open-e

Open-E High Availability Certification report for FUJITSU PRIMERGY SX350 S8
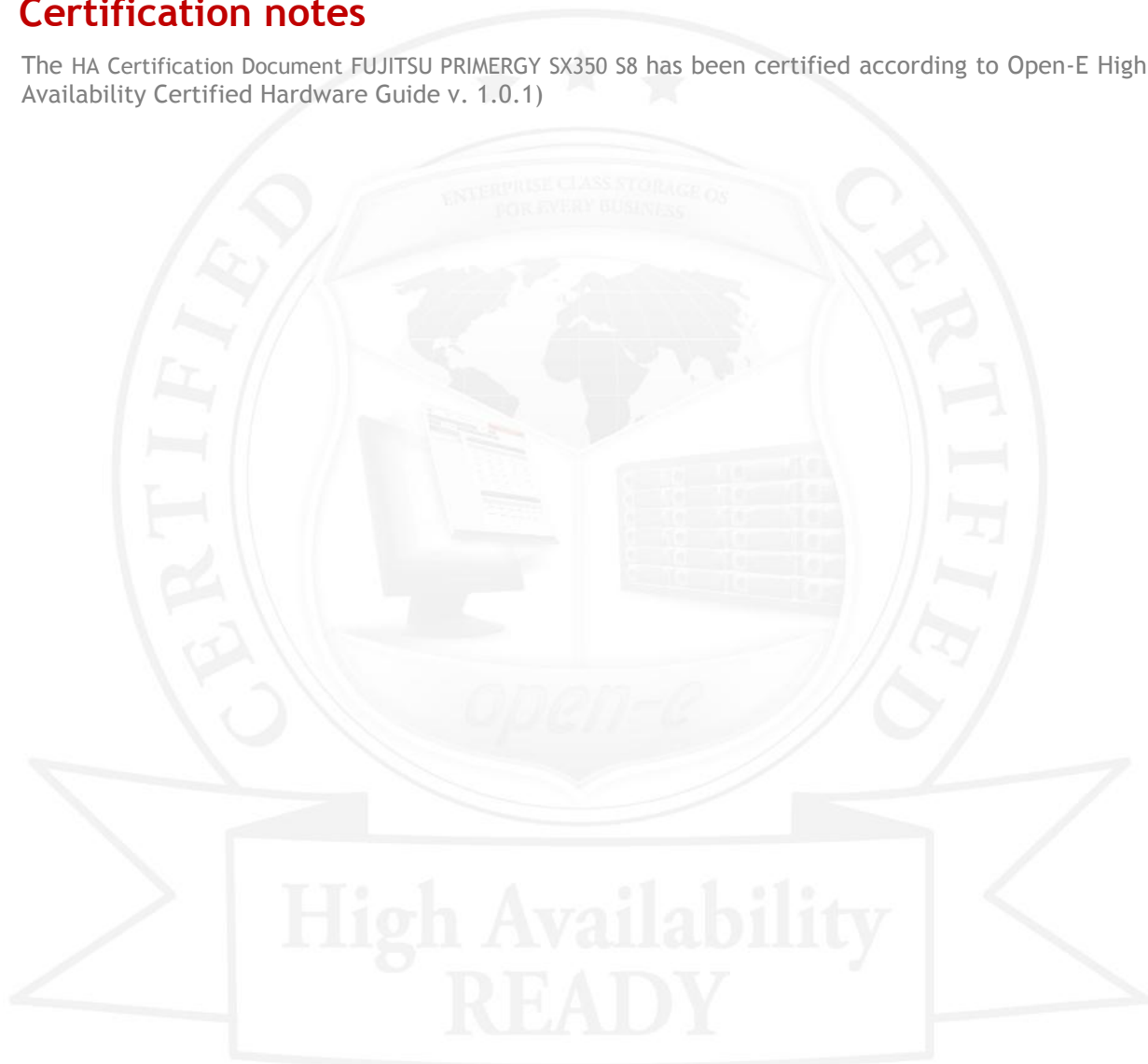
Executive summary

After successfully passing all the required tests, the FUJITSU PRIMERGY SX350 S8 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 FUJITSU PRIMERGY SX350 S8 has met specific Open-E integration and interoperability standards.

The Open-E High Availability solution, based on the FUJITSU PRIMERGY SX350 S8, is considered to be stable and secure with superb performance.

Certification notes

The HA Certification Document FUJITSU PRIMERGY SX350 S8 has been certified according to Open-E High Availability Certified Hardware Guide v. 1.0.1)

High Availability solution hardware components

Technical specification of iSCSI Failover nodes is listed below:

Model	FUJITSU PRIMERGY SX350 S8
Operating system	Open-E DSS V7 build 18016
Enclosure/chassis	PRIMERGY SX350 S8
CPU	Intel® Xeon® Processor E5-2630 v2 2.60GHz
Motherboard	FUJITSU D2949-B1
Memory	2x 8GB Hynix HMT41GR7AFR4A DDR3 ECC REG
Network	2x Intel® Ethernet Controller I350-AM2
Network	2x FUJITSU PRIMERGY 10Gb Network Controller (D2755)
HW RAID	FUJITSU RAID Controller SAS 6Gbit/s 1GB (D3116C)
Hard disk drives	2x 300GB Seagate Savio® ST300MM0006
Hard disk drives	8x 600GB Seagate Savio® 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	Intel® R2224GZ4GC4 2U Chassis
Motherboard	Intel® Server Board S2600GZ4
CPU	2x Intel® Xeon® Processor E5-2643 3.30GHz
Memory	8x 16GB Kingston 9965516-421.A00LF DDR3 ECC REG
Network	4x Intel® Ethernet Controller I350-AM4
Network	2x Dual Port Intel® 82599EB 10GbE I/O Module (AXX10GBNIAIOM)
Hard disk controller	Intel® Integrated RAID Module RMS25PB080
Hard disk drives	900GB Western Digital XE WD9001BKHG

TABLE 2: Hardware components of first Workstations with MS Windows

Model	Custom
Operating system	MS Windows Server 2012 R2
Enclosure/chassis	Intel® R2224GZ4GC4 2U Chassis
Motherboard	Intel® Server Board S2600GZ4
CPU	2x Intel® Xeon® Processor E5-2643 3.30GHz
Memory	8x 16GB Kingston 9965516-421.A00LF DDR3 ECC REG
Network	4x Intel® Ethernet Controller I350-AM4
Network	2x Dual Port Intel® 82599EB 10GbE I/O Module (AXX10GBNIAIOM)
Hard disk controller	Intel® Integrated RAID Module RMS25PB080
Hard disk drives	900GB Western Digital XE WD9001BKHG

TABLE 3: Hardware components of second Workstations with MS Windows

Model	Supermicro SSE-G24-TG4
Description	4 ports 10GbE, 24 ports 1GbE, 4 ports SFP Combo

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

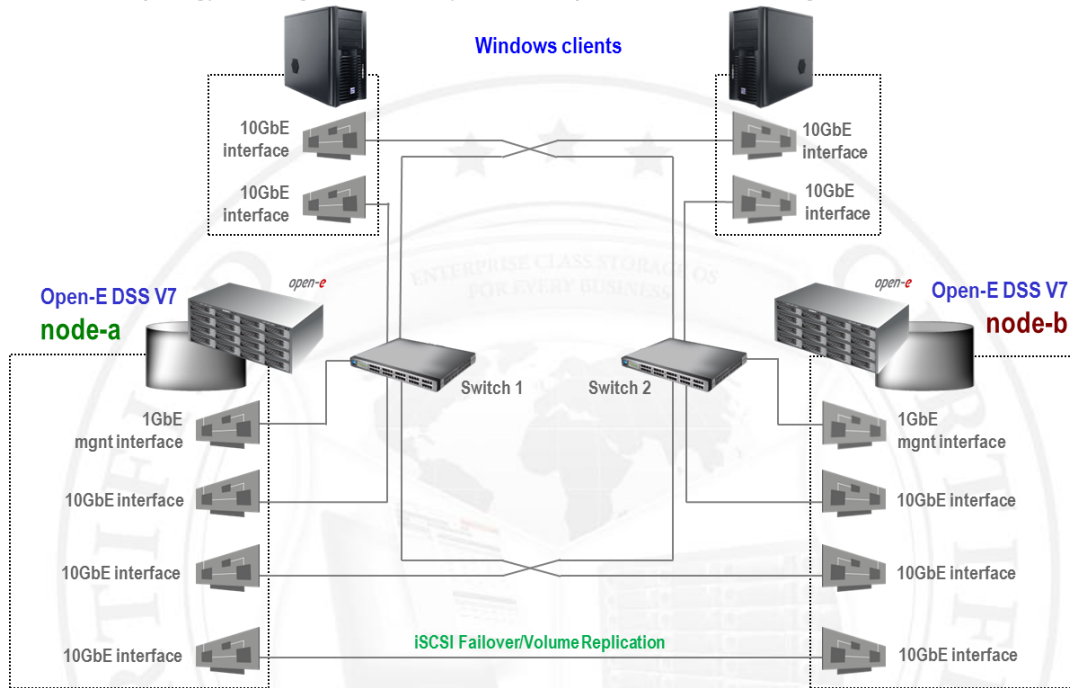Network topology for High Availability solution performance testing is shown below.

FIGURE 1: *Network topology for High Availability performance testing*

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 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 FUJITSU PRIMERGY 10Gb Network Controller (D2755) 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	313.24	240.57	passed
32	898.74	605.16	passed
64	917.26	687.40	passed
128	969.82	673.61	passed
256	988.11	664.26	passed
512	981.97	676.30	passed
1024	986.42	777.87	passed
4096	973.87	721.21	passed

TABLE 5: *Active-Passive iSCSI Failover data throughput performance test results table for FUJITSU PRIMERGY 10Gb Network Controller (D2755) on one active node*
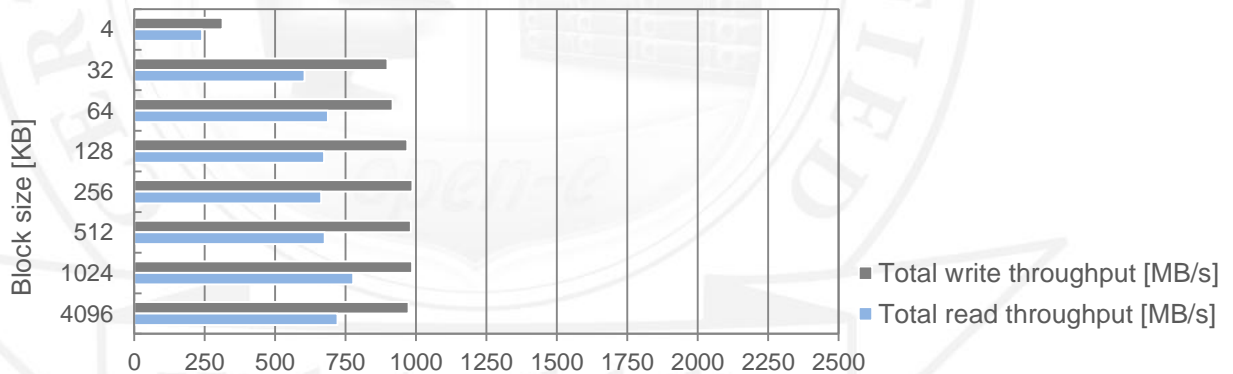

FIGURE 2: *Active-Passive iSCSI Failover data throughput performance test results chart for FUJITSU PRIMERGY 10Gb Network Controller (D2755) on one active node*

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 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 FUJITSU PRIMERGY 10Gb Network Controller (D2755) 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	317.85	512.44	passed
32	1439.96	991.54	passed
64	1635.46	1166.67	passed
128	1372.60	1177.19	passed
256	1500.34	1168.89	passed
512	2061.55	1275.29	passed
1024	2016.91	1463.41	passed
4096	1954.06	1468.77	passed

TABLE 6: Active-Active iSCSI Failover data throughput performance test results table for FUJITSU PRIMERGY 10Gb Network Controller (D2755) on both active nodes
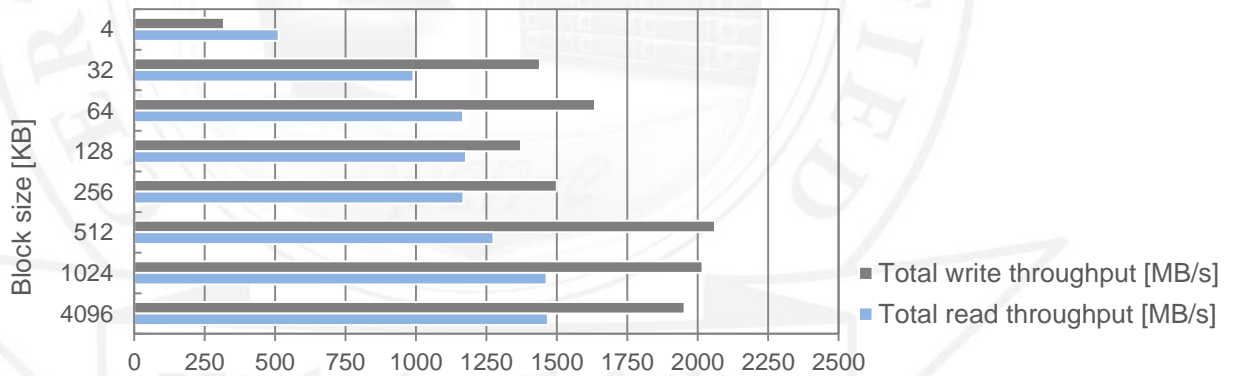

FIGURE 3: Active-Active iSCSI Failover data throughput performance test results chart for FUJITSU PRIMERGY 10Gb Network Controller (D2755) on both active nodes

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 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. One 10GbE interface is used on each node for Volume replication.

2. Test results for Active-Passive iSCSI Failover resource group switching time using FUJITSU PRIMERGY 10Gb Network Controller (D2755) on both active nodes

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

TABLE 7: Active-Passive iSCSI Failover resource group switching time test results table for FUJITSU PRIMERGY 10Gb Network Controller (D2755) on one active node
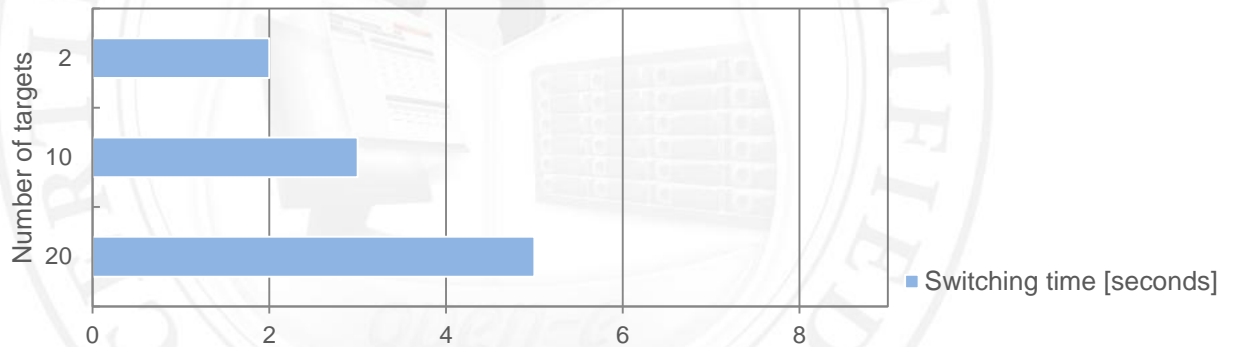

FIGURE 4: Active-Passive iSCSI Failover resource group switching time test chart for FUJITSU PRIMERGY 10Gb Network Controller (D2755) on one active node

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 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. One 10GbE interface is used on each node for Volume replication.

2. Test results for Active-Active iSCSI Failover resource groups switching time using FUJITSU PRIMERGY 10Gb Network Controller (D2755) 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	2	passed
20	3	passed

TABLE 8: *Active-Active iSCSI Failover resource groups switching time test results table for FUJITSU PRIMERGY 10Gb Network Controller (D2755) on both active nodes*
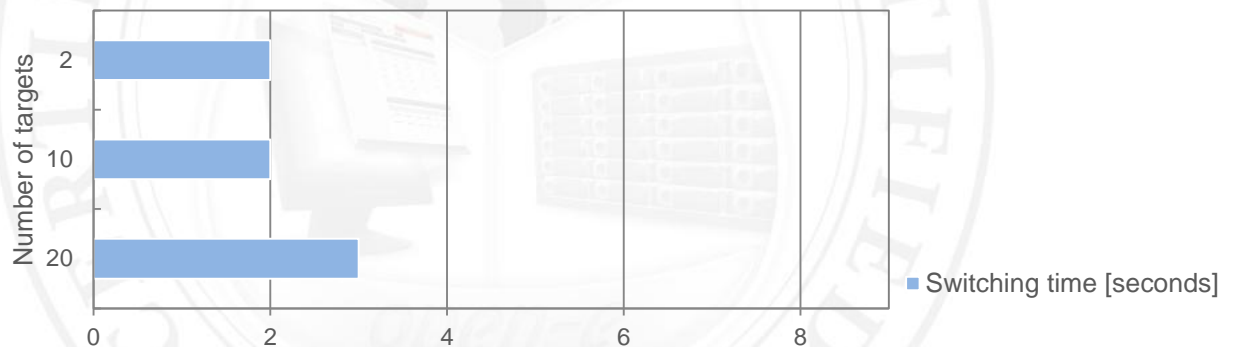

FIGURE 5: *Active-Active iSCSI Failover resource groups switching time test chart for FUJITSU PRIMERGY 10Gb Network Controller (D2755) on both active nodes*

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

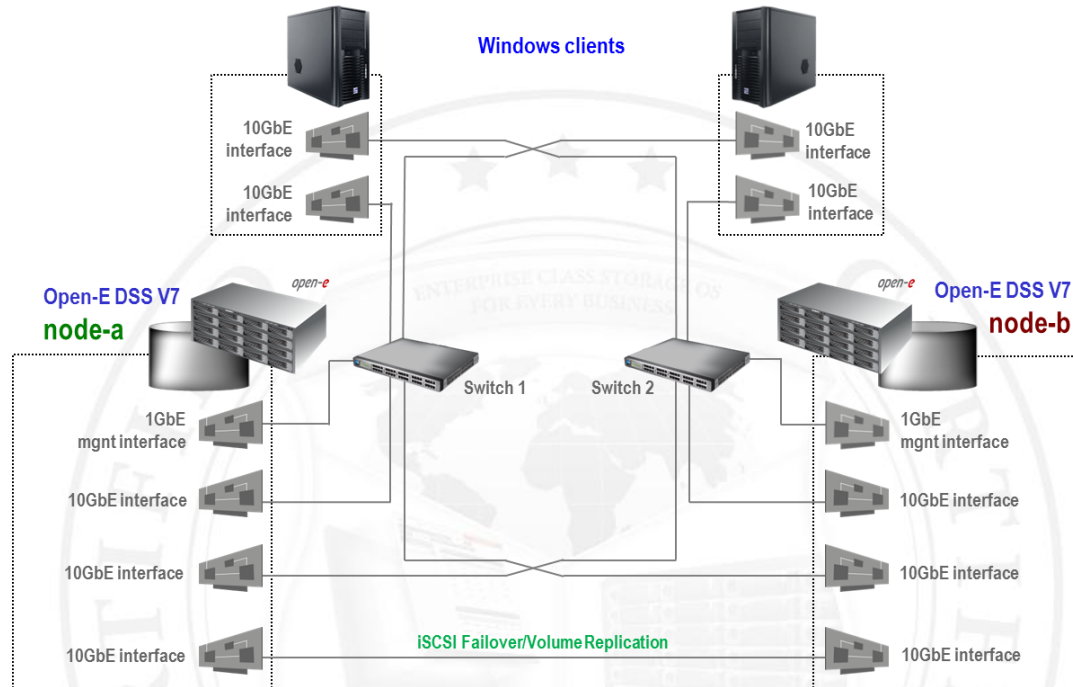Network topology for High Availability solution functionality testing is presented below.

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 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 9: High Availability solution functionality test results table