Open-E High Availability Certification report for Broadberry CyberStore 424S

Executive summary

After successfully passing all the required tests, the Broadberry CyberStore 424S 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 Broadberry CyberStore 424S has met specific Open-E integration and interoperability standards.

The Open-E High Availability solution, based on the Broadberry CyberStore 424S, is considered to be stable and secure with superb performance.

Certification notes

The Broadberry CyberStore 424S has been certified according to Open-E High Availability Certified Hardware Guide v. 1.0.

High Availability solution hardware components

Technical specification of iSCSI Failover nodes is listed below:

Model	Broadberry CyberStore 424S
Operating system	Open-E DSS V7 build 7356
Enclosure/chassis	Supermicro SC846BE160-R1200B
CPU	Intel Xeon E5-2620 2.00GHz
Motherboard	Supermicro X9DRi-LN4F+
Memory	4x 8GB DDR3 Samsung M393B1K70DH0-CK0
Network	4x Intel Gigabit Server Adapter I350 (on-board)
Network	Solarflare SFN5162F Dual-Port 10GbE SFP+ Midrange Server Adapter
HW RAID	LSI MegaRAID SAS 9280-4i4e
Hard disk drives	2x 32GB Kingston SSDNow V100 SV100S2/32G
Hard disk drives	2x 240GB OCZ Vertex-3 MAX IOPS VTX3MI-25SAT3-240G
Hard disk drives	22x 3TB Seagate Constellation ES.2 ST33000650SS

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.

| Model	Supermicro SYS-6026TT-BIBQRF
Operating system	MS Windows Server 2008 R2
Enclosure/chassis	Supermicro CSE-827H-R1400B
Motherboard	Supermicro X8DTT-IBQF
CPU	Intel Xeon E5620 2.40GHz
Memory	6x 4GB DDR3 1333 ECC-REG ATP AL12M72E4BJH9S
Network	Intel Gigabit ET Dual Port Server Adapter (i82576) (on board)
Hard disk drives	1x 750GB Seagate Barracuda ST3750330NS

TABLE 2: Hardware components of Workstations with MS Windows

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

Model	Supermicro SSE-G24-TG4
Description	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.
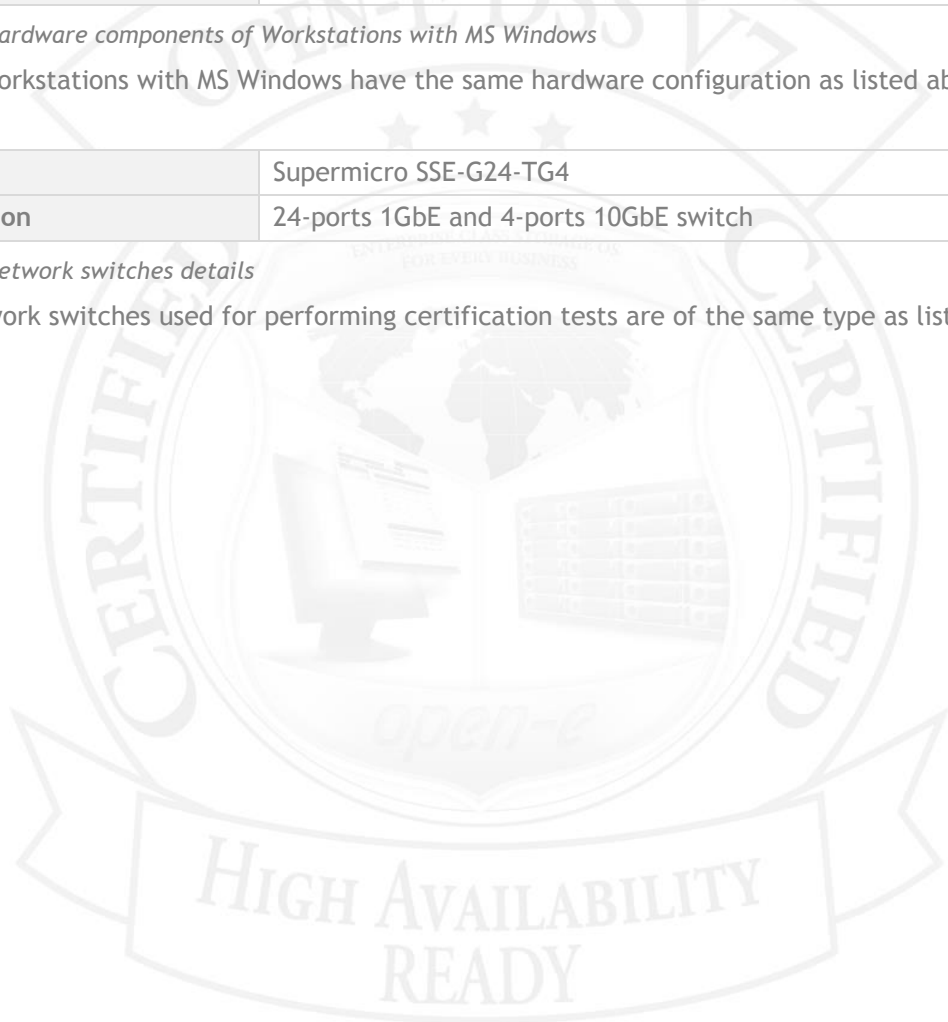
High Availability solution performance

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

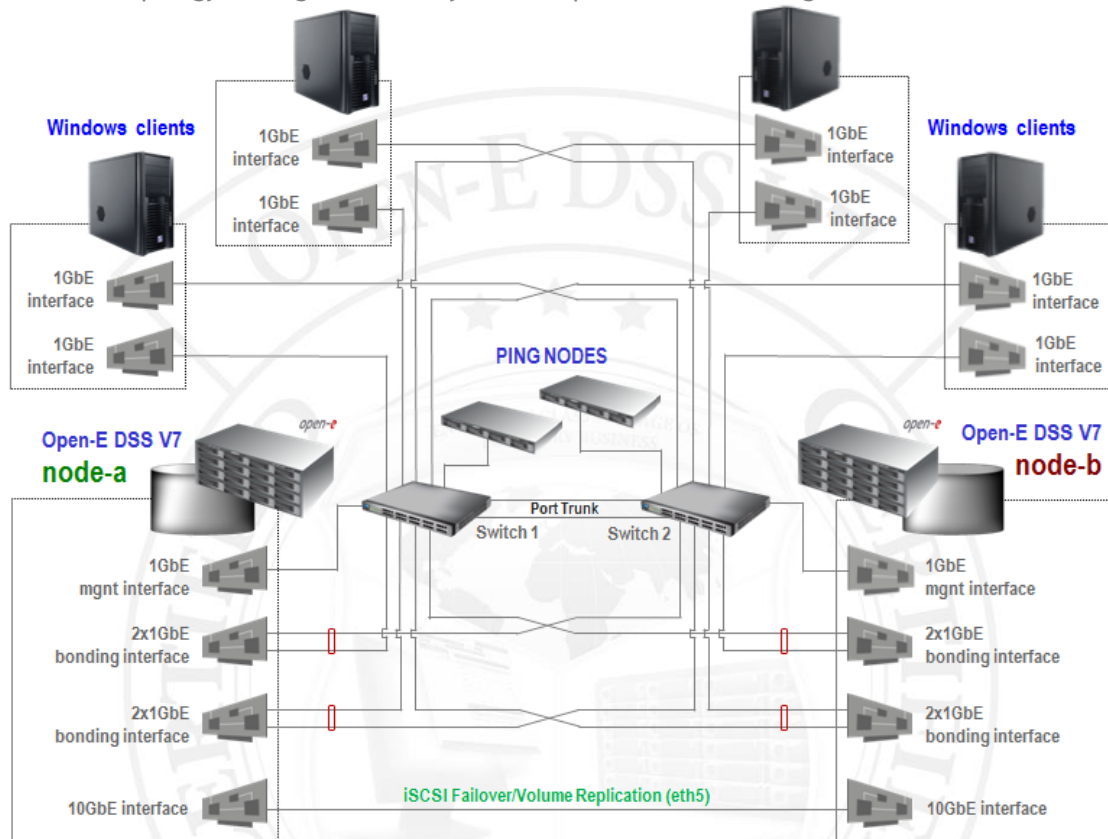Network topology for High Availability solution performance testing is shown below.

FIGURE 1: Network topology for High Availability performance testing

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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 1GbE interfaces each to iSCSI targets located on one active node using the Iometer tool. One 10GbE interface is used on each node for Volume replication.

2. Test results for Active-Passive iSCSI Failover data throughput performance using Intel Gigabit Server Adapter I350 (on-board) 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	85.12	107.21	passed
32	293.47	426.63	passed
64	346.58	434.36	passed
128	381.24	414.57	passed
256	392.96	416.42	passed
512	417.80	436.90	passed
1024	420.35	439.14	passed
4096	419.19	437.75	passed

TABLE 4: *Active-Passive iSCSI Failover data throughput performance test results table for Intel Gigabit Server Adapter I350 (on-board) on one active node*
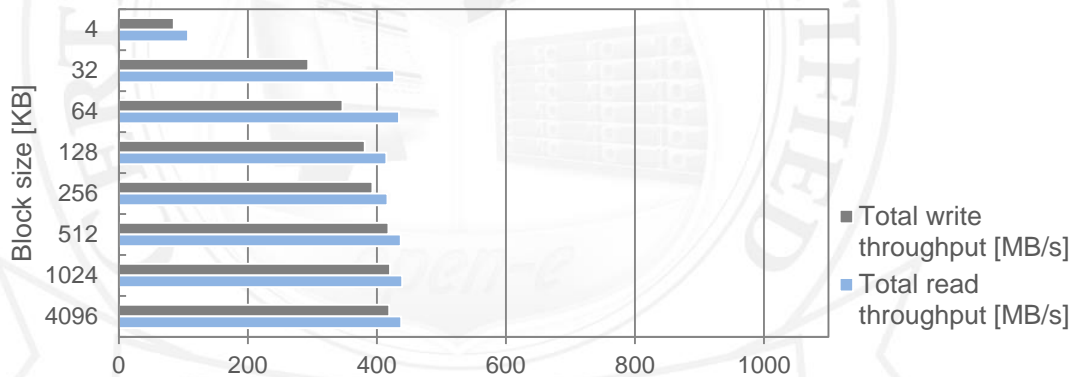

FIGURE 2: *Active-Passive iSCSI Failover data throughput performance test results chart for Intel Gigabit Server Adapter I350 (on-board) on one active node*

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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 1GbE interfaces each to iSCSI targets located on two active nodes using the Iometer tool. One 10GbE interface is used on each node for Volume replication.

2. Test results for Active-Active iSCSI Failover data throughput performance using Intel Gigabit Server Adapter I350 (on-board) 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	118.71	197.20	passed
32	515.46	536.57	passed
64	669.98	753.18	passed
128	743.23	758.95	passed
256	746.58	754.41	passed
512	752.80	759.73	passed
1024	749.65	761.64	passed
4096	748.37	760.99	passed

TABLE 5: *Active-Active iSCSI Failover data throughput performance test results table for Intel Gigabit Server Adapter I350 (on-board) on both active nodes*
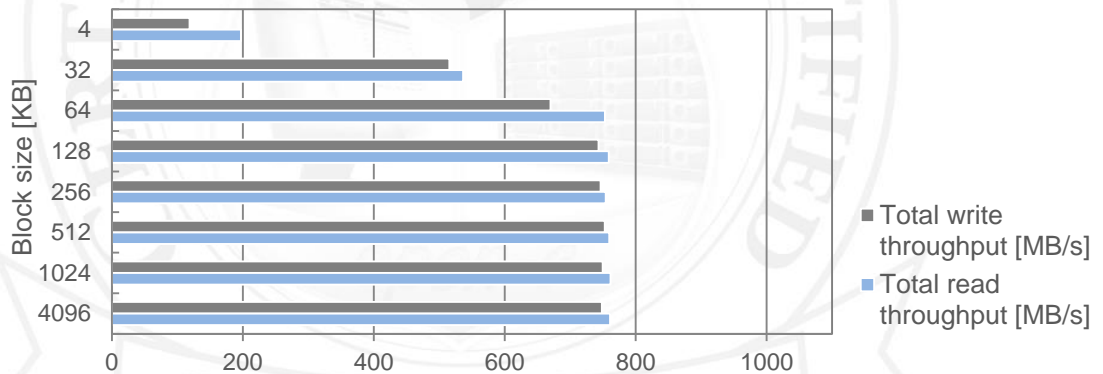

FIGURE 3: *Active-Active iSCSI Failover data throughput performance test results chart for Intel Gigabit Server Adapter I350 (on-board) on both active nodes*

Active-Passive iSCSI Failover resource group switching time test

1. Test description

The test relies on copying data of 4MB block size using the Iometer tool from four *Workstations with MS Windows* equipped with two 1GbE 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 Intel Gigabit Server Adapter I350 (on-board) on both active nodes

Active-Passive iSCSI Failover resource switching time test results		
Total number of targets	Switching time [seconds]	Performance test results
2	1	passed
10	2	passed
20	4	passed

TABLE 6: Active-Passive iSCSI Failover resource group switching time test results table for Intel Gigabit Server Adapter I350 (on-board) on one active node
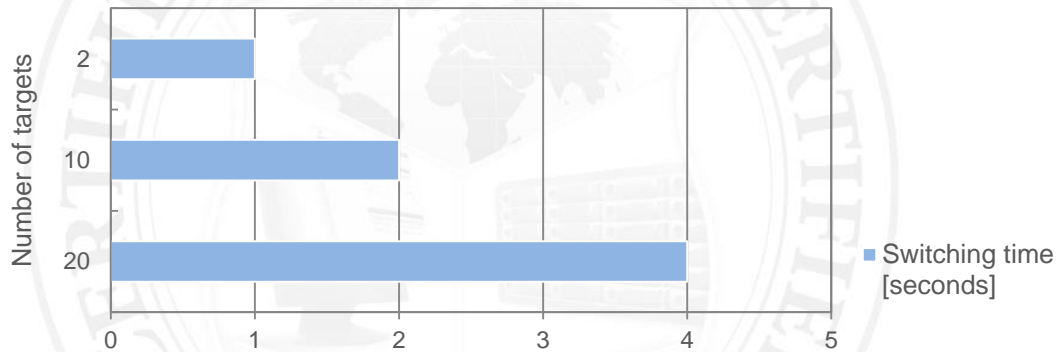

FIGURE 4: Active-Passive iSCSI Failover resource group switching time test chart for Intel Gigabit Server Adapter I350 (on-board) on one active node

Active-Active iSCSI Failover resource group switching time test

1. Test description

The test relies on copying data of 4MB block size using the Iometer tool from four *Workstations with MS Windows* equipped with two 1GbE 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 Intel Gigabit Server Adapter I350 (on-board) on both active nodes

Active-Active iSCSI Failover resource switching time test results		
Total number of targets	Switching time [seconds]	Performance test results
2	1	passed
10	2	passed
20	2	passed

TABLE 7: Active-Active iSCSI Failover resource groups switching time test results table for Intel Gigabit Server Adapter I350 (on-board) on both active nodes
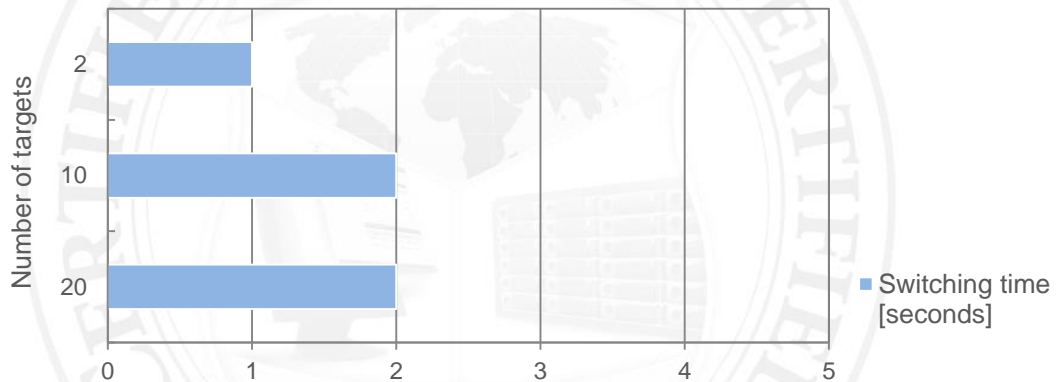

FIGURE 5: Active-Active iSCSI Failover resource groups switching time test chart for Intel Gigabit Server Adapter I350 (on-board) on both active nodes

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

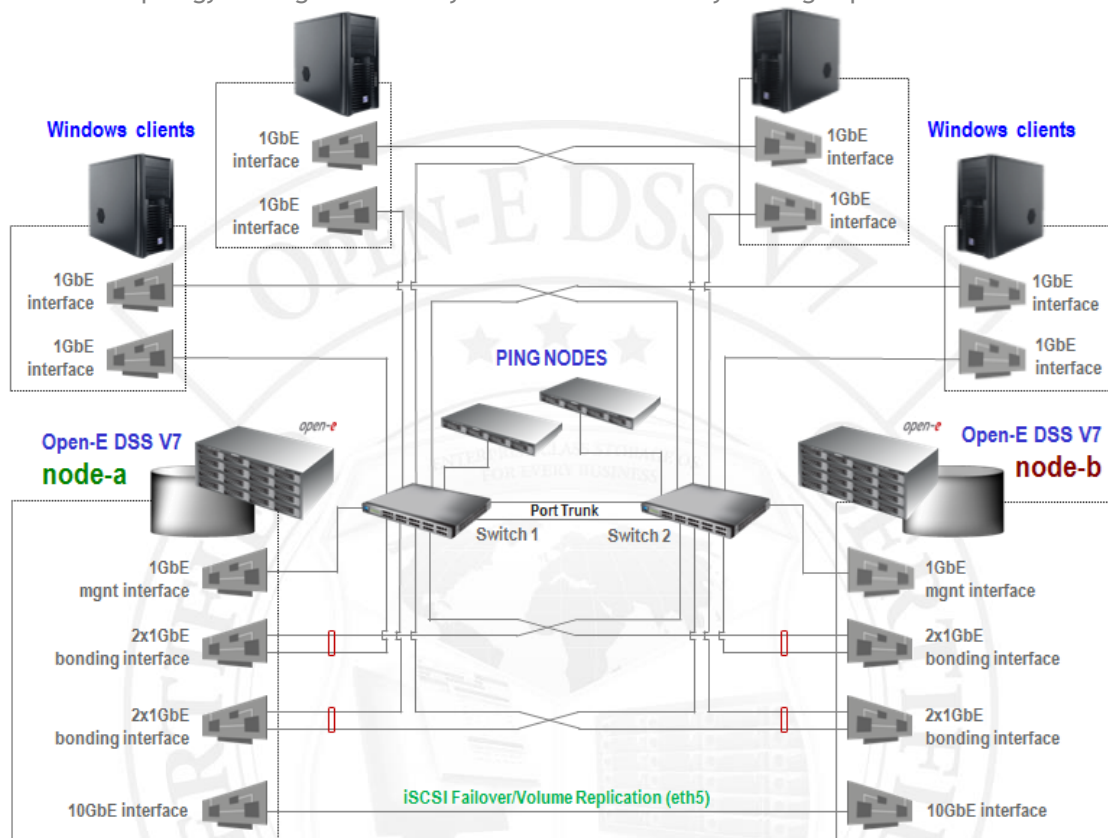Network topology for High Availability solution functionality testing is presented below.

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 1GbE 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