NETWORK SLICING NBI

A view on concerns
What is the scope of the NBI model?

Option 1: Customer service model?

RFC8309

Option 2: Service delivery model?

Customer

Service Orchestrator

Application

BSS/OSS

Service Delivery Model

Network Orchestrator (operator)

Network Orchestrator (operator)

OSS/Orchestration (operator)

Controller

Controller

Controller

Controller

Device Configuration Model

Network Element

Network Element

Network Element

Network Element

Network Element

(Network model)
Service Model vs Network Model

From RFC 8453

From reality (as in ACTN POI)

CNC (customer, not operator)

OSS/Orchestration (operator)

Customer Service model

Network model (existing)

Customer (not operator)

Boundary between Customer & Network Operator

MDSC

PNC

PNC

PNC

Network

Network

Network

Figure 2: ACTN Base Architecture
Network slicing applied to ACTN and non ACTN

**ACTN enabled**

- CNC (customer)
- OSS/Orchestration (operator)
- MDSC
  - PNC
  - NSC

**Non ACTN** (with or w/o TE)  
E.G ONF, TIP MUST, MEF LSO

- Customer
- OSS/Orchestration (operator)
- H-SDN
  - SDN
  - NSC

Service model (missing)
Network model (existing)
Customer service model for network slicing

- Let's assume the Network Slicing NBI is a customer service model.
- Service model for network slicing missing. Only L2SM and L3SM available but not enough for network slicing.
- `draft-wd-teas-ietf-network-slice-nbi-yang-04` is a candidate to fulfill it?
  - To be used by the customer to request a slice to the operator.
  - Expected to be on the OSS/Orchestration NBI, not the NSC NBI.
- `draft-wd-teas-ietf-network-slice-nbi-yang-04` shouldn't be used by the operator as network model because existing models can meet the requirements with minor augmentation.
- VN is not just a network model, can be used also as service model.
Network model for network slicing

- NSC is a functionality of the H-SDN (in non ACTN) or of the MDSC (in ACTN).
- NSC NBI is towards the OSS, not the customer, hence NSC NBI should be supporting network models.
Existing network models with or without ACTN

Available Network Models
- VPN network models: L1CSM, L2NM, L3NM
- Topology: Topo, TE-Topo
- Infrastructure: TE tunnel, VN, LSP, Policy
- TE service mapping

Network Slice request example using existing models
- NON TE (connectivity only)
  - Eg 1: Plain VPN
    - L2VPN or L3VPN
  - Eg 2: Plain infrastructure
    - LSP or Policy
    -VN non TE (can be augmented)
- TE (ACTN)
  - E.g. 1: VPN + TE tunnel + TE service mapping
  - E.g. 2: VPN + VN + TE service mapping
(*) Please note ACTN is the primary example of the usage of the VN YANG model but not the only one.
(Non-exhaustive) Proposed augmentations

- Support for technology-agnostic topology
  - VN abstract node (virtual-network/vn/abstract-node) to reference a topology which today is a TE topology. Using a profile of the TE topology for non TE scenarios (as explained in draft-busi-teas-te-topology-profiles) it is possible to apply the abstract node also to non TE topologies.
  - Use draft-liu-teas-transport-network-slice-yang which augments network topo (RFC8345). And just change the reference of /virtual-network/vn/abstract-node to /nw:networks/network/node/node-id

- Expose path constraints of the VN and VN member as SLO/SLE (instead of in the connectivity matrix)
  - Define (path-)constraints under /virtual-network/vn and /virtual-network/vn/vn-member
  - The current vn-compute/input/path-constraints may be able to be used to specify SLO/SLE.

- Support of technology-agnostic connectivity matrix
  - Need to discuss if the current /virtual-network/vn/vn-member itself can realize the connectivity matrix defined in Sec. 3.2. of draft-ietf-teas-ietf-network-slices-04, or need to define a new technology-agnostic connectivity matrix

- Map the terminologies of draft-ietf-teas-ietf-network-slices to those of the VN model
  - Network-slice : Virtual-network
  - Slo-sle-policy : Path-constraints
  - Ns-endpoint : Access-point/VN-Access-point
  - Ns-connections : Vn-member
Model convergence

◦ OTN slicing is OTN-technology specific slicing which has its own use cases and customers different from the 5G use cases
  ◦ Support for two types of slices:
    ◦ Connectivity-based (connection)
    ◦ Resource-based (topology) partitioning

◦ From OTN slicing’s viewpoint, it is preferrable to:
  ◦ Merge three models into one technology-independent network slicing model package, supporting both types of slices
    ◦ draft-wd-teas-transport-slice-yang
    ◦ draft-ietf-teas-actn-vn-yang
    ◦ draft-liu-teas-transport-network-slice-yang
  ◦ Augment the technology-independent merged network slicing model