

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



Asynchronous Data Replication within a System

	Replication Mode		Source/Destination			I/O type		Volume Type		
	Synchronous	Asynchronous	w/ System	LAN	WAN	File based	Block based	NAS	iSCSI	FC
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 from the source to the target storage system.
 - Once the target system has the point-in-time copy of the data, the source storage system creates a delta set of all of the changes since the point-in-time copy was created. This delta set doesn't include every write or change, just the last set of changes prior to the snapshot.
 - 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**

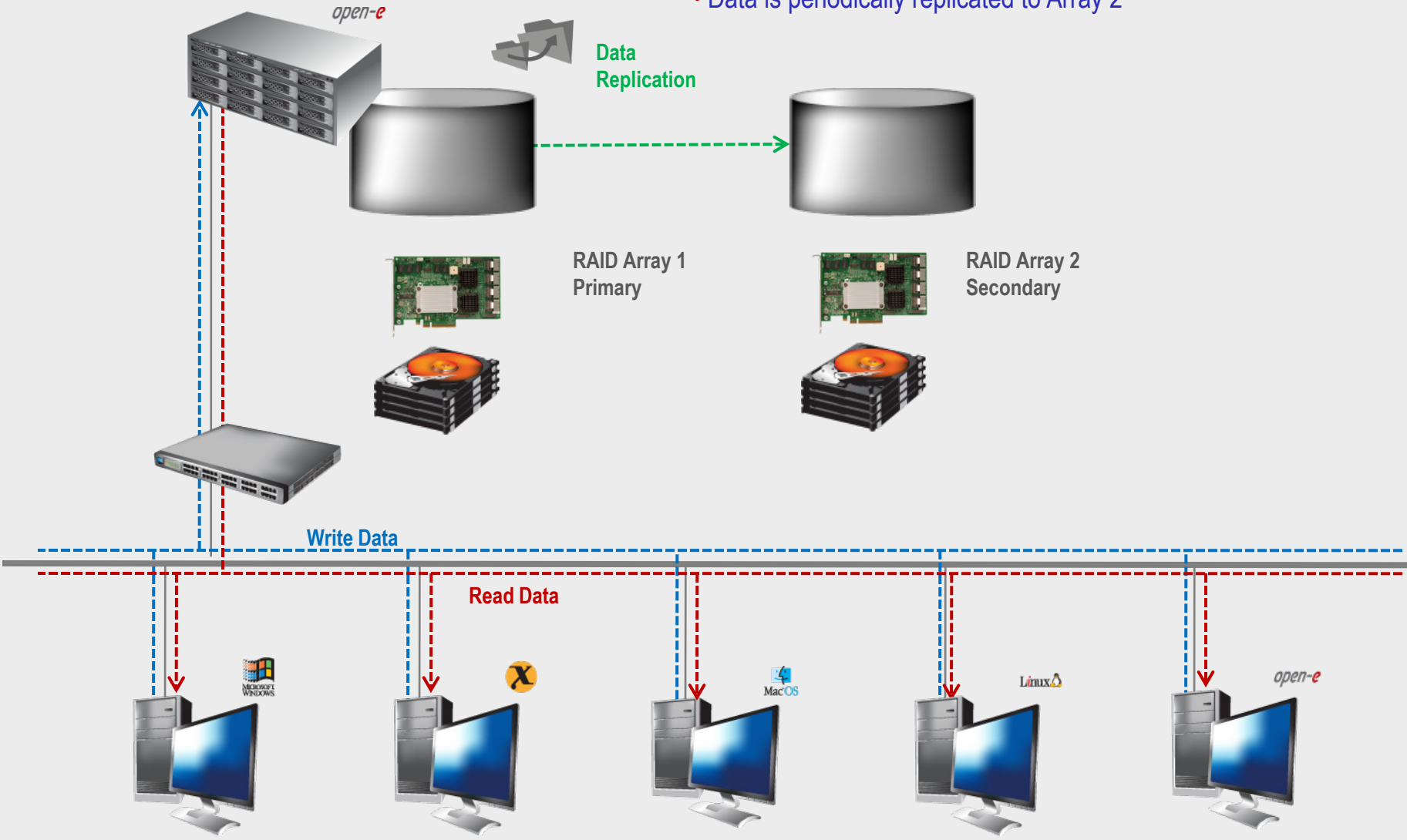
- Data redundancy over RAID Array
- Local data availability
- Low cost solution

■ **Disadvantages**

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

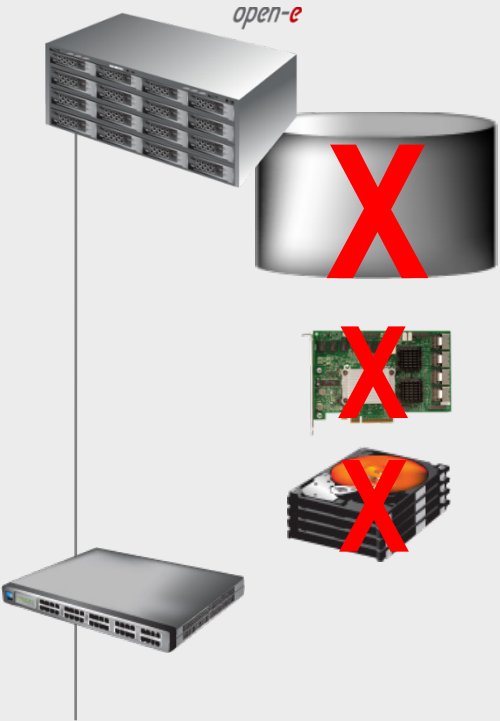
Asynchronous Data Replication within a System

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



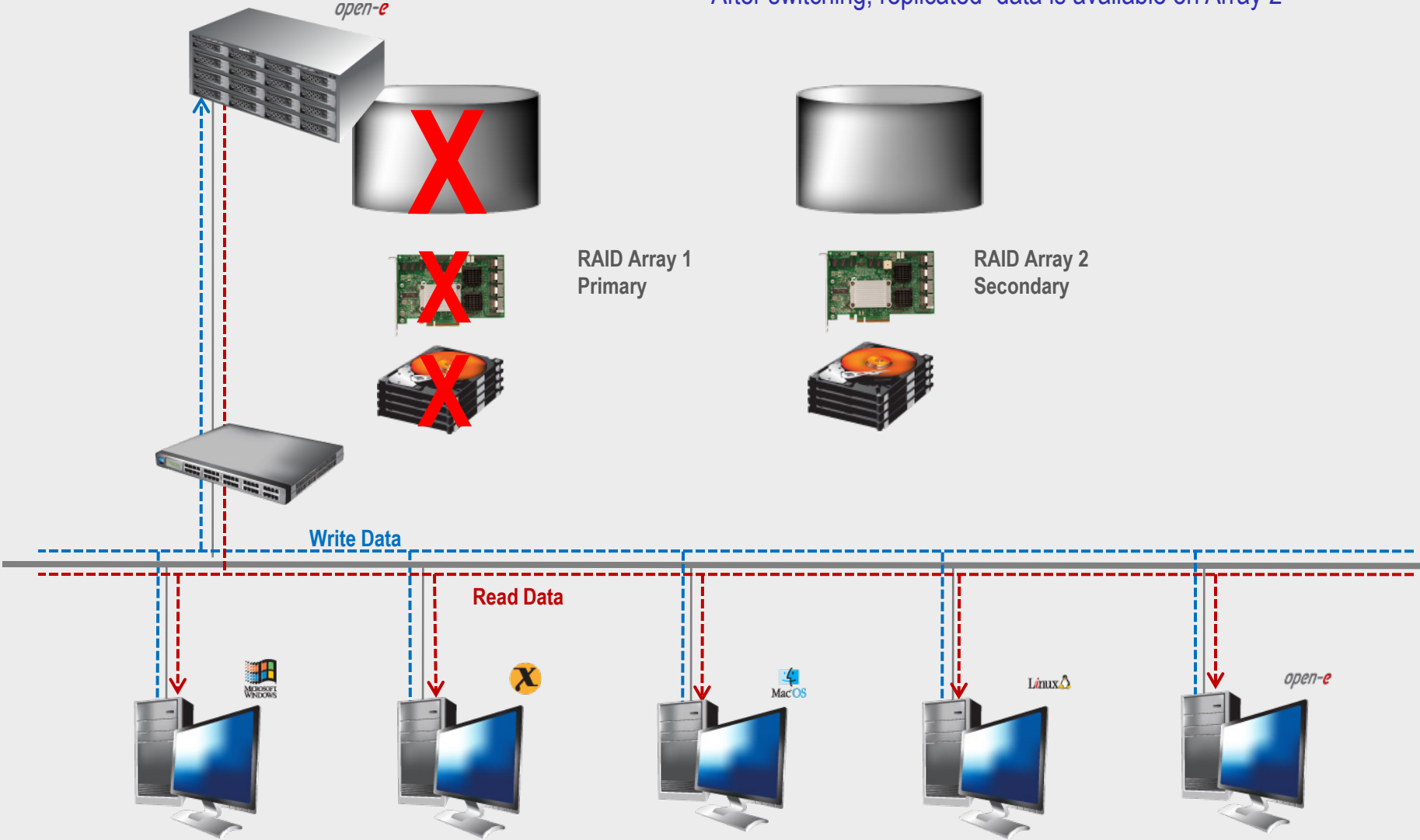
Asynchronous Data Replication within a System

- 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:

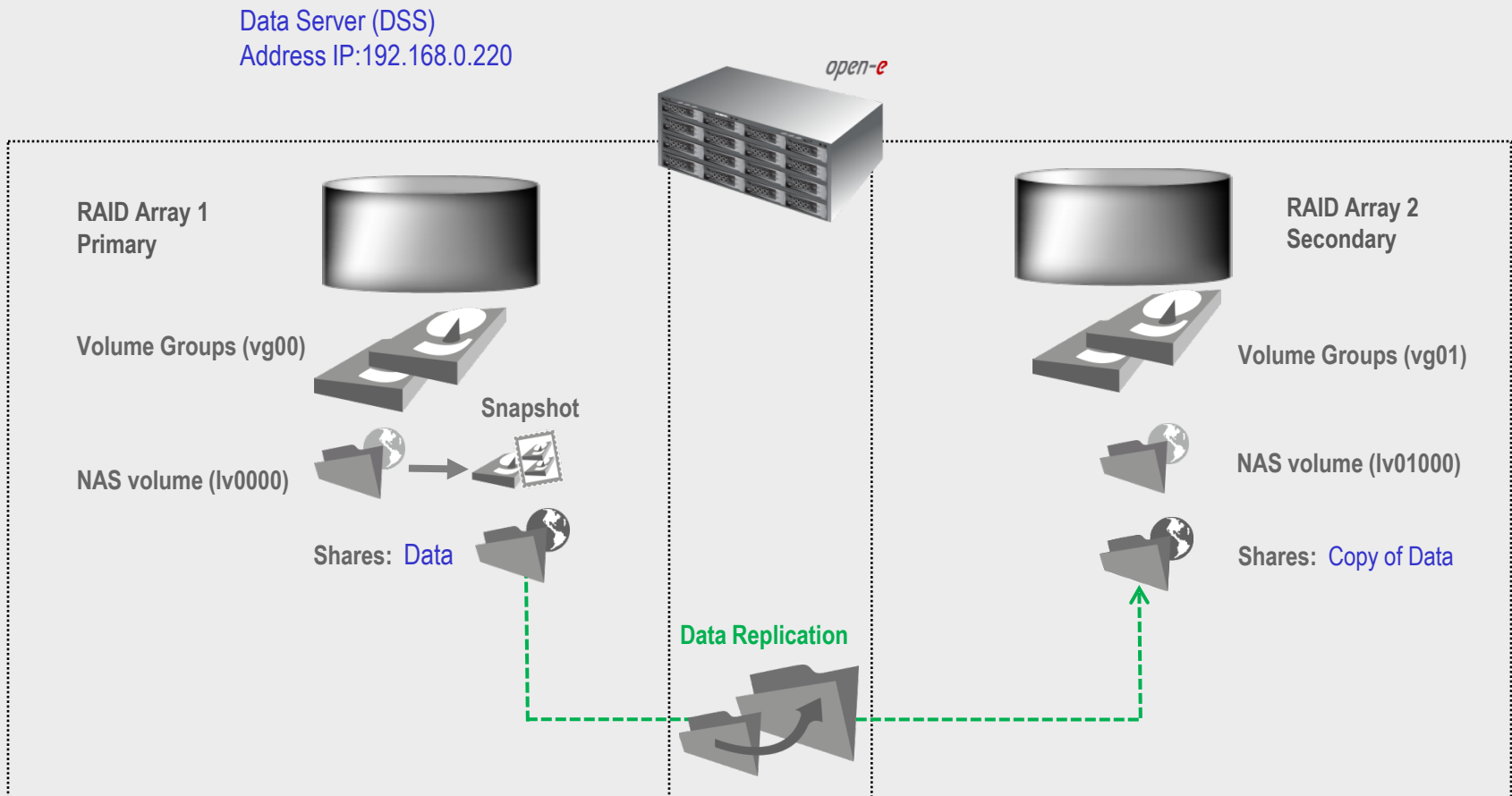
1. Hardware configuration
2. Configure the destination node
3. Configure the source node
4. Create Schedule replication
5. Checking status data replication

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
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 (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, 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 form: Action: new volume group, Name: vg01.
- Buttons: rescan, apply.
- Status: status: ✓
- Footer: 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
Address IP: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 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" list containing "vg01" (selected), and "Vol. replication" section.
- Main content area: "Volume group: vg01" header, "Volume manager" section with a table of logical volumes, and a "new NAS volume" configuration form.

Logical Volume	Type	Snap.	Rep.	Init.	Blocksize (bytes)	Size (GB)
lv0100					N/A	40.00
System volumes						Size (GB)
Reserved for swap						4.00
Reserved for snapshots						0.00
Reserved for system						1.00
Reserved for replication						0.00
Free						188.72

Configuration form details:

- Action: new NAS volume
- Use volume replication:
- WORM:
- add: 0.00 GB
- apply button

Setting up Asynchronous Data Replication within a System



Data Server
Raid Array System 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) web interface. The main 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 for '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 an 'Info' box stating 'No shares found.'. Each section has an 'apply' button. The status bar at the bottom shows 'status: ✓' and 'Data Storage Server. All rights reserved'.

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



Data Server
Raid Array System 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 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 NAS resources sub-tab is selected, and the Shares menu is active. On the left side, there is a tree listing of NAS shared volumes (Shares), Users, and Groups. The Shares section shows a tree listing with 1. users. The main content area displays the 'Create new share' form with the following fields: Name (Copy of Data), Comment, Default path (/lv0000/Copy of Data), and Specified path (/). An 'apply' button is visible. Below the form is the 'ACL (Access control list)' section, which includes a 'Browser' tab (Users & Groups, Access Permissions), a 'Selection' field, and a 'Filter' field. The status bar at the bottom indicates 'Data Storage Server. All rights reserved'.

Setting up Asynchronous Data Replication within a System



Data Server
Raid Array System 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) 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 'CONFIGURATION', there are sub-tabs for 'volume manager', 'NAS settings', 'NAS resources', 'iSCSI target manager', and 'FC target manager'. The 'NAS resources' tab is active, showing a list of shares. The share 'Copy of Data' is selected. The 'Data replication agent settings' section is expanded, and the 'Use data replication' checkbox is checked. Below this are fields for 'Login name:', 'Password:', 'Confirm password:', and 'Allow access IP:'. An 'apply' button is located at the bottom right of this section. At the bottom of the interface, there is a status bar that reads 'Data Storage Server. All rights reserved'.

The configuration of the destination node is now complete.

Setting up Asynchronous Data Replication within a System



Data Server
Raid Array System 1
Address IP:192.168.0.220

2. 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, displaying 'Vol. groups' and 'Vol. replication' sections. The 'Unit manager' table is visible, showing 'Unit MD0' selected. The 'Action' dropdown is set to 'new volume group' and the 'Name' field contains 'vg00'. An 'apply' button is at the bottom right.

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

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

Setting up Asynchronous Data Replication within a System

2. Configure the source node



Data Server
Raid Array System 1
Address IP:192.168.0.220

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 'DATA STORAGE SERVER' web interface. The 'CONFIGURATION' tab is active, and the 'volume manager' sub-tab is selected. On the left, under 'Vol. groups', 'vg00' is selected. On the right, the 'Volume group: vg00' configuration page is shown. It features a table of logical volumes and system volumes, and a 'new NAS volume' configuration section.

Logical Volume	Type	Snap.	Rep.	Init.	Blocksize (bytes)	Size (GB)
lv0000					N/A	40.00
System volumes						
Reserved for swap						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



Data Server
Raid Array System 1
Address IP:192.168.0.220

2. Configure the source node

To run the replication process, you must first define a **new snapshot** to be taken of the volume to be replicated.

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



The screenshot shows the 'Volume manager' configuration page for volume group 'vg00'. The page includes a table of logical volumes and system volumes. The 'Action' dropdown is set to 'new snapshot' and the 'add' field is set to '0.00 GB'. The 'apply' button is highlighted with a blue arrow.

Logical Volume	Type	Snap.	Rep.	Init.	Blocksize (bytes)	Size (GB)
lv0000					N/A	40.00
snap00000	S				N/A	4.00
System volumes						
Reserved for swap						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
Address IP:192.168.0.220

2. Configure the source node

NAS volume
(lv0000)



Snapshot

Assign the **snapshot00000** 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
- vg01

Vol. replication

Volume group: vg00

Reserved for replication 0.00

Free 416.72

Action: new snapshot

0 416.72

add: 0.00 GB

apply

Snapshot definition

Name	LV	Status
→ snap00000	lv0000	unused

apply

status: ✓

Data Storage Server. All rights reserved

Setting up Asynchronous Data Replication within a System



Data Server
Raid Array System 1
Address IP:192.168.0.220

2. 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
Address IP:192.168.0.220

3. Configure the source node

After creating the new shared volume, configure it:

- Click on its name **Data**,
- Check the box **Use data replication**, within the *Data Replication Agent Settings* table.
- 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 'CONFIGURATION', there are sub-tabs for 'volume manager', 'NAS settings', 'NAS resources', 'iSCSI target manager', and 'FC target manager'. The 'Shares' section is active, showing a list of shares: '1. Copy of Data' and '2. Data'. The '2. Data' share is selected, and its configuration is shown on the right. The 'Use data replication' checkbox is checked. Below this are input fields for 'Login name:', 'Password:', 'Confirm password:', and 'Allow access IP:'. An 'apply' button is visible. There are also sections for 'NDMP data server access' and 'Remove share'.

Data Storage Server. All rights reserved

NOTE:

It is strongly recommended to protect the replication protocol with a user name and password, along with a list of allowed IP address. This will prevent local network users from accessing this share. **The user name and password must be the same as on the destination node.**

Setting up Asynchronous Data Replication within a System



Data Server
Raid Array System 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

Backup pools Backup devices Backup tasks **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

Data replication tasks

Info
No tasks have been found.

status: ✓

Data Storage Server. All rights reserved

Setting up Asynchronous Data Replication within a System



Data Server
Raid Array System 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 DSS (Data Storage Server) web interface. The main navigation bar includes 'logout', 'DSS', and 'DATA STORAGE SERVER'. Below this, there are tabs for 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. Under 'MAINTENANCE', there are sub-menus for 'shutdown', 'connections', 'snapshot', 'backup', 'restore', 'antivirus', 'miscellaneous', and 'software update'. The 'backup' menu is selected, and the 'Create new data replication task' form is displayed. 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. A status bar at the bottom shows 'status: ✓' and 'Data Storage Server. All rights reserved'.

Setting up Asynchronous Data Replication within a System



Data Server
Raid Array System 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, showing a list of backup pools on the left and a configuration page for a 'Data replication task: Replication_D01' on the right. The configuration page includes a table of attributes and values, and a section for creating a schedule.

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 titled 'Create schedule for data replication task' with the following fields:

- Comment:
- Select time: Interval
- Interval: 10 min. time period

An 'apply' button is located at the bottom right of the configuration page. The status bar at the bottom of the console shows 'status: ✓' and '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



Data Server
Raid Array System 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.

The screenshot shows the DSS (Data Storage Server) web interface. The top 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' sub-tab is selected. On the left sidebar, there are sections for 'Backup pools', 'Backup devices', 'Backup tasks', 'Data replication', and 'Replication_D01'. The 'Data replication' section is expanded, showing a task named 'Replication_D01'. The main content area displays a 'Data replication task: Replication_D01' and a 'Create schedule for data replication task' form. The form has fields for 'Comment:', 'Select time:' (with a dropdown menu set to 'Interval'), and 'Interval:' (with a dropdown menu set to '10 min. time period'). There is an 'apply' button below the form. Below the form, there is a 'Schedule for data replication task' section with an information icon and the text 'No schedules found.' At the bottom, there is a 'Remove data replication task' section with a 'remove' button. The status bar at the bottom indicates 'status: ✓' and 'Data Storage Server. All rights reserved'.

Setting up Asynchronous Data Replication within a System



Data Server
Raid Array System 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 web interface with the 'MAINTENANCE' tab selected. Under the 'backup' sub-tab, the 'Data replication tasks' section is expanded. A table lists the replication task 'Replication_D01' with its start time and various configuration options. A status indicator at the bottom shows a green checkmark.

Name	Start time	Action
Replication_D01	2008-09-26 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

status:

Setting up Asynchronous Data Replication within a System



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 open-e DSS web interface. The 'STATUS' tab is selected, and the 'tasks' menu item is highlighted. The 'Tasks: Data Replication' section shows a table of running tasks and a table of task logs. The task log shows a completed replication task for 'Replication_D01' on 2008-09-26 at 23:15:16 with a status of 'OK' and 'Finished'.

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

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!