

TeraFlow

Utilizing Optical Network Slicing to Connect
Clouds for Autonomic 5G and Beyond
Services

Deploying and Integrating Automated Optical Network Slicing

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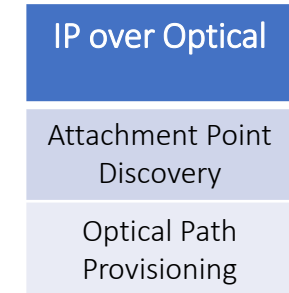
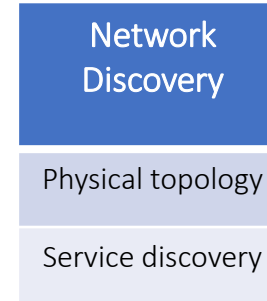
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Operator need for optical automation and programming



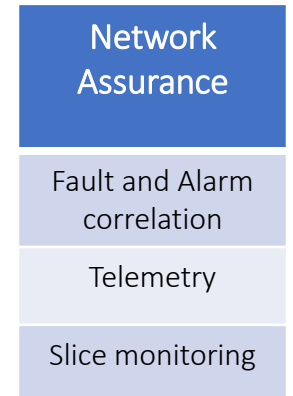
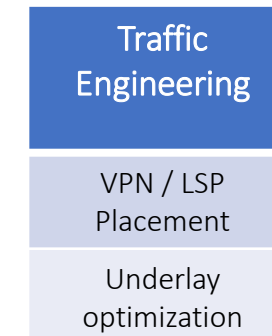
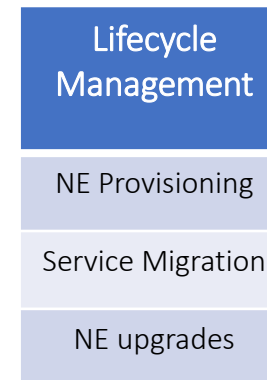
• Question 1. Why automate and program our networks?

- Simplify network operations
- Facilitate integration with OSS/BSS
- Provide new services & Increase revenue
- Make our service better and Reduce churn and protect revenue?
- Optimize and maximize network assets
- Faster time to market



• Question 2. How to automate?

- We must consider the implementation, what can we do better and faster, and with less manual/human resources
- Not only allow to automate common tasks, but also program the network, like software.

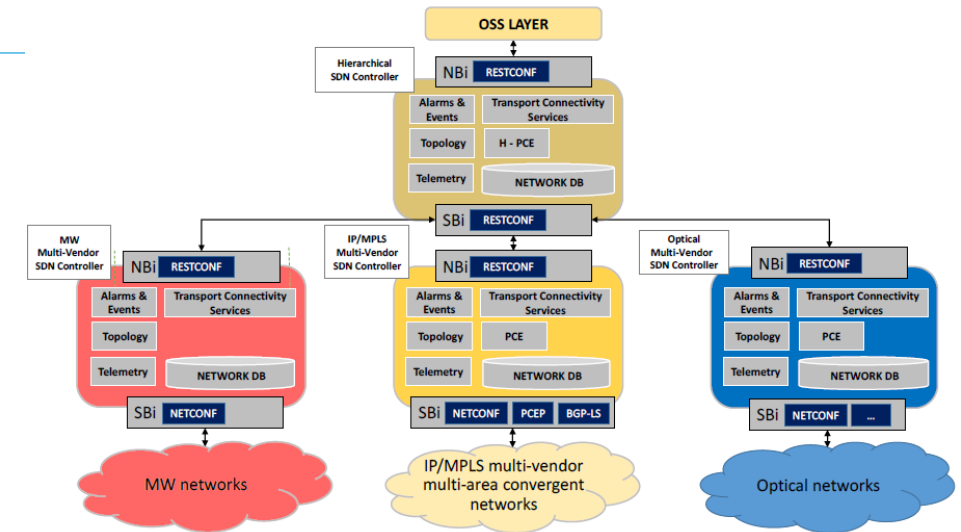


• Question 3. Can we minimize risk?

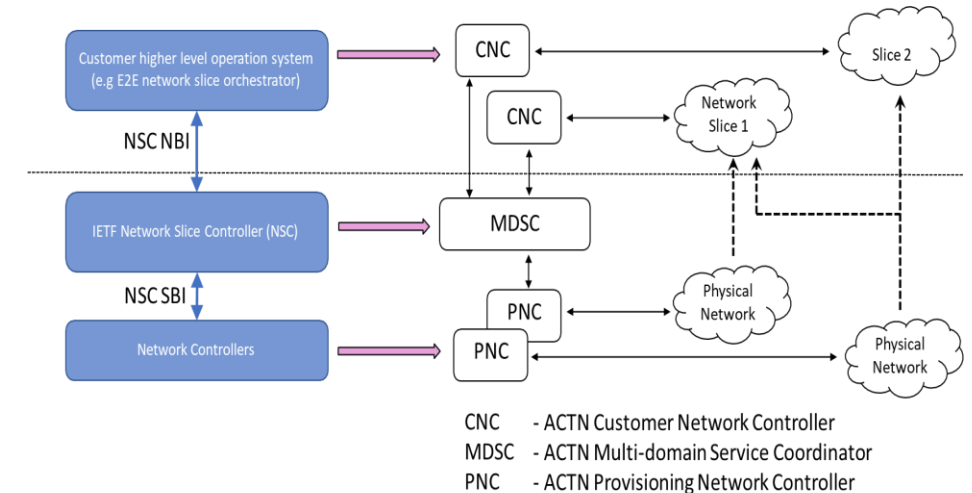
- It is critical we select programmable tools that provide flexibility, in case we need to change the direction and depth of specific technology deployment

Building the optical underlay

- Hierarchical SDN Architecture widely adopted by Industry
 - TIP Open Transport SDN architecture
 - IETF Abstraction and Control of TE Networks (ACTN)
 - Defined in RFC 8453
 - A management architecture and YANG models for building Virtual Network services
- ONF Transport API to NBI of optical networks
 - Topology Service
 - Connectivity Service
 - Path Computation Service
 - Virtual network Service
 - Notification Framework
 - Optical Transport (OTN, DWDM)
- Optical Integration
 - Accessing Cloud via Optical Network Problem Statement
 - draft-liu-rtgwg-optical2cloud-problem-statement
 - Framework and Data Model for OTN Network Slicing
 - draft-zheng-ccamp-yang-otn-slicing
 - Applicability of Abstraction and Control of Traffic Engineered Networks (ACTN) to Packet Optical Integration (POI)
 - draft-ietf-teas-actn-poi-applicability

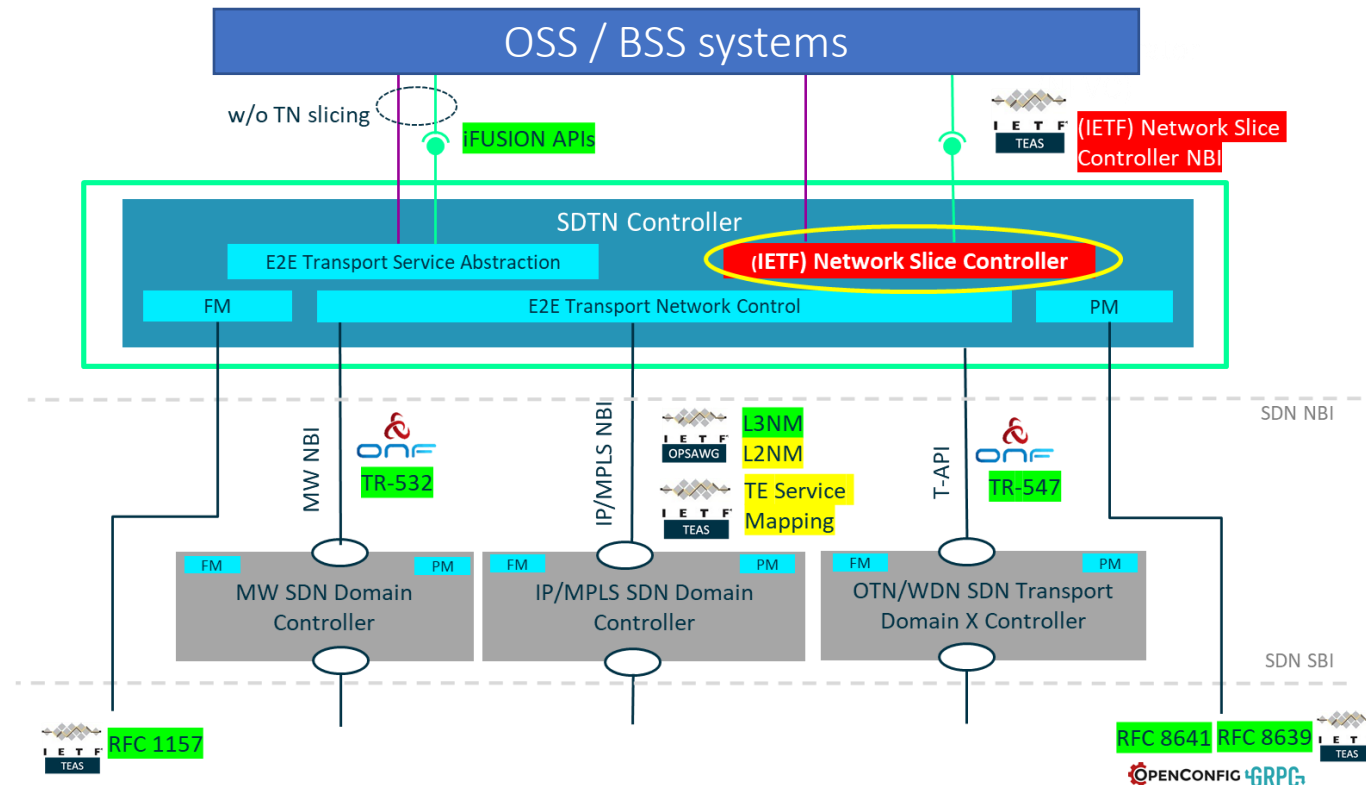


Telecom Infra project Open Transport SDN architecture



Slicing: Ongoing Challenges for operators

- Complete the **deployment** the SDN domain controllers
- **Network Slicing**: ongoing debate in the industry. Yang models / APIs still in definition.
- Hierarchical controller including the Slice controller are the pieces to tight all layers together.



Telefonica Architecture to deploy automation