OpenFabrics Alliance

Interoperability Working Group (OFA-IWG)

April 2007 Interoperability Event Report

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Report Rev1.1

Enclosed are the results from OFA Interoperability testing performed on the following devices under test (DUTs):

Voltaire IPStor (iSER Target)

The test suite referenced in this report is available at the OFA website, at test time release 1.10 (April 10, 2007) was used:

http://www.openfabrics.org/docs/InteropTestPlan.pdf http://www.iol.unh.edu/services/testing/ofa/testplan.pdf

Test Procedure	IWG Test Status	Result/Notes
IB Link Initialize	**Mandatory**	Passed – no issues seen
IB Fabric Initialization	**Mandatory**	Passed – no issues seen
IB IPoIB	**Mandatory**	Passed – no issues seen
TI iSER	Beta	Refer to Comments
IB SRP	**Mandatory**	Not applicable to DUT
TI SDP	**Mandatory**	Not applicable to DUT
IB SM Failover	Beta	Partially tested due to time constraints of test period
TI MPI - OSU	Beta	Not tested due to time constraints of test period
TI MPI - Intel	Beta	Not tested due to time constraints of test period
TI uDAPL	Beta	Not applicable to DUT
FibreChannel Gateway(IB)	Beta	Not available for test
Ethernet Gateway(IB)	Beta	Not available for test

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

Testing Completed 4/27/2007

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Review Completed 5/22/2007

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Report Revision History

v1.0 Initial Release

v1.1 Changed results to Refer to Comments

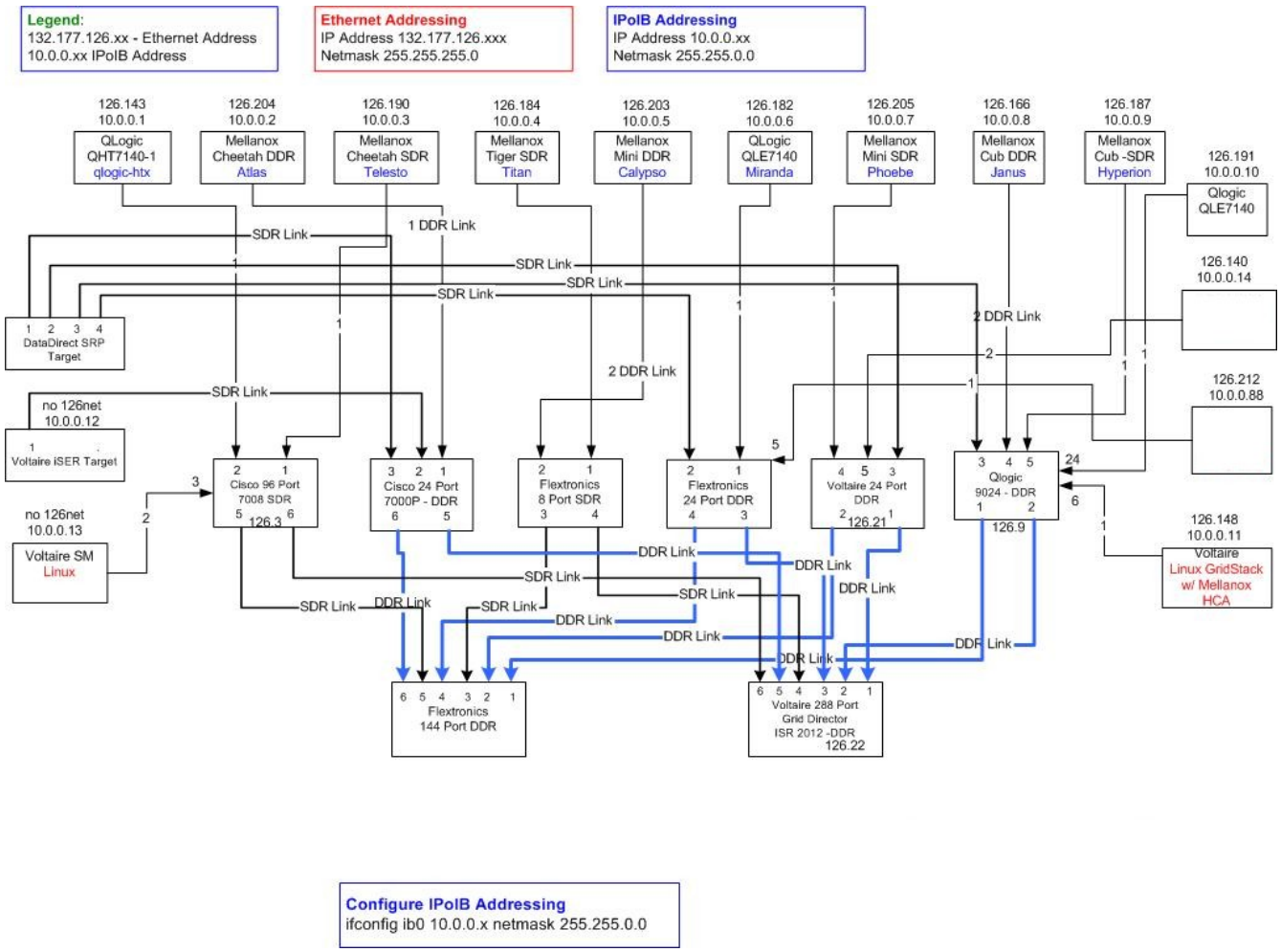
Table 1: Result Key

The following table contains possible results and their meanings:

Result:	Description:
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 this test.
Not Available	Due to testing station limitations 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.

Table 2: DUT and Test Setup Information

Figure 1: The IB fabric configuration utilized for any tests requiring a multi-switch configuration is shown below.



DUT #1 Details			
Manufacturer	Voltaire	Firmware Rev	5187
Model	IPSTOR	Hardware Rev	N/A
Speed	SDR	IP Address in Fabric	10.0.0.12
Additional Comments/Notes			
Voltaire IPStore (iSER Target)			

Mandatory Tests - IB Device Test Summary Results:

The following tables detail results for tests identified by the OFA-IWG as mandatory tests for the OFA Interoperability Logo Program (OFILP) per the OFA-IWG Interoperability Test Plan Release 1.10 (April 10, 2007)

Test Number and Name	Part(s)	Summary Note(s)	Result(s)
Group 1: IB Link Initialize	Test #1: Phy link up all ports	Link partners link as expected	PASS
	Test #2: Logical link up all ports switch SM	ibstatus reports active links	PASS
	Test #3: Logical link up all ports HCA SM	ibstatus reports active links	PASS
Discussion: Test #1: Phy link up all ports			
DDR cables were used for all link tests. Device LEDs validated visually. Link width and link speed validated via use of "ibdiagnet -lw 4x" and ibdiagnet -ls 10"			
Discussion: Test #2 & 3: Logical link up all ports switch SM / HCA SM			
The switch-under-test's SM, OFED's OpenSM, and the Voltaire SMHost (GVFM) SM were all used to validate that the link could be brought to the Active state as verified via the "ibstatus" command. All SMs were initially off as the switch was powered up. After checking for an initial physical link, the SM under test was started and the state of the link verified. Note, for HCA to HCA link checks, the nature of the direct cable connection prevented the validation of any SM but the OpenSM. Refer to the table below for specific link configurations tested.			

For Voltaire IPStor (iSER Target)	Switch SM	OpenSM	Voltaire SMHost (GVFM)
Cisco SFS 7000D 24-port DDR (Switch)	PASS	PASS	PASS
Cisco SFS 7008 96-port SDR (Switch)	PASS	PASS	PASS
Data Direct Networks S2A 9550 (SRP Target)	PASS	PASS	PASS
Flextronics 8 Modular SDR (Switch)	PASS	PASS	PASS
Flextronics 24 Modular DDR (Switch)	PASS	PASS	PASS
Flextronics 144 Modular DDR (Switch)	PASS	PASS	PASS
Mellanox MHEA28-1TC (HCA)	PASS	PASS	PASS
Mellanox MHEA28-XT (HCA)	PASS	PASS	PASS
Mellanox MHGA28-1TC (HCA)	PASS	PASS	PASS
Mellanox MHGA28-XTC (HCA)	PASS	PASS	PASS
Mellanox MHES14-XT (HCA)	PASS	PASS	PASS
Mellanox MHES18-XTC (HCA)	PASS	PASS	PASS
Mellanox MHGS18-XTC (HCA)	PASS	PASS	PASS
Qlogic SilverStorm 24-port DDR (Switch)	PASS	PASS	PASS
Qlogic QHT-7140 (HCA)	PASS	PASS	PASS
Qlogic QLE-7140 (HCA)	PASS	PASS	PASS
Voltaire Gridstack (HCA)	PASS	PASS	PASS

Test Number and Name	Part(s)	Summary Note(s)	Result(s)
Group 2: IB Fabric Initialization	Test #1: Verify all SMs configure fabric	Port is Active with all SMs	**PASS**
Discussion: Test #1: Verify all SMs configure fabric			
The fabric configuration shown in Figure 1 was used for this test. 'ibdiagnet -c 1000' showed no Port errors counters increment. Only one SM is run at a time. All switches are power cycled between SM trials. All links are validated via use of 'ibdiagnet' and on each host 'ibstatus' to validate speed, width and link state. Refer to the table below for SM details.			

For Voltaire IPStor (iSER Target)	All ports Armed/Active	No Dup GUIDs	No Port errors
Cisco SFS 7000D 24-port DDR (Switch)	**PASS**	**PASS**	**PASS**
Cisco SFS 7008 96-port SDR (Switch)	**PASS**	**PASS**	**PASS**
OFED 1.2 RC1 OpenSM	**PASS**	**PASS**	**PASS**
Qlogic SilverStorm 24-port DDR (Switch)	**PASS**	**PASS**	**PASS**
Voltaire ISR 9024D-M 24-port DDR (Switch)	**PASS**	**PASS**	**PASS**
Voltaire ISR 2012 288-port DDR (Switch)	**PASS**	**PASS**	**PASS**
Voltaire SMHost (GVFM) (HCA)	**PASS**	**PASS**	**PASS**

Test Number and Name	Part(s)	Summary Note(s)	Result(s)
Group 3: IPoIB	Test #1: Ping Test all to all	HCAs can ping all to all with all byte sizes	**PASS**
	Test #2: Connect disconnect host	Connectivity functions after topology change	**PASS**
	Test #3: File Transfer Procedure	4MB file SFTP transfers were validated	**PASS**
Discussion: Test #1: Ping all to all			
IP connectivity to all HCAs using each class of SMs was validated. SMs include Cisco SM, OpenSM, Qlogic SM, Voltaire SM (9024), and Voltaire SMHost (GVFM) SM. Note that to achieve ICMP echo requests (pings) with a packet size of 64, 256, 511, 512, 1024, 1025, 2044, 4096, 8192, 16384, 32768, 65507, ping -s # was utilized where # corresponds respectively in the following list: 36, 228, 483, 484, 996, 997, 2016, 4068, 8164, 16356, 32740, 65479			
Discussion: Test #2: Disconnect and Reconnect HCA			
Each class of SMs was tested (Cisco SM, OpenSM, Qlogic SM, Voltaire SM (9024), Voltaire SMHost (GVFM) SM). Refer to the default fabric configuration. All HCAs were connected except the MiniDDR HCA (10.0.0.5). All SMs were disabled, all switches were then power cycled. The SM under test was enabled, and all HCAs were confirmed to be reachable except for the station at 10.0.0.5. The QLE7140 HCA (10.0.0.6) was removed from the fabric. All HCAs were confirmed to be reachable except 5 and 6. The MiniDDR HCA (5) was then connected to the fabric. All HCAs are now reachable except 6. The Qlogic QLE7140 HCA is now connected to the Flextronics 8 port SDR switch (at port 7) rather than the Flextronics 24 port switch (at port 1). All HCAs are now reachable. Using host system 10.0.0.5, “ifconfig ib1 down” results in a loss of IP connectivity, “ifconfig ib1 up” results in a restoration of IP connectivity			
Discussion:. Test #3: File transfer procedure			
For expediency, SFTP was utilized as FTP servers were not configured at test time. File transfer was validated from the Tiger SDR host (10.0.0.4) to each other station by sending a 4MB file to the remote station and then copying it back and comparing the file. Tests were repeated 4 times. All file transfers completed successfully and the file was identical in all cases.			

Test Number and Name	Part(s)	Summary Note(s)	Result(s)
Group 5: IB SRP	Test #1-4	Not Applicable to DUT	**Not Applicable**
Discussion: Test #1-4			
The OFA Logo Program does not require these tests for an iSER Target under test.			

Test Number and Name	Part(s)	Summary Note(s)	Result(s)
Group 6: TI SDP	Test #1-3	Not Applicable to DUT	**Not Applicable**
Discussion: Test #1-4			
The OFA Logo Program does not require these tests for an iSER Target under test.			

Beta Tests - IB Device Test Results:

The following table details results for tests identified by the OFA-IWG as beta tests for the OFA Interoperability Logo Program (OFILP) per the OFA-IWG Interoperability Test Plan Release 1.10 (April 10, 2007)

Test Number and Name	Part(s)	Summary Note(s)	Result(s)
Group 4: TI iSER	Test #1-5	Multiple issues observed	**Refer to Comments**
Discussion: Test Results			
All iSER testing occurred between the Voltaire iSER target and the 9 HCA systems within the topology outlined in Figure 1. Though successful iSER dd exchanges were observed, of 9 systems tested, 1 system failed to list the iSER target device in the results of sg_map, 2 systems locked up during testing, and 1 system was observed to crash. The cause of these incidents is unknown, but was investigated throughout a day of testing at the interoperability event by attending vendor staff. Note, this testing was driven, with thanks, by attending vendor staff and not overseen by UNH-IOL. Retesting occurred the following week in an effort to provide additional details of the failure conditions. In the time available, two systems were re-investigated, one that had locked up, and one that had worked properly. In this retesting, inconsistent results from previous testing was observed, suggesting one of several issues: A) Test process error: The test procedure outlined in test plan v1.10 lacked sufficient detail to govern the test process, through the efforts of attending vendor staff, a more detailed process was developed during the week of testing; however, it is possible that some of this process was implemented in error. B) OFED 1.2 RC1 iSER support issues. C) Vendor device iSER issues (either target or initiator). There is insufficient observational evidence to support either of the last two items at this time, further testing and improvements to the test process are required to this Beta test process. Two sets of system output are included in the Appendix at the end of this report. The first is captured from a system that was previously observed to lockup during iSER testing. The second from a system that was not observed to experience any issue.			

Test Number and Name	Part(s)	Summary Note(s)	Result(s)
Group 5: IB SM Failover/Handover	Test #1-4	No issues observed	**Refer to Comments**
Discussion: Test Results			
Testing time prevented complete execution of all switch permutations. Modifications to the v1.10 test plan were developed during the testing event to further clarify the process, and additional clarifications are sought to better test true handover from on SM to another from the same vendor and allow for failover testing for SMs from different vendors. Due to these pending modifications, and the incomplete execution of the current test plan procedure, further testing is required for this Beta test process. Note – of the same-vendor SMs tested, no issue was observed for: ● standby SMs becoming master SMs in the event that the current master SM is removed, or ● the standby SM's priority is adjusted to a priority higher than the current master SM, or ● the standby SM's priority is adjusted to the same priority of the current master SM but the GUID of the standby SM is lower than the current master.			

Test Number and Name	Part(s)	Summary Note(s)	Result(s)
Group 8: TI MPI – Ohio State University	Test #1-14	Not tested due to lack of time	**Not Available**
Group 9: MPI – Intel MPI	Test #1-21	Not tested due to lack of time	**Not Available**
Discussion: Test Results			
Testing time prevented execution of these tests. Further automation and early execution of IB link and fabric initialization tests should allow for greater test time within the testing week of future events.			

Test Number and Name	Part(s)	Summary Note(s)	Result(s)
Group 10: TI uDAPLTEST Commands	Test #1-10	Not applicable to DUT	**Not Applicable**
Discussion: Test Results			
The OFA Logo Program does not require these tests for an iSER Target under test.			

Test Number and Name	Part(s)	Summary Note(s)	Result(s)
Group 12: Fibre Channel Gateway (IB)	Test #1-10	No supporting devices available	**Not Available**
Group 13: Ethernet Gateway (IB)	Test #1-7	No supporting devices available	**Not Available**
Discussion: Test Results			
These beta tests could not be performed as no such gateway devices were available during the testing period.			

Appendix A: Example Testing Scripts

Examples of some testing scripts employed during the testing period are embedded below for reference.

Appendix B: iSER Retest Output

Two sets of system output are embedded below for reference.

The first is captured from a system that was previously observed to lockup during iSER testing, upon retest this system was able to perform dd operations with user intervention (restarting iscsi).

The second capture is from a system that was not observed to experience any issue during initial testing, but was not observed to complete dd operations during retesting.

Retesting occurred several days after initial testing, however system changes should include nothing greater than a reboot.