



Open-E High Availability Certification report for NEC Express5800/R120f-1M



Executive summary

After successfully passing all the required tests, the NEC Express5800/R120f-1M 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 NEC Express5800/R120f-1M has met specific Open-E integration and interoperability standards.

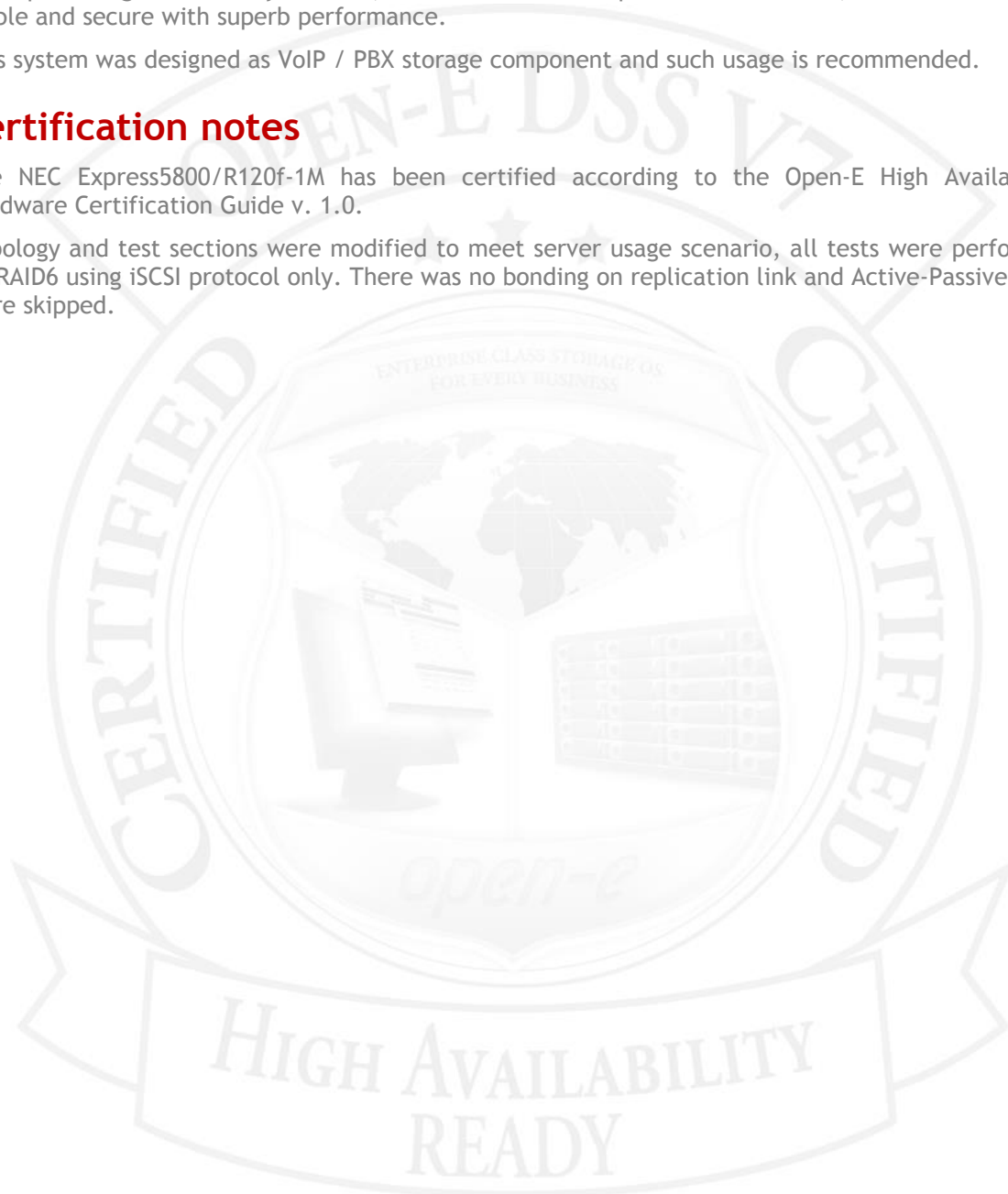
The Open-E High Availability solution, based on the NEC Express5800/R120f-1M, is considered to be stable and secure with superb performance.

This system was designed as VoIP / PBX storage component and such usage is recommended.

Certification notes

The NEC Express5800/R120f-1M has been certified according to the Open-E High Availability Hardware Certification Guide v. 1.0.

Topology and test sections were modified to meet server usage scenario, all tests were performed on RAID6 using iSCSI protocol only. There was no bonding on replication link and Active-Passive tests were skipped.





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High Availability solution hardware components

Technical specification of iSCSI Failover nodes is listed below:

| | |
|-----------------------------|--|
| Model | NEC Express5800/R120f-1M |
| Operating system | Open-E DSS V7 build 16323 |
| Enclosure/chassis | R120f-1M Base Unit |
| Motherboard | Micro-Star MS-S0901 |
| CPU | 2x Intel® Xeon® E5-2620 v3 2.40GHz |
| Memory | 2x 4GB hynix HMA451R7MFR8N-TF DDR4 ECC REG |
| Network | Broadcom Corporation NetXtreme BCM5719 quad-port |
| Hard disk controller | Avago MR9362-8i 1GB |
| Hard disk drives | 4x 1.09TB HGST HUC101812CSS200 |
| Hard disk drives | 2x 279GB HGST HUC101830CSS200 (boot drive) |

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 |
| Enclosure/chassis | R120f-1M Base Unit |
| Motherboard | Micro-Star MS-S0901 |
| CPU | Intel® Xeon® L5640 2.27GHz |
| Memory | 6x 4GB Samsung PC3-10600 DDR3 |
| Network | Intel® 82576 GbE Controller |
| Network | Intel® Gigabit ET Quad Port Server Adapter |
| Hard disk controller | Promise Supertrak EX8760T |
| Hard disk drives | 3x 300GB Seagate ST93000603SS |

TABLE 2: Hardware components of first Workstations with MS Windows

| | |
|----------------------|--|
| Model | Custom |
| Enclosure/chassis | R120f-1M Base Unit |
| Motherboard | Micro-Star MS-S0901 |
| CPU | Intel® Xeon® L5640 2.27GHz |
| Memory | 6x 4GB Samsung PC3-10600 DDR3 |
| Network | Intel® 82576 GbE Controller |
| Network | Intel® Gigabit ET Quad Port Server Adapter |
| Hard disk controller | Promise Supertrak EX8760T |
| Hard disk drives | 3x 300GB Seagate ST93000603SS |

TABLE 3: Hardware components of second Workstations with MS Windows

| | |
|-------------|------------------------|
| Model | 2x D-Link® DGS-1210-24 |
| Description | 24 x 1Gb ports |

TABLE 4: Network switches details

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

HIGH AVAILABILITY
READY

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.

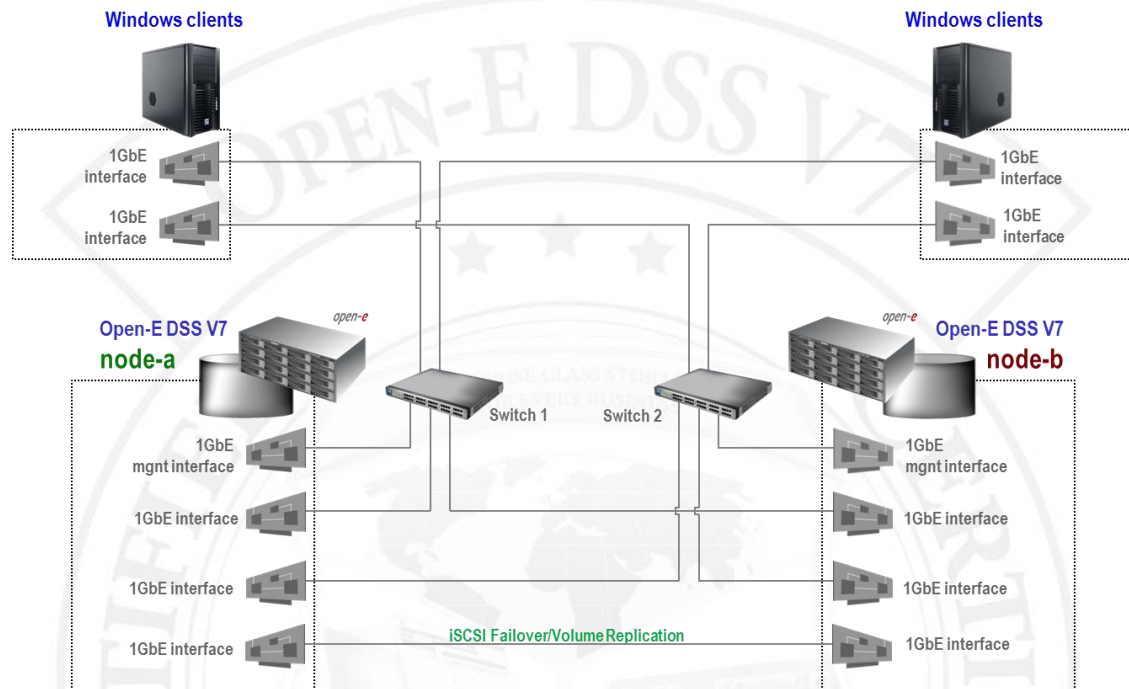


FIGURE 1: Network topology for High Availability performance testing

Active-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 lometer tool. One 1GbE interface is used on each node for Volume replication.

2. Test results for Active-Active iSCSI Failover data throughput performance using Broadcom Corporation NetXtreme BCM5719 quad-port 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 | 157.52 | 259.03 | passed |
| 32 | 229.99 | 468.68 | passed |
| 64 | 231.11 | 473.69 | passed |
| 128 | 231.62 | 473.79 | passed |
| 256 | 232.16 | 473.82 | passed |
| 512 | 231.96 | 473.86 | passed |
| 1024 | 231.88 | 473.98 | passed |
| 4096 | 231.67 | 473.39 | passed |

TABLE 5: Active-Active iSCSI Failover data throughput performance test results table for Broadcom Corporation NetXtreme BCM5719 quad-port on both active nodes

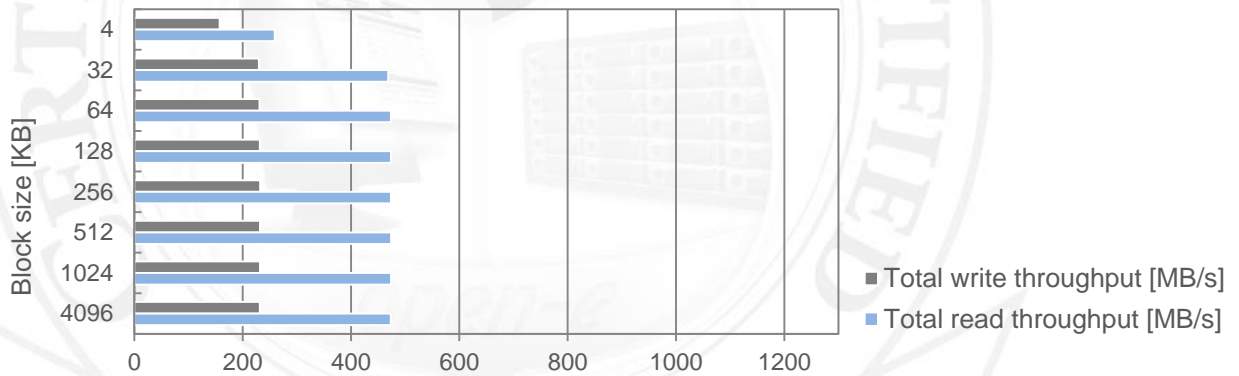


FIGURE 2: Active-Active iSCSI Failover data throughput performance test results chart for Broadcom Corporation NetXtreme BCM5719 quad-port on both active nodes

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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 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 1GbE interface is used on each node for Volume replication.

2. Test results for Active-Active iSCSI Failover resource groups switching time using Broadcom Corporation NetXtreme BCM5719 quad-port 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 | 5 | passed |
| 20 | 8 | passed |

TABLE 6: Active-Active iSCSI Failover resource groups switching time test results table for Broadcom Corporation NetXtreme BCM5719 quad-port on both active nodes

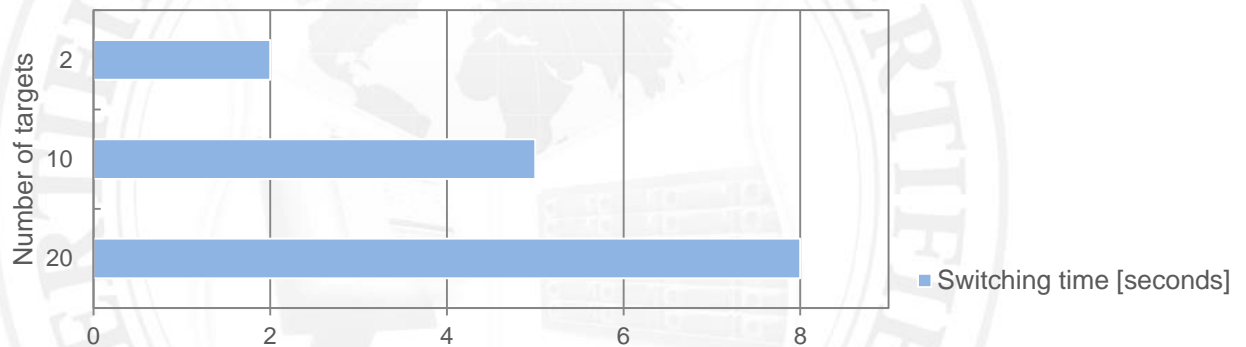


FIGURE 3: Active-Active iSCSI Failover resource groups switching time test chart for Broadcom Corporation NetXtreme BCM5719 quad-port on both active nodes

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.

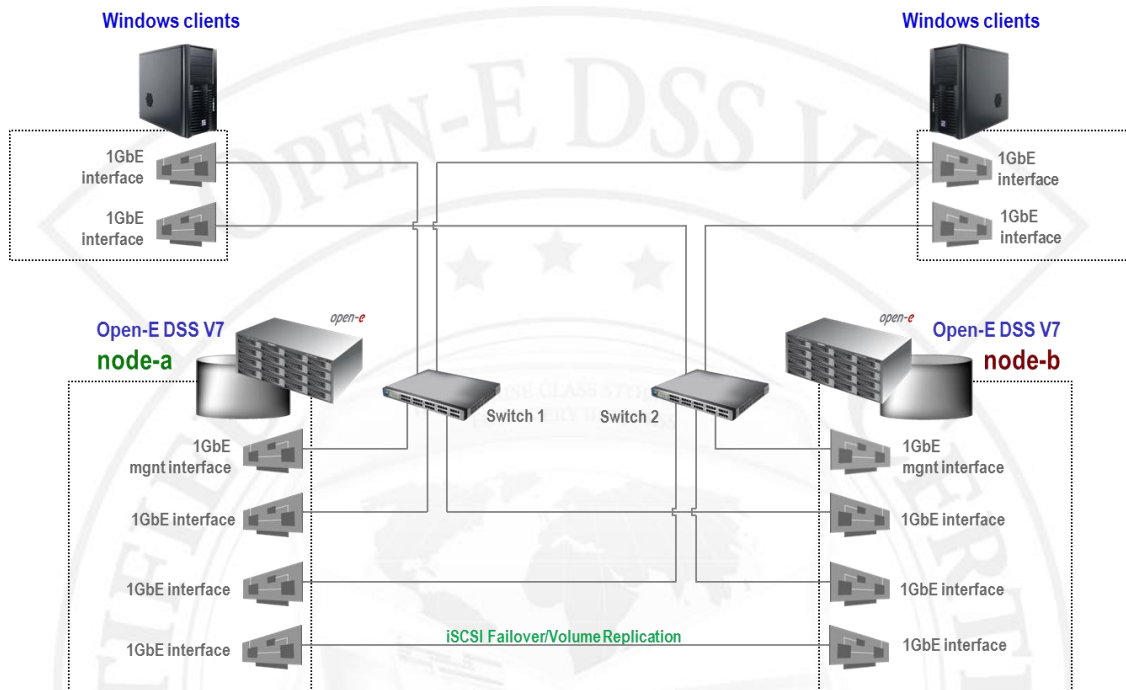


FIGURE 4: Network topology for High Availability solution functionality testing

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 1GbE 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 7: High Availability solution functionality test results table

