



40 and 100 Gigabit Ethernet Consortium Interoperability Test Report

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Enclosed are the results from the Optical Interoperability testing performed on:

Device Under Test (DUT): Mellanox SwitchX
IOL ID: 17070

The test suite referenced in this report is available at the UNH-IOL website:

ftp://ftp.iol.unh.edu/pub/10gec/10GEC_Optical_Interop_test_suite_v1.0.pdf

Issues Observed While Testing

No issues were observed during Interop testing.

For specific details regarding issues please see the corresponding test result.

Testing Completed 10/09/2012
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Result Key

The following table contains possible results and their meanings:

Result	Interpretation
PASS	The Device Under Test (DUT) was observed to exhibit conformant behavior.
PASS with Comments	The DUT was observed to exhibit conformant behavior however an additional explanation of the situation is included, such as due to time limitations only a portion of the testing was performed.
FAIL	The DUT was observed to exhibit non-conformant behavior.
Warning	The DUT was observed to exhibit behavior that is not recommended.
Informative	Results are for informative purposes only and are not judged on a pass or fail basis.
Refer to Comments	From the observations, a valid pass or fail could not be determined. An additional explanation of the situation is included.
Not Applicable	The DUT does not support the technology required to perform these tests.
Not Available	Due to testing station or time limitations, the tests could not be performed.
Borderline	The observed values of the specified parameters are valid at one extreme, and invalid at the other.
Not Tested	Not tested due to the time constraints of the test period.

Comments on Test Procedure:

In the case of a multiport device, testing is performed on the lowest numbered port that supports the requested technology. Please note that this port may not be an accurate representation of the remaining ports.

Test #1 Link Configuration

Case 1: This test entails powering on the DUT and the link partner separately and then connecting them together once they have booted up and have been configured. Traffic is then sent from one of the two devices and checked at the other end for correct reception. Additionally, the devices are disconnected and reconnected several times. Refer to the following tables for further information regarding the results of this test.

Case 2: This test entails power cycling both the link partner and the DUT with the devices connected during power up; however the DUT is brought to a fully operational state before turning the link partner on. Once the link partner has booted up, a link should be established between the two devices and traffic should be able to be transmitted between them. Refer to the following tables for further information regarding the results of this test.

Case 3: This test mimics Case 2 except that the link partner is turned on before the DUT. Refer to the following tables for further information regarding the results of this test.

Case 4: This test entails power cycling both the link partner and the DUT with the DUT's pluggable transceiver removed during power up. When the DUT and Link Partner are brought to a fully operational state, plug in the DUT's transceiver. Verify that a link has been established between the two devices and that traffic can be transmitted in both directions. Repeat this test with the Link Partner's transceiver if applicable. Refer to the following tables for further information regarding the results of this test.

Case 5: This test entails power cycling both the link partner and the DUT. When the DUT and Link Partner are brought to a fully operational state, confirm a valid link and transmit traffic in both directions. Remove the DUT's transceiver and then reinsert the transceiver shortly after. Verify that a link has been established between the two devices and that traffic can be transmitted in both directions. Repeat this test with the Link Partner's transceiver if applicable. Refer to the following tables for further information regarding the results of this test.

Test #2 Packet Error Ratio Estimation

The two devices are connected to each end of a 10km channel with a short fiber optic cable. A number of ICMP echo requests (Refer to the 10 Gigabit Ethernet Optical Interoperability Test Suite: Table 2) are sent to verify that traffic can successfully be sent between the link partners. The number of packets lost is noted. Refer to the following tables for further information regarding the results of this test.

Test #3 Endurance Stress Test

This test is designed to verify that no obvious buffer management problems occur when directing a large volume of traffic with minimum IPG at the DUT. This test is informative only and is designed to verify that the DUT has no obvious buffer management problems. The DUT is attached to a sourcing station that is capable of sending 1 billion 1518-byte ICMP echo requests at minimum IPG. The DUT does not have to respond to all of the requests but the test should not cause any system failures. Refer to the following tables for further information regarding the results of this test.

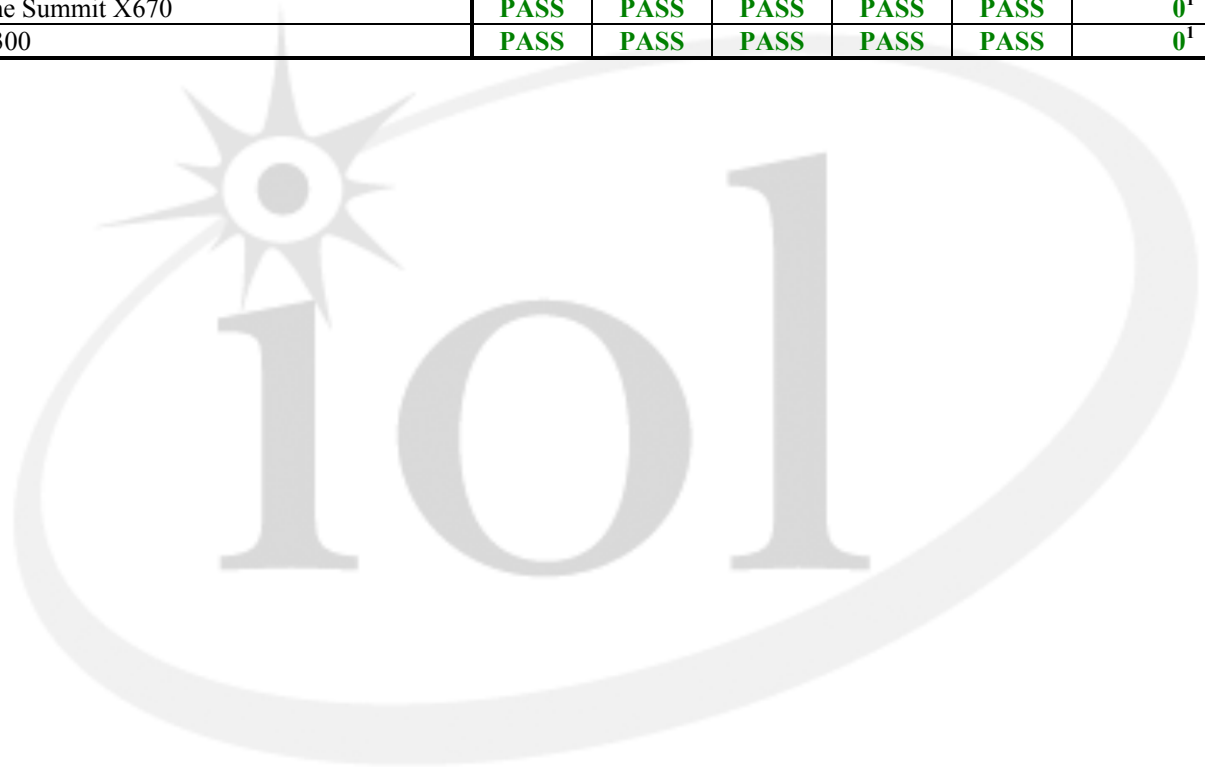
Test Matrix

The matrices are divided into sections according to the type of device being tested against. Each matrix contains four columns:

- The manufacturer and name of the device being tested against.
- Results of link speed detection testing.
- Results of the packet error ratio test over a 10km reference channel
- The optical power measured at the receiver of the DUT and link partner after the 10km reference channel.

Test Results

Switches/Routers Tested	Test 1 Link Configuration					Test 2: BER Est.
	Case 1	Case 2	Case 3	Case 4	Case 5	1518-byte
Broadcom BCM56840	PASS	PASS	PASS	PASS	PASS	0 ¹
Broadcom BCM8731	PASS	PASS	PASS	PASS	PASS	0 ¹
Extreme Black Diamond with 8900-40G6X 6-port QSFP+ Blade	PASS	PASS	PASS	PASS	PASS	0 ¹
Extreme Summit X670	PASS	PASS	PASS	PASS	PASS	0 ¹
F5 B4300	PASS	PASS	PASS	PASS	PASS	0 ¹



¹ To verify a BER of 1E-12 on 4 lanes with 95% confidence, 989 million packets were transmitted.

Test # and Label	Part(s)	Result(s)
Test 3 – Endurance Stress Test	a	Informative
Expected Results and Procedural Comments		
<p>The DUT is attached to a sourcing station that is capable of sending an appropriate number of 1518-byte ICMP echo requests with minimum IPG. The DUT does not have to respond to all of the requests but the test should not cause any system failures.</p>		
Comments on Test Results		
<p>While passing 1 billion 64-byte frames with a minimum IFG, the DUT did not show any system failures. The DUT responded appropriately to all 64-byte frames.</p>		
<p>While passing 1 billion 1518-byte frames with a minimum IFG, the DUT did not show any system failures. The DUT responded appropriately to all 1518-byte frames.</p>		



ANNEX A: TEST SETUP

Test Equipment

The following test equipment was used in performing all Interoperability testing:

Testing Equipment	Brand and Version Information
Traffic Generator	Ixia XM2 chassis with HSE40GEQSFP1-01 Load Module

Test Configuration

For the possible test configurations, refer to Figures 1-1 through 1-3 in the Interoperability Test Suite.

