



Instantiation of IETF Network Slices in service providers networks

draft-barguil-teas-network-slices-instantation-03

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Goals and non goals of the draft (reminder)

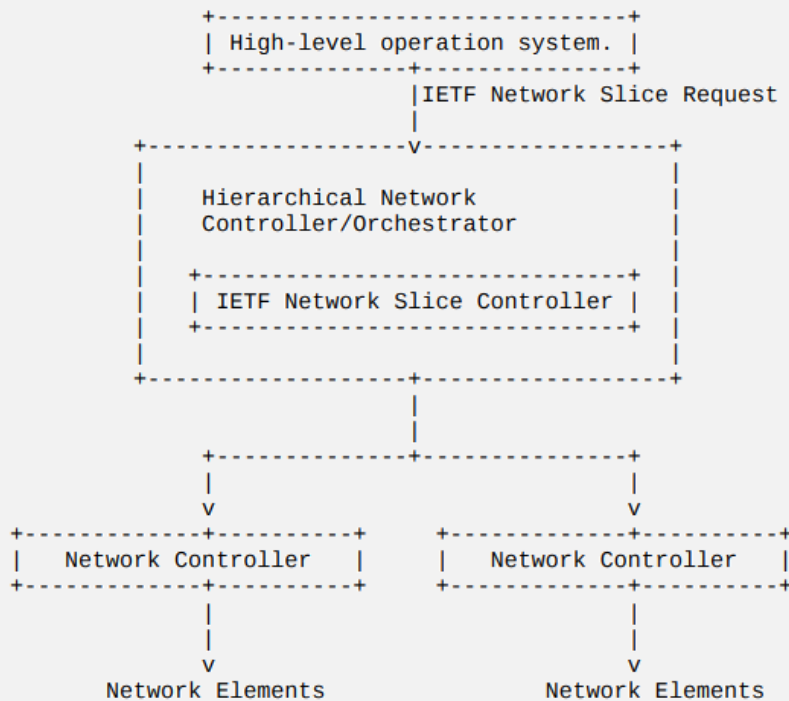
- Goals:
 - How to use existing IETF “machinery” to operate IETF Network Slices in Service Provider Networks
 - Evaluate existing YANG models (RFCs, WGs, individual drafts), identify where they apply in the network slicing architecture and find gaps vs the IETF network slice requirements.
- Non goals:
 - Not defining new YANG models
 - Not re-defining architecture or adding new requirements

Context

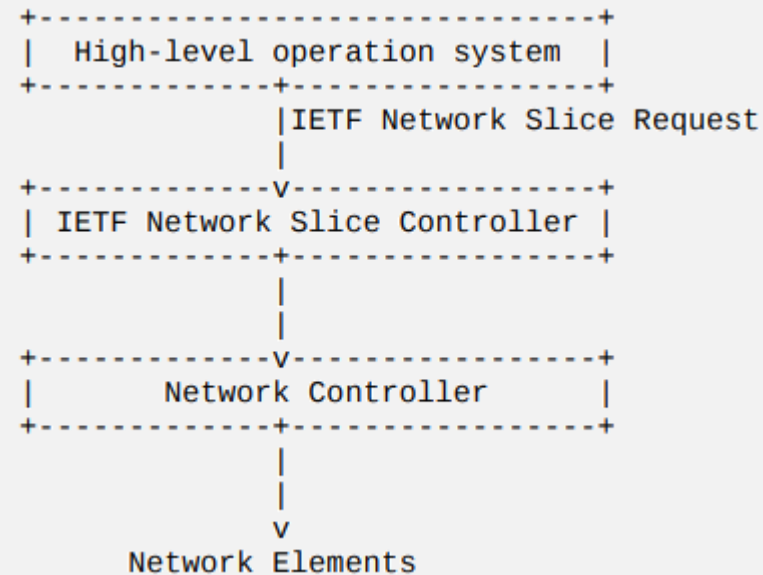
- IETF Network Slices:
 - Requirements: draft-ietf-teas-ietf-network-slices and draft-contreras-teas-slice-nbi
 - Network Slice service framework: draft-ietf-teas-ietf-network-slices
 - Slice attributes and functionalities expected: draft-contreras-teas-slice-nbi
- IETF Network Automation:
 - Service Models: Capture the customer requirements (i.e. LXSM, ...)
 - Network Models: Capture the Network requirements to deliver a service. (i.e. LXNM)
 - TE Models and Service Mapping: Maps the TE data models and the service/network models.
 - ACLs and Routing Policies
- Existing architectures and frameworks for Network Automation and SDN:
 - [RFC 8969] A Framework for Automating Service and Network Management with YANG
 - [RFC 8453] Framework for Abstraction and Control of TE Networks (ACTN)
 - [RFC 8309] Service Models Explained

Possible architectural options

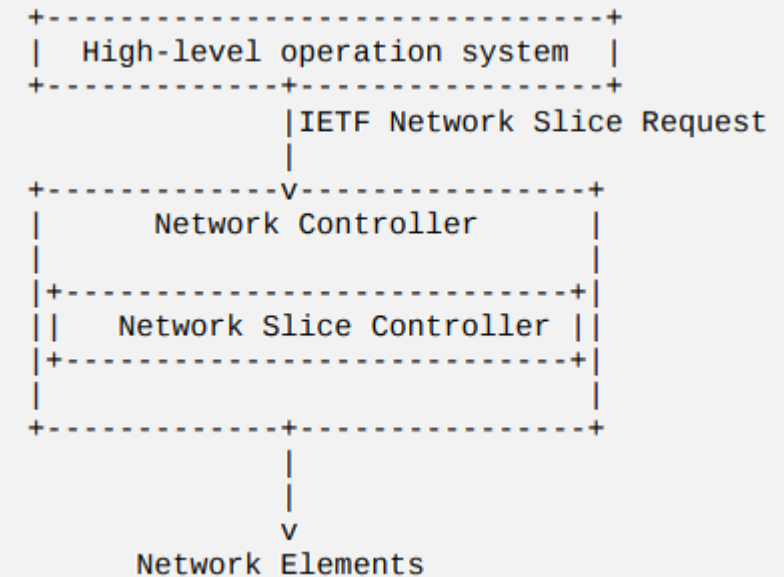
IETF NSC as a module of the Hierarchical SDN controller



IETF NSC as a stand-alone entity



IETF NSC as a module of the Network controller

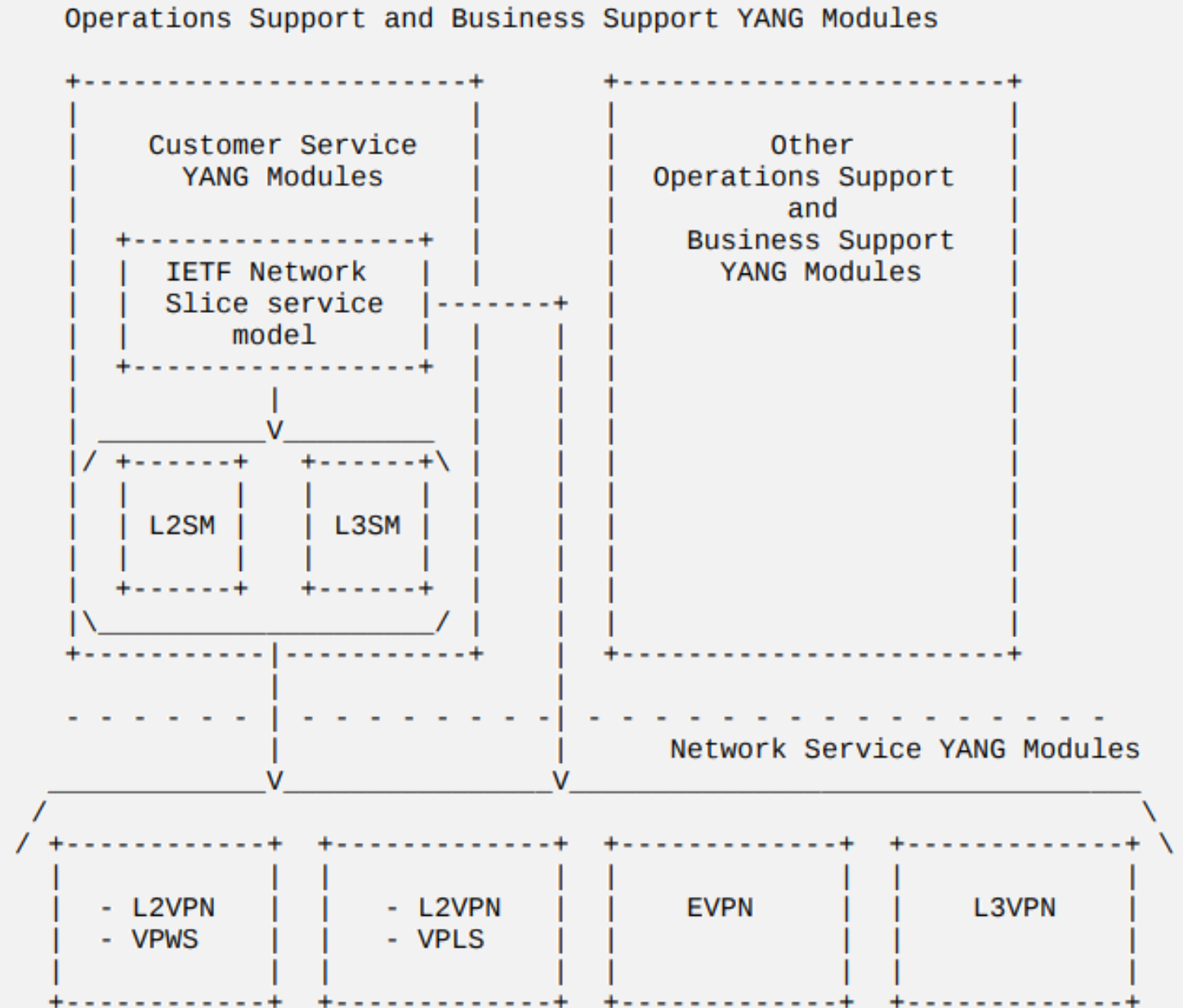


Updates from -02 version

- A relationship between models is described based on the possible architectural options
- New section for LxSM utilization in NS Mapping
- An annex is added showing mapping between IETF NS NBI service model and L3SM to show feasibility and identify gaps

Relationship between models

- Based on RFC 8309 models relationship
- Realization of IETF NS service model could be mapped either to a Service model (e.g., L3SM) or directly to a Network model (e.g., L3NM)



Addition of LxSM utilization in NS Mapping

- A subsection was created including the LxSM mapping.
- The aim is to align the work with the alternatives proposed in the RFC 8969 “A Framework for Automating Service and Network Management with YANG”

Relationship between IETF NBI model parameters and L3SM model parameters

L3SM (RFC 8299)	IETF NSC NBI YANG model
Bandwidth	Sum of bandwidth SLO per NSE counting all connections
MTU	MTU attribute in SLE
QoS	
- QoS classification policy	Defined in the model as network-access-qos-policy-name to be applied per access-point
- QoS profile	
- rate-limit	Defined in the model as incoming/outgoing rate-limits per end-point (or access-point)
- latency	One-way / Two-way latency SLO
- jitter	One-way / Two-way delay variation SLO
- bandwidth	One-way / Two-way bandwidth SLO
Multicast	The need of replication can be inferred from ns-connectivity-type. Further details are not available (e.g. source or receiver role)

Considerations

- QoS profile in L3SM applies per service class in a per site-network-access (interface) domain; but the parameters in IETF NS NBI apply per end-to-end connection
 - If per-class granularity is required in an IETF network slice, then different connections must be defined between the same end-points, one per service class
- L3SM could not be sufficient to realize IETF network slices specific needs such as e.g. packet loss, isolation or security.
 - Unless those other objectives and expectations are provided by other means (e.g., realizing the L3SM through technologies guaranteeing dedicated resource allocation such as OTN).

Next Steps

- Version -04 will provide further updates
 - Fix editorial updates (references mainly) not properly addressed in -03
 - A new architectural option where a service model is further mapped/realized to a IETF NS service
 - New version for IETF#113 week (or immediately afterwards)
- Keep working on detailing the different implementation options and its operational considerations.
- Collect additional operational requirements for the gap analysis.
- Provide feedback to solution drafts.
- Collect feedback / comments from the WG to enhance the document. Consider WG adoption to incorporate the WG view (targeting IETF 114)

Additional proposed architectures

