

# Applicability of ACTN to Network Slicing

draft-king-teas-applicability-actn-slicing-04

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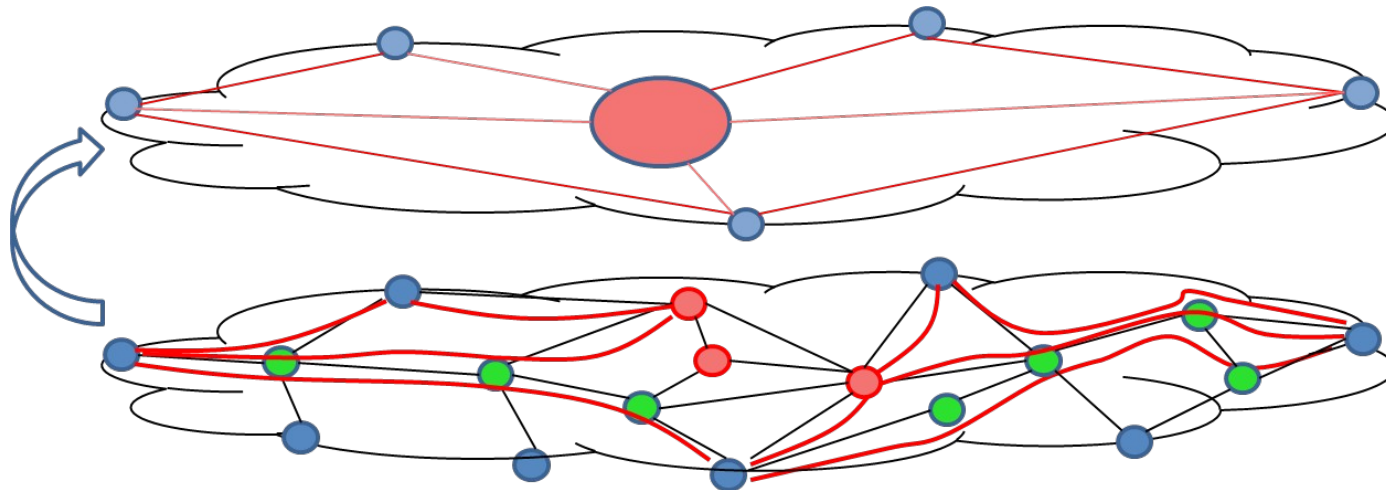
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# What is Network Slicing? for TE Transport Networks

- TE Network Slicing Definition (from the ACTN Framework)
  - In the context of ACTN, a TE network slice is a collection of resources that is used to establish a logically dedicated virtual network over one or more TE networks. TE network slicing allows a network operator to provide dedicated virtual networks applications/customers over a common network infrastructure.
- Essentially network slicing (in the context of ACTN) provides Traffic Engineered Network Slices
  - Connectivity to serve customers with a wide variety of service
  - Constraints, which may be characterised with metrics: latency, reliability, capacity, and service function specific capabilities

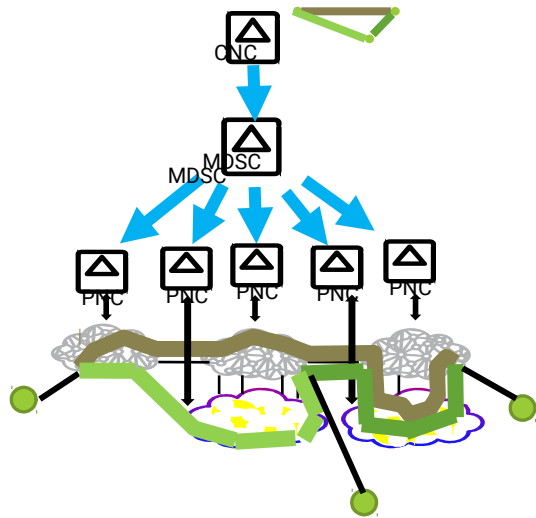


# ACTN Requirements for TE Network Slicing

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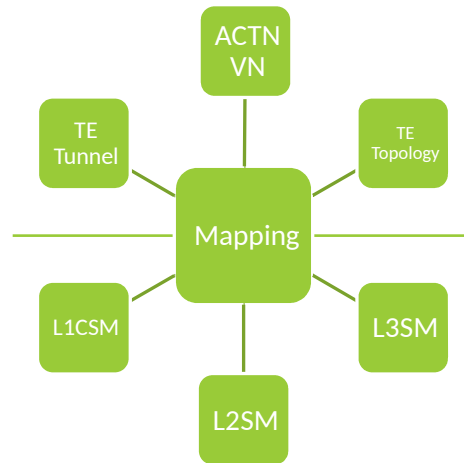
- **Resource Slicing:** provide a range of services both by partitioning (slicing) the network resources and provide specific Service Functions with the required chaining logic
- **Network and Function Virtualization:** The resources to be virtualized can be physical or already virtualized, supporting a recursive pattern with different abstraction layers
- **Resource Isolation:** operate concurrent network slices across a common shared underlying infrastructure
  - **Performance:** Each slice is defined to meet specific service requirements, usually expressed in the form of Key Performance Indicators (KPIs)
  - **Security:** Attacks or faults occurring in one slice must not have an impact on other slices, or customer flows, if required, are not only isolated on network edge, but multiple customers traffic is not mixed across the core of the network
  - **Management:** Each slice must be independently viewed, utilised and managed as a separate network
- **Control and Orchestration:** Orchestration is the overriding control method for network slicing
  - **Multi-domain Orchestration:** Managing connectivity setup of the transport service, across multiple administrative domains which belong to the same administrative entity;
  - **End-to-end Orchestration:** Combining resources for an "end-to-end" service (e.g., transport connectivity with firewalling and guaranteed bandwidth and minimum delay for premium radio users (spanning multiple domains)).

# Identifies Key ACTN Building Blocks for TE Network Slicing



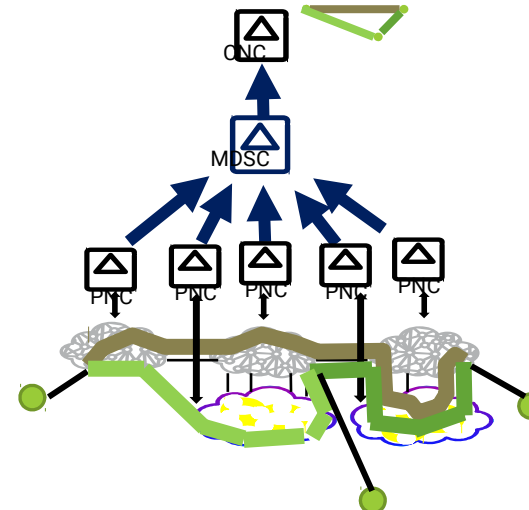
draft-ietf-teas-actn-framework  
draft-ietf-actn-vn-yang

- Orchestration and control of VNS
- CRUD operation of VN slices



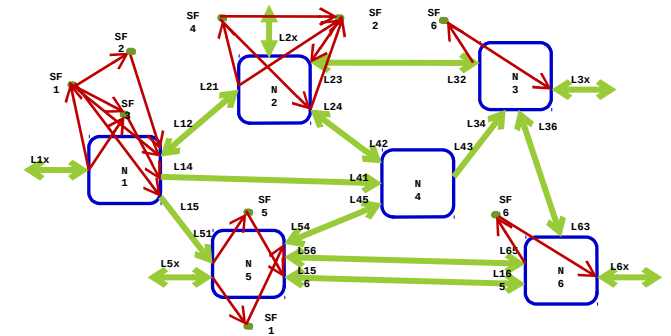
draft-lee-teas-te-service-mapping-yang

- TE & Service Mapping for overlay & TE-underlay visibility
- Provides Service Requirements for isolation, reliability, and so on.



draft-lee-teas-actn-pm-telemetry-autonomics

- Subscription of KPI PM data per VN and Telemetry streaming of PM data to VN owner.
- Customized Autonomous Scaling mechanism with PM data



draft-ietf-teas-sf-aware-topo-model

- Enhancement of TE network slicing with connectivity + SF/VNF/NF and compute/storage aware topology.

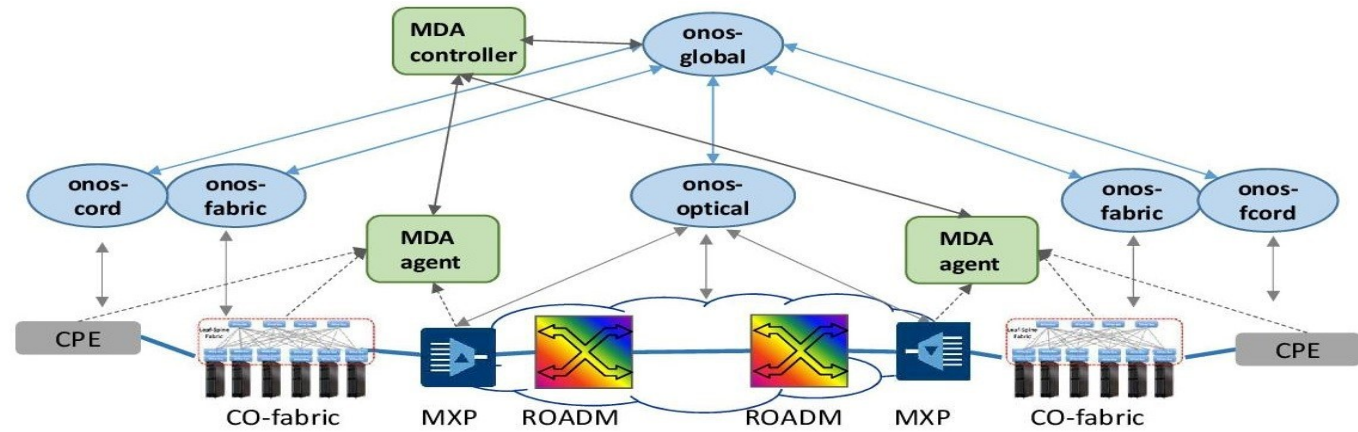
# Next Steps for draft-king-teas-applicability-actn- slicing

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- At IETF 102 there seemed to be support for continuing this effort, however the document discussion space is starting to overlap with other work, specifically:
  - A Framework for Enhanced Virtual Private Networks (VPN+)
    - <https://tools.ietf.org/html/draft-dong-teas-enhanced-vpn>
  - Applicability of Abstraction and Control of Traffic Engineered Networks (ACTN) to Enhanced VPN
    - <https://tools.ietf.org/html/draft-lee-rtgwg-actn-applicability-enhanced-vpn>
- The authors of the above documents propose
  - Identifying complimentary content
  - Merge all three documents
- Liaise with relevant SDOs to see if the merged solution is suitable for solving mobile network slicing requirements

# Finally...

If you want to see an ACTN-based network slicing proof of concept for mobile networks, please see the 5G METRO-HAUL project demo - [https://youtu.be/AO8\\_rb5ZLBA](https://youtu.be/AO8_rb5ZLBA)



The MDSC (named ONOS global) coordinates three domains (IP, Ethernet and Optical) and a total of five ONOS (PNC) instances

