



IBTA RoCE Interoperability List October 2017



These Interoperability results represent system tests and include the testing of the entire environment including device transmitters, cable media and device receivers. The Interoperability results include 10, 25, 40, 50 and 100 GbE RoCE devices and SFP28 and QSFP28 cables.

While every effort was made to test worst-case conditions, results may vary with alternative port configurations, device and cable manufacturing variation, device firmware and software, traffic density and data patterns, temperature variation, etc. The following documentation identifies the test conditions used to obtain these Interoperability results.

Hardware used to test Interoperability

Manufacturer	Description of Hardware	Model	Type	FW	SW	Speed
Broadcom	BCM957414A4140 40GbE	BCM957414A4140-40	RNIC	20.8.35	20.8.0.6	40 GbE
Broadcom	BCM957414A4140 50GbE	BCM957414A4140-50	RNIC	20.8.35	20.8.0.6	50 GbE
Broadcom	BCM957454A4540 100GbE	BCM957454A4540	RNIC	20.8.35	20.8.0.6	100 GbE
Cavium	QLogic FastLinQ Dual-Port 10GbE	QL45212HL	RNIC	8.30.14.0	8.30.13.0	10 GbE
Cavium	QLogic FastLinQ Dual-Port 25GbE	QL45212HL	RNIC	8.30.14.0	8.30.13.0	25 GbE
Cavium	QLogic FastLinQ Dual-Port 25GbE	QL41212HL	RNIC	8.30.14.0	8.30.13.0	25 GbE
Cavium	QLogic FastLinQ Dual-Port 40GbE	QL45412HL	RNIC	8.30.14.0	8.30.13.0	40 GbE
Cavium	QLogic FastLinQ Single-Port 100GbE	QL45611HL	RNIC	8.30.14.0	8.30.13.0	100 GbE
Huawei	Smart-IO-NIC-4-25, 25GbE, quad-port	Smart-IO-NIC-4-25	Ext-RNIC	20171027_2300	0.1.2.2.99999	25 GbE
Huawei	Smart-IO-NIC-2-100, 40 GbE, dual-port	Smart-IO-NIC-2-40	RNIC	20171027_2300	0.1.2.2.99999	40 GbE
Huawei	Smart-IO-NIC-2-100, 100GbE, dual-port	Smart-IO-NIC-2-100	RNIC	20171027_2300	0.1.2.2.99999	100 GbE
Mellanox	ConnectX@-3 Pro EN network interface card, 10GbE, dual-port SFP+	MCX312B-XCCT	RNIC	2.40.7000	4.1-1.0.2.0	10 GbE
Mellanox	ConnectX@-3 Pro EN network interface card, 40/56GbE, dual-port QSFP	MCX314A-BCCT	RNIC	2.40.7000	4.1-1.0.2.0	40 GbE
Mellanox	ConnectX@-3 Pro VPI adapter card, dual-port QSFP, FDR IB (56Gb/s) and 40/56GbE	MCX354A-FCCT	RNIC	2.40.7000	4.1-1.0.2.0	40 GbE
Mellanox	ConnectX@-4 Lx EN network interface card, 25GbE dual-port SFP28	MCX4121A-ACAT	RNIC	14.20.1010	4.1-1.0.2.0	25 GbE
Mellanox	ConnectX@-4 Lx EN network interface card, 10GbE dual-port SFP+	MCX4121A-XCAT	RNIC	14.20.1010	4.1-1.0.2.0	10 GbE
Mellanox	ConnectX@-4 Lx EN network interface card, 40GbE single-port QSFP28	MCX4131A-BCAT	RNIC	14.20.1010	4.1-1.0.2.0	40 GbE
Mellanox	ConnectX@-4 Lx EN network interface card, 50GbE single-port QSFP28	MCX4131A-GCAT	RNIC	14.20.1010	4.1-1.0.2.0	50 GbE
Mellanox	ConnectX@-4 EN network interface card, 50GbE dual-port QSFP28	MCX414A-GCAT	RNIC	10.20.1010	4.1-1.0.2.0	50 GbE
Mellanox	ConnectX@-4 EN network interface card, 40/56GbE dual-port QSFP28	MCX416A-BCAT	RNIC	10.20.1010	4.1-1.0.2.0	40 GbE
Mellanox	ConnectX@-4 EN network interface card, 100GbE dual-port QSFP28	MCX416A-CCAT	RNIC	10.20.1010	4.1-1.0.2.0	100 GbE
Mellanox	ConnectX@-5 EN network interface card, 100GbE dual-port QSFP28	MCX516A-CCAT	RNIC	16.20.1010	4.1-1.0.2.0	100 GbE
Mellanox	ConnectX@-5 VPI adapter card; EDR IB (100Gb/s) and 100GbE; single-port QSFP28	MCX555A-ECAT	RNIC	16.20.1010	4.1-1.0.2.0	100 GbE
Mellanox	Half-Width 12-port Non-blocking 40/56GbE	MSX1012B-2BFS	Switch	9.4.2160	3.6.3004	40 GbE
Mellanox	SwitchX@-2 InfiniBand to Ethernet gateway, 36 QSFP ports	MSX6036G-2SFS	Switch	9.4.2160	3.6.3004	40 GbE
Mellanox	32-port Non-blocking 100GbE Supports speeds of 10/25/40/50/56/100GbE	MSN2700-CS2F	Switch	13.1452.178	3.6.3506	100 GbE
Mellanox	48 SFP28 ports, 8 QSFP28 ports, 100GbE Supports speeds of 10/25/40/50/56/100GbE	MSN2410-CB2F	Switch	13.1452.178	3.6.4114	100 GbE



IBTA RoCE Interoperability List October 2017



Software Used to Test Interoperability

Software	Versions
Operating System	CentOS 7.2
OFED Versions	OFED 4.8, 4.8-1-rc1
Mellanox OFED Version	4.1-1.0.2.0
Open MPI Used	Open MPI 2.1
Open MPI Documentation	https://www.open-mpi.org/doc/
Intel Benchmarks	https://software.intel.com/en-us/imb-user-guide
Test Plan version	https://cw.infinibandta.org/wg/CIWG/document/8069
Test Duration	3-15 minutes

Conditions for passing Interoperability Testing	
Link Width	Link width is @ expected width - i.e. 1x,4x, etc
Link Speed	Link speed is @ expected speed - e.g. 100 GbE
Symbol Errors	There must be no errors during the MPI Benchmark
Link and Port Errors	There must be no errors during the MPI Benchmark
MPI Test	The MPI Benchmark must run to completion without error

Software	Versions
Software Forge HPC-Performance Monitor	HPC-PM-2.0.80

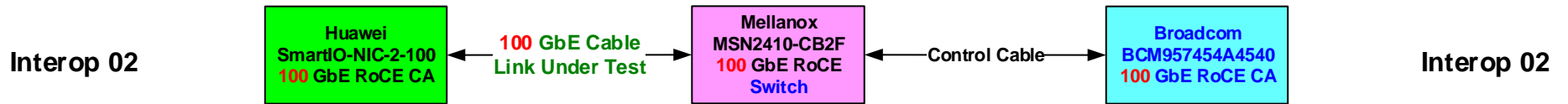
Open MPI Intel Benchmark Tests	
PingPong	Gather
PingPing	Gatherv
Sendrecv	Scatter
Exchange	Scatterv
Allreduce	Alltoall
Reduce	Alltoallv
Reduce_scatter	Bcast
Allgather	Barrier
Allgatherv	

RDMA over Converged Ethernet (RoCE) Interop Testing

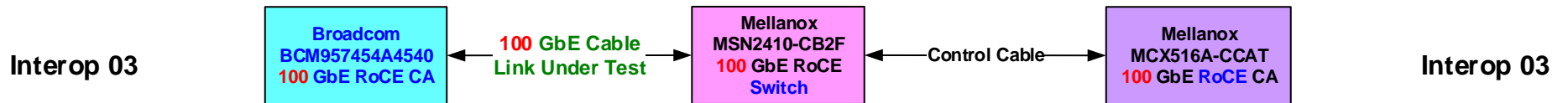
Broadcom BCM957454A4540 to Mellanox MSN2700 Switch to Cavium QL45611



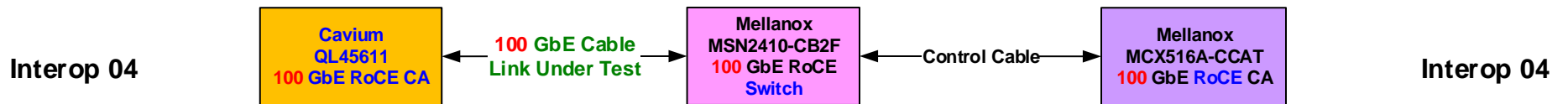
Huawei SmartIO-NIC-2-100 to Mellanox MSN2410 Switch to Broadcom BCM957454A4540



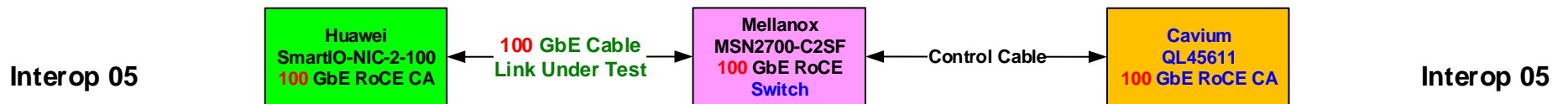
Broadcom BCM957454A4540 to Mellanox MSN2410 Switch to Mellanox MCX516A



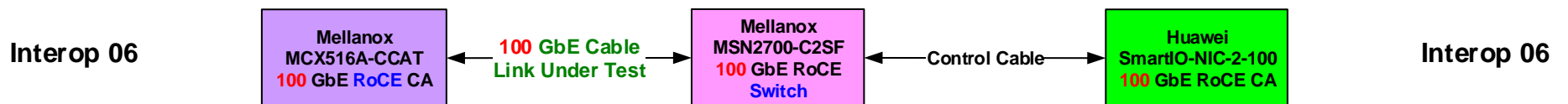
Cavium QL45611 to Mellanox MSN2410 Switch to Mellanox MCX516A



Huawei SmartIO-NIC-2-100 to Mellanox MSN2700 Switch to Cavium QL45611

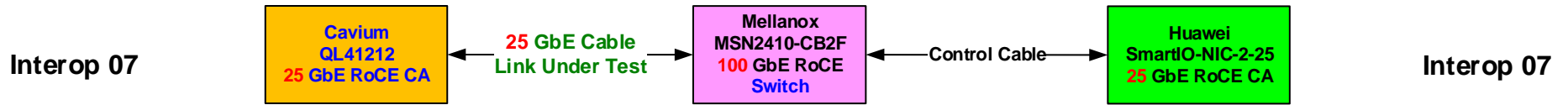


Mellanox MCX516A to Mellanox MSN2700 Switch to Huawei SmartIO-NIC-2-100

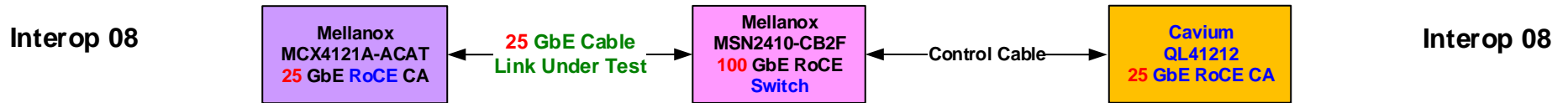


RDMA over Converged Ethernet (RoCE) Interop Testing

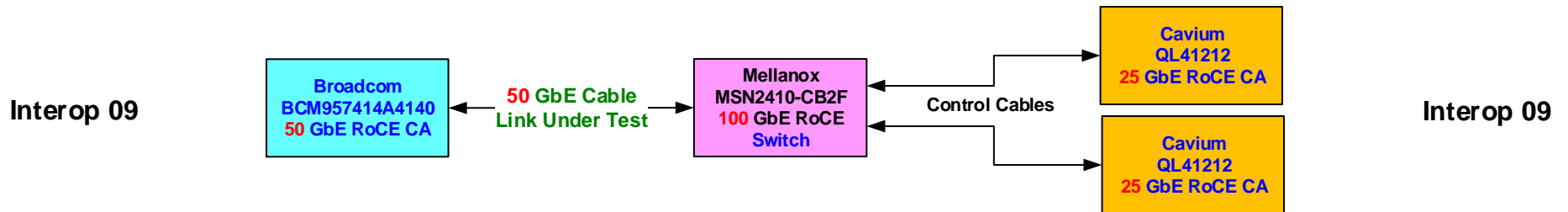
Cavium QL41212 to Mellanox MSN2410 Switch to Huawei SmartIO-NIC-2-25



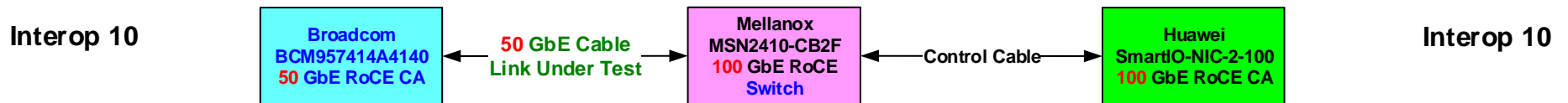
Mellanox MCX4121A to Mellanox MSN2410 Switch to Cavium QL41212



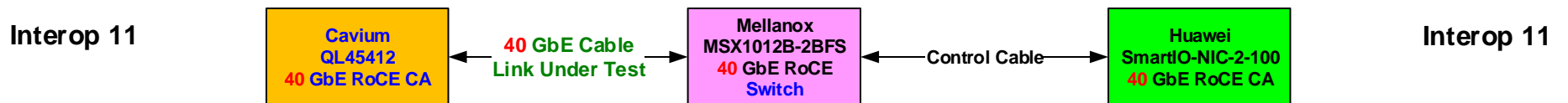
Broadcom BCM957414A4140 to Mellanox MSN2410 Switch to Cavium QL41212



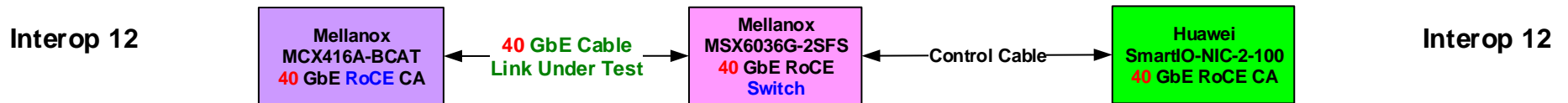
Broadcom BCM957414A4140 to Mellanox MSN2410 Switch to Huawei SmartIO-NIC-2-100



Cavium QL45412 to Mellanox MSX1012B Switch to Huawei SmartIO-NIC-2-100



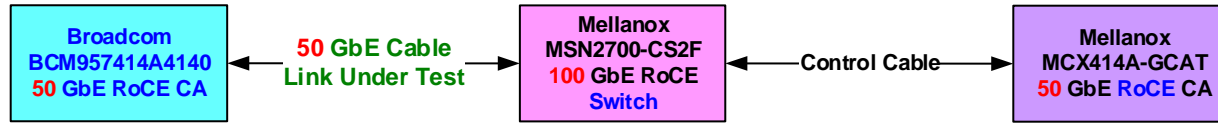
Mellanox MCX416A to Mellanox MSX6036G Switch to Huawei SmartIO-NIC-2-100



RDMA over Converged Ethernet (RoCE) Interop Testing

Broadcom BCM957414A4140 to Mellanox MSN2700 Switch to Mellanox MCX414A

Interop 13



Interop 13

Huawei SmartIO-NIC-4-25 to Mellanox MSN2410 Switch to Mellanox MCX4121A

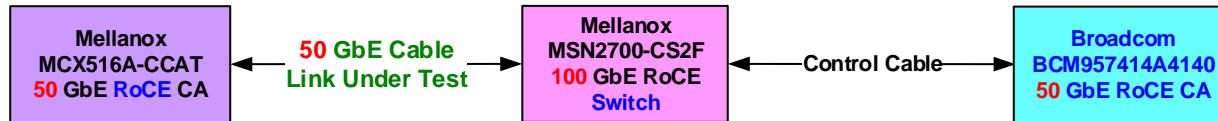
Interop 14



Interop 14

Mellanox MCX516A to Mellanox MSN2700 Switch to Broadcom BCM957414A4140

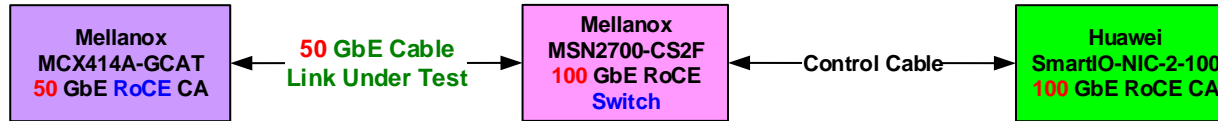
Interop 15



Interop 15

Mellanox MCX414A to Mellanox MSN2410 Switch to Huawei SmartIO-NIC-2-100

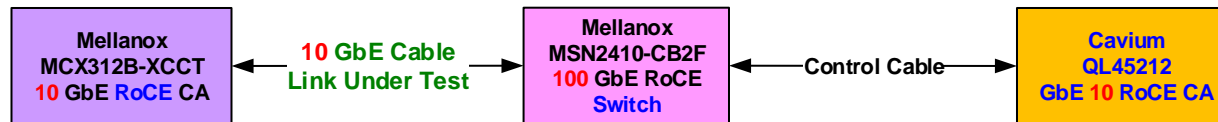
Interop 16



Interop 16

Mellanox MCX312B to Mellanox MSX1012B Switch to Cavium QL45212

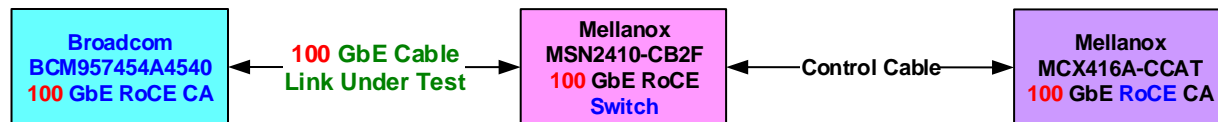
Interop 17



Interop 17

Broadcom BCM957454A4540 to Mellanox MSN2410 Switch to Mellanox MCX416A

Interop 19

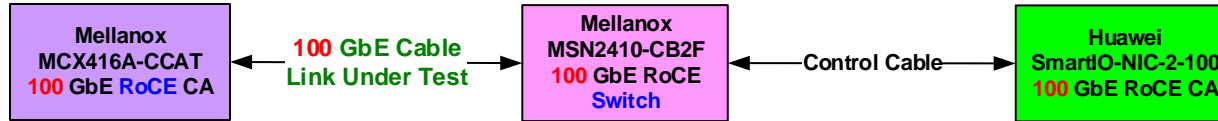


Interop 19

RDMA over Converged Ethernet (RoCE) Interop Testing

Mellanox MCX416A to Mellanox MSN2410 Switch to Huawei SmartIO-NIC-2-100

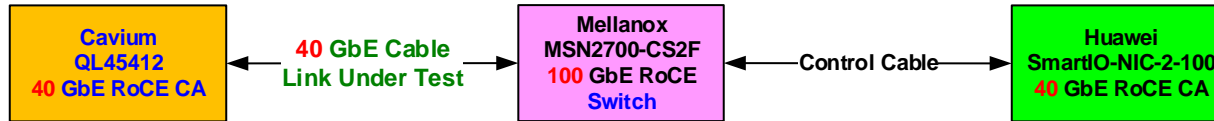
Interop 20



Interop 20

Cavium QL45412 to Mellanox MSN2700 Switch to Huawei SmartIO-NIC-2-100

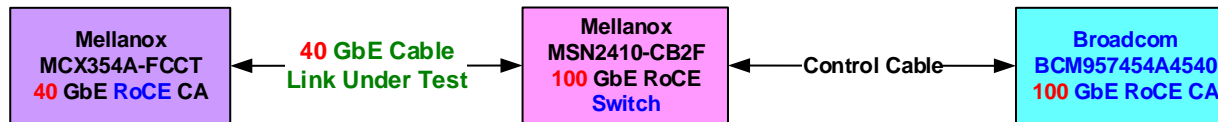
Interop 21



Interop 21

Mellanox MCX354A to Mellanox MSN2410 Switch to Broadcom BCM957454A4540

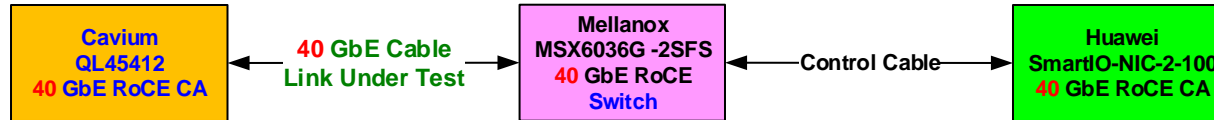
Interop 22



Interop 22

Cavium QL45412 to Mellanox MSX6036G Switch to Huawei SmartIO-NIC-2-100

Interop 23



Interop 23

Huawei SmartIO-NIC-2-100 to Mellanox MSN2410 Switch to Mellanox MCX516A

Interop 25



Interop 25

Cavium QL45611 to Mellanox MCX516A

Interop 26



Interop 26



IBTA PF32 RoCE Interoperability

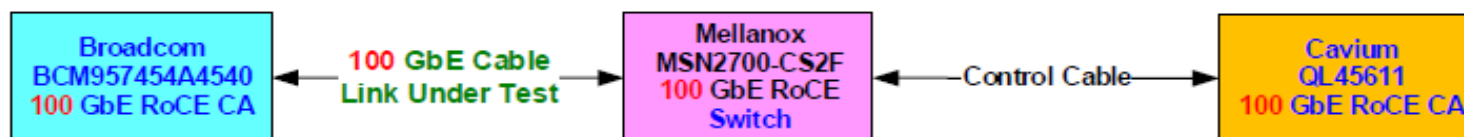
100 Gigabit Ethernet

Interop 01



Company	Length Meters	AWG	Equalization	Connector Type	Broadcom RoCE Card #1	Cable Under Test	Mellanox Switch	Cavium RoCE Card #2	Link Speed	Interop Result
AOI	70	NA	Fiber - Active	QSFP28	BCM957454A4540	AQPA9N70ADLN0851	MSN2700-CS2F	QL45611	100	Pass
AOI	70	NA	Fiber - Active	QSFP28		AQPA9N70ADLN0851			100	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0851			100	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0851			100	Pass
Finisar	1	N/A	Fiber - Active	QSFP28		FCBN425QE1C01			100	Pass
Finisar	5	N/A	Fiber - Active	QSFP28		FCBN425QB1C05			100	Pass
Finisar	100	N/A	Fiber - Active	QSFP28		FCBN425QE1CX0			100	Pass
Luxshare-ICT	0.5	30	Copper - Unequalized	QSFP28		LA0QF081-SD-R			100	Pass
Luxshare-ICT	1	30	Copper - Unequalized	QSFP28		LA0QF082-SD-R			100	Pass
Luxshare-ICT	2	30	Copper - Unequalized	QSFP28		LA0QF083-SD-R			100	Pass
Luxshare-ICT	1	28	Copper - Unequalized	QSFP28		LA0QF084-SD-R			100	Pass
Luxshare-ICT	2	28	Copper - Unequalized	QSFP28		LA0QF085-SD-R			100	Pass
Luxshare-ICT	1	26	Copper - Unequalized	QSFP28		LA0QF086-SD-R			100	Pass
Luxshare-ICT	2	26	Copper - Unequalized	QSFP28		LA0QF087-SD-R			100	Pass
Luxshare-ICT	3	26	Copper - Unequalized	QSFP28		LA0QF088-SD-R			100	Pass
Mellanox	0.5	30	Copper - Unequalized	QSFP28		MCP1650-H00AE30			100	Pass
Mellanox	1	30	Copper - Unequalized	QSFP28		MCP1650-H001E30			100	Pass
Mellanox	1.5	30	Copper - Unequalized	QSFP28		MCP1650-H01AE30			100	Pass
Mellanox	2	26	Copper - Unequalized	QSFP28		MCP1650-H002E28			100	Pass
Molex LLC	0.5	26	Copper - Unequalized	QSFP28		100297-3051			100	Pass
Molex LLC	0.5	30	Copper - Unequalized	QSFP28		100297-1051			100	Pass
TE Connectivity	2	33	Copper - Unequalized	QSFP28		1-2231368-8			100	Pass
TE Connectivity	3	30	Copper - Unequalized	QSFP28		2231368-8			100	Pass
Voelx	1	30	Copper - Unequalized	QSFP56		VAHS-30-0568			100	Pass
Voelx	2	30	Copper - Unequalized	QSFP28		VAHS-30-0570			100	Pass
Voelx	2	26	Copper - Unequalized	QSFP56		VAHS-26-0349			100	Pass
Voelx	2.5	26	Copper - Unequalized	QSFP28		VAHS-26-0351			100	Pass
Voelx	3	26	Copper - Unequalized	QSFP28		VAHS-26-0352			100	Pass

Broadcom BCM957454A4540 to Mellanox MSN2700 Switch to Cavium QL45611





IBTA PF32 RoCE Interoperability

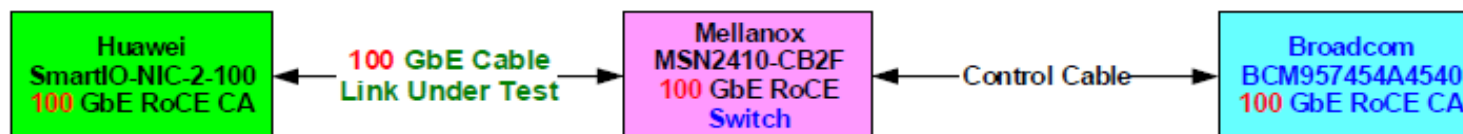
100 Gigabit Ethernet

Interop 02



Company	Length Meters	AWG	Equalization	Connector Type	Huawei RoCE Card #1	Cable Under Test	Mellanox Switch	Broadcom RoCE Card #2	Link Speed	Interop Result
AOI	70	NA	Fiber - Active	QSFP28	SmartIO-NIC-2-100	AQPA9N70ADLN0851	MSN2410-CB2F	BCM957454A4540	100	Pass
AOI	70	NA	Fiber - Active	QSFP28		AQPA9N70ADLN0851			100	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0851			100	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0851			100	Pass
AOI	70	NA	Fiber - Active	QSFP28		AQPA9N70ADLN0990			100	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0990			100	Pass
Finisar	1	N/A	Fiber - Active	QSFP28		FCBN425QE1C01			100	Pass
Finisar	5	N/A	Fiber - Active	QSFP28		FCBN425QB1C05			100	Pass
Finisar	100	N/A	Fiber - Active	QSFP28		FCBN425QE1CX0			100	Pass
Luxshare-ICT	0.5	30	Copper - Unequalized	QSFP28		LA0QF081-SD-R			100	Pass
Luxshare-ICT	1	30	Copper - Unequalized	QSFP28		LA0QF082-SD-R			100	Pass
Luxshare-ICT	2	30	Copper - Unequalized	QSFP28		LA0QF083-SD-R			100	Pass
Luxshare-ICT	1	28	Copper - Unequalized	QSFP28		LA0QF084-SD-R			100	Pass
Luxshare-ICT	2	28	Copper - Unequalized	QSFP28		LA0QF085-SD-R			100	Pass
Luxshare-ICT	1	26	Copper - Unequalized	QSFP28		LA0QF086-SD-R			100	Pass
Luxshare-ICT	2	26	Copper - Unequalized	QSFP28		LA0QF087-SD-R			100	Pass
Luxshare-ICT	3	26	Copper - Unequalized	QSFP28		LA0QF088-SD-R			100	Pass
Mellanox	0.5	30	Copper - Unequalized	QSFP28		MCP1650-H00AE30			100	Pass
Mellanox	1	30	Copper - Unequalized	QSFP28		MCP1650-H001E30			100	Pass
Mellanox	1.5	30	Copper - Unequalized	QSFP28		MCP1650-H01AE30			100	Pass
Mellanox	2	26	Copper - Unequalized	QSFP28		MCP1650-H002E28			100	Pass
Mellanox	3	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			100	Pass
Mellanox	3	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			100	Pass
Mellanox	30	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			100	Pass
Mellanox	30	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			100	Pass
Mellanox	3	NA	Fiber - Active	QSFP28		MFA1A00-E003			100	Pass
Mellanox	30	NA	Fiber - Active	QSFP28		MFA1A00-E030			100	Pass
Mellanox	50	NA	Fiber - Active	QSFP28		MFA1A00-E050			100	Pass
Mellanox	100	NA	Fiber - Active	QSFP28		MFA1A00-E100			100	Pass
Molex LLC	0.5	26	Copper - Unequalized	QSFP28		100297-3051			100	Pass
Molex LLC	0.5	30	Copper - Unequalized	QSFP28		100297-1051			100	Pass
TE Connectivity	2	33	Copper - Unequalized	QSFP28		1-2231368-8			100	Pass
TE Connectivity	3	30	Copper - Unequalized	QSFP28		2231368-8			100	Pass
Voilex	1	30	Copper - Unequalized	QSFP56		VAHS-30-0568			100	Pass
Voilex	2	30	Copper - Unequalized	QSFP28		VAHS-30-0570			100	Pass
Voilex	2	26	Copper - Unequalized	QSFP56		VAHS-26-0349			100	Pass
Voilex	2.5	26	Copper - Unequalized	QSFP28		VAHS-26-0351			100	Pass
Voilex	3	26	Copper - Unequalized	QSFP28		VAHS-26-0352			100	Pass

Huawei SmartIO-NIC-2-100 to Mellanox MSN2410 Switch to Broadcom BCM957454A4540





IBTA PF32 RoCE Interoperability

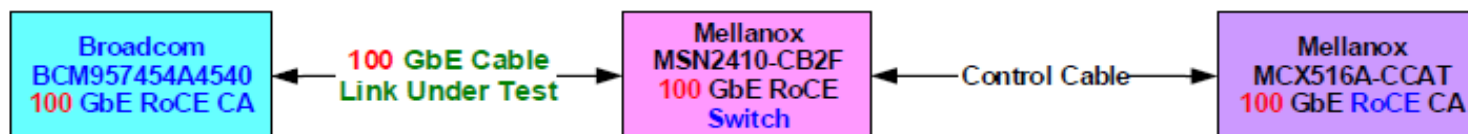
100 Gigabit Ethernet

Interop 03



Company	Length Meters	AWG	Equalization	Connector Type	Broadcom RoCE Card #1	Cable Under Test	Mellanox Switch	Mellanox RoCE Card #2	Link Speed	Interop Result
AOI	70	NA	Fiber - Active	QSFP28	BCM957454A4540	AQPA9N70ADLN0851	MSN2410-CB2F	MCX516A-CCAT	100	Pass
AOI	70	NA	Fiber - Active	QSFP28		AQPA9N70ADLN0851			100	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0851			100	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0851			100	Pass
Finisar	1	N/A	Fiber - Active	QSFP28		FCBN425QE1C01			100	Pass
Finisar	5	N/A	Fiber - Active	QSFP28		FCBN425QB1C05			100	Pass
Finisar	100	N/A	Fiber - Active	QSFP28		FCBN425QE1CX0			100	Pass
Luxshare-ICT	0.5	30	Copper - Unequalized	QSFP28		LA0QF081-SD-R			100	Pass
Luxshare-ICT	1	30	Copper - Unequalized	QSFP28		LA0QF082-SD-R			100	Pass
Luxshare-ICT	2	30	Copper - Unequalized	QSFP28		LA0QF083-SD-R			100	Pass
Luxshare-ICT	1	28	Copper - Unequalized	QSFP28		LA0QF084-SD-R			100	Pass
Luxshare-ICT	2	28	Copper - Unequalized	QSFP28		LA0QF085-SD-R			100	Pass
Luxshare-ICT	1	26	Copper - Unequalized	QSFP28		LA0QF086-SD-R			100	Pass
Luxshare-ICT	2	26	Copper - Unequalized	QSFP28		LA0QF087-SD-R			100	Pass
Luxshare-ICT	3	26	Copper - Unequalized	QSFP28		LA0QF088-SD-R			100	Pass
Mellanox	0.5	30	Copper - Unequalized	QSFP28		MCP1650-H00AE30			100	Pass
Mellanox	1	30	Copper - Unequalized	QSFP28		MCP1650-H001E30			100	Pass
Mellanox	1.5	30	Copper - Unequalized	QSFP28		MCP1650-H01AE30			100	Pass
Mellanox	2	26	Copper - Unequalized	QSFP28		MCP1650-H002E28			100	Pass
Molex LLC	0.5	26	Copper - Unequalized	QSFP28		100297-3051			100	Pass
Molex LLC	0.5	30	Copper - Unequalized	QSFP28		100297-1051			100	Pass
TE Connectivity	2	33	Copper - Unequalized	QSFP28		1-2231368-8			100	Pass
TE Connectivity	3	30	Copper - Unequalized	QSFP28		2231368-8			100	Pass
Volex	1	30	Copper - Unequalized	QSFP56		VAHS-30-0568			100	Pass
Volex	2	30	Copper - Unequalized	QSFP28		VAHS-30-0570			100	Pass
Volex	2	26	Copper - Unequalized	QSFP56		VAHS-26-0349			100	Pass
Volex	2.5	26	Copper - Unequalized	QSFP28		VAHS-26-0351			100	Pass
Volex	3	26	Copper - Unequalized	QSFP28		VAHS-26-0352			100	Pass

Broadcom BCM957454A4540 to Mellanox MSN2410 Switch to Mellanox MCX516A





IBTA PF32 RoCE Interoperability

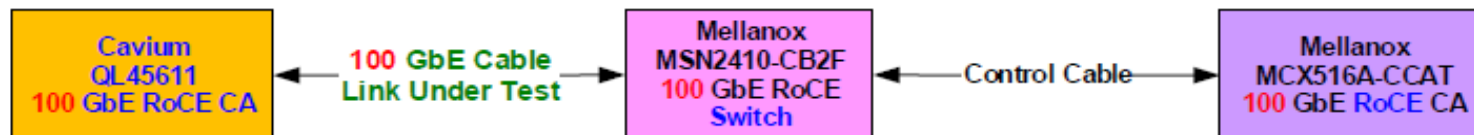
100 Gigabit Ethernet

Interop 04



Company	Length Meters	AWG	Equalization	Connector Type	Cavium RoCE Card #1	Cable Under Test	Mellanox Switch	Mellanox RoCE Card #2	Link Speed	Interop Result
AOI	70	NA	Fiber - Active	QSFP28	QL45611	AQPA9N70ADLN0851	MSN2410-CB2F	MCX516A-CCAT	100	Pass
AOI	70	NA	Fiber - Active	QSFP28		AQPA9N70ADLN0851			100	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0851			100	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0851			100	Pass
AOI	70	NA	Fiber - Active	QSFP28		AQPA9N70ADLN0990			100	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0990			100	Pass
Finisar	1	N/A	Fiber - Active	QSFP28		FCBN425QE1C01			100	Pass
Finisar	5	N/A	Fiber - Active	QSFP28		FCBN425QB1C05			100	Pass
Finisar	100	N/A	Fiber - Active	QSFP28		FCBN425QE1CX0			100	Pass
Luxshare-ICT	0.5	30	Copper - Unequalized	QSFP28		LA0QF081-SD-R			100	Pass
Luxshare-ICT	1	30	Copper - Unequalized	QSFP28		LA0QF082-SD-R			100	Pass
Luxshare-ICT	2	30	Copper - Unequalized	QSFP28		LA0QF083-SD-R			100	Pass
Luxshare-ICT	1	28	Copper - Unequalized	QSFP28		LA0QF084-SD-R			100	Pass
Luxshare-ICT	2	28	Copper - Unequalized	QSFP28		LA0QF085-SD-R			100	Pass
Luxshare-ICT	1	26	Copper - Unequalized	QSFP28		LA0QF086-SD-R			100	Pass
Luxshare-ICT	2	26	Copper - Unequalized	QSFP28		LA0QF087-SD-R			100	Pass
Luxshare-ICT	3	26	Copper - Unequalized	QSFP28		LA0QF088-SD-R			100	Pass
Mellanox	0.5	30	Copper - Unequalized	QSFP28		MCP1650-H00AE30			100	Pass
Mellanox	1	30	Copper - Unequalized	QSFP28		MCP1650-H001E30			100	Pass
Mellanox	1.5	30	Copper - Unequalized	QSFP28		MCP1650-H01AE30			100	Pass
Mellanox	2	26	Copper - Unequalized	QSFP28		MCP1650-H002E28			100	Pass
Mellanox	3	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			100	Pass
Mellanox	3	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			100	Pass
Mellanox	30	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			100	Pass
Mellanox	30	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			100	Pass
Mellanox	3	NA	Fiber - Active	QSFP28		MFA1A00-E003			100	Pass
Mellanox	30	NA	Fiber - Active	QSFP28		MFA1A00-E030			100	Pass
Mellanox	50	NA	Fiber - Active	QSFP28		MFA1A00-E050			100	Pass
Mellanox	100	NA	Fiber - Active	QSFP28		MFA1A00-E100			100	Pass
Molex LLC	0.5	26	Copper - Unequalized	QSFP28		100297-3051			100	Pass
Molex LLC	0.5	30	Copper - Unequalized	QSFP28		100297-1051			100	Pass
TE Connectivity	2	33	Copper - Unequalized	QSFP28		1-2231368-8			100	Pass
TE Connectivity	3	30	Copper - Unequalized	QSFP28	2231368-8	100	Pass			
Volex	1	30	Copper - Unequalized	QSFP56	VAHS-30-0568	100	Pass			
Volex	2	30	Copper - Unequalized	QSFP28	VAHS-30-0570	100	Pass			
Volex	2	26	Copper - Unequalized	QSFP56	VAHS-26-0349	100	Pass			
Volex	2.5	26	Copper - Unequalized	QSFP28	VAHS-26-0351	100	Pass			
Volex	3	26	Copper - Unequalized	QSFP28	VAHS-26-0352	100	Pass			

Cavium QL45611 to Mellanox MSN2410 Switch to Mellanox MCX516A





IBTA PF32 RoCE Interoperability

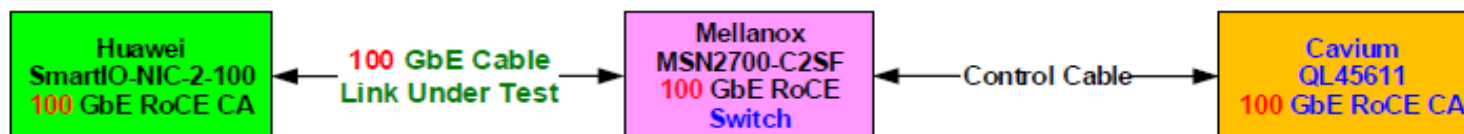
100 Gigabit Ethernet

Interop 05



Company	Length Meters	AWG	Equalization	Connector Type	Huawei RoCE Card #1	Cable Under Test	Mellanox Switch	Cavium RoCE Card #2	Link Speed	Interop Result
AOI	70	NA	Fiber - Active	QSFP28	SmartIO-NIC-2-100	AQPA9N70ADLN0851	MSN2700-CS2F	QL45611	100	Pass
AOI	70	NA	Fiber - Active	QSFP28		AQPA9N70ADLN0851			100	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0851			100	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0851			100	Pass
AOI	70	NA	Fiber - Active	QSFP28		AQPA9N70ADLN0990			100	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0990			100	Pass
Finisar	1	N/A	Fiber - Active	QSFP28		FCBN425QE1C01			100	Pass
Finisar	5	N/A	Fiber - Active	QSFP28		FCBN425QB1C05			100	Pass
Finisar	100	N/A	Fiber - Active	QSFP28		FCBN425QE1CX0			100	Pass
Luxshare-ICT	0.5	30	Copper - Unequalized	QSFP28		LA0QF081-SD-R			100	Pass
Luxshare-ICT	1	30	Copper - Unequalized	QSFP28		LA0QF082-SD-R			100	Pass
Luxshare-ICT	2	30	Copper - Unequalized	QSFP28		LA0QF083-SD-R			100	Pass
Luxshare-ICT	1	28	Copper - Unequalized	QSFP28		LA0QF084-SD-R			100	Pass
Luxshare-ICT	2	28	Copper - Unequalized	QSFP28		LA0QF085-SD-R			100	Pass
Luxshare-ICT	1	26	Copper - Unequalized	QSFP28		LA0QF086-SD-R			100	Pass
Luxshare-ICT	2	26	Copper - Unequalized	QSFP28		LA0QF087-SD-R			100	Pass
Luxshare-ICT	3	26	Copper - Unequalized	QSFP28		LA0QF088-SD-R			100	Pass
Mellanox	0.5	30	Copper - Unequalized	QSFP28		MCP1650-H00AE30			100	Pass
Mellanox	1	30	Copper - Unequalized	QSFP28		MCP1650-H001E30			100	Pass
Mellanox	1.5	30	Copper - Unequalized	QSFP28		MCP1650-H01AE30			100	Pass
Mellanox	2	26	Copper - Unequalized	QSFP28		MCP1650-H002E28			100	Pass
Mellanox	3	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			100	Pass
Mellanox	3	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			100	Pass
Mellanox	30	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			100	Pass
Mellanox	30	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			100	Pass
Mellanox	3	NA	Fiber - Active	QSFP28		MFA1A00-E003			100	Pass
Mellanox	30	NA	Fiber - Active	QSFP28		MFA1A00-E030			100	Pass
Mellanox	50	NA	Fiber - Active	QSFP28		MFA1A00-E050			100	Pass
Mellanox	100	NA	Fiber - Active	QSFP28		MFA1A00-E100			100	Pass
Molex LLC	0.5	26	Copper - Unequalized	QSFP28		100297-3051			100	Pass
Molex LLC	0.5	30	Copper - Unequalized	QSFP28		100297-1051			100	Pass
TE Connectivity	2	33	Copper - Unequalized	QSFP28		1-2231368-8			100	Pass
TE Connectivity	3	30	Copper - Unequalized	QSFP28		2231368-8			100	Pass
Volex	1	30	Copper - Unequalized	QSFP56		VAHS-30-0568			100	Pass
Volex	2	30	Copper - Unequalized	QSFP28		VAHS-30-0570			100	Pass
Volex	2	26	Copper - Unequalized	QSFP56		VAHS-26-0349			100	Pass
Volex	2.5	26	Copper - Unequalized	QSFP28		VAHS-26-0351			100	Pass
Volex	3	26	Copper - Unequalized	QSFP28		VAHS-26-0352			100	Pass

Huawei SmartIO-NIC-2-100 to Mellanox MSN2700 Switch to Cavium QL45611





IBTA PF32 RoCE Interoperability

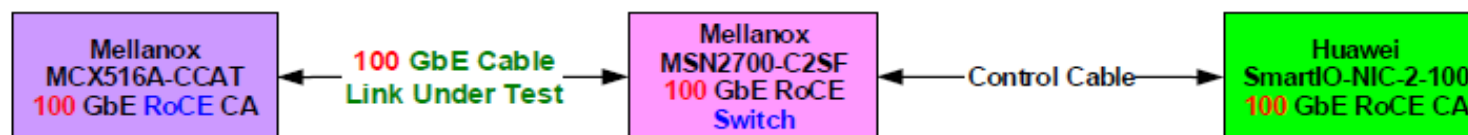
100 Gigabit Ethernet

Interop 06



Company	Length Meters	AWG	Equalization	Connector Type	Mellanox RoCE Card #1	Cable Under Test	Mellanox Switch	Huawei RoCE Card #2	Link Speed	Interop Result
AOI	70	NA	Fiber - Active	QSFP28	MCX516A-CCAT	AQPA9N70ADLN0851	MSN2700-CS2F	SmartIO-NIC-2-100	100	Pass
AOI	70	NA	Fiber - Active	QSFP28		AQPA9N70ADLN0851			100	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0851			100	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0851			100	Pass
AOI	70	NA	Fiber - Active	QSFP28		AQPA9N70ADLN0990			100	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0990			100	Pass
Finisar	1	N/A	Fiber - Active	QSFP28		FCBN425QE1C01			100	Pass
Finisar	5	N/A	Fiber - Active	QSFP28		FCBN425QB1C05			100	Pass
Finisar	100	N/A	Fiber - Active	QSFP28		FCBN425QE1CX0			100	Pass
Luxshare-ICT	0.5	30	Copper - Unequalized	QSFP28		LA0QF081-SD-R			100	Pass
Luxshare-ICT	1	30	Copper - Unequalized	QSFP28		LA0QF082-SD-R			100	Pass
Luxshare-ICT	2	30	Copper - Unequalized	QSFP28		LA0QF083-SD-R			100	Pass
Luxshare-ICT	1	28	Copper - Unequalized	QSFP28		LA0QF084-SD-R			100	Pass
Luxshare-ICT	2	28	Copper - Unequalized	QSFP28		LA0QF085-SD-R			100	Pass
Luxshare-ICT	1	26	Copper - Unequalized	QSFP28		LA0QF086-SD-R			100	Pass
Luxshare-ICT	2	26	Copper - Unequalized	QSFP28		LA0QF087-SD-R			100	Pass
Luxshare-ICT	3	26	Copper - Unequalized	QSFP28		LA0QF088-SD-R			100	Pass
Mellanox	0.5	30	Copper - Unequalized	QSFP28		MCP1650-H00AE30			100	Pass
Mellanox	1	30	Copper - Unequalized	QSFP28		MCP1650-H001E30			100	Pass
Mellanox	1.5	30	Copper - Unequalized	QSFP28		MCP1650-H01AE30			100	Pass
Mellanox	2	26	Copper - Unequalized	QSFP28		MCP1650-H002E28			100	Pass
Mellanox	3	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			100	Pass
Mellanox	3	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			100	Pass
Mellanox	30	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			100	Pass
Mellanox	30	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			100	Pass
Mellanox	3	NA	Fiber - Active	QSFP28		MFA1A00-E003			100	Pass
Mellanox	30	NA	Fiber - Active	QSFP28		MFA1A00-E030			100	Pass
Mellanox	50	NA	Fiber - Active	QSFP28		MFA1A00-E050			100	Pass
Mellanox	100	NA	Fiber - Active	QSFP28		MFA1A00-E100			100	Pass
Molex LLC	0.5	26	Copper - Unequalized	QSFP28		100297-3051			100	Pass
Molex LLC	0.5	30	Copper - Unequalized	QSFP28		100297-1051			100	Pass
TE Connectivity	2	33	Copper - Unequalized	QSFP28		1-2231368-8			100	Pass
TE Connectivity	3	30	Copper - Unequalized	QSFP28		2231368-8			100	Pass
Voilex	1	30	Copper - Unequalized	QSFP56		VAHS-30-0568			100	Pass
Voilex	2	30	Copper - Unequalized	QSFP28		VAHS-30-0570			100	Pass
Voilex	2	26	Copper - Unequalized	QSFP56		VAHS-26-0349			100	Pass
Voilex	2.5	26	Copper - Unequalized	QSFP28		VAHS-26-0351			100	Pass
Voilex	3	26	Copper - Unequalized	QSFP28		VAHS-26-0352			100	Pass

Mellanox MCX516A to Mellanox MSN2700 Switch to Huawei SmartIO-NIC-2-100





IBTA PF32 RoCE Interoperability

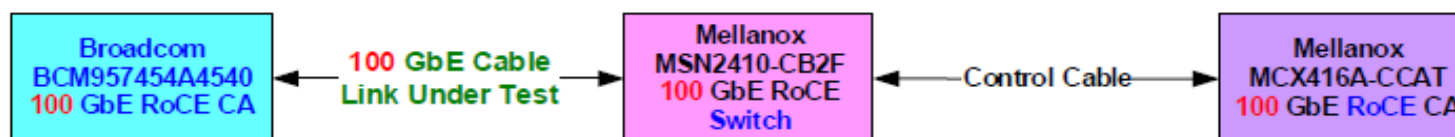
100 Gigabit Ethernet

Interop 19



Company	Length Meters	AWG	Equalization	Connector Type	Broadcom RoCE Card #1	Cable Under Test	Mellanox Switch	Mellanox RoCE Card #2	Link Speed	Interop Result
AOI	70	NA	Fiber - Active	QSFP28	BCM957454A4540	AQPA9N70ADLN0851	MSN2410-CB2F	MCX416A-CCAT	100	Pass
AOI	70	NA	Fiber - Active	QSFP28		AQPA9N70ADLN0851			100	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0851			100	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0851			100	Pass
Finisar	1	N/A	Fiber - Active	QSFP28		FCBN425QE1C01			100	Pass
Finisar	5	N/A	Fiber - Active	QSFP28		FCBN425QB1C05			100	Pass
Finisar	100	N/A	Fiber - Active	QSFP28		FCBN425QE1CX0			100	Pass
Luxshare-ICT	0.5	30	Copper - Unequalized	QSFP28		LA0QF081-SD-R			100	Pass
Luxshare-ICT	1	30	Copper - Unequalized	QSFP28		LA0QF082-SD-R			100	Pass
Luxshare-ICT	2	30	Copper - Unequalized	QSFP28		LA0QF083-SD-R			100	Pass
Luxshare-ICT	1	28	Copper - Unequalized	QSFP28		LA0QF084-SD-R			100	Pass
Luxshare-ICT	2	28	Copper - Unequalized	QSFP28		LA0QF085-SD-R			100	Pass
Luxshare-ICT	1	26	Copper - Unequalized	QSFP28		LA0QF086-SD-R			100	Pass
Luxshare-ICT	2	26	Copper - Unequalized	QSFP28		LA0QF087-SD-R			100	Pass
Luxshare-ICT	3	26	Copper - Unequalized	QSFP28		LA0QF088-SD-R			100	Pass
Mellanox	0.5	30	Copper - Unequalized	QSFP28		MCP1650-H00AE30			100	Pass
Mellanox	1	30	Copper - Unequalized	QSFP28		MCP1650-H001E30			100	Pass
Mellanox	1.5	30	Copper - Unequalized	QSFP28		MCP1650-H01AE30			100	Pass
Mellanox	2	26	Copper - Unequalized	QSFP28		MCP1650-H002E28			100	Pass
Molex LLC	0.5	26	Copper - Unequalized	QSFP28		100297-3051			100	Pass
Molex LLC	0.5	30	Copper - Unequalized	QSFP28		100297-1051			100	Pass
TE Connectivity	2	33	Copper - Unequalized	QSFP28		1-2231368-8			100	Pass
TE Connectivity	3	30	Copper - Unequalized	QSFP28		2231368-8			100	Pass
Volex	1	30	Copper - Unequalized	QSFP56		VAHS-30-0568			100	Pass
Volex	2	30	Copper - Unequalized	QSFP28		VAHS-30-0570			100	Pass
Volex	2	26	Copper - Unequalized	QSFP56		VAHS-26-0349			100	Pass
Volex	2.5	26	Copper - Unequalized	QSFP28		VAHS-26-0351			100	Pass
Volex	3	26	Copper - Unequalized	QSFP28		VAHS-26-0352			100	Pass

Broadcom BCM957454A4540 to Mellanox MSN2410 Switch to Mellanox MCX416A





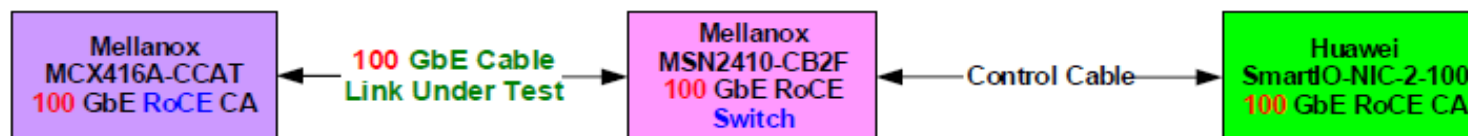
IBTA PF32 RoCE Interoperability

100 Gigabit Ethernet Interop 20



Company	Length Meters	AWG	Equalization	Connector Type	Mellanox RoCE Card #1	Cable Under Test	Mellanox Switch	Huawei RoCE Card #2	Link Speed	Interop Result
AOI	70	NA	Fiber - Active	QSFP28	MCX416A-CCAT	AQPA9N70ADLN0851	MSN2410-CB2F	SmartIO-NIC-2-100	100	Pass
AOI	70	NA	Fiber - Active	QSFP28		AQPA9N70ADLN0851			100	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0851			100	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0851			100	Pass
AOI	70	NA	Fiber - Active	QSFP28		AQPA9N70ADLN0990			100	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0990			100	Pass
Finisar	1	N/A	Fiber - Active	QSFP28		FCBN425QE1C01			100	Pass
Finisar	5	N/A	Fiber - Active	QSFP28		FCBN425QB1C05			100	Pass
Finisar	100	N/A	Fiber - Active	QSFP28		FCBN425QE1CX0			100	Pass
Luxshare-ICT	0.5	30	Copper - Unequalized	QSFP28		LA0QF081-SD-R			100	Pass
Luxshare-ICT	1	30	Copper - Unequalized	QSFP28		LA0QF082-SD-R			100	Pass
Luxshare-ICT	2	30	Copper - Unequalized	QSFP28		LA0QF083-SD-R			100	Pass
Luxshare-ICT	1	28	Copper - Unequalized	QSFP28		LA0QF084-SD-R			100	Pass
Luxshare-ICT	2	28	Copper - Unequalized	QSFP28		LA0QF085-SD-R			100	Pass
Luxshare-ICT	1	26	Copper - Unequalized	QSFP28		LA0QF086-SD-R			100	Pass
Luxshare-ICT	2	26	Copper - Unequalized	QSFP28		LA0QF087-SD-R			100	Pass
Luxshare-ICT	3	26	Copper - Unequalized	QSFP28		LA0QF088-SD-R			100	Pass
Mellanox	0.5	30	Copper - Unequalized	QSFP28		MCP1650-H00AE30			100	Pass
Mellanox	1	30	Copper - Unequalized	QSFP28		MCP1650-H001E30			100	Pass
Mellanox	1.5	30	Copper - Unequalized	QSFP28		MCP1650-H01AE30			100	Pass
Mellanox	2	26	Copper - Unequalized	QSFP28		MCP1650-H002E28			100	Pass
Mellanox	3	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			100	Pass
Mellanox	3	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			100	Pass
Mellanox	30	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			100	Pass
Mellanox	30	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			100	Pass
Mellanox	3	NA	Fiber - Active	QSFP28		MFA1A00-E003			100	Pass
Mellanox	30	NA	Fiber - Active	QSFP28		MFA1A00-E030			100	Pass
Mellanox	50	NA	Fiber - Active	QSFP28		MFA1A00-E050			100	Pass
Mellanox	100	NA	Fiber - Active	QSFP28		MFA1A00-E100			100	Pass
Molex LLC	0.5	26	Copper - Unequalized	QSFP28		100297-3051			100	Pass
Molex LLC	0.5	30	Copper - Unequalized	QSFP28		100297-1051			100	Pass
TE Connectivity	2	33	Copper - Unequalized	QSFP28		1-2231368-8			100	Pass
TE Connectivity	3	30	Copper - Unequalized	QSFP28		2231368-8			100	Pass

Mellanox MCX416A to Mellanox MSN2410 Switch to Huawei SmartIO-NIC-2-100





IBTA PF32 RoCE Interoperability

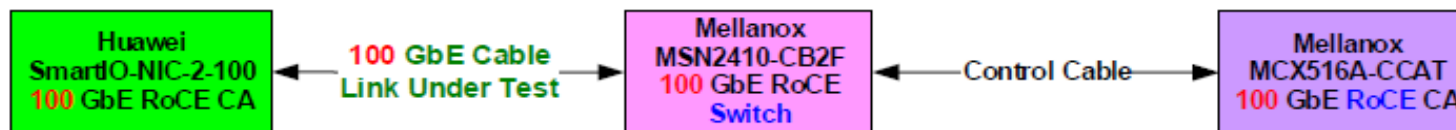
100 Gigabit Ethernet

Interop 25



Company	Length Meters	AWG	Equalization	Connector Type	Huawei RoCE Card #1	Cable Under Test	Mellanox Switch	Mellanox RoCE Card #2	Link Speed	Interop Result
AOI	70	NA	Fiber - Active	QSFP28	SmartIO-NIC-2-100	AQPA9N70ADLN0851	MSN2410-CB2F	MCX516A-CCAT	100	Pass
AOI	70	NA	Fiber - Active	QSFP28		AQPA9N70ADLN0851			100	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0851			100	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0851			100	Pass
AOI	70	NA	Fiber - Active	QSFP28		AQPA9N70ADLN0990			100	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0990			100	Pass
Finisar	1	N/A	Fiber - Active	QSFP28		FCBN425QE1C01			100	Pass
Finisar	5	N/A	Fiber - Active	QSFP28		FCBN425QB1C05			100	Pass
Finisar	100	N/A	Fiber - Active	QSFP28		FCBN425QE1CX0			100	Pass
Luxshare-ICT	0.5	30	Copper - Unequalized	QSFP28		LA0QF081-SD-R			100	Pass
Luxshare-ICT	1	30	Copper - Unequalized	QSFP28		LA0QF082-SD-R			100	Pass
Luxshare-ICT	2	30	Copper - Unequalized	QSFP28		LA0QF083-SD-R			100	Pass
Luxshare-ICT	1	28	Copper - Unequalized	QSFP28		LA0QF084-SD-R			100	Pass
Luxshare-ICT	2	28	Copper - Unequalized	QSFP28		LA0QF085-SD-R			100	Pass
Luxshare-ICT	1	26	Copper - Unequalized	QSFP28		LA0QF086-SD-R			100	Pass
Luxshare-ICT	2	26	Copper - Unequalized	QSFP28		LA0QF087-SD-R			100	Pass
Luxshare-ICT	3	26	Copper - Unequalized	QSFP28		LA0QF088-SD-R			100	Pass
Mellanox	0.5	30	Copper - Unequalized	QSFP28		MCP1650-H00AE30			100	Pass
Mellanox	1	30	Copper - Unequalized	QSFP28		MCP1650-H001E30			100	Pass
Mellanox	1.5	30	Copper - Unequalized	QSFP28		MCP1650-H01AE30			100	Pass
Mellanox	2	26	Copper - Unequalized	QSFP28		MCP1650-H002E28			100	Pass
Mellanox	3	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			100	Pass
Mellanox	3	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			100	Pass
Mellanox	30	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			100	Pass
Mellanox	30	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			100	Pass
Mellanox	3	NA	Fiber - Active	QSFP28		MFA1A00-E003			100	Pass
Mellanox	30	NA	Fiber - Active	QSFP28		MFA1A00-E030			100	Pass
Mellanox	50	NA	Fiber - Active	QSFP28		MFA1A00-E050			100	Pass
Mellanox	100	NA	Fiber - Active	QSFP28		MFA1A00-E100			100	Pass
Molex LLC	0.5	26	Copper - Unequalized	QSFP28		100297-3051			100	Pass
Molex LLC	0.5	30	Copper - Unequalized	QSFP28		100297-1051			100	Pass
TE Connectivity	2	33	Copper - Unequalized	QSFP28		1-2231368-8			100	Pass
TE Connectivity	3	30	Copper - Unequalized	QSFP28		2231368-8			100	Pass
Voilex	1	30	Copper - Unequalized	QSFP56		VAHS-30-0568			100	Pass
Voilex	2	30	Copper - Unequalized	QSFP28		VAHS-30-0570			100	Pass
Voilex	2	26	Copper - Unequalized	QSFP56		VAHS-26-0349			100	Pass
Voilex	2.5	26	Copper - Unequalized	QSFP28		VAHS-26-0351			100	Pass
Voilex	3	26	Copper - Unequalized	QSFP28		VAHS-26-0352			100	Pass

Huawei SmartIO-NIC-2-100 to Mellanox MSN2410 Switch to Mellanox MCX516A





IBTA PF32 RoCE Interoperability

100 Gigabit Ethernet

Interop 26



Company	Length Meters	AWG	Equalization	Connector Type	Cavium RoCE Card #1	Cable Under Test	Mellanox RoCE Card #2	Link Speed	Interop Result
AOI	70	NA	Fiber - Active	QSFP28	QL45611	AQPA9N70ADLN0851	MCX516A-CCAT	100	Pass
AOI	70	NA	Fiber - Active	QSFP28		AQPA9N70ADLN0851		100	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0851		100	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0851		100	Pass
AOI	70	NA	Fiber - Active	QSFP28		AQPA9N70ADLN0990		100	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0990		100	Pass
Finisar	1	N/A	Fiber - Active	QSFP28		FCBN425QE1C01		100	Pass
Finisar	5	N/A	Fiber - Active	QSFP28		FCBN425QB1C05		100	Pass
Finisar	100	N/A	Fiber - Active	QSFP28		FCBN425QE1CX0		100	Pass
Luxshare-ICT	0.5	30	Copper - Unequalized	QSFP28		LA0QF081-SD-R		100	Pass
Luxshare-ICT	1	30	Copper - Unequalized	QSFP28		LA0QF082-SD-R		100	Pass
Luxshare-ICT	2	30	Copper - Unequalized	QSFP28		LA0QF083-SD-R		100	Pass
Luxshare-ICT	1	28	Copper - Unequalized	QSFP28		LA0QF084-SD-R		100	Pass
Luxshare-ICT	2	28	Copper - Unequalized	QSFP28		LA0QF085-SD-R		100	Pass
Luxshare-ICT	1	26	Copper - Unequalized	QSFP28		LA0QF086-SD-R		100	Pass
Luxshare-ICT	2	26	Copper - Unequalized	QSFP28		LA0QF087-SD-R		100	Pass
Luxshare-ICT	3	26	Copper - Unequalized	QSFP28		LA0QF088-SD-R		100	Pass
Mellanox	0.5	30	Copper - Unequalized	QSFP28		MCP1650-H00AE30		100	Pass
Mellanox	1	30	Copper - Unequalized	QSFP28		MCP1650-H001E30		100	Pass
Mellanox	1.5	30	Copper - Unequalized	QSFP28		MCP1650-H01AE30		100	Pass
Mellanox	2	26	Copper - Unequalized	QSFP28		MCP1650-H002E28		100	Pass
Mellanox	3	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D		100	Pass
Mellanox	3	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D		100	Pass
Mellanox	30	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D		100	Pass
Mellanox	30	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D		100	Pass
Mellanox	3	NA	Fiber - Active	QSFP28		MFA1A00-E003		100	Pass
Mellanox	30	NA	Fiber - Active	QSFP28		MFA1A00-E030		100	Pass
Mellanox	50	NA	Fiber - Active	QSFP28		MFA1A00-E050		100	Pass
Mellanox	100	NA	Fiber - Active	QSFP28		MFA1A00-E100		100	Pass

Cavium QL45611 to Mellanox MCX516A





IBTA PF32 RoCE Interoperability

100 Gigabit Ethernet

Interop 26



Company	Length Meters	AWG	Equalization	Connector Type	Cavium RoCE Card #1	Cable Under Test	Mellanox RoCE Card #2	Link Speed	Interop Result
Molex LLC	0.5	26	Copper - Unequalized	QSFP28	QL45611	100297-3051	MCX516A-CCAT	100	Pass
Molex LLC	0.5	30	Copper - Unequalized	QSFP28		100297-1051		100	Pass
TE Connectivity	2	33	Copper - Unequalized	QSFP28		1-2231368-8		100	Pass
TE Connectivity	3	30	Copper - Unequalized	QSFP28		2231368-8		100	Pass
Volex	1	30	Copper - Unequalized	QSFP56		VAHS-30-0568		100	Pass
Volex	2	30	Copper - Unequalized	QSFP28		VAHS-30-0570		100	Pass
Volex	2	26	Copper - Unequalized	QSFP56		VAHS-26-0349		100	Pass
Volex	2.5	26	Copper - Unequalized	QSFP28		VAHS-26-0351		100	Pass
Volex	3	26	Copper - Unequalized	QSFP28		VAHS-26-0352		100	Pass

Cavium QL45611 to Mellanox MCX516A





IBTA PF32 RoCE Interoperability

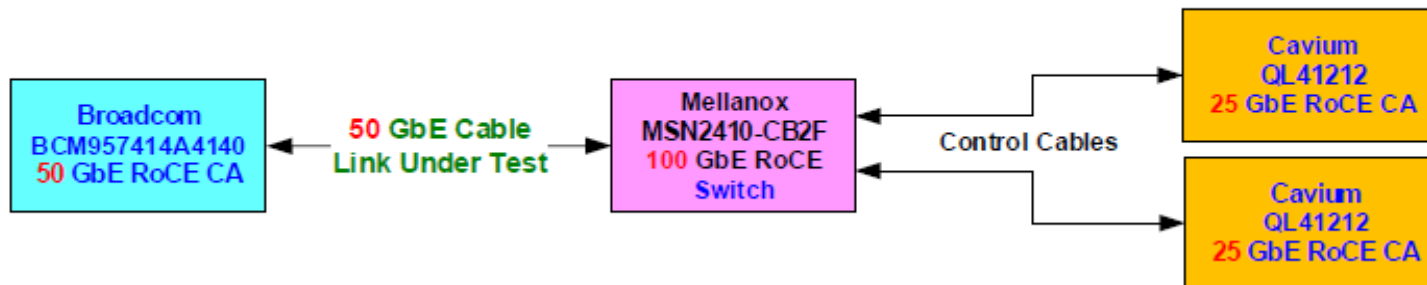
50 Gigabit Ethernet

Interop 09



Company	Length Meters	AWG	Equalization	Connector Type	Broadcom RoCE Card #1	Cable Under Test	Mellanox Switch	Cavium RoCE Card #2	Link Speed	Interop Result
AOI	70	NA	Fiber - Active	QSFP28	BCM957414A4140	AQPA9N70ADLN0851	MSN2410-CB2F	QL41212	50	Pass
AOI	70	NA	Fiber - Active	QSFP28		AQPA9N70ADLN0851			50	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0851			50	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0851			50	Pass
Finisar	1	N/A	Fiber - Active	QSFP28		FCBN425QE1C01			50	Pass
Finisar	5	N/A	Fiber - Active	QSFP28		FCBN425QB1C05			50	Pass
Finisar	100	N/A	Fiber - Active	QSFP28		FCBN425QE1CX0			50	Pass
Luxshare-ICT	0.5	30	Copper - Unequalized	QSFP28		LA0QF081-SD-R			50	Pass
Luxshare-ICT	1	30	Copper - Unequalized	QSFP28		LA0QF082-SD-R			50	Pass
Luxshare-ICT	2	30	Copper - Unequalized	QSFP28		LA0QF083-SD-R			50	Pass
Luxshare-ICT	1	28	Copper - Unequalized	QSFP28		LA0QF084-SD-R			50	Pass
Luxshare-ICT	2	28	Copper - Unequalized	QSFP28		LA0QF085-SD-R			50	Pass
Luxshare-ICT	1	26	Copper - Unequalized	QSFP28		LA0QF086-SD-R			50	Pass
Luxshare-ICT	2	26	Copper - Unequalized	QSFP28		LA0QF087-SD-R			50	Pass
Luxshare-ICT	3	26	Copper - Unequalized	QSFP28		LA0QF088-SD-R			50	Pass
Mellanox	0.5	30	Copper - Unequalized	QSFP28		MCP1650-H00AE30			50	Pass
Mellanox	1	30	Copper - Unequalized	QSFP28		MCP1650-H001E30			50	Pass
Mellanox	1.5	30	Copper - Unequalized	QSFP28		MCP1650-H01AE30			50	Pass
Mellanox	2	26	Copper - Unequalized	QSFP28		MCP1650-H002E28			50	Pass
Mellanox	100	NA	Fiber - Active	QSFP28		MFA1A00-E100			50	Pass
Molex LLC	0.5	26	Copper - Unequalized	QSFP28		100297-3051			50	Pass
Molex LLC	0.5	30	Copper - Unequalized	QSFP28		100297-1051			50	Pass
Volex	1	30	Copper - Unequalized	QSFP56		VAHS-30-0568			50	Pass
Volex	2	30	Copper - Unequalized	QSFP28		VAHS-30-0570			50	Pass
Volex	2	26	Copper - Unequalized	QSFP56		VAHS-26-0349			50	Pass
Volex	2.5	26	Copper - Unequalized	QSFP28		VAHS-26-0351			50	Pass
Volex	3	26	Copper - Unequalized	QSFP28		VAHS-26-0352			50	Pass

Broadcom BCM957414A4140 to Mellanox MSN2410 Switch to Cavium QL41212





IBTA PF32 RoCE Interoperability

50 Gigabit Ethernet

Interop 10



Company	Length Meters	AWG	Equalization	Connector Type	Broadcom RoCE Card #1	Cable Under Test	Mellanox Switch	Huawei RoCE Card #2	Link Speed	Interop Result
AOI	70	NA	Fiber - Active	QSFP28	BCM957414A4140	AQPA9N70ADLN0851	MSN2410-CB2F	SmartIO-NIC-2-100	50	Pass
AOI	70	NA	Fiber - Active	QSFP28		AQPA9N70ADLN0851			50	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0851			50	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0851			50	Pass
Finisar	1	N/A	Fiber - Active	QSFP28		FCBN425QE1C01			50	Pass
Finisar	5	N/A	Fiber - Active	QSFP28		FCBN425QB1C05			50	Pass
Finisar	100	N/A	Fiber - Active	QSFP28		FCBN425QE1CX0			50	Pass
Luxshare-ICT	0.5	30	Copper - Unequalized	QSFP28		LA0QF081-SD-R			50	Pass
Luxshare-ICT	1	30	Copper - Unequalized	QSFP28		LA0QF082-SD-R			50	Pass
Luxshare-ICT	2	30	Copper - Unequalized	QSFP28		LA0QF083-SD-R			50	Pass
Luxshare-ICT	1	28	Copper - Unequalized	QSFP28		LA0QF084-SD-R			50	Pass
Luxshare-ICT	2	28	Copper - Unequalized	QSFP28		LA0QF085-SD-R			50	Pass
Luxshare-ICT	1	26	Copper - Unequalized	QSFP28		LA0QF086-SD-R			50	Pass
Luxshare-ICT	2	26	Copper - Unequalized	QSFP28		LA0QF087-SD-R			50	Pass
Luxshare-ICT	3	26	Copper - Unequalized	QSFP28		LA0QF088-SD-R			50	Pass
Mellanox	0.5	30	Copper - Unequalized	QSFP28		MCP1650-H00AE30			50	Pass
Mellanox	1	30	Copper - Unequalized	QSFP28		MCP1650-H001E30			50	Pass
Mellanox	1.5	30	Copper - Unequalized	QSFP28		MCP1650-H01AE30			50	Pass
Mellanox	2	26	Copper - Unequalized	QSFP28		MCP1650-H002E28			50	Pass
Mellanox	100	NA	Fiber - Active	QSFP28		MFA1A00-E100			50	Pass
Molex LLC	0.5	26	Copper - Unequalized	QSFP28		100297-3051			50	Pass
Molex LLC	0.5	30	Copper - Unequalized	QSFP28		100297-1051			50	Pass
Volex	1	30	Copper - Unequalized	QSFP56		VAHS-30-0568			50	Pass
Volex	2	30	Copper - Unequalized	QSFP28		VAHS-30-0570			50	Pass
Volex	2	26	Copper - Unequalized	QSFP56		VAHS-26-0349			50	Pass
Volex	2.5	26	Copper - Unequalized	QSFP28		VAHS-26-0351			50	Pass
Volex	3	26	Copper - Unequalized	QSFP28		VAHS-26-0352			50	Pass

Broadcom BCM957414A4140 to Mellanox MSN2410 Switch to Huawei SmartIO-NIC-2-100





IBTA PF32 RoCE Interoperability

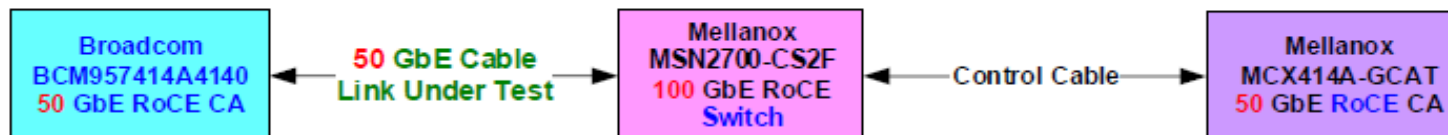
50 Gigabit Ethernet

Interop 13



Company	Length Meters	AWG	Equalization	Connector Type	Broadcom RoCE Card #1	Cable Under Test	Mellanox Switch	Mellanox RoCE Card #2	Link Speed	Interop Result
AOI	70	NA	Fiber - Active	QSFP28	BCM957414A4140	AQPA9N70ADLN0851	MSN2700-CS2F	MCX414A-GCAT	50	Pass
AOI	70	NA	Fiber - Active	QSFP28		AQPA9N70ADLN0851			50	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0851			50	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0851			50	Pass
Finisar	1	N/A	Fiber - Active	QSFP28		FCBN425QE1C01			50	Pass
Finisar	5	N/A	Fiber - Active	QSFP28		FCBN425QB1C05			50	Pass
Finisar	100	N/A	Fiber - Active	QSFP28		FCBN425QE1CX0			50	Pass
Luxshare-ICT	0.5	30	Copper - Unequalized	QSFP28		LA0QF081-SD-R			50	Pass
Luxshare-ICT	1	30	Copper - Unequalized	QSFP28		LA0QF082-SD-R			50	Pass
Luxshare-ICT	2	30	Copper - Unequalized	QSFP28		LA0QF083-SD-R			50	Pass
Luxshare-ICT	1	28	Copper - Unequalized	QSFP28		LA0QF084-SD-R			50	Pass
Luxshare-ICT	2	28	Copper - Unequalized	QSFP28		LA0QF085-SD-R			50	Pass
Luxshare-ICT	1	26	Copper - Unequalized	QSFP28		LA0QF086-SD-R			50	Pass
Luxshare-ICT	2	26	Copper - Unequalized	QSFP28		LA0QF087-SD-R			50	Pass
Luxshare-ICT	3	26	Copper - Unequalized	QSFP28		LA0QF088-SD-R			50	Pass
Mellanox	0.5	30	Copper - Unequalized	QSFP28		MCP1650-H00AE30			50	Pass
Mellanox	1	30	Copper - Unequalized	QSFP28		MCP1650-H001E30			50	Pass
Mellanox	1.5	30	Copper - Unequalized	QSFP28		MCP1650-H01AE30			50	Pass
Mellanox	2	26	Copper - Unequalized	QSFP28		MCP1650-H002E28			50	Pass
Mellanox	100	NA	Fiber - Active	QSFP28		MFA1A00-E100			50	Pass
Molex LLC	0.5	26	Copper - Unequalized	QSFP28		100297-3051			50	Pass
Molex LLC	0.5	30	Copper - Unequalized	QSFP28		100297-1051			50	Pass
Volex	1	30	Copper - Unequalized	QSFP56		VAHS-30-0568			50	Pass
Volex	2	30	Copper - Unequalized	QSFP28		VAHS-30-0570			50	Pass
Volex	2	26	Copper - Unequalized	QSFP56		VAHS-26-0349			50	Pass
Volex	2.5	26	Copper - Unequalized	QSFP28		VAHS-26-0351			50	Pass
Volex	3	26	Copper - Unequalized	QSFP28		VAHS-26-0352			50	Pass

Broadcom BCM957414A4140 to Mellanox MSN2700 Switch to Mellanox MCX414A





IBTA PF32 RoCE Interoperability

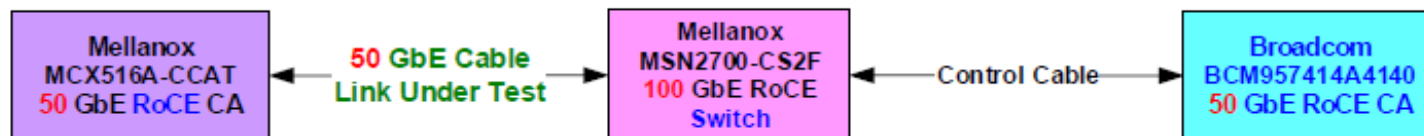
50 Gigabit Ethernet

Interop 15



Company	Length Meters	AWG	Equalization	Connector Type	Mellanox RoCE Card #1	Cable Under Test	Mellanox Switch	Broadcom RoCE Card #2	Link Speed	Interop Result
AOI	70	NA	Fiber - Active	QSFP28	MCX516A-CCAT	AQPA9N70ADLN0851	MSN2700-CS2F	BCM957414A4140	50	Pass
AOI	70	NA	Fiber - Active	QSFP28		AQPA9N70ADLN0851			50	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0851			50	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0851			50	Pass
AOI	70	NA	Fiber - Active	QSFP28		AQPA9N70ADLN0990			50	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0990			50	Pass
Finisar	1	N/A	Fiber - Active	QSFP28		FCBN425QE1C01			50	Pass
Finisar	5	N/A	Fiber - Active	QSFP28		FCBN425QB1C05			50	Pass
Finisar	100	N/A	Fiber - Active	QSFP28		FCBN425QE1CX0			50	Pass
Luxshare-ICT	0.5	30	Copper - Unequalized	QSFP28		LA0QF081-SD-R			50	Pass
Luxshare-ICT	1	30	Copper - Unequalized	QSFP28		LA0QF082-SD-R			50	Pass
Luxshare-ICT	2	30	Copper - Unequalized	QSFP28		LA0QF083-SD-R			50	Pass
Luxshare-ICT	1	28	Copper - Unequalized	QSFP28		LA0QF084-SD-R			50	Pass
Luxshare-ICT	2	28	Copper - Unequalized	QSFP28		LA0QF085-SD-R			50	Pass
Luxshare-ICT	1	26	Copper - Unequalized	QSFP28		LA0QF086-SD-R			50	Pass
Luxshare-ICT	2	26	Copper - Unequalized	QSFP28		LA0QF087-SD-R			50	Pass
Luxshare-ICT	3	26	Copper - Unequalized	QSFP28		LA0QF088-SD-R			50	Pass
Mellanox	0.5	30	Copper - Unequalized	QSFP28		MCP1650-H00AE30			50	Pass
Mellanox	1	30	Copper - Unequalized	QSFP28		MCP1650-H001E30			50	Pass
Mellanox	1.5	30	Copper - Unequalized	QSFP28		MCP1650-H01AE30			50	Pass
Mellanox	2	26	Copper - Unequalized	QSFP28		MCP1650-H002E28			50	Pass
Mellanox	3	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			50	Pass
Mellanox	3	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			50	Pass
Mellanox	30	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			50	Pass
Mellanox	30	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			50	Pass
Mellanox	3	NA	Fiber - Active	QSFP28		MFA1A00-E003			50	Pass
Mellanox	30	NA	Fiber - Active	QSFP28		MFA1A00-E030			50	Pass
Mellanox	50	NA	Fiber - Active	QSFP28		MFA1A00-E050			50	Pass
Mellanox	100	NA	Fiber - Active	QSFP28		MFA1A00-E100			50	Pass
Molex LLC	0.5	26	Copper - Unequalized	QSFP28		100297-3051			50	Pass
Molex LLC	0.5	30	Copper - Unequalized	QSFP28		100297-1051			50	Pass
Volex	1	30	Copper - Unequalized	QSFP56		VAHS-30-0568			50	Pass
Volex	2	30	Copper - Unequalized	QSFP28		VAHS-30-0570			50	Pass
Volex	2	26	Copper - Unequalized	QSFP56		VAHS-26-0349			50	Pass
Volex	2.5	26	Copper - Unequalized	QSFP28		VAHS-26-0351			50	Pass
Volex	3	26	Copper - Unequalized	QSFP28		VAHS-26-0352			50	Pass

Mellanox MCX516A to Mellanox MSN2700 Switch to Broadcom BCM957414A4140





IBTA PF32 RoCE Interoperability

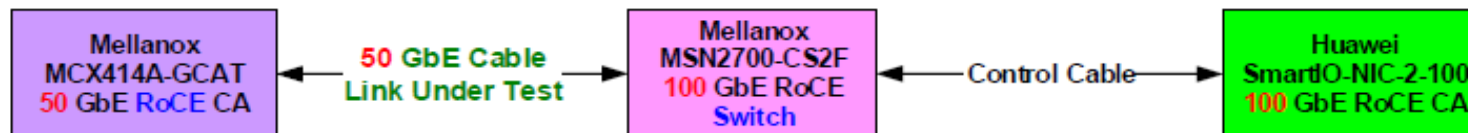
50 Gigabit Ethernet

Interop 16



Company	Length Meters	AWG	Equalization	Connector Type	Mellanox RoCE Card #1	Cable Under Test	Mellanox Switch	Huawei RoCE Card #2	Link Speed	Interop Result
AOI	70	NA	Fiber - Active	QSFP28	MCX414A-GCAT	AQPA9N70ADLN0851	MSN2700-CS2F	SmartIO-NIC-2-100	50	Pass
AOI	70	NA	Fiber - Active	QSFP28		AQPA9N70ADLN0851			50	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0851			50	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0851			50	Pass
AOI	70	NA	Fiber - Active	QSFP28		AQPA9N70ADLN0990			50	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0990			50	Pass
Finisar	1	N/A	Fiber - Active	QSFP28		FCBN425QE1C01			50	Pass
Finisar	5	N/A	Fiber - Active	QSFP28		FCBN425QB1C05			50	Pass
Finisar	100	N/A	Fiber - Active	QSFP28		FCBN425QE1CX0			50	Pass
Luxshare-ICT	0.5	30	Copper - Unequalized	QSFP28		LA0QF081-SD-R			50	Pass
Luxshare-ICT	1	30	Copper - Unequalized	QSFP28		LA0QF082-SD-R			50	Pass
Luxshare-ICT	2	30	Copper - Unequalized	QSFP28		LA0QF083-SD-R			50	Pass
Luxshare-ICT	1	28	Copper - Unequalized	QSFP28		LA0QF084-SD-R			50	Pass
Luxshare-ICT	2	28	Copper - Unequalized	QSFP28		LA0QF085-SD-R			50	Pass
Luxshare-ICT	1	26	Copper - Unequalized	QSFP28		LA0QF086-SD-R			50	Pass
Luxshare-ICT	2	26	Copper - Unequalized	QSFP28		LA0QF087-SD-R			50	Pass
Luxshare-ICT	3	26	Copper - Unequalized	QSFP28		LA0QF088-SD-R			50	Pass
Mellanox	0.5	30	Copper - Unequalized	QSFP28		MCP1650-H00AE30			50	Pass
Mellanox	1	30	Copper - Unequalized	QSFP28		MCP1650-H001E30			50	Pass
Mellanox	1.5	30	Copper - Unequalized	QSFP28		MCP1650-H01AE30			50	Pass
Mellanox	2	26	Copper - Unequalized	QSFP28		MCP1650-H002E28			50	Pass
Mellanox	3	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			50	Pass
Mellanox	3	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			50	Pass
Mellanox	30	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			50	Pass
Mellanox	30	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			50	Pass
Mellanox	3	NA	Fiber - Active	QSFP28		MFA1A00-E003			50	Pass
Mellanox	30	NA	Fiber - Active	QSFP28		MFA1A00-E030			50	Pass
Mellanox	50	NA	Fiber - Active	QSFP28		MFA1A00-E050			50	Pass
Mellanox	100	NA	Fiber - Active	QSFP28		MFA1A00-E100			50	Pass
Molex LLC	0.5	26	Copper - Unequalized	QSFP28		100297-3051			50	Pass
Molex LLC	0.5	30	Copper - Unequalized	QSFP28		100297-1051			50	Pass
Voelx	1	30	Copper - Unequalized	QSFP56		VAHS-30-0568			50	Pass
Voelx	2	30	Copper - Unequalized	QSFP28		VAHS-30-0570			50	Pass
Voelx	2	26	Copper - Unequalized	QSFP56		VAHS-26-0349			50	Pass
Voelx	2.5	26	Copper - Unequalized	QSFP28		VAHS-26-0351			50	Pass
Voelx	3	26	Copper - Unequalized	QSFP28		VAHS-26-0352			50	Pass

Mellanox MCX414A to Mellanox MSN2410 Switch to Huawei SmartIO-NIC-2-100





IBTA PF32 RoCE Interoperability

40 Gigabit Ethernet

Interop 11



Company	Length Meters	AWG	Equalization	Connector Type	Cavium RoCE Card #1	Cable Under Test	Mellanox Switch	Huawei RoCE Card #2	Link Speed	Interop Result
AOI	100	NA	Fiber - Active	QSFP+	QL45412	AQKA9N00ADLN0874	MSX1012B-2BFS	SmartIO-NIC-2-100	40	Pass
AOI	100	NA	Fiber - Active	QSFP+		AQKA9N00ADLN0874			40	Pass
AOI	70	NA	Fiber - Active	QSFP28		AQPA9N70ADLN0851			40	Pass
AOI	70	NA	Fiber - Active	QSFP28		AQPA9N70ADLN0851			40	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0851			40	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0851			40	Pass
AOI	70	NA	Fiber - Active	QSFP28		AQPA9N70ADLN0990			40	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0990			40	Pass
Finisar	1	N/A	Fiber - Active	QSFP28		FCBN425QE1C01			40	Pass
Finisar	5	N/A	Fiber - Active	QSFP28		FCBN425QB1C05			40	Pass
Finisar	100	N/A	Fiber - Active	QSFP28		FCBN425QE1CX0			40	Pass
Finisar	1	N/A	Fiber - Active	QSFP+		FCBN410QD3C01			40	Pass
Finisar	100	N/A	Fiber - Active	QSFP+		FCBN410QD3CX0			40	Pass
Luxshare-ICT	0.5	30	Copper - Unequalized	QSFP28		LA0QF081-SD-R			40	Pass
Luxshare-ICT	1	30	Copper - Unequalized	QSFP28		LA0QF082-SD-R			40	Pass
Luxshare-ICT	2	30	Copper - Unequalized	QSFP28		LA0QF083-SD-R			40	Pass
Luxshare-ICT	1	28	Copper - Unequalized	QSFP28		LA0QF084-SD-R			40	Pass
Luxshare-ICT	2	28	Copper - Unequalized	QSFP28		LA0QF085-SD-R			40	Pass
Luxshare-ICT	1	26	Copper - Unequalized	QSFP28		LA0QF086-SD-R			40	Pass
Luxshare-ICT	2	26	Copper - Unequalized	QSFP28		LA0QF087-SD-R			40	Pass
Luxshare-ICT	3	26	Copper - Unequalized	QSFP28		LA0QF088-SD-R			40	Pass
Mellanox	0.5	30	Copper - Unequalized	QSFP28		MCP1650-H00AE30			40	Pass
Mellanox	1	30	Copper - Unequalized	QSFP28		MCP1650-H001E30			40	Pass
Mellanox	1.5	30	Copper - Unequalized	QSFP28		MCP1650-H01AE30			40	Pass
Mellanox	2	26	Copper - Unequalized	QSFP28		MCP1650-H002E28			40	Pass
Mellanox	3	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			40	Pass
Mellanox	3	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			40	Pass
Mellanox	30	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			40	Pass
Mellanox	30	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			40	Pass
Mellanox	3	NA	Fiber - Active	QSFP28		MFA1A00-E003			40	Pass
Mellanox	30	NA	Fiber - Active	QSFP28		MFA1A00-E030			40	Pass
Mellanox	50	NA	Fiber - Active	QSFP28		MFA1A00-E050			40	Pass
Mellanox	100	NA	Fiber - Active	QSFP28	MFA1A00-E100	40	Pass			

Cavium QL45412 to Mellanox MSX1012B Switch to Huawei SmartIO-NIC-2-100





IBTA PF32 RoCE Interoperability

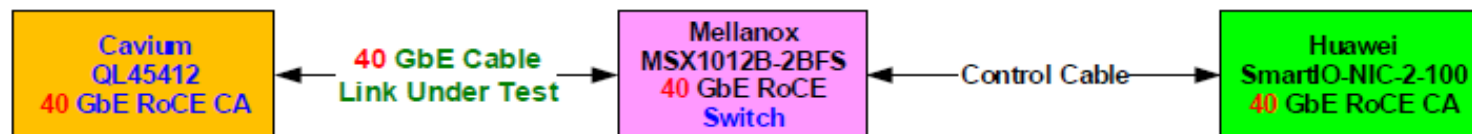
40 Gigabit Ethernet

Interop 11



Company	Length Meters	AWG	Equalization	Connector Type	Cavium RoCE Card #1	Cable Under Test	Mellanox Switch	Huawei RoCE Card #2	Link Speed	Interop Result
Molex LLC	0.5	26	Copper - Unequalized	QSFP28	QL45412	100297-3051	MSX1012B-2BFS	SmartIO-NIC-2-100	40	Pass
Molex LLC	0.5	30	Copper - Unequalized	QSFP28		100297-1051			40	Pass
TE Connectivity	2	33	Copper - Unequalized	QSFP28		1-2231368-8			40	Pass
TE Connectivity	3	30	Copper - Unequalized	QSFP28		2231368-8			40	Pass
Volex	1	30	Copper - Unequalized	QSFP56		VAHS-30-0568			40	Pass
Volex	2	30	Copper - Unequalized	QSFP28		VAHS-30-0570			40	Pass
Volex	2	26	Copper - Unequalized	QSFP56		VAHS-26-0349			40	Pass
Volex	2.5	26	Copper - Unequalized	QSFP28		VAHS-26-0351			40	Pass
Volex	3	26	Copper - Unequalized	QSFP28		VAHS-26-0352			40	Pass

Cavium QL45412 to Mellanox MSX1012B Switch to Huawei SmartIO-NIC-2-100





IBTA PF32 RoCE Interoperability

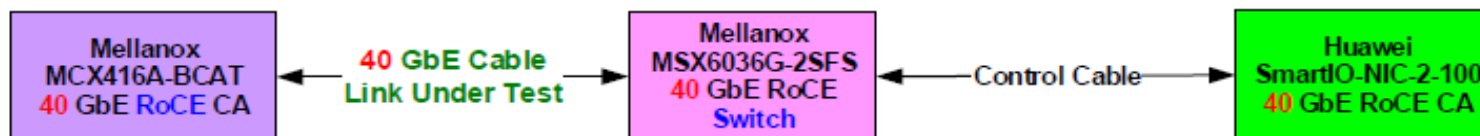
40 Gigabit Ethernet

Interop 12



Company	Length Meters	AWG	Equalization	Connector Type	Mellanox RoCE Card #1	Cable Under Test	Mellanox Switch	Huawei RoCE Card #2	Link Speed	Interop Result
AOI	70	NA	Fiber - Active	QSFP28	MCX416A-BCAT	AQPA9N70ADLN0851	MSX6036G-2SFS	SmartIO-NIC-2-100	40	Pass
AOI	70	NA	Fiber - Active	QSFP28		AQPA9N70ADLN0851			40	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0851			40	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0851			40	Pass
AOI	70	NA	Fiber - Active	QSFP28		AQPA9N70ADLN0990			40	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0990			40	Pass
Finisar	1	N/A	Fiber - Active	QSFP+		FCBN410QD3C01			40	Pass
Finisar	100	N/A	Fiber - Active	QSFP+		FCBN410QD3CX0			40	Pass
Luxshare-ICT	0.5	30	Copper - Unequalized	QSFP28		LA0QF081-SD-R			40	Pass
Luxshare-ICT	1	30	Copper - Unequalized	QSFP28		LA0QF082-SD-R			40	Pass
Luxshare-ICT	2	30	Copper - Unequalized	QSFP28		LA0QF083-SD-R			40	Pass
Luxshare-ICT	1	28	Copper - Unequalized	QSFP28		LA0QF084-SD-R			40	Pass
Luxshare-ICT	2	28	Copper - Unequalized	QSFP28		LA0QF085-SD-R			40	Pass
Luxshare-ICT	1	26	Copper - Unequalized	QSFP28		LA0QF086-SD-R			40	Pass
Luxshare-ICT	2	26	Copper - Unequalized	QSFP28		LA0QF087-SD-R			40	Pass
Luxshare-ICT	3	26	Copper - Unequalized	QSFP28		LA0QF088-SD-R			40	Pass
Mellanox	0.5	30	Copper - Unequalized	QSFP28		MCP1650-H00AE30			40	Pass
Mellanox	1	30	Copper - Unequalized	QSFP28		MCP1650-H001E30			40	Pass
Mellanox	1.5	30	Copper - Unequalized	QSFP28		MCP1650-H01AE30			40	Pass
Mellanox	2	26	Copper - Unequalized	QSFP28		MCP1650-H002E28			40	Pass
Mellanox	3	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			40	Pass
Mellanox	3	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			40	Pass
Mellanox	30	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			40	Pass
Mellanox	30	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			40	Pass
Mellanox	3	NA	Fiber - Active	QSFP28		MFA1A00-E003			40	Pass
Mellanox	30	NA	Fiber - Active	QSFP28		MFA1A00-E030			40	Pass
Mellanox	50	NA	Fiber - Active	QSFP28		MFA1A00-E050			40	Pass
Mellanox	100	NA	Fiber - Active	QSFP28		MFA1A00-E100			40	Pass
Molex LLC	0.5	26	Copper - Unequalized	QSFP28		100297-3051			40	Pass
Molex LLC	0.5	30	Copper - Unequalized	QSFP28		100297-1051			40	Pass
TE Connectivity	2	33	Copper - Unequalized	QSFP28		1-2231368-8			40	Pass
TE Connectivity	3	30	Copper - Unequalized	QSFP28		2231368-8			40	Pass
Volex	1	30	Copper - Unequalized	QSFP56		VAHS-30-0568			40	Pass
Volex	2	30	Copper - Unequalized	QSFP28	VAHS-30-0570	40	Pass			
Volex	2	26	Copper - Unequalized	QSFP56	VAHS-26-0349	40	Pass			
Volex	2.5	26	Copper - Unequalized	QSFP28	VAHS-26-0351	40	Pass			
Volex	3	26	Copper - Unequalized	QSFP28	VAHS-26-0352	40	Pass			

Mellanox MCX416A to Mellanox MSX6036G Switch to Huawei SmartIO-NIC-2-100





IBTA PF32 RoCE Interoperability

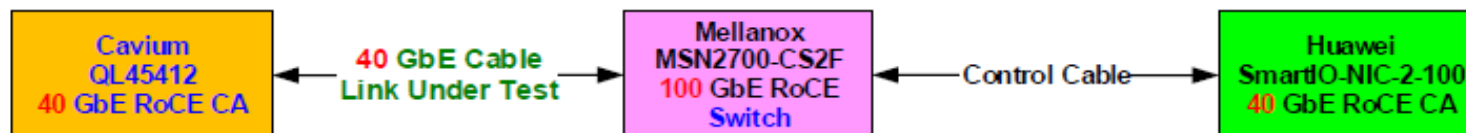
40 Gigabit Ethernet

Interop 21



Company	Length Meters	AWG	Equalization	Connector Type	Cavium RoCE Card #1	Cable Under Test	Mellanox Switch	Huawei RoCE Card #2	Link Speed	Interop Result
AOI	100	NA	Fiber - Active	QSFP+	QL45412	AQKA9N00ADLN0874	MSN2700-CS2F	SmartIO-NIC-2-100	40	Pass
AOI	100	NA	Fiber - Active	QSFP+		AQKA9N00ADLN0874			40	Pass
AOI	70	NA	Fiber - Active	QSFP28		AQPA9N70ADLN0851			40	Pass
AOI	70	NA	Fiber - Active	QSFP28		AQPA9N70ADLN0851			40	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0851			40	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0851			40	Pass
AOI	70	NA	Fiber - Active	QSFP28		AQPA9N70ADLN0990			40	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0990			40	Pass
Finisar	5	N/A	Fiber - Active	QSFP28		FCBN425QB1C05			40	Pass
Finisar	1	N/A	Fiber - Active	QSFP+		FCBN410QD3C01			40	Pass
Finisar	100	N/A	Fiber - Active	QSFP+		FCBN410QD3CX0			40	Pass
Luxshare-ICT	0.5	30	Copper - Unequalized	QSFP28		LA0QF081-SD-R			40	Pass
Luxshare-ICT	1	30	Copper - Unequalized	QSFP28		LA0QF082-SD-R			40	Pass
Luxshare-ICT	2	30	Copper - Unequalized	QSFP28		LA0QF083-SD-R			40	Pass
Luxshare-ICT	1	28	Copper - Unequalized	QSFP28		LA0QF084-SD-R			40	Pass
Luxshare-ICT	2	28	Copper - Unequalized	QSFP28		LA0QF085-SD-R			40	Pass
Luxshare-ICT	1	26	Copper - Unequalized	QSFP28		LA0QF086-SD-R			40	Pass
Luxshare-ICT	2	26	Copper - Unequalized	QSFP28		LA0QF087-SD-R			40	Pass
Luxshare-ICT	3	26	Copper - Unequalized	QSFP28		LA0QF088-SD-R			40	Pass
Mellanox	0.5	30	Copper - Unequalized	QSFP28		MCP1650-H00AE30			40	Pass
Mellanox	1	30	Copper - Unequalized	QSFP28		MCP1650-H001E30			40	Pass
Mellanox	1.5	30	Copper - Unequalized	QSFP28		MCP1650-H01AE30			40	Pass
Mellanox	2	26	Copper - Unequalized	QSFP28		MCP1650-H002E28			40	Pass
Mellanox	3	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			40	Pass
Mellanox	3	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			40	Pass
Mellanox	30	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			40	Pass
Mellanox	30	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			40	Pass
Mellanox	3	NA	Fiber - Active	QSFP28		MFA1A00-E003			40	Pass
Mellanox	30	NA	Fiber - Active	QSFP28		MFA1A00-E030			40	Pass
Mellanox	50	NA	Fiber - Active	QSFP28		MFA1A00-E050			40	Pass
Mellanox	100	NA	Fiber - Active	QSFP28	MFA1A00-E100	40	Pass			

Cavium QL45412 to Mellanox MSN2700 Switch to Huawei SmartIO-NIC-2-100





IBTA PF32 RoCE Interoperability

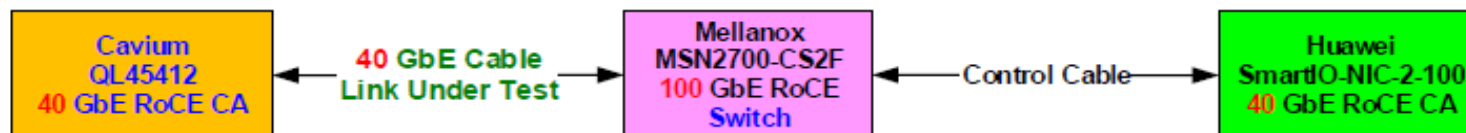
40 Gigabit Ethernet

Interop 21



Company	Length Meters	AWG	Equalization	Connector Type	Cavium RoCE Card #1	Cable Under Test	Mellanox Switch	Huawei RoCE Card #2	Link Speed	Interop Result
Molex LLC	0.5	26	Copper - Unequalized	QSFP28	QL45412	100297-3051	MSN2700-CS2F	SmartIO-NIC-2-100	40	Pass
Molex LLC	0.5	30	Copper - Unequalized	QSFP28		100297-1051			40	Pass
TE Connectivity	2	33	Copper - Unequalized	QSFP28		1-2231368-8			40	Pass
TE Connectivity	3	30	Copper - Unequalized	QSFP28		2231368-8			40	Pass
Volex	1	30	Copper - Unequalized	QSFP56		VAHS-30-0568			40	Pass
Volex	2	30	Copper - Unequalized	QSFP28		VAHS-30-0570			40	Pass
Volex	2	26	Copper - Unequalized	QSFP56		VAHS-26-0349			40	Pass
Volex	2.5	26	Copper - Unequalized	QSFP28		VAHS-26-0351			40	Pass
Volex	3	26	Copper - Unequalized	QSFP28		VAHS-26-0352			40	Pass

Cavium QL45412 to Mellanox MSN2700 Switch to Huawei SmartIO-NIC-2-100





IBTA PF32 RoCE Interoperability

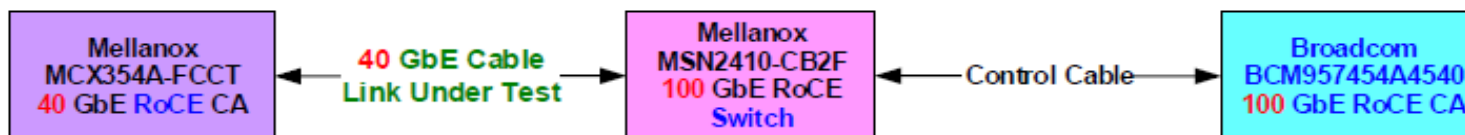
40 Gigabit Ethernet

Interop 22



Company	Length Meters	AWG	Equalization	Connector Type	Mellanox RoCE Card #1	Cable Under Test	Mellanox Switch	Broadcom RoCE Card #2	Link Speed	Interop Result
AOI	100	NA	Fiber - Active	QSFP+	MCX354A-FCCT	AQKA9N00ADLN0874	MSN2410-CB2F	BCM957454A4540	40	Pass
AOI	100	NA	Fiber - Active	QSFP+		AQKA9N00ADLN0874			40	Pass
AOI	70	NA	Fiber - Active	QSFP28		AQPA9N70ADLN0851			40	Pass
AOI	70	NA	Fiber - Active	QSFP28		AQPA9N70ADLN0851			40	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0851			40	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0851			40	Pass
AOI	70	NA	Fiber - Active	QSFP28		AQPA9N70ADLN0990			40	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0990			40	Pass
Finisar	5	N/A	Fiber - Active	QSFP28		FCBN425QB1C05			40	Pass
Finisar	1	N/A	Fiber - Active	QSFP+		FCBN410QD3C01			40	Pass
Finisar	100	N/A	Fiber - Active	QSFP+		FCBN410QD3CX0			40	Pass
Luxshare-ICT	0.5	30	Copper - Unequalized	QSFP28		LA0QF081-SD-R			40	Pass
Luxshare-ICT	1	30	Copper - Unequalized	QSFP28		LA0QF082-SD-R			40	Pass
Luxshare-ICT	2	30	Copper - Unequalized	QSFP28		LA0QF083-SD-R			40	Pass
Luxshare-ICT	1	28	Copper - Unequalized	QSFP28		LA0QF084-SD-R			40	Pass
Luxshare-ICT	2	28	Copper - Unequalized	QSFP28		LA0QF085-SD-R			40	Pass
Luxshare-ICT	1	26	Copper - Unequalized	QSFP28		LA0QF086-SD-R			40	Pass
Luxshare-ICT	2	26	Copper - Unequalized	QSFP28		LA0QF087-SD-R			40	Pass
Luxshare-ICT	3	26	Copper - Unequalized	QSFP28		LA0QF088-SD-R			40	Pass
Mellanox	0.5	30	Copper - Unequalized	QSFP28		MCP1650-H00AE30			40	Pass
Mellanox	1	30	Copper - Unequalized	QSFP28		MCP1650-H001E30			40	Pass
Mellanox	1.5	30	Copper - Unequalized	QSFP28		MCP1650-H01AE30			40	Pass
Mellanox	2	26	Copper - Unequalized	QSFP28		MCP1650-H002E28			40	Pass
Mellanox	3	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			40	Pass
Mellanox	3	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			40	Pass
Mellanox	30	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			40	Pass
Mellanox	30	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			40	Pass
Mellanox	3	NA	Fiber - Active	QSFP28		MFA1A00-E003			40	Pass
Mellanox	30	NA	Fiber - Active	QSFP28		MFA1A00-E030			40	Pass
Mellanox	50	NA	Fiber - Active	QSFP28		MFA1A00-E050			40	Pass
Mellanox	100	NA	Fiber - Active	QSFP28	MFA1A00-E100	40	Pass			

Mellanox MCX354A to Mellanox MSN2410 Switch to Broadcom BCM957454A4540





IBTA PF32 RoCE Interoperability

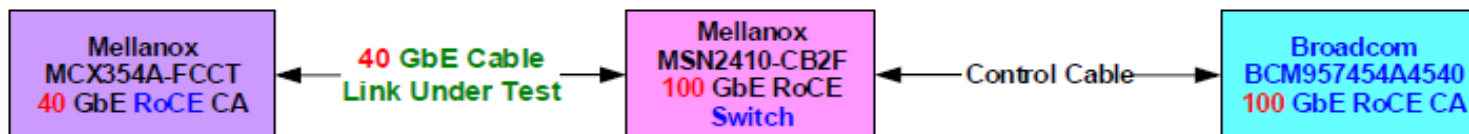
40 Gigabit Ethernet

Interop 22



Company	Length Meters	AWG	Equalization	Connector Type	Mellanox RoCE Card #1	Cable Under Test	Mellanox Switch	Broadcom RoCE Card #2	Link Speed	Interop Result
Molex LLC	0.5	26	Copper - Unequalized	QSFP28	MCX354A-FCCT	100297-3051	MSN2410-CB2F	BCM957454A4540	40	Pass
Molex LLC	0.5	30	Copper - Unequalized	QSFP28		100297-1051			40	Pass
TE Connectivity	2	33	Copper - Unequalized	QSFP28		1-2231368-8			40	Pass
TE Connectivity	3	30	Copper - Unequalized	QSFP28		2231368-8			40	Pass
Volex	1	30	Copper - Unequalized	QSFP56		VAHS-30-0568			40	Pass
Volex	2	30	Copper - Unequalized	QSFP28		VAHS-30-0570			40	Pass
Volex	2	26	Copper - Unequalized	QSFP56		VAHS-26-0349			40	Pass
Volex	2.5	26	Copper - Unequalized	QSFP28		VAHS-26-0351			40	Pass
Volex	3	26	Copper - Unequalized	QSFP28		VAHS-26-0352			40	Pass

Mellanox MCX354A to Mellanox MSN2410 Switch to Broadcom BCM957454A4540





IBTA PF32 RoCE Interoperability

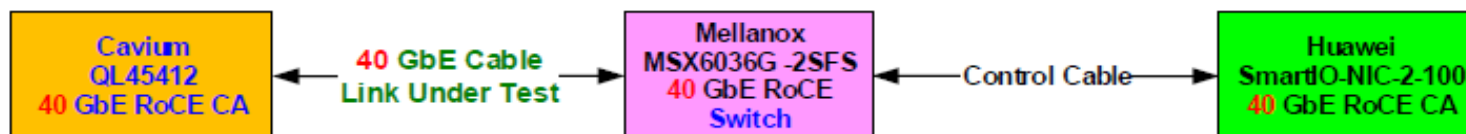
40 Gigabit Ethernet

Interop 23



Company	Length Meters	AWG	Equalization	Connector Type	Cavium RoCE Card #1	Cable Under Test	Mellanox Switch	Huawei RoCE Card #2	Link Speed	Interop Result
AOI	100	NA	Fiber - Active	QSFP+	QL45412	AQKA9N00ADLN0874	MSX6036G-2SFS	SmartIO-NIC-2-100	40	Pass
AOI	100	NA	Fiber - Active	QSFP+		AQKA9N00ADLN0874			40	Pass
AOI	70	NA	Fiber - Active	QSFP28		AQPA9N70ADLN0851			40	Pass
AOI	70	NA	Fiber - Active	QSFP28		AQPA9N70ADLN0851			40	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0851			40	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0851			40	Pass
AOI	70	NA	Fiber - Active	QSFP28		AQPA9N70ADLN0990			40	Pass
AOI	100	NA	Fiber - Active	QSFP28		AQPA9N00ADLN0990			40	Pass
Finisar	1	N/A	Fiber - Active	QSFP+		FCBN410QD3C01			40	Pass
Finisar	100	N/A	Fiber - Active	QSFP+		FCBN410QD3CX0			40	Pass
Luxshare-ICT	0.5	30	Copper - Unequalized	QSFP28		LA0QF081-SD-R			40	Pass
Luxshare-ICT	1	30	Copper - Unequalized	QSFP28		LA0QF082-SD-R			40	Pass
Luxshare-ICT	2	30	Copper - Unequalized	QSFP28		LA0QF083-SD-R			40	Pass
Luxshare-ICT	1	28	Copper - Unequalized	QSFP28		LA0QF084-SD-R			40	Pass
Luxshare-ICT	2	28	Copper - Unequalized	QSFP28		LA0QF085-SD-R			40	Pass
Luxshare-ICT	1	26	Copper - Unequalized	QSFP28		LA0QF086-SD-R			40	Pass
Luxshare-ICT	2	26	Copper - Unequalized	QSFP28		LA0QF087-SD-R			40	Pass
Luxshare-ICT	3	26	Copper - Unequalized	QSFP28		LA0QF088-SD-R			40	Pass
Mellanox	0.5	30	Copper - Unequalized	QSFP28		MCP1650-H00AE30			40	Pass
Mellanox	1	30	Copper - Unequalized	QSFP28		MCP1650-H001E30			40	Pass
Mellanox	1.5	30	Copper - Unequalized	QSFP28		MCP1650-H01AE30			40	Pass
Mellanox	2	26	Copper - Unequalized	QSFP28		MCP1650-H002E28			40	Pass
Mellanox	3	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			40	Pass
Mellanox	3	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			40	Pass
Mellanox	30	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			40	Pass
Mellanox	30	NA	Fiber - Module Only	QSFP28		MMA1B00-C100D			40	Pass
Mellanox	3	NA	Fiber - Active	QSFP28		MFA1A00-E003			40	Pass
Mellanox	30	NA	Fiber - Active	QSFP28		MFA1A00-E030			40	Pass
Mellanox	50	NA	Fiber - Active	QSFP28		MFA1A00-E050			40	Pass
Mellanox	100	NA	Fiber - Active	QSFP28		MFA1A00-E100			40	Pass

Cavium QL45412 to Mellanox MSX6036G Switch to Huawei SmartIO-NIC-2-100





IBTA PF32 RoCE Interoperability

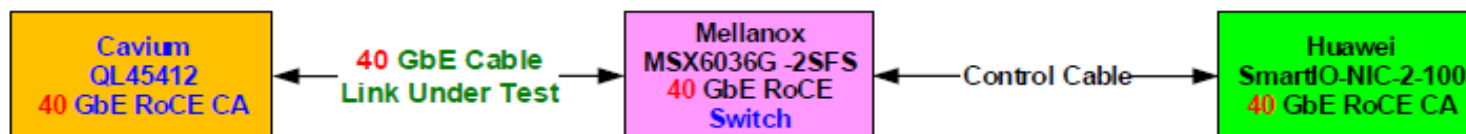
40 Gigabit Ethernet

Interop 23



Company	Length Meters	AWG	Equalization	Connector Type	Cavium RoCE Card #1	Cable Under Test	Mellanox Switch	Huawei RoCE Card #2	Link Speed	Interop Result
Molex LLC	0.5	26	Copper - Unequalized	QSFP28	QL45412	100297-3051	MSX6036G-2SFS	SmartIO-NIC-2-100	40	Pass
Molex LLC	0.5	30	Copper - Unequalized	QSFP28		100297-1051			40	Pass
TE Connectivity	2	33	Copper - Unequalized	QSFP28		1-2231368-8			40	Pass
TE Connectivity	3	30	Copper - Unequalized	QSFP28		2231368-8			40	Pass
Volex	1	30	Copper - Unequalized	QSFP56		VAHS-30-0568			40	Pass
Volex	2	30	Copper - Unequalized	QSFP28		VAHS-30-0570			40	Pass
Volex	2	26	Copper - Unequalized	QSFP56		VAHS-26-0349			40	Pass
Volex	2.5	26	Copper - Unequalized	QSFP28		VAHS-26-0351			40	Pass
Volex	3	26	Copper - Unequalized	QSFP28		VAHS-26-0352			40	Pass

Cavium QL45412 to Mellanox MSX6036G Switch to Huawei SmartIO-NIC-2-100





IBTA PF32 RoCE Interoperability

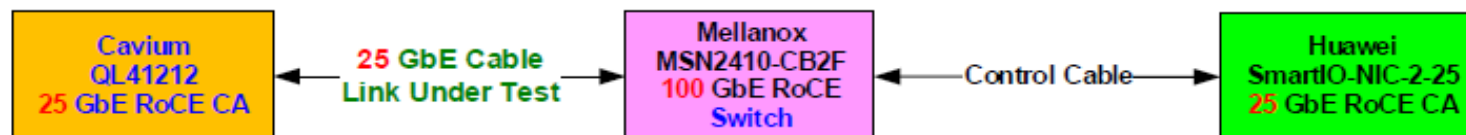
25 Gigabit Ethernet

Interop 07



Company	Length Meters	AWG	Equalization	Connector Type	Cavium RoCE Card #1	Cable Under Test	Mellanox Switch	Huawei RoCE Card #2	Link Speed	Interop Result
Molex LLC	1	30	Copper - Unequalized	SFP28	QL41212	11145-1101	MSN2410-CB2F	SmartIO-NIC-2-25	25	Pass
Molex LLC	3	30	Copper - Unequalized	SFP28		11145-1301			25	Pass
Molex LLC	5	26	Copper - Unequalized	SFP28		11145-3501			25	Pass
TE Connectivity	2	33	Copper - Unequalized	SFP28		2821262-4			25	Pass
TE Connectivity	3	30	Copper - Unequalized	SFP28		2821222-1			25	Pass
Volex	1	30	Copper - Unequalized	SFP28		VAHS-30-0569			25	Pass
Volex	2	26	Copper - Unequalized	SFP28		VAHS-26-0350			25	Pass

Cavium QL41212 to Mellanox MSN2410 Switch to Huawei SmartIO-NIC-2-25





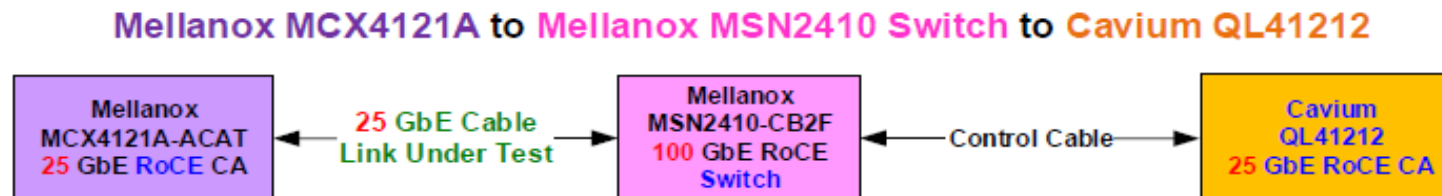
IBTA PF32 RoCE Interoperability

25 Gigabit Ethernet

Interop 08



Company	Length Meters	AWG	Equalization	Connector Type	Mellanox RoCE Card #1	Cable Under Test	Mellanox Switch	Cavium RoCE Card #2	Link Speed	Interop Result
Molex LLC	1	30	Copper - Unequalized	SFP28	MCX4121A-ACAT	11145-1101	MSN2410-CB2F	QL41212	25	Pass
Molex LLC	3	30	Copper - Unequalized	SFP28		111145-1301			25	Pass
Molex LLC	5	26	Copper - Unequalized	SFP28		111145-3501			25	Pass
TE Connectivity	2	33	Copper - Unequalized	SFP28		2821262-4			25	Pass
TE Connectivity	3	30	Copper - Unequalized	SFP28		2821222-1			25	Pass
Volex	1	30	Copper - Unequalized	SFP28		VAHS-30-0569			25	Pass
Volex	2	26	Copper - Unequalized	SFP28		VAHS-26-0350			25	Pass





IBTA PF32 RoCE Interoperability

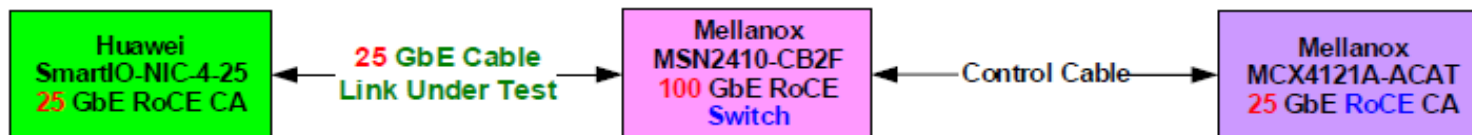
25 Gigabit Ethernet

Interop 14



Company	Length Meters	AWG	Equalization	Connector Type	Huawei RoCE Card #1	Cable Under Test	Mellanox Switch	Mellanox RoCE Card #2	Link Speed	Interop Result
Molex LLC	1	30	Copper - Unequalized	SFP28	SmartIO-NIC-2-25	11145-1101	MSN2410-CB2F	MCX4121A-ACAT	25	Pass
Molex LLC	3	30	Copper - Unequalized	SFP28		111145-1301			25	Pass
Molex LLC	5	26	Copper - Unequalized	SFP28		111145-3501			25	Pass
TE Connectivity	2	33	Copper - Unequalized	SFP28		2821262-4			25	Pass
TE Connectivity	3	30	Copper - Unequalized	SFP28		2821222-1			25	Pass
Volex	1	30	Copper - Unequalized	SFP28		VAHS-30-0569			25	Pass
Volex	2	26	Copper - Unequalized	SFP28		VAHS-26-0350			25	Pass

Huawei SmartIO-NIC-4-25 to Mellanox MSN2410 Switch to Mellanox MCX4121A





IBTA PF32 RoCE Interoperability

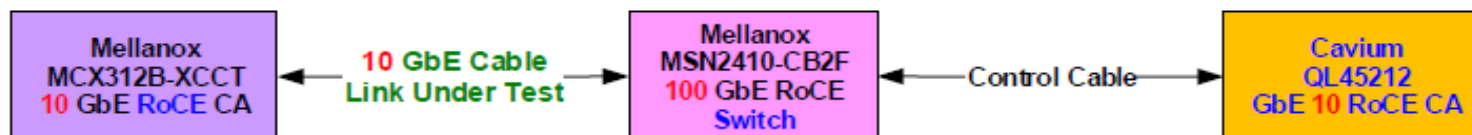
10 Gigabit Ethernet

Interop 17



Company	Length Meters	AWG	Equalization	Connector Type	Mellanox RoCE Card #1	Cable Under Test	Mellanox Switch	Cavium RoCE Card #2	Link Speed	Interop Result
Molex LLC	1	30	Copper - Unequalized	SFP28	MCX312B-XCCT	11145-1101	MSN2410-CB2F	QL45212	10	Pass
Molex LLC	3	30	Copper - Unequalized	SFP28		11145-1301			10	Pass
Molex LLC	5	26	Copper - Unequalized	SFP28		11145-3501			10	Pass
TE Connectivity	2	33	Copper - Unequalized	SFP28		2821262-4			10	Pass
TE Connectivity	3	30	Copper - Unequalized	SFP28		2821222-1			10	Pass
Volex	1	30	Copper - Unequalized	SFP28		VAHS-30-0569			10	Pass
Volex	2	26	Copper - Unequalized	SFP28		VAHS-26-0350			10	Pass

Mellanox MCX312B to Mellanox MSX1012B Switch to Cavium QL45212





RoCE IBTA RoCE Interoperability List

October 2017



These Interoperability results represent system tests and include the testing of the entire environment including device transmitters, cable media and device receivers. The Interoperability results that follow include 25, 50 and 100 GbE RoCE devices and SFP28 and QSFP28 hybrid cables.

This section focuses on **Hybrid Cables** which have a QSFP28 connector on one end. There are two options for the other end:

1. Two QSFP28 Connectors which can connect to 50 GbE devices two lanes at 25 GbE
2. Four SFP28 Connectors which can connect to four 25 GbE devices each lane running at 25 GbE

Open MPI does not currently support Hybrid cable scenarios so we used the Software Forge application called HPC Performance Monitor which allows us to both generate traffic at 100 GbE speeds and monitor the performance of the test scenario. An example output is illustrated at the end of this Interoperability List

Hardware used to test Interoperability

Manufacturer	Description of Hardware	Model	Type	FW	SW	Speed
Broadcom	BCM957414A4140 50GbE	BCM957414A4140-	RNIC	20.8.35	20.8.0.6	50 GbE
Broadcom	BCM957454A4540 100GbE	BCM957454A4540	RNIC	20.8.35	20.8.0.6	100 GbE
Cavium	QLogic FastLinQ Dual-Port 25GbE	QL41212HL	RNIC	8.30.14.0	8.30.13.0	25 GbE
Huawei	Smart-IO-NIC-4-25, 25GbE, quad-port	Smart-IO-NIC-4-25	Ext-RNIC	20171027_2300	0.1.2.2.99999	25 GbE
Huawei	Smart-IO-NIC-2-100, 100GbE, dual-port	Smart-IO-NIC-2-100	RNIC	20171027_2300	0.1.2.2.99999	100 GbE
Mellanox	ConnectX@-4 Lx EN network interface card, 25GbE dual-port SFP28	MCX4121A-ACAT	RNIC	14.20.1010	4.1-1.0.2.0	25 GbE
Mellanox	ConnectX@-4 Lx EN network interface card, 50GbE single-port QSFP28	MCX4131A-GCAT	RNIC	14.20.1010	4.1-1.0.2.0	50 GbE
Mellanox	ConnectX@-5 EN network interface card, 100GbE dual-port QSFP28	MCX516A-CCAT	RNIC	16.20.1010	4.1-1.0.2.0	100 GbE
Mellanox	32-port Non-blocking 100GbE Supports speeds of 10/25/40/50/56/100GbE	MSN2700-CS2F	Switch	13.1452.178	3.6.3506	100 GbE

Software Used to Test Interoperability

Software	Versions
Operating System	CentOS 7.2
OFED Versions	OFED 4.8, 4.8-1-rc1
Mellanox OFED Version	4.1-1.0.2.0

Software	Versions
Software Forge HPC-Performance Monitor	HPC-PM-2.0.80

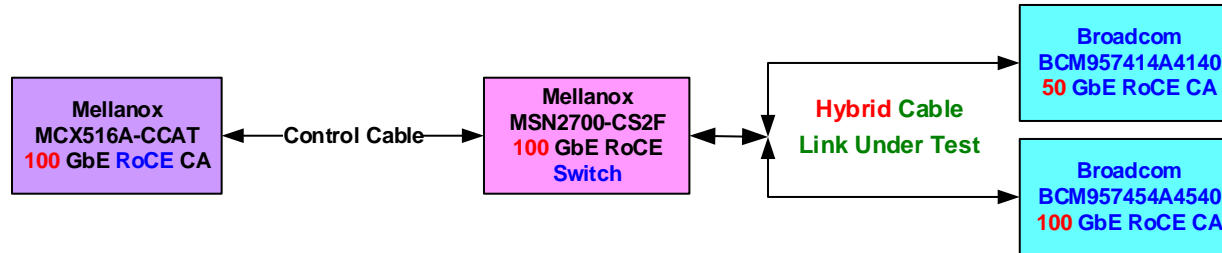
Conditions for passing Interoperability Testing	
Link Width	Link width is @ expected width - i.e. 1x,4x, etc
Link Speed	Link speed is @ expected speed - e.g. 100 GbE
Symbol Errors	There must be no errors during the sfi_perf run
Link and Port Errors	There must be no errors during the sfi_perf run
sfi_perf Test	The sfi_perf test must run to completion without error

Message Size	Iterations	Verbs used		
2	30000000	Read	Write	Send
256	21000000			
1024	15000000			
16384	3000000			
524288	85036			
1048576	39968			
2097152	19984			
4194304	10000			

RDMA over Converged Ethernet (RoCE) Interop Testing

Mellanox MCX4131A to Mellanox MSN2700 Switch
Broadcom BCM957414A4140 and Broadcom BCM957454A4540

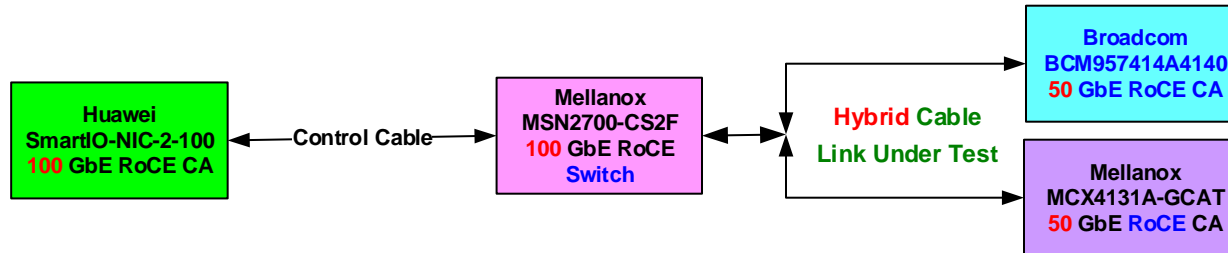
Interop 27



Interop 27

Huawei SmartIO-NIC-2-100 to Mellanox MSN2700 Switch to
Broadcom BCM957414A4140 and Mellanox MCX4131A

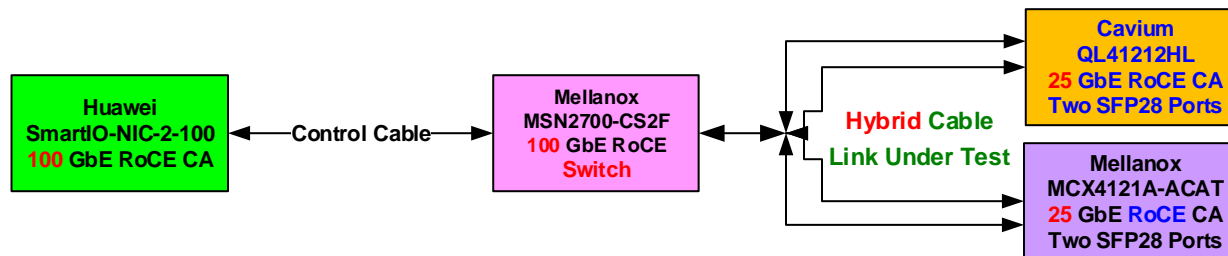
Interop 28



Interop 28

Huawei SmartIO-NIC-2-100 to Mellanox MSN2700 Switch to
2 Ports Cavium QL41212HL and 2 Ports Mellanox MCX4121A

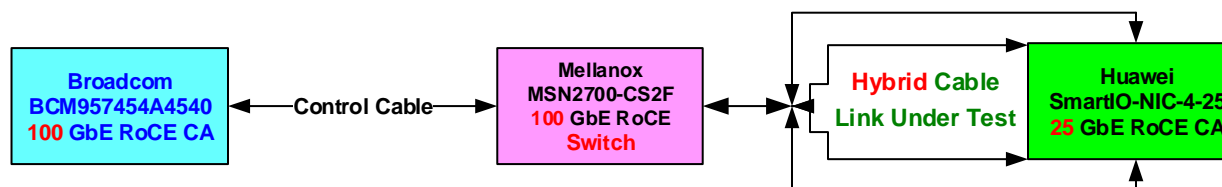
Interop 29



Interop 29

Broadcom BCM957454A4540 to Mellanox MSN2700 Switch to
4 Ports Huawei SmartIO-NIC-4-25

Interop 30



Interop 30



IBTA PF32 RoCE Interoperability

100 Gigabit Ethernet

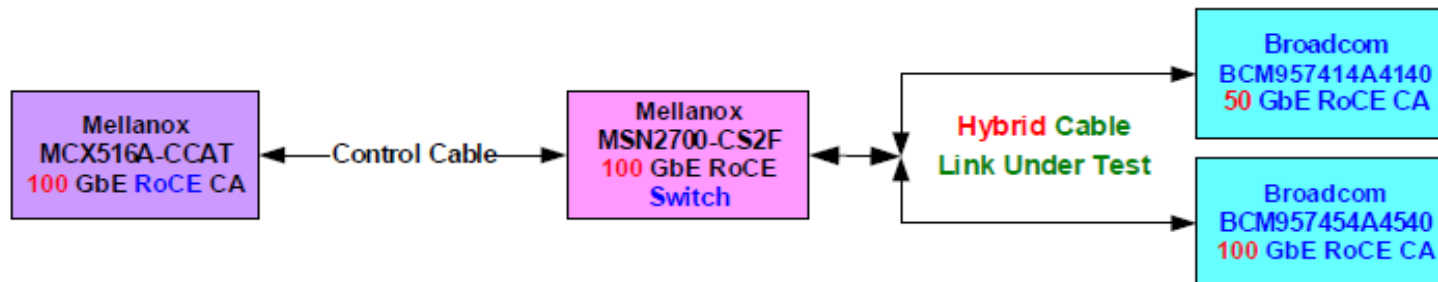
Interop 27



Company	Length Meters	AWG	Equalization	Connector Type	Mellanox RoCE Card #1	Cable Under Test	Mellanox Switch	Broadcom RoCE Card #2	Link Speed	Interop Result
TE Connectivity	1	33	Copper - Unequalized	Hybrid-QSFP28-QSFP28-Dual	MCX516A-CCAT	2821309-7	MSN2700-CS2F	BCM957454A4540	100	Pass

Mellanox MCX4131A to Mellanox MSN2700 Switch

Broadcom BCM957414A4140 and Broadcom BCM957454A4540





IBTA PF32 RoCE Interoperability

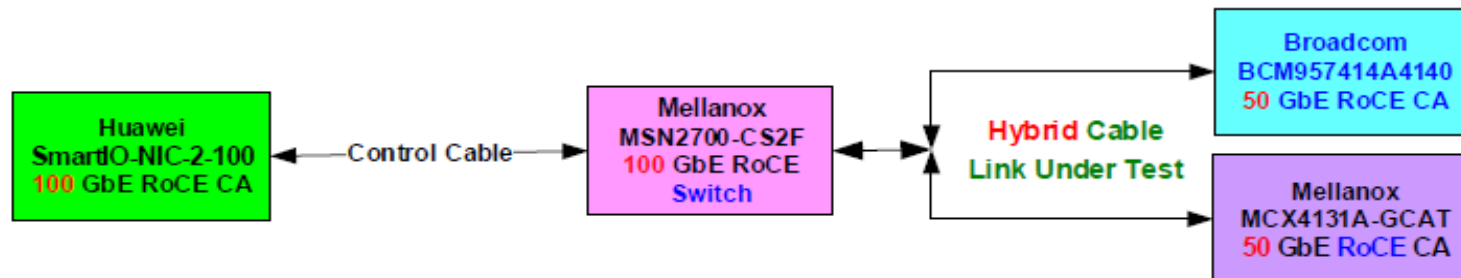
100 Gigabit Ethernet

Interop 28



Company	Length Meters	AWG	Equalization	Connector Type	Huawei RoCE Card #1	Link Speed	Cable Under Test	Mellanox Switch	Endpoint RNICs #2 and #3	Link Speed	Interop Result
TE Connectivity	1	33	Copper - Unequalized	Hybrid QSFP28-QSFP28-Dual	SmartIO-NIC-2-100	100	2821309-7	MSN2700-CS2F	BCM957414A4140	25	Pass
										25	
									MCX4131A-GCAT	25	

Huawei SmartIO-NIC-2-100 to Mellanox MSN2700 Switch to Broadcom BCM957414A4140 and Mellanox MCX4131A





IBTA PF32 RoCE Interoperability

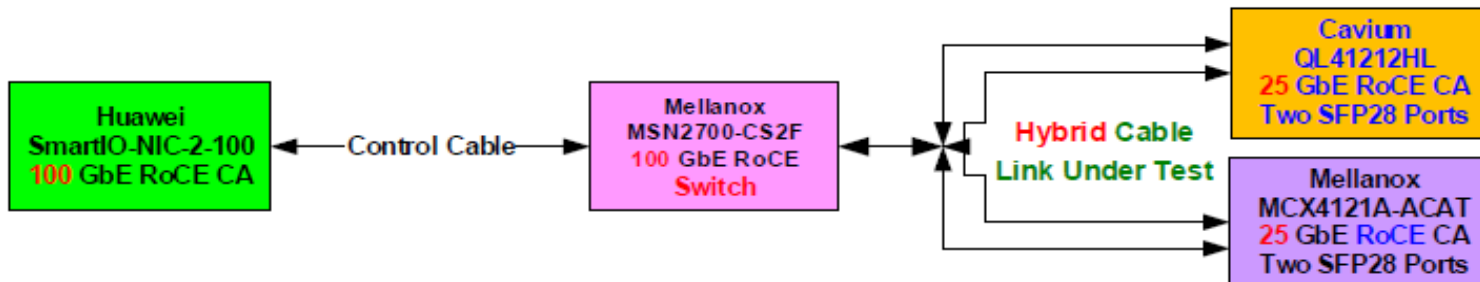
100 Gigabit Ethernet

Interop 29



Company	Length Meters	AWG	Equalization	Connector Type	Huawei RoCE Card #1	Link Speed	Cable Under Test	Mellanox Switch	Endpoint RNICs #2 and #3	Link Speed	Interop Result
TE Connectivity	1	33	Copper - Unequalized	Hybrid - SFP-QSFP	SmartIO-NIC-2-100	100	2821033-8	MSN2700-CS2F	QL41212	25	Pass
									QL41212	25	
									MCX4121A-ACAT	25	
TE Connectivity	2	30	Copper - Unequalized	Hybrid - SFP-QSFP	SmartIO-NIC-2-100	100	1-2821033-0	MSN2700-CS2F	QL41212	25	Pass
									QL41212	25	
									MCX4121A-ACAT	25	

Huawei SmartIO-NIC-2-100 to Mellanox MSN2700 Switch to
2 Ports Cavium QL41212HL and 2 Ports Mellanox MCX4121A





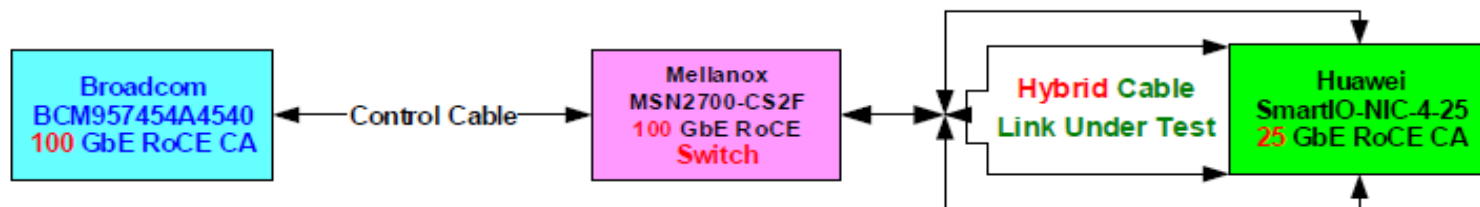
IBTA PF32 RoCE Interoperability

100 Gigabit Ethernet Interop 30



Company	Length Meters	AWG	Equalization	Connector Type	Broadcom RoCE Card #1	Link Speed	Cable Under Test	Mellanox Switch	Huawei RoCE Card #2	Link Speed	Interop Result
TE Connectivity	1	33	Copper - Unequalized	Hybrid - SFP-QSFP	BCM957454A4540	100	2821033-8	MSN2700-CS2F	SmartIO-NIC-4-25	25	Pass
									SmartIO-NIC-4-25	25	
									SmartIO-NIC-4-25	25	
TE Connectivity	2	30	Copper - Unequalized	Hybrid - SFP-QSFP	BCM957454A4540	100	1-2821033-0	MSN2700-CS2F	SmartIO-NIC-4-25	25	Pass
									SmartIO-NIC-4-25	25	
									SmartIO-NIC-4-25	25	

Broadcom BCM957454A4540 to Mellanox MSN2700 Switch to 4 Ports Huawei SmartIO-NIC-4-25



HPC-PM used to drive traffic when testing Hybrid Cables

