

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



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# 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**

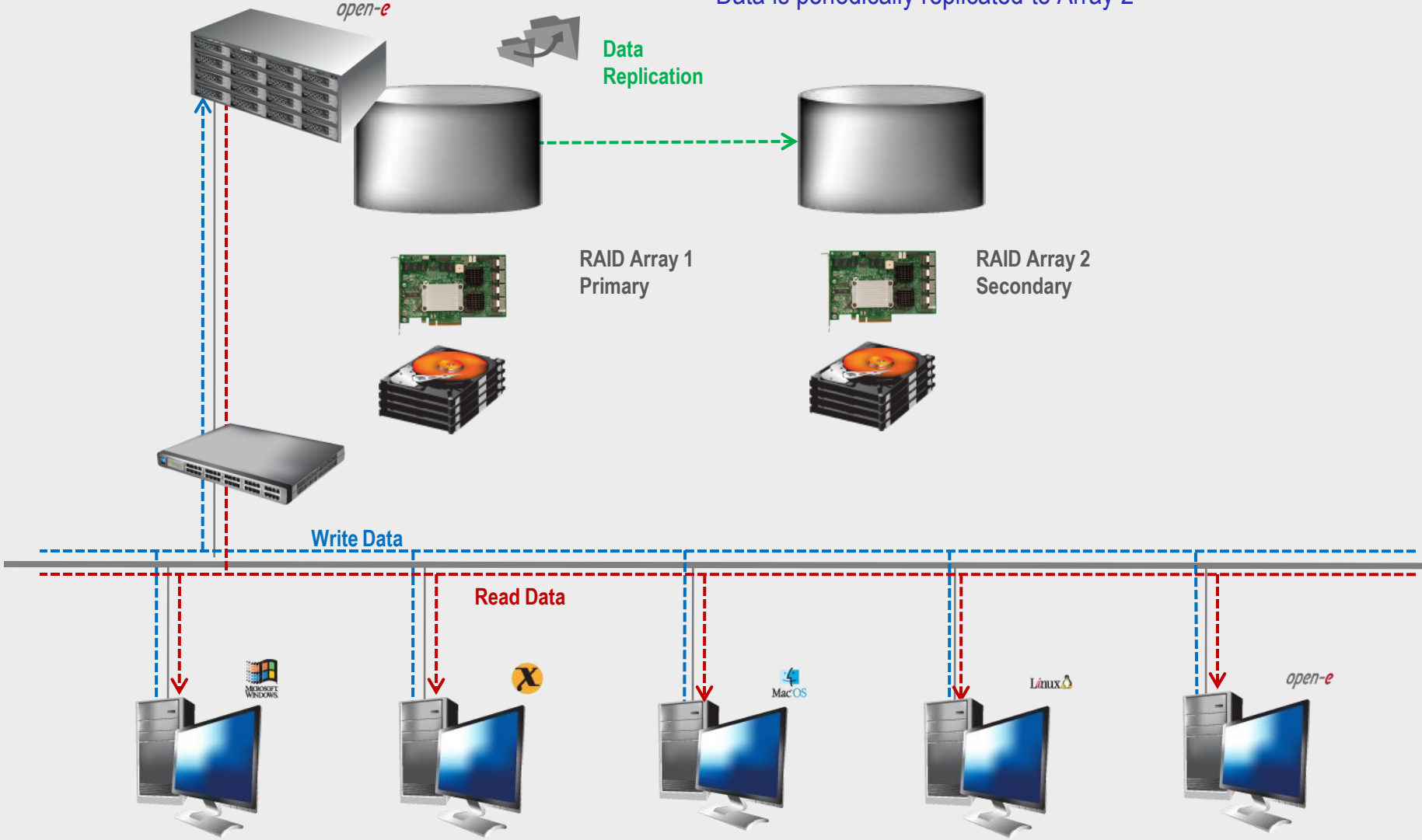
- Data redundancy over RAID Array
- Local data availability
- Low cost solution

### ■ **Disadvantages**

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

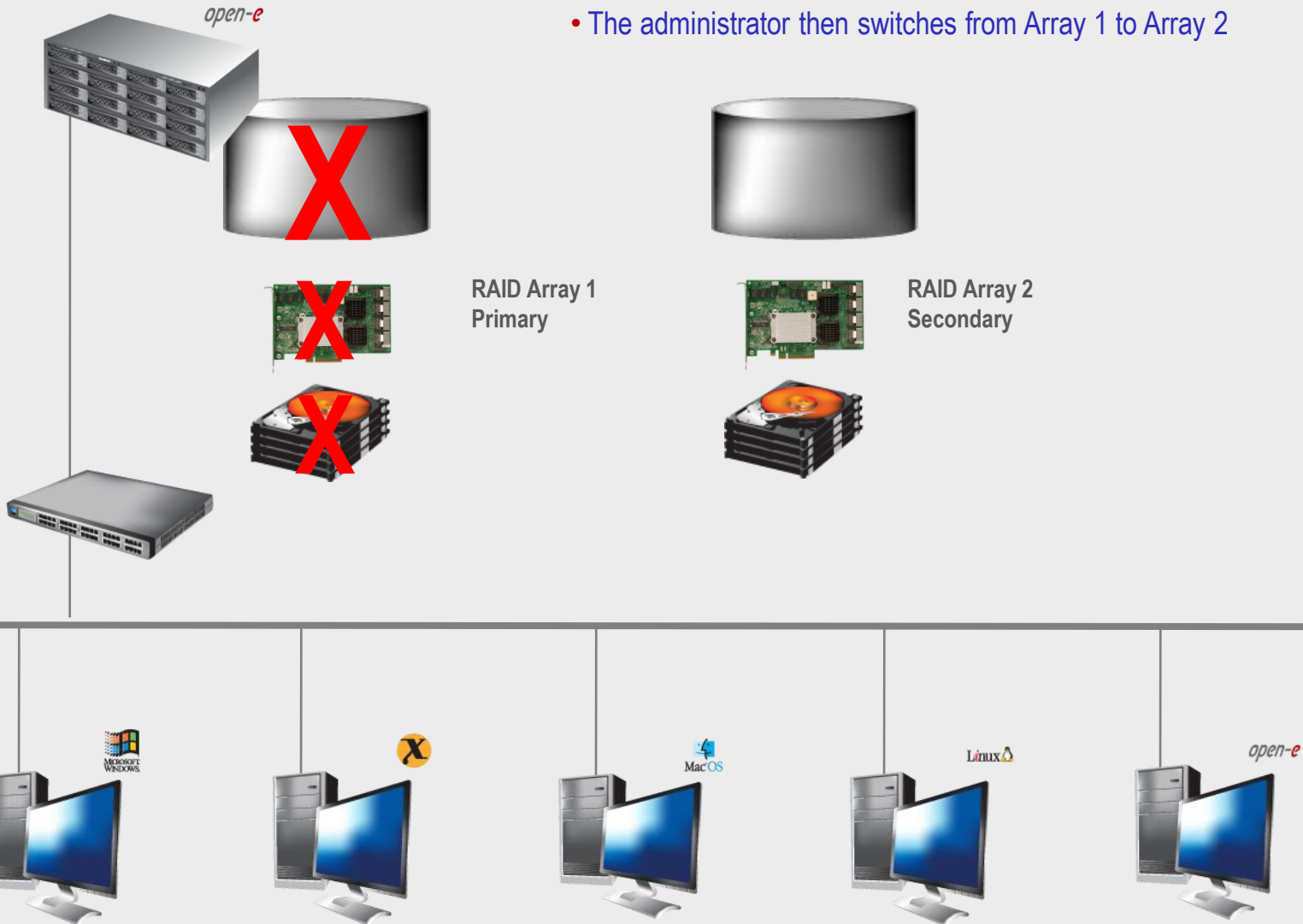
# Asynchronous Data Replication within a System

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



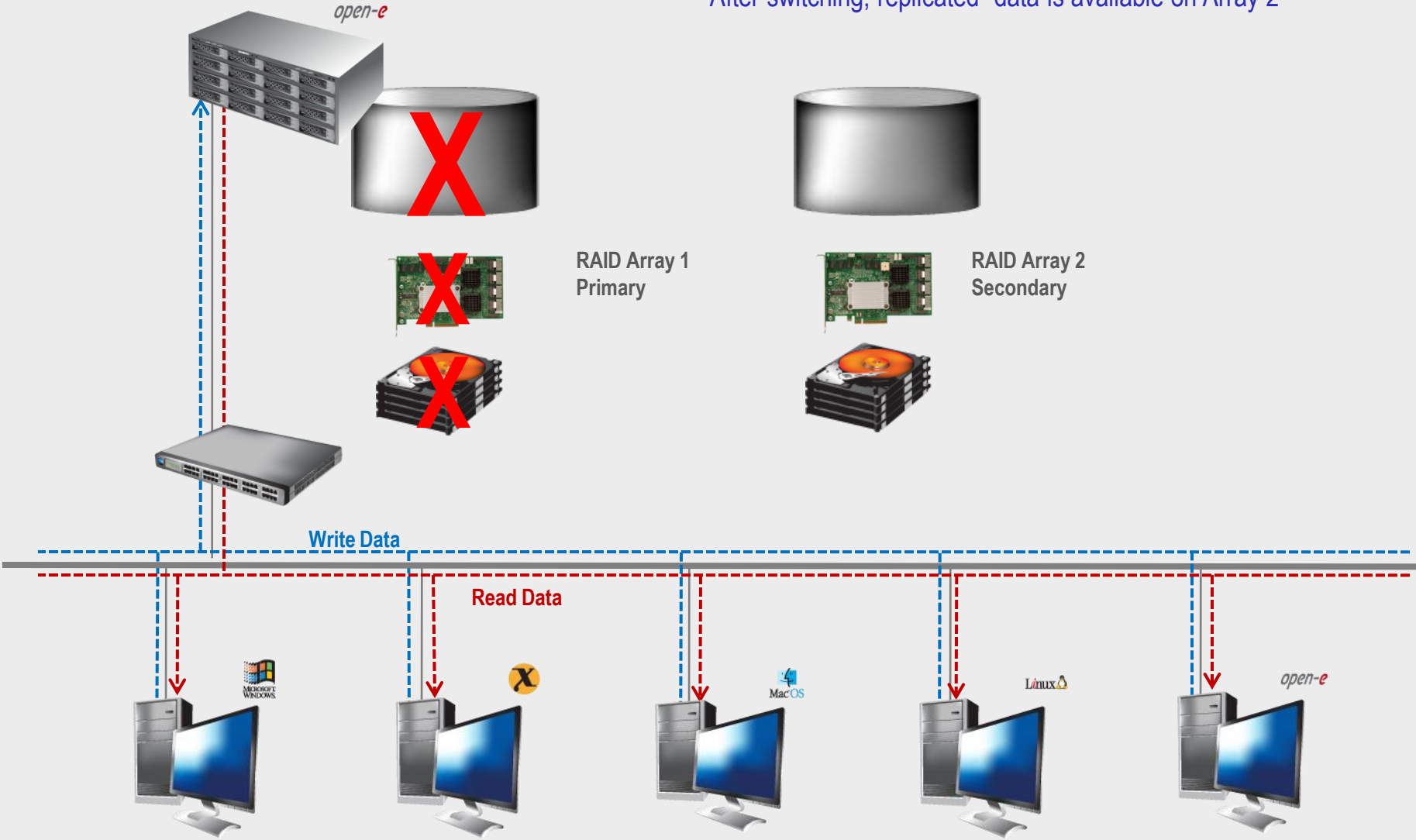
# Asynchronous Data Replication within a System

- 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



**TO SET UP DATA REPLICATION, PERFORM THE FOLLOWING STEPS:**

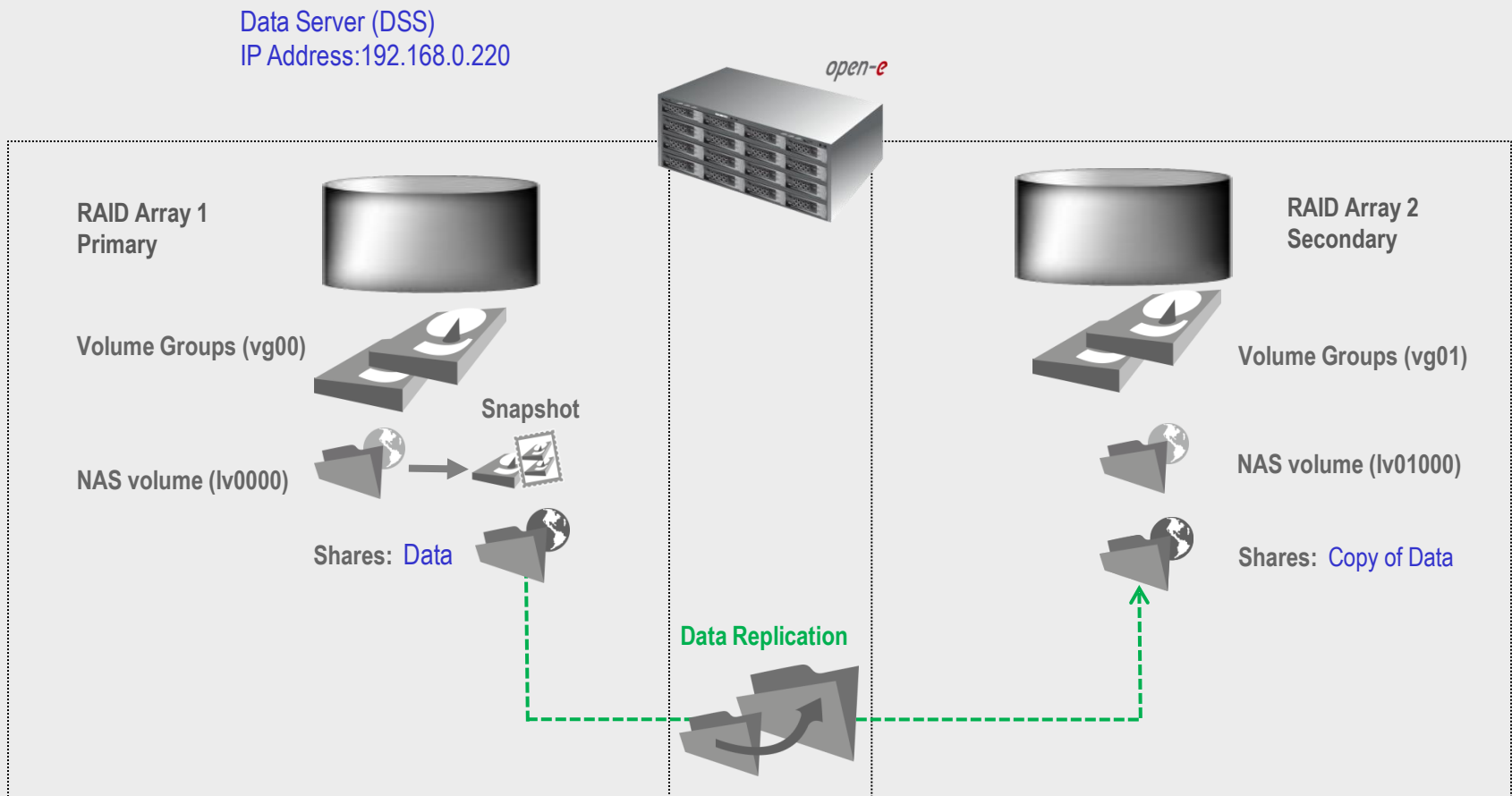
1. Hardware configuration
2. Configure the destination node
3. Configure the source node
4. Create Schedule replication
5. Checking status data replication

# Setting up Asynchronous Data Replication within a System

## 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:



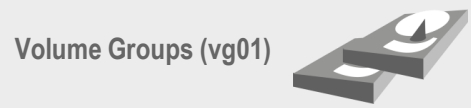
# Setting up Asynchronous Data Replication within a System



Data Server  
Raid Array System 2  
IP Address:192.168.0.220

## 2. Configure the destination node

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



Add the selected physical units (Unit S001) to create a new volume group (in this case, vg01) 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
<input type="checkbox"/> Unit M00	465.77	N/A	available
<input checked="" type="checkbox"/> Unit S001	233.76	Y636PANE	available

Action: new volume group

Name: vg01

apply

Drive identifier

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

Event Viewer:

Data Storage Server. All rights reserved

# Setting up Asynchronous Data Replication within a System

## 2. Configure the destination node



Data Server  
Raid Array System 2  
IP Address:192.168.0.220

Volume Groups (vg01)



NAS volume (lv0100)



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

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, a tree view shows 'Vol. groups' with 'vg01' selected. Below it, 'Vol. replication' is also visible. The main content area shows 'Volume group: vg01' and a 'Volume manager' section with a table of logical volumes. The 'lv0100' volume is highlighted. Below the table, the 'Action:' dropdown is set to 'new NAS volume'. There are checkboxes for 'Use volume replication' and 'WORM'. A slider shows the available space (188.72 GB) and the 'add:' field is set to '0.00' GB. An 'apply' button is at the bottom right.

Logical Volume	Type	Snap.	Rep.	Init.	Blocksize (bytes)	Size (GB)
lv0100					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						188.72

# Setting up Asynchronous Data Replication within a System



Data Server  
Raid Array System 2  
IP Address: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 web interface with the following elements:

- Logout button
- Navigation tabs: SETUP, CONFIGURATION (selected), MAINTENANCE, STATUS, HELP
- Sub-navigation tabs: volume manager, NAS settings (selected), NAS resources, iSCSI target manager, FC target manager
- NDMP data server section:  Enable NDMP data server, apply button
- Data replication agent section:  Enable Data replication Agent, apply button
- Antivirus setup section:  Use antivirus,  Use quarantine
- Event Viewer: [icon]
- Footer: Data Storage Server. All rights reserved

# Setting up Asynchronous Data Replication within a System



Data Server  
Raid Array System 2  
IP Address: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.

# Setting up Asynchronous Data Replication within a System



Data Server  
Raid Array System 2  
IP Address: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.

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.
- Share name: Copy of Data
- Section: Data replication agent settings
  - Use data replication
  - Login name: [input field]
  - Password: [input field]
  - Confirm password: [input field]
  - Allow access IP: [input field]
  - apply button
- Section: NDMP data server access
  - Info: NDMP data server is off!

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 is now complete.

# Setting up Asynchronous Data Replication within a System



Data Server  
Raid Array System 1  
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 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 (vg01), Vol. replication.
- Main content area: Unit manager table and form.

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

Action: new volume group  
Name: vg00

apply

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

Event Viewer: [icon]

Data Storage Server. All rights reserved

# Setting up Asynchronous Data Replication within a System

## 3. Configure the source node



Data Server  
Raid Array System 1  
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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

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						420.72

# Setting up Asynchronous Data Replication within a System

## 3. Configure the source node



Data Server  
Raid Array System 1  
IP Address: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.



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

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

# Setting up Asynchronous Data Replication within a System



Data Server  
Raid Array System 1  
IP Address: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.

Name	LV	Status
snap00000	lv0000	unused

# Setting up Asynchronous Data Replication within a System



Data Server  
Raid Array System 1  
IP Address: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.

# Setting up Asynchronous Data Replication within a System



Data Server  
Raid Array System 1  
IP Address: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.

# Setting up Asynchronous Data Replication within a System



Data Server  
Raid Array System 1  
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 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 DSS (Data Storage Server) web interface. The main navigation bar includes 'logout', 'DSS', and 'DATA STORAGE SERVER'. Below this are tabs for 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. Under 'MAINTENANCE', there are sub-tabs for '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 (192.168.0.220), Destination share (Copy of Data), Destination agent login, and Destination agent password. There are checkboxes for 'Log replication errors', 'Use ACL', and 'Don't delete files'. 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.' The footer of the interface says 'Data Storage Server. All rights reserved.'

# Setting up Asynchronous Data Replication within a System



Data Server  
 Raid Array System 1  
 IP Address: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 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 this task are as follows:

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 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 within a System



Data Server  
Raid Array System 1  
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.

# Setting up Asynchronous Data Replication within a System



Data Server  
Raid Array System 1  
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 'MAINTENANCE' tab selected. Under 'backup', the 'Data replication' sub-tab is active. A tree view on the left shows 'Replication\_D01'. On the right, 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 this is the 'Data replication tasks' section, which contains a table with one entry: 'Replication\_D01' with a start time of '2009-03-09 23:14:24'. Below the table, configuration details are listed: Destination IP: 192.168.0.220, Source share: Data, Snapshot: snap00000, Destination share: Copy of Data, Destination agent login: (blank), Log replication errors: yes, Use ACL: yes, Don't delete files: no. An 'Event Viewer' button is at the bottom left, and a footer at the bottom right 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: snap00000  
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



Data Server  
Raid Array System 1  
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 (Data Storage Server) web interface. The 'STATUS' tab is selected, and the 'tasks' menu item is highlighted. The 'Data Replication' task is selected in the left-hand menu. The main content area displays a table of running tasks and a tasks log.

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

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

Thank you!