OIF @ Transport SDN

Hans-Martin Foisel
OIF Carrier WG Chair
Deutsche Telekom

GLOBECOM 2014
Austin, TX, USA
December 10, 2014
The Optical Internetworking Forum:

- Represents an end-to-end ecosystem membership base...
- Focused on multi-layer and multi-domain transport interoperability...
- Positioned at the industry crossroads...
- Optimized for IA development and interop testing...
- Fills gaps, removes obstacles...
- Accelerates market adoption and ROI for new technologies...
- Improves network efficiency, lowers Opex/Capex for network operators...
- Unlike any other forum or SDO
Why Does Transport Need SDN?

- Optical and transport networks continue to be difficult and expensive to manage
  - Many manual processes
  - Very long provisioning times
- SDN and virtualization have the promise of
  - Simplifying optical transport network control,
  - Adding management flexibility
  - Allowing the rapid development of new service offerings by enabling programmable control of optical transport networks
- Aiming at reducing the cost of optical switches by moving control and management
  - from embedded processors
  - to general-purpose COTS hardware and virtualized, programmable software
Goal: Seamless Interworking

- On-demand services are provisioned using ASON control functions
  - Multi-domain
  - Multi-layer
  - Multi-technology

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

Domains can use different technologies internally
Challenges

- Operational simplicity
  - On-board new clients rapidly
- Differentiated service delivery
  - Automate resource allocation on the fly
- Scalability
  - Support X transactions per hour
- Security
  - Service isolation and authentication per client
- Continuous Availability
  - Disaster avoidance / recovery
- Current transport business model

Programmability and Application Awareness
OIF Role and Expectations

- SDN Reference Architecture
- Carrier SDN Requirements
- Meaningful demo and testing in carrier environment showing
  - Status of technology
  - Interfaces and interoperability
  - Operation tools needed
  - Pertinent use cases
SDN Reference Architecture
Components of Transport SDN

SDN northbound:
OGF NSI, ...

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

Application Plane

Mgt- & Control-Plane

Transport Network

Data Plane

Orchestrator

Service

Service

Service

DC Mgt/Controller

Mgt

TN Controller

Transport

Data Center
Carrier Requirements on Transport Networks in SDN Architectures

- 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’s and forums
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
OIF/ONF Global Transport SDN Demo

- **Goal** - accelerate the deployment of practical, programmable transport networks that enable a new era of dynamic services

- **Test prototype transport SDN technologies in real-world applications**

- **Application:** Cloud bursting over optical networks

- **Features:**
  - Subset of OTWG OpenFlow Extensions (ONF lead)
    - CDPI and CVNI
    - Experimental encoding of extensions
  - Northbound Interface Protocols - Service Request and Topology network APIs (OIF lead)
  - Multi-domain controller hierarchy (OIF lead)
2014 Global Transport SDN Demonstration

Joint activity of OIF and ONF on “Cloud Bursting”

- Demonstrate current state of SDN in Transport industry
  - REST APIs
  - OpenFlow
- Participants from both OIF and ONF
  - **OIF:** ADVA, Alcatel-Lucent, China Telecom, Ciena, Coriant, DT, FiberHome, Fujitsu, Huawei, KDDI, NEC, Orange, Telus, Verizon, ZTE
  - **ONF:** ADVA, Alcatel-Lucent, CATR, China Mobile, China Telecom, Ciena, Coriant, DT, FiberHome, Fujitsu, Huawei, KDDI, NEC, Telus, Verizon, ZTE
2014 Global Transport SDN Demonstration
2014 Global Transport SDN Demonstration
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 behaviors in heterogeneous NE deployments
  • Application awareness

• **OIF is providing guidance to accelerate deployment**
  • Use cases and architecture
  • Carrier requirements
  • Framework document
  • Demonstrations
Thank You!

www.oiforum.com