INTEL OMNI-PATH® FABRIC OPEN SOURCE OVERVIEW

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INTEL OMNI-PATH ® ARCHITECTURE

Introduction

Highly Leverages existing Aries and Intel® True Scale technologies

Open Source software and supports standards like the OpenFabrics Alliance*

Innovative Features for high fabric performance, resiliency, and QoS

Robust Ecosystem of trusted computing partners and providers
Open Sourcing software is not just throwing code on GitHub

- Phase 1 – Project
  - Define the project
  - Build the contribution base
- Phase 2 – Product
  - Definition and packaging
  - Identify customer pain points
  - Work to enhance the project
- Phase 3 – Proliferation
  - Established presence
  - Community development

What does the community want?
How can we collaborate with members?
INTEL OMNI-PATH® ARCHITECTURE
OPEN SOURCE APPROACH

- **Leverage:** OpenFabrics Alliance Infrastructure
  - Off-the-shelf application compatibility
  - Extensive set of upper layer protocols
  - Integrate scalable PSM for HPC

- **Access:** Open Source Key Elements
  - Push new software to kernel.org
  - Push Intel® Omni-Path management elements to github

- **Channels:** Integrate into Linux Distributions
  - Work with Red Hat and SuSE
OPEN SOURCE IMPLEMENTATION

OPA Software → Kernel.org → linux-firmware

OpenFabrics Alliance Workshop 2016
**Fabric Management**

- Traditional SM responsibilities
- Extended TrueScale

**SM, SA, PM, PA, FE**

[https://github.com/01org/opa-fm](https://github.com/01org/opa-fm)
- **User space tools**
  - Fabric bring up
  - Fabric debug
- **RPM Packages for...**
  - Management node
  - Compute node
  - Address resolution
  - MPI benchmarks

- [https://github.com/01org/opa-ff](https://github.com/01org/opa-ff)
- [https://github.com/01org/opa-mpi-apps](https://github.com/01org/opa-mpi-apps)
Three RPMs built from this package

Basic Tools RPM
- sma and pma query tools

Fast Fabric RPM
- opatop
- opareport

Address resolution
- Plugin for ibacm
- Library to share path records with PSM

MPI APPs
- Benchmarks and fabric verification
- PSM library for OPA
- High performance MPI data path
- Supports many ranks

https://github.com/01org/opa-psm2
- libibverbs plugin
- Enables our verbs interface
- Requires no changes to libibverbs

- [https://github.com/01org/opa-libhfi1verbs](https://github.com/01org/opa-libhfi1verbs)
- FM GUI
- Java based application
- Supports Fabric Monitoring
- Interfaces the Fabric Manager via the FE
- Provide Windows and Linux packages

https://github.com/01org/opa-fmgui
OpenMPI
- Pushed changes for PSM2 support
- Accepted
- Fully supported in 1.10.2 release

Libibumad
- Added support for user space RMPP

Mvapich2
- PSM2 support found in the 2.2rc1 release track.

openshmem / GASNet
- Pushed changes to support PSM2
- Found in GASNet 1.26.0 release

ibacm
- Worked to get a plugin architecture
- Currently have a plugin as part of FF tools
- Added kernel netlink support
**INTEL OMNI-PATH ® ARCHITECTURE**

**Kernel Elements**

- **linux-firmware**
  - Four pieces of firmware

- **RDMA Core Kernel Patches**
  - Fully accepted 2K MAD changes in 4.2 kernel
  - Enhancements to IPoIB for scalability
  - Added netlink interface to ibacm
  - Allows ULPs to access the path record cache
  - Accepted in the 4.3 kernel
  - Added rdmavt, common software before

- **HFI1 Driver**
  - Currently in staging
  - Patches accepted in 4.6 kernel
INTEL OMNI-PATH ® ARCHITECTURE
HOSTED REPOSITORIES

- Current Locations for Intel Omni-Path ® Architecture software

- FM and Tools centric
  - https://github.com/01org/opa-fm
  - https://github.com/01org/opa-ff
  - https://github.com/01org/opa-mpi-apps

- PSM2 library
  - https://github.com/01org/opa-psm2

- Verbs plugin
  - https://github.com/01org/opa-libhfi1verbs

- Fabric Manager GUI
  - https://github.com/01org/opa-fmgui
INTEL OMNI-PATH ® ARCHITECTURE
MAIL LIST

- Collaborate with the OPA project via the following mail list
  - intel-opa@lists.01.org

- Sign up at the following link
  - https://lists.01.org/mailman/listinfo/intel-opa

- Kernel changes use the linux-rdma mail list
  - linux-rdma@vger.kernel.org
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