

XPOINT HP ProLiant DL380p Gen8 storage system



Executive summary

After performing all tests, the XPOINT HP ProLiant DL380p Gen8 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 XPOINT HP ProLiant DL380p Gen8 is stable and performs well.

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

✓ iSCSI storage

The following features make XPOINT HP ProLiant DL380p Gen8 good iSCSI storage:

- HW RAID5 and RAID50 for high performance and data safety.
- Four 10GbE interfaces for fast MPIO connection.
- Redundant power supply for system reliability.

✓ NAS filer

The following features make XPOINT HP ProLiant DL380p Gen8 a great NAS filer solution:

- Eight high class SAS hard drives provide fast random data access.
- Hardware RAID5 and RAID50 for fault tolerance and the most efficient use of available disk space.
- Four 1GbE interfaces for independent connection to different networks or link aggregation for improved throughput.

Certification notes

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

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XPOINT HP ProLiant DL380p Gen8 hardware components

Technical specifications about the certified system are listed below:

Model	XPOINT HP ProLiant DL380p Gen8
Operating system	Open-E DSS V7 build 7356
Enclosure/chassis	HP ProLiant DL380p Gen8
CPU	Intel Xeon E5-2620 2.00GHz
Motherboard	HP FXNESSN-001P
Memory	2x 4GB DDR3 ECC-REG Hynix HMT351R7CFR4A-H9 T3 AC
Network	HP FlexibleLOM 1Gb 4-port 331FLR Ethernet Adapter (BCM 5719)
HW RAID	HP Smart Array P420i/1GB FBWC
Hard disk drives	8x 300GB Seagate Savvio 10K.5 ST9300505SS

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

All components were detected and properly recognized.



XPOINT HP ProLiant DL380p Gen8 photos



FIGURE 1: Front photo



FIGURE 2: Rear photo

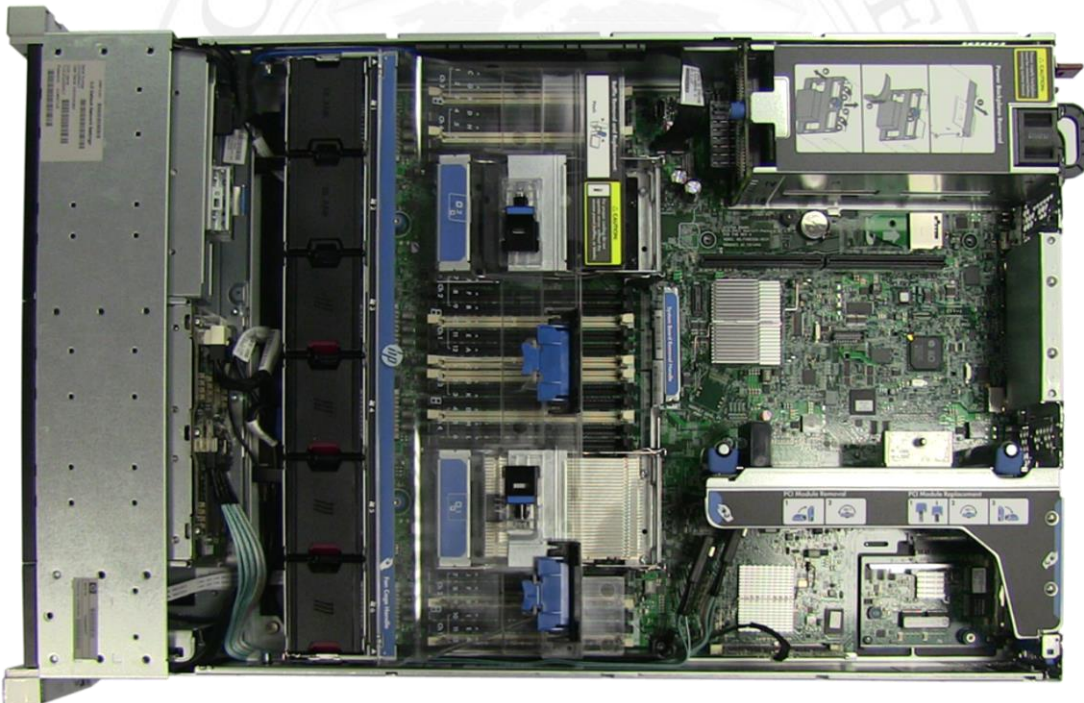


FIGURE 3: Top photo

Auxiliary systems hardware components

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

Model	Supermicro SYS-6026TT-BIBQRF
Operating system	MS Windows Server 2008 R2
Enclosure/chassis	Supermicro CSE-827H-R1400B
Motherboard	Supermicro X8DTT-IBQF
CPU	Intel Xeon E5620 2.40GHz
Memory	6x 4GB DDR3 1333 ECC-REG ATP AL12M72E4BJH9S
Network	Intel Gigabit ET Dual Port Server Adapter (i82576) (on board)
Hard disk drives	1x 750GB Seagate Barracuda ST3750330NS

TABLE 2: Hardware components of first Workstation with MS Windows

Model	Supermicro SYS-6026TT-BIBQRF
Operating system	MS Windows Server 2008 R2
Enclosure/chassis	Supermicro CSE-827H-R1400B
Motherboard	Supermicro X8DTT-IBQF
CPU	Intel Xeon E5620 2.40GHz
Memory	6x 4GB DDR3 1333 ECC-REG ATP AL12M72E4BJH9S
Network	Intel Gigabit ET Dual Port Server Adapter (i82576) (on board)
Hard disk drives	1x 750GB Seagate Barracuda ST3750330NS

TABLE 3: Hardware components of second Workstation with MS Windows

Model	Custom
Operating system	Open-E DSS V7 build 6645
Enclosure/chassis	lpc-4u-600
CPU	Intel Xeon E5630 2.53GHz
Motherboard	Supermicro X8DTH-IF
Memory	4x 4GB DDR3 ECC-REG Samsung M393B5270CH0-CH9
Network	Intel dual port (on-board) (i82576)
Network	Intel PRO/1000 PT Quad LP Server Adapter (i82571GB)
HW RAID	LSI MegaRAID SAS 9280-4i4e
Hard disk drives	8x 300GB Seagate Savio ST9300605SS

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

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

TABLE 5: Network switch details

Administration functionality

The following functionality has been tested.

Drive identifier	OK
Power button	OK
Front and rear LEDs	OK

TABLE 6: 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.

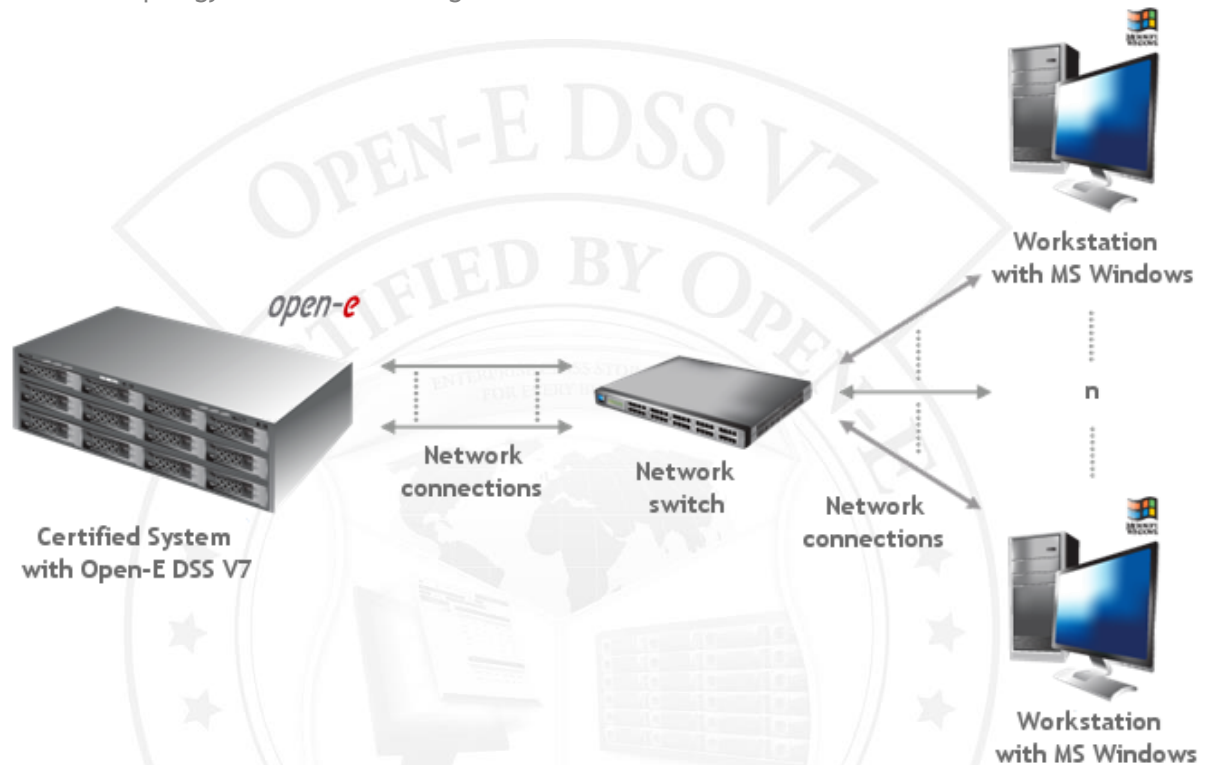


FIGURE 4: Network topology for Network testing

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 HP FlexibleLOM 1Gb 4-port 331FLR Ethernet Adapter (BCM 5719)

802.3ad bonding mode performance test results			
NIC model	HP FlexibleLOM 1Gb 4-port 331FLR (BCM 5719)		
Workstations with MS Windows	Write speed [MB/s]	Read speed [MB/s]	Performance test results
1 st Workstation	56.42	41.19	passed
2 nd Workstation	108.00	39.28	passed
3 rd Workstation	108.83	32.96	passed
4 th Workstation	57.53	111.87	passed

TABLE 7: 802.3ad bonding mode performance test results table for HP FlexibleLOM 1Gb 4-port 331FLR Ethernet Adapter (BCM 5719)

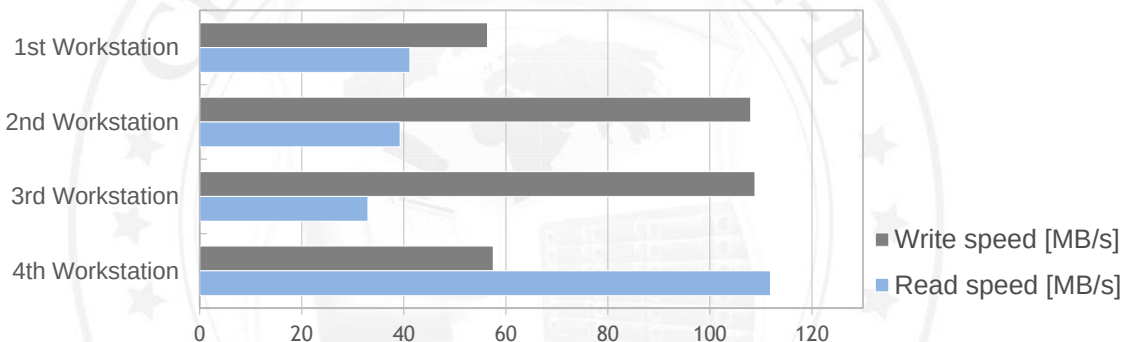


FIGURE 5: 802.3ad bonding mode performance test results chart for HP FlexibleLOM 1Gb 4-port 331FLR Ethernet Adapter (BCM 5719)

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 HP FlexibleLOM 1Gb 4-port 331FLR Ethernet Adapter (BCM 5719)

Balance-alb bonding mode performance test results			
NIC model	HP FlexibleLOM 1Gb 4-port 331FLR (BCM 5719)		
Workstations with MS Windows	Write speed [MB/s]	Read speed [MB/s]	Performance test results
1 st Workstation	58.55	111.27	passed
2 nd Workstation	53.11	111.54	passed
3 rd Workstation	108.20	111.63	passed
4 th Workstation	107.71	111.93	passed

TABLE 8: Balance-alb bonding mode performance test results table for HP FlexibleLOM 1Gb 4-port 331FLR Ethernet Adapter (BCM 5719)

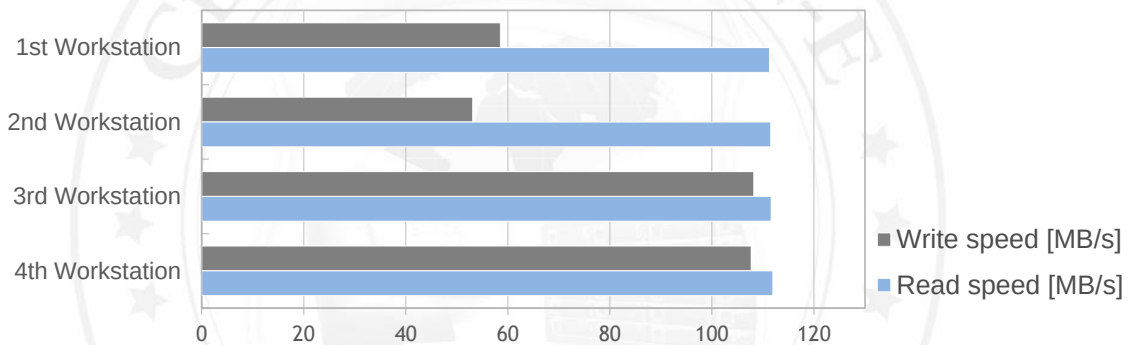


FIGURE 6: Balance-alb bonding mode performance test results chart for HP FlexibleLOM 1Gb 4-port 331FLR Ethernet Adapter (BCM 5719)

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 HP FlexibleLOM 1Gb 4-port 331FLR Ethernet Adapter (BCM 5719)

Balance-rr bonding mode performance test results			
NIC model	HP FlexibleLOM 1Gb 4-port 331FLR (BCM 5719)		
Workstations with MS Windows	Write speed [MB/s]	Read speed [MB/s]	Performance test results
1 st Workstation	52.57	71.84	passed
2 nd Workstation	52.98	72.14	passed
3 rd Workstation	52.51	72.02	passed
4 th Workstation	52.53	72.05	passed

TABLE 9: Balance-rr bonding mode performance test results table for HP FlexibleLOM 1Gb 4-port 331FLR Ethernet Adapter (BCM 5719)

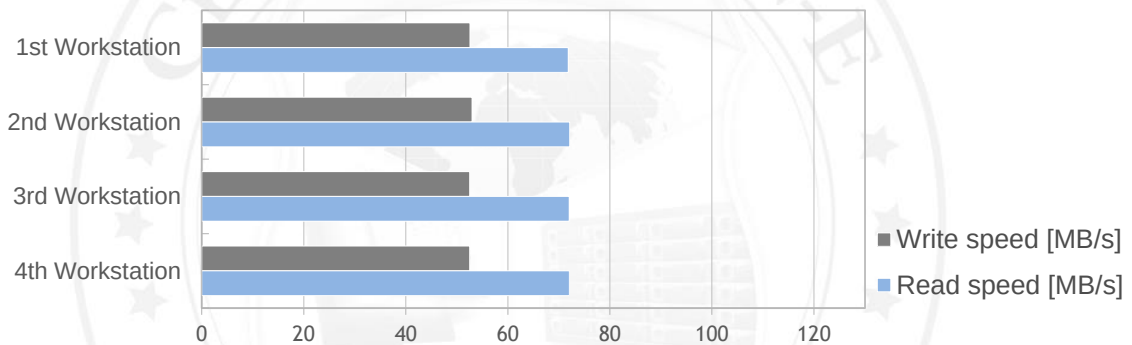


FIGURE 7: Balance-rr bonding mode performance test results chart for HP FlexibleLOM 1Gb 4-port 331FLR Ethernet Adapter (BCM 5719)

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 HP FlexibleLOM 1Gb 4-port 331FLR Ethernet Adapter (BCM 5719)

Single NIC performance test results			
NIC model	HP FlexibleLOM 1Gb 4-port 331FLR (BCM 5719)		
Workstations with MS Windows	Write speed [MB/s]	Read speed [MB/s]	Performance [passed/failed]
1 st Workstation	108.79	112.03	passed

TABLE 10: Single NIC test results table for HP FlexibleLOM 1Gb 4-port 331FLR Ethernet Adapter (BCM 5719)

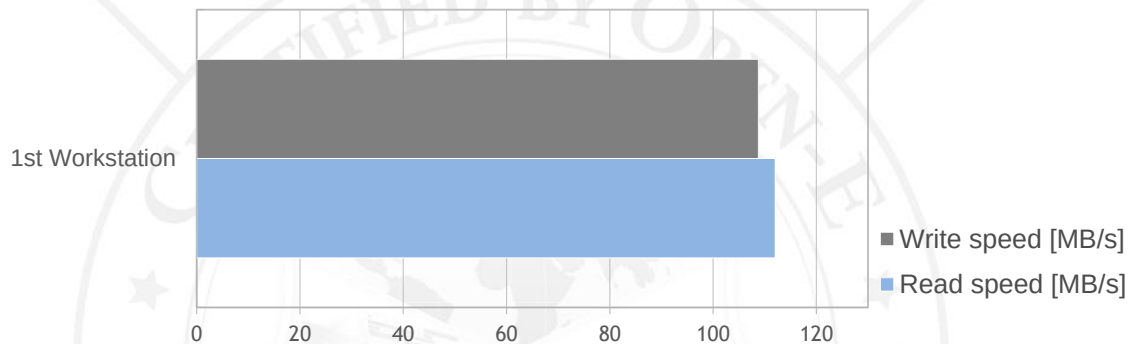


FIGURE 8: Single NIC performance test results chart for HP FlexibleLOM 1Gb 4-port 331FLR Ethernet Adapter (BCM 5719)

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, 10 and 50 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

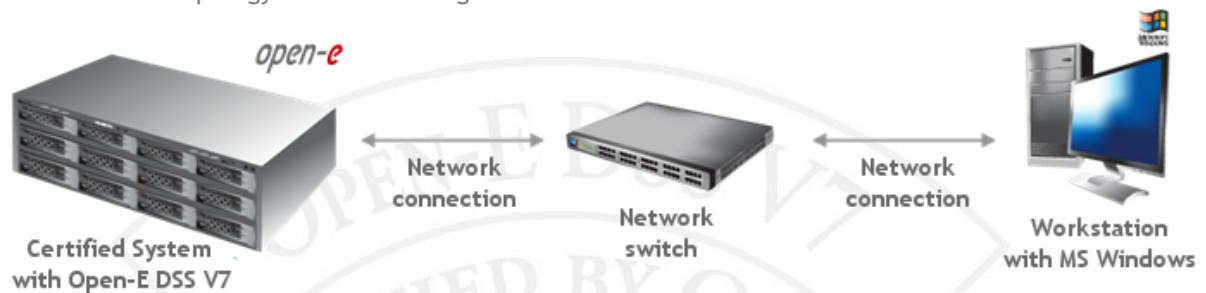


FIGURE 9: Network test topology for RAID testing

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 HP FlexibleLOM 1Gb 4-port 331FLR Ethernet Adapter (BCM 5719)

RAID0 performance test results			
Block size [KB]	Write speed [MB/s]	Read speed [MB/s]	Performance test results
4	18.27	31.59	passed
32	91.64	111.01	passed
64	86.93	111.98	passed
128	89.80	112.02	passed
256	98.32	112.02	passed
512	99.26	112.09	passed
1024	98.92	112.11	passed
4096	99.23	112.07	passed

TABLE 11: RAID0 performance test results table for HP FlexibleLOM 1Gb 4-port 331FLR Ethernet Adapter (BCM 5719)

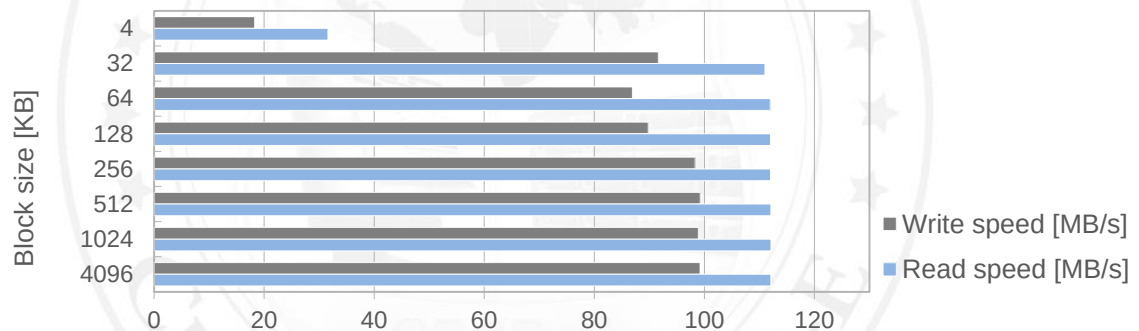


FIGURE 10: RAID0 performance test results chart for HP FlexibleLOM 1Gb 4-port 331FLR Ethernet Adapter (BCM 5719)

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 HP FlexibleLOM 1Gb 4-port 331FLR Ethernet Adapter (BCM 5719)

RAID5 performance test results			
Block size [KB]	Write speed [MB/s]	Read speed [MB/s]	Performance test results
4	26.42	30.35	passed
32	82.79	107.72	passed
64	110.31	111.37	passed
128	101.59	111.75	passed
256	105.68	111.96	passed
512	108.68	112.03	passed
1024	108.21	112.03	passed
4096	108.62	112.00	passed

TABLE 12: RAID5 performance test results table for HP FlexibleLOM 1Gb 4-port 331FLR Ethernet Adapter (BCM 5719)

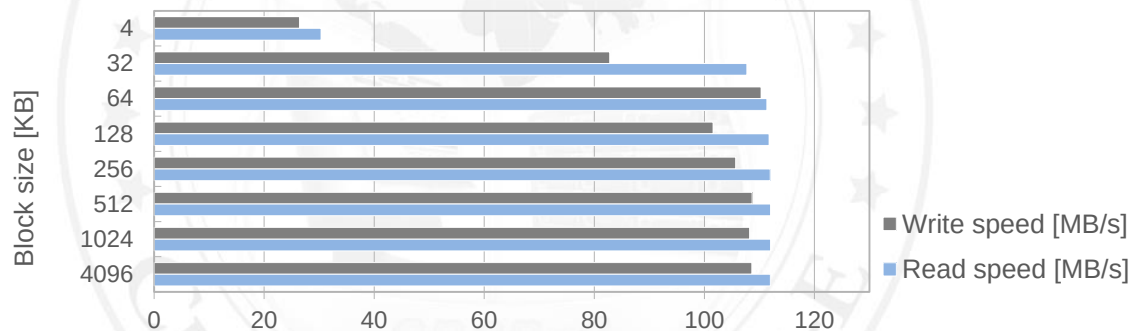


FIGURE 11: RAID5 performance test results chart for HP FlexibleLOM 1Gb 4-port 331FLR Ethernet Adapter (BCM 5719)

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 lometer testing tool.

2. Test results for RAID10 and HP FlexibleLOM 1Gb 4-port 331FLR Ethernet Adapter (BCM 5719)

RAID10 performance test results			
Block size [KB]	Write speed [MB/s]	Read speed [MB/s]	Performance test results
4	26.45	30.41	passed
32	82.88	107.76	passed
64	111.18	111.40	passed
128	105.99	111.92	passed
256	105.29	112.02	passed
512	108.74	112.04	passed
1024	109.36	112.04	passed
4096	107.74	111.94	passed

TABLE 13: RAID10 performance test results table for HP FlexibleLOM 1Gb 4-port 331FLR Ethernet Adapter (BCM 5719)

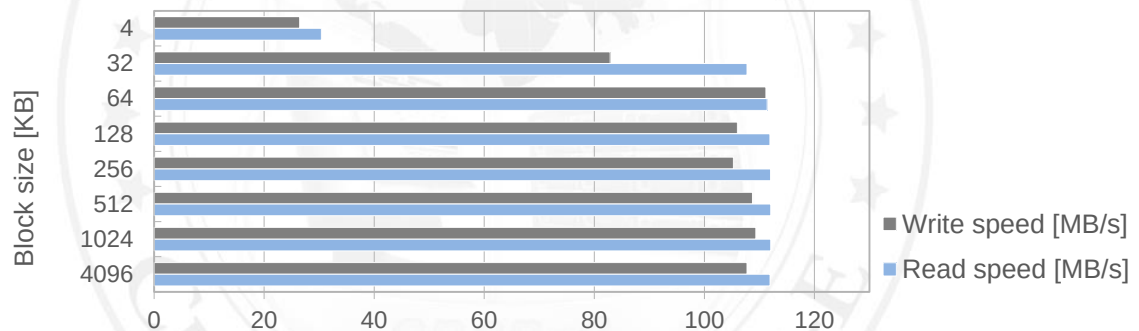


FIGURE 12: RAID10 performance test results chart for HP FlexibleLOM 1Gb 4-port 331FLR Ethernet Adapter (BCM 5719)

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 HP FlexibleLOM 1Gb 4-port 331FLR Ethernet Adapter (BCM 5719)

RAID50 performance test results			
Block size [KB]	Write speed [MB/s]	Read speed [MB/s]	Performance test results
4	26.36	30.31	passed
32	82.53	107.85	passed
64	110.73	111.31	passed
128	100.67	111.89	passed
256	105.98	111.97	passed
512	108.39	112.05	passed
1024	107.78	111.97	passed
4096	107.73	111.96	passed

TABLE 14: RAID50 performance test results table for HP FlexibleLOM 1Gb 4-port 331FLR Ethernet Adapter (BCM 5719)

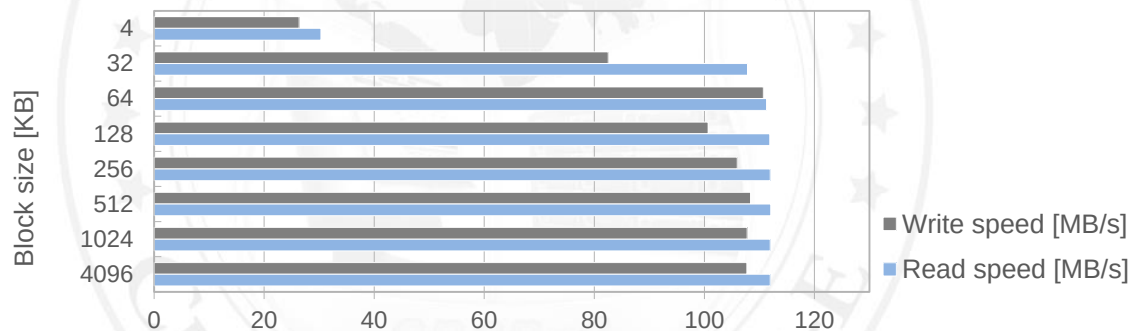


FIGURE 13: RAID50 performance test results chart for HP FlexibleLOM 1Gb 4-port 331FLR Ethernet Adapter (BCM 5719)

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.

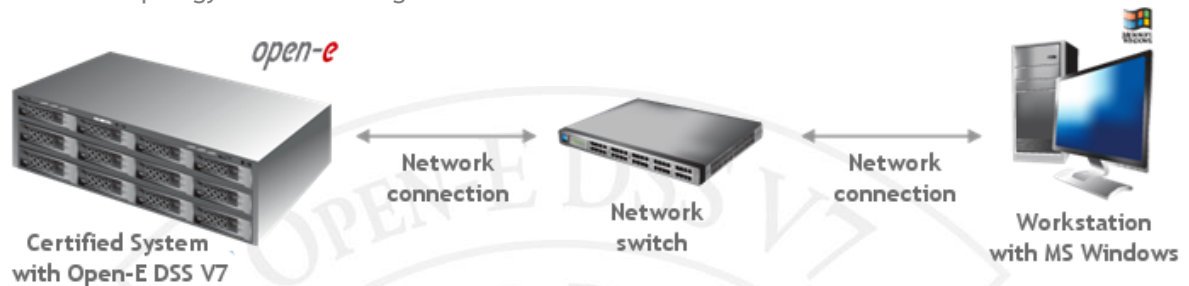


FIGURE 14: Network topology for NAS testing

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 HP FlexibleLOM 1Gb 4-port 331FLR Ethernet Adapter (BCM 5719)

SMB performance test results			
Block size [KB]	Write speed [MB/s]	Read speed [MB/s]	Performance test results
4	53.78	52.58	passed
32	112.78	112.80	passed
64	113.03	111.31	passed
128	113.02	109.40	passed
256	113.04	112.85	passed
512	113.01	112.90	passed
1024	113.00	112.87	passed
4096	112.97	112.86	passed

TABLE 15: SMB performance test results table for HP FlexibleLOM 1Gb 4-port 331FLR Ethernet Adapter (BCM 5719)

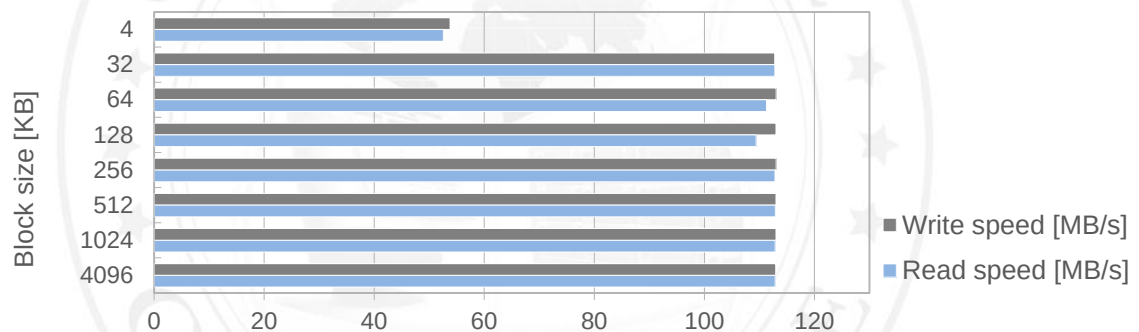


FIGURE 15: SMB performance test results chart for HP FlexibleLOM 1Gb 4-port 331FLR Ethernet Adapter (BCM 5719)

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.

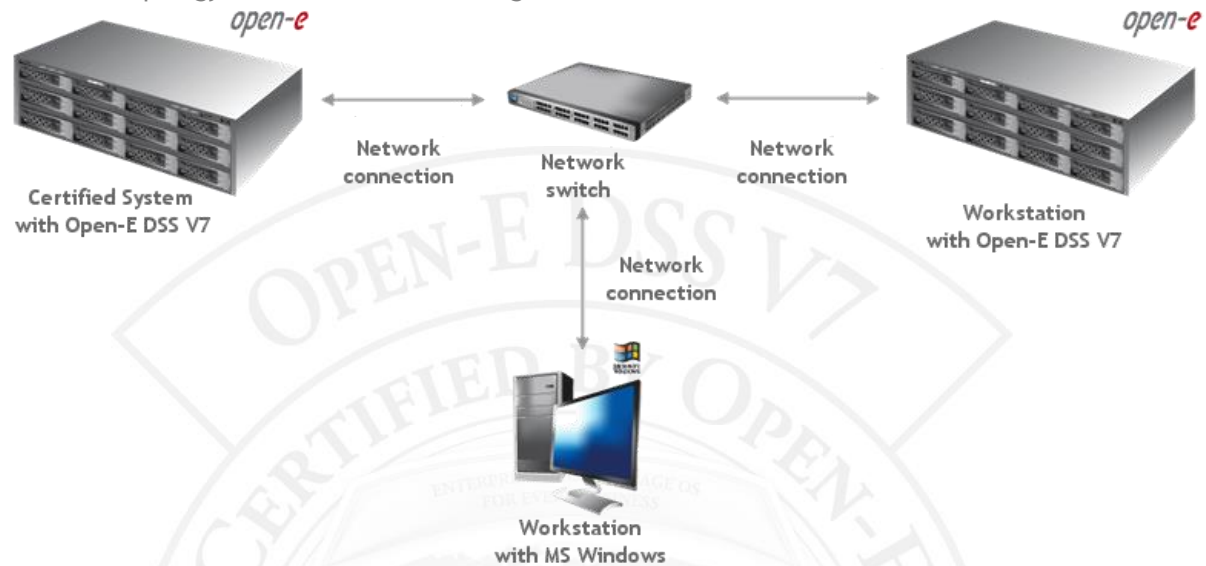


FIGURE 16: Network topology for iSCSI Initiator testing

iSCSI Target test topology

Network topology for iSCSI Target testing is shown below.

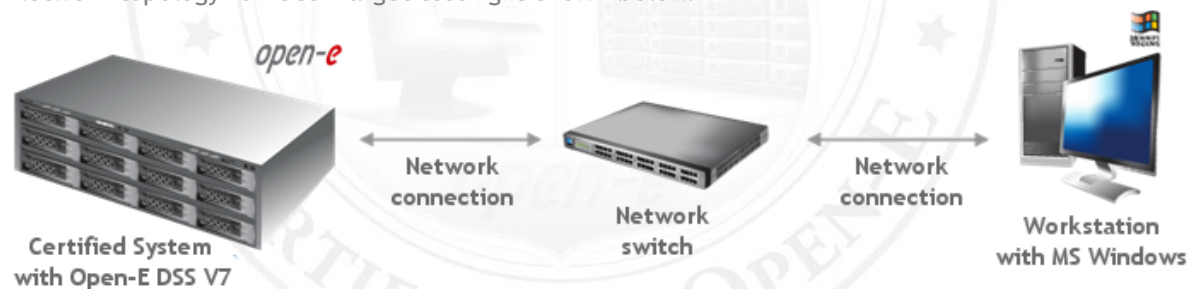


FIGURE 17: Network topology for iSCSI Target testing

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 HP FlexibleLOM 1Gb 4-port 331FLR Ethernet Adapter (BCM 5719)

iSCSI Initiator performance test results			
Block size [KB]	Write speed [MB/s]	Read speed [MB/s]	Performance test results
4	57.12	54.28	passed
32	111.73	111.71	passed
64	112.09	110.98	passed
128	112.30	112.27	passed
256	112.63	112.51	passed
512	112.77	112.40	passed
1024	112.65	112.32	passed
4096	112.76	112.43	passed

TABLE 16: iSCSI Initiator performance test results table for HP FlexibleLOM 1Gb 4-port 331FLR Ethernet Adapter (BCM 5719)

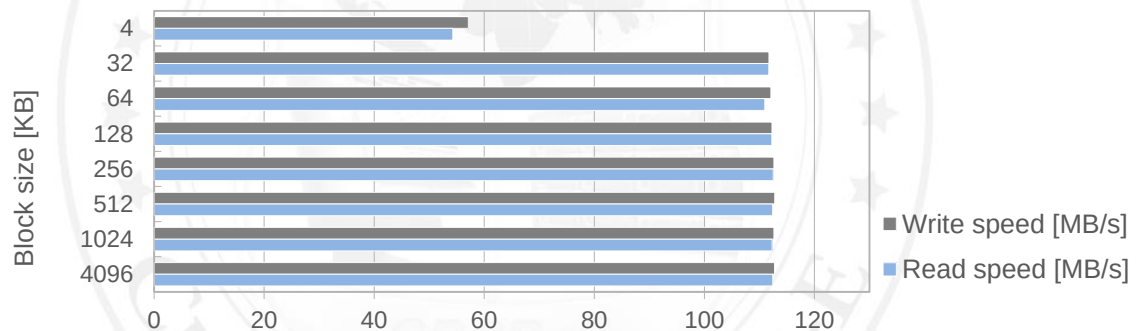


FIGURE 18: iSCSI Initiator performance test results chart for HP FlexibleLOM 1Gb 4-port 331FLR Ethernet Adapter (BCM 5719)

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 *lomometer* tool.

2. Test results for iSCSI Target and HP FlexibleLOM 1Gb 4-port 331FLR Ethernet Adapter (BCM 5719)

iSCSI Target performance test results			
Block size [KB]	Write speed [MB/s]	Read speed [MB/s]	Performance test results
4	12.83	25.99	passed
32	94.02	111.70	passed
64	98.75	111.31	passed
128	96.01	111.99	passed
256	97.09	111.19	passed
512	97.60	112.12	passed
1024	97.65	112.15	passed
4096	98.94	112.08	passed

TABLE 17: iSCSI Target performance test results table for HP FlexibleLOM 1Gb 4-port 331FLR Ethernet Adapter (BCM 5719)

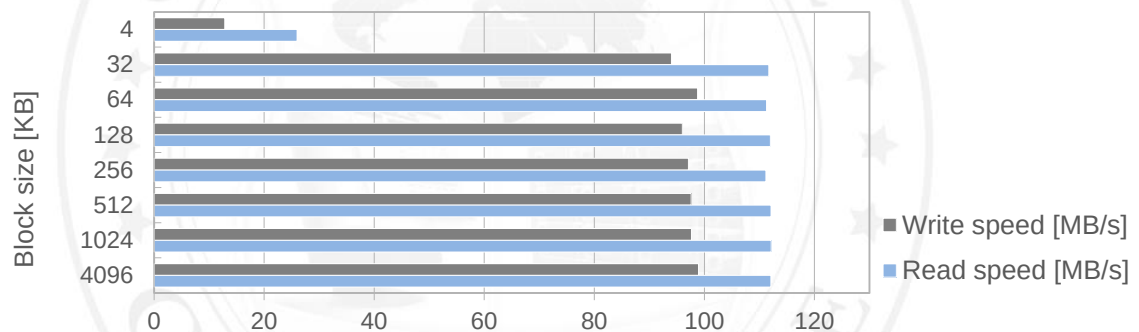


FIGURE 19: iSCSI Target performance test results chart for HP FlexibleLOM 1Gb 4-port 331FLR Ethernet Adapter (BCM 5719)