Transport SDN @ OIF

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What is the OIF?

• Since 1998 OIF has brought together industry groups from the data and optical worlds

• Mission: To foster the development and deployment of interoperable products and services for data switching and routing using optical networking technologies

• Our 100+ member companies represent the entire industry ecosystem:
  • Carriers and network users
  • Component and systems vendors
  • Testing and software companies

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How OIF is organized

- Board of Directors
  - Carrier WG
  - Networking & Operations WG
  - Physical & Link Layer WG
  - Interop WG
- Technical Committee
  - Implementation Agreements
  - Interop Demonstrations
  - Implementation Agreements

*PLUG: Physical Layer User Group

OIF: Optical Internetworking Forum
• **Requirements on Transport Networks in SDN**
  - **Architectures - Transport SDN**
  - Document is based on contributions of major carriers worldwide
  - Comprises requirements on Transport SDN
    - Orchestrator (transport network relevant part)
    - Control and management planes
    - Data plane
  - Being used as guidance within OIF but also communicated to other SDO and forums
SDN Reference Architecture
Components of Transport SDN

Service

Orchestrator

Application Plane

Mgt- & Control-Plane

Transport Network

Data Plane

SDN northbound: OGF NSI, ...

Mgt

TN Controller

SDN southbound: OF, XML, SNMP, PCEP, ...
(could be NE-internal)

Data Center

Transport

Data Plane

OIF OPTICAL INTERNETWORKING FORUM
General Requirements

- Requirements are not aimed at a particular set of protocols, HW and SW implementations
  - Packet & circuit switching
  - Centralized & distributed control instances
  - Allow multiple protocols
  - Modular SW and HW (COTS)
  - Decoupling of network layers
- Guarantee interoperability among different vendor implementations, carrier network domains, data center functions, ...
  - Well defined interfaces for an increased level of interoperability
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OF, MTOSI, REST, ...

Transport
Requirements on Orchestrator

- The Orchestrator is responsible for the coordination and management of SDN services
- The Orchestrator
  - Coordinates data center and transport network actions
  - Requests transport network service primitives from the control and management plane
  - Represents the transport network to the Application Plane using virtualization and abstraction
- The Orchestrator needs to provide structured, extensible, flexible, well defined interfaces
  - To the application plane (northbound API)
  - To the TN control and MP (southbound)
  - To the DC control and Mgt. systems (southbound)
  - Between SDN controllers (hierarchical/federated)
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Management & Control Plane

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The Vision - Seamless Interworking

- On-demand services are provisioned, based on ASON/GMPLS control plane functions
  - Multi-domain
  - Multi-layer
  - Multi-technology
- OIF control plane follows ASON multi-domain architecture and allows UNI, E-NNI protocol separate from domain operation
- Interworking with SDN domains is ensured

Domains can use Network Management, SDN or distributed control plane internally

Domains can use different technologies internally
Summary

- **SDN has great promise to improve transport control**
  - Programmability
    - Ability to deliver new behaviors not (yet) considered by standards, vendors, …
  - Simplified multi-layer control
  - Common behavior in heterogeneous NE deployments
  - Application awareness

- **OIF is providing guidance to accelerate deployment**
  - Use cases and architecture
  - Carrier requirements
  - Framework document
  - Demonstrations
Thank you for your kind attention!

Carrier Requirements Document

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