

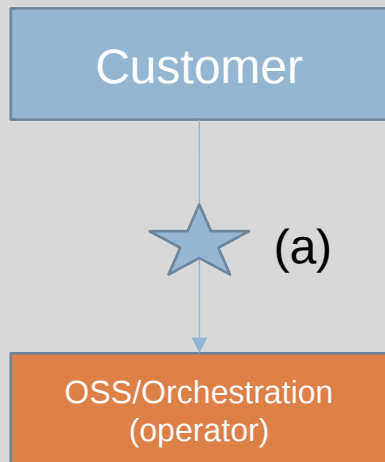
The background of the slide features a series of horizontal, wavy stripes in black and white, creating a sense of motion and depth. The stripes are more pronounced in the lower half of the image and fade into a plain white background at the top.

NETWORK SLICING NBI

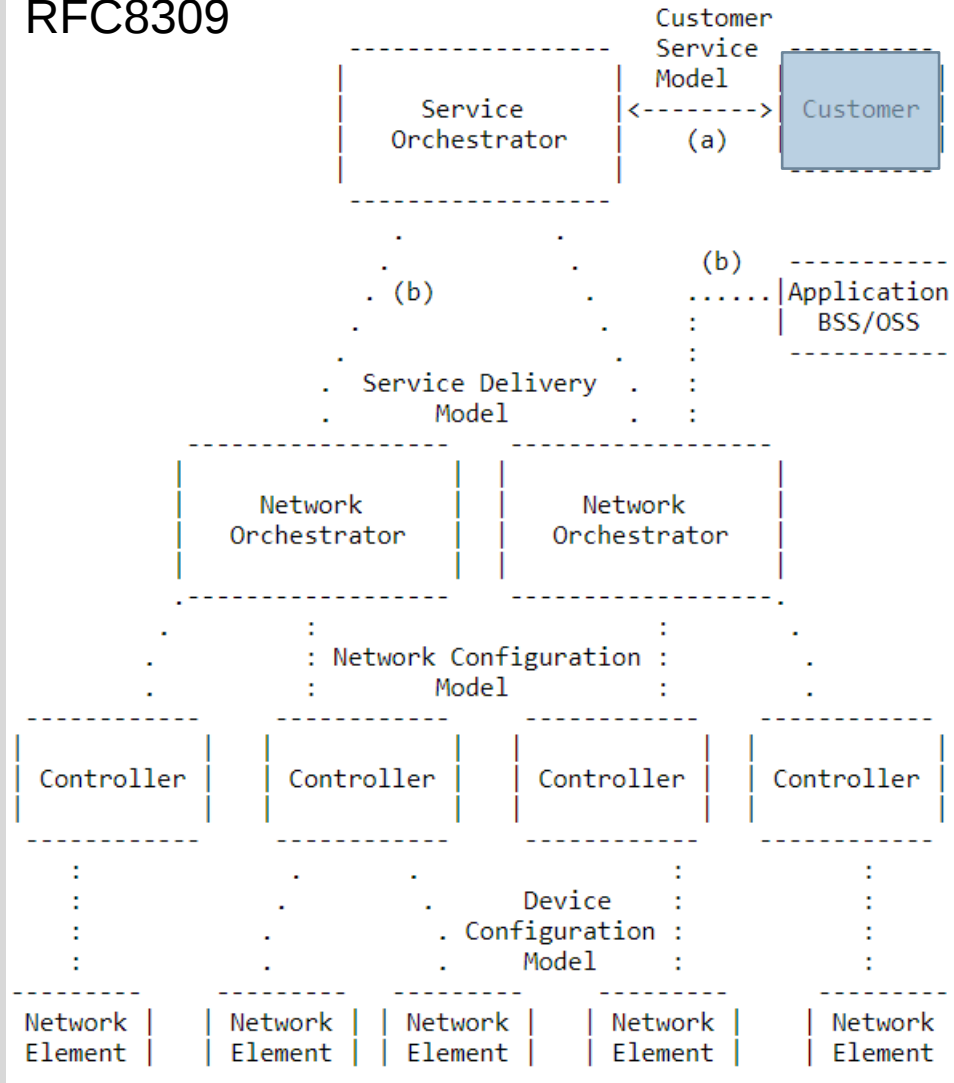
A view on concerns

What is the scope of the NBI model?

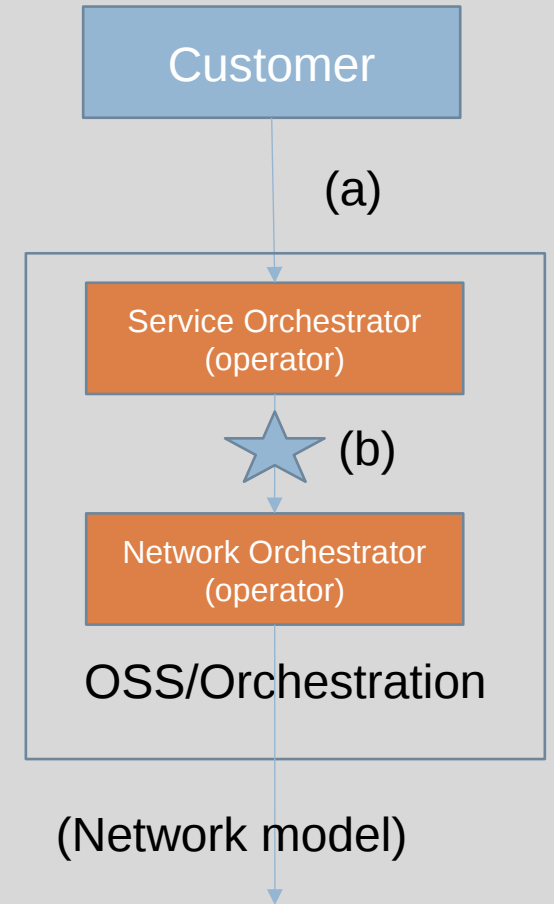
Option 1:
Customer service
model ?



RFC8309



Option 2:
Service delivery
model ?



Service Model vs Network Model

From RFC 8453

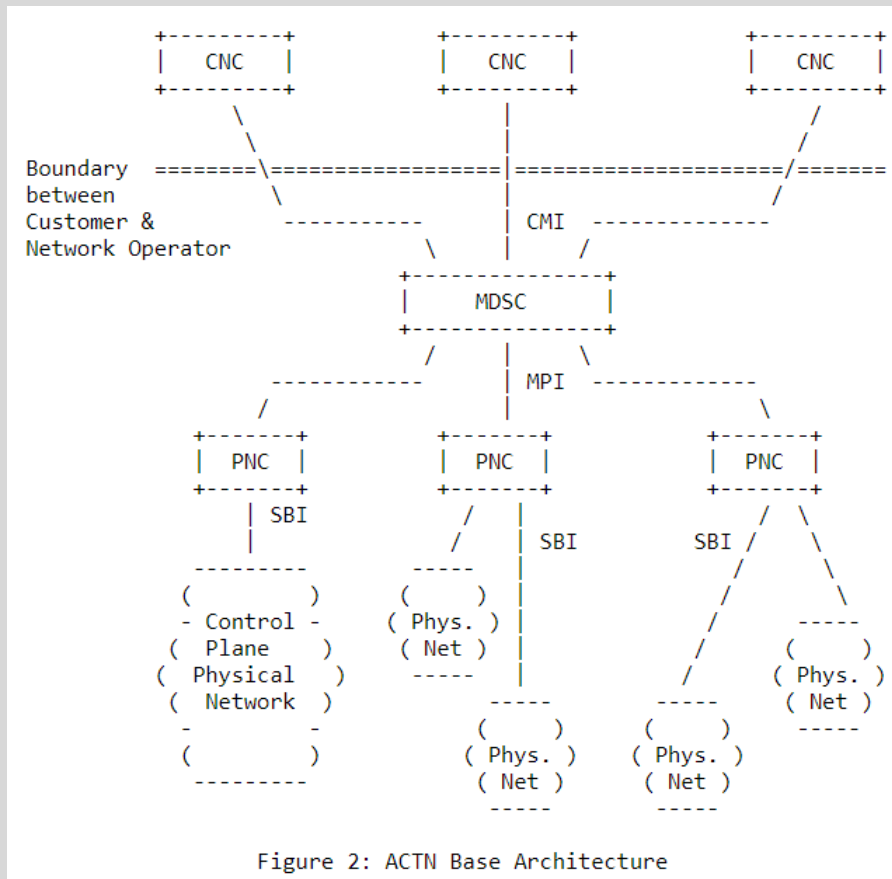
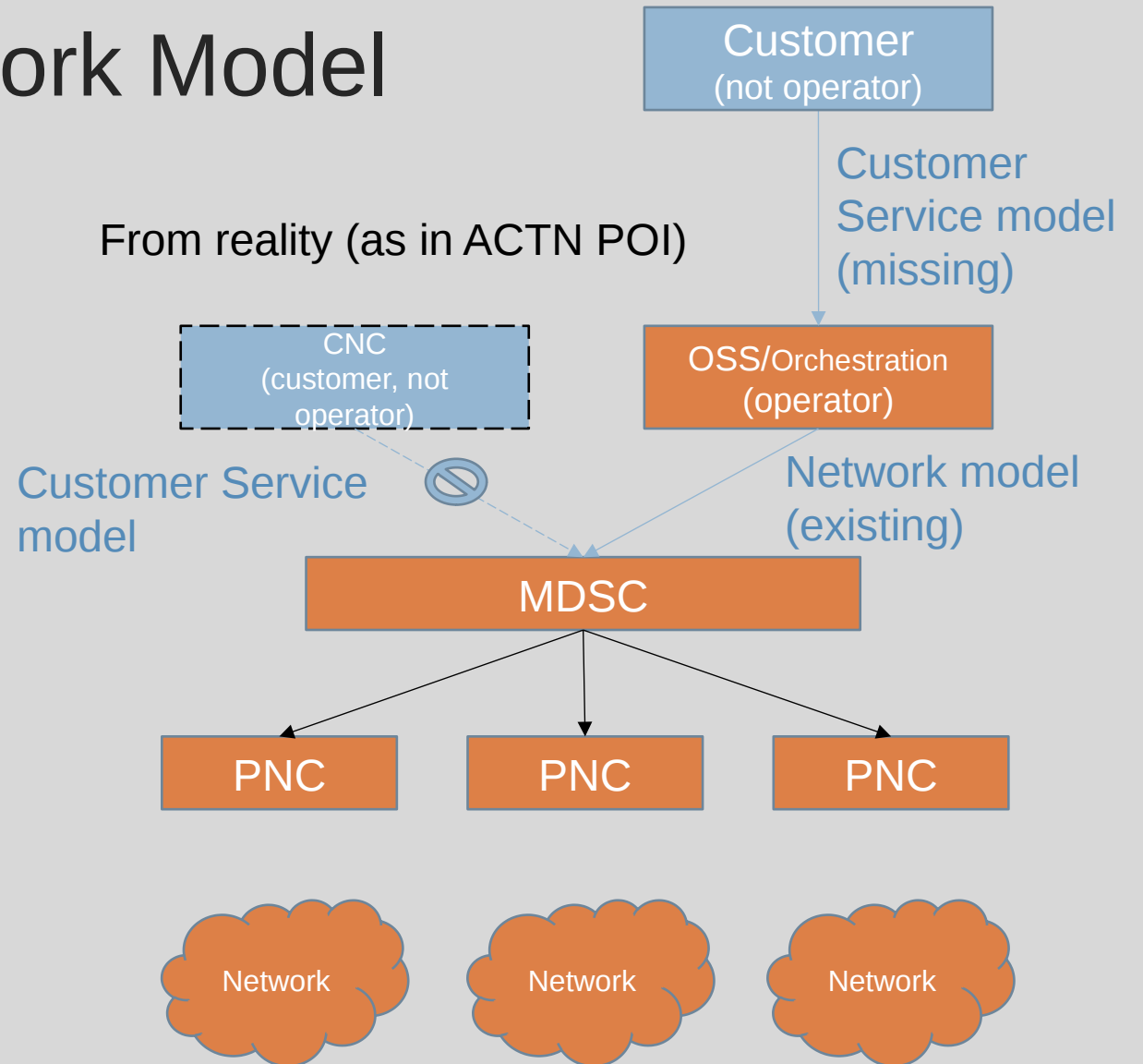
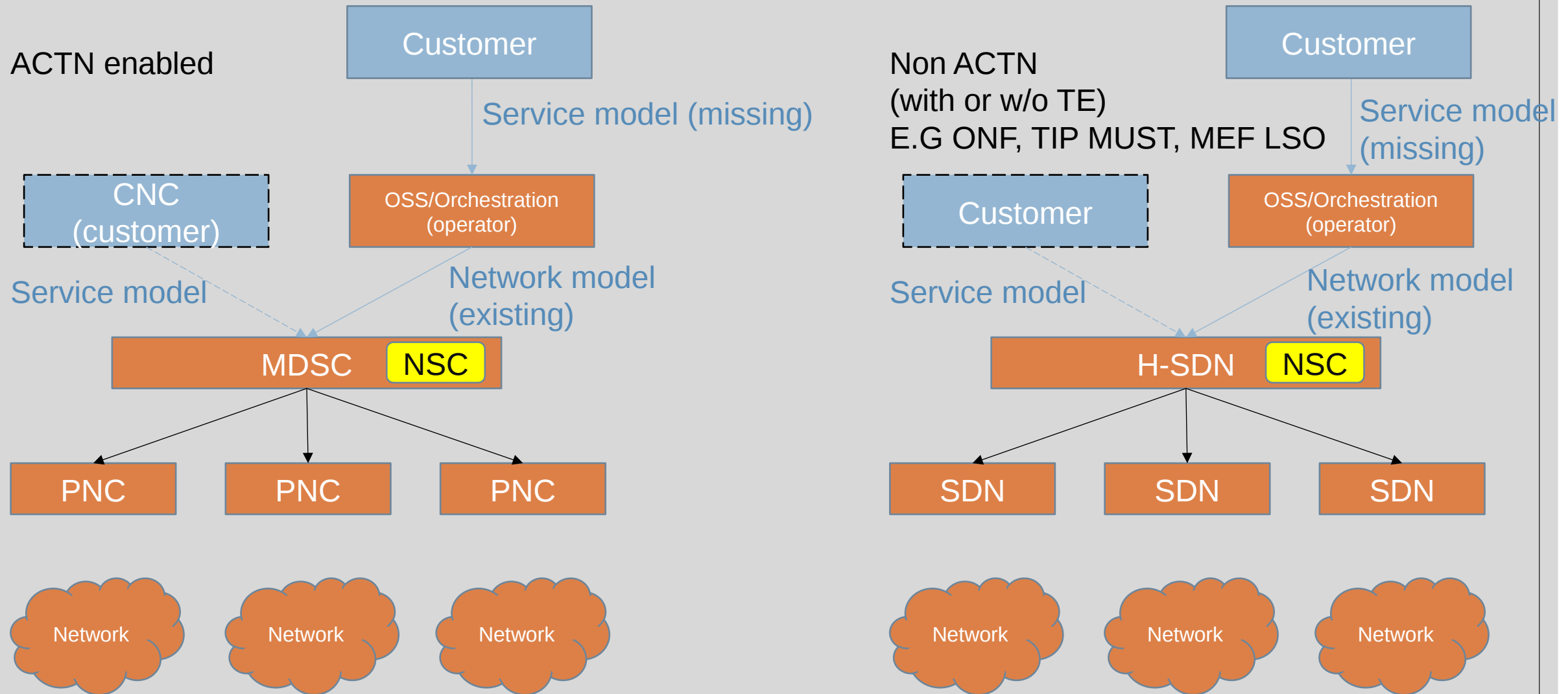


Figure 2: ACTN Base Architecture

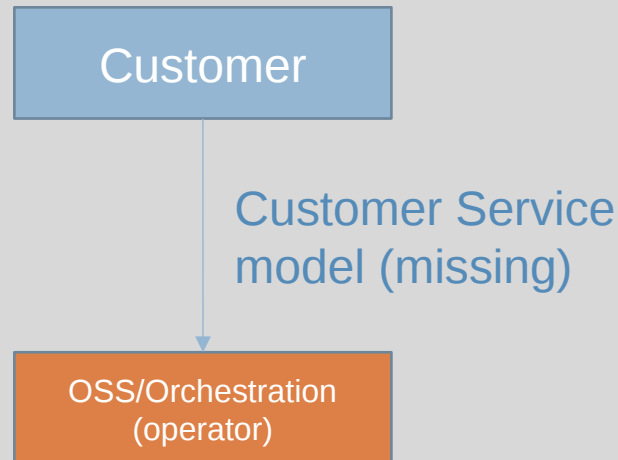
From reality (as in ACTN POI)



Network slicing applied to ACTN and non ACTN

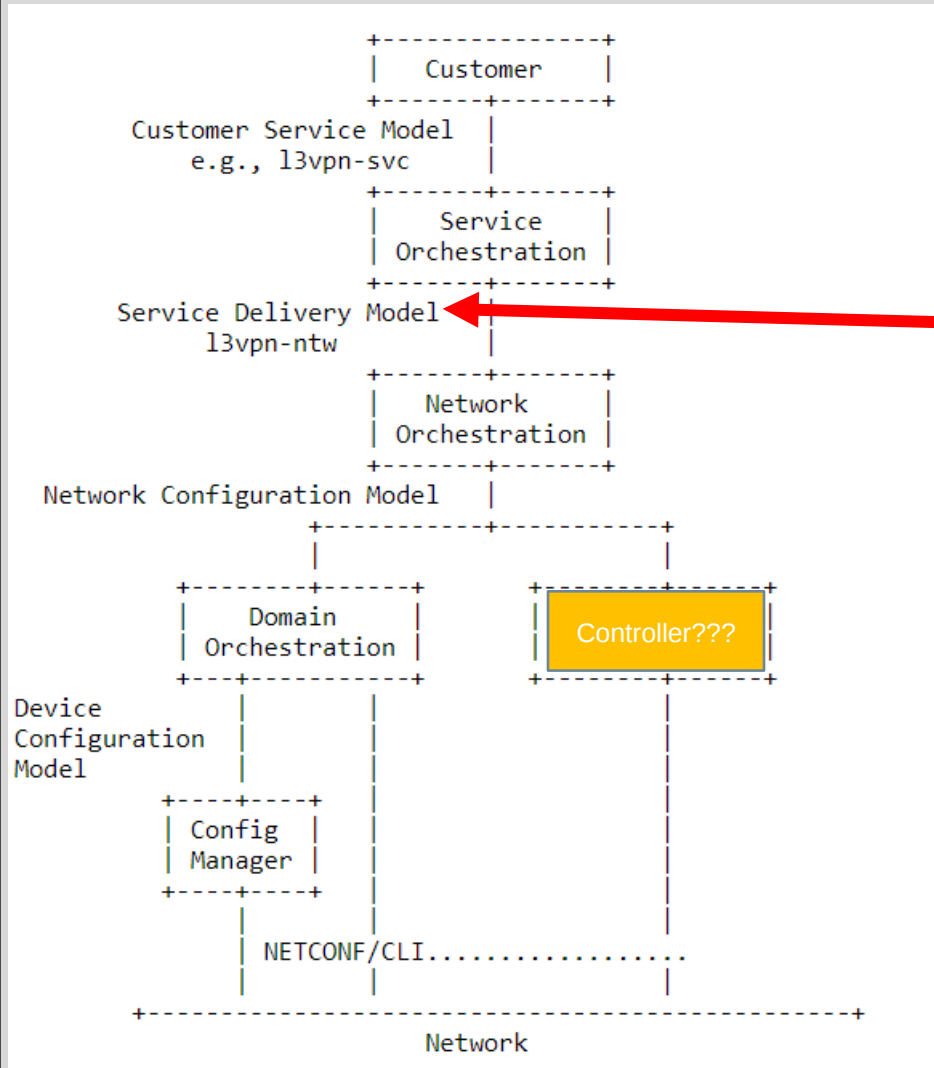


Customer service model for network slicing

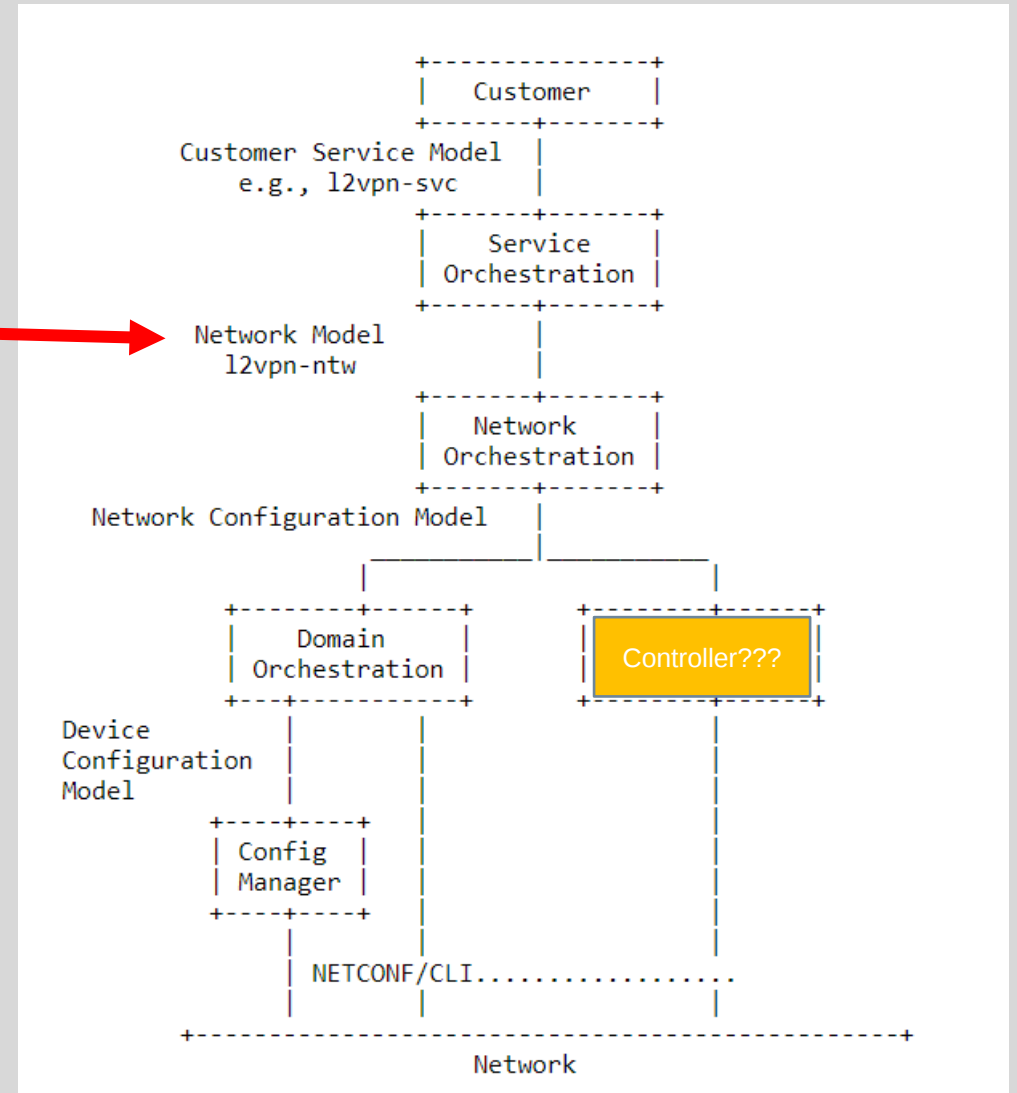


- Let's assume the Network Slicing NBI is a customer service model
- Service model for network slicing missing. Only L2SM and L3SM available but not enough for network slicing.
- draft-wd-teas-ietf-network-slice-nbi-yang-04 is a candidate to fulfill it?
 - To be used by the customer to request a slice 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.

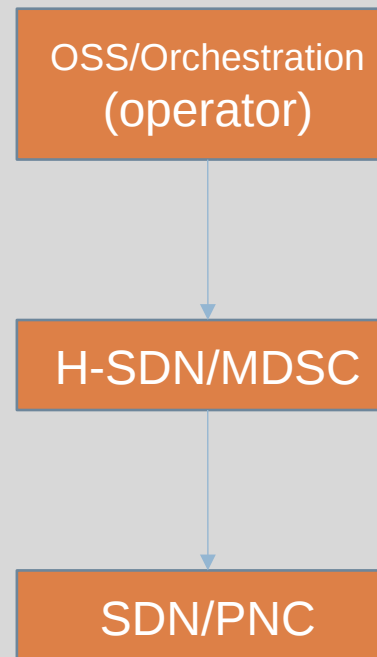
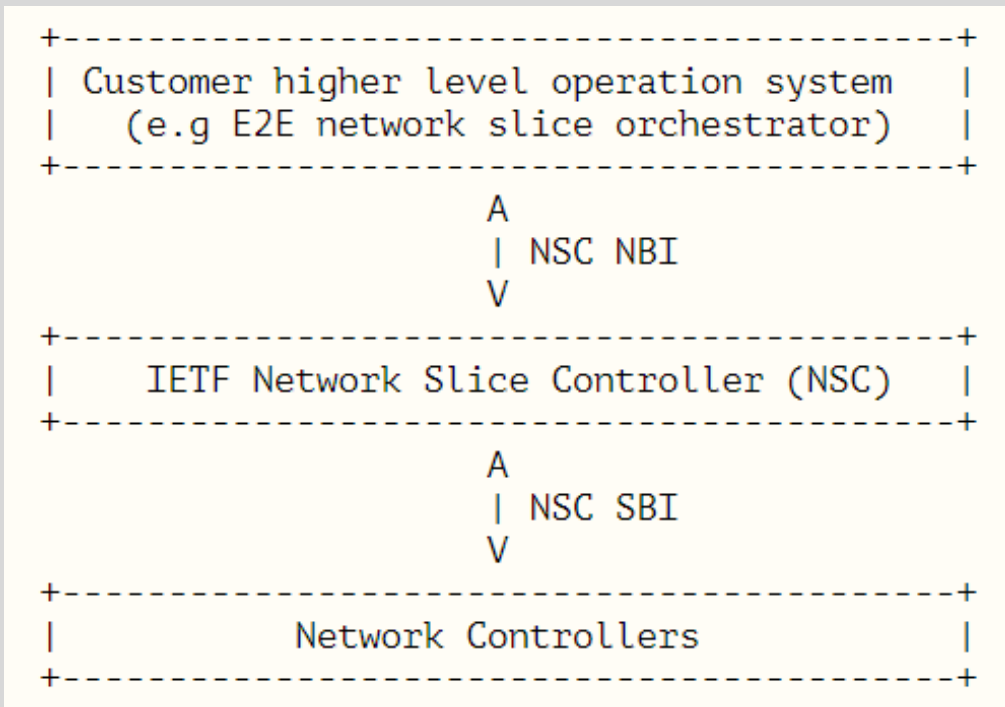
◦ L3SM-L3NM



◦ L2SM-L2NM



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

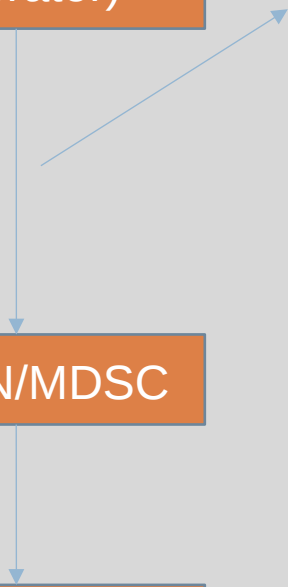
Network Slice request example using existing models

- 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.

OSS/BSS
(operator)

H-SDN/MDSC

SDN/PNC



(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 preferable 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