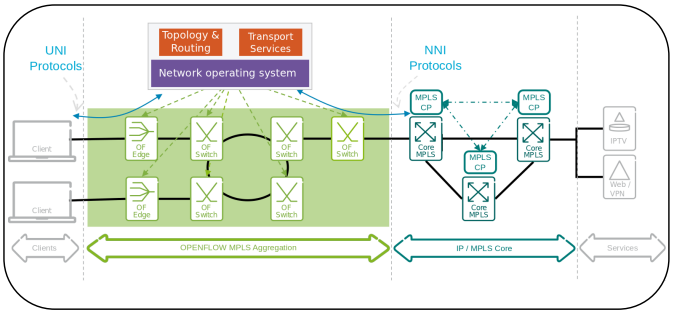
Carrier-Grade network Management Extensions to the SDN framework

Summary

Applying Software-defined networking (SDN) in the carrier domain poses additional requirements such as network management (NM) functionalities. We derive concrete NM requirements for the use-case of virtualized multi-provider aggregation networks. Based on these requirements, we provide initial architectural considerations to integrate NM into the SDN framework as defined by the Open Networking Foundation (ONF).

1. Use-case



2. Network Mgmt Requirements

I Device management

Password and certificate management, Firmware management, Network booting

II Bootstrapping

Resource discovery, Instantiation of logical switches, Port and Queue configuration, IP address management, OF Controller discovery, Control Network discovery, Virtual link management

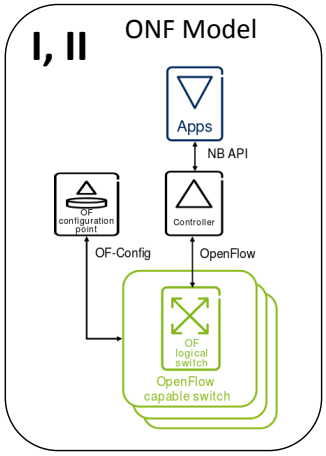
III Operational configuration

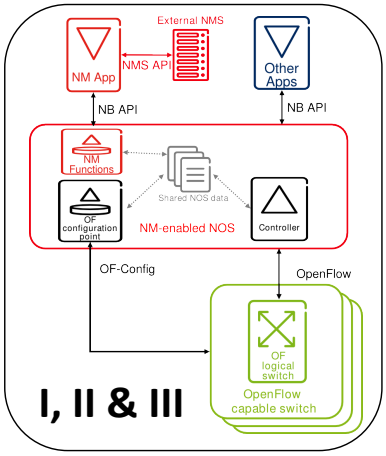
Capability discovery, Topology discovery, Tunnel management, Connectivity configuration

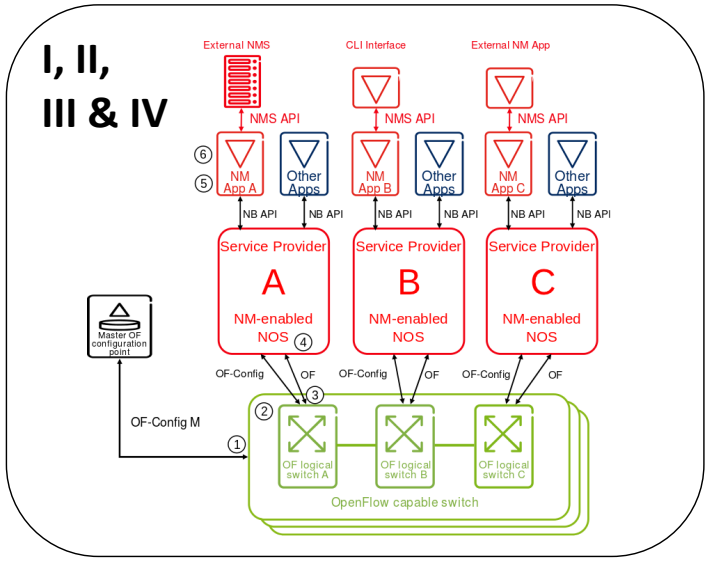
IV Additional carrier-grade requirements

Multi-provider support, Support for configuration of OAM tools, Event triggers from network elements

3. Architectural considerations







4. Configuration Example (PWE)

① Device configuration and bootstrapping
② Virtual network creation
③ Connectivity bootstrapping
④ Topology and capability discovery
⑤ Pseudowire creation
⑥ OAM configuration

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