



Open-E High Availability Certification report for EUROstor ES-8724XSS



Executive summary

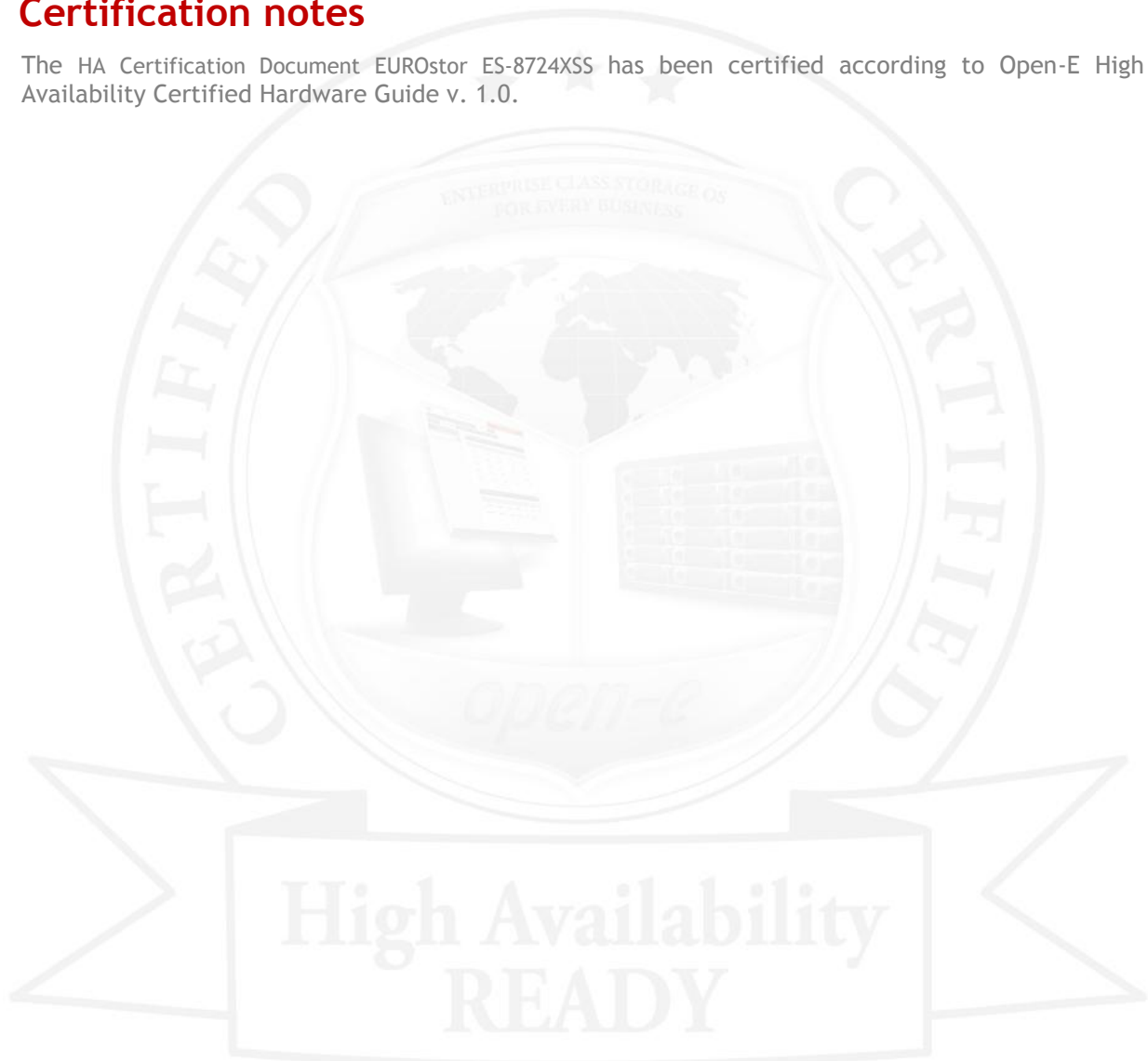
After successfully passing all the required tests, the EUROstor ES-8724XSS is now officially declared as [Open-E](#) High Availability Certified Storage Server.

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 EUROstor ES-8724XSS has met specific Open-E integration and interoperability standards.

The Open-E High Availability solution, based on the EUROstor ES-8724XSS, is considered to be stable and secure with superb performance.

Certification notes

The HA Certification Document EUROstor ES-8724XSS has been certified according to Open-E High Availability Certified Hardware Guide v. 1.0.





High Availability solution hardware components 4

Auxiliary systems hardware components 5

High Availability solution performance 6

 High Availability solution performance test topology6

 Active-Passive iSCSI Failover data throughput performance test7

 Active-Active iSCSI Failover data throughput performance test8

 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



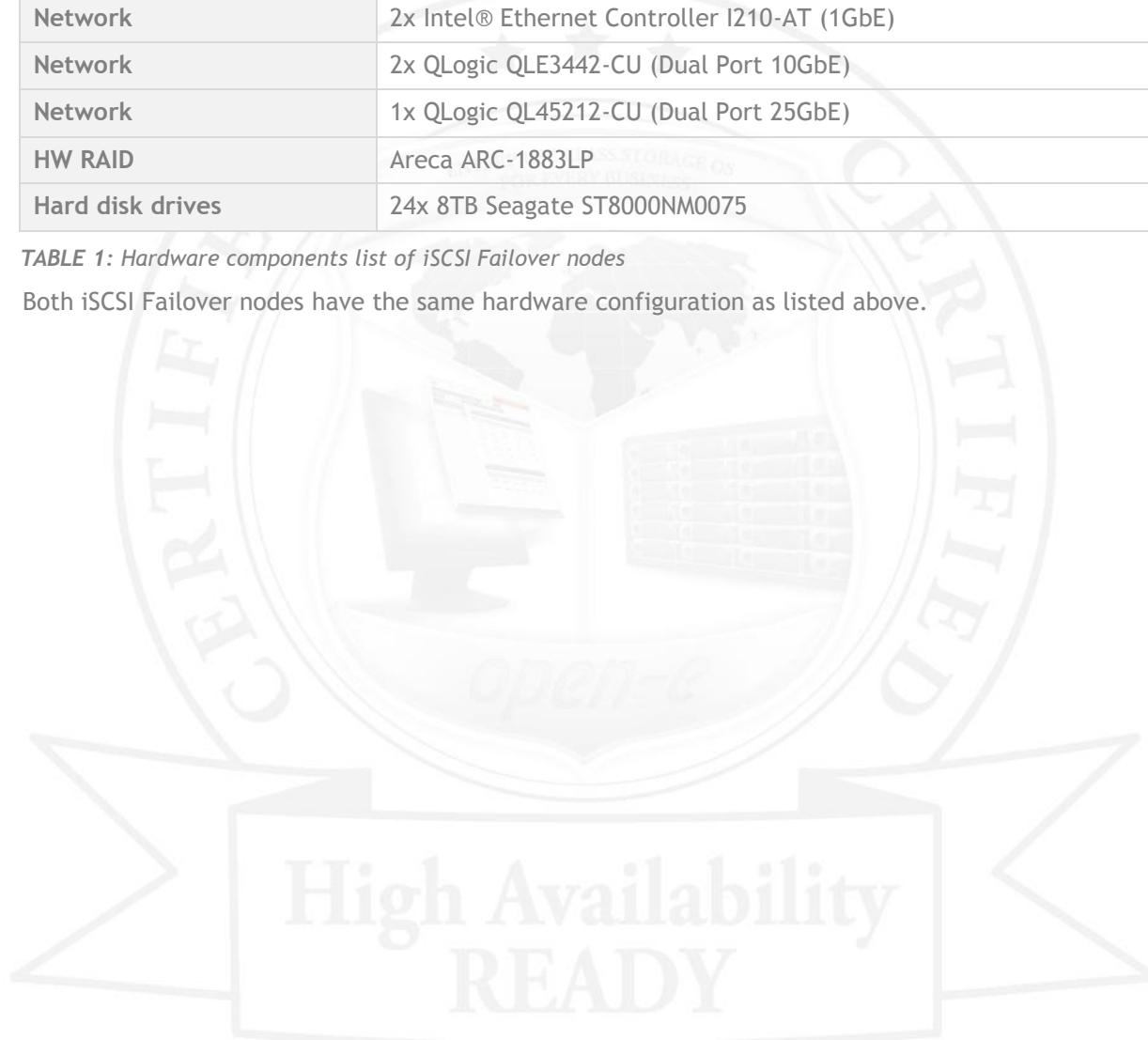
High Availability solution hardware components

Technical specification of iSCSI Failover nodes is listed below:

Model	EUROstor ES-8724XSS
Operating system	Open-E DSS V7 build 20188 (Final build will be provided after official release)
Enclosure/chassis	Supermicro SC846BE1C-R1K28B
CPU	Intel® Xeon® Processor E5-1620 v4 3.50 GHz
Motherboard	Supermicro X10SRL-F
Memory	8x 16GB Samsung M393A2K40BB1-CRC DDR4 ECC REG
Network	2x Intel® Ethernet Controller I210-AT (1GbE)
Network	2x QLogic QLE3442-CU (Dual Port 10GbE)
Network	1x QLogic QL45212-CU (Dual Port 25GbE)
HW RAID	Areca ARC-1883LP
Hard disk drives	24x 8TB Seagate ST8000NM0075

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	Custom
Operating system	MS Windows Server 2012 R2
Enclosure/chassis	Supermicro SC826BE1C-R920LPB
Motherboard	Supermicro X10DRi-T
CPU	Intel® Xeon® Processor E5-2623 v3 3.00GHz
Memory	4x 8GB Kingston KVR21R15S4/8HA DDR4 ECC REG
Network	1x Intel® Ethernet Controller X540-AT2 (Dual Port 10GbE)
Network	2x QLogic QLE3442-CU (Dual Port 10GbE)
Network	1x QLogic QL45212-CU (Dual Port 25GbE)

TABLE 2: Hardware components of first Workstations with MS Windows

Model	Custom
Operating system	MS Windows Server 2012 R2
Enclosure/chassis	Supermicro SC826BE1C-R920LPB
Motherboard	Supermicro X10DRi-T
CPU	Intel® Xeon® Processor E5-2623 v3 3.00GHz
Memory	4x 8GB Kingston KVR21R15S4/8HA DDR4 ECC REG
Network	1x Intel® Ethernet Controller X540-AT2 (Dual Port 10GbE)
Network	2x QLogic QLE3442-CU (Dual Port 10GbE)
Network	1x QLogic QL45212-CU (Dual Port 25GbE)

TABLE 3: Hardware components of second Workstations with MS Windows

Model	Supermicro SSE-X24S
Description	24x 10GbE SFP+ Ports

TABLE 4: 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.

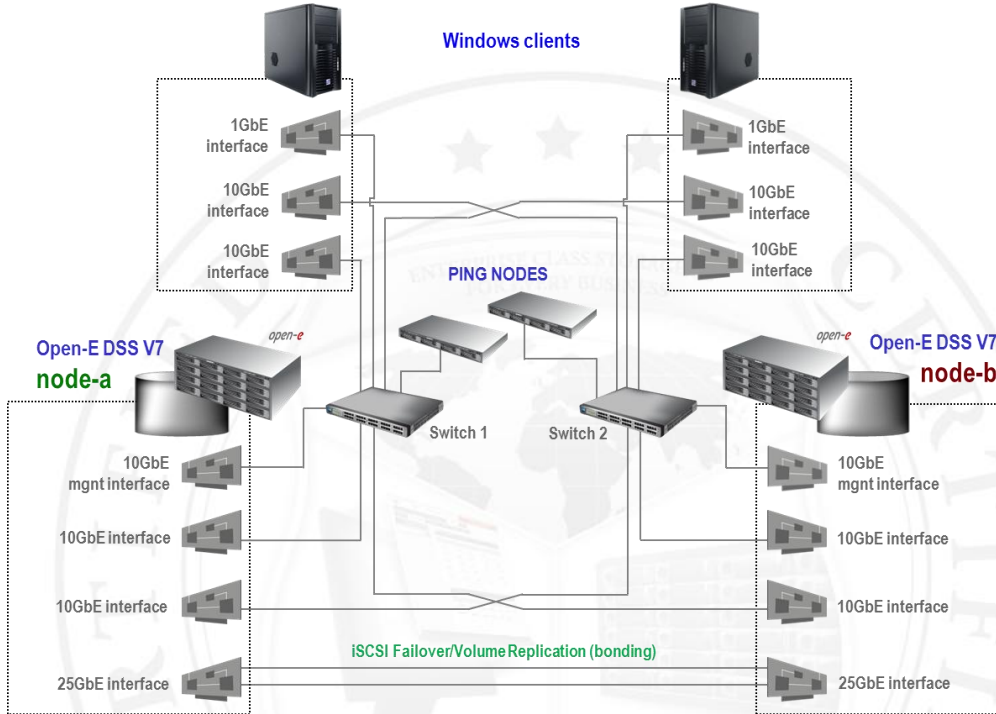


FIGURE 1: Network topology for High Availability performance testing

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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 two *Workstations with MS Windows* equipped with two 10GbE interfaces each to iSCSI targets located on one active node using the lometer tool. Two 25GbE interfaces were used on each node for Volume replication.

2. Test results for Active-Passive iSCSI Failover data throughput performance using QLogic QLE3442-CU (Dual Port 10GbE) with MPIO

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	183.80	401.50	passed
32	1135.49	1728.92	passed
64	1413.52	2087.70	passed
128	1809.63	2169.16	passed
256	1955.93	2142.08	passed
512	1868.53	2151.57	passed
1024	1907.11	2024.98	passed
4096	1943.76	2041.00	passed

TABLE 5: Active-Passive iSCSI Failover data throughput performance test results table for QLogic QLE3442-CU (Dual Port 10GbE) with MPIO

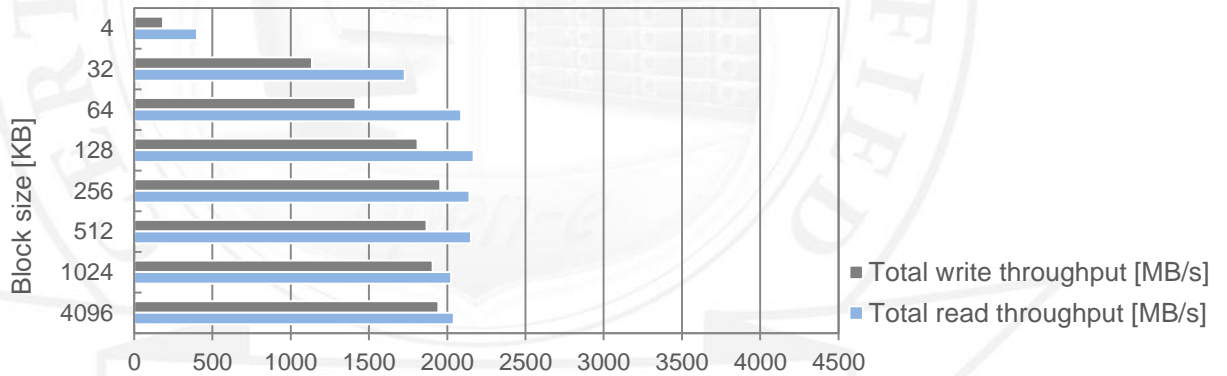


FIGURE 2: Active-Passive iSCSI Failover data throughput performance test results chart for QLogic QLE3442-CU (Dual Port 10GbE) with MPIO

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 two *Workstations with MS Windows* equipped with two 10GbE interfaces each to iSCSI targets located on two active nodes using the lometer tool. Two 25GbE interfaces were used on each node for Volume replication.

2. Test results for Active-Active iSCSI Failover data throughput performance using QLogic QLE3442-CU (Dual Port 10GbE) with MPIO

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	378.63	802.99	passed
32	2339.11	3457.83	passed
64	2911.86	4175.40	passed
128	3727.84	4338.31	passed
256	4029.21	4284.16	passed
512	3923.91	4303.14	passed
1024	4004.94	4049.95	passed
4096	4081.89	4082.00	passed

TABLE 6: Active-Active iSCSI Failover data throughput performance test results table for QLogic QLE3442-CU (Dual Port 10GbE) with MPIO

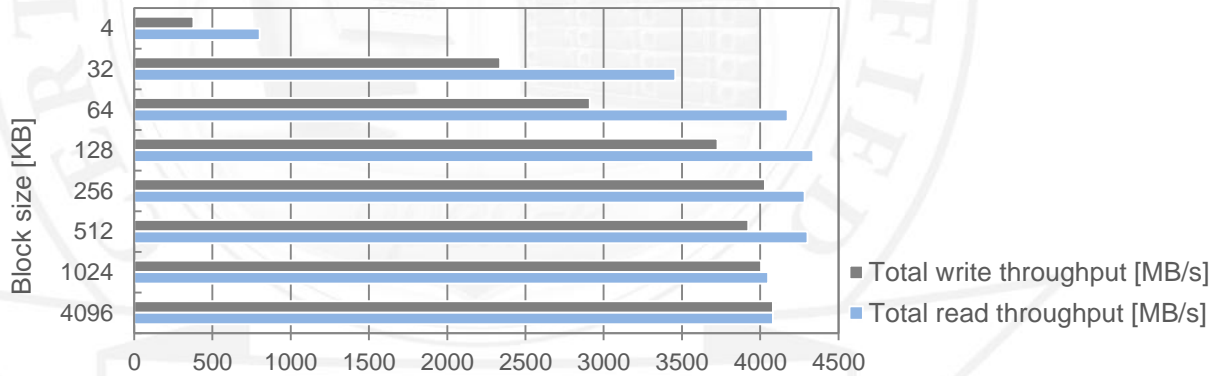


FIGURE 3: Active-Active iSCSI Failover data throughput performance test results chart for QLogic QLE3442-CU (Dual Port 10GbE) with MPIO

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 two 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. Two 25GbE interfaces were used on each node for Volume replication.

2. Test results for Active-Passive iSCSI Failover resource group switching time using QLogic QLE3442-CU (Dual Port 10GbE) with MPIO

Active-Passive iSCSI Failover resource switching time test results		
Total number of targets	Switching time [seconds]	Performance test results
2	1	passed
10	1	passed
20	3	passed

TABLE 7: Active-Passive iSCSI Failover resource group switching time test results table for QLogic QLE3442-CU (Dual Port 10GbE) with MPIO

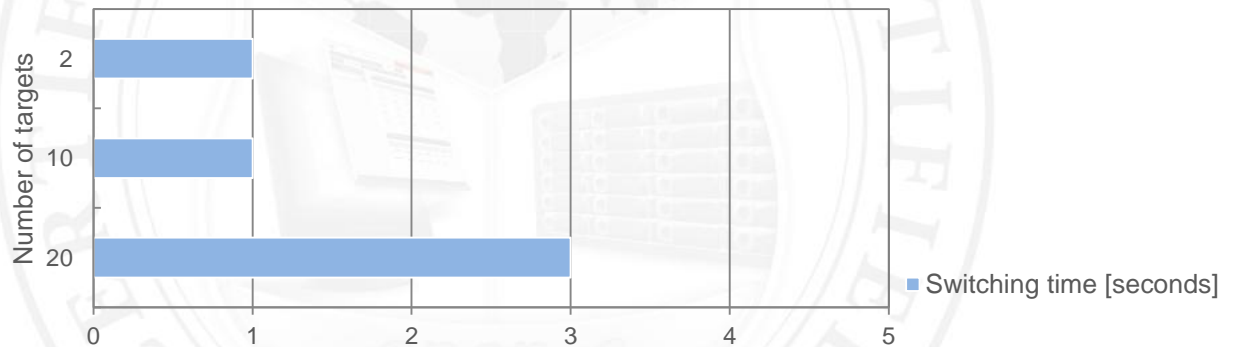


FIGURE 4: Active-Passive iSCSI Failover resource group switching time test chart for QLogic QLE3442-CU (Dual Port 10GbE) with MPIO

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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 two 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. Two 25GbE interfaces were used on each node for Volume replication.

2. Test results for Active-Active iSCSI Failover resource groups switching time using QLogic QLE3442-CU (Dual Port 10GbE) with MPIO

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

TABLE 8: Active-Active iSCSI Failover resource groups switching time test results table for QLogic QLE3442-CU (Dual Port 10GbE) with MPIO



FIGURE 5: Active-Active iSCSI Failover resource groups switching time test chart for QLogic QLE3442-CU (Dual Port 10GbE) with MPIO



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.

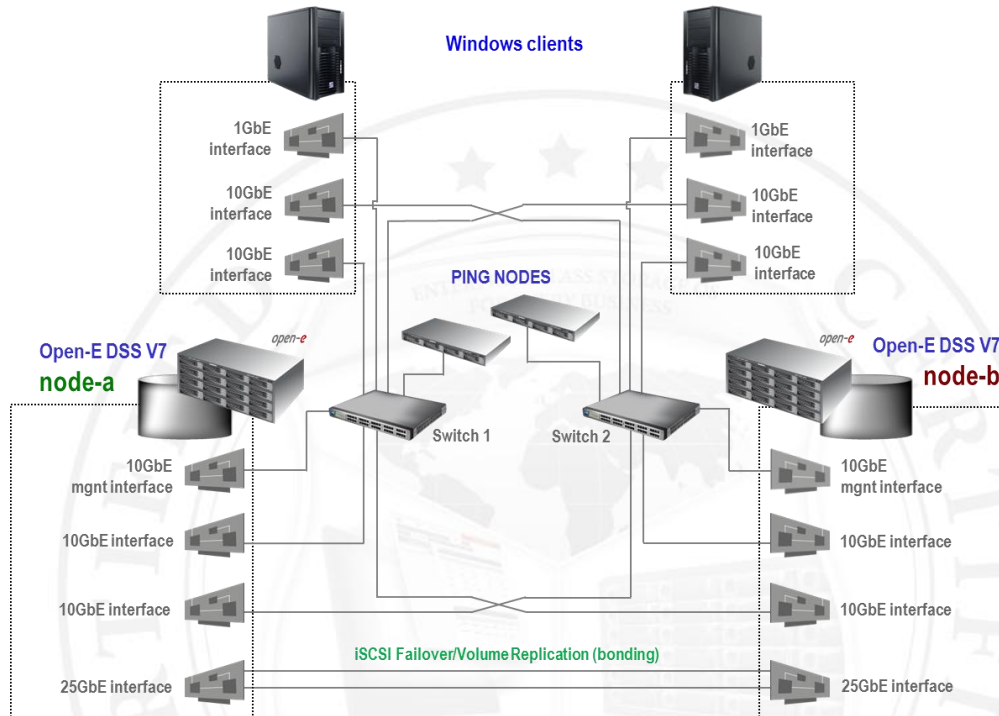


FIGURE 6: Network topology for High Availability solution functionality testing

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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 two *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. Two 25GbE interfaces were 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 9: High Availability solution functionality test results table

