

Step-by-Step Guide to Open-E DSS V7 Synchronous Volume Replication over a LAN

Software Version: DSS ver. 7.00 up11

Presentation updated: July 2013

TO SET UP VOLUME REPLICATION, PERFORM THE FOLLOWING STEPS:

1. Configure hardware
2. Network configuration
3. Configure the destination node
4. Configure the source node
5. Configure the replication task
6. Check the status of volume replication

Setting up Volume Replication over a LAN

1. Configure hardware

Hardware Requirements

To run the Volume Replication of Open-E DSS V7, a minimum of two systems are required. Both servers are working in the Local Area Network. An example configuration is shown below:

Data Server (DSS1)

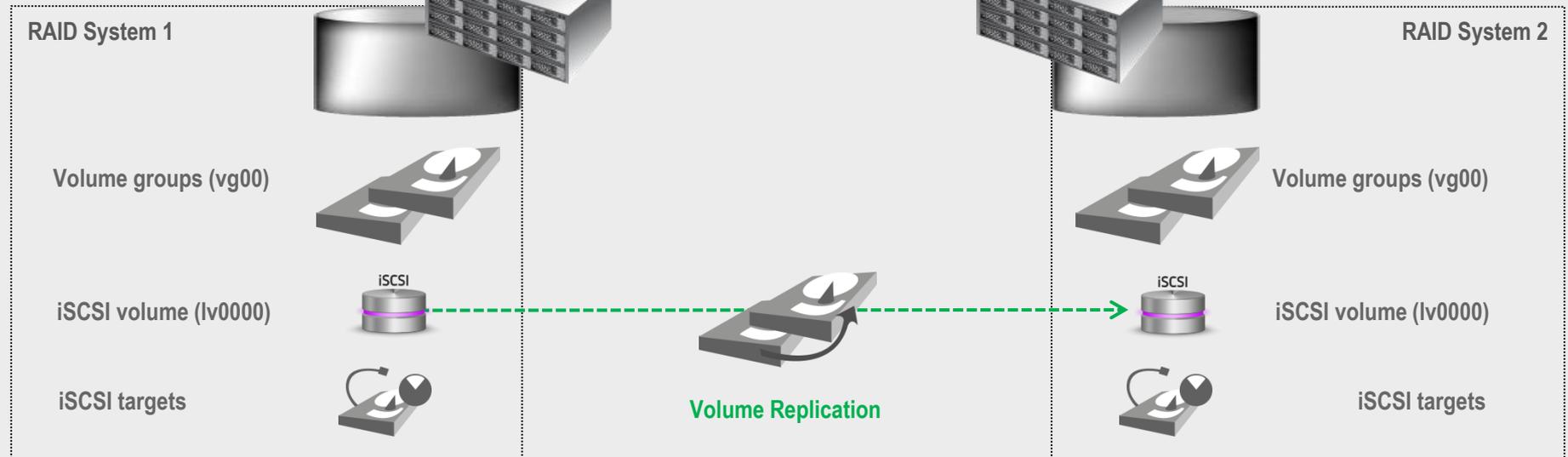
node-a

IP Address: 192.168.0.220

Data Server (DSS2)

node-b

IP Address: 192.168.0.221



Setting up Volume Replication over a LAN



Data Server (DSS1)
node-a
IP Address: 192.168.0.220

2. Network configuration

After logging in to node-a, please go to "SETUP" and choose the "Network interfaces" option. In the Hostname box, replace "dss" prefix with "node-a" and click **apply** (this will require a reboot).

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

- Navigation:** SETUP, CONFIGURATION, MAINTENANCE, STATUS, HELP
- Current Page:** You are here: Setup > Network interfaces
- Interfaces:** A list of network interfaces: eth0, eth1, eth2, eth3.
- Server Name:** Server name: dss1; Comment: Data Storage Software; apply button.
- Hostname:** Hostname: node-a-44602; apply button. A blue arrow points from the text box to this field.
- DNS settings:** DNS: 194.204.152.34;194.204.159.1; apply button.

NOTE:
This step is optional but recommended in multi-node configuration.

Setting up Volume Replication over a LAN

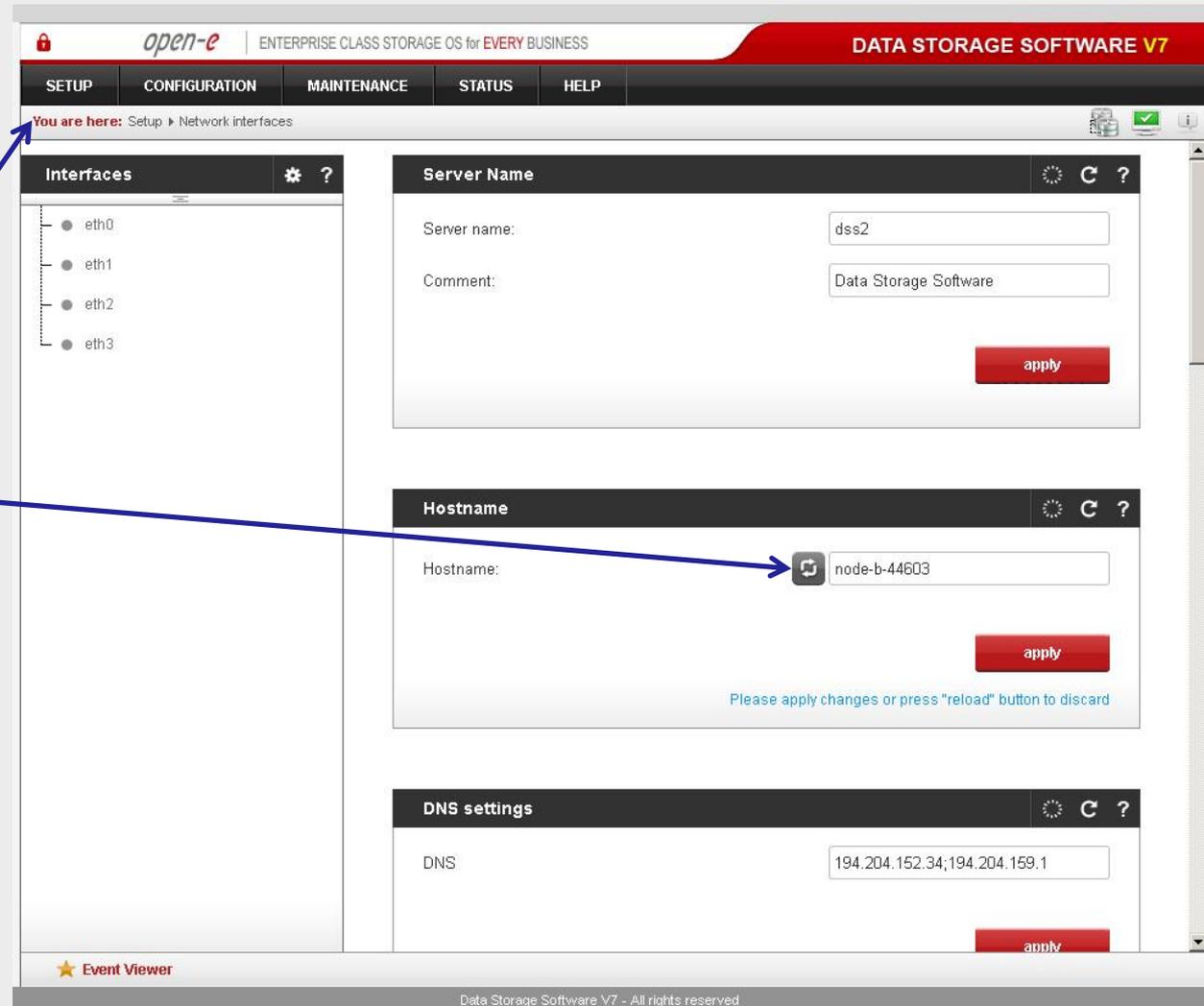
open-e



open-e Data Server (DSS2)
node-b
IP Address:192.168.0.221

2. Network configuration

Like in node-a, after logging to node-b please go to "SETUP" and choose the "Network interfaces" option.
In the **Hostname** box, replace "dss" prefix with "node-b" and click **apply** (this will require a reboot).



The screenshot shows the open-e web interface for "Data Storage Software V7". The navigation menu includes SETUP, CONFIGURATION, MAINTENANCE, STATUS, and HELP. The current page is "Network interfaces" under the "SETUP" section. The "Interfaces" list shows eth0, eth1, eth2, and eth3. The "Server Name" section has "Server name:" set to "dss2" and "Comment:" set to "Data Storage Software". The "Hostname" section has "Hostname:" set to "node-b-44603". The "DNS settings" section has "DNS" set to "194.204.152.34;194.204.159.1". Each section has an "apply" button. A blue arrow points from the text box to the "Server Name" section, and another blue arrow points from the text box to the "Hostname" section.

Setting up Volume Replication over a LAN

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open-e Data Server (DSS2)
node-b
IP Address:192.168.0.221

3. Configure the destination node

In the "CONFIGURATION" menu, select "Volume manager" and "Volume groups".



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

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

- Unit rescan:** A panel with a "rescan" button.
- Unit manager:** A table with columns: Unit, Size (GB), Serial number, Status. The table contains one row: Unit MD0, 298.10, N/A, available. Below the table is an "Action:" dropdown menu set to "new volume group" and a "Name:" input field containing "vg00". An "apply" button is at the bottom.
- Vol. groups:** A panel on the left side of the interface.
- Vol. replication:** A panel at the bottom of the left side.
- Drive identifier:** A table with columns: Unit, Serial number, Status. The table contains two rows: Unit S000, 9SY0QWBT, and Unit S001, 9RA6VDG3.

At the bottom of the interface, there is an "Event Viewer" icon and the text "Data Storage Software V7 - All rights reserved".

Setting up Volume Replication over a LAN

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Data Server (DSS2)

node-b

IP Address:192.168.0.221

3. Configure the destination node

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

iSCSI volume (lv0000)



Check the box to **Use volume replication**.

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

The screenshot shows the open-e web interface for configuring a new iSCSI volume. The breadcrumb trail is: Configuration > Volume manager > Volume groups > vg00. The 'Vol. groups' panel on the left shows 'vg00' selected. The 'Volume manager' panel on the right shows the following details:

System volumes	Size (GB)
SWAP	4.00
Reserved for snapshots	0.00
Reserved for system	4.00
Reserved for replication	0.00
Free	290.06

The configuration options are:

- Action: new iSCSI volume
- Options: Just create volume
- Use volume replication
- File I/O
 - Initialize
 - Rate: medium
- Block I/O

The 'add:' field is set to 20 GB, with a note '(+0.12 GB for replication)'. The 'apply' button is visible at the bottom right.

Setting up Volume Replication over a LAN



Data Server (DSS2)
node-b
IP Address:192.168.0.221

3. Configure the destination node

The destination iSCSI Volume Block I/O is now configured.



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 V7
- Navigation: SETUP | CONFIGURATION | MAINTENANCE | STATUS | HELP
- Breadcrumbs: You are here: Configuration > Volume manager > Volume groups > vg00
- Left Panel: Vol. groups (vg00), Vol. replication
- Main Panel: Volume manager
- Info: Logical volume lv0000 has been created successfully.
- Table:

Logical Volume	Type	Snap.	Rep.	Init.	Blocksize (bytes)	Size (GB)
lv0000	iSCSI		✓		N/A	20.00
System volumes						Size (GB)
SWAP						4.00
Reserved for snapshots						0.00
Reserved for system						4.00
Reserved for replication						0.13
Free						269.94

Action: new NAS volume

Use volume replication

WORM

add: 0.00 GB

apply

Setting up Volume Replication over a LAN



open-e

Data Server (DSS2)

node-b

IP Address:192.168.0.221

3. Configure the destination node

Now, select the "Volume replication mode", check the box under **Destination** and click the **apply** button.

Volume Replication



Then, under "Hosts Binding" function, enter the IP address of the Remote node (in our example, this would be 192.168.1.220), enter administrator password and click the **connect** button.

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

- Navigation:** SETUP, CONFIGURATION, MAINTENANCE, STATUS, HELP. Breadcrumbs: You are here: Configuration > Volume manager > Volume replication.
- Vol. groups:** A list containing 'vg00'.
- Volume replication mode:** A table with columns: Logical Volume, Init, Source, Destination, Clear metadata.

Logical Volume	Init	Source	Destination	Clear metadata
lv0000	done	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

 An 'apply' button is located below the table.
- Hosts Binding:** A section titled 'Define remote node' with input fields for 'Remote node IP address:' (containing '192.168.0.220') and 'Remote node GUI (administrator) password:' (containing '.....'). A 'connect' button is at the bottom.
- Create new volume replication task:** An 'Info' message stating: 'Volume replication tasks can not be created because there is no remote node connected.'

Setting up Volume Replication over a LAN

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Data Server (DSS2)

node-b

IP Address: 192.168.0.221

3. Configure the destination node

After reloading a page, "Hosts Binding" status should be "Reachable".

The screenshot shows the open-e web interface for configuring volume replication. The top navigation bar includes 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. The current page is 'Configuration > Volume manager > Volume replication'. The interface is divided into several sections:

- Vol. groups:** A list containing 'vg00'.
- Volume replication mode:** A table with columns: Logical Volume, Init, Source, Destination, and Clear metadata. The row for 'lv0000' shows 'Init' as 'done', 'Source' as unchecked, and 'Destination' as checked. An 'apply' button is at the bottom right.
- Hosts Binding:** An info box stating 'Hosts have been bound successfully.' Below it, a 'Remote node' section shows 'Host name: node-a-4...' and 'IP address: 192.168.0.220' with a 'Status: Reachable' indicator. A 'disconnect' button is at the bottom right.
- Create new volume replication task:** An info box stating 'No volumes with replication functionality found or all volumes have a task assigned already.'

An arrow from the text box on the left points to the 'Status: Reachable' text in the 'Hosts Binding' section.

Setting up Volume Replication over a LAN

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open-e Data Server (DSS2)
node-b
IP Address: 192.168.0.221

3. Configure the destination node

Choose "CONFIGURATION", "iSCSI target manager" and "Targets" from the menu.

iSCSI targets



In the Create new target function enter a name for the new target (as desired) in the Name field and click **apply** to confirm.

The screenshot shows the open-e web interface for configuring iSCSI targets. The breadcrumb trail is "Configuration > iSCSI target manager > Targets". The "Create new target" form is displayed, with the following fields and options:

- Target Default Name
- Name:
- Alias:
-

The "Discovery CHAP user access" section has the following options:

- No discovery CHAP user access authentication
- Enable discovery CHAP user access authentication
-

Setting up Volume Replication over a LAN



Data Server (DSS2)
node-b
IP Address:192.168.0.221

3. Configure the destination node

Select **target0** within the **Targets** field.

iSCSI targets



To assign a volume to the target, click the **attach** located under **Action**.

The configuration of the destination node (storage server) is now complete.

The screenshot shows the open-e web interface for configuring iSCSI targets. The breadcrumb trail is: Configuration > iSCSI target manager > Targets > iqn.2013-07:dss2.target0 (target0). The 'Targets' section shows a list with 'target0' selected. The 'Target volume manager' section contains two informational messages and a table of logical volumes. The table 'Available logical volumes' has the following data:

Volume	Type	SCSI ID	LUN	Access mode	Action
lv0000	iSCSI	OmX2Bwq13mLgUrUi	0	write-through	attach

Setting up Volume Replication over a LAN

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Data Server (DSS1)

node-a

IP Address:192.168.0.220

4. Configure the source node

In the "CONFIGURATION" menu, select "Volume manager" and "Volume groups".

Volume groups (vg00)



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 components:

- Header: open-e | ENTERPRISE CLASS STORAGE OS for EVERY BUSINESS | DATA STORAGE SOFTWARE V7
- Navigation: SETUP | CONFIGURATION | MAINTENANCE | STATUS | HELP
- Breadcrumbs: You are here: Configuration > Volume manager > Volume groups
- Left Panel: Vol. groups, Vol. replication
- Unit rescan: rescan button
- Unit manager table:

Unit	Size (GB)	Serial number	Status
<input checked="" type="checkbox"/> Unit S001	1862.95	N/A	available
- Form: Action: new volume group, Name: vg00, apply button
- Drive identifier table:

Unit	Serial number	Status
<input type="checkbox"/> Unit S001	N/A	
- Footer: Event Viewer, Data Storage Software V7 - All rights reserved

Setting up Volume Replication over a LAN



Data Server (DSS1)
node-a
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 iSCSI volume** of the required size. This logical volume will be the source of the replication process.



Check the box to **Use volume replication**. After assigning an appropriate amount of space for the iSCSI volume, click the **apply** button.

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SETUP | CONFIGURATION | MAINTENANCE | STATUS | HELP

You are here: Configuration > Volume manager > Volume groups > vg00

Vol. groups

- vg00

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	1854.91

Action: new iSCSI volume

Options: Just create volume

Use volume replication

File I/O

Initialize

Rate: medium

Block I/O

add: 20 GB (+0.12 GB for replication)

apply

Please apply changes or press "reload" button to discard

Event Viewer

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NOTE:

The source and destination volumes must be of identical size. Remember to enable Volume Replication.

Setting up Volume Replication over a LAN



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

4. Configure the source node



iSCSI volume (lv0000)

The source iSCSI Volume Block I/O is now configured.

The screenshot shows the open-e Volume manager interface. The top navigation bar includes 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. The breadcrumb trail indicates the current location: 'Configuration > Volume manager > Volume groups > vg00'. The 'Vol. groups' panel on the left shows a tree view with 'vg00' selected. The main 'Volume manager' panel displays a success message: 'Logical volume lv0000 has been created successfully.' Below this is a table of logical volumes:

Logical Volume	Type	Snap.	Rep.	Init.	Blocksize (bytes)	Size (GB)
lv0000	iSCSI		✓		N/A	20.00

Below the table, the 'System volumes' section shows details for 'SWAP' (4.00 GB) and various reserved space amounts (Reserved for snapshots: 0.00, Reserved for system: 4.00, Reserved for replication: 0.13, Free: 1834.78). At the bottom, there are configuration options for the volume, including an 'Action' dropdown set to 'new NAS volume', checkboxes for 'Use volume replication' and 'WORM', and a slider for size adjustment. An 'apply' button is visible at the bottom right.

Setting up Volume Replication over a LAN

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Data Server (DSS1)
node-a
IP Address: 192.168.0.220

4. Configure the source node

In the "CONFIGURATION" menu, select "iSCSI target manager" and "Targets".

iSCSI targets



In the **Create new target** function enter a name for the new target (as desired) in the Name field and click **apply** to confirm.

Setting up Volume Replication over a LAN



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

4. Configure the source node

Select target0 within the Targets field.

iSCSI targets



To assign a volume to the target, click the **attach** button located under **Action**.

The screenshot shows the open-e web interface for configuring an iSCSI target. The breadcrumb trail is: Configuration > iSCSI target manager > Targets > iqn.2013-07:dss1.target0 (target0). The interface is divided into several sections:

- Targets:** A list containing 'target0'.
- CHAP users:** A section for configuring CHAP users, currently empty.
- Target volume manager:** Contains an info box, a table of logical volumes attached to the target (currently empty), and a table of available logical volumes. The available volumes table has the following data:

Volume	Type	SCSI ID	LUN	Access mode	Action
lv0000	iSCSI	j01zYguiEoLDJGyg	0	write-through	attach
- CHAP user access authentication:** Radio buttons for 'No CHAP user access authentication' (selected) and 'Enable CHAP user access authentication'.

At the bottom of the interface, there is an 'Event Viewer' section and a footer that reads 'Data Storage Software V7 - All rights reserved'.

Setting up Volume Replication over a LAN



Data Server (DSS1)
node-a
IP Address: 192.168.0.220

4. Configure the source node

Now, select the "Volume replication". In the "Volume replication mode" function, set logical volume as source and click **apply**. "Hosts Binding" status should be "Reachable".

The screenshot shows the open-e web interface for configuring volume replication. The breadcrumb trail is: Configuration > Volume manager > Volume replication. The interface is divided into several panels:

- Vol. groups:** Shows a single group named 'vg00'.
- Volume replication mode:** A table with columns: Logical Volume, Init, Source, Destination, and Clear metadata. The row for 'lv0000' shows 'Init' as 'done', 'Source' as checked, and 'Destination' as unchecked. An 'apply' button is at the bottom right.
- Hosts Binding:** Shows a 'Remote node' with 'Host name: node-b-4...' and 'IP address: 192.168.0.221'. The 'Status' is 'Reachable'. A 'disconnect' button is at the bottom right.
- Vol. replication:** An empty panel for listing replication tasks.
- Create new volume replication task:** A form with fields for 'Task name', 'Source volume' (set to 'lv0000'), and 'Destination volume' (set to 'lv0000').

Blue arrows from the text box point to the 'Source' checkbox in the 'Volume replication mode' table and the 'Status: Reachable' text in the 'Hosts Binding' panel.

Volume Replication



Setting up Volume Replication over a LAN



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

5. Configure replication task

In the **Create new volume replication task**, enter the task name in the **Task name** field, then click on the  button.
In the **Destination volume** field, select the appropriate volume (in this example, lv0000).

In the **Bandwidth for SyncSource (MB)** field you must change the value. In the example, 35MB is used. Next, click the **create** button.

NOTE:
The "Bandwidth for SyncSource (MB)" needs to be calculated based on available Ethernet Network throughput and number of replication tasks and the limitation factor (about 0.7).

For example: 1 Gbit Ethernet and 2 replication tasks (assuming 1 Gbit provides about 100 MB/sec sustained network throughput)

- Bandwidth for SyncSource (MB): = $0.7 * 100 / 2 = 35$

For example: 10 Gbit Ethernet and 10 replication tasks (assuming 10 Gbit provides about 700 MB/sec sustained network throughput)

- Bandwidth for SyncSource (MB): = $0.7 * 700 / 10 = 49$

Setting up Volume Replication over a LAN



Data Server (DSS1)
node-a
IP Address: 192.168.0.220

5. Configure replication task

After the DSS V7 Web console has been reloaded, you can start, stop or delete the task within the **Replication task manager** function.

The screenshot shows the open-e web console interface. The top navigation bar includes 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. The breadcrumb trail indicates the current location: 'You are here: Configuration > Volume manager > Volume replication'. The main content area is divided into several sections:

- Vol. groups:** A list containing 'vg00'.
- Vol. replication:** A list containing 'Mirror_task'.
- Hosts Binding:** A section showing a 'Remote node' with 'Host name: node-b-4...' and 'IP address: 192.168.0.221'. The status is 'Reachable' and there is a 'disconnect' button.
- Create new volume replication task:** An information box stating 'No volumes with replication functionality found or all volumes have a task assigned already.'
- Replication tasks manager:** A table with columns 'Name', 'Start time', and 'Action'. It contains one entry: 'Mirror_task' with a start time of 'n/a' and action buttons for play, stop, and delete.

The footer of the console includes 'Event Viewer' and 'Data Storage Software V7 - All rights reserved'.

Setting up Volume Replication over a LAN



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

5. Configure replication task

Also, you can start, stop or delete the task within the **Replication Task Manager** function by clicking on the name. (in this case, **Mirror_task**)

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

- Navigation:** SETUP, CONFIGURATION, MAINTENANCE, STATUS, HELP. Breadcrumbs: Configuration > Volume manager > Volume groups > Mirror_task.
- Vol. groups:** A list containing 'vg00'.
- Vol. replication:** A list containing 'Mirror_task'.
- Replication tasks manager:** A table with columns Name, Start time, and Action. It lists 'Mirror_task' with start time '2013-07-24 20:48:55'. Below the table, details are shown: Source volume: N0000, Destination volume: N0000, Destination IP: 192.168.0.221, Protocol type: Synchronous.
- Create schedule for volume replication task:** A form with a Comment field, checkboxes for days of the week (Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday), and radio buttons for frequency: Every week (selected), Every even week, and Every odd week. There are also dropdown menus for Start and Stop times.

NOTE: Once the replication process has started, the replication direction can not be changed.

Setting up Volume Replication over a LAN

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Data Server (DSS1)
node-a
IP Address: 192.168.0.220

6. Check the status of volume replication

In the "STATUS" menu, select "Tasks", then select Volume Replication.

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SETUP | CONFIGURATION | MAINTENANCE | STATUS | HELP

You are here: Status > Tasks > Volume Replication

Tasks

- Data (File) Replication
- Antivirus
- **Volume Replication**
- Snapshots

Running tasks

Name	Type	Start time
Mirror_task	Volume replication	2013-07-24 20:48:55

Tasks log

Time	Name	Type	Status	Action
2013-07-24 20:49:04	Mirror_task	Volume replication	OK	Started

★ Event Viewer

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Setting up Volume Replication over a LAN

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

6. Check the status of volume replication

You can check the status of Volume Replication anytime in **STATUS** → **"Tasks"** → **"Volume Replication"** menu.

Click on the button, located next to a task name (in this case **Mirror_task**) to display detailed information on the current replication task.

The screenshot shows the open-e web interface. The navigation bar includes 'SETUP', 'CONFIGURATION', 'MAINTENANCE', 'STATUS', and 'HELP'. The breadcrumb trail is 'You are here: Status > Tasks > Volume Replication'. The 'Tasks' menu is expanded, showing 'Data (File) Replication', 'Antivirus', 'Volume Replication' (selected), and 'Snapshots'. The 'Running tasks' table has the following data:

Name	Type	Start time
<input type="checkbox"/> Mirror_task	Volume replication	2013-07-24 20:48:55

Below the table, the following details are shown for the selected task:

- Protocol type: Synchronous
- Connection: SyncSource
- Total size to replicate: 20476 MB
- Remain to replicate: 13128 MB
- Speed (avg): 37196 kB/s (35844 kB/s)
- Time left: 0:06:01
- Source info:**
 - Logical volume: lv0000
 - Consistency: Consistent
- Destination info:**
 - Logical volume: lv0000
 - Consistency: **Inconsistent**
 - IP address: 192.168.0.221

Setting up Volume Replication over a LAN

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Data Server (DSS1)
node-a
IP Address:192.168.0.220

6. Check the status of volume replication

The replication task drop-down list provides information about the **consistency** of the data on destination node. In this case the replication process for the destination node is ended.

Volume Replication between source and destination nodes, is now complete.

The screenshot shows the open-e web interface for 'DATA STORAGE SOFTWARE V7'. The navigation menu includes SETUP, CONFIGURATION, MAINTENANCE, STATUS, and HELP. The current page is 'Volume Replication' under 'Tasks'. The 'Tasks' list on the left includes Data (File) Replication, Antivirus, Volume Replication (selected), and Snapshots. The 'Running tasks' table shows:

Name	Type	Start time
Mirror_task	Volume replication	2013-07-24 20:48:55

Details for the 'Mirror_task' task:

- Protocol type: Synchronous
- Connection: Connected
- Source info:
 - Logical volume: lv0000
 - Consistency: Consistent
- Destination info:
 - Logical volume: lv0000
 - Consistency: Consistent
 - IP address: 192.168.0.221

The 'Tasks log' table at the bottom shows:

Time	Name	Type	Status	Action
2013-07-24 20:49:04	Mirror_task	Volume replication	OK	Started

Thank you!

Follow Open-E:

