Standards Activities
Supporting Transport SDN

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Many Standards Bodies Active

Different Areas of Focus
“Godfather of SDN”

- Home of OpenFlow protocol
  - Dataplane/Control Plane separation
- Historically Packet Focused (OF1.0, 1.1, 1.3)

Many Transport SDN related projects active

- “Optical” Extensions for OpenFlow
- Common Architecture
  - Hierarchical SDN Controllers
- Core Information Model
  - Common data model
Specialized Forum for Optical Transport

- Dataplane (100G, CEI25)
- Control Plane (OIF UNI, OIF E-NNI)

SDN activities underway

- SDN Carrier Requirements
- SDN Framework document
  - Controller API discussion
- OIF/ONF Joint Prototype Demonstration
Carrier Requirements

- Requirements on Transport Networks in SDN Architectures
  - 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
ONF & OIF Team Up on Transport SDN Prototype Demo

**What and Who:**
- Joint prototype testing and marketing activity
- Organized by OIF Interop WG and ONF Optical Transport WG
- 5 Carriers including CATR, China Mobile, China Telecom, Telus, Verizon
- 9 Vendors: ADVA, Alcatel-Lucent, Ciena, Coriant, FiberHome, Fujitsu, Huawei, NEC, ZTE

**Why:**
- Assure seamless evolution of transport networks in an SDN architecture
- Assure seamless operation of heterogeneous networks in an SDN architecture
- Leverage strengths of ONF and OIF:
  - ONF OpenFlow/SDN specifications, with optical extensions and use cases
  - OIF carrier and optical expertise, worldwide interop testing experience

**When, Where, How:**
- March-April: Technical spec development, contracts and NDAs
- August-September: Carrier-hosted lab testing
- October: Demo events culminating in read-out at L123 SDN WC Dusseldorf
Three separate but related activities

- **Cloud - SG 13: Q17, Q18, Q19**
  - Network to support cloud computing

- **Packet - SG 13: Q3, Q6, Q11, Q14**
  - QoS, Service Awareness

- **Transport - SG 15: Q12**
  - Applicability of ASON Architecture
  - Modeling of Compute, Storage and Network
Q 12/15: Trinitarian Architecture

Past: Networks composed of switches and links

Now: Networks composed of
  • Processing (Switching or Computing)
  • Storage
  • Communicating (Links)

Architecture facilitates understanding of NFV
Three parallel activities

- I2RS
- ALTO
- ABNO
Interface to the Routing System

- Retrieve internal information from routing protocols
  - Topology
  - State

- Inject policy
  - Route preferences
**Service request interface**

**Query service/network condition**

- Make distribution decisions
- Parameters (Cost, SLA)
- Scenarios are time dependent
ABNO Architecture

Leverages PCE for service awareness/control
Utilizes GMPLS for service provisioning

Figure 1: Generic ABNO Architecture
Phase 1: (2012-2014)
- Requirements and Architecture Focused
  - Specified
- Not specifically Transport or Packet focused

Phase 2: (2014- )
- Implementation focused
  - Open source projects
  - APIs
- Initial focus is packet network VNFs
NFV Architecture
Application of NFV to Optical Transport

Common NE Functions
- “One-size fits all” package

NFV puts function into containers
- Enable/Disable
- Location independent
  - Move off-board

VNF enabled NE can introduce new functions
- Firewall

VNFs are interconnected to deliver services
- “Service Chaining”
- Requires orchestration
Summary

Transport SDN fundamentally changes the operation of the network

Standards are needed to ensure interoperability, efficient ecosystem

Many standards bodies are active in Transport SDN

- Compute aspects
- Packet network
- Transport network
Thank you for your kind attention!

SDN Carrier Requirements Document
www.oiforum.com