NEWNET Huawei Tecal RH2285 V2 system

Executive summary

After performing all tests, the NEWNET HUAWEI Tecal RH2285 V2 has been officially certified according to the Open-E Hardware Certification Program Guide 2.1

During the tests, it was found that the system is functional and efficient. With the Open-E DSS V7 operating system installed, the NEWNET HUAWEI Tecal RH2285 V2 is stable and performs well. In general, the system can be used for many different applications, but the following are recommended:

✓ **NAS filer**

The following features make NEWNET HUAWEI Tecal RH2285 V2 a good NAS filer solution:

➢ Twelve high capacity SAS hard drives with SSD cache provide a lot of space for user files and ensure fast random access.

➢ Hardware RAID5, RAID6, RAID10, RAID50 and RAID60 for fault tolerance and the most efficient use of available disk space.

➢ Two 10GbE interfaces for independent connection to different networks or link aggregation for improved throughput.

➢ Two 1GbE interfaces for flexible network topology

✓ **Storage for virtualization**

For this application the following can be used:

➢ Hardware RAID 10 for high performance and data safety.

➢ Two 1GbE interfaces for flexible network topology or fast MPIO connection.

➢ Two 10GbE interfaces for efficient network connections to virtualization platforms.

➢ SSD cache for I/O bottlenecks elimination and increased virtual machine density.

✓ **iSCSI storage**

For this application the following server features are useful:

➢ Two 10GbE interfaces provides enough throughput for large amount of users. MPIO may be used for even greater performance.

➢ Four 1GbE interfaces for fast MPIO connection.

➢ High hardware RAID levels with SSD cache for high performance, data safety and the most efficient use of available disk space.

➢ Redundant power supply for system reliability

Certification notes

For link aggregation, it is recommended to use balance-alb bonding mode.

Tests were performed on four iSCSI Targets simultaneously.

NEWNET Huawei RH2285 V2 hardware components

Technical specifications about the certified system are listed below:

Model	Huawei RH2285 V2
Operating system	Open-E DSS V7 build 10529
Enclosure/chassis	Huawei RH2285 V2
CPU	2x Intel® Xeon® Processor E5-2407 2.20GHz
Motherboard	Huawei RH2285 V2
Memory	6x 8GB HYNIX DDR3 ECC-REG 1333MHz
Network	Intel® 82580 EB Gigabit Ethernet Conroller
Network	Intel® Ethernet Converged Network Adapter X520-SR2
HW RAID	Huawei SR320BC 1GB
HW RAID	Intel® C600/X79 series chipset 6-Port SATA AHCI Controller
Hard disk drives	2x Intel® SSD 520 Series SSDSC2CW240A3
Hard disk drives	12x 3TB Seagate Constellation ES.2 ST33000650SS

TABLE 1: *Hardware components list of Certified System with Open-E DSS V7*

NEWNET Huawei RH2285 V2 photos

FIGURE 1: Front photo

FIGURE 2: Rear photo

FIGURE 3: Top photo

Auxiliary systems hardware components

Auxiliary systems with MS Windows or Open-E DSS V7 installed, used in Open-E Hardware Certification Process.

Model	Custom
Operating system	MS Windows Server 2012 R2
Enclosure/chassis	Intel® Server System SR2600UR
Motherboard	Intel® S5500UR
CPU	Intel® Xeon® Processor E5520 2.26GHz
Memory	4x Kingston KVR1333D3E9S/4G
Network	Intel® 82575EB Gigabit Ethernet Controller
Network	Intel® Ethernet Converged Network Adapter X520-SR1
HW RAID	Intel® 82801JI (ICH10 Family) 4 port SATA IDE Controller
Hard disk drives	Hitachi Ultrastar A7K1000 HUA721075KLA330

TABLE 2: Hardware components of first Workstation with MS Windows

Model	Custom
Operating system	MS Windows Server 2012 R2
Enclosure/chassis	Intel® Server System SR2520SA
Motherboard	Intel® Server Board S5000VSA
CPU	2x Intel® Xeon® Processor 5130 2.0Ghz
Memory	2x Kingston KVR667D2D8F5/2G
Memory	2x Kingston KVR667D2D8F5/1G
Network	2x Intel® 80003ES2LAN Gigabit Ethernet Controller
Network	Intel® Ethernet Converged Network Adapter X520-SR1
HW RAID	Intel® 631xESB/632xESB SATA AHCI Controller
Hard disk drives	Hitachi Deskstar T7K250 HDT722525DLA380

TABLE 3: Hardware components of second Workstation with MS Windows

Model	Custom
Operating system	Open-E DSS V7 build 10529
Enclosure/chassis	Huawei RH2285 V2
CPU	2x Intel® Xeon® Processor E5-2407 2.20GHz
Motherboard	Huawei RH2285 V2
Memory	6x 8GB HYNIX DDR3 ECC-REG 1333MHz
Network	Intel® 82580 EB Gigabit Ethernet Controller
Network	Intel® Ethernet Converged Network Adapter X520-SR2
HW RAID	Huawei SR320BC 1GB
HW RAID	Intel® C600/X79 series chipset 6-Port SATA AHCI Controller
Hard disk drives	2x Intel® SSD 520 Series SSDSC2CW240A3
Hard disk drives	12x 3TB Seagate Constellation ES.2 ST33000650SS

TABLE 4: Hardware components of Workstation with Open-E DSS V7

Model	Netgear GS724T-300
Description	24 ports Gigabit with 1000BaseT connection

TABLE 5: Network switch details for 1GbE connections

Model	Huawei Quidway S6700-24-EI
Description	24 ports 10GbE with SFP+ connection

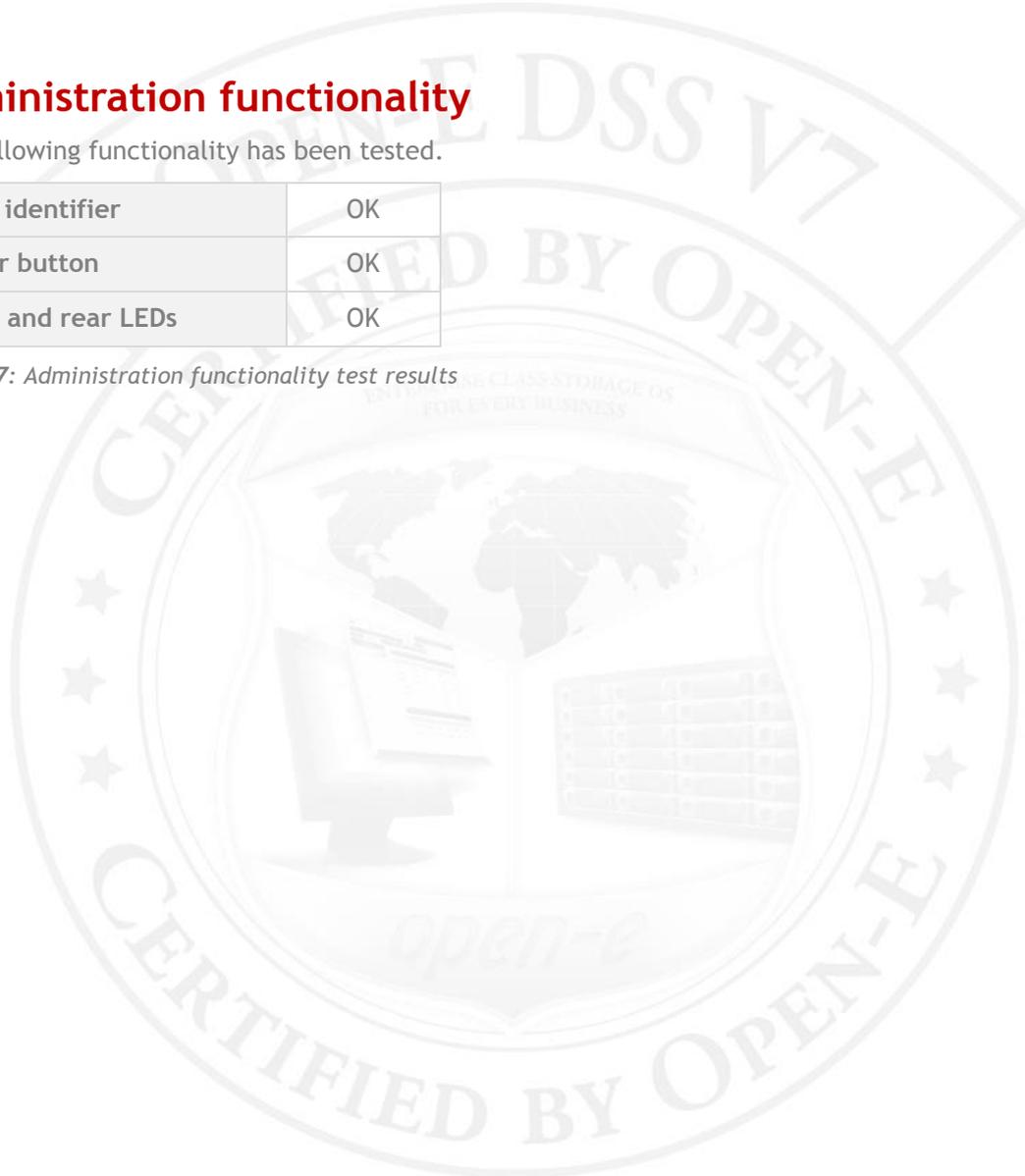*TABLE 6: Network switch details for 10 GbE connections*

Administration functionality

The following functionality has been tested.

Drive identifier	OK
Power button	OK
Front and rear LEDs	OK

TABLE 7: Administration functionality test results

Network functionality

Tests performed in this section check the functionality, performance and stability of the network solutions available in the Open-E DSS V7 product on the certified system.

The tests rely on configuring the iSCSI targets and copying the data from many *Workstations with MS Windows* through various network connections with big block size using appropriate testing tools.

Network test topology

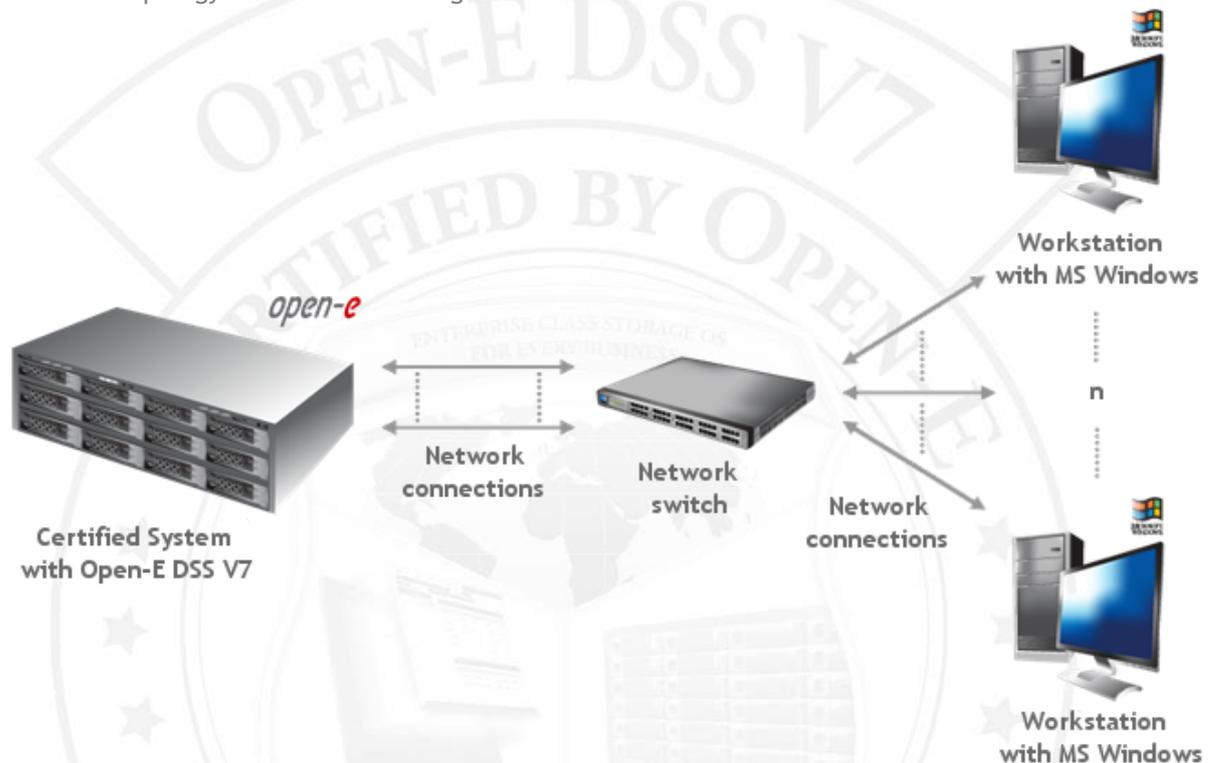Network topology for Network testing is shown below.

FIGURE 4: Network topology for Network testing

802.3ad bonding mode test

1. Test description

The test relies on configuring the iSCSI targets and copying the data from many *Workstations with MS Windows* through an 802.3ad bonding mode network connection with a 4MB block size using the Iometer testing tool.

2. Test results for 802.3ad bonding mode test performed on Intel® 82580 EB Gigabit Ethernet Controller

802.3ad bonding mode performance test results			
NIC model	Intel® 82580 EB Gigabit Ethernet Controller		
Workstations with MS Windows	Write speed [MB/s]	Read speed [MB/s]	Performance test results
1st Workstation	117.75	117.56	passed
2nd Workstation	117.79	117.56	passed

TABLE 8: *802.3ad bonding mode performance test results table for Intel® 82580 EB Gigabit Ethernet Controller*
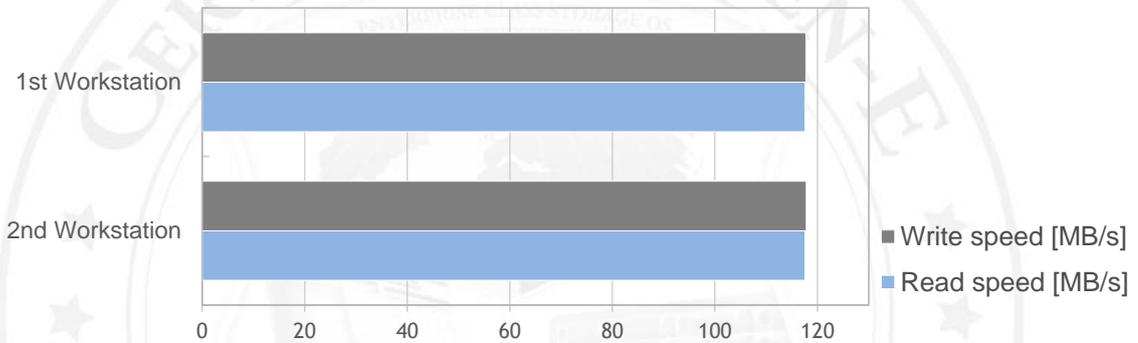

FIGURE 5: *802.3ad bonding mode performance test results chart for Intel® 82580 EB Gigabit Ethernet Controller*

3. Test results for 802.3ad bonding mode test performed on Intel® Ethernet Converged Network Adapter X520-SR2

802.3ad bonding mode performance test results			
NIC model	Intel® Ethernet Converged Network Adapter X520		
Workstations with MS Windows	**Write speed [MB/s]**	**Read speed [MB/s]**	**Performance test results**
1st Workstation	964.52	771.11	passed
2nd Workstation	629.93	405.54	passed

TABLE 9: 802.3ad bonding mode performance test results table for Intel® Ethernet Converged Network Adapter X520-SR2
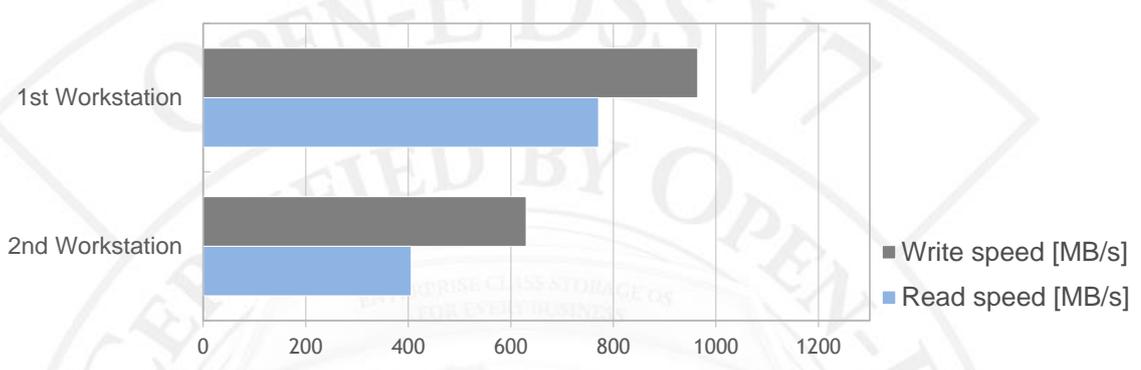

FIGURE 6: 802.3ad bonding mode performance test results chart for Intel® Ethernet Converged Network Adapter X520-SR2

Balance-alb bonding mode test

1. Test description

The test relies on configuring the iSCSI targets and copying the data from many *Workstations with MS Windows* through a Balance-alb bonding mode network connection with a 4MB block size using the Iometer testing tool.

2. Test results for Balance-alb bonding mode test performed on Intel® 82580 EB Gigabit Ethernet Controller

Balance-alb bonding mode performance test results			
NIC model	Intel® 82580 EB Gigabit Ethernet Controller		
Workstations with MS Windows	Write speed [MB/s]	Read speed [MB/s]	Performance test results
1st Workstation	117.66	117.56	passed
2nd Workstation	117.79	117.55	passed

TABLE 10: *Balance-alb bonding mode performance test results table for Intel® 82580 EB Gigabit Ethernet Controller*
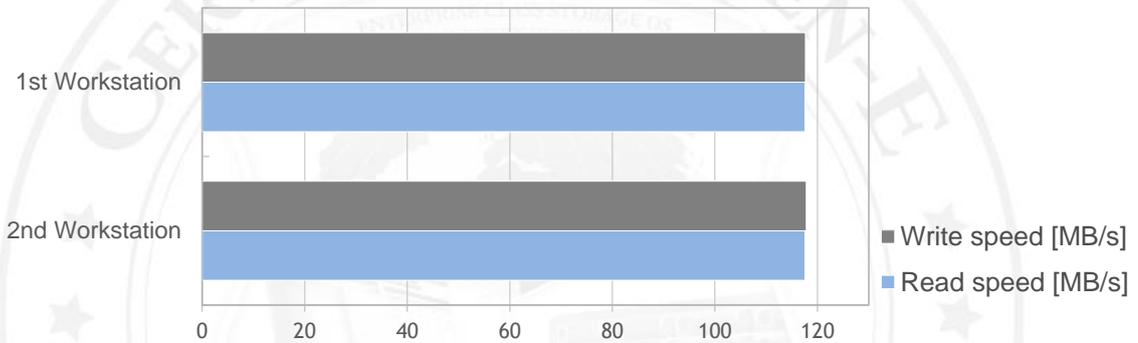

FIGURE 7: *Balance-alb bonding mode performance test results chart for Intel® 82580 EB Gigabit Ethernet Controller*

3. Test results for Balance-alb bonding mode test performed on Intel® Ethernet Converged Network Adapter X520-SR2

Balance-alb bonding mode performance test results			
NIC model	Intel® Ethernet Converged Network Adapter X520		
Workstations with MS Windows	Write speed [MB/s]	Read speed [MB/s]	Performance test results
1st Workstation	1041.67	930.96	passed
2nd Workstation	629.93	405.54	passed

TABLE 11: *Balance-alb bonding mode performance test results table for Intel® Ethernet Converged Network Adapter X520-SR2*
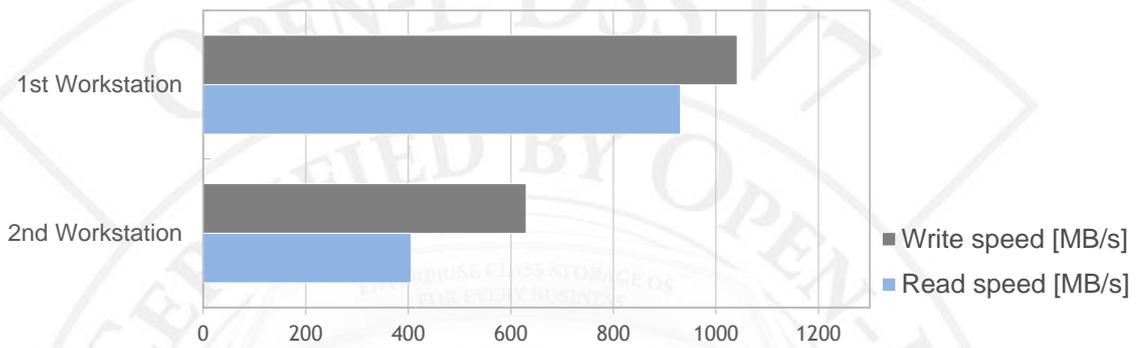

FIGURE 8: *Balance-alb bonding mode performance test results chart for Intel® Ethernet Converged Network Adapter X520-SR2*

Balance-rr bonding mode test

1. Test description

The test relies on configuring the iSCSI targets and copying the data from many *Workstations with MS Windows* through a Balance-rr bonding mode network connection with a 4MB block size using the Iometer testing tool.

2. Test results for Balance-rr bonding mode test performed on Intel® 82580 EB Gigabit Ethernet Controller

Balance-rr bonding mode performance test results			
NIC model	Intel® 82580 EB Gigabit Ethernet Controller		
Workstations with MS Windows	Write speed [MB/s]	Read speed [MB/s]	Performance test results
1st Workstation	91.20	91.16	passed
2nd Workstation	92.87	95.20	passed

TABLE 12: Balance-rr bonding mode performance test results table for Intel® 82580 EB Gigabit Ethernet Controller
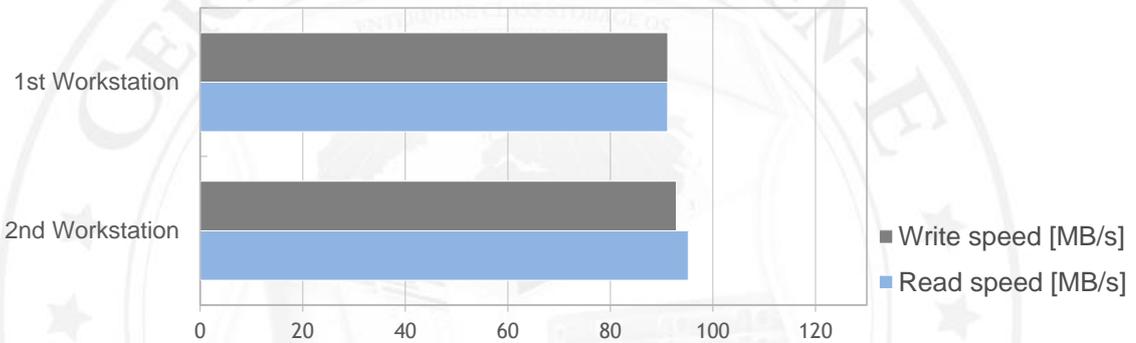

FIGURE 9: Balance-rr bonding mode performance test results chart for Intel® 82580 EB Gigabit Ethernet Controller

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3. Test results for Balance-rr bonding mode test performed on Intel® Ethernet Converged Network Adapter X520-SR2

Balance-rr bonding mode performance test results			
NIC model	Intel® Ethernet Converged Network Adapter X520		
Workstations with MS Windows	Write speed [MB/s]	Read speed [MB/s]	Performance test results
1st Workstation	556.42	470.36	passed
2nd Workstation	579.92	514.05	passed

TABLE 13: Balance-rr bonding mode performance test results table for Intel® Ethernet Converged Network Adapter X520-SR2
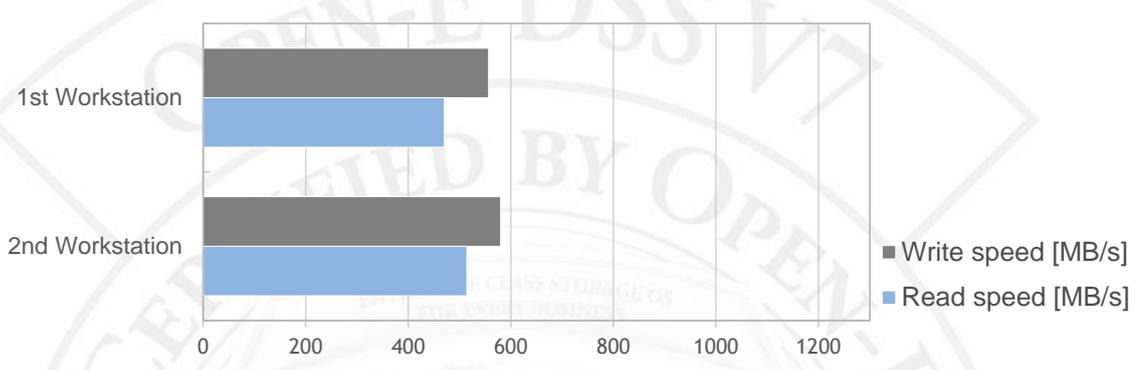

FIGURE 10: Balance-rr bonding mode performance test results chart for Intel® Ethernet Converged Network Adapter X520-SR2

Single NIC performance test

1. Test description

The test relies on configuring the iSCSI targets and copying the data from *Workstations with MS Windows* through single NIC with a 4MB block size using the Iometer testing tool.

2. Test results for single NIC test performed on Intel® 82580 EB Gigabit Ethernet Controller

Single NIC performance test results			
NIC model	Intel® 82580 EB Gigabit Ethernet Controller		
Workstations with MS Windows	Write speed [MB/s]	Read speed [MB/s]	Performance test results
1st Workstation	117.78	117.56	passed

TABLE 14: Single NIC performance test results table for Intel® 82580 EB Gigabit Ethernet Controller
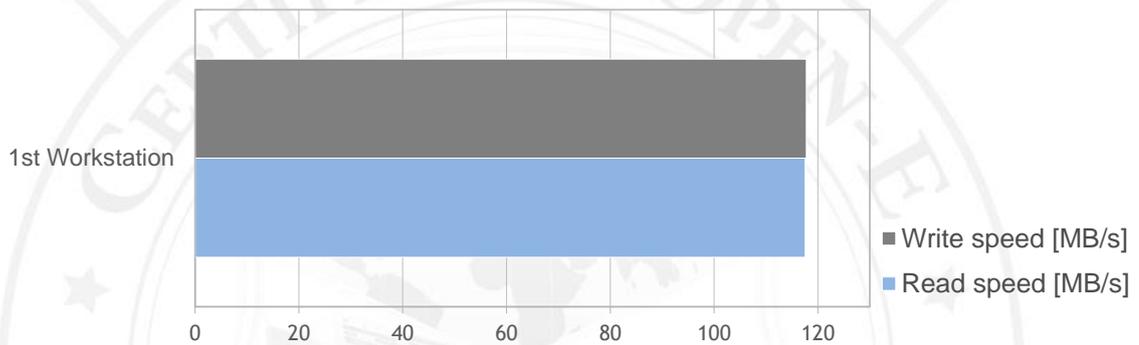

FIGURE 11: Single NIC performance test results chart for Intel® 82580 EB Gigabit Ethernet Controller

3. Test results for single NIC test performed on Intel® Ethernet Converged Network Adapter X520-SR2

Single NIC performance test results			
NIC model	Intel® Ethernet Converged Network Adapter X520		
Workstations with MS Windows	Write speed [MB/s]	Read speed [MB/s]	Performance test results
1st Workstation	1169.70	1175.39	passed

TABLE 15: *Single NIC performance test results table for Intel® Ethernet Converged Network Adapter X520-SR2*
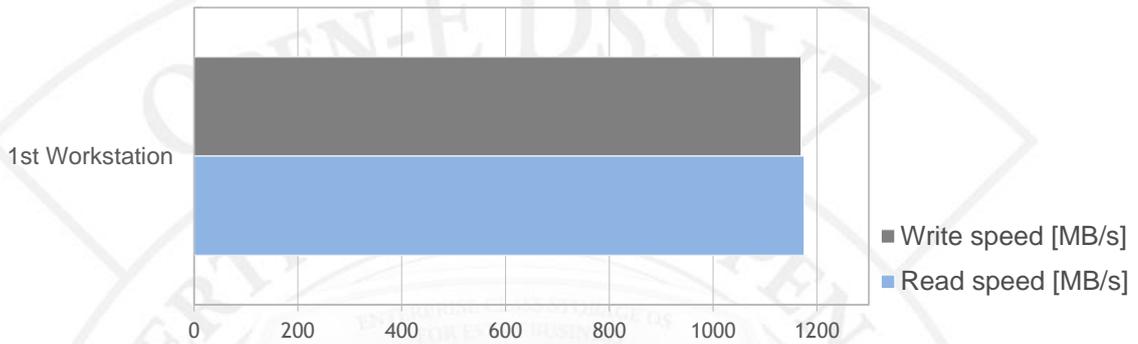

FIGURE 12: *Single NIC performance test results chart for Intel® Ethernet Converged Network Adapter X520-SR2*

RAID functionality

Tests performed in this section check the functionality, performance and stability of Open-E DSS V7 storage devices on the certified system.

Tests in this section rely on the creation of the RAID units on 0, 1, 5, 6, 10, 50 and 60 levels, configuring the iSCSI target and copying the data from a *Workstation with MS Windows* via network connection with various block sizes using the Iometer testing tool.

RAID test topology

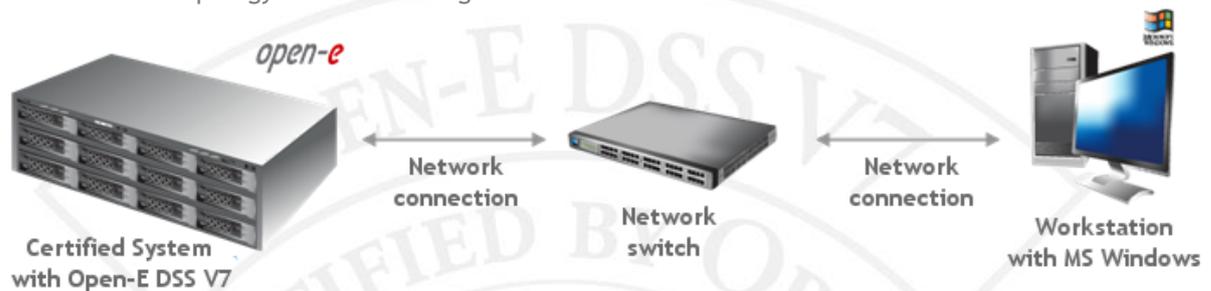Network test topology for RAID testing is shown below

FIGURE 13: Network test topology for RAID testing

Hardware RAID0 test

1. Test description

The test relies on creation of the RAID0 unit on all hard disk drives, configuring the iSCSI target and copying the data from a *Workstation with MS Windows* via network connection with various block sizes using the Iometer testing tool.

2. Test results for RAID0 and Intel® Ethernet Converged Network Adapter X520-SR2

RAID0 performance test results			
Block size [KB]	Write speed [MB/s]	Read speed [MB/s]	Performance test results
4	35.95	80.55	passed
32	264.48	548.55	passed
64	464.21	950.80	passed
128	754.56	1170.61	passed
256	1096.07	1172.44	passed
512	1174.35	1172.21	passed
1024	1176.68	1176.55	passed
4096	1178.79	1177.83	passed

TABLE 16: *RAID0 performance test results table for Intel® Ethernet Converged Network Adapter X520-SR2*
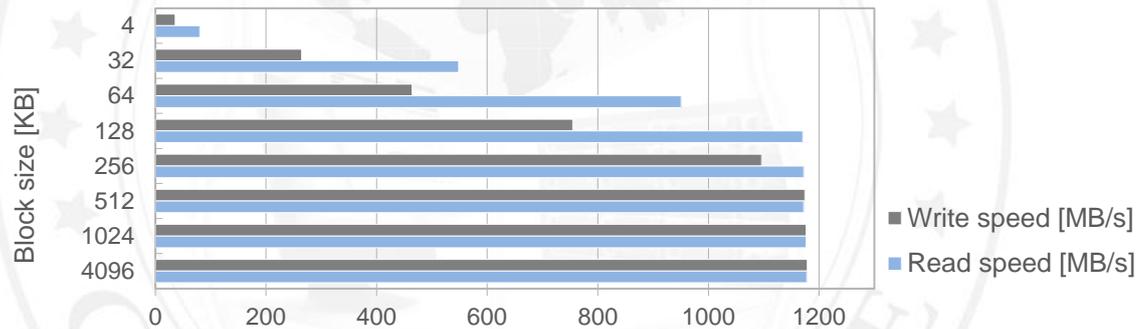

FIGURE 14: *RAID0 performance test results chart for Intel® Ethernet Converged Network Adapter X520-SR2*

Hardware RAID1 test

1. Test description

The test relies on creation of the RAID1 unit on all hard disk drives, configuring the iSCSI target and copying the data from a *Workstation with MS Windows* via network connection with various block sizes using the Iometer testing tool.

2. Test results for RAID1 and Intel® Ethernet Converged Network Adapter X520-SR2

RAID1 performance test results			
Block size [KB]	Write speed [MB/s]	Read speed [MB/s]	Performance test results
4	36.83	74.84	passed
32	261.55	533.78	passed
64	455.34	896.09	passed
128	721.29	1166.04	passed
256	1030.04	674.14	passed
512	1162.95	524.04	passed
1024	1176.12	655.19	passed
4096	1177.84	849.51	passed

TABLE 17: RAID1 performance test results table for Intel® Ethernet Converged Network Adapter X520-SR2
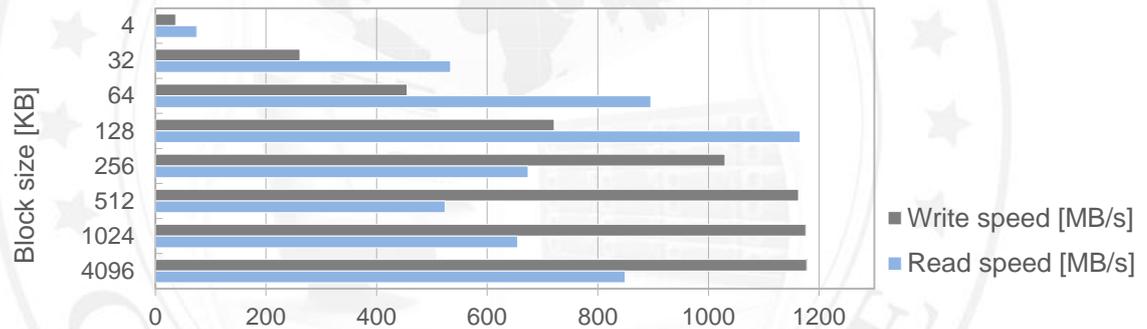

FIGURE 15: RAID1 performance test results chart for Intel® Ethernet Converged Network Adapter X520-SR2

Hardware RAID5 test

1. Test description

The test relies on creation of the RAID5 unit on all hard disk drives, configuring the iSCSI target and copying the data from a *Workstation with MS Windows* via network connection with various block sizes using the Iometer testing tool.

2. Test results for RAID5 and Intel® Ethernet Converged Network Adapter X520-SR2

RAID5 performance test results			
Block size [KB]	Write speed [MB/s]	Read speed [MB/s]	Performance test results
4	34.52	68.64	passed
32	256.27	517.68	passed
64	441.07	813.63	passed
128	695.00	987.14	passed
256	985.39	935.69	passed
512	1119.92	1099.82	passed
1024	1154.68	1102.20	passed
4096	1176.76	1043.61	passed

TABLE 18: RAID5 performance test results table for Intel® Ethernet Converged Network Adapter X520-SR2
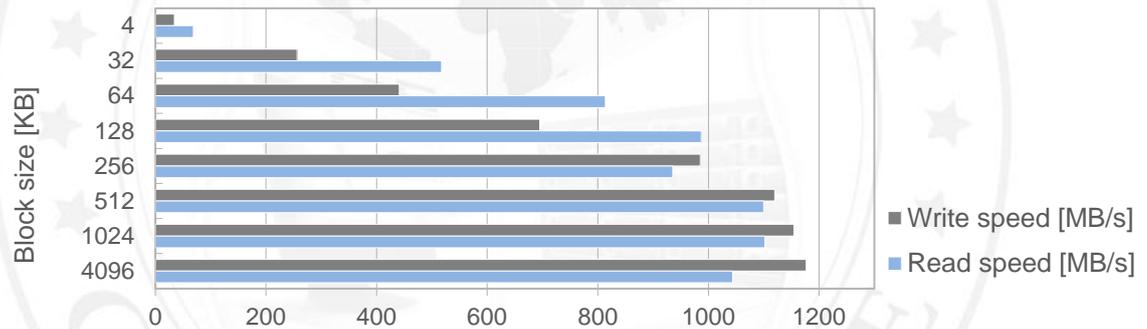

FIGURE 16: RAID5 performance test results chart for Intel® Ethernet Converged Network Adapter X520-SR2

Hardware RAID6 test

1. Test description

The test relies on creation of the RAID6 unit on all hard disk drives, configuring the iSCSI target and copying the data from a *Workstation with MS Windows* via network connection with various block sizes using the Iometer testing tool.

2. Test results for RAID6 and Intel® Ethernet Converged Network Adapter X520-SR2

RAID6 performance test results			
Block size [KB]	Write speed [MB/s]	Read speed [MB/s]	Performance test results
4	33.96	68.87	passed
32	254.21	518.05	passed
64	432.88	792.03	passed
128	681.81	932.22	passed
256	975.70	902.63	passed
512	1111.78	1041.20	passed
1024	1162.49	1043.51	passed
4096	1175.20	988.66	passed

TABLE 19: *RAID6 performance test results table for Intel® Ethernet Converged Network Adapter X520-SR2*
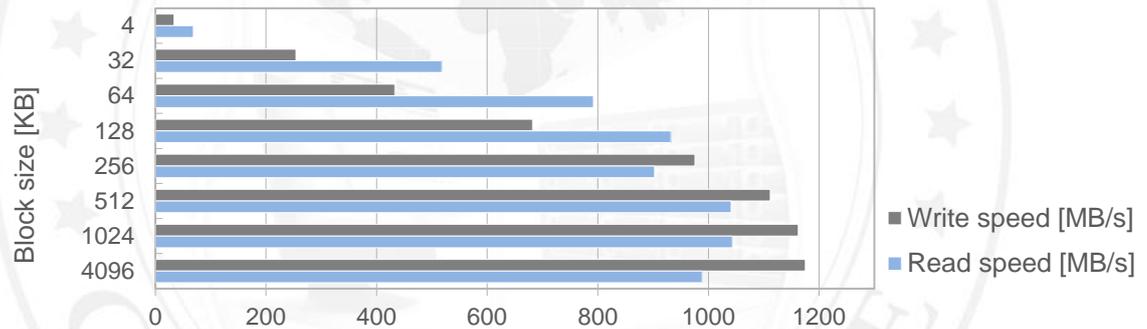

FIGURE 17: *RAID6 performance test results chart for Intel® Ethernet Converged Network Adapter X520-SR2*

Hardware RAID10 test

1. Test description

The test relies on creation of the RAID10 unit on all hard disk drives, configuring the iSCSI target and copying the data from a *Workstation with MS Windows* via network connection with various block sizes using the Iometer testing tool.

2. Test results for RAID10 and Intel® Ethernet Converged Network Adapter X520-SR2

RAID10 performance test results			
Block size [KB]	Write speed [MB/s]	Read speed [MB/s]	Performance test results
4	35.98	71.00	passed
32	262.12	535.17	passed
64	459.52	877.68	passed
128	722.29	1153.26	passed
256	1043.26	993.09	passed
512	1144.21	513.86	passed
1024	931.12	673.27	passed
4096	1178.56	839.57	passed

TABLE 20: RAID10 performance test results table for Intel® Ethernet Converged Network Adapter X520-SR2
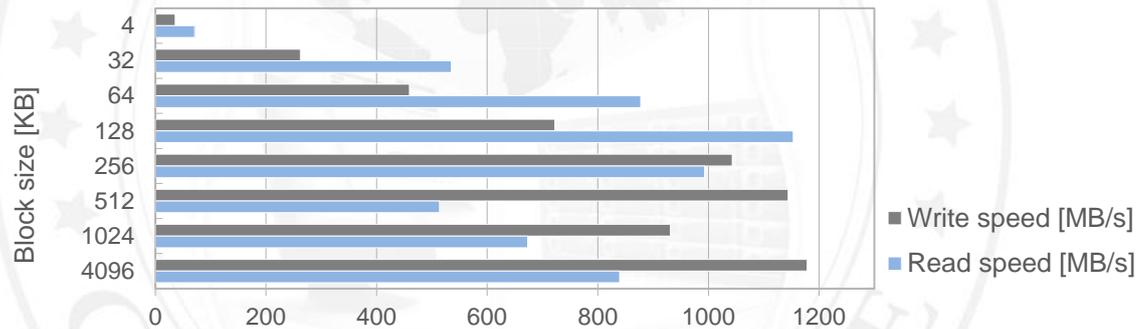

FIGURE 18: RAID10 performance test results chart for Intel® Ethernet Converged Network Adapter X520-SR2

Hardware RAID50 test

1. Test description

The test relies on creation of the RAID50 unit on all hard disk drives, configuring the iSCSI target and copying the data from a *Workstation with MS Windows* via network connection with various block sizes using the Iometer testing tool.

2. Test results for RAID50 and Intel® Ethernet Converged Network Adapter X520-SR2

RAID50 performance test results			
Block size [KB]	Write speed [MB/s]	Read speed [MB/s]	Performance test results
4	34.80	81.99	passed
32	257.57	531.62	passed
64	453.54	872.80	passed
128	717.98	1122.05	passed
256	1028.02	1118.82	passed
512	1143.80	1152.20	passed
1024	1173.70	1106.83	passed
4096	1178.62	1136.72	passed

TABLE 21: RAID50 performance test results table for Intel® Ethernet Converged Network Adapter X520-SR2
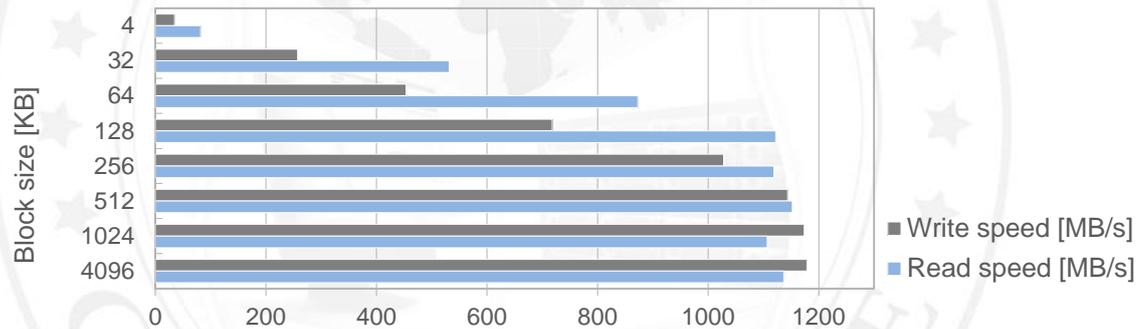

FIGURE 19: RAID50 performance test results chart for Intel® Ethernet Converged Network Adapter X520-SR2

Hardware RAID60 test

1. Test description

The test relies on creation of the RAID60 unit on all hard disk drives, configuring the iSCSI target and copying the data from a *Workstation with MS Windows* via network connection with various block sizes using the Iometer testing tool.

2. Test results for RAID60 and Intel® Ethernet Converged Network Adapter X520-SR2

RAID60 performance test results			
Block size [KB]	Write speed [MB/s]	Read speed [MB/s]	Performance test results
4	36.00	74.06	passed
32	261.46	533.57	passed
64	460.32	876.22	passed
128	721.78	1038.22	passed
256	1037.03	1058.55	passed
512	1167.79	1021.10	passed
1024	1173.07	1032.11	passed
4096	1178.81	1046.56	passed

TABLE 22: *RAID60 performance test results table for Intel® Ethernet Converged Network Adapter X520-SR2*
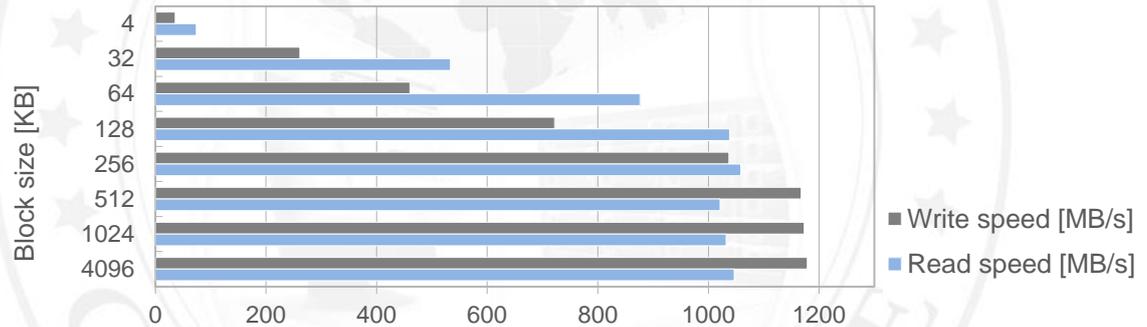

FIGURE 20: *RAID60 performance test results chart for Intel® Ethernet Converged Network Adapter X520-SR2*

NAS functionality

Tests performed in this section check the functionality, performance and stability of the NAS protocols in the Open-E DSS V7 product on the certified system.

The tests rely on creating NAS shares and copying the data from a *Workstation with MS Windows* via network connection with various block sizes using the Iometer testing tool.

NAS test topology
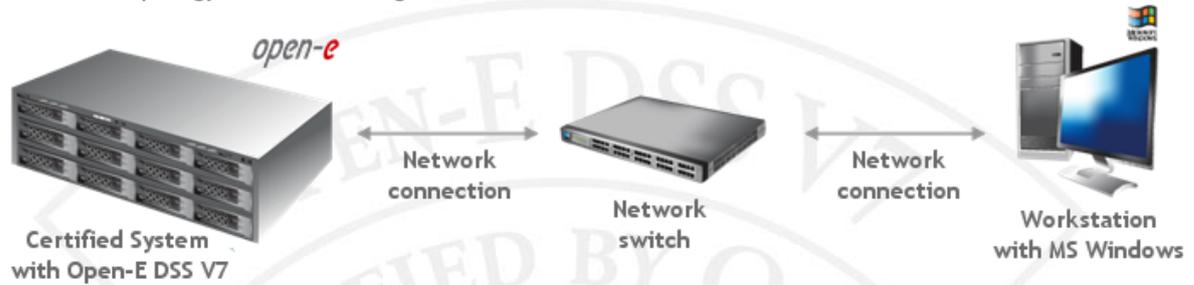
Network topology for NAS testing is shown below.

FIGURE 21: Network topology for NAS testing

SMB test

1. Test description

The tests rely on creating NAS shares and copying the data from a *Workstation with MS Windows* via network connection with various block sizes using the Iometer testing tool.

2. Test results for SMB and Intel® Ethernet Converged Network Adapter X520-SR2

SMB performance test results			
Block size [KB]	Write speed [MB/s]	Read speed [MB/s]	Performance test results
4	97.64	130.27	passed
32	690.06	802.64	passed
64	880.77	778.49	passed
128	1175.24	941.60	passed
256	1182.76	1084.47	passed
512	1183.95	1156.11	passed
1024	1184.83	1147.38	passed
4096	1183.56	1168.33	passed

TABLE 23: SMB performance test results table for Intel® Ethernet Converged Network Adapter X520-SR2
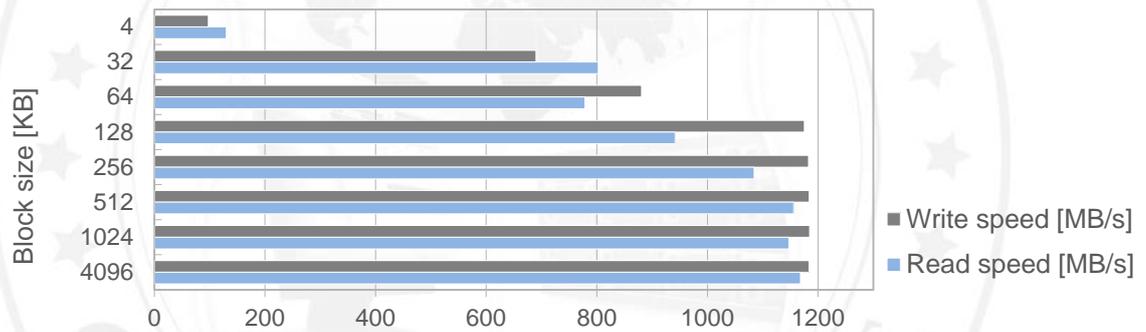

FIGURE 22: SMB performance test results chart for Intel® Ethernet Converged Network Adapter X520-SR2

3. NEWNET SMB performance test results with two Workstations and Intel® Ethernet Converged Network Adapter X520-SR2

SMB performance test results			
Block size [KB]	**Write speed [MB/s]**	**Read speed [MB/s]**	**Performance test results**
4	142.22	187.84	passed
32	939.64	1135.50	passed
64	1242.03	1123.99	passed
128	1695.38	1392.67	passed
256	1873.44	1588.59	passed
512	1905.17	1673.32	passed
1024	1914.25	1645.96	passed
4096	1900.60	1661.13	passed

TABLE 24: NEWNET SMB performance test results table for Intel® Ethernet Converged Network Adapter X520-SR2
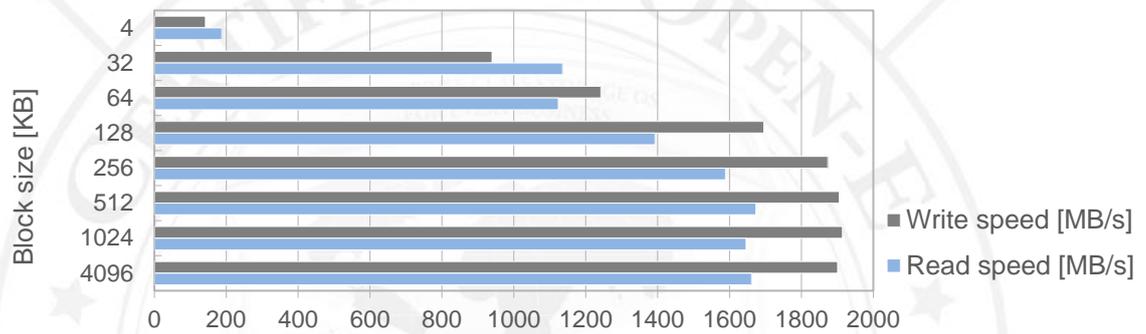

FIGURE 23: NEWNET SMB performance test results chart for Intel® Ethernet Converged Network Adapter X520-SR2

iSCSI functionality

Tests performed in this section check the functionality, performance and stability of the iSCSI protocol in the Open-E DSS V7 product on the certified system.

iSCSI Target test topology

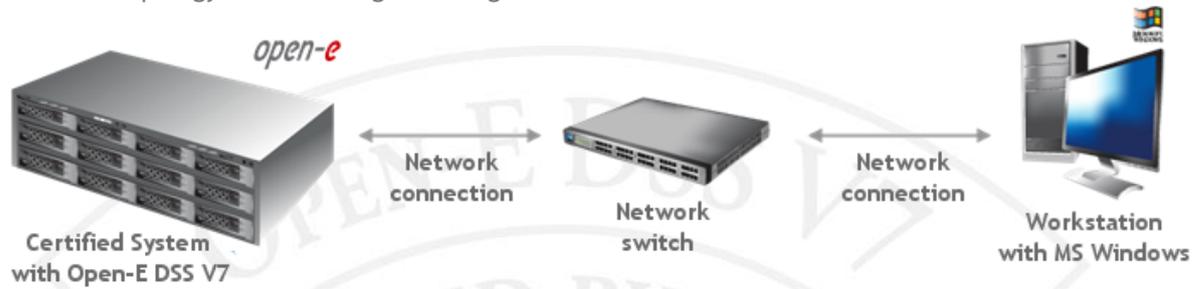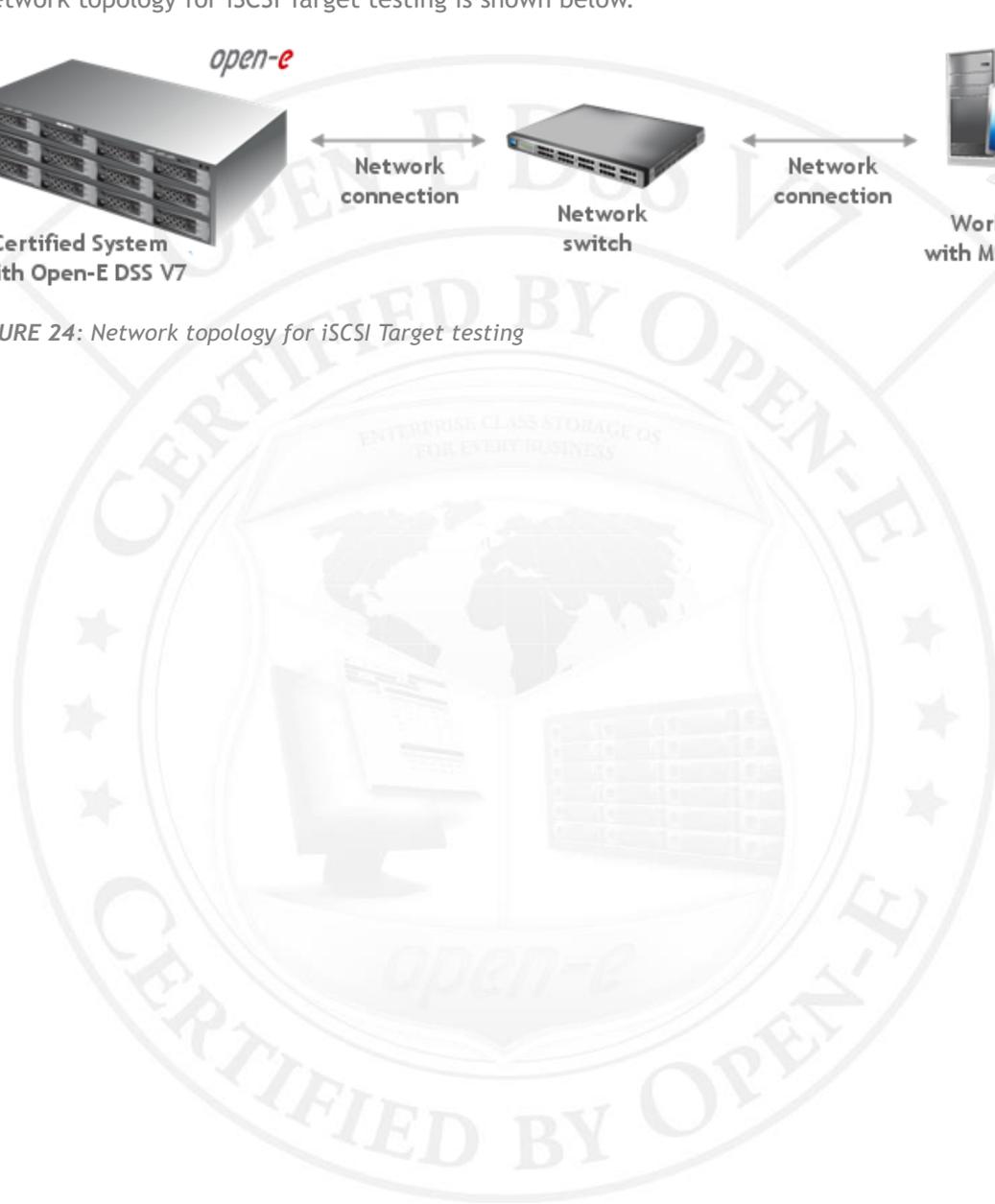Network topology for iSCSI Target testing is shown below.

FIGURE 24: Network topology for iSCSI Target testing

iSCSI Target test

1. Test description

The test relies on creating the iSCSI target on the certified system and copying the data from a *Workstation with MS Windows* to it with various block sizes using the Iometer tool.

2. Test results for iSCSI Target and Intel® Ethernet Converged Network Adapter X520-SR2

iSCSI Target performance test results			
Block size [KB]	Write speed [MB/s]	Read speed [MB/s]	Performance test results
4	34.16	75.98	passed
32	256.37	511.46	passed
64	450.16	799.18	passed
128	695.33	987.90	passed
256	998.18	527.93	passed
512	1143.28	474.35	passed
1024	1169.05	559.81	passed
4096	1178.31	911.24	passed

TABLE 25: iSCSI Target performance test results table for Intel® Ethernet Converged Network Adapter X520-SR2
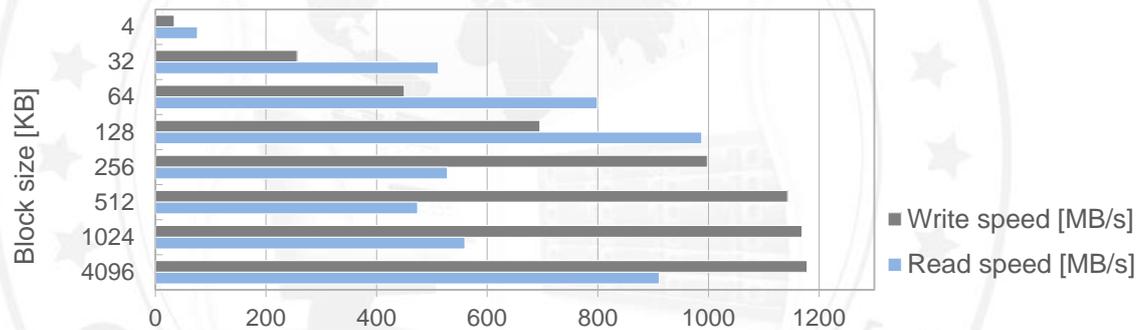

FIGURE 25: iSCSI Target performance test results chart for Intel® Ethernet Converged Network Adapter X520-SR2

3. NEWNET iSCSI Target test results with 2 Workstations and Intel® Ethernet Converged Network Adapter X520-SR2

iSCSI Target performance test results			
Block size [KB]	Write speed [MB/s]	Read speed [MB/s]	Performance test results
4	48.64	90.50	passed
32	369.58	572.38	passed
64	583.36	922.58	passed
128	866.03	1162.07	passed
256	1207.40	572.85	passed
512	1433.37	587.64	passed
1024	1496.86	786.09	passed
4096	1501.15	1215.16	passed

TABLE 26: NEWNET iSCSI Target performance test results table for Intel® Ethernet Converged Network Adapter X520-SR2
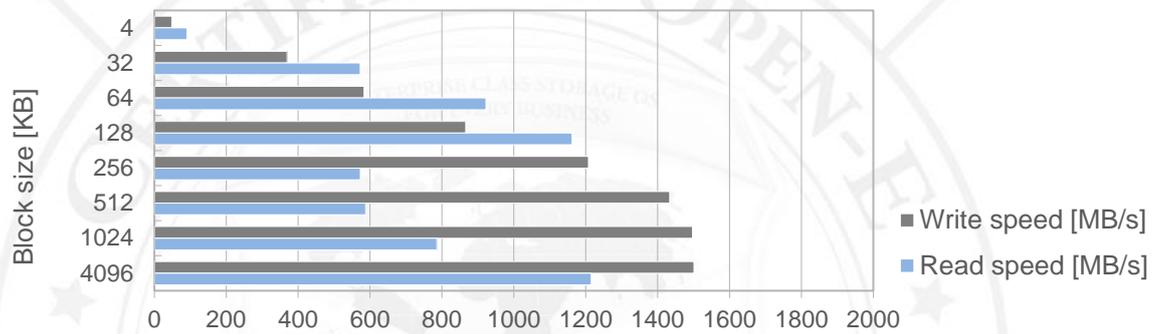

FIGURE 26:NEWNET iSCSI Target performance test results chart for Intel® Ethernet Converged Network Adapter X520-SR2

SSD Cache performance

Tests performed in this section check the performance of SSD cache in the Open-E DSS V7 product on the certified system.

SSD Cache test topology

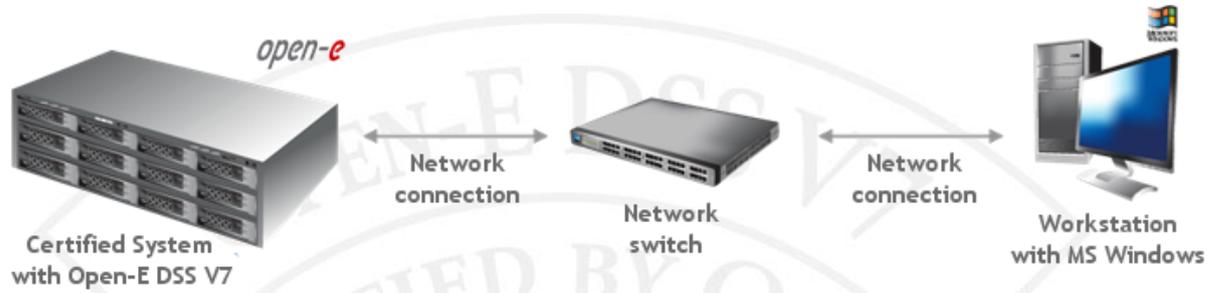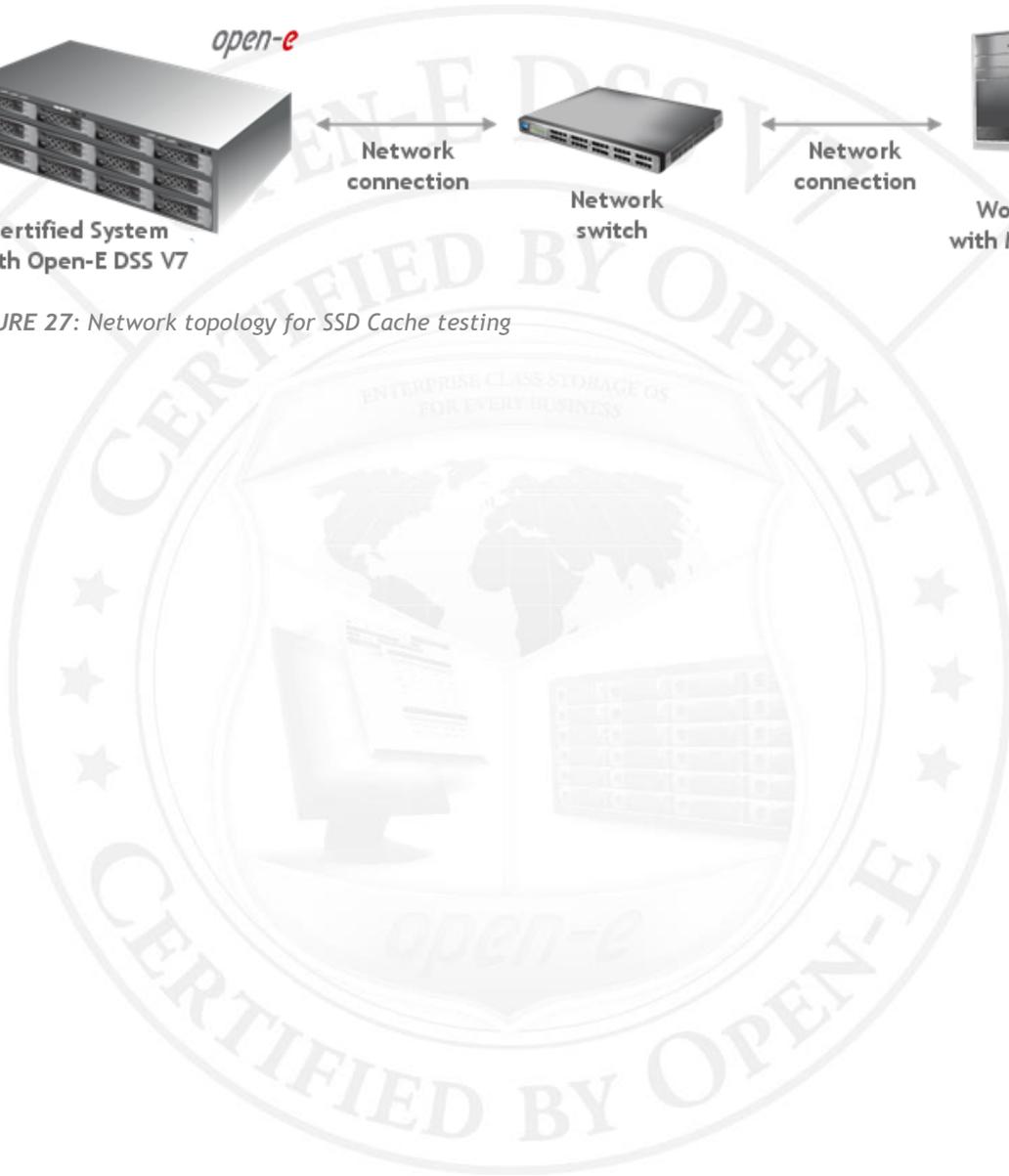Network topology for SSD Cache testing is shown below.

FIGURE 27: Network topology for SSD Cache testing

SSD Cache with real life pattern test

1. Test description

The test relies on creating the iSCSI target on the certified system. writing (35%) and reading (65%) random data from a *Workstation with MS Windows* to it with various block sizes using the Iometer tool.

2. Test results for SSD Cache with real life pattern and Intel® Ethernet Converged Network Adapter X520-SR2

SSD Cache with real life pattern test results		
Block size [KB]	Performance [IOPS]	Performance test results
1	33855.19	passed
2	34802.21	passed
4	30939.23	passed

TABLE 27: SSD Cache with real life pattern test results table for Intel® Ethernet Converged Network Adapter X520-SR2
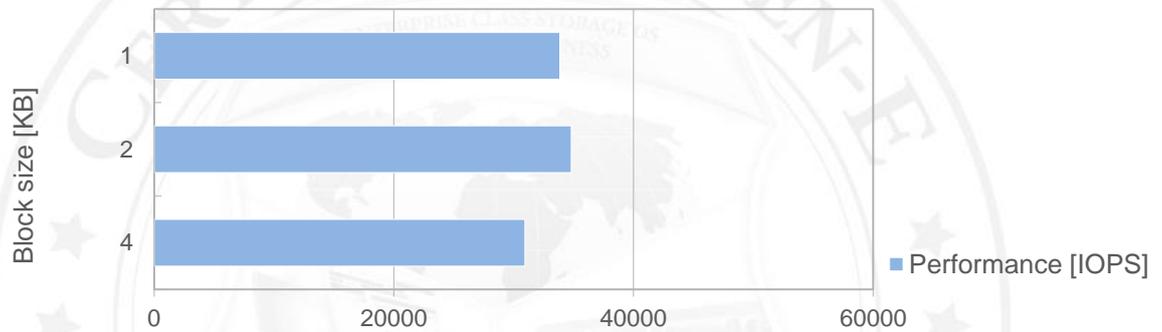

FIGURE 28: SSD Cache with real life pattern test results chart for Intel® Ethernet Converged Network Adapter X520-SR2

SSD Cache with random read/write pattern test

1. Test description

The test relies on creating the iSCSI target on the certified system and copying random data from a *Workstation with MS Windows* to it with various block sizes using the Iometer tool.

2. Test results for SSD cache with random read/write pattern Intel® Ethernet Converged Network Adapter X520-SR2

SSD cache with random read/write pattern test results			
Block size [KB]	**Write speed [IOPS]**	**Read speed [IOPS]**	**Performance test results**
1	20515.62	48225.78	passed
2	20276.90	58496.71	passed
4	19935.40	54999.50	passed

TABLE 28: SSD cache with random read/write pattern test results table for Intel® Ethernet Converged Network Adapter X520-SR2
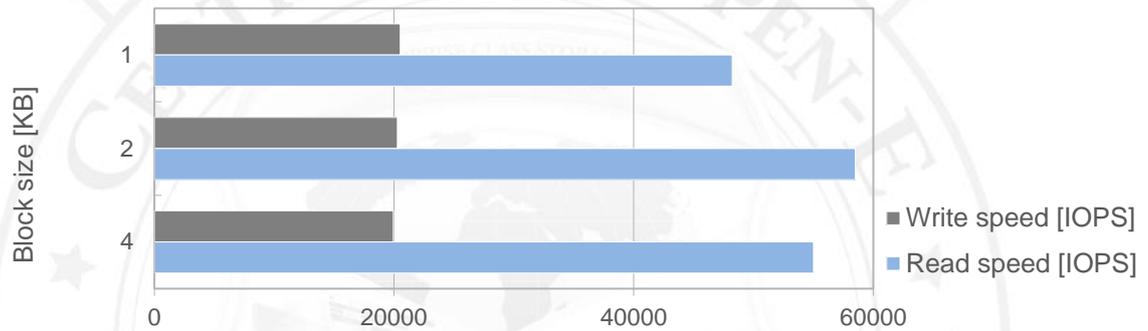

FIGURE 29: SSD cache with random read/write pattern test results chart for Intel® Ethernet Converged Network Adapter X520-SR2