Step-by-Step Guide

Round the clock backup of everything with On- & Off-site Data Protection
The aim of this document is to demonstrate an example setup of a SAN volume backup which can be called Round the clock backup of everything.

Round the clock: Because the replication task can run every minute for 24/7/365
Backup of everything: Because it can backup virtual machines including operating systems, applications, databases and all kind of user data

On- & Off-site Data Protection creates the backup copy of the production volume with just a minute delay, and with guaranteed access to previous versions. The number and age of previous versions are defined by the user. The number and age of previous versions can be different on the source (production) and destination (backup). Users can also define more than one destination (backup).

The next slides present the technology details and the setup example starts with slide no. 18.
The On- & Off-site Data Protection feature is a strategy for Storage, Backup, Business Continuity and Archiving (optional) that allows for an instant restore of crucial company data in case of an unexpected disaster.
On- & Off-site Data Protection – How it works

Main server used for day-to-day work with automated snapshots.

Replication of snapshot deltas to the off-site server.

Server at off-site location. Independent snapshots retention-interval policy, usually covering longer period than on main server.
On- & Off-site Data Protection: Retention-interval plans

On both local and Off-site locations there are independent snapshots retention policies for:

- Making new snapshots as often as 5 minutes
- Keeping snapshots even for years without running out of space
Disaster Recovery

What are the key factors to measure the efficiency of disaster recovery?

RPO – Recovery Point Objective
Amount of time between the incident that caused data loss or corruption and the time of the last successful backup. Smaller RPO = better.

RTO – Recovery Time Objective
Amount of time required to restore the data and successfully resume the company’s operations. Smaller RTO = better.

With On- & Off-site Data Protection both RPO and RTO can be counted in minutes. These parameters are among the best in the industry!
Features & Benefits

**All-in-one storage and native backup**
Built-in Enterprise-grade Backup and Disaster Recovery.

**Backup of everything**
All running virtual machines with applications and data even databases backups are consistent.

**Solved problem of Backup Window**
Backup Window reduced to minutes, only delta of all-data is replicated every interval.

**Protection against ransomware**
Very frequent snapshots with instant access to all-data provide very quick way to roll-back to the state before a virus attack.
Instant access to / restoration of old images

Old images and data versions can be accessed / restored quickly. Via SMB every user has direct access to "Previous Versions" without administrator help.
Features & Benefits

Very light backup engine
Continuous interval-based replication works in the background with insignificant influence on production. Option to skip virtual machine snapshots in very heavy load time frames. Third party backup solutions are "very heavy" and generate high load during backup not to mention expensive.

Optional removal and rotation of backup media
Thanks to Export/Import users can safely remove the backup media (disks) and rotate with other sets, or ship to another location.

Encrypted transport
Data stream is sent via SSH. Easy to send via the Internet.
On- & Off-site Data Protection & High Availability

On- & Off-site Data Protection complements High Availability Clusters, but does not replace them!

On- & Off-Site Data Protection
- Protects data by constantly backing it up and storing copies both locally and remotely
- Allows restoring data to a previously saved point in case of hardware failure or data corruption

High Availability Cluster
- Ensures business continuity by providing uninterrupted access to data even during hardware failures
- Maximizes utilization of hardware and network resources
Data safety levels and customer cases
## Data safety level 1

### Open-E JovianDSS production server

<table>
<thead>
<tr>
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<tbody>
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<td>None</td>
</tr>
<tr>
<td>Natural disaster</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Theft</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Human error</td>
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<td>None</td>
</tr>
<tr>
<td>Downtime</td>
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Open-E JovianDSS production server
Backup on local pool

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Data safety level 3

Open-E JovianDSS production server
Backup on local pool
Backup on system in same location

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Data safety level 4

Open-E JovianDSS production server
Backup on local pool
Backup on system in same location
Backup on remote site

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<td>Downtime</td>
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</tr>
</tbody>
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Data safety level 5

High-Availability Open-E JovianDSS production server
Backup on local pool
Backup on system in same location
Backup on remote site

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<td>Downtime</td>
<td>High Availability</td>
<td>Instant</td>
</tr>
</tbody>
</table>
Data safety level 6

Local site

Existing company's IT infrastructure

... NFS, SMB, iSCSI ...

Remote site

Remote Backup Server as High Availability Cluster

Data Storage as High Availability Cluster

Local Backup Server as High Availability Cluster

Off-site Data Protection

Storage Management

SSL / TLS 256 bit

Storage monitoring

Mobile monitoring

SSL / TLS 256 bit
Round the clock backup of everything with On- & Off-site Data Protection

To set up a backup of everything with On- & Off-site Data Protection, perform the following steps:

1. Create a Zpool and iSCSI target on source and destination nodes
2. Detach the backup destination volume on the Backup node
3. Create a Replication task
4. List all created snapshots
5. Export the backup volume via a target in order to access or restore the data
6. Detach the volume network-export on the Backup node
7. Clone snapshots in order to access or restore the data

**NOTE:** This document is using iSCSI volume (zvol) only. The backup of NAS volumes (dataset) will be analogical. The only difference is that the NAS volumes are exported via a share and the SAN volumes are exported via an iSCSI target.
Round the clock backup of everything with On- & Off-site Data Protection

1. Creating a Zpool and iSCSI target on both nodes

This step-by-step assumes that a pool and a target have already been created.

**NOTE:** Please refer to JovianDSS Jump-Start in order to create a Zpool and iSCSI target.

In the **production node**, please go to the Storage menu. The **iSCSI targets** tab shows the configured zvol00 on the Production node.
2. Detaching the backup destination volume on Backup node

Next, in the Backup node go to the Storage menu, and select the iSCSI targets tab.

The backup destination volume should be not available on the network. In order to hide the volume on the network, click the Options drop-down menu and select Detach.
2. Detaching the backup destination volume on the Backup node

Next, click the Yes button to confirm the detachment.
Round the clock backup of everything with On- & Off-site Data Protection

2. Detaching the backup destination volume on the Backup node

JovianDSS: Backup node
IP Address: 192.168.0.83

Now, the zvol00 is listed in the Zvols not attached to targets section.
Go back to the Production node. In the menu **Backup & Recovery -> Tasks**, click the **Add replication task** button in order to start the **Backup task wizard**.
In the first wizard step, click the **Browse** button.

JovianDSS: Production node
IP Address: 192.168.0.82

Round the clock backup of everything with On- & Off-site Data Protection
Now, select the Pool-0/zvol00 as the source volume and click the Apply button.

JovianDSS: Production node
IP Address: 192.168.0.82

Round the clock backup of everything with On- & Off-site Data Protection
3. Backup task setting

The wizard will show the default retention-interval plan. It can be modified any time. Then, please click the Next button.
3. Backup task setting

In the Destination configuration step select the Destination server.

JovianDSS: Production node
IP Address: 192.168.0.82

Round the clock backup of everything with On- & Off-site Data Protection
Now add the new server information credentials of the Backup node. In this example the IP Address: 192.168.0.83 Default port = 40000 can be changed as well. In the Password field enter the current GUI password of the of Backup node. Next, click the Apply button.
3. Backup task setting

In the Resource path click the Browse button.

JovianDSS: Production node
IP Address: 192.168.0.82

Round the clock backup of everything with On- & Off-site Data Protection
Round the clock backup of everything with On- & Off-site Data Protection

3. Backup task setting

In the Browse window select the Pool-0-backup/zvol and click the Apply button.

JovianDSS: Production node
IP Address: 192.168.0.82
The wizard will show the default retention-interval plans. The destination default retention is much longer than on the source volume. This is why the destination volume requires more storage capacity than the source. The retention-interval plans can be modified any time.

Now click the Next button.
3. Backup task setting

In the vCenter / vSphere server integration, click the Next button in order to skip this step.

JovianDSS: Production node IP Address: 192.168.0.82

Round the clock backup of everything with On- & Off-site Data Protection
Round the clock backup of everything with On- & Off-site Data Protection

3. Backup task setting

JovianDSS: Production node
IP Address: 192.168.0.82

In the Task Properties please enter the task description, and click the Next button.
NOTE: It is possible to assign extra RAM for buffering the replication data stream with the mbuffer option.
Round the clock backup of everything with On- & Off-site Data Protection

3. Backup task setting

JovianDSS: Production node
IP Address: 192.168.0.82

Next, in the **Summary** click the **Add** button.
After completing the **Backup task wizard**, return to the **Backup & Recovery**. It shows all the details of the backup tasks. The **Task** has the **Enabled** status. The status can be either disabled or all settings can be edited, or the task can be deleted using the **Options** menu.

**JovianDSS: Production node**
IP Address: 192.168.0.82

Round the clock backup of everything with On- & Off-site Data Protection
Next, go to the **Storage** menu. In the **Snapshot** tab, the zvol00 includes A and B icons. A for Auto-snapshots and B for Backup functionality. Once the first auto-snapshot is created the + icon appears. After clicking the + icon, the GUI will list all the created snapshots.

**JovianDSS: Production node**

IP Address: 192.168.0.82

Round the clock backup of everything with On- & Off-site Data Protection
Round the clock backup of everything with On- & Off-site Data Protection

4. List all created snapshots

Next, go to the Backup node. In the Storage menu select the Snapshot tab.

Once the first auto-snapshot backup is COMPLETED the + icon appears. After clicking the + icon the GUI will list all the REPLICATED snapshots on the backup volume.
In order to access the most recent data backup, the backup volume will need to be exported via a target.

On the backup node, select the iSCSI targets tab, then click the Options drop-down menu and select the Attach to target.

JovianDSS: **Backup node**
IP Address: 192.168.0.83
In the Attach zvol00 to target, select the Target in drop-down menu and click the Add button.

JovianDSS: Backup node
IP Address: 192.168.0.83

Round the clock backup of everything with On- & Off-site Data Protection
5. Exporting of the backup volume to the target

Now the zvol00 is listed under the volume attached to the target section. The zvol00 can be connected via an iSCSI initiator on the client’s computer. The user data can be accessed and restored if required.

JovianDSS: Backup node
IP Address: 192.168.0.83
Once the data restore is completed, the volume network-export should be disabled again. In order to disable the network export of the volume, click the **Options** drop-down menu and select the **Detach** and confirm it by clicking the **Yes** button.
In order to access **not** the most recent but previous data backup, the requested snapshot will need to be cloned first.

In the **Snapshots** tab, click the **Options** drop-down menu and select the **Clone**.
Round the clock backup of everything with On- & Off-site Data Protection

7. Cloning of snapshots backup data

JovianDSS: **Backup node**
IP Address: 192.168.0.83

Enter the volume-clone name and select the **Attach to target**
7. Cloning of snapshots backup data

JovianDSS: **Backup node**
IP Address: 192.168.0.83

Select the target from the drop-down menu and click the **Add** button.
7. Cloning of snapshots backup data

A new zvol00-clone has been created and attached to the target. The **zvol00-clone** can be connected via an iSCSI initiator on the client's computer. The user data can be accessed and restored if required.
After a while the GUI will list more auto created snapshots, accordingly to the retention-interval plans defined in the replication tasks.

JovianDSS: **Production node**
IP Address: 192.168.0.82

7. Cloning of snapshots backup data
Round the clock backup of everything with On- & Off-site Data Protection

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