



ENTERPRISE LEVEL STORAGE OS
for EVERY BUSINESS

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

DSS V6
DATA STORAGE SOFTWARE

16 TB



Easy to use, GUI based management provides performance and security.



Reliable disk based backup and recovery, along with Snapshot capability enable fast and reliable backup and restore.



Easy to implement remote Replication, at block or volume level, enables cost-effective disaster recovery.



IP based storage management combines NAS and iSCSI functionality for centralized storage and storage consolidation.

Software Version: DSS ver. 6.00 up85

Presentation updated: September 2011

www.open-e.com

Asynchronous Data (File) Replication over a WAN

	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 (File) Replication over a WAN		✓			✓	✓		✓			

- ASYNCHRONOUS Data (File) Replication over a WAN** enables **asynchronous** file and folder copy from one storage system to another over the Wide Area Network:
 - With Asynchronous Replication, a point-in-time or snapshot copy of data on the source is made and copied to the target storage system.
 - For maximum flexibility, you can run a Data (File) 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 BETWEEN TWO SYSTEMS OVER A WAN

■ Recommended Resources

- Key Hardware (two system)
 - ✓ x86 compatible
 - ✓ RAID Controller
 - ✓ HDD's
 - ✓ Network Interface Cards
- Software:
 - ✓ Open-E DSS V6, 2 units

■ Benefits

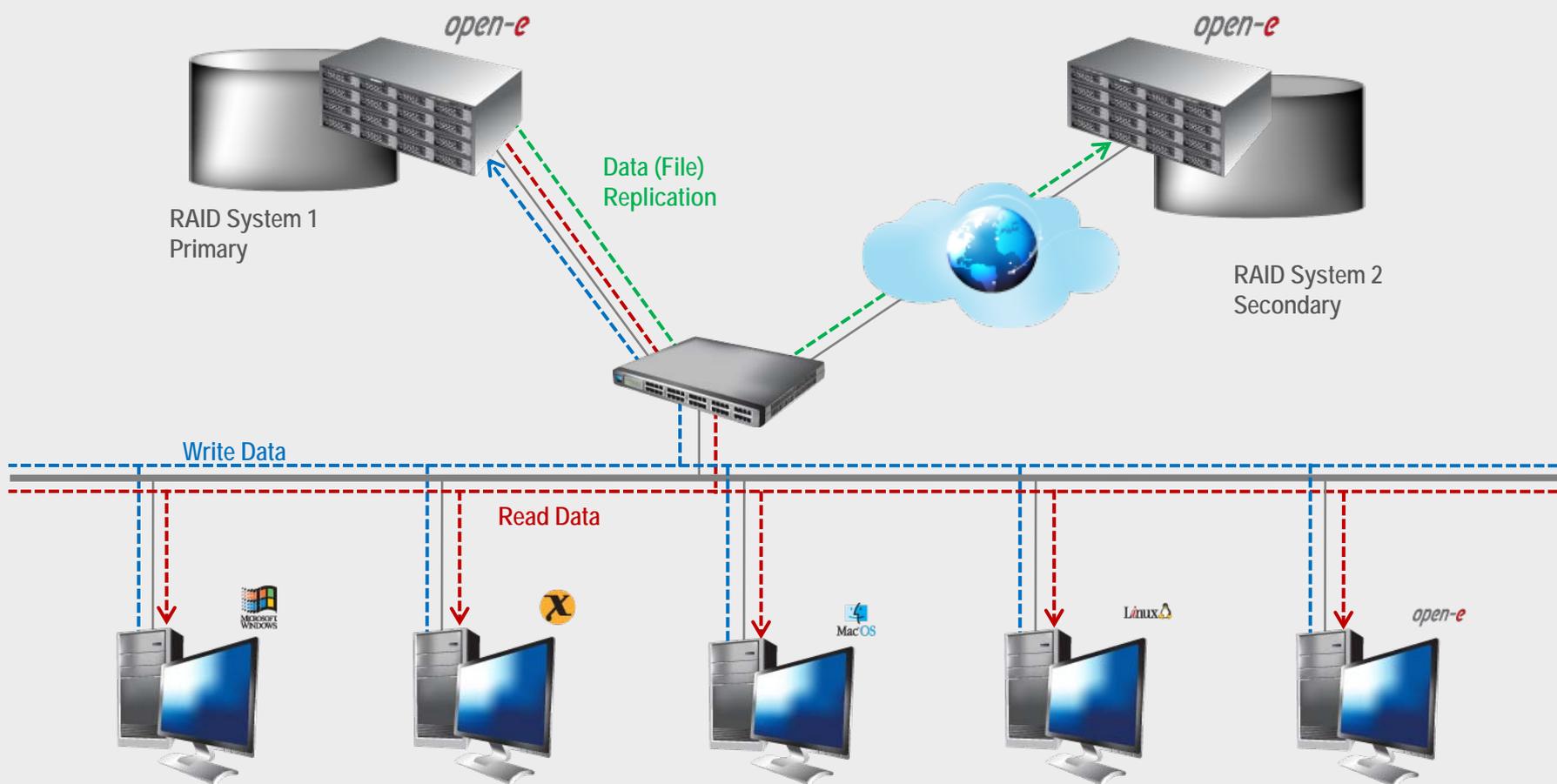
- Data redundancy
- Maximum data safety

■ Disadvantages

- High cost of WAN solution

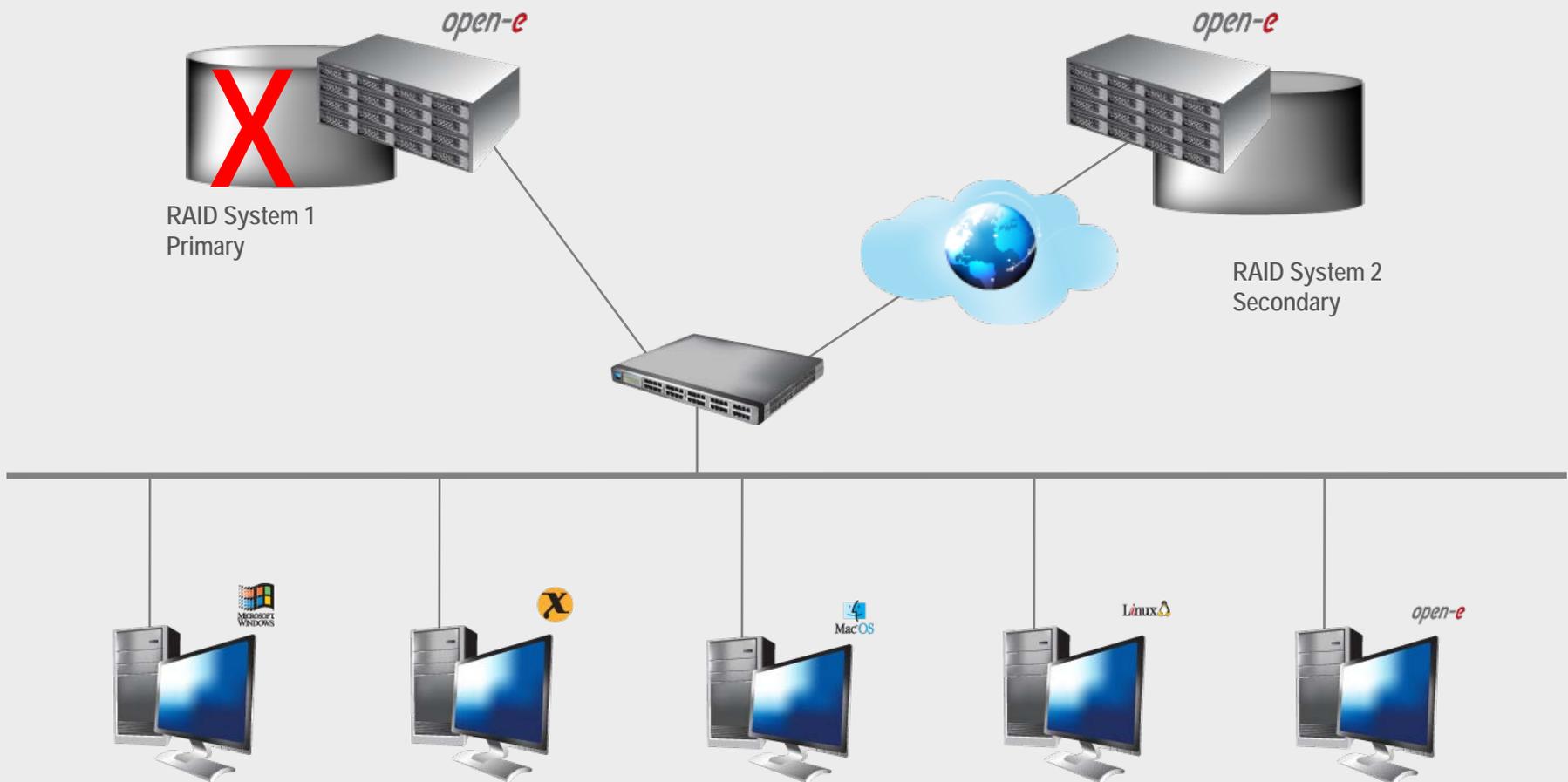
Asynchronous Data (File) Replication over a WAN

- Data is written and read in System 1
- Data is periodically replicated to System 2 via an Internet connection.



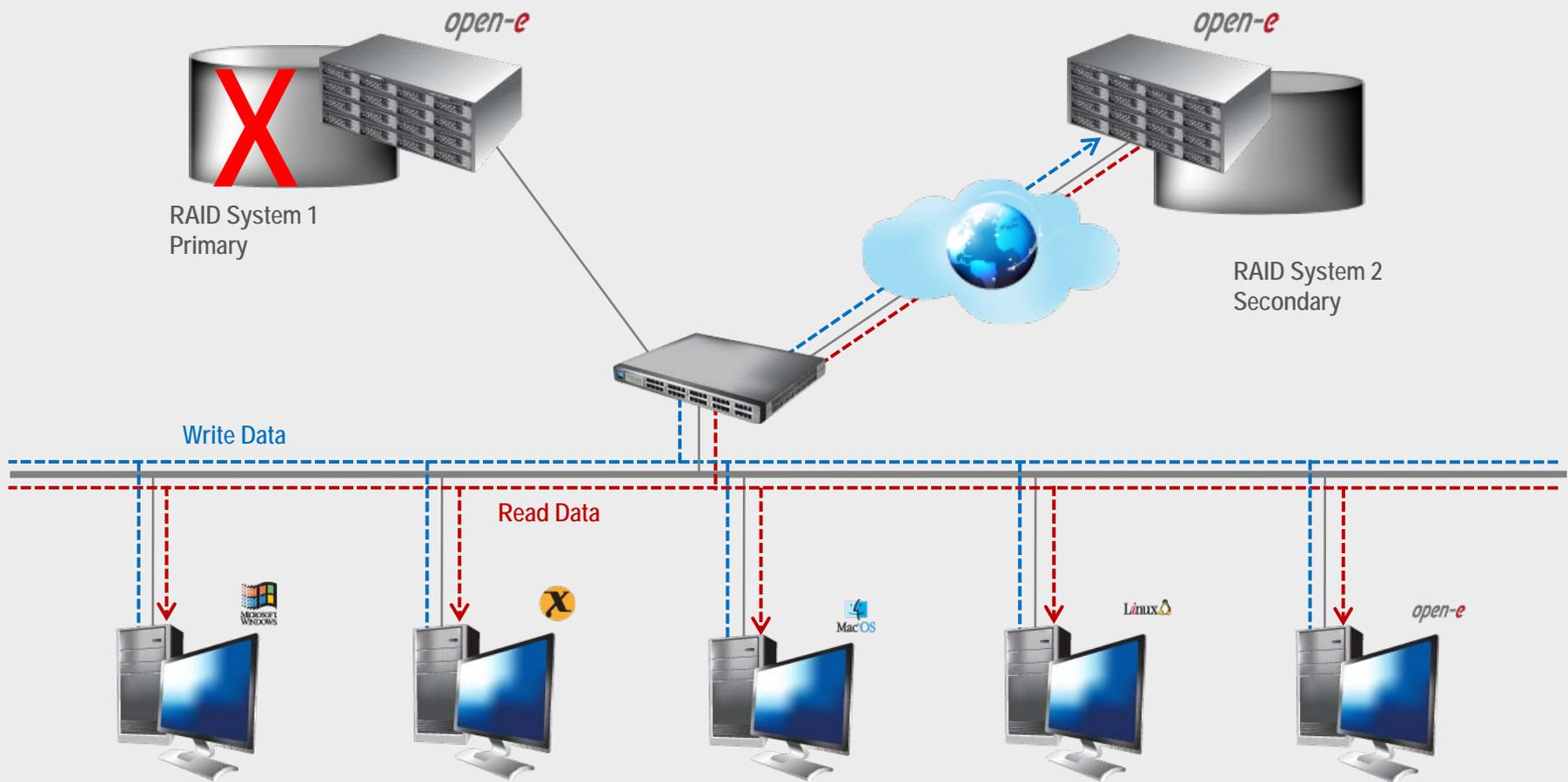
Asynchronous Data (File) Replication over a WAN

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



Asynchronous Data (File) Replication over a WAN

- After switching, replicated data is available on System 2



TO SET UP DATA (FILE) REPLICATION, PERFORM THE FOLLOWING STEPS:

1. Hardware configuration
2. Configure DSS1 and DSS2 on the WAN
3. Configure the destination node
4. Configure the source node
5. Schedule replication
6. Check the status Data (File) Replication

Asynchronous Data (File) Replication over a WAN

Hardware Requirements

To run the Data (File) Replication of Open-E DSS V6, 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 Wide Area Network. An example configuration is shown below:

1. Hardware Configuration

Data Server (DSS1)

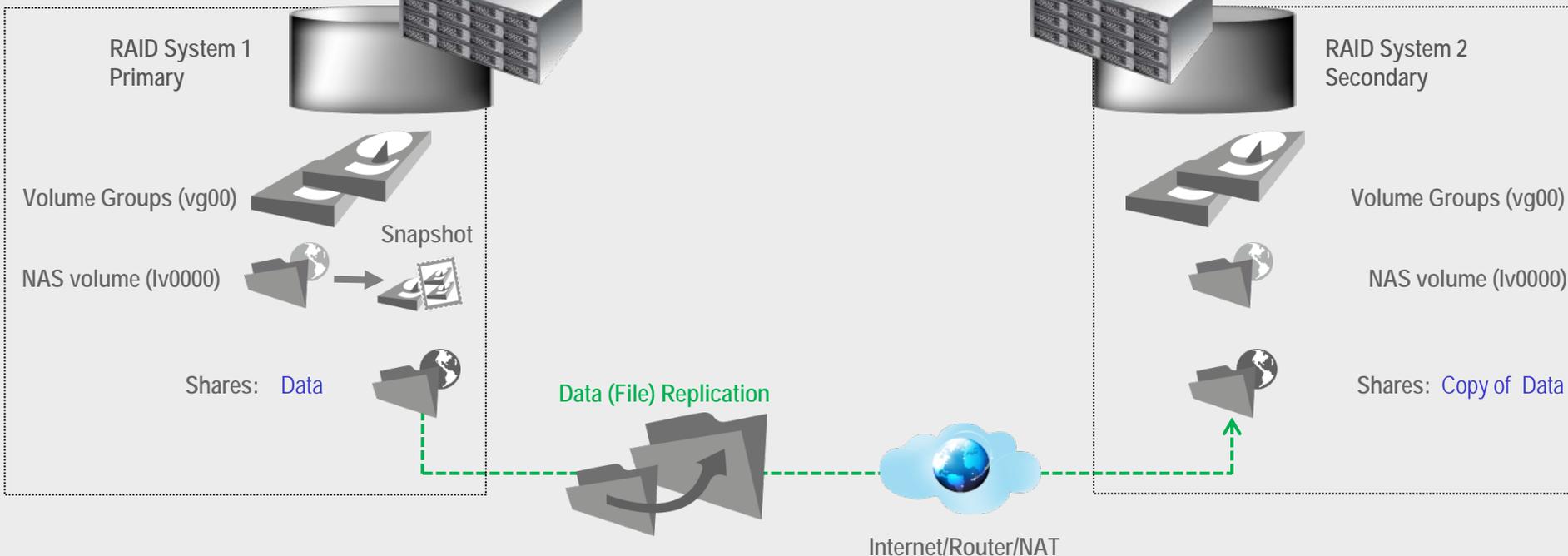
Source node

IP Address: 192.168.0.220

Data Server (DSS2)

Destination node

IP Address: 83.238.22.4



Setting up Asynchronous Data (File) Replication over a WAN *open-e*

2. Configure DSS1 and DSS2 on the WAN

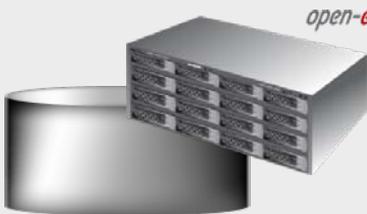
BELOW YOU CAN FIND OF SETTING THE DSS1 AND DSS2 ON THE WAN:

- DSS 1 - machine behind the NAT with local IP address,
- Forwarding port 873 to local Ip from DSS 1 in your router (eg. below screenshot)

Port Range					
Application	Start	End	Protocol	IP Address	Enable
DSS	873	to 873	TCP	192.168.0.220	<input checked="" type="checkbox"/>
		to	TCP	192.168.0.	<input type="checkbox"/>
		to	TCP	192.168.0.	<input type="checkbox"/>
		to	TCP	192.168.0.	<input type="checkbox"/>

- DSS 2 – Data Storage System with external internet IP address router/firewall

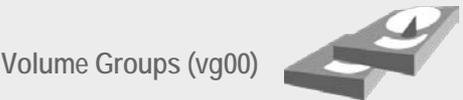
Setting up Asynchronous Data (File) Replication over a WAN *open-e*



Data Server (DSS2)
Destination node
IP Address: 83.238.22.4

3. Configure the Destination Node

Under the „CONFIGURATION“ tab, select „volume manager“ and next Vol. Groups.



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

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SETUP | CONFIGURATION | MAINTENANCE | STATUS | HELP

You are here: CONFIGURATION > volume manager > Vol. groups

Vol. groups

Unit rescan

rescan

Unit manager

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

Action: new volume group
Name: vg00

apply

Please apply changes or press "reload" button to discard

Vol. replication

Drive identifier

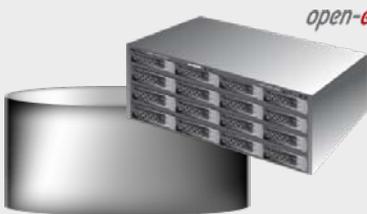
Unit	Serial number	Status
<input type="checkbox"/> Unit H1	S01JJ10Y402753	
<input type="checkbox"/> Unit H0	S01JJ50Y893447	

apply

Event Viewer: [icon]

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Setting up Asynchronous Data (File) Replication over a WAN *open-e*



Data Server (DSS2)
Destination node
IP Address: 83.238.22.4

3. Configure the Destination Node

Volume Groups (vg00)



NAS volume (lv0000)



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

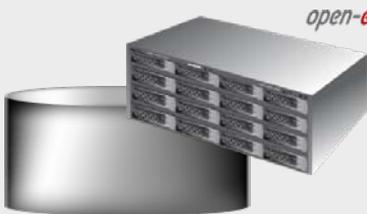
After assigning an appropriate amount of space for the NAS volume, click the **apply** button

The screenshot shows the open-e web interface with the following elements:

- Header: **open-e** | ENTERPRISE CLASS STORAGE OS for EVERY BUSINESS | **DATA STORAGE SOFTWARE V6**
- Navigation: SETUP | CONFIGURATION | MAINTENANCE | STATUS | HELP
- Breadcrumbs: You are here: CONFIGURATION > volume manager > Vol. groups > vg00
- Left Panel: "Vol. groups" tab with a list containing "vg00".
- Right Panel: "Volume manager" section with a table of system volumes.
- Table of System Volumes:

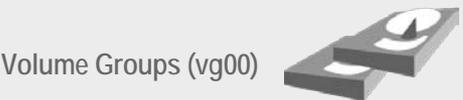
System volumes	Size (GB)
SWAP	4.00
Reserved for snapshots	0.00
Reserved for system	4.00
Reserved for replication	0.00
Free	66.56
- Action: "new NAS volume" dropdown menu.
- Options: Use volume replication, WORM.
- Slider: Range from 0 to 66.56 GB.
- Input field: "add: 40 GB".
- Buttons: "apply" (red), "Please apply changes or press 'reload' button to discard".
- Bottom Panel: "Snapshot definition" section.
- Footer: Event Viewer icon, Data Storage Software V6 - All rights reserved.

Setting up Asynchronous Data (File) Replication over a WAN *open-e*



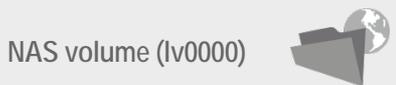
open-e Data Server (DSS2)
Destination node
IP Address: 83.238.22.4

3. Configure the Destination Node



Volume Groups (vg00)

The destination NAS Volume is now configured.



NAS volume (lv0000)

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SETUP CONFIGURATION MAINTENANCE STATUS HELP

You are here: CONFIGURATION > volume manager > Vol. groups > vg00

Vol. groups

- vg00

Vol. replication

Volume manager

Info
Logical volume lv0000 has been created successfully.

Logical Volume	Type	Snap.	Rep.	Init.	Blocksize (bytes)	Size (GB)
lv0000					N/A	40.00
System volumes						Size (GB)
SWAP						4.00
Reserved for snapshots						0.00
Reserved for system						4.00
Reserved for replication						0.00
Free						26.56

Action: new NAS volume

Use volume replication
 WORM

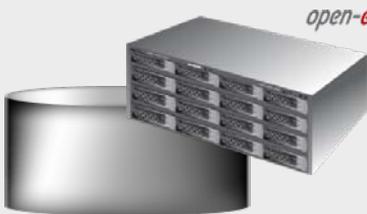
add: 0.00 GB

apply

Event Viewer: [icon]

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Setting up Asynchronous Data (File) Replication over a WAN *open-e*



Data Server (DSS2)
Destination node
IP Address: 83.238.22.4

3. Configure the Destination Node

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

In the Data (file) replication agent function check the Enable data (file) replication agent box, and click the **apply** button.

Data (File) Replication



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SETUP | CONFIGURATION | MAINTENANCE | STATUS | HELP

You are here: CONFIGURATION > NAS settings

Enable NDMP data server apply

Data (file) replication agent

Enable data (file) replication agent apply
Please apply changes or press "reload" button to discard

Antivirus setup

Info
No shares found.

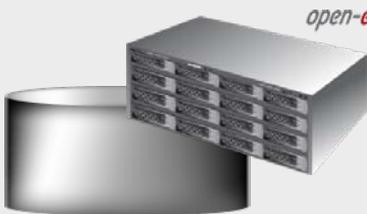
Local backup settings

Use local backup apply

Event Viewer: [icon]

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Setting up Asynchronous Data (File) Replication over a WAN *open-e*



open-e Data Server (DSS2)
Destination node
IP Address: 83.238.22.4

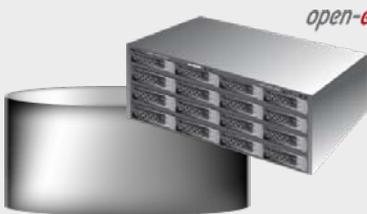
3. Configure the Destination Node

Under the „CONFIGURATION“, select „NAS settings“ and „Shares“ 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 (File) Replication over a WAN *open-e*



Data Server (DSS2)
Destination node
IP Address: 83.238.22.4

3. 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 (file) replication** within **Data (file) replication agent settings** function.
- Click on the **apply** button.

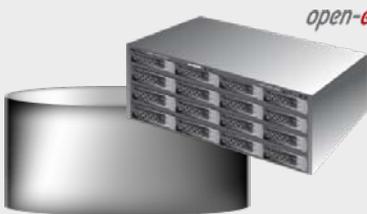
Data (File) Replication



NOTE:
It is strongly recommended protecting the replication protocol with a user name and password, along with a list of allowed IP address. This will prevent other Data (File) Replication tasks 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.

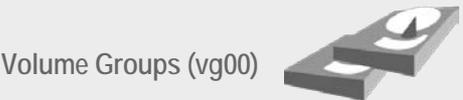
Setting up Asynchronous Data (File) Replication over a WAN *open-e*



open-e Data Server (DSS1)
Source node
IP Address: 192.168.0.220

4. Configure the Source Node

Under the „CONFIGURATION“ tab, select „volume manager“ and Vol. groups.



Add the selected physical units (Unit S001) to create a new volume group (in this case, vg00) and click **apply** button.

The screenshot shows the open-e web interface with the following elements:

- Navigation tabs: SETUP, CONFIGURATION, MAINTENANCE, STATUS, HELP
- Breadcrumb: You are here: CONFIGURATION > volume manager > Vol. groups
- Left sidebar: Vol. groups, Vol. replication
- Main content area:
 - Unit rescan** panel with a **rescan** button.
 - Unit manager** panel with a table:

Unit	Size (GB)	Serial number	Status
<input checked="" type="checkbox"/> Unit S001	465.70	N/A	available

Action: new volume group (dropdown)
Name: vg00 (input field)

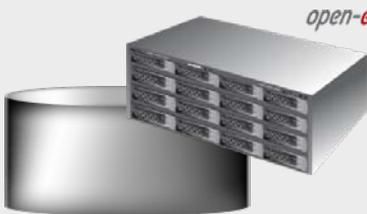
apply button

Please apply changes or press "reload" button to discard
 - Drive identifier** panel with a table:

Unit	Serial number	Status
<input type="checkbox"/> Unit S001	N/A	

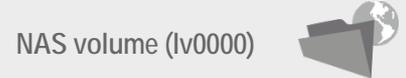
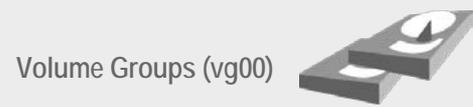
apply button

Setting up Asynchronous Data (File) Replication over a WAN *open-e*



open-e Data Server (DSS1)
Source node
IP Address: 192.168.0.220

4. 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

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SETUP CONFIGURATION MAINTENANCE STATUS HELP

You are here: CONFIGURATION > volume manager > Vol. groups > vg00

Vol. groups

- vg00

Vol. replication

Volume manager

System volumes	Size (GB)
SWAP	4.00
Reserved for snapshots	0.00
Reserved for system	4.00
Reserved for replication	0.00
Free	457.66

Action: new NAS volume

Use volume replication
 WORM

0 457.66

add: 40 GB

apply

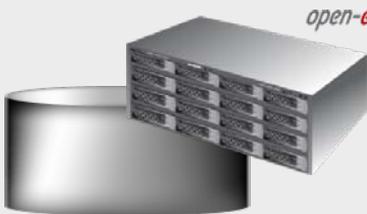
Please apply changes or press "reload" button to discard

Snapshot definition

Event Viewer: [icon]

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Setting up Asynchronous Data (File) Replication over a WAN *open-e*



Data Server (DSS1)
Source node
IP Address: 192.168.0.220

4. Configure the Source Node

Snapshot



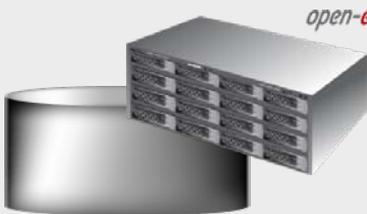
To run the replication process, you must first define a new snapshot in Volume manager function to be taken of the volume to be replicated. Snapshot size should be large enough to accommodate the changes you anticipate, 10% to 15% of the logical volume is sometimes recommend.

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

The screenshot shows the open-e Volume manager interface. At the top, it says 'open-e ENTERPRISE CLASS STORAGE OS for EVERY BUSINESS' and 'DATA STORAGE SOFTWARE V6'. The navigation tabs include SETUP, CONFIGURATION, MAINTENANCE, STATUS, and HELP. The current path is 'You are here: CONFIGURATION > volume manager > Vol. groups > vg00'. The main area is divided into 'Vol. groups' and 'Vol. replication'. The 'Vol. replication' section is active, showing a table of logical volumes and system volumes. Below the table, there are dropdown menus for 'Action:' (set to 'new snapshot') and 'Assign to volume:' (set to 'Just create snapshot volume'). A slider bar shows the available free space (417.66 GB) and the amount to be added (4 GB). An 'apply' button is at the bottom right.

Logical Volume	Type	Snap.	Rep.	Init.	Blocksize (bytes)	Size (GB)
lv0000					N/A	40.00
System volumes						Size (GB)
SWAP						4.00
Reserved for snapshots						0.00
Reserved for system						4.00
Reserved for replication						0.00
Free						417.66

Setting up Asynchronous Data (File) Replication over a WAN *open-e*



open-e Data Server (DSS1)
Source node
IP Address: 192.168.0.220

4. Configure the Source Node

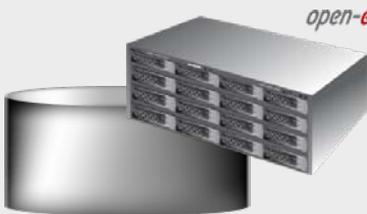


Assign the snapshot (snap00000) to the logical volume to be replicated (in this example: lv0000) and click the **apply** button.

The screenshot shows the open-e web interface. The top navigation bar includes 'open-e', 'ENTERPRISE CLASS STORAGE OS for EVERY BUSINESS', and 'DATA STORAGE SOFTWARE V6'. The main menu has 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. The breadcrumb trail reads 'You are here: CONFIGURATION > volume manager > Vol. groups > vg00'. The left sidebar shows 'Vol. groups' with 'vg00' selected, and 'Vol. replication' below it. The main content area is divided into two sections. The top section, 'Reserved for replication', shows 'Reserved for replication' at 0.00 and 'Free' at 413.66. It includes an 'Action:' dropdown set to 'new NAS volume', checkboxes for 'Use volume replication' and 'WORM', a slider, and an 'add:' input field set to '0.00' GB. A red 'apply' button is at the bottom right. The bottom section, 'Snapshot definition', contains a table with columns 'Name', 'LV', and 'Status'. The table has one row: 'snap00000', 'lv0000', and 'unused'. A red 'apply' button is at the bottom right of this section. A blue box with arrows points from the text in the bottom left to the 'lv0000' dropdown and the 'apply' button in the 'Snapshot definition' section.

Name	LV	Status
snap00000	lv0000	unused

Setting up Asynchronous Data (File) Replication over a WAN *open-e*



Data Server (DSS1)
Source node
IP Address: 192.168.0.220

4. Configure the Source Node

Under the „CONFIGURATION“ menu, select „NAS settings“

Data (File)
Replication



Check the Enable Data (File) Replication Agent box, and click the **apply** button.

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SETUP | CONFIGURATION | MAINTENANCE | STATUS | HELP

You are here: CONFIGURATION > NAS settings

apply

Data (file) replication agent

Enable data (file) replication agent

apply

Please apply changes or press "reload" button to discard

Antivirus setup

Use antivirus

apply

Local backup settings

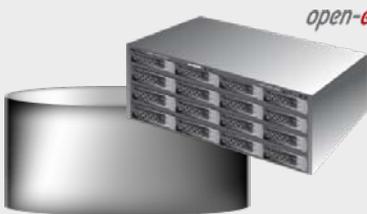
Use local backup

apply

Event Viewer: [icon]

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Setting up Asynchronous Data (File) Replication over a WAN *open-e*



open-e Data Server (DSS1)
Source node
IP Address: 192.168.0.220

4. Configure the Source Node

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

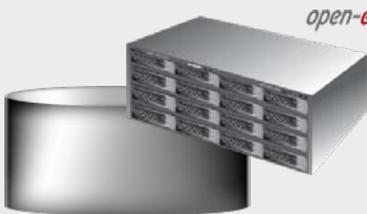
To create a share, enter the share name in field Name. In this example a new share named **Data** has been created

The screenshot shows the open-e web management interface. At the top, there's a navigation bar with tabs for SETUP, CONFIGURATION, MAINTENANCE, STATUS, and HELP. The current page is 'Shares' under 'NAS resources'. A 'Create new share' dialog is open, with the following fields: Name (Data), Comment (empty), Default path (/lv0000/Data), and Specified path (/). An 'apply' button is at the bottom right of the dialog. Below the dialog is an 'ACL (Access control list)' section with a 'Browser' tab and a list of users, including '1. users'. The footer of the interface reads 'Data Storage Software V6 - All rights reserved'.

Shares: Data



Setting up Asynchronous Data (File) Replication over a WAN *open-e*



Data Server (DSS1)
Source node
IP Address: 192.168.0.220

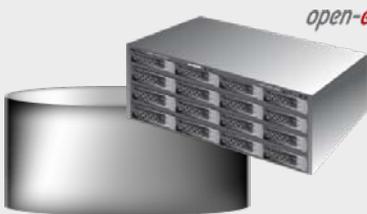
4. Configure the Source Node

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

Data (File)
Replication



Setting up Asynchronous Data (File) Replication over a WAN *open-e*



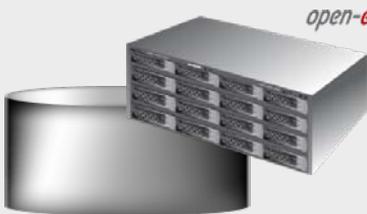
Data Server (DSS1)
Source node
IP Address: 192.168.0.220

4. Configure the Source Node

Select the source share to be replicated. Under **Create new data (file) 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, 83.238.22.4) 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 is appear. Click on the **apply** button.

Setting up Asynchronous Data (File) Replication over a WAN *open-e*



Data Server (DSS1)
Source node
IP Address: 192.168.0.220

4. Configure the Source Node

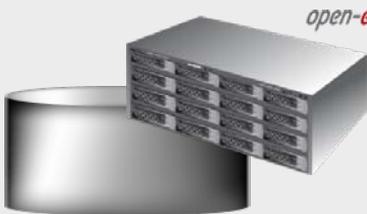
After the DSS WEB console, has been reloaded, the new task should appear (ReplicationTask). Obtain additional information about a selected replication task by accessing the Data (file) replication task function.

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

The screenshot shows the open-e web console interface. At the top, there is a navigation bar with tabs for SETUP, CONFIGURATION, MAINTENANCE, STATUS, and HELP. The current page is titled "Data (file) replication task" and shows a table of attributes and values for the task. Below the table, there is a section for "Create schedule for data (file) replication task" with input fields for Comment, Select time, and Interval, and an "apply" button. At the bottom, there is a "Schedule for data (file) replication task" section with an "Info" message stating "No schedules found." The left sidebar contains navigation options for Backup pools, Backup devices, Backup tasks, and Data (file) rep. The "ReplicationTask" option is selected.

Attribute	Value
Destination IP:	83.238.22.4
Source share:	Data
Snapshot:	snap00000
Destination share:	Copy of Data
Log replication errors:	Yes
Use ACL:	Yes
Don't delete files:	No

Setting up Asynchronous Data (File) Replication over a WAN *open-e*



open-e Data Server (DSS1)
Source node
IP Address: 192.168.0.220

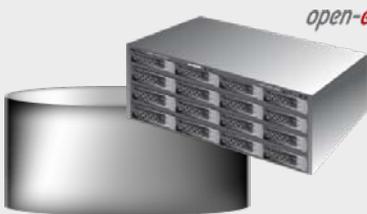
5. Configure Schedule replication

Using the Create schedule for data (file) replication task function, set the desired replication schedules or explicitly start, stop and delete Data (File) Replication tasks, as desired.

The screenshot shows the open-e web interface with the following elements:

- Header: *open-e* | ENTERPRISE CLASS STORAGE OS for EVERY BUSINESS | DATA STORAGE SOFTWARE V6
- Navigation: SETUP | CONFIGURATION | MAINTENANCE | STATUS | HELP
- Breadcrumbs: You are here: MAINTENANCE > backup > Data (file) replication > ReplicationTask
- Left sidebar: Backup pools, Backup devices, Backup tasks, Data (file) rep., ReplicationTask
- Main content area:
 - Use ACL: Yes
 - Don't delete files: No
 - Create schedule for data (file) replication task** (active)
 - Comment: EveryHour
 - Select time: Interval
 - Interval: 1h time period
 - apply button
 - Please apply changes or press "reload" button to discard
 - Schedule for data (file) replication task
 - Info: No schedules found.
 - Remove data (file) replication task
 - remove button
- Footer: Event Viewer: [icon] | Data Storage Software V6 - All rights reserved

Setting up Asynchronous Data (File) Replication over a WAN *open-e*



open-e Data Server (DSS1)
Source node
IP Address: 192.168.0.220

6. Check the status Data (File) Replication

In Data (file) replication tasks function set the desired Data (File) Replication to start, stop and delete tasks. Click on the button with task name (in this case **ReplicationTask**) to display detailed information on the current replication task (the replication task running at 8 pm.

open-e | ENTERPRISE CLASS STORAGE OS for EVERY BUSINESS | DATA STORAGE SOFTWARE V6

SETUP | CONFIGURATION | MAINTENANCE | STATUS | HELP

You are here: MAINTENANCE > backup > Data (file) replication

Backup pools

Backup devices

Backup tasks

Data (file) rep.

ReplicationTask

Source share: <Choose share>

Snapshot: <Dropdown>

Destination IP: <Input>

Destination share: <Dropdown>

Destination agent login: <Input>

Destination agent password: <Input>

Log replication errors

Use ACL

Don't delete files

apply

Data (file) replication tasks

Name	Start time	Action
ReplicationTask	2011-08-31 20:00:05	

Destination IP: 83.238.22.4

Source share: Data

Snapshot: snap00000

Destination share: Copy of Data

Destination agent login:

Log replication errors: yes

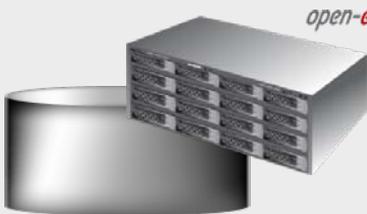
Use ACL: yes

Don't delete files: no

Event Viewer:

Data Storage Software V6 - All rights reserved

Setting up Asynchronous Data (File) Replication over a WAN *open-e*



Data Server (DSS1)
Source node
IP Address: 192.168.0.220

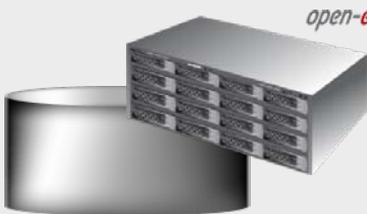
6. Check the status Data (File) Replication

To obtain detailed information about the progress of Data (File) Replication tasks, under the „STATUS“ menu, select „tasks“. Next click Data (File) Replication tasks and select the Tasks.

The screenshot shows the open-e web interface. At the top, there's a navigation bar with 'open-e' logo and 'ENTERPRISE CLASS STORAGE OS for EVERY BUSINESS'. Below it, a red bar says 'DATA STORAGE SOFTWARE V6'. The main navigation menu includes 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. The 'STATUS' menu is expanded to show 'tasks' > 'Data Replication'. The 'Tasks' sidebar on the left lists: Backup, Restore from backup, Data (File) Replication (selected), Antivirus, Volume Replication, and Snapshots. The main content area has three sections: 'Running tasks' (Info: No running tasks!), 'Tasks log' (table below), and 'Event Viewer' at the bottom.

Time	Name	Type	tatus	Action
2011-08-31 20:16:46	ReplicationTask	Data (file) replication	OK	Finished
Files overall:		11		
Files transferred:		5		
Preparing time:		0.01 sec		
Sent:		62.51 MB		
Transfer:		0.06 MB/s		
2011-08-31 20:00:28	ReplicationTask	Data (file) replication	OK	Started

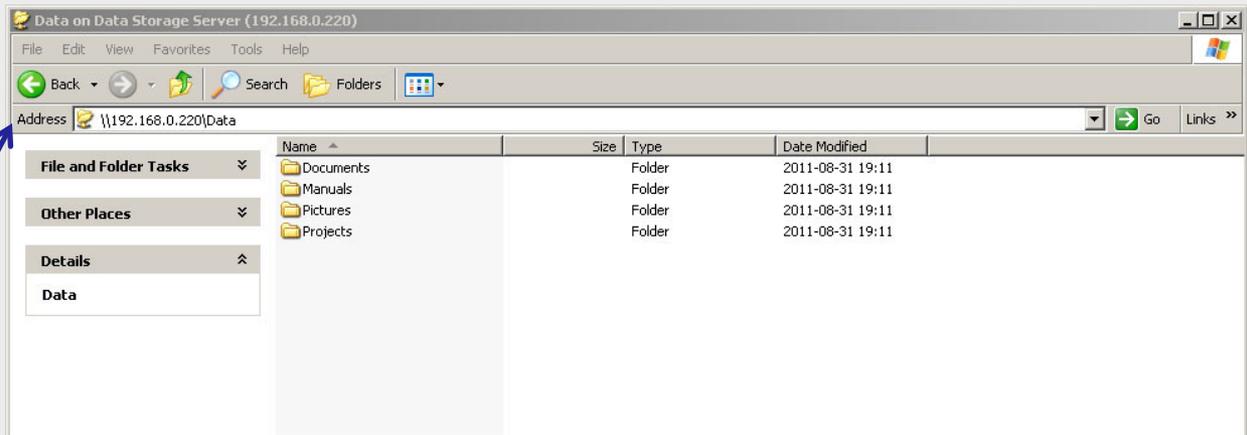
Setting up Asynchronous Data (File) Replication over a WAN *open-e*



Data Server (DSS1 and DSS2)
Source and Destination node
IP Address: 192.168.0.220 and 83.238.22.4

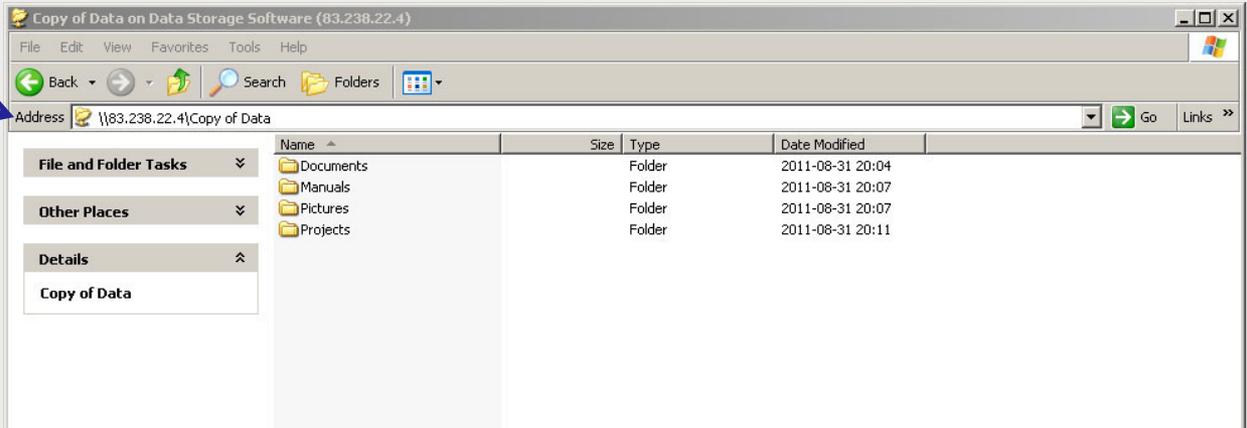
6. Check the status Data (File) Replication

Share: Data



After the end of the Data (File) Replication task all data from the „Data“ share are available on the “Copy of data” share.

Share: Copy of Data



The configuration of the source and destination nodes for asynchronous Data (File) Replication is now complete.

Thank you!