



Open-E High Availability Certification report for Starline Computer GmbH NASdeluxe NDL-4224R/L



Executive summary

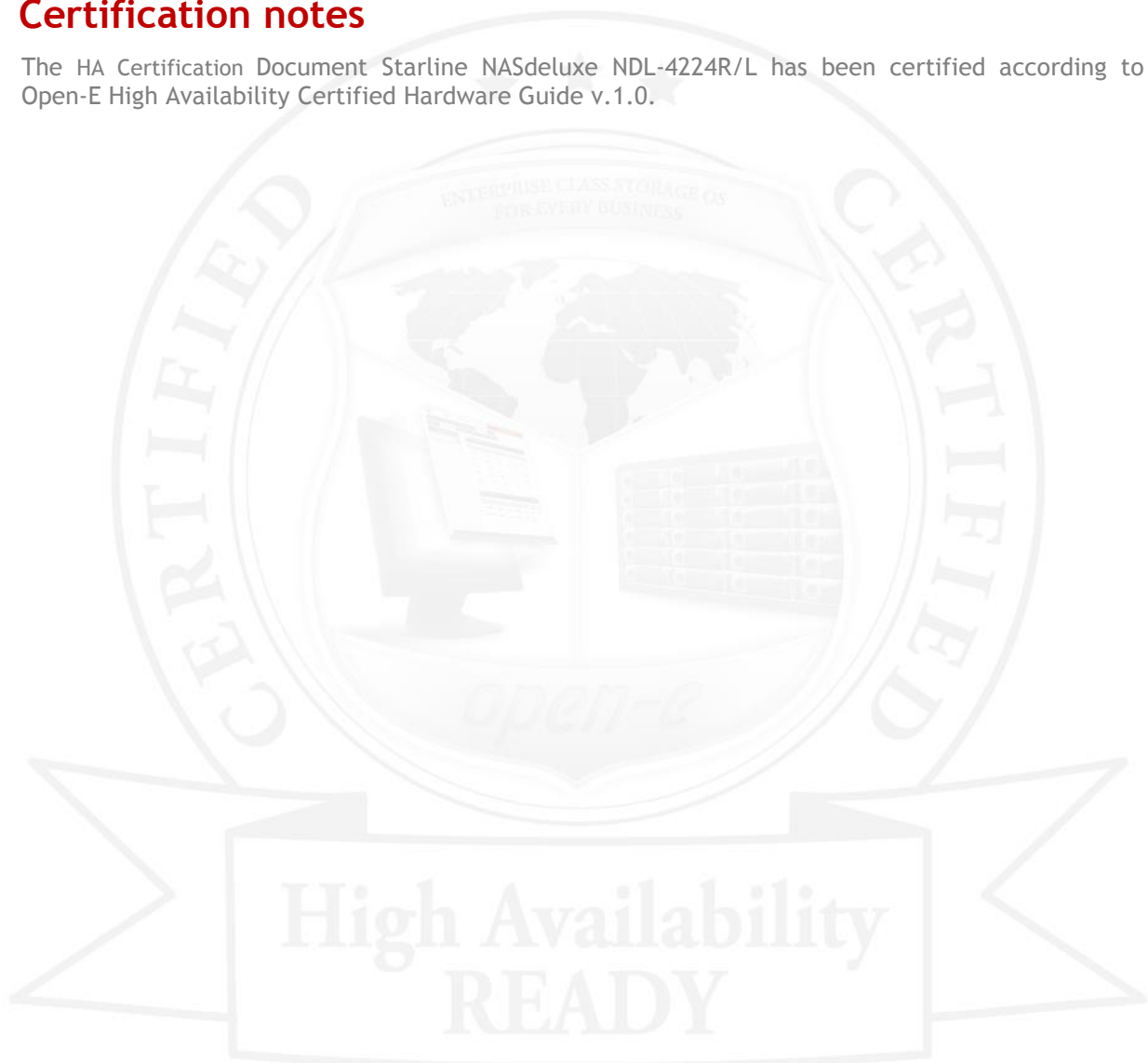
After successfully passing all the required tests, the Starline NASdeluxe NDL-4224R/L is now officially declared as [Open-E](#) High Availability Certified Storage Server.

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 Starline NASdeluxe NDL-4224R/L has met specific Open-E integration and interoperability standards.

The Open-E High Availability solution, based on the Starline NASdeluxe NDL-4224R/L, is considered to be stable and secure with superb performance.

Certification notes

The HA Certification Document Starline NASdeluxe NDL-4224R/L has been certified according to Open-E High Availability Certified Hardware Guide v.1.0.





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High Availability solution hardware components

Technical specification of iSCSI Failover nodes is listed below:

Model	Starline NASdeluxe NDL-4224R/L
Operating system	Open-E DSS V7 build 16323
Enclosure/chassis	Supermicro SC216BE1C-R920LPB
CPU	Intel® Xeon® Processor E5 2623 v3 3.00GHz
Motherboard	Supermicro X10DRi-T
Memory	4x 8GB Samsung DDR4-2133 ECC REG
Network	Intel® Ethernet Controller X540-AT2
Network	2x QLogic QLE3442-CU
HW RAID	Areca ARC-1883LP
Hard disk drives	24x 600GB SEAGATE ST600MM0006

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 CSE-819TQ-R700WB
Motherboard	Supermicro X9DRW-3LN4F+
CPU	Intel® Xeon® Processor E5-2609 v2 2.50GHz
Memory	4x 8GB Samsung DDR3-1600 ECC REG
Network	Intel® Ethernet Controller I350-AM4
Network	QLogic QLE3442-CU
Hard disk controller	Intel® C606 chipset SAS Controller
Hard disk drives	2x 1TB SEAGATE ST1000NM0033

TABLE 2: Hardware components of first Workstations with MS Windows

Model	Custom
Operating system	MS Windows Server 2012 R2
Enclosure/chassis	Supermicro CSE-819TQ-R700WB
Motherboard	Supermicro X9DRW-3LN4F+
CPU	Intel® Xeon® Processor E5-2630 v2 2.60GHz
Memory	4x 8GB Samsung DDR3-1600 ECC REG
Network	Intel® Ethernet Controller I350-AM4
Network	QLogic QLE3442-CU
Hard disk controller	Intel® C606 chipset SAS Controller
Hard disk drives	2x 1TB SEAGATE ST1000NM0033

TABLE 3: Hardware components of second Workstations with MS Windows

Model	2x Brocade VDX6740
Description	48x 10GbE SFP+ Ports

TABLE 4: Network switches details

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.

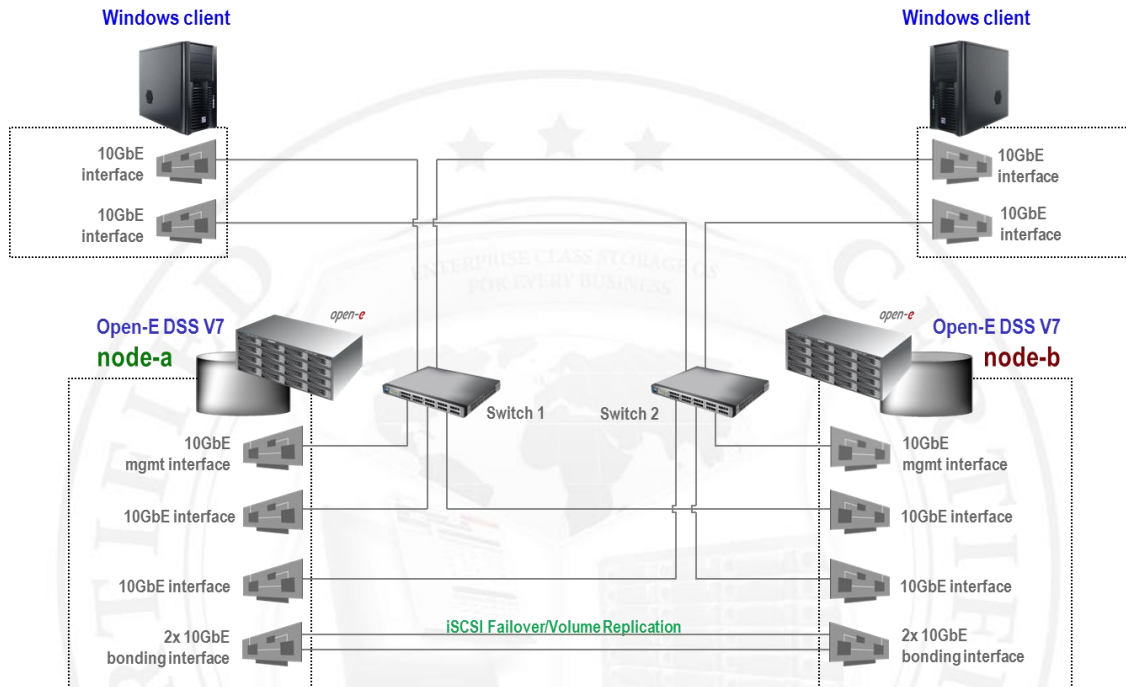


FIGURE 1: Network topology for High Availability performance testing

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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 connected to iSCSI targets located on one active node using the *lometer* tool. Two bonded 10GbE interfaces were used on each node for Volume replication.

2. Test results for Active-Passive iSCSI Failover data throughput performance using QLogic QLE3442-CU 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	211.57	359.08	passed
32	1104.09	1539.56	passed
64	1764.29	1950.12	passed
128	2181.20	2328.78	passed
256	2296.63	2365.17	passed
512	2354.43	2364.45	passed
1024	2351.47	2367.74	passed
4096	2351.16	2322.00	passed

TABLE 5: Active-Passive iSCSI Failover data throughput performance test results table for QLogic QLE3442-CU on one active node

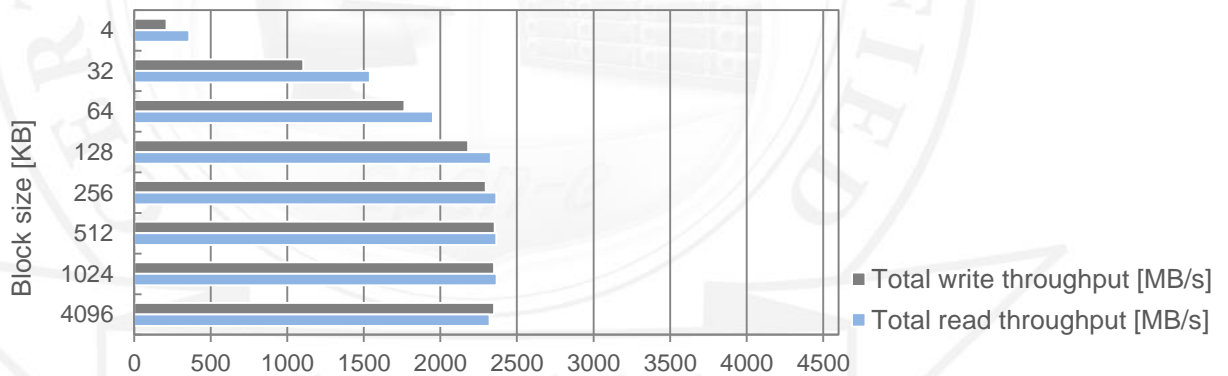


FIGURE 2: Active-Passive iSCSI Failover data throughput performance test results chart for QLogic QLE3442-CU on one active node

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

2. Test results for Active-Active iSCSI Failover data throughput performance using QLogic QLE3442-CU 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	244.38	333.95	passed
32	1238.88	1546.93	passed
64	2061.18	2150.24	passed
128	2646.72	3124.02	passed
256	3244.19	4269.15	passed
512	3462.07	4375.09	passed
1024	3484.30	4309.79	passed
4096	3477.72	4337.56	passed

TABLE 6: Active-Active iSCSI Failover data throughput performance test results table for QLogic QLE3442-CU on both active nodes

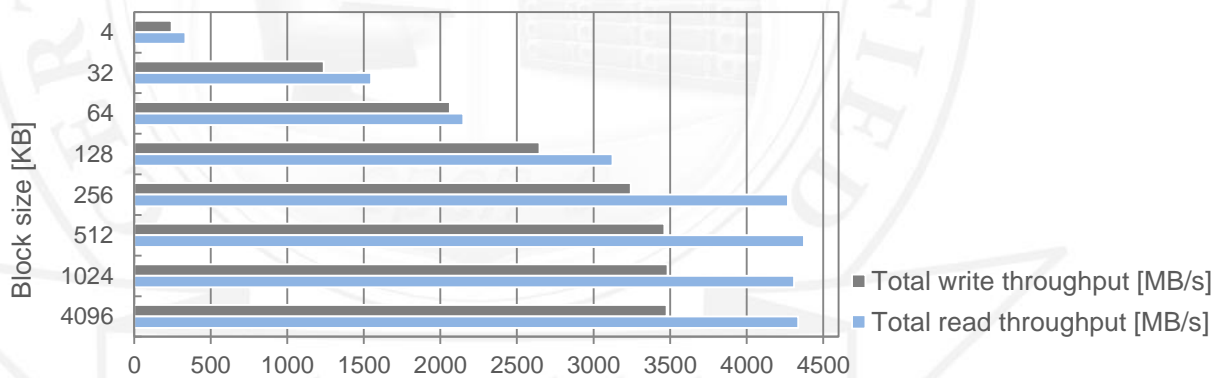


FIGURE 3: Active-Active iSCSI Failover data throughput performance test results chart for QLogic QLE3442-CU on both active nodes

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 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 bonded 10GbE 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 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	1	passed
20	4	passed

TABLE 7: Active-Passive iSCSI Failover resource group switching time test results table for QLogic QLE3442-CU on one active node

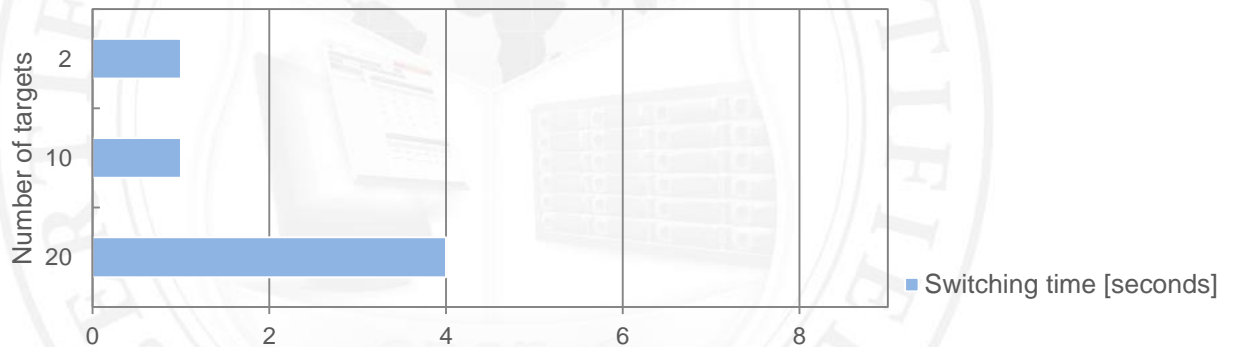


FIGURE 4: Active-Passive iSCSI Failover resource group switching time test chart for QLogic QLE3442-CU on one active node

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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 connected 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 bonded 10GbE 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 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	1	passed
20	2	passed

TABLE 8: Active-Active iSCSI Failover resource groups switching time test results table for QLogic QLE3442-CU on both active nodes

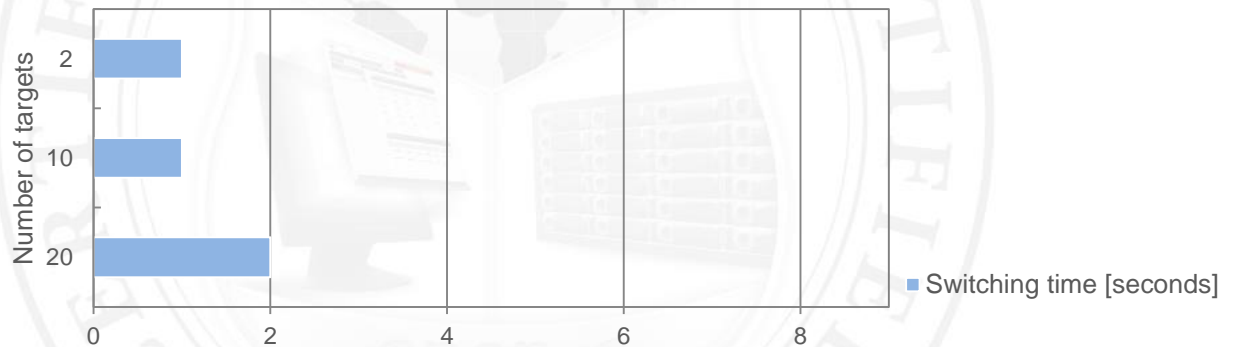


FIGURE 5: Active-Active iSCSI Failover resource groups switching time test chart for QLogic QLE3442-CU on both active nodes

High Availability
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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.

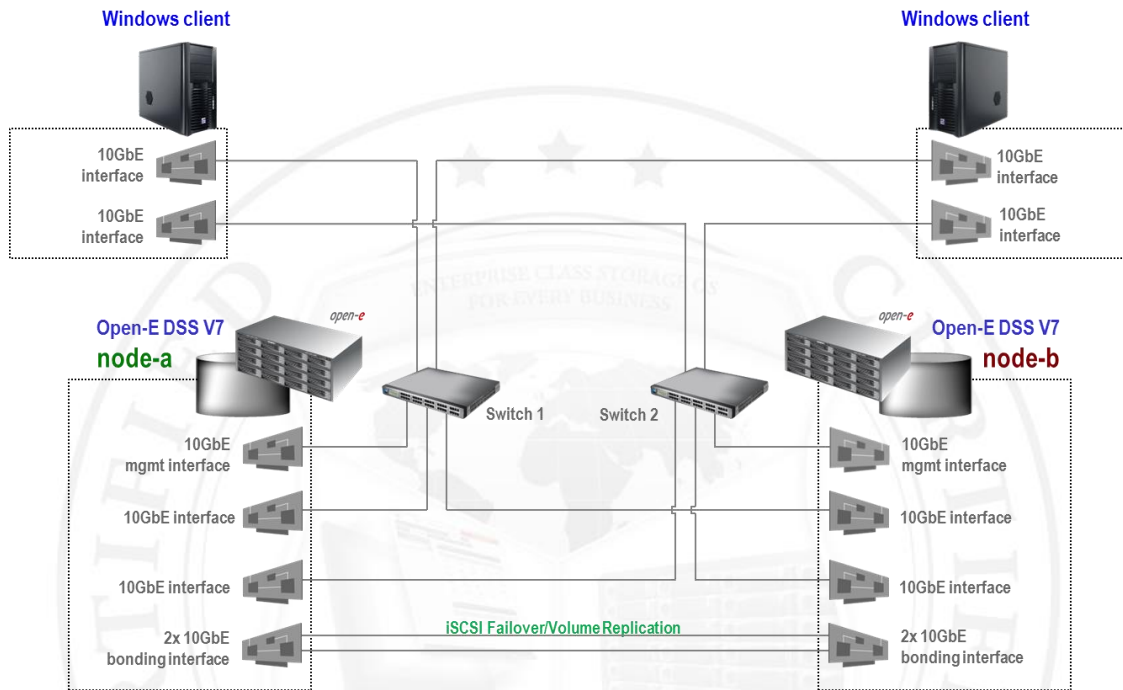


FIGURE 6: Network topology for High Availability solution functionality testing

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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 connected 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 bonded 10GbE 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

