ForCES-based I2RS for E2E Control/Maintenance of MPLS

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Outline

• Background

• I2RS Framework

• Applicability of ForCES Framework

• Using ForCES in I2RS Framework

• Next Step, Q&A, and Discussion

• THANKS!
Background

• Can we use ForCES (http://datatracker.ietf.org/wg/forces/charter/) based Interface to Routing System (I2RS) for controlling/maintaining End-to-End MPLS session
  – End-points of MPLS session
  – Mid-points of MPLS session
  – Core-points of MPLS session

• Where do we place the ForCES Agents?

• What types of ForCES Apps may be necessary?

• What other types of Interfaces may be involved?

• Can ForCES CE be an integral part of the traditional SDN controller/orchestrator for ETE MPLS-based session/circuit management
I2RS Framework

- Application
- Server
  - I2RS Client
- Router
  - I2RS Agent
  - RIBs and RIB Manager
  - Policy DB
  - FIB
  - Topology DB
  - Routing and Signaling Protocols
- OAM, Events and Measurement
- I2RS Protocol & Data Encoding

I2RS Framework Diagram
Applicability of ForCES Framework

• Apps must support dynamic and fine-grained control/management of label and label-based paths
  – ForCES Apps can be utilized for this purpose

• Control/Orchestration must support the desired Security, Policy, QoS, Inspection/Analytics, Routing and Topology/Configuration Management
  – ForCES CE Agent with NBI to Apps and SBI to FE Agent can serve these purposes
Using ForCES in I2RS Framework

Diagram showing the interaction between various components such as Application, Server, App Interface, ForCES APP, ForCES Protocol & Data Encoding, Router, OAM, Events and Measurement, Policy Manager, RIB Manager, Topology Manager, Routing and Signaling Protocols, Data Plane, FIB, FE Agent, and LSR.
Next Steps

• Work on Developing a draft
  • Welcome Contributions/Participations from others

• Comments/Suggestions
Q&A, and Discussion

THANKS!
Misc. Additional Information

based on http://www.ietf.org/id/draft-hu-i2rs-overlay-use-case-02.txt
Application and Orchestration

• Applications can adapt based on
  – Loading and Recovery status
  – Pre- and post-condition(s)
  – Any other Requirements ?!

• Orchestration
  – Multiple CE/VCE scenarios
  – Handling of Bursts and/or Multiple Conflicting Requests from the Apps/Services
    • For example, using CLI based Apps at the Controller
Overlay Structure
ER1 and ER2 need to establish SA (security Association) with instructions from the Controller (CE Agent resides in the Controller) and adopt IPSec as the security mechanism for the transport channel.
Network Virtualization

Diagram showing network components and virtualization relationships.
CE/FE/LFB Life Cycle Management

Allocate (from the Pool of healthy Ones)

Activate/Commission

Monitor (for SLA) & Replace (if needed)

Return to the Pool of healthy Ones

Sanitize & Test (Fix, if needed)

Release (After allotted time has elapsed)