



UNH-IOL Overview

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OpenFabrics
Software
User Group
Workshop

#OFSUserGroup

Overview

- Introduction
- IOL
- OpenFabrics
- Future



InterOperability
Laboratory

<https://www.iol.unh.edu/>

- 3rd-party test facility for data, telecom and storage networking technology & consumer electronics
- 100% funded by commercial industry
 - 150+ companies
- ~25 Full Time Staff, ~110 Students
- 32,000 sq. ft. lab – Boston, USA Metro Area
- 7,200 sq. ft. dedicated Plugfest space
- New Custom Built Facility opening in 2016

Member Involvement

(150+ Companies)



Our Model

- Focused, collaborative Conformance and Interoperability effort established/based at UNH-IOL
- Funded and guided by vendor community in a neutral, not-for-profit environment
 - Develops testing tools
 - Maintains knowledge center (online)
 - Coordinates interoperability demonstrations
 - Provides testing services
 - Can operate independently, or serve as “technical arm” for an industry body
- Offers 25 years of helping industry bring “interoperable” technology to market

Technology Testing Areas

- Broadband
 - DSL
 - Home Networking (TR-069 & IPv6 CE Router)
 - VDSL2 Vectoring
 - GPON
 - G.fast
- IP Networking
 - IPv6
 - Real-Time Communications
 - Routing/SDN
- Consumer/Home
 - DLNA/RVU
 - Wireless
- Switching/Timing
 - Avnu
 - IEEE 1588
 - Ethernet Switching Protocols
- Storage
 - Fibre Channel
 - iSCSI
 - NVMe
 - PCIe
- High Performance Computing
 - OpenFabrics
 - 40 & 100 Gigabit Ethernet
 - 10 G Ethernet
 - Ethernet Switching Protocols
- Mobile/Wireless
 - MIPI Camera
 - MIPI Display
 - MIPI Battery
 - MIPI M-PHY
 - Wireless
- Ethernet/Enterprise
 - Power over Ethernet
 - 40 & 100 Gigabit Ethernet
 - Backplane Ethernet
 - 10 Gigabit Ethernet
 - Automotive Ethernet
 - Gigabit Ethernet
 - Fast Ethernet
 - 10BASE-T Testing
 - Cable/Channel Testing

Automated Test Tools IOL Developed



- Ethernet Physical Layer (100 mb/s – 40/100 Gb/s)
 - PoE Cert
 - HW (FPGA)/SW
- IMTC Test Tool (IMTC Certification Program)
- INTERACT Software (NVMe Integrator's List)
- IOL INTACT Software (IPv6 Forum IPv6 Ready Logo, USGv6 Test Program)
- MIPI Test Boards (MIPI Alliance)
- VIOLETT (AVnu Alliance Certification)
- TR-069 Scripts, QA Café Partnership (BBF.069 Certification Program)

OpenFabrics



- OpenFabrics Interoperability Logo Group (OFILG)
 - Members participate in test events validating OpenFabrics Software (OFS)
- OpenFabrics Cluster
 - Hosted at IOL – Durham, NH
 - Remote Access to Members
 - IB, iWARP, RoCE, Automated Install, Testing

Interoperability Logo List

- [OFILG Interoperability Logo List - May 2014](#)

OpenFabrics Alliance Interoperability
Working Group (OFA-IWG)

OFED Version Tested: 3.12

Introduction

This Logo List contains products which were found to pass all Mandatory testing required for the OFILG Logo. The reports listed on this page have been approved for publication by their respective member company.



Contents

- InfiniBand Host Channel Adapters
- Ethernet RNICs
- RoCE Channel Adapters
- InfiniBand Switches With Managers
- InfiniBand Switches Without Managers
- SRP Targets
- OFILG Cluster Contributors

OFILG Cluster

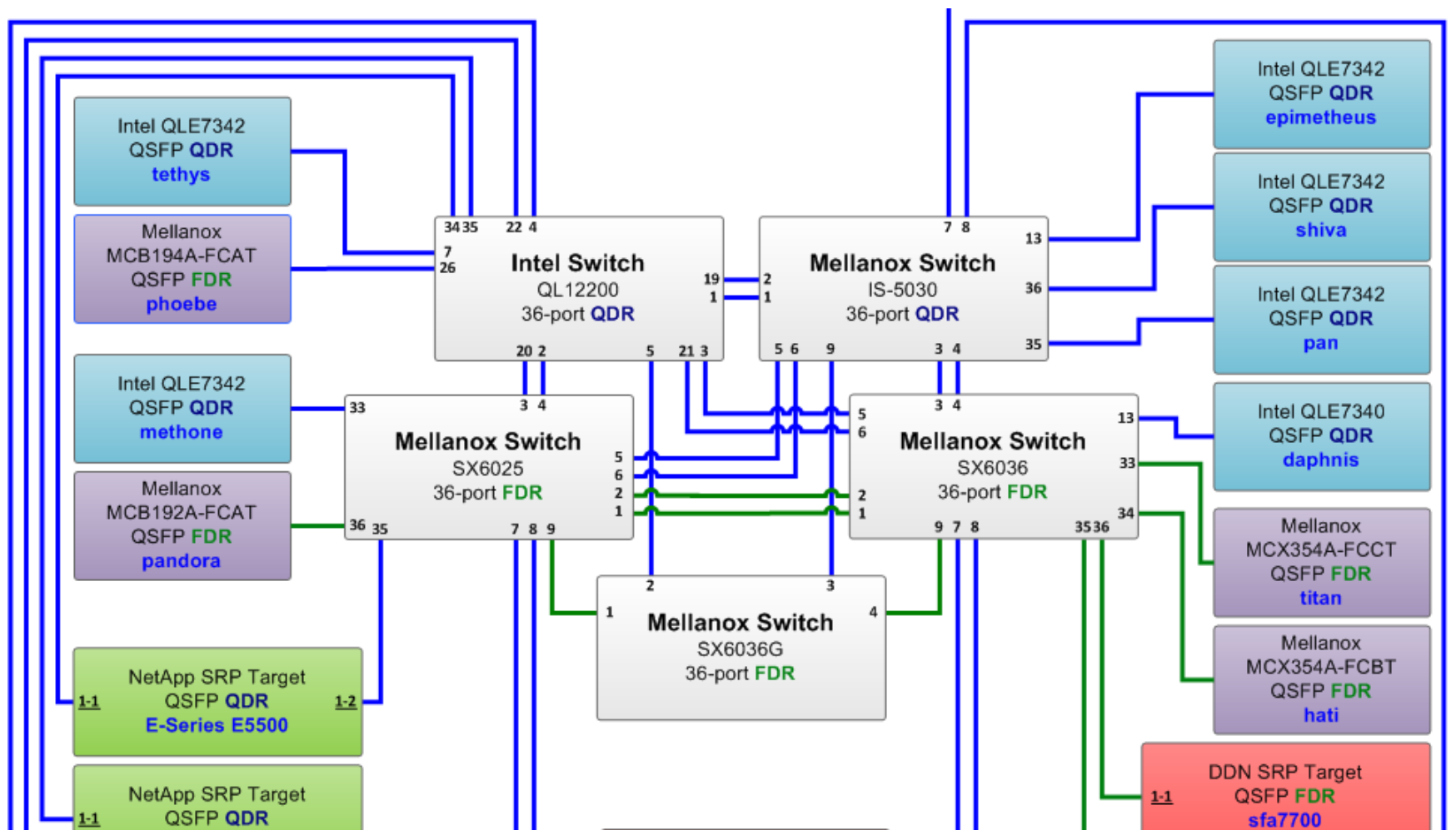


- OpenFabrics Cluster hosted at IOL – Durham, NH
 - 7 racks of equipment hosted at UNH-IOL
 - 56 heterogeneous nodes
 - 11 Switches
 - 5 SRP Targets
- Servers: AMD Opteron, IBM PPC64, Intel x86_64
- InfiniBand: Intel, Mellanox
- iWARP: Intel, Chelsio
- RoCE: Emulex, IBM, Mellanox
- SRP Targets: DataDirect Networks, NetApp
- OFED: 1.5.x, 3.5.x, 3.12, 3.12-1, 3.18
- PXE Boot: CentOS, RHEL, SLES, Ubuntu
- Scripted and Automated
- Remote VPN Access

Upcoming Events

- Event Dates
 - IBTA PF 27
 - 13-April => 24-April
 - 12-October => 23-Oct
 - OFA Interop Debug Event (Followed by Logo)
 - 20-April => 24-April
 - 19-Oct => 23-Oct
- April OFA Debug
 - OFED 3.18 or 3.20
 - ULP - iSER, NFSoRDMA

Test Topology - InfiniBand

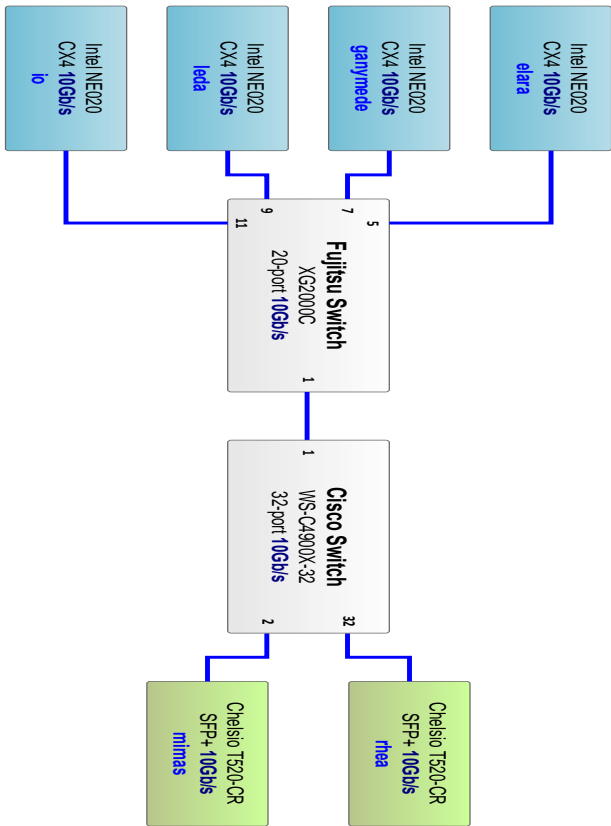


Topology - iWARP

October 2014
iWARP Topology

Ethernet Addressing
<hostname>-d1a

iWarp Addressing
<hostname>-iW/d1a

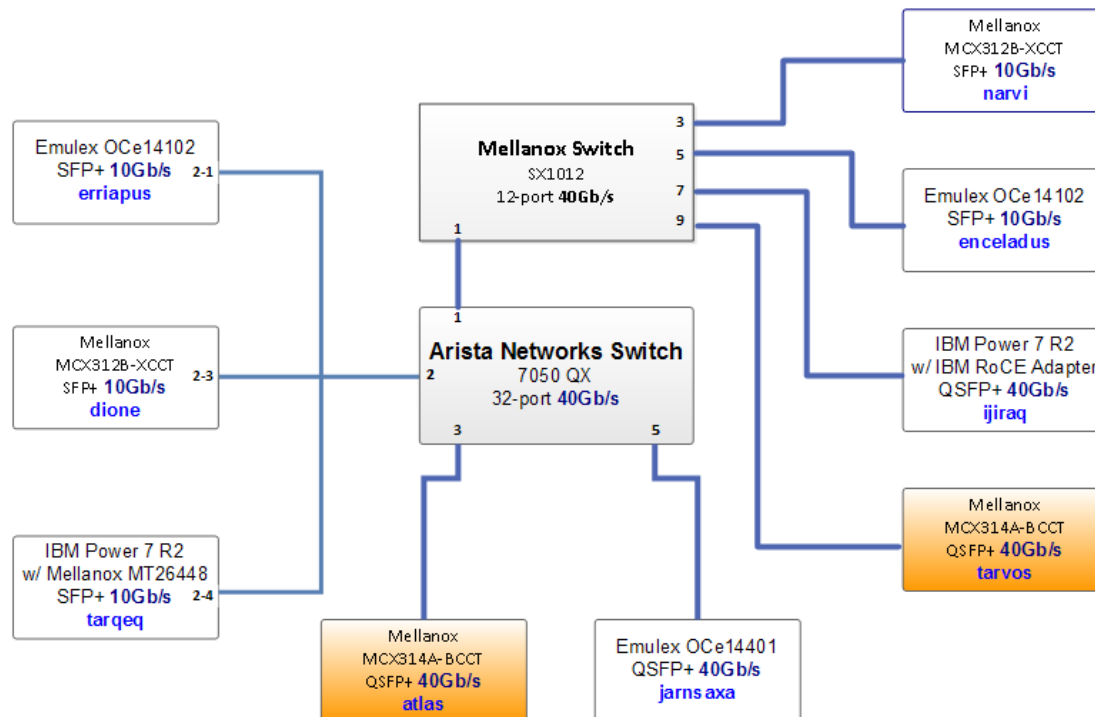


Topology - RoCE

October 2014
RoCE Topology

Ethernet Addressing
<hostname>.ofa

RoCE Addressing
<hostname>-ce.ofa



Required Tests - InfiniBand

InfiniBand Transport - Test Status for April 2015 Interop Event	
Test Procedures	Linux
IB Link Initialize	Mandatory
IB Fabric Initialization	Mandatory
IB IPoIB Connected Mode	Mandatory
IB IPoIB Datagram Mode	Mandatory
IB SM Failover/Handover - OpenSM	Mandatory
IB SM Failover/Handover - Vendor SM	Optional
IB SRP	Mandatory
IB Ethernet Gateway	Beta
IB Fibre Channel Gateway	Beta
Transport Independent Tests	Linux
TI iSER	Beta
TI NFS over RDMA	Mandatory
TI Rsockets	Mandatory
TI uDAPL	Mandatory
TI RDMA Basic Interop	Mandatory
TI RDMA Stress Test	Mandatory
TI MPI - Open MPI	Mandatory

Required Tests - iWARP

iWARP Transport - Test Status for April 2015 Interop Event	
Test Procedures	Linux
iWARP Link Initialize	Mandatory
Transport Independent Tests	Linux
TI iSER	Beta
TI NFS over RDMA	Beta
TI uDAPL	Mandatory
TI RDMA Basic Interop	Mandatory
TI RDMA Stress Test	Mandatory
TI MPI - Open MPI	Mandatory

Required Tests - RoCE

RoCE Transport - Test Status for April 2015 Interop Event	
Test Procedures	Linux
RoCE Link Initialize	Mandatory
RoCE Fabric Initialization	TBD
RoCE IPoCE	Mandatory
RoCE InfiniBand Gateway	TBD
RoCE Fibre Channel Gateway	TBD
Transport Independent Tests	Linux
TI Rsockets	Mandatory
TI iSER	Beta
TI NFS over RDMA	Beta
TI uDAPL	Mandatory
TI RDMA Basic Interop	Mandatory
TI RDMA Stress Test	Beta
TI MPI - Open MPI	Mandatory

RDMA Research

- Implementation and Comparison of iSCSI Over RDMA
 - iSCSI Extensions for RDMA (iSER)
- Implementation of an RDMA Verbs Driver for GRIDFTP
- UNH Extended Sockets Library (UNH-EXS)
 - Implementation of Extended Sockets-API (OpenGroup)

Looking Ahead

- RoCE Bridge
- RoCEv2
- EDR
- Virtualization
- OS Involvement
- Speed/Performance
- NVMe
- IPv6 – IPoIB, IPoCE, iWARPoIPv6
- OFA Interfaces WG Collaboration
- Conformance

Growing the Relationship

- What UNH-IOL can offer:
 - Guidance on testing programs based on 25 years of best practices
 - Standards feedback from a testing perspective
 - (IEEE, IETF, ITU Experience)
 - Develop customized test tools
 - Training opportunities
 - Vendor Testing with detailed reports
- What can we help with?



Thank You



OpenFabrics Software
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