Step-by-Step Guide

to configure
Open-E DSS V7 Active-Passive iSCSI Failover
on Intel Server Systems R2224GZ4GC4

Software Version: DSS ver. 7.00 up05

Presentation updated: April 2013
### TECHNICAL SPECIFICATIONS OF THE INTEL SERVER SYSTEM R2224GZ4GC4 USED DURING TESTS ARE LISTED BELOW:

<table>
<thead>
<tr>
<th>Model</th>
<th>Intel Server System R2224GZ4GC4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating system</td>
<td>Open-E DSS V7</td>
</tr>
<tr>
<td>Enclosure/chassis</td>
<td>Intel R2224 2U Chassis</td>
</tr>
<tr>
<td>CPU</td>
<td>Intel Xeon E5-2643 3.30GHz</td>
</tr>
<tr>
<td>Motherboard</td>
<td>Intel Server Board S2600GZ</td>
</tr>
<tr>
<td>Memory</td>
<td>8x 4GB DDR3 1600 ECC-REG Kingston KVR16R11D8/4</td>
</tr>
<tr>
<td>Network</td>
<td>1GbE Intel I350 Quad Port Ethernet Controller (on-board)</td>
</tr>
<tr>
<td>Network</td>
<td>10GbE Intel AXX10GBNIAOM Dual Port I/O Module (i82599EB)</td>
</tr>
<tr>
<td>HW RAID</td>
<td>Intel Integrated RAID Module RMS25PB080</td>
</tr>
<tr>
<td>Hard disk drives</td>
<td>24x 900GB Western Digital WD9001BKHG-02D22V1</td>
</tr>
<tr>
<td>Hard disk drives</td>
<td>100GB Intel 710 Series SSDSA2BZ100G301</td>
</tr>
</tbody>
</table>

**NOTE:**
Presented Intel server is an example. Other Intel servers could be used for the purpose of this configuration.
TO SET UP ACTIVE-PASSIVE iSCSI FAILOVER ON INTEL SERVER SYSTEMS R2224GZ4GC4, GO THROUGH THE FOLLOWING STEPS:

1. Hardware configuration:
2. Network Configuration
   • Set server hostnames and Ethernet ports on both nodes (node-a, node-b)
3. Configure the node-b:
   • Create a Volume Group, iSCSI Volume
   • Configure Volume Replication mode (destination and source mode) – define remote mode of binding, create Volume Replication task and start the replication task
4. Configure the node-a
   • Create a Volume Group, iSCSI Volume
   • Configure Volume Replication mode (source and destination mode), create Volume Replication task and start the replication task.
5. Create targets (node-a and node-b)
6. Configure Failover (node-a and node-b)
7. Start Failover Service
8. Test Failover Function
9. Run Failback Function
Open-E DSS V7 Active-Passive iSCSI Failover

1. Hardware Configuration

Data Server (DSS1) 
node-a (Intel Server System R2224GZ4GC4)  
IP Address: 192.168.0.220

RAID System 1
- Port used for WEB GUI management  
  IP: 192.168.0.220
- Storage Client Access, Multipath 
  Auxiliary connection (Heartbeat)  
  IP: 192.168.1.220
- Storage Client Access, Multipath 
  Auxiliary connection (Heartbeat)  
  IP: 192.168.2.220
- Volume Replication, 
  Auxiliary connection (Heartbeat)  
  IP: 192.168.3.220
- Volume Groups (vg00)
- iSCSI volumes (lv0000)
- iSCSI targets

iSCSI Failover/Volume Replication (eth3)

Virtual IP Address: 192.168.20.100 (iSCSI Target)

Virtual IP Address: 192.168.21.100 (iSCSI Target)

Note:
It is strongly recommended to use direct point-to-point and if possible 10Gb connection for the volume replication. Optionally Round-Robin-Bonding with 1Gb or 10Gb ports can be configured for the volume replication. The volume replication connection can work over the switch, but the most reliable is a direct connection.

Data Server (DSS2)  
node-b (Intel Server System R2224GZ4GC4)  
IP Address: 192.168.0.221

RAID System 2
- Port used for WEB GUI management  
  IP: 192.168.0.221
- Storage Client Access, Multipath 
  Auxiliary connection (Heartbeat)  
  IP: 192.168.1.221
- Storage Client Access, Multipath, 
  Auxiliary connection (Heartbeat)  
  IP: 192.168.2.221
- Volume Replication, 
  Auxiliary connection (Heartbeat)  
  IP: 192.168.3.221
- Volume Groups (vg00)
- iSCSI volumes (lv0000)
- iSCSI targets

NOTE:
For additional layer of redundancy, you may add an extra connection between switches and ping nodes.

www.open-e.com
After logging on to the Open-E DSS V7 (node-b), please go to **SETUP** and choose the "**Network interfaces**" option.

In the **Hostname** box, replace the "dss" letters in front of the numbers with "node-b" server, in this example "node-b-59979144" and click the **apply** button (this will require a reboot).
Next, select \texttt{eth0} interface and in the IP address field, change the IP address from 192.168.0.220 to 192.168.0.221. Then click apply (this will restart network configuration).
Afterwards, select **eth1** interface and change the IP address from 192.168.1.220 to 192.168.1.221 in the field **IP address** and click the **apply** button.

Next, change the IP addresses in **eth2** and **eth3** interfaces accordingly.
After logging in to node-a, please go to SETUP and choose the "Network interfaces" option. In the Hostname box, replace the "dss" letters in front of the numbers with "node-a" server, in this example "node-a-39166501" and click apply (this will require a reboot).
2. Configure the node-b

IP Address: 192.168.0.221

Data Server (DSS2)

**node-b**

Under **CONFIGURATION**, select "Volume manager", then click on "Volume groups".

In the **Unit manager** function menu, add the selected physical units (Unit MD0 or other) to create a new volume group (in this case, vg00) and click the **apply** button.
Select the appropriate volume group (vg00) from the list on the left and create a **new iSCSI volume** of the required size. The logical volume (lv0000) will be the destination of the replication process on node-b.

Next, check the box **Use volume replication**.

After assigning an appropriate amount of space for the iSCSI volume, click the **apply** button.
2. Configure the node-b

Data Server (DSS2)

**node-b**

IP Address: 192.168.0.221

Logical iSCSI Volume Block I/O is now configured.

**iSCSI volume (lv0000)**
3. Configure the node-a

Next, go to the node-a system. Under **CONFIGURATION**, select "Volume manager" and then click on "Volume groups".

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

Select the appropriate volume group (vg00) from the list on the left and create a new iSCSI volume of the required size. The logical volume (lv0000) will be a source of the replication process on the node-a.

Next, check the box for "Use volume replication"

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

NOTE:
The source and destination volumes must be of identical size.
3. Configure the node-a

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

Logical iSCSI Volume Block I/O is now configured.

iSCSI volume (lv0000)
2. Configure the node-b

Now, on the node-b, go to "Volume replication". Within Volume replication mode function, check the Destination box for lv0000. Then, click the apply button.

In the Hosts binding function, enter the IP address of node-a (in our example, this would be 192.168.3.220), enter node-a administrator password and click the apply button. After applying all the changes, the status should be: Reachable.

NOTE:
The Mirror server IP Address must be on the same subnet in order for the replication to communicate. VPN connections can work, providing you are not using a NAT. Please follow example:

- Source: 192.168.3.220
- Destination: 192.168.3.221
3. Configure the node-a

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 case of a 10GbE connection it is recommended to set for the replication a higher Bandwidth for SyncSource (MB). To achieve better performance you can set 500MB. In the example, maximum 600MB is used. Next, click the create button.
Data Server (DSS1)  
**node-a**  
IP Address: 192.168.0.220

Now, in the *Replication task manager* function, click the corresponding "play" button to start the Replication task on the node-a.
3. Configure the node-a

In the Replication tasks manager function, information is available on currently running replication tasks. When a task is started, a date and time will appear.
Data Server (DSS1)

**node-a**

IP Address: 192.168.0.220

### 3. Configure the node-a

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 **MirrorTask-a**) to display detailed information on the current replication task.

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**NOTE:**

Please allow the replication task to complete (similar to above with status being "Consistent") before writing to the iSCSI Logical Volume.
4. Create new target on the node-b

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

In the "Create new target" function, uncheck the box Target Default Name. In the Name field, enter a name for the new target and click apply to confirm.

NOTE:
Both systems must have the same Target name.
After that, select \textbf{target0} within the \textbf{Targets} field.

To assign appropriate volume to the target (iqn.2012-11:mirror-0 -> lv0000) and click the \textbf{+} button located under \textbf{Action}.
Next, go to node-a, click on **CONFIGURATION** and choose "iSCSI target manager" and "Targets" from the menu.

Within the "Create new target" function, uncheck the box **Target Default Name**. In the **Name** field, enter a name for the new target and click **apply** to confirm.

**NOTE:**
Both systems must have the same Target name.
After that, select `target0` within the Targets field.

To assign appropriate volume to the target (`iqn.2012-11:mirror-0 -> lv0000`) and click the `+` button located under Action.

**NOTE:**
Before clicking the `+` button again, please copy & paste the SCSI ID and LUN# from the node-b.
6. Configure Failover

On the node-a go to Setup and select "Failover"

In the "Auxiliary paths" function, select the 1st New auxiliary path on the local and remote node and click the add new auxiliary path button.
In the "Auxiliary paths" function, select the 2nd New auxiliary path on the local and remote node and click the add new auxiliary path button.
In the "Ping nodes" function, enter two ping nodes.
In the IP address field enter IP address and click the add new ping node button (according to the configuration in the third slide).
In this example, IP address of the first ping node is: 192.168.1.107 and the second ping node: 192.168.2.107.
Next, go to the Resources Pool Manager function (on node-a resources) and click the add virtual IP button. After that, enter 1st Virtual IP, (in this example 192.168.20.100 according to the configuration in the third slide) and select two appropriate interfaces on local and remote nodes. Then, click the add button.
Now, still on node-a resources (local node) enter the next Virtual IP address. Click add virtual IP enter 2nd Virtual IP, (in this example 192.168.21.100), and select two appropriate interfaces on the local and remote nodes. Then, click the add button.
Data Server (DSS1)
node-a
IP Address: 192.168.0.220

6. Configure Failover

Now you have 2 Virtual IP addresses configured on two interfaces.
When you are finished with setting the virtual IP, go to the "iSCSI resources" tab on the local node resources and click the add or remove targets button. After moving the target mirror-0 from "Available targets" to "Targets already in cluster" click the apply button.
After that, scroll to the top of the Failover manager function. At this point, both nodes are ready to start the Failover. In order to run the Failover service, click the start button and confirm this action by clicking the start button again.

NOTE:
If the start button is grayed out, the setup has not been completed.
After clicking the **start** button, configuration of both nodes is complete.

**NOTE:**
You can now connect with iSCSI Initiators. The storage client, in order to connect to target0 please setup multipath with following IP on the initiator side: 192.168.20.100 and 192.168.21.100.
In order to test Failover, go to the **Resources pool manager** function. Then, in the **local node** resources, click on the **move to remote node** button and confirm this action by clicking the **move** button.
After performing this step, the status for local node resources should state "active on node-b (remote node)" and the Synchronization status should state "synced".
In order to test failback, click the **move to local node** button in the **Resources pool manager** box for local node resources and confirm this action by clicking the **move** button.
After completing this step the status for node-a resources should state "active on node-a" (local node) and the Synchronization status should state: synced.

NOTE:
The Active-Passive option allows configuring a resource pool only on one of the nodes. In such a case, all volumes are active on a single node only. The Active-Active option allows configuring resource pools on both nodes and makes it possible to run some active volumes on node-a and other active volumes on node-b. The Active-Active option is enabled with the TRIAL mode for 60 days or when purchasing the Active-Active Failover Feature Pack.

The configuration and testing of Active-Passive iSCSI Failover is now complete.
Thank you!