



# Open-E High Availability Certification report for Happyware HW-OPE2123-R1



## Executive summary

After successfully passing all the required tests, the Happyware HW-OPE2123-R1 is now officially declared as [Open-E](#) High Availability Certified Storage Server.

The tests, conducted by Open-E's Quality Assurance team, prove that Open-E High Availability solution works effectively and efficiently on the certified system. The certification also signifies to customers that the Happyware HW-OPE2123-R1 has met specific Open-E integration and interoperability standards.

The Open-E High Availability solution, based on the Happyware HW-OPE2123-R1, is considered to be stable and secure with superb performance.

## Certification notes

The Happyware HW-OPE2123-R1 has been certified according to Open-E High Availability Certified Hardware Guide v. 1.0.

System was certified with Software Update 70021 applied.



**High Availability solution hardware components ..... 4**

**Auxiliary systems hardware components..... 5**

**High Availability solution performance ..... 6**

    High Availability solution performance test topology..... 6

    Active-Passive iSCSI Failover data throughput performance test..... 7

    Active-Active iSCSI Failover data throughput performance test ..... 8

    Active-Passive iSCSI Failover resource group switching time test ..... 9

    Active-Active iSCSI Failover resource group switching time test ..... 10

**High Availability solution functionality ..... 11**

    High Availability solution functionality test topology..... 11

    High Availability solution functionality test ..... 12



## High Availability solution hardware components

Technical specification of iSCSI Failover nodes is listed below:

Model	Happyware HW-OPE2123-R1
Operating system	Open-E DSS V7 build 7356
Enclosure/chassis	Supermicro SuperChassis 826BE16-R1K28LPB
CPU	2x Intel Xeon E5-2603 1.80GHz
Motherboard	Supermicro X9DRD-iF
Memory	4x 4GB DDR3 1333 ECC-REG ATP AL12M72E4BJH9S
Network	2x Emulex OneConnect OCe11102-NM
Network	2x Intel Gigabit Server Adapter I350 (on-board)
HW RAID	LSI MegaRAID SAS 9266-4i
Hard disk drives	10x 300GB Hitachi Ultrastar 15K600 HUS156030VLS600
Hard disk drives	2x 60GB Intel SSD 520 Series SSDSC2CW060A3

TABLE 1: Hardware components list of iSCSI Failover nodes

Both iSCSI Failover nodes have the same hardware configuration as listed above.



## Auxiliary systems hardware components

Auxiliary systems with MS Windows installed, used in Open-E High Available solution Hardware Certification Process.

<b>Model</b>	Custom system
<b>Operating system</b>	MS Windows Server 2008 R2
<b>Enclosure/chassis</b>	Inter-Tech IPC 4088 4HE
<b>Motherboard</b>	Asus P8B-E / 4L
<b>CPU</b>	Intel Xeon E3-1230 3.20 GHz
<b>Memory</b>	4x 4GB DDR3 1333 ECC Kingston KVR1333D3E9S/4G
<b>Network</b>	Intel Ethernet Server Adapter X520-SR2
<b>Network</b>	Intel Gigabit Server Adapter (i82574L) (on-board)
<b>Hard disk drives</b>	1x 750GB Seagate Barracuda ST3750330NS

TABLE 2: Hardware components of Workstations with MS Windows

Both Workstations with MS Windows have the same hardware configuration as listed above.

<b>Model</b>	Supermicro SSE-G24-TG4
<b>Description</b>	24-ports 1GbE and 4-ports 10GbE switch

TABLE 3: Network switches details

Both Network switches used for performing certification tests are of the same type as listed above.



## High Availability solution performance

Tests performed in this section compare the performance of Active-Passive iSCSI Failover with Active-Active iSCSI Failover available in the Open-E DSS V7 software running on the certified systems.

### High Availability solution performance test topology

Network topology for High Availability solution performance testing is shown below.

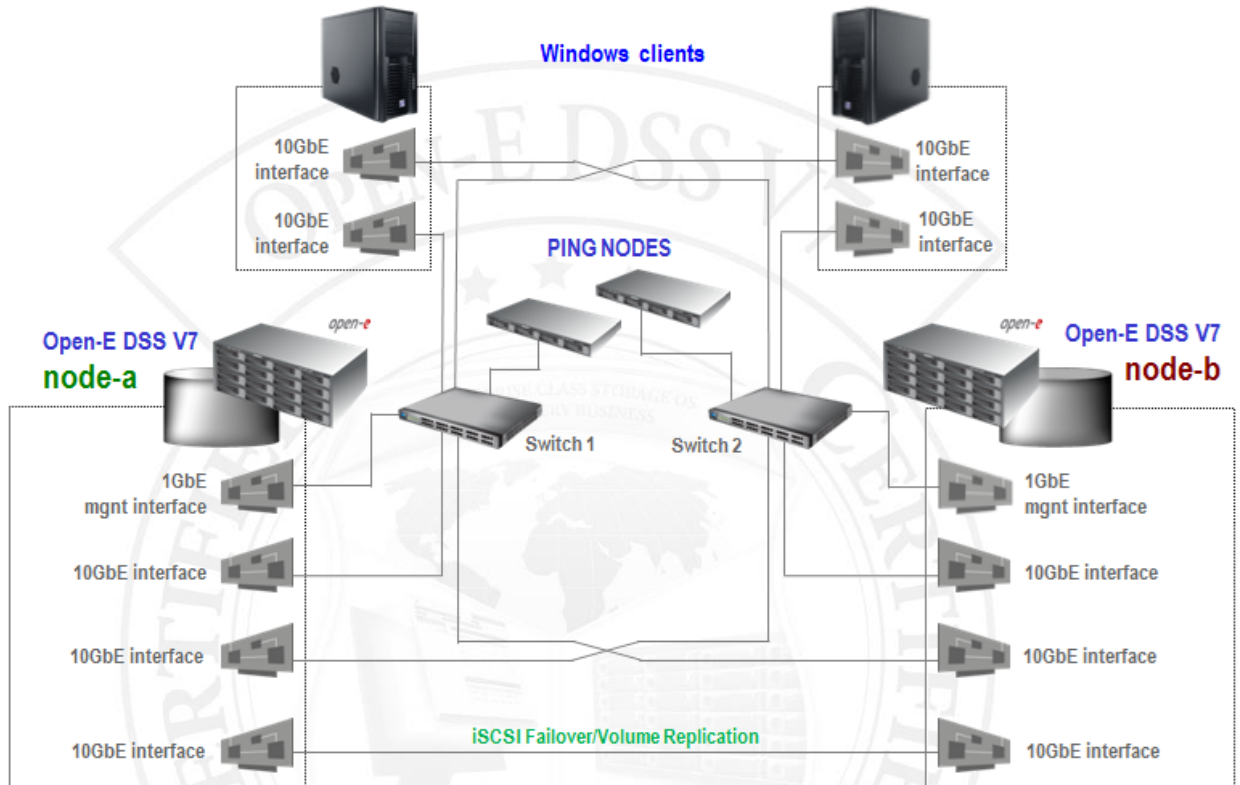


FIGURE 1: Network topology for High Availability performance testing

## Active-Passive iSCSI Failover data throughput performance test

### 1. Test description

The test relies on using the iSCSI targets exported by Active-Passive iSCSI Failover running on certified systems. The data are copied from four *Workstations with MS Windows* equipped with two 10GbE interfaces each to iSCSI targets located on one active node using the lometer tool. One 10GbE interface is used on each node for Volume replication.

### 2. Test results for Active-Passive iSCSI Failover data throughput performance using Emulex OneConnect OCe11102-NX on one active node

Active-Passive iSCSI Failover data throughput performance test results			
Block size [KB]	Total write throughput [MB/s]	Total read throughput [MB/s]	Performance test results
4	100.44	98.88	passed
32	488.22	688.65	passed
64	578.49	995.23	passed
128	483.50	997.59	passed
256	494.25	607.75	passed
512	606.26	664.63	passed
1024	681.06	665.14	passed
4096	640.16	609.78	passed

TABLE 4: Active-Passive iSCSI Failover data throughput performance test results table for Emulex OneConnect OCe11102-NX on one active node

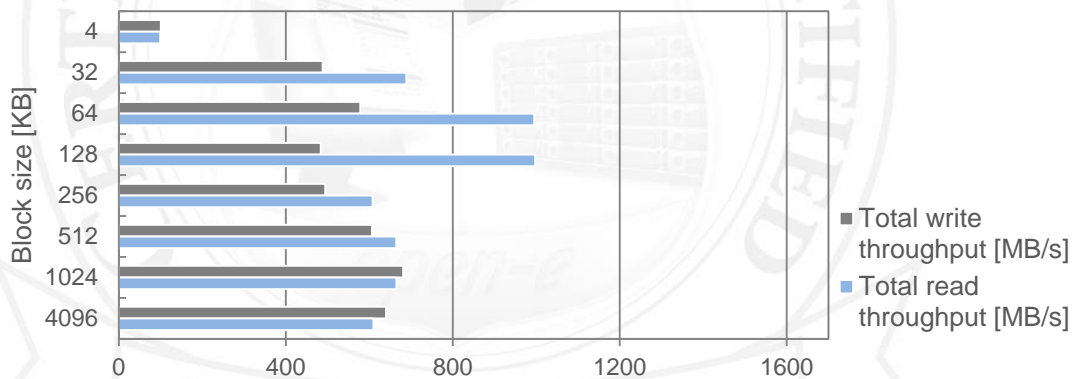


FIGURE 2: Active-Passive iSCSI Failover data throughput performance test results chart for Emulex OneConnect OCe11102-NX on one active node

## Active-Active iSCSI Failover data throughput performance test

### 1. Test description

The test relies on using the iSCSI targets exported by Active-Active iSCSI Failover running on certified systems. The data are copied from four *Workstations with MS Windows* equipped with two 10GbE interfaces each to iSCSI targets located on two active nodes using the lometer tool. One 10GbE interface is used on each node for Volume replication.

### 2. Test results for Active-Active iSCSI Failover data throughput performance using Emulex OneConnect OCe11102-NX on both active nodes

Active-Active iSCSI Failover data throughput performance test results			
Block size [KB]	Total write throughput [MB/s]	Total read throughput [MB/s]	Performance test results
4	103.82	209.71	passed
32	538.65	1080.40	passed
64	682.40	1501.26	passed
128	778.99	1272.25	passed
256	942.94	1478.10	passed
512	812.25	1609.00	passed
1024	725.66	1580.38	passed
4096	1252.93	1380.79	passed

TABLE 5: Active-Active iSCSI Failover data throughput performance test results table for Emulex OneConnect OCe11102-NX on both active nodes

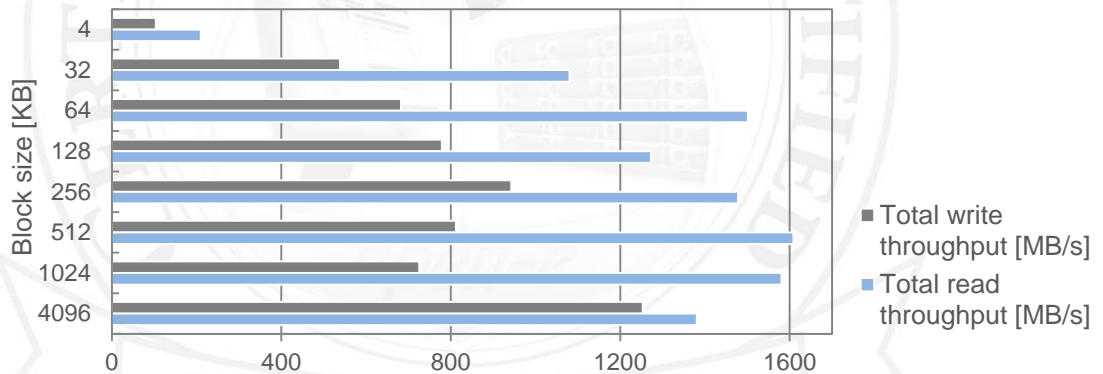


FIGURE 3: Active-Active iSCSI Failover data throughput performance test results chart for Emulex OneConnect OCe11102-NX on both active nodes



## Active-Passive iSCSI Failover resource group switching time test

### 1. Test description

The test relies on copying data of 4MB block size using the lometer tool from four Workstations with MS Windows equipped with two 10GbE interfaces each to iSCSI targets located on one active node. The Resource group switching time is measured under high load for 2, 10 and 20 iSCSI targets located on one active node. One 10GbE interface is used on each node for Volume replication.

### 2. Test results for Active-Passive iSCSI Failover resource group switching time using Emulex OneConnect OCe11102-NX on both active nodes

Active-Passive iSCSI Failover resource switching time test results		
Total number of targets	Switching time [seconds]	Performance test results
2	3	passed
10	5	passed
20	8	passed

TABLE 6: Active-Passive iSCSI Failover resource group switching time test results table for Emulex OneConnect OCe11102-NX on one active node

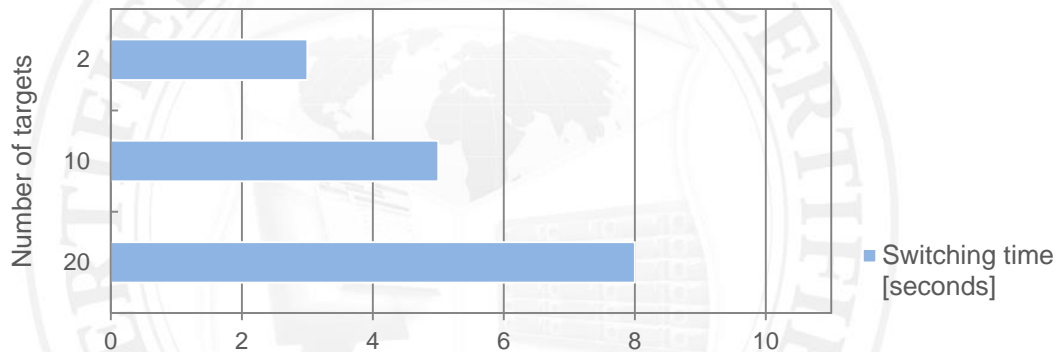


FIGURE 4: Active-Passive iSCSI Failover resource group switching time test chart for Emulex OneConnect OCe11102-NX on one active node

HIGH AVAILABILITY  
READY

## Active-Active iSCSI Failover resource group switching time test

### 1. Test description

The test relies on copying data of 4MB block size using the lometer tool from four Workstations with MS Windows equipped with two 10GbE interfaces each to iSCSI targets located on two active nodes. The Resource group switching time is measured under high load for 2, 10 and 20 iSCSI targets located on two active nodes. One 10GbE interface is used on each node for Volume replication.

### 2. Test results for Active-Active iSCSI Failover resource groups switching time using Emulex OneConnect OCe11102-NX on both active nodes

Active-Active iSCSI Failover resource switching time test results		
Total number of targets	Switching time [seconds]	Performance test results
2	2	passed
10	4	passed
20	6	passed

TABLE 7: Active-Active iSCSI Failover resource groups switching time test results table for Emulex OneConnect OCe11102-NX on both active nodes

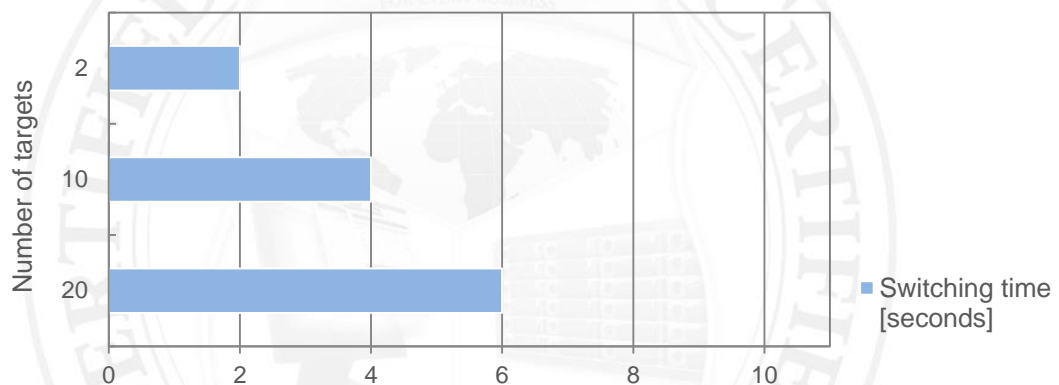


FIGURE 5: Active-Active iSCSI Failover resource groups switching time test chart for Emulex OneConnect OCe11102-NX on both active nodes

HIGH AVAILABILITY  
READY

## High Availability solution functionality

Tests performed in this section analyze the functionality of [High Availability solution](#) configured as Active-Active iSCSI Failover, available in the Open-E DSS V7 product on the certified systems.

### High Availability solution functionality test topology

Network topology for High Availability solution functionality testing is presented below.

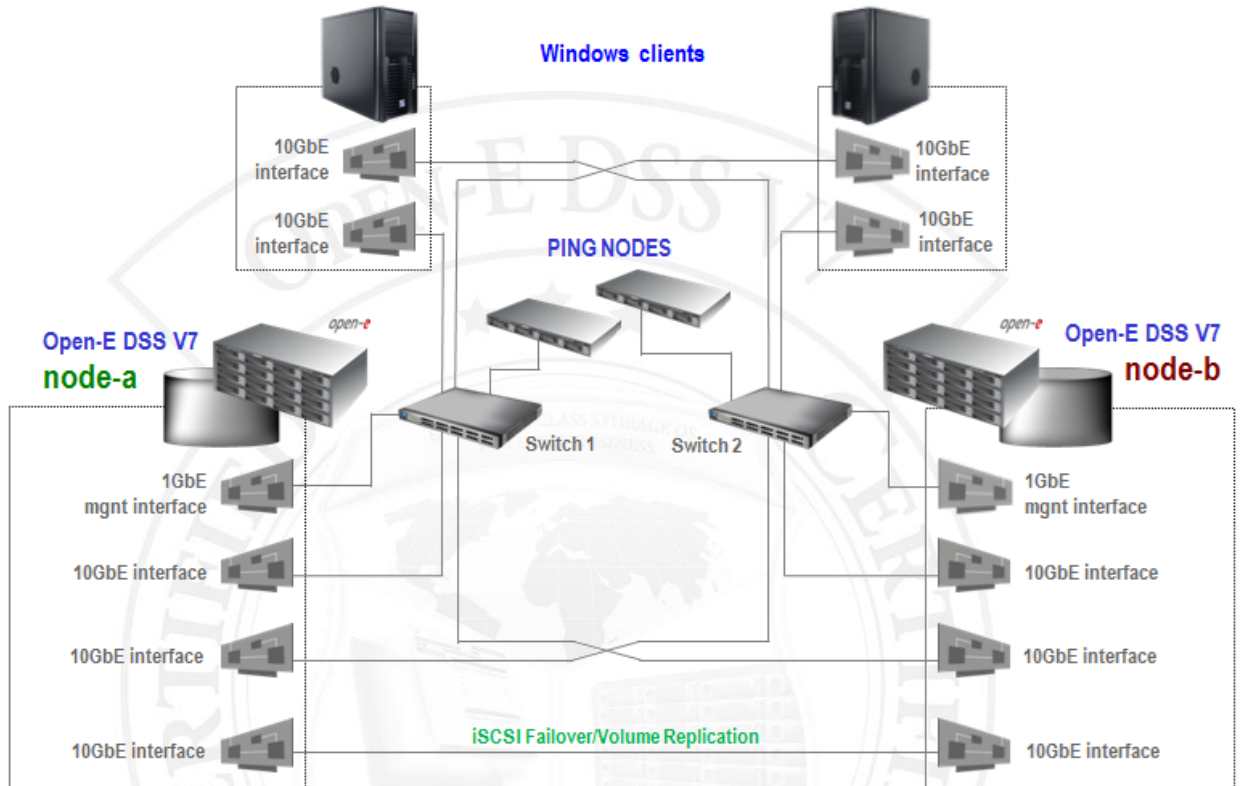


FIGURE 6: Network topology for High Availability solution functionality testing

## High Availability solution functionality test

### 1. Test description

The test relies on performing various actions which should cause Resource group switching during copying data from four *Workstations with MS Windows* equipped with two 10GbE interfaces each to iSCSI targets exported by Active-Active iSCSI Failover. It tests whether failover occurs and if all resources are still reachable for 20 iSCSI targets located on two active nodes. One 10GbE interface is used on each node for Volume replication.

### 2. Test results for High Availability solution functionality

High Availability solution functionality test		
Total number of targets	Test case	Test results
20	Manual resources transfer test	passed
20	Network malfunction test	passed
20	Reboot test	passed
20	Shutdown test	passed
20	I/O error test	passed

TABLE 8: High Availability solution functionality test results table

