

Ronver Systems X3-NAS storage system



Executive summary

After performing all tests, the Ronver Systems X3-NAS system has been officially certified according to the [Open-E](#) Hardware Certification Program.

During the tests, it was found that the system is functional and efficient. With the [Open-E DSS V7](#) operating system installed, the Ronver Systems X3-NAS is stable and performs well.

In general, the system can be used for many different applications, but the following are recommended:

✓ Fibre Channel Storage

The following features make Ronver Systems X3-NAS a great Fibre Channel Storage solution:

- Dual port Fibre Channel HBA for stable, low latency and high throughput connection.
- Sixteen high class enterprise SAS drives combined with Fibre Channel HBA ensure fast random data access and reliability.
- Redundant power supply for system reliability.

✓ Storage for databases

The following features decides that Ronver Systems X3-NAS is a great Storage for databases:

- Hardware RAID10 for high performance, best I/Ops ratio and data safety.
- Sixteen high class enterprise SAS drives ensure fast random data access and reliability.
- Dual port Fibre Channel HBA for reliable, low latency connection to application server.

✓ Storage for Virtualization

For this application the following can be used:

- HW RAID5, RAID50, RAID6 or RAID60 for high performance and data safety.
- Two 10GbE interfaces for efficient network connections to virtualization systems.
- Four 1GbE interfaces for fast MPIO connection.
- Fast Fibre Channel connection.

Certification notes

Certification was performed according to the Open-E Hardware Certification Program Guide 2.1.

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

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Ronver Systems X3-NAS hardware components

Technical specifications about the certified system are listed below:

Model	Ronver Systems X3-NAS
Operating system	Open-E DSS V7 build 7637
Enclosure/chassis	SuperChassis 836E16-R1200B
CPU	2x Intel Xeon E5-2620 2.00GHz
Motherboard	Intel S2600CP4
Memory	8x 4GB DDR3 ECC-REG Samsung M393B5270DH0-CH9
Network	4x Intel Gigabit Server Adapter I350 (on-board)
Network	Intel Ethernet Server Adapter X520-SR2
Fibre Channel HBA	QLogic QLE2562 Fibre Channel Host Bus Adapter
HW RAID	Areca ARC-1882LP
Hard disk drives	16x 600GB Seagate Cheetah NS.2 ST3600002SS
Boot media drive	80GB Intel SSD 320 series SSDSA2CW080G310

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



Ronver Systems X3-NAS 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 2008 R2
Enclosure/chassis	Inter Tech 19" IPC - 4088 4U
Motherboard	Asus P8B-E / 4L
CPU	Intel Xeon E3-1230 3.20 GHz
Memory	4x 4GB ECC Kingston KVR1333D3E9S/4G
Network	4x Intel Gigabit Server Adapter (i82574L) (on-board)
Network	Intel Ethernet Server Adapter X520-SR2
Fibre Channel HBA	QLogic QLE2562 Fibre Channel Host Bus Adapter
HW RAID	LSI MegaRAID SAS 9280-16i4e
Hard disk drives	8x 1TB Hitachi Ultrastar A7K2000 HUA722010CLA330

TABLE 2: Hardware components of first Workstation with MS Windows

Model	Custom
Operating system	MS Windows Server 2008 R2
Enclosure/chassis	Inter Tech 19" IPC - 4088 4U
Motherboard	Asus P8B-E / 4L
CPU	Intel Xeon E3-1230 3.20 GHz
Memory	4x 4GB ECC Kingston KVR1333D3E9S/4G
Network	4x Intel Gigabit Server Adapter (i82574L) (on-board)
Network	Intel Ethernet Server Adapter X520-SR2
Fibre Channel HBA	QLogic QLE2562 Fibre Channel Host Bus Adapter
HW RAID	LSI MegaRAID SAS 9280-4i4e
Hard disk drives	4x 750GB Seagate Barracuda ST3750330NS

TABLE 3: Hardware components of second Workstation with MS Windows

Model	Custom
Operating system	MS Windows Server 2008 R2
Enclosure/chassis	Inter Tech 19" IPC - 4088 4U
Motherboard	Asus P8B-E / 4L
CPU	Intel Xeon E3-1230 3.20 GHz
Memory	4x 4GB ECC Kingston KVR1333D3E9S/4G
Network	4x Intel Gigabit Server Adapter (i82574L) (on-board)
Network	Intel PRO/1000 PT Dual Port Server Adapter (i82561EB)
HW RAID	LSI MegaRAID SAS 9280-4i4e
Hard disk drives	4x 750GB Seagate Barracuda ST3750330NS

TABLE 4: Hardware components of third Workstation with MS Windows

Model	Custom
Operating system	MS Windows Server 2008 R2
Enclosure/chassis	Inter Tech 19" IPC - 4088 4U
Motherboard	Asus P8B-E / 4L
CPU	Intel Xeon E3-1230 3.20 GHz
Memory	4x 4GB ECC Kingston KVR1333D3E9S/4G
Network	4x Intel Gigabit Server Adapter (i82574L) (on-board)
Network	Intel PRO/1000 PT Dual Port Server Adapter (i82561EB)
HW RAID	LSI MegaRAID SAS 9280-4i4e
Hard disk drives	4x 750GB Seagate Barracuda ST3750330NS

TABLE 5: Hardware components of fourth Workstation with MS Windows

Model	Custom
Operating system	Open-E DSS V7 build 7637
Enclosure/chassis	Inter Tech 19" IPC - 4088 4U
Motherboard	Asus P8B-E / 4L
CPU	Intel Xeon E3-1230 3.20 GHz
Memory	4x 4GB ECC Kingston KVR1333D3E9S/4G
Network	4x Intel Gigabit Server Adapter (i82574L) (on-board)
Network	Intel Ethernet Server Adapter X520-SR2
Fibre Channel HBA	QLogic QLE2562 Fibre Channel Host Bus Adapter
HW RAID	LSI MegaRAID SAS 9280-16i4e
Hard disk drives	8x 1TB Hitachi Ultrastar A7K2000 HUA722010CLA330

TABLE 6: Hardware components of Workstation with Open-E DSS V7

Model	Supermicro SSE-G24-TG4
Description	24-ports 1GbE and 4-ports 10GbE switch

TABLE 7: Network switch details for 1GbE and 10GbE connections

Model	Qlogic SB5800V-08A
Description	8-ports 8Gb Fabric switch

TABLE 8: Fabric switch details for Fibre Channel connections

Administration functionality

The following functionality has been tested.

Drive identifier	OK
Power button	OK
Front and rear LEDs	OK

TABLE 9: 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.

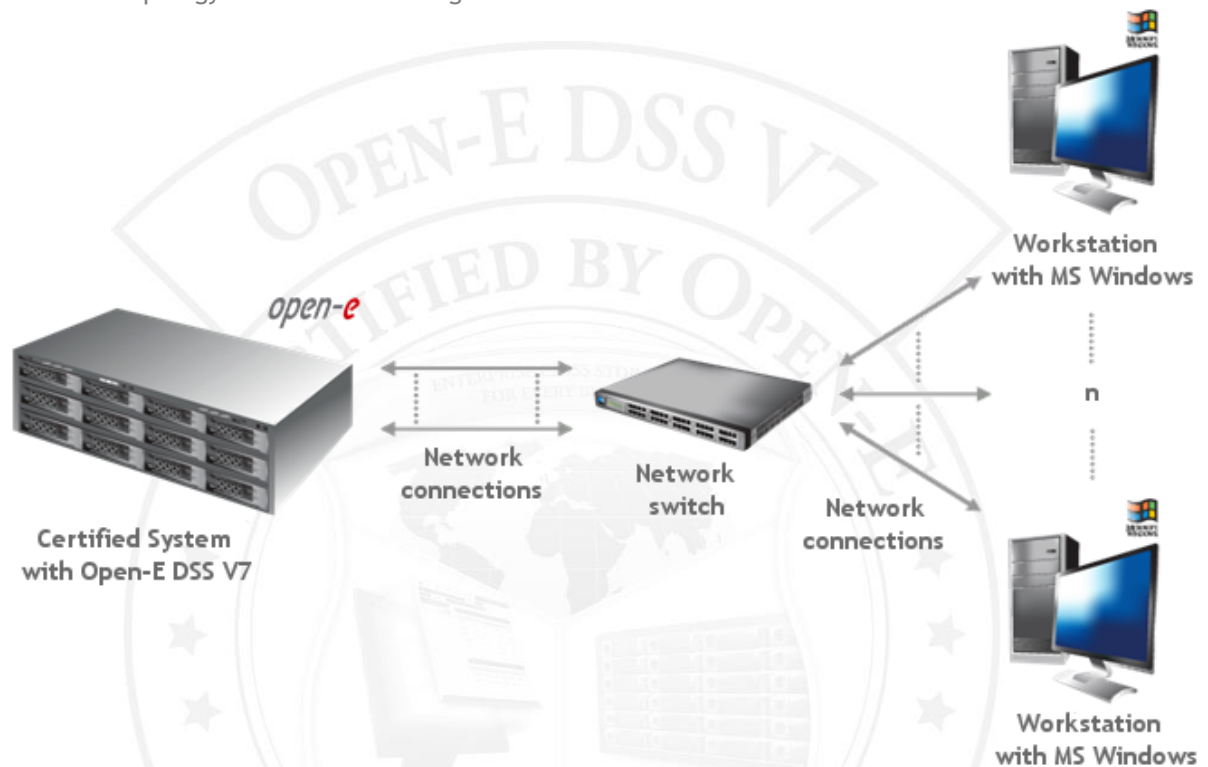


FIGURE 4: Network topology for Network testing

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 Ethernet Server Adapter X520-SR2

802.3ad bonding mode performance test results			
NIC model	Intel Ethernet Server Adapter X520-SR2		
Workstations with MS Windows	Write speed [MB/s]	Read speed [MB/s]	Performance test results
1 st Workstation	455.53	437.57	passed
2 nd Workstation	358.97	310.49	passed

TABLE 10: 802.3ad bonding mode performance test results table for Intel Ethernet Server Adapter X520-SR2

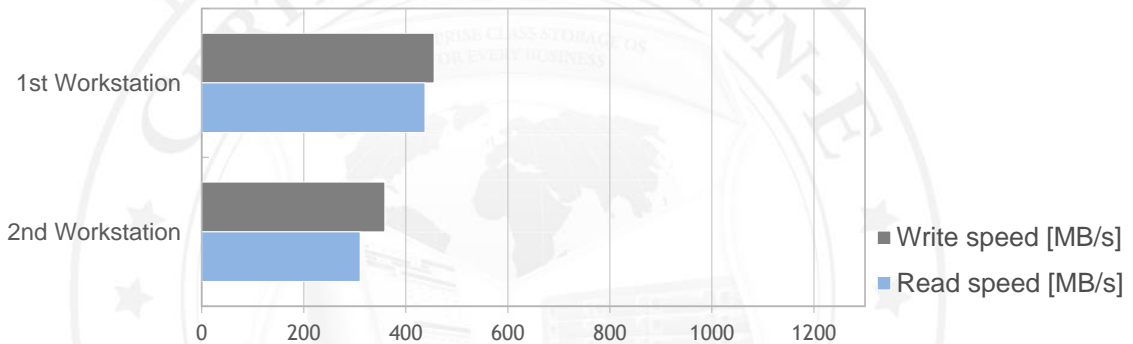


FIGURE 5: 802.3ad bonding mode performance test results chart for Intel Ethernet Server Adapter X520-SR2

3. Test results for 802.3ad bonding mode test performed on Intel Gigabit Server Adapter I350 (on-board)

802.3ad bonding mode performance test results			
NIC model	Intel Gigabit Server Adapter I350 (on-board)		
Workstations with MS Windows	Write speed [MB/s]	Read speed [MB/s]	Performance test results
1 st Workstation	112.20	112.03	passed
2 nd Workstation	109.66	112.00	passed
3 rd Workstation	112.01	57.65	passed
4 th Workstation	112.20	55.15	passed

TABLE 11: 802.3ad bonding mode performance test results table for Intel Gigabit Server Adapter I350 (on-board)

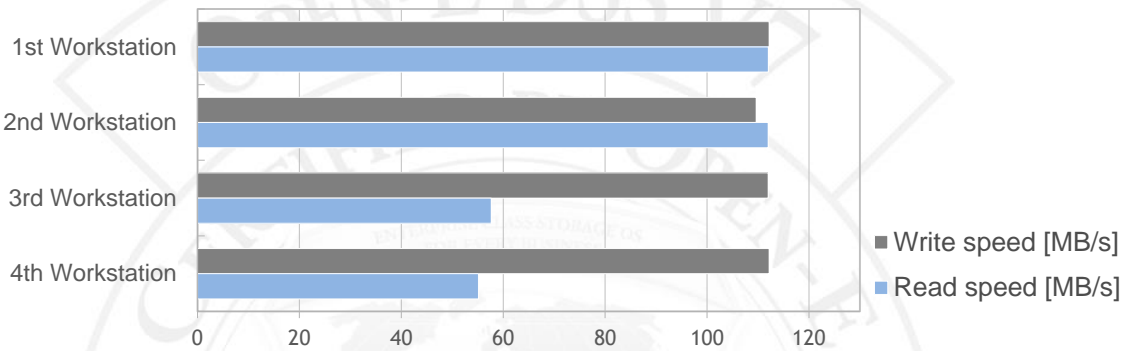
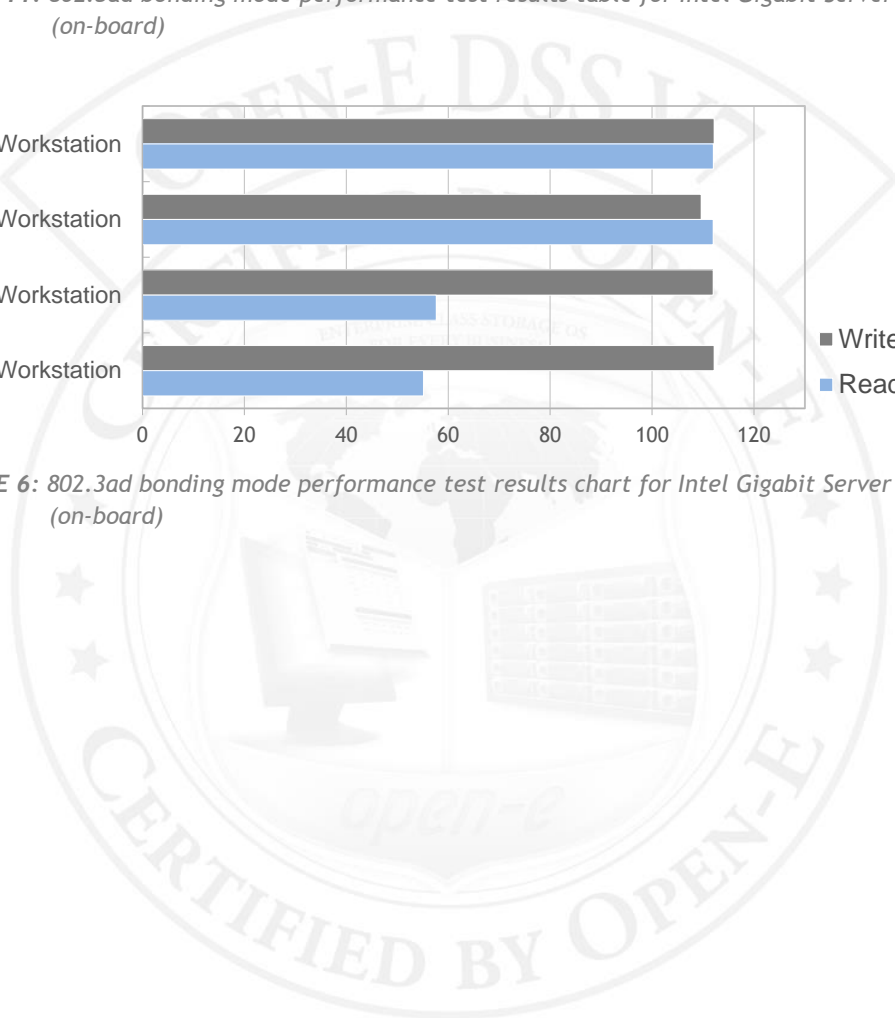


FIGURE 6: 802.3ad bonding mode performance test results chart for Intel Gigabit Server Adapter I350 (on-board)



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 Ethernet Server Adapter X520-SR2

Balance-alb bonding mode performance test results			
NIC model	Intel Ethernet Server Adapter X520-SR2		
Workstations with MS Windows	Write speed [MB/s]	Read speed [MB/s]	Performance test results
1 st Workstation	386.97	520.14	passed
2 nd Workstation	383.99	520.19	passed

TABLE 12: Balance-alb bonding mode performance test results table for Intel Ethernet Server Adapter X520-SR2

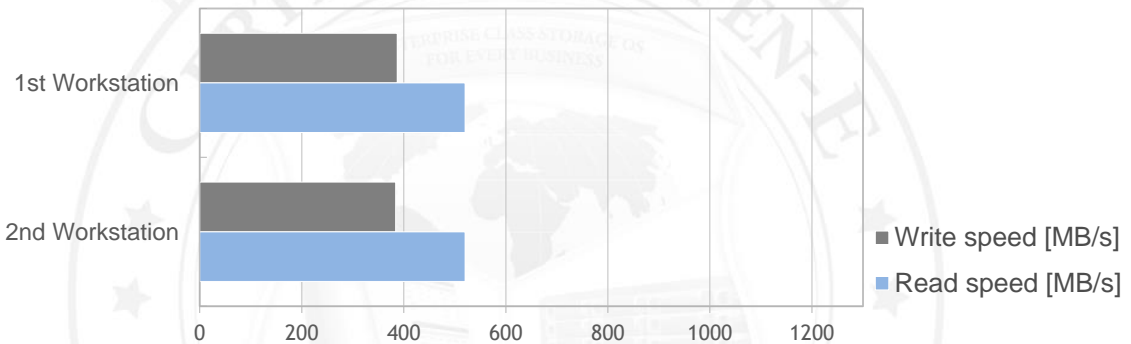


FIGURE 7: Balance-alb bonding mode performance test results chart for Intel Ethernet Server Adapter X520-SR2

3. Test results for Balance-alb bonding mode test performed on Intel Gigabit Server Adapter I350 (on-board)

Balance-alb bonding mode performance test results			
NIC model	Intel Gigabit Server Adapter I350 (on-board)		
Workstations with MS Windows	Write speed [MB/s]	Read speed [MB/s]	Performance test results
1 st Workstation	111.95	111.90	passed
2 nd Workstation	112.24	111.78	passed
3 rd Workstation	112.25	111.58	passed
4 th Workstation	111.50	111.69	passed

TABLE 13: Balance-alb bonding mode performance test results table for Intel Gigabit Server Adapter I350 (on-board)

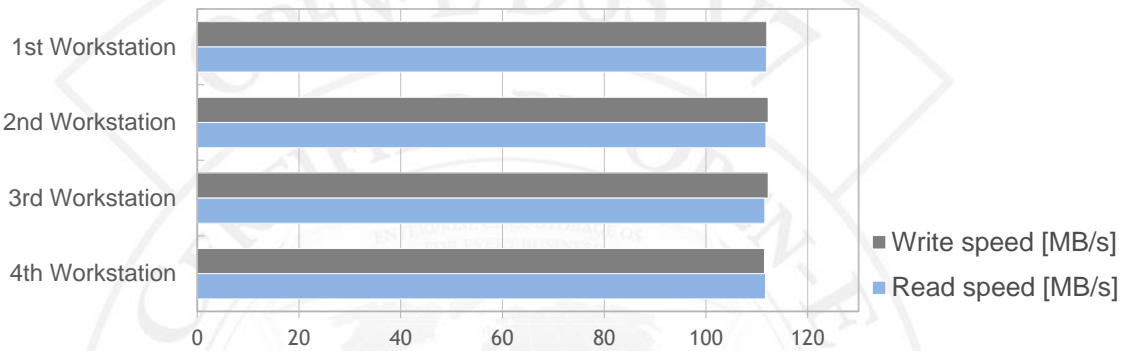
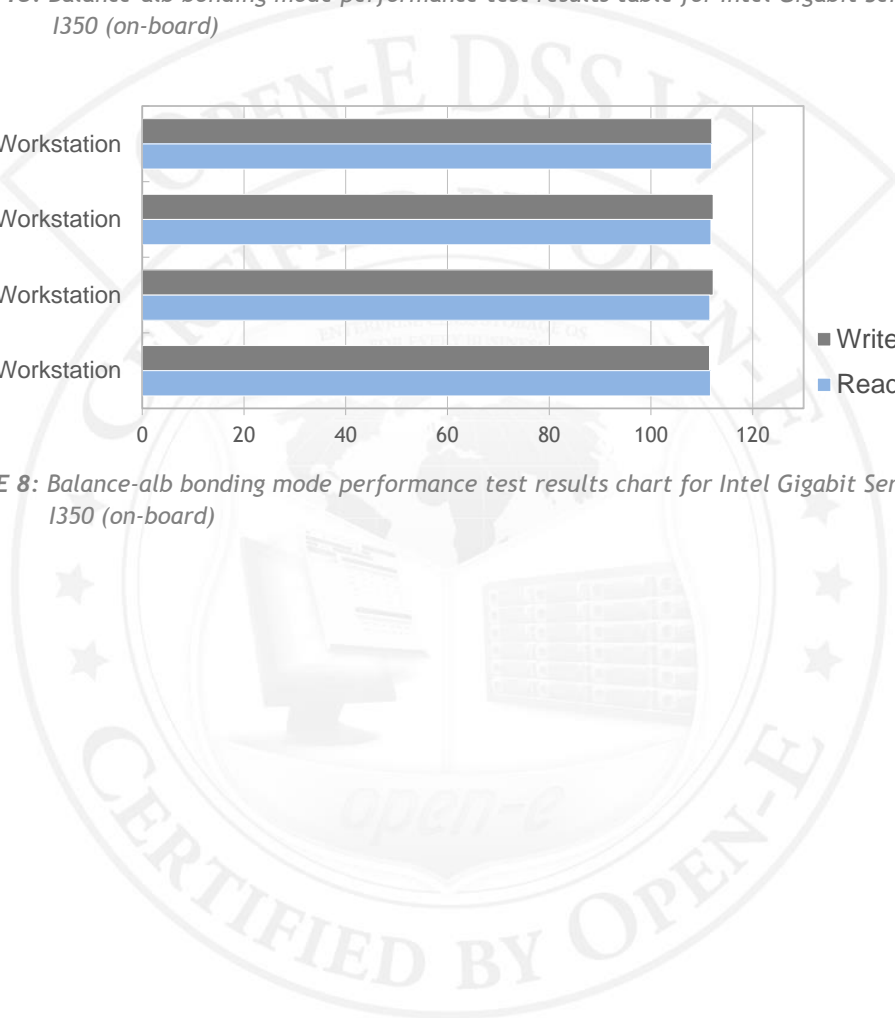


FIGURE 8: Balance-alb bonding mode performance test results chart for Intel Gigabit Server Adapter I350 (on-board)



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 lometer testing tool.

2. Test results for Balance-rr bonding mode test performed on Intel Ethernet Server Adapter X520-SR2

Balance-rr bonding mode performance test results			
NIC model	Intel Ethernet Server Adapter X520-SR2		
Workstations with MS Windows	Write speed [MB/s]	Read speed [MB/s]	Performance test results
1 st Workstation	435.99	255.64	passed
2 nd Workstation	432.40	261.14	passed

TABLE 14: Balance-rr bonding mode performance test results table for Intel Ethernet Server Adapter X520-SR2

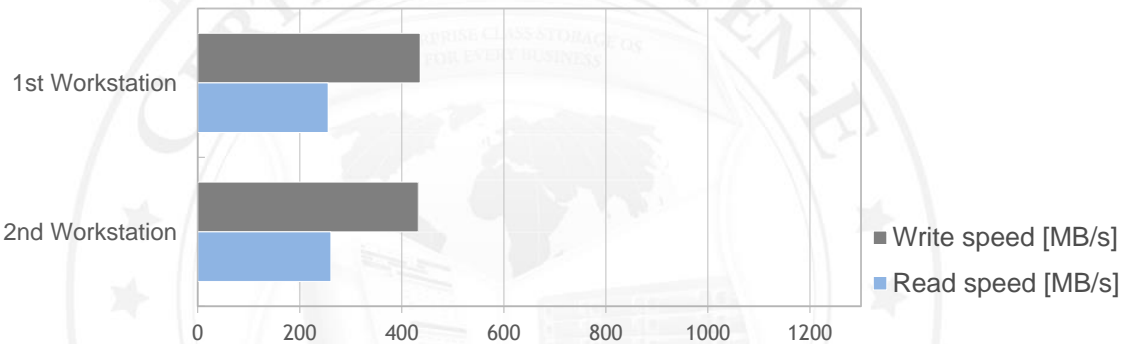


FIGURE 9: Balance-rr bonding mode performance test results chart for Intel Ethernet Server Adapter X520-SR2

3. Test results for Balance-rr bonding mode test performed on Intel Gigabit Server Adapter I350 (on-board)

Balance-rr bonding mode performance test results			
NIC model	Intel Gigabit Server Adapter I350 (on-board)		
Workstations with MS Windows	Write speed [MB/s]	Read speed [MB/s]	Performance test results
1 st Workstation	111.96	58.90	passed
2 nd Workstation	111.96	58.78	passed
3 rd Workstation	112.02	89.45	passed
4 th Workstation	111.97	86.58	passed

TABLE 15: Balance-rr bonding mode performance test results table for Intel Gigabit Server Adapter I350 (on-board)

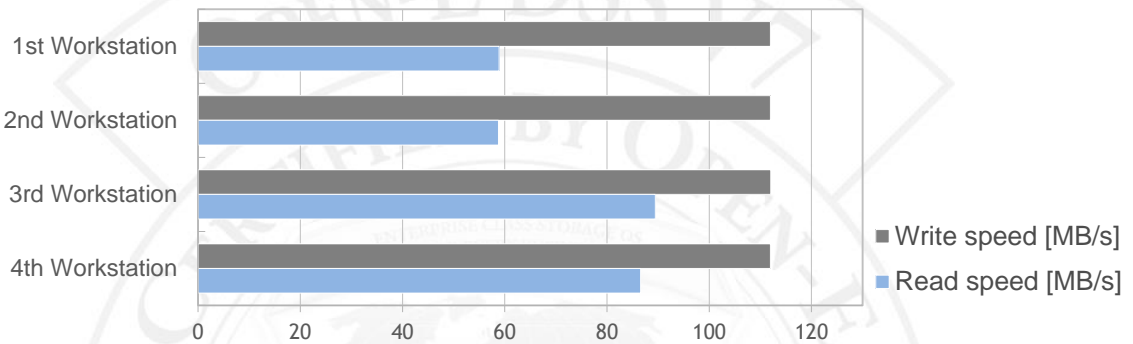
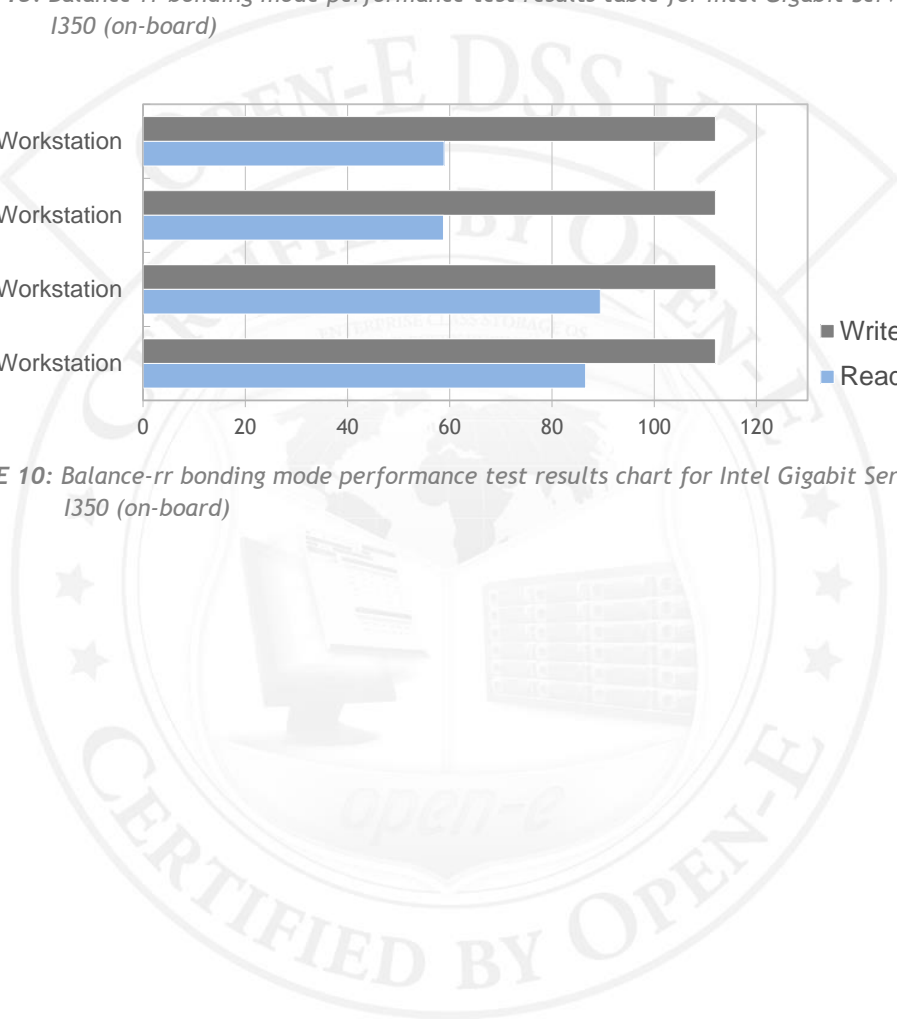


FIGURE 10: Balance-rr bonding mode performance test results chart for Intel Gigabit Server Adapter I350 (on-board)



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 Ethernet Server Adapter X520-SR2

Single NIC performance test results			
NIC model	Intel Ethernet Server Adapter X520-SR2		
Workstations with MS Windows	Write speed [MB/s]	Read speed [MB/s]	Performance test results
1 st Workstation	617.98	541.89	passed

TABLE 16: Single NIC performance test results table for Intel Ethernet Server Adapter X520-SR2

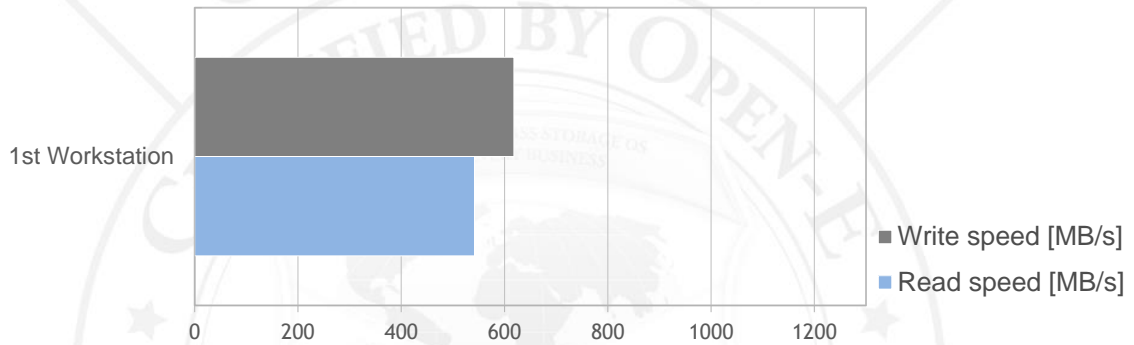


FIGURE 11: Single NIC performance test results chart for Intel Ethernet Server Adapter X520-SR2

3. Test results for single NIC test performed on Intel Gigabit Server Adapter I350 (on-board)

Single NIC performance test results			
NIC model	Intel Gigabit Server Adapter I350 (on-board)		
Workstations with MS Windows	Write speed [MB/s]	Read speed [MB/s]	Performance test results
1 st Workstation	112.02	111.89	passed

TABLE 17: Single NIC performance test results table for Intel Gigabit Server Adapter I350 (on-board)

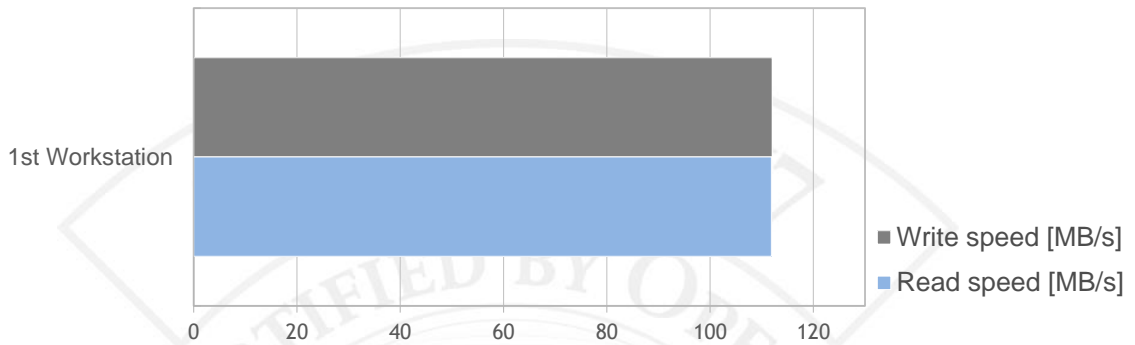


FIGURE 12: Single NIC performance test results chart for Intel Gigabit Server Adapter I350 (on-board)



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, 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 lometer testing tool.

RAID test topology

Network test topology for RAID testing is shown below

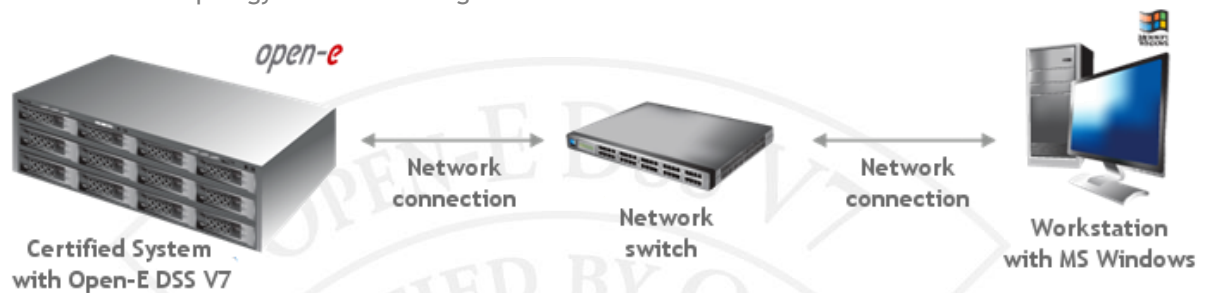


FIGURE 13: Network test topology for RAID testing

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 lometer testing tool.

2. Test results for RAID0 and Intel Ethernet Server Adapter X520-SR2

RAID0 performance test results			
Block size [KB]	Write speed [MB/s]	Read speed [MB/s]	Performance test results
4	72.76	98.12	passed
32	342.93	382.91	passed
64	422.11	462.04	passed
128	534.24	589.29	passed
256	594.96	637.08	passed
512	618.74	529.35	passed
1024	625.74	526.25	passed
4096	626.75	525.19	passed

TABLE 18: RAID0 performance test results table for Intel Ethernet Server Adapter X520-SR2

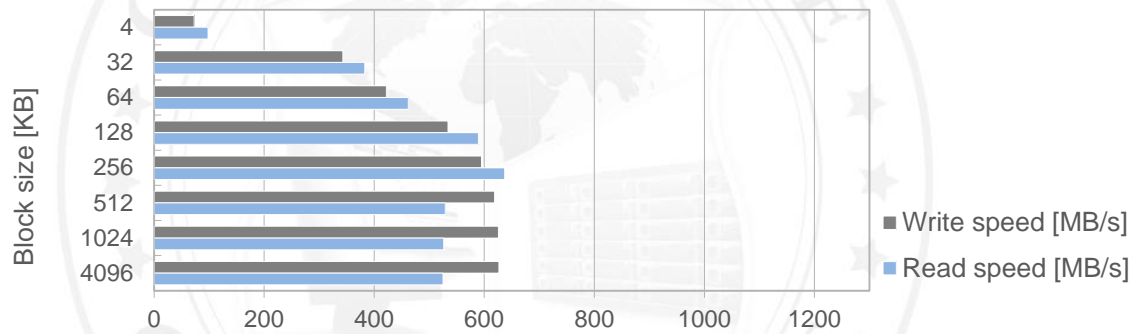


FIGURE 14: RAID0 performance test results chart for Intel Ethernet Server Adapter X520-SR2

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 lometer testing tool.

2. Test results for RAID5 and Intel Ethernet Server Adapter X520-SR2

RAID5 performance test results			
Block size [KB]	Write speed [MB/s]	Read speed [MB/s]	Performance test results
4	70.77	98.61	passed
32	343.23	391.99	passed
64	425.40	452.81	passed
128	525.82	552.56	passed
256	608.55	659.51	passed
512	610.81	528.31	passed
1024	612.79	524.92	passed
4096	622.06	520.27	passed

TABLE 19: RAID5 performance test results table for Intel Ethernet Server Adapter X520-SR2

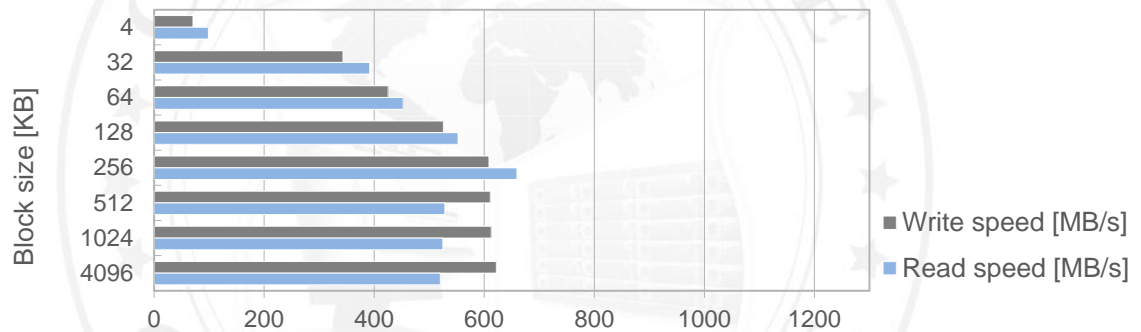


FIGURE 15: RAID5 performance test results chart for Intel Ethernet Server Adapter X520-SR2

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 Server Adapter X520-SR2

RAID6 performance test results			
Block size [KB]	Write speed [MB/s]	Read speed [MB/s]	Performance test results
4	69.90	97.16	passed
32	335.23	396.17	passed
64	421.76	464.67	passed
128	508.10	511.05	passed
256	596.64	622.66	passed
512	609.02	561.31	passed
1024	628.09	581.64	passed
4096	618.75	578.44	passed

TABLE 20: RAID6 performance test results table for Intel Ethernet Server Adapter X520-SR2

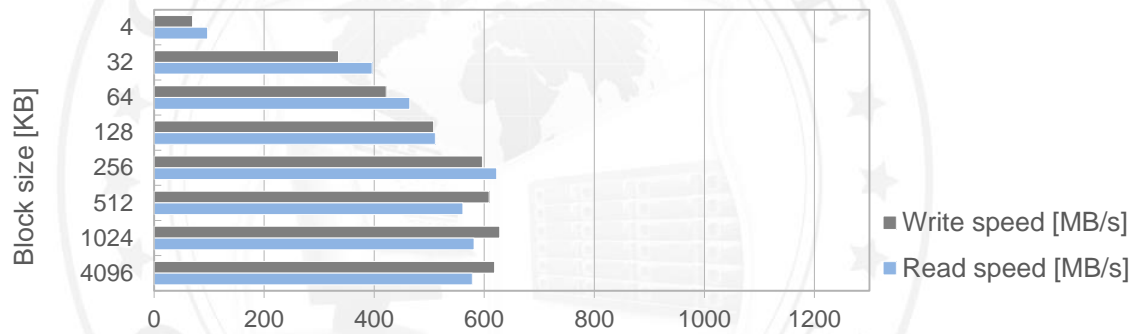


FIGURE 16: RAID6 performance test results chart for Intel Ethernet Server Adapter X520-SR2

Hardware RAID10 test

3. 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 lometer testing tool.

4. Test results for RAID10 and Intel Ethernet Server Adapter X520-SR2

RAID10 performance test results			
Block size [KB]	Write speed [MB/s]	Read speed [MB/s]	Performance test results
4	72.76	98.12	passed
32	342.93	382.91	passed
64	422.11	462.04	passed
128	534.24	589.29	passed
256	594.96	637.08	passed
512	618.74	529.35	passed
1024	625.74	526.25	passed
4096	626.75	525.19	passed

TABLE 21: RAID10 performance test results table for Intel Ethernet Server Adapter X520-SR2

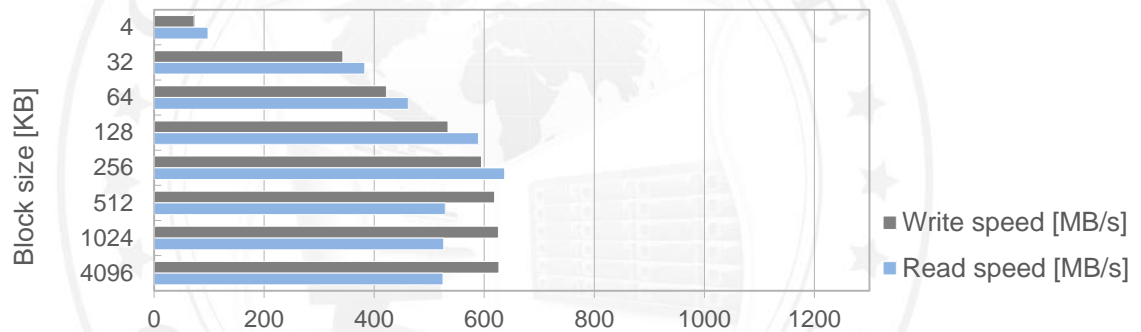


FIGURE 17: RAID10 performance test results chart for Intel Ethernet Server Adapter X520-SR2

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 lometer testing tool.

2. Test results for RAID50 and Intel Ethernet Server Adapter X520-SR2

RAID50 performance test results			
Block size [KB]	Write speed [MB/s]	Read speed [MB/s]	Performance test results
4	71.99	100.71	passed
32	340.98	375.13	passed
64	420.84	479.54	passed
128	510.85	579.09	passed
256	598.79	625.67	passed
512	613.86	564.93	passed
1024	612.06	569.00	passed
4096	634.26	543.96	passed

TABLE 22: RAID50 performance test results table for Intel Ethernet Server Adapter X520-SR2

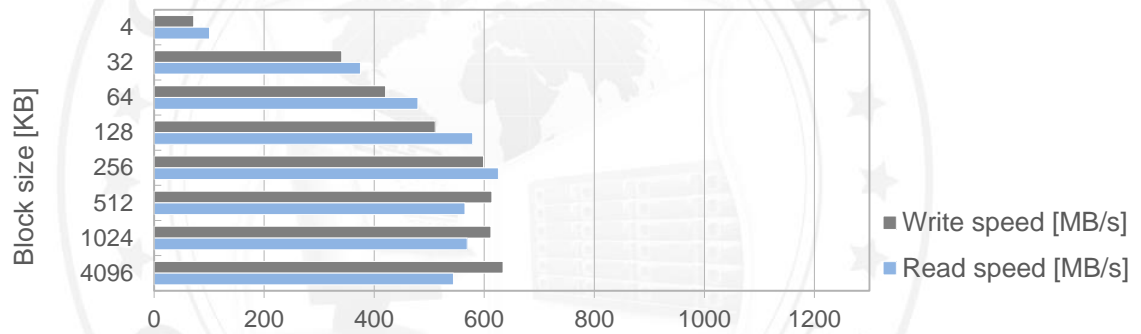


FIGURE 18: RAID50 performance test results chart for Intel Ethernet Server Adapter X520-SR2

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 lometer testing tool.

2. Test results for RAID60 and Intel Ethernet Server Adapter X520-SR2

RAID60 performance test results			
Block size [KB]	Write speed [MB/s]	Read speed [MB/s]	Performance test results
4	66.40	99.14	passed
32	345.81	378.67	passed
64	421.88	456.48	passed
128	526.82	529.21	passed
256	603.97	661.11	passed
512	593.02	526.61	passed
1024	620.75	527.66	passed
4096	623.07	522.37	passed

TABLE 23: RAID60 performance test results table for Intel Ethernet Server Adapter X520-SR2

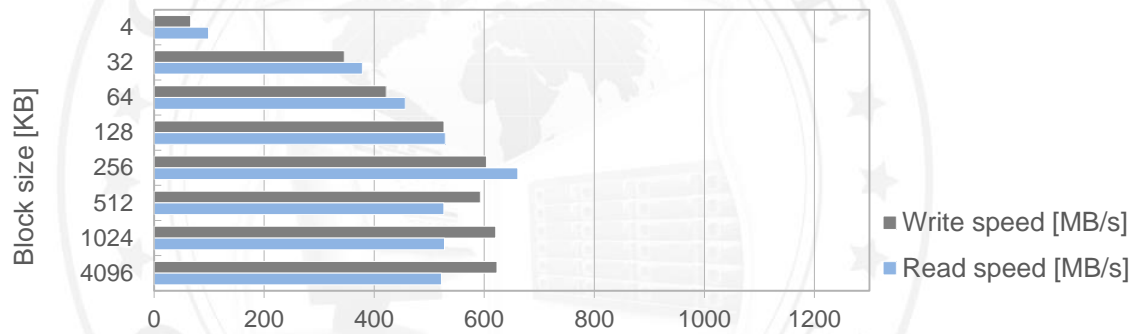


FIGURE 19: RAID60 performance test results chart for Intel Ethernet Server Adapter X520-SR2

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.

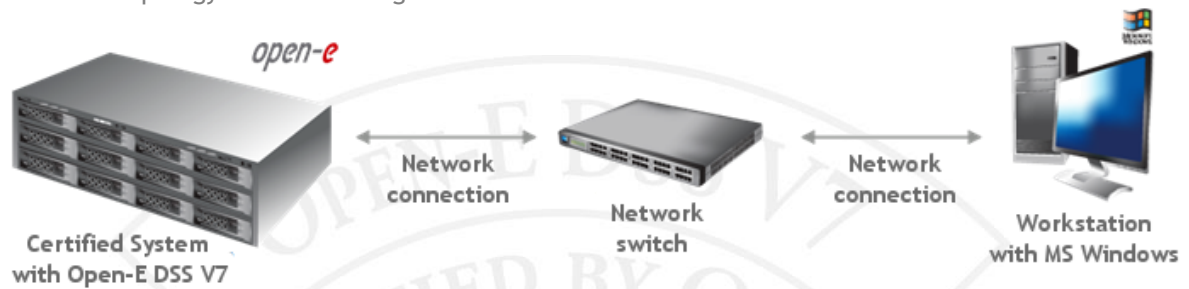
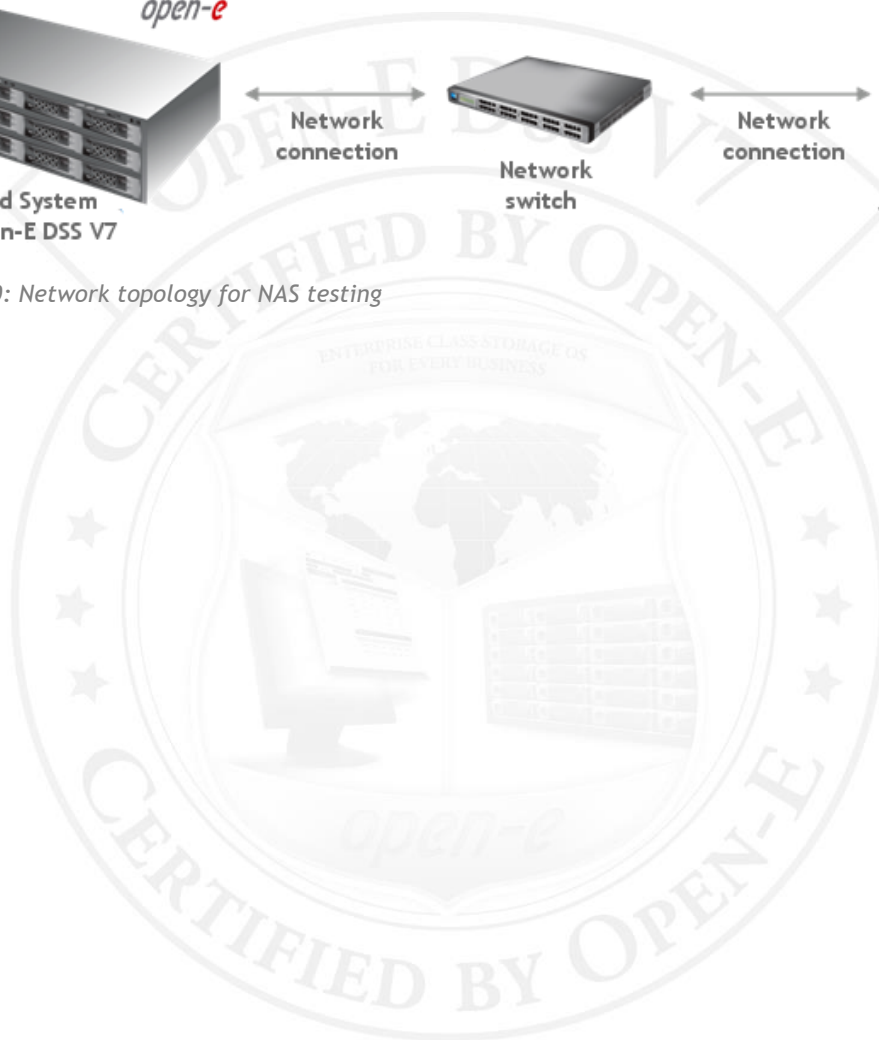


FIGURE 20: Network topology for NAS testing



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 lometer testing tool.

2. Test results for SMB and Intel Ethernet Server Adapter X520-SR2

SMB performance test results			
Block size [KB]	Write speed [MB/s]	Read speed [MB/s]	Performance test results
4	115.76	117.65	passed
32	464.75	548.32	passed
64	617.66	501.39	passed
128	571.72	481.79	passed
256	599.31	502.48	passed
512	591.83	508.20	passed
1024	595.10	505.42	passed
4096	583.41	503.92	passed

TABLE 24: SMB performance test results table for Intel Ethernet Server Adapter X520-SR2

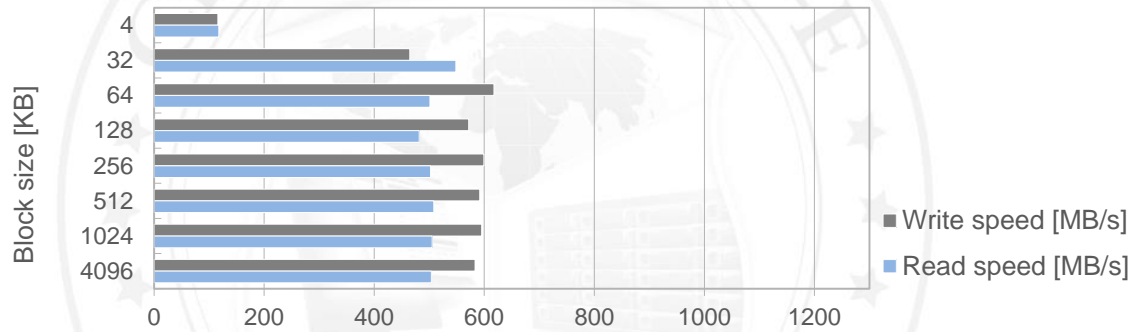


FIGURE 21: SMB performance test results chart for Intel Ethernet Server Adapter X520-SR2

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 Initiator test topology

Network topology for iSCSI Initiator testing is shown below.

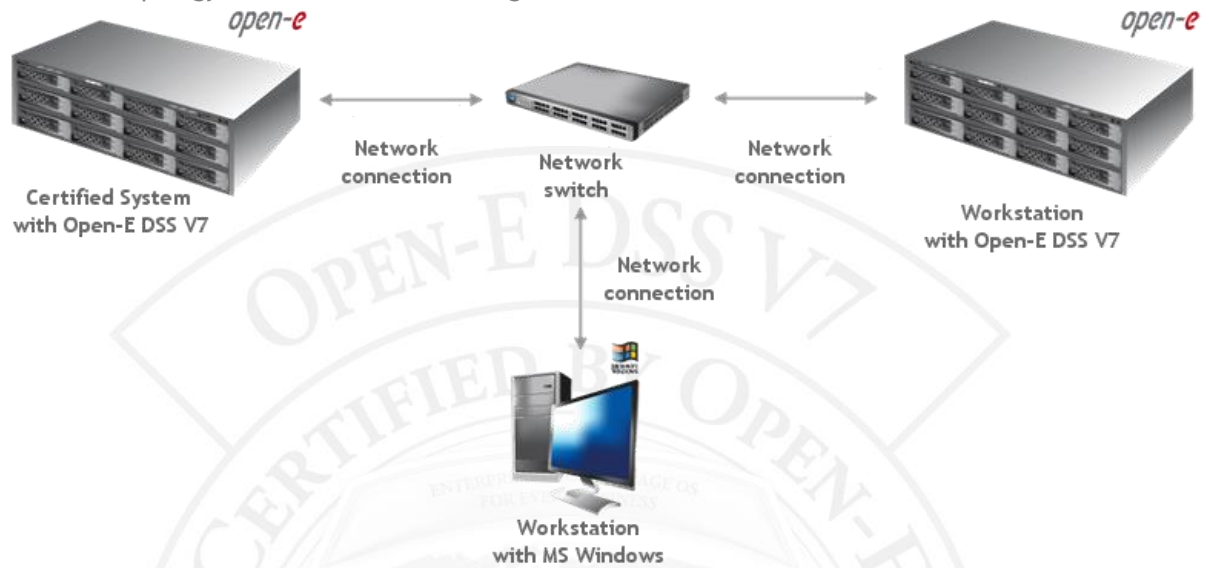


FIGURE 22: Network topology for iSCSI Initiator testing

iSCSI Target test topology

Network topology for iSCSI Target testing is shown below.

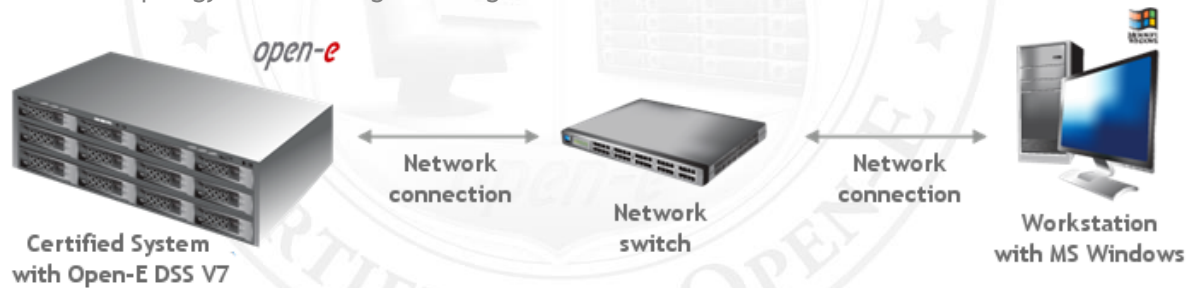


FIGURE 23: Network topology for iSCSI Target testing

iSCSI Initiator test

1. Test description

The test relies on using the storage connected via the built-in iSCSI Initiator for NAS volumes, creating SMB shares on these NAS volumes and copying data from a *Workstation with MS Windows* to them with various block sizes using the lometer testing tool.

2. Test results for iSCSI Initiator and Intel Ethernet Server Adapter X520-SR2

iSCSI Initiator performance test results			
Block size [KB]	Write speed [MB/s]	Read speed [MB/s]	Performance test results
4	100.41	117.38	passed
32	466.12	543.99	passed
64	529.85	473.75	passed
128	546.33	472.92	passed
256	515.39	519.93	passed
512	519.63	516.88	passed
1024	548.94	504.48	passed
4096	561.68	503.01	passed

TABLE 25: iSCSI Initiator performance test results table for Intel Ethernet Server Adapter X520-SR2

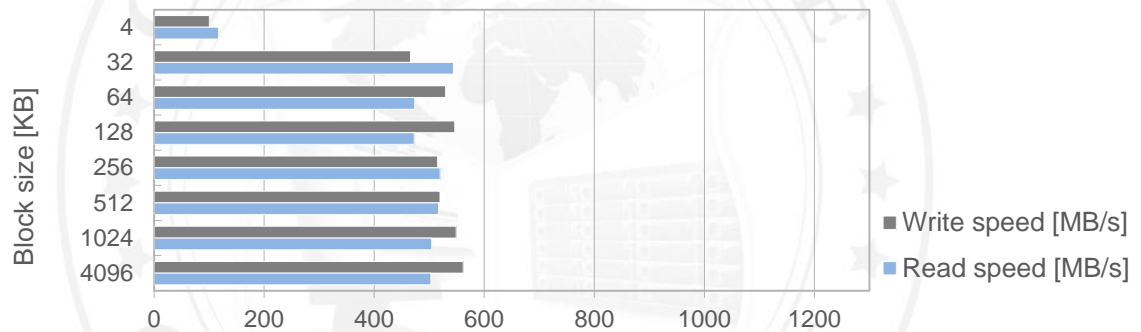


FIGURE 24: iSCSI Initiator performance test results chart for Intel Ethernet Server Adapter X520-SR2

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 Server Adapter X520-SR2

iSCSI Target performance test results			
Block size [KB]	Write speed [MB/s]	Read speed [MB/s]	Performance test results
4	70.23	99.85	passed
32	344.16	384.64	passed
64	423.64	462.29	passed
128	534.81	591.76	passed
256	593.99	634.47	passed
512	620.40	530.61	passed
1024	623.82	526.93	passed
4096	627.55	524.06	passed

TABLE 26: iSCSI Target performance test results table for Intel Ethernet Server Adapter X520-SR2

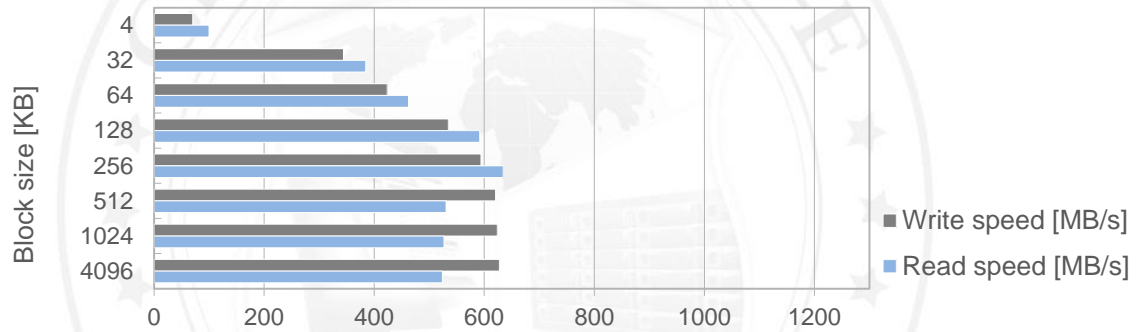


FIGURE 25: iSCSI Target performance test results chart for Intel Ethernet Server Adapter X520-SR2

Fibre Channel functionality

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

Fibre Channel Initiator test topology

Network topology for Fibre Channel Initiator testing is shown below.

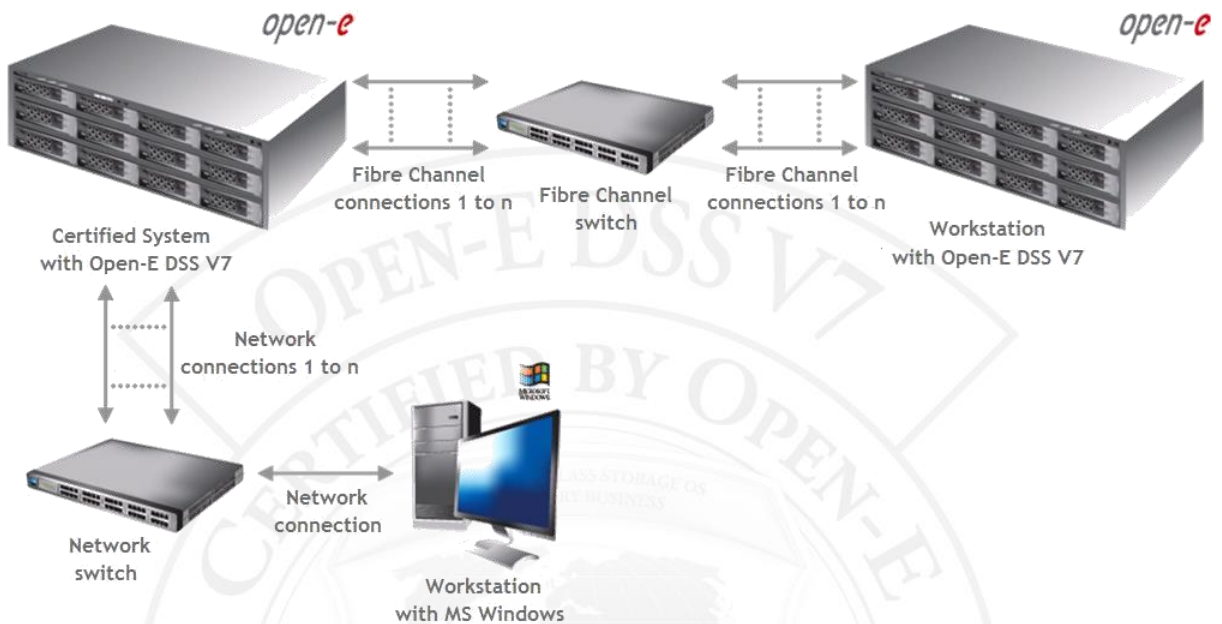


FIGURE 26: Network topology for Fibre Channel Initiator testing

Fibre Channel Target test topology

Network topology for Fibre Channel Target testing is shown below.

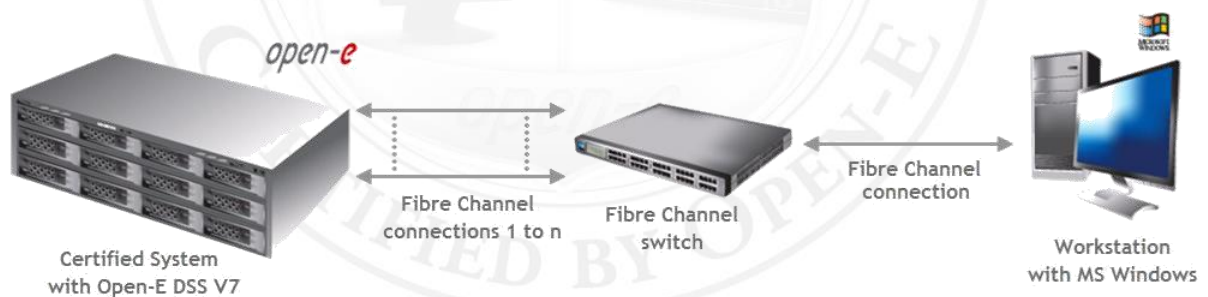


FIGURE 27: Network topology for Fibre Channel Target testing

Fibre Channel Initiator test

1. Test description

Test relies on creating the Fibre Channel Target on *Workstation with Open-E DSS V7*, connecting to the target using *Certified System with Open-E DSS V7* Fibre Channel Initiator and copying the data to the previously exported Fibre Channel LUNs using the iometer through the SMB protocol using *Workstation with MS Windows* on the certified system. All the tests were performed using 10GbE network connections and 8Gb Fibre Channel connection.

2. Test results for Fibre Channel Initiator and Qlogic QLE2562 HBA Adapter

Fibre Channel Initiator performance test results			
Block size [KB]	Write speed [MB/s]	Read speed [MB/s]	Performance test results
4	109.33	116.82	passed
32	454.83	603.61	passed
64	576.99	467.46	passed
128	577.78	473.86	passed
256	604.91	495.14	passed
512	585.15	523.53	passed
1024	598.27	497.19	passed
4096	599.73	500.10	passed

TABLE 27: Fibre Channel Initiator performance test results table for Qlogic QLE2562 HBA Adapter

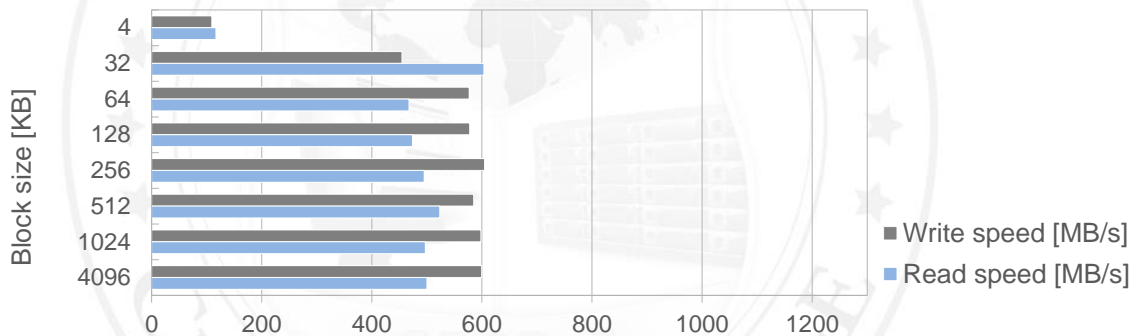


FIGURE 28: Fibre Channel Initiator performance test results chart for Qlogic QLE2562 HBA Adapter

Fibre Channel Target test

1. Test description

Test relies on creating the Fibre Channel Target on *Certified System with Open-E DSS V7*, connecting to the target using *Workstation with MS Windows* with a Fibre Channel Controller in the initiator mode and copying the data to connected LUN using *lometer*. All the tests were performed using 8Gb Fibre Channel connection.

2. Test results for Fibre Channel Target and Qlogic QLE2562 HBA Adapter

Fibre Channel Target performance test results			
Block size [KB]	Write speed [MB/s]	Read speed [MB/s]	Performance test results
4	130.08	98.80	passed
32	556.17	599.91	passed
64	515.77	488.78	passed
128	522.75	550.12	passed
256	565.19	543.00	passed
512	626.05	580.34	passed
1024	692.53	663.23	passed
4096	779.56	715.31	passed

TABLE 28: Fibre Channel Target performance test results table for Qlogic QLE2562 HBA Adapter

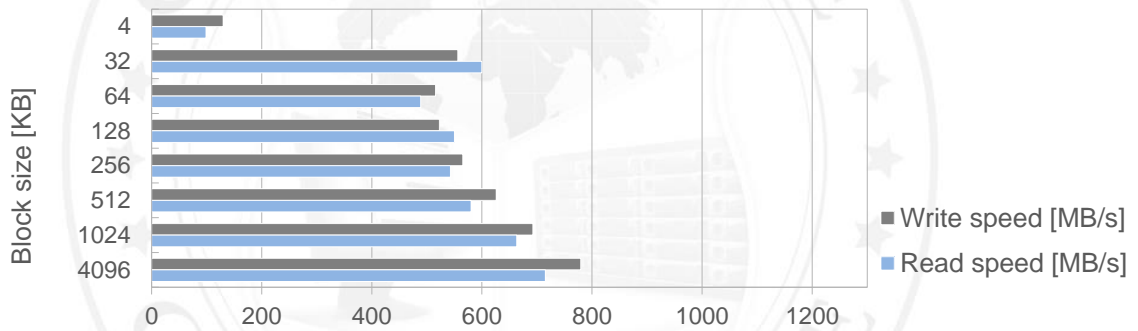


FIGURE 29: Fibre Channel Target performance test results chart for Qlogic QLE2562 HBA Adapter