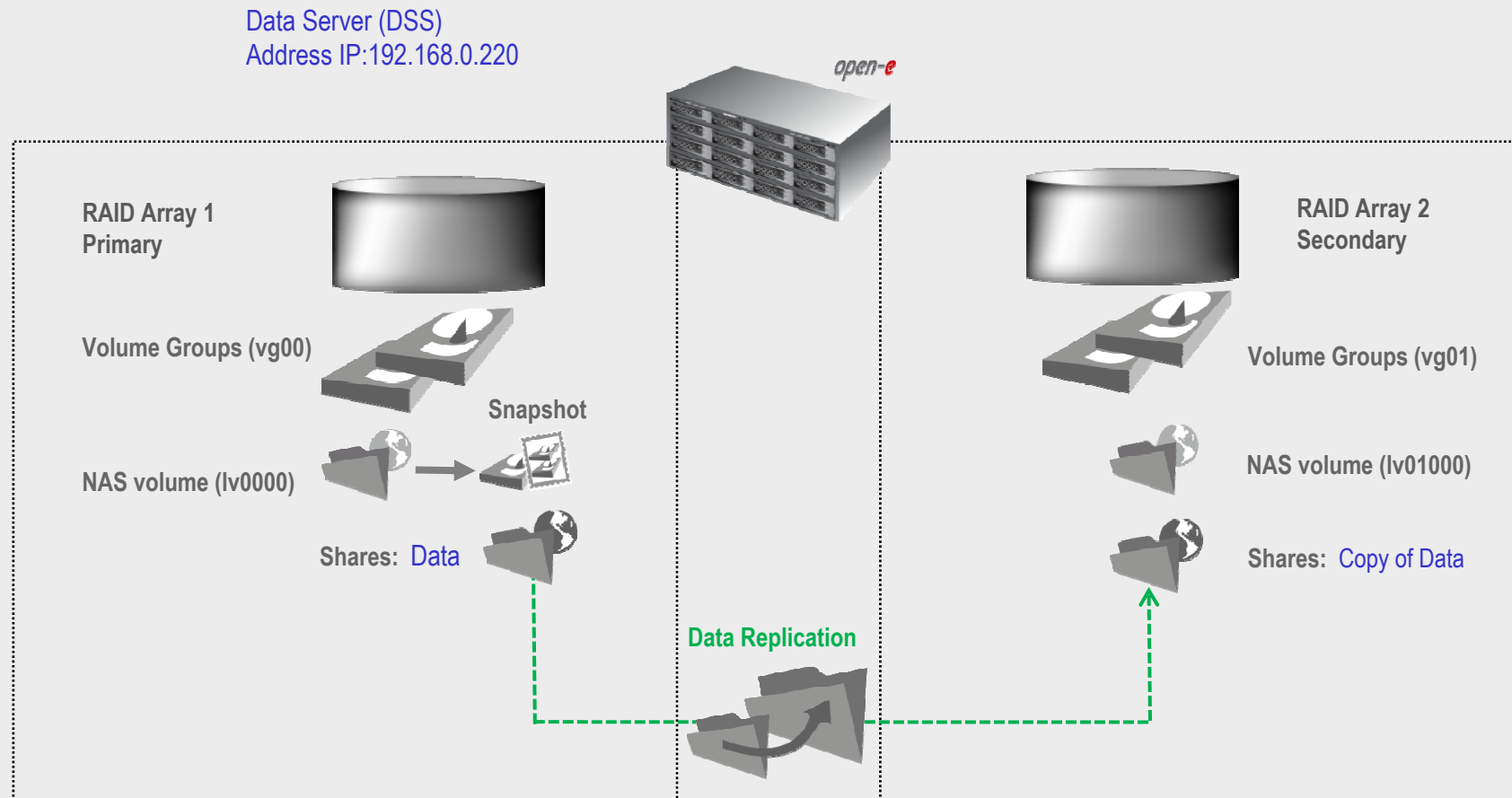
1. Hardware configuration
2. Configure the destination node
3. Configure the source node
4. Create Schedule replication
5. Checking status data replication

Setting up Asynchronous **Data Replication** within a System *open-e*

1. Hardware Configuration

Hardware Requirements

To run the data replication of Open-E DSS (or NAS R-3), a minimum of two RAID Systems are required on one system. Logical volumes working in slave mode must have snapshots created and enabled. An example configuration is shown below:



Setting up Asynchronous Data Replication within a System *open-e*



Data Server
Raid Array 2
Address IP:192.168.0.220

2. Configure the destination node

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

Volume Groups (vg01)



Add the selected physical units (Unit S001) to create a new volume group (in this case, vg01) and click **apply** button.

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

- Navigation tabs: SETUP, CONFIGURATION, MAINTENANCE, STATUS, HELP.
- Sub-tabs under CONFIGURATION: volume manager, NAS settings, NAS resources, iSCSI target manager, FC target manager.
- Left sidebar: Vol. groups, Vol. replication.
- Main content area: Unit rescan, Unit manager, and Drive identifier sections.
- Unit manager table:

Unit	Size (GB)	Serial number	Status
Unit M00	465.77	N/A	available
Unit S001	233.76	Y636PANE	available
- Action: new volume group (dropdown menu)
- Name: vg01 (input field)
- Buttons: rescan, apply.

Setting up Asynchronous Data Replication within a System *open-e*



Data Server
Raid Array 2
Address IP:192.168.0.220

Volume Groups (vg01)



NAS volume (lv0100)



2. Configure the destination node

Select the appropriate **volume group (vg01)** from the list on the left and create a **new NAS volume** of the required size. This logical volume **lv0100** will be the destination 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

Vol. groups

Volume group: vg01

Volume manager

Logical Volume	Type	Snap.	Rep.	Init.	Blocksize (bytes)	Size (GB)
lv0100					N/A	40.00

System volumes

System volumes	Size (GB)
Reserved Pool	4.00
Reserved for snapshots	0.00
Reserved for system	1.00
Reserved for replication	0.00
Free	188.72

Action: new NAS volume

Use volume replication

WORM

add: 0.00 GB

apply

Event Viewer: [x]

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Setting up Asynchronous Data Replication within a System *open-e*



Data Server
Raid Array 2
Address IP:192.168.0.220

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 navigation menu includes 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. Under 'CONFIGURATION', there are sub-menus: 'volume manager', 'NAS settings', 'NAS resources', 'iSCSI target manager', and 'FC target manager'. The 'NAS settings' menu is selected, showing three configuration sections: 'NDMP data server', 'Data replication agent', and 'Antivirus setup'. The 'Data replication agent' section has the 'Enable Data replication Agent' checkbox checked. The 'Antivirus setup' section has the 'Use antivirus' checkbox checked and the 'Use quarantine' checkbox unchecked. Each section has an 'apply' button. The footer shows 'Event Viewer:' and 'Data Storage Server. All rights reserved.'

Setting up Asynchronous **Data Replication** within a System *open-e*



Data Server
Raid Array 2
Address IP:192.168.0.220

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.

The screenshot shows the DSS (Data Storage Server) web interface. The top navigation bar includes 'logout', 'DSS', and 'DATA STORAGE SERVER'. 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 resources' sub-tab is active, showing a left sidebar with a tree view of 'Shares', 'Users', and 'Groups'. The 'Shares' section is expanded, showing a tree listing with '1. users'. The main content area displays the 'Create new share' form, which includes fields for 'Name' (set to 'Copy of Data'), 'Comment', 'Default path' (set to '/lv0000/Copy of Data'), and 'Specified path' (set to '/'). Below the form is an 'ACL (Access control list)' section with a 'Browser' tab and 'Users & Groups' and 'Access Permissions' sub-tabs. The footer of the console reads 'Data Storage Server. All rights reserved'.

Setting up Asynchronous Data Replication within a System *open-e*



Data Server
Raid Array 2
Address IP:192.168.0.220

2. Configure the destination node

After creating the new shared volume, configure it.

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

Data Replication



The screenshot shows the DSS (Data Storage Server) configuration interface. The 'CONFIGURATION' tab is active, and the 'NAS resources' sub-tab is selected. A share named 'Copy of Data' is highlighted. The 'Data replication agent settings' section is expanded, showing the 'Use data replication' checkbox checked. Below it are input fields for 'Login name:', 'Password:', 'Confirm password:', and 'Allow access IP:'. An 'apply' button is visible. At the bottom, an information box states 'Info: NDMP data server is off!'.

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 is now complete.

Setting up Asynchronous Data Replication within a System *open-e*

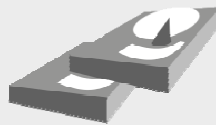


Data Server
Raid Array 1
Address IP:192.168.0.220

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 web interface with the 'CONFIGURATION' tab selected. The 'volume manager' sub-tab is active. The 'Unit manager' section displays a table of physical units:

Unit	Size (GB)	Serial number	Status
<input checked="" type="checkbox"/> Unit MD0	465.77	N/A	available
<input type="checkbox"/> Unit S001	233.76	Y636PANE	in use, vg01

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 right of the unit manager section.

The 'Drive identifier' section below shows a table of drives:

Unit	Serial number	Status
<input type="checkbox"/> Unit S000	9RY1GP7W	

The footer of the interface reads 'Data Storage Server. All rights reserved'.

Setting up Asynchronous Data Replication within a System *open-e*



Data Server
Raid Array 1
Address IP:192.168.0.220

Volume Groups (vg00)



NAS volume (lv0000)



3. Configure the source node

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 components:

- Navigation:** Logout, DSS, DATA STORAGE SERVER, open-e logo. Tabs include SETUP, CONFIGURATION, MAINTENANCE, STATUS, HELP. Sub-tabs include volume manager, NAS settings, NAS resources, iSCSI target manager, FC target manager.
- Left Panel:** "Vol. groups" section with a list containing "vg00" and "vg01". "Vol. replication" section is also visible.
- Right Panel:** "Volume group: vg00" section. "Volume manager" section contains a table of logical volumes and system volumes.

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						420.72

Action: new NAS volume

Use volume replication
 WORM

add: 0.00 GB

apply

Setting up Asynchronous Data Replication within a System *open-e*

3. Configure the source node



Data Server
Raid Array 1
Address IP:192.168.0.220

To run the replication process, you must first define a **new snapshot** 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.

Snapshot



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

The screenshot shows the DSS web interface with the 'CONFIGURATION' tab selected. The 'Volume manager' section is active, showing a table of logical volumes and system volumes. The 'Action' dropdown is set to 'new snapshot' and the 'Assign to volume' dropdown is set to 'Just create snapshot volume'. The 'Free' space is 416.72 GB. The 'apply' button is highlighted.

Logical Volume	Type	Snap.	Rep.	Init.	Blocksize (bytes)	Size (GB)
lv0000					N/A	40.00
snap00000	S				N/A	4.00
System volumes						
Reserved Pool						4.00
Reserved for snapshots						4.00
Reserved for system						1.00
Reserved for replication						0.00
Free						416.72

Setting up Asynchronous Data Replication within a System *open-e*



Data Server
Raid Array 1
Address IP:192.168.0.220

3. Configure the source node

NAS volume
(lv0000)



Snapshot

Assign the **snap00000** to the logical volume to be replicated (in this example, **lv0000**), 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

Volume group: vg00

Free 416.72

Action: new NAS volume

Use volume replication

WORM

0 416.72

add: 0.00 GB

apply

Snapshot definition

Name	LV	Status
snap00000	lv0000	unused

apply

Event Viewer: [x]

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Setting up Asynchronous Data Replication within a System *open-e*



Data Server
Raid Array 1
Address IP:192.168.0.220

3. Configure the source node

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

Shares: 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 **Data** has been created.

The screenshot shows the DSS (Data Storage Server) web console interface. The 'CONFIGURATION' tab is active, and the 'NAS resources' menu is selected. The left sidebar shows a tree listing of NAS shared volumes, including 'Shares' (with a sub-item 'Copy of Data'), 'Users', and 'Groups' (with a sub-item 'users'). The main content area shows the 'Create new share' form, where the 'Name' field is set to 'Data'. The 'Default path' is set to '/v0000/Data'. Below the form is the 'ACL (Access control list)' section, which includes a 'Browser' tab and a 'Selection:' field. The footer of the console reads 'Data Storage Server. All rights reserved'.

Setting up Asynchronous Data Replication within a System *open-e*



Data Server
Raid Array 1
Address IP:192.168.0.220

3. Configure the source node

Data Replication



After the share to be replicated has been configured, go to the „MAINTENANCE” tab and select „backup” to choose the Data replication.

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

i Info
No tasks have been found.

Event Viewer:

Data Storage Server. All rights reserved.

Setting up Asynchronous Data Replication within a System *open-e*



Data Server
Raid Array 1
Address IP: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 of the source share will automatically be assigned.

In the **Destination IP** field, enter the IP address of the destination server (in this example, 192.168.0.220) 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 appears. Click on the **apply** button.

The screenshot shows the 'Create new data replication task' form in the DSS web interface. The form fields are as follows:

Task name:	Replication_D01
Source share:	Data
Snapshot:	snap00000
Destination IP:	192.168.0.220
Destination share:	Copy of Data
Destination agent login:	
Destination agent password:	

Checkboxes:

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

Buttons: apply

Info: No tasks have been found.

Setting up Asynchronous Data Replication within a System *open-e*



Data Server
Raid Array 1
Address IP:192.168.0.220

3. Configure the source node

After the DSS WEB console, has been reloaded, the new task should appear

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 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 'backup' tab is active, and a 'Data replication' task named 'Replication_D01' is selected. The task configuration is displayed in a table:

Attribute	Value
Destination IP:	192.168.0.220
Source share:	Data
Snapshot:	snap00000
Destination share:	Copy of Data
Log replication errors:	Yes
Use ACL:	Yes
Don't delete files:	No

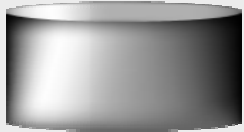
Below the table, there is a section for 'Create schedule for data replication task' with the following fields:

- Comment:
- Select time:
- Interval:

An 'apply' button is located at the bottom right of the configuration area. The footer of the console reads 'Data Storage Server. All rights reserved'.

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

Setting up Asynchronous Data Replication within a System *open-e*



Data Server
Raid Array 1
Address IP: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.

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

SETUP CONFIGURATION **MAINTENANCE** STATUS HELP

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

Data replication task: Replication_D01

Replication_D01

? Create schedule for data replication task

Comment:

Select time: Interval

Interval: 10 min. time period

apply

? Schedule for data replication task

i Info
No schedules found.

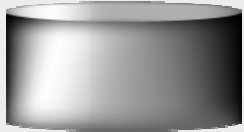
? Remove data replication task

remove

Event Viewer:

Data Storage Server. All rights reserved

Setting up Asynchronous Data Replication within a System *open-e*



Data Server
Raid Array 1
Address IP: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 (Data Storage Server) web 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 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 2009-03-09 at 23:14:24. The table has columns for Name, Start time, and Action. Below the table, the configuration details for the task are listed: Destination IP: 192.168.0.220, Source share: Data, Snapshot: snap000000, Destination share: Copy of Data, Destination agent login: (blank), Log replication errors: yes, Use ACL: yes, and Don't delete files: no. At the bottom, there is an 'Event Viewer' field and a footer that reads 'Data Storage Server. All rights reserved'.

Name	Start time	Action
Replication_D01	2009-03-09 23:14:24	[Start] [Stop] [Delete]

Destination IP: 192.168.0.220
Source share: Data
Snapshot: snap000000
Destination share: Copy of Data
Destination agent login:
Log replication errors: yes
Use ACL: yes
Don't delete files: no

Setting up Asynchronous Data Replication within a System *open-e*



Data Server
Raid Array System 1
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 expanded, and 'Data Replication' is selected. The 'Tasks: Data Replication' section displays a table of running tasks and a log of completed tasks.

Name	Type	Start time
Replication_D01	Data replication	2008-09-26 23:17:17

Time	Name	Type	Status	Action
2008-09-26 23:17:38	Replication_D01	Data replication	OK	Started
2008-09-26 23:15:16	Replication_D01	Data replication	OK	Finished

Files overall: 8
Files transferred: 1
Preparing time: 0.05 sec
Sent: 260.75 MB
Transfer: 14.90 MB/s

Time	Name	Type	Status	Action
2008-09-26 23:14:46	Replication_D01	Data replication	OK	Started

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

Thank You!