A Yang Data Model for ACTN VN Operation

draft-ietf-teas-actn-vn-yang-02

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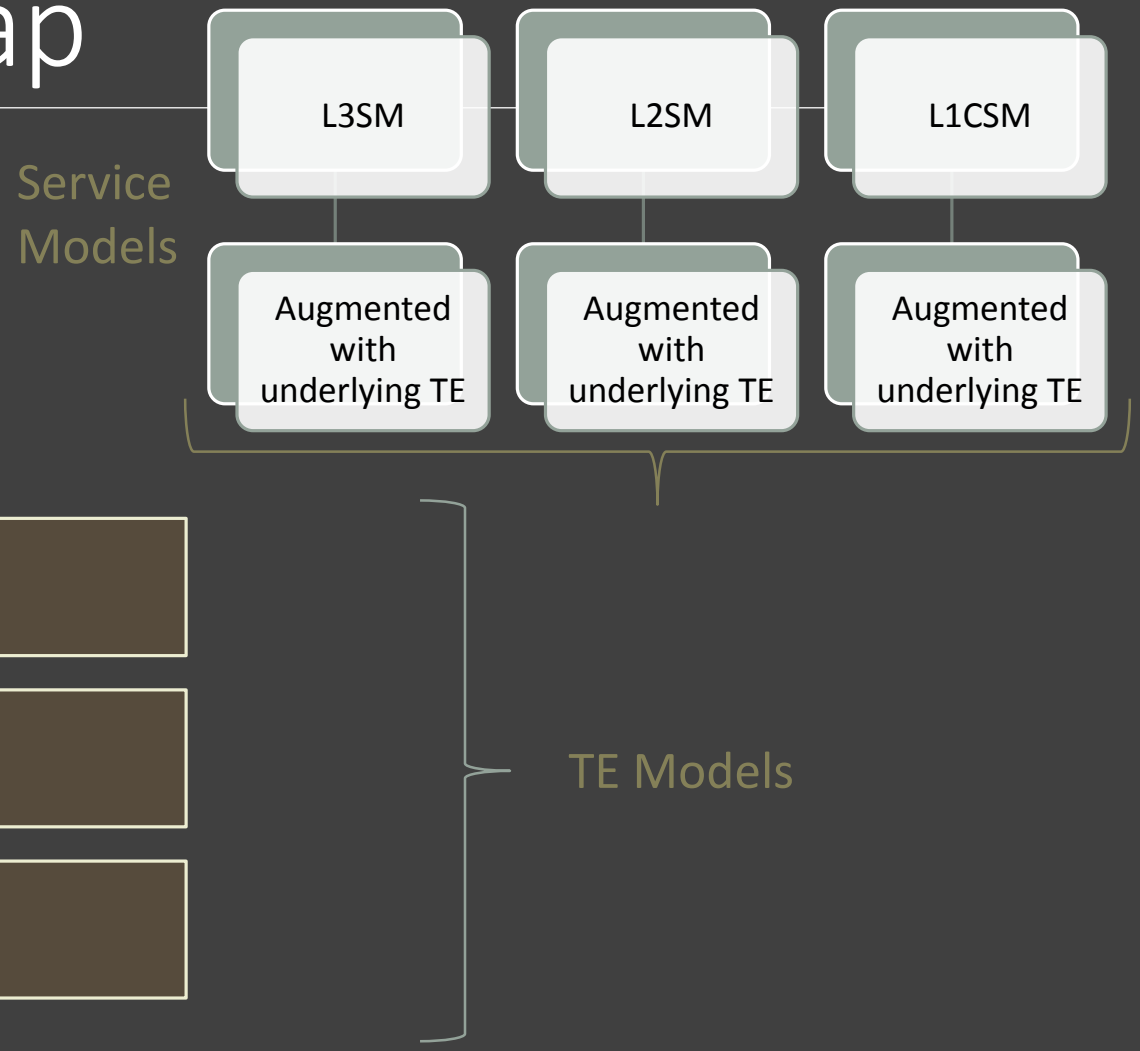
ACTN Yang Model Map



ACTN VN Yang

Yang model for Virtual Network Service (VNS) operations

- From the point of view of Customer

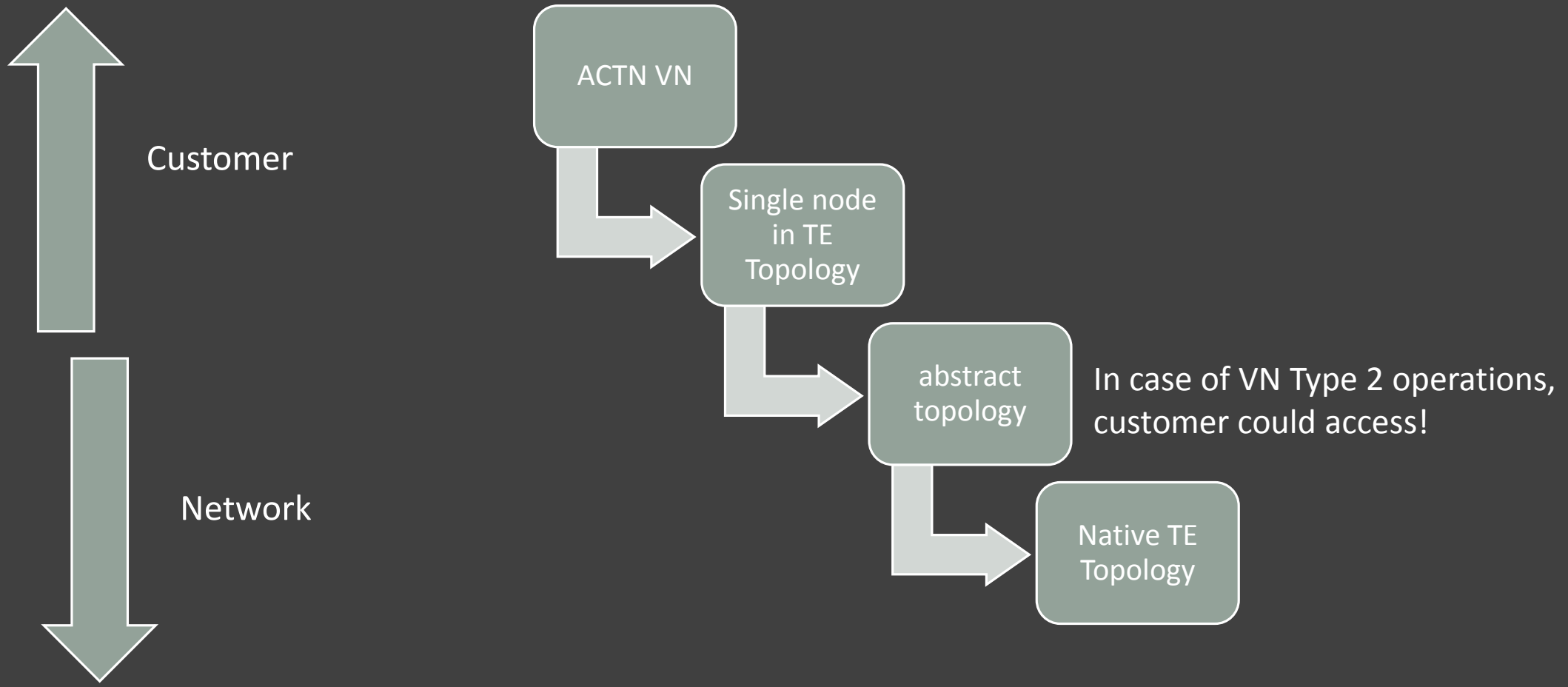
An abstraction over the TE-Topo and TE-Tunnel

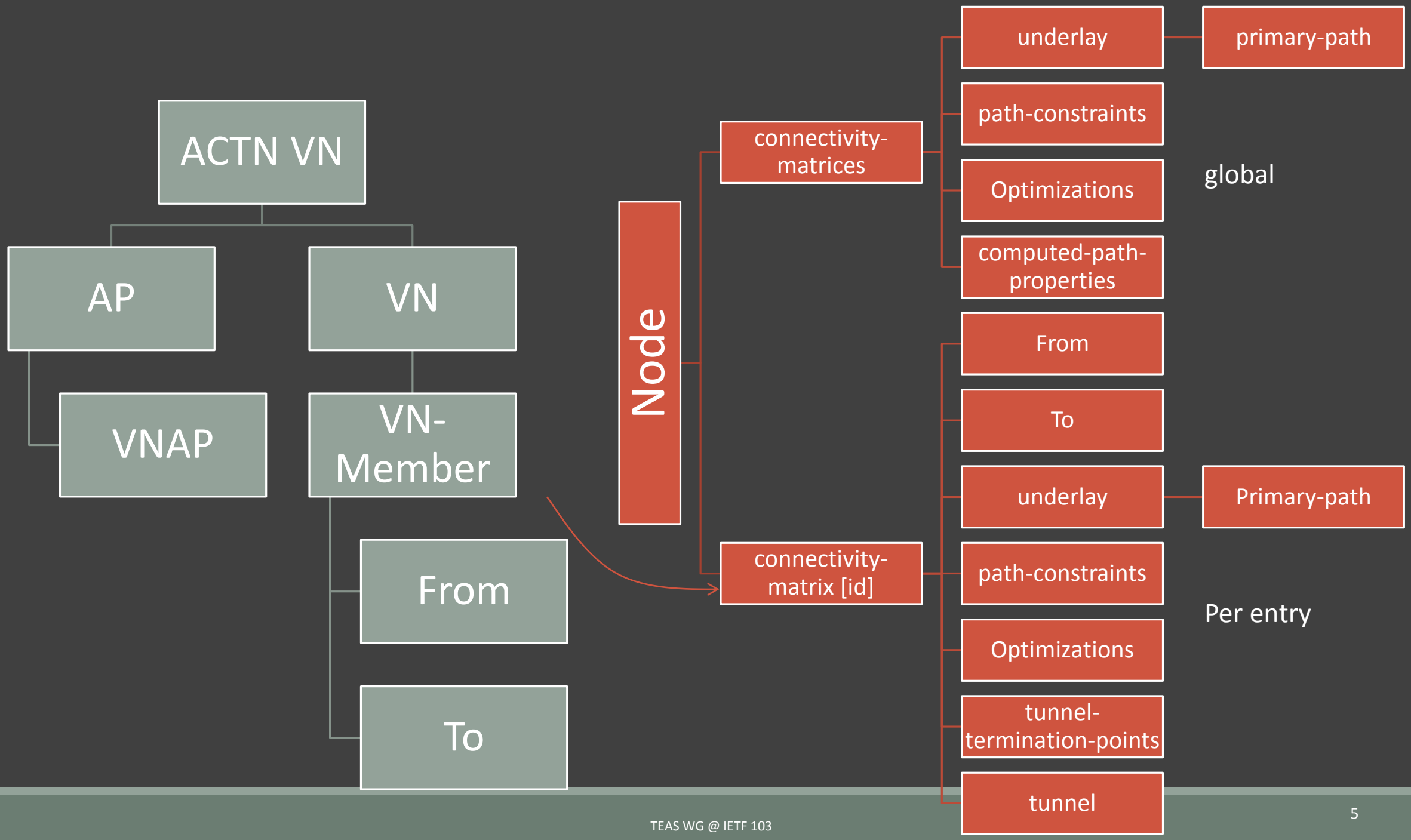
- These models are from the point of view of Network

Some similarity, but still different!

- VN is a higher level of abstraction than topology!
  - VN depends on topology!

Relationship




ACTN VN
AP
VNAP
VN
VN-Member
From
To
Node
connectivity-matrices
connectivity-matrix [id]
underlay
primary-path
path-constraints
Optimizations
computed-path-properties
global
From
To
underlay
Primary-path
path-constraints
Optimizations
tunnel-termination-points
tunnel
Per entry

Overview

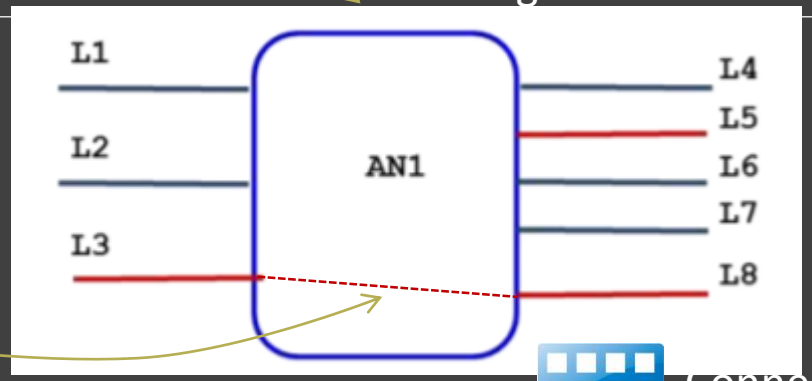
ACTN VN Yang Model

AP/VNAP

VN

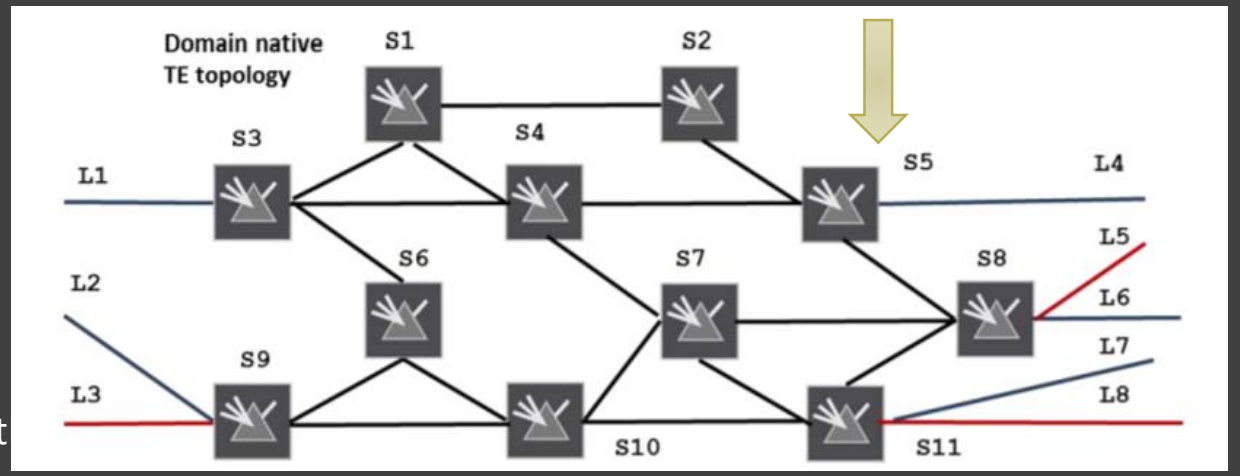
VN-Member

Abstract Topology with a Single Node



Connectivity Matrix

- For both VN Type 1 or Type 2 VN Yang model rely on a single node in the abstract TE Topology
- The abstract node has
  - connectivity-matrices
  - connectivity-matrix [id]
  - The attributes directly under container connectivity-matrices are the default attributes for all connectivity-matrix entries when the per entry corresponding attribute is not specified. When a per entry attribute is specified, it overrides the corresponding attribute direct under the container connectivity-matrices.

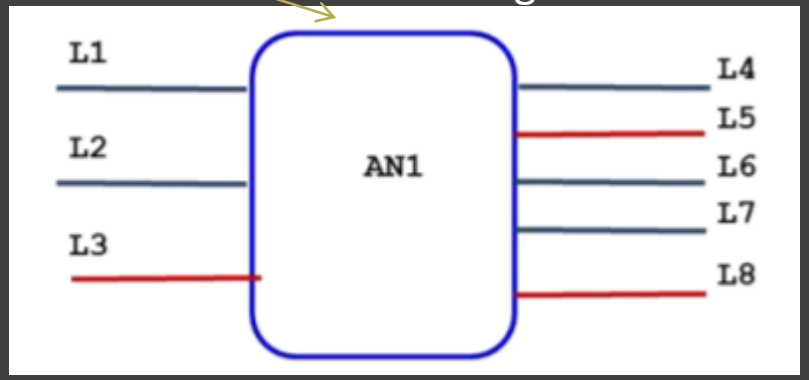


- VN is seen as edge to edge links (VN-members) setup as tunnels across underlying networks!

VN Type 1

- VN 1
  - VN-Member 1 L1-L4
  - VN-Member 2 L1-L7
  - VN-Member 3 L2-L4
  - VN-Member 4 L3-L8
  - This VN has following properties
    - Bandwidth 500
    - Optimize by delay

Abstract Topology with a Single Node



connectivity-matrices

These properties are set in TE Topo

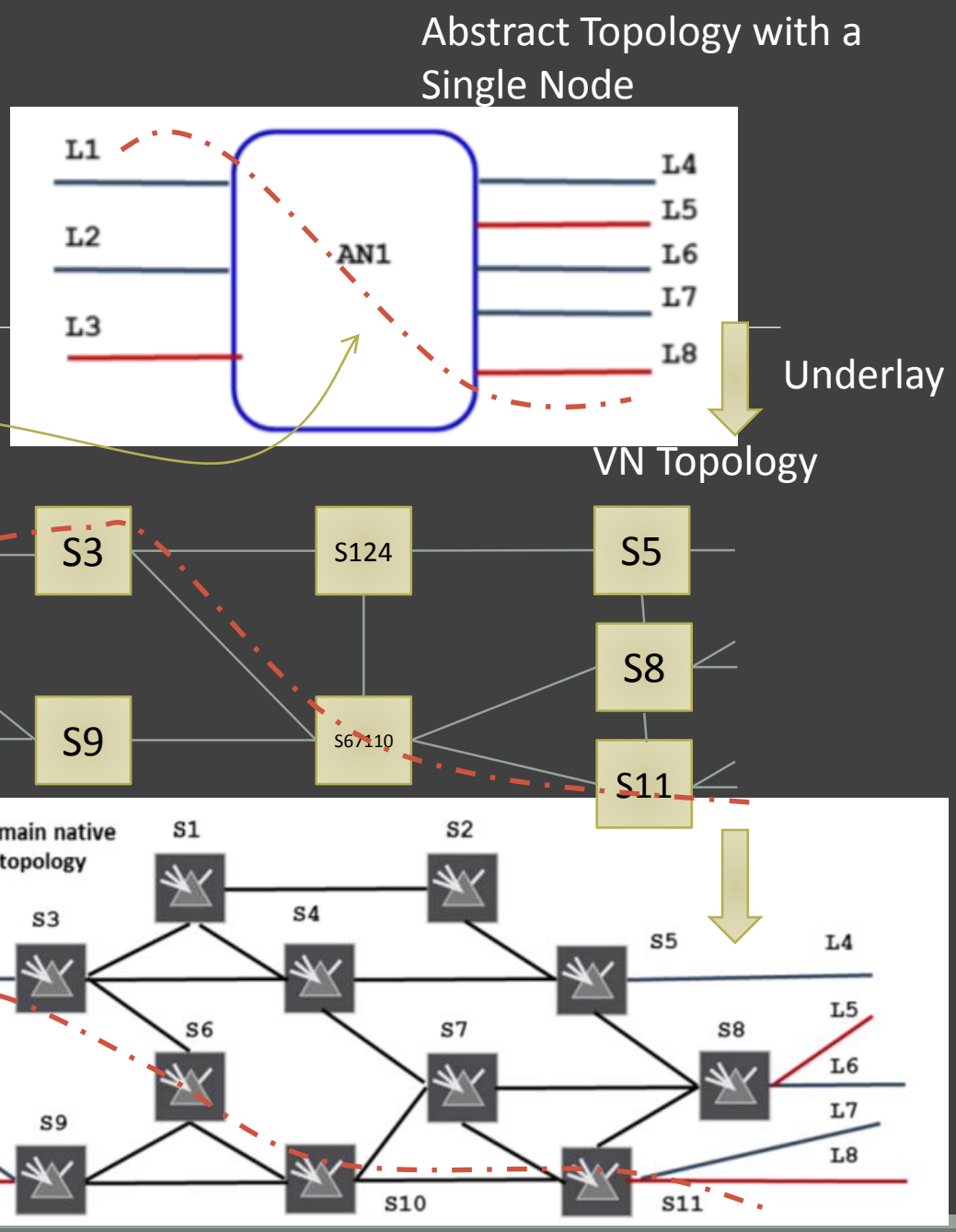
Attributes

14: L1-L4	17: L1-L7
24: L2-L4	38: L3-L8

Connectivity Matrix

VN Type 2

- VN is seems as a topology of virtual nodes and links
- To ease mapping between VN Yang Model and TE models, an abstract single node topology is created with VN topology as the underlay!
- The same mapping as VN Type 1 is reused.
- VN 2
  - VN-Member 1: L1-L8 via S3, S67110, S11
    - Set via the underlay path in connectivity-matrix[id]



ACTN Info Model [RFC 8454]

- VN Action primitives on CMI -
  - VN Instantiate
  - VN Modify
  - VN Delete
  - VN Update
  - VN Path Compute
  - VN Query
- Maps to actions on ACTN VN Yang model easily
  - But, with dependency on the TE topology model when it comes to details such as constraints, actual path etc

ACTN VN Operations

- VN could be explicitly created via this yang model
- VN could also be auto-created based on the service model
  - With a service mapping to the VN
  - Via ACTN VN abstraction, customer could learn how the network fulfills the service!
- Further allow some new interesting services!
  - Multi-Source / Multi-Destination
  - VN Compute

Status

- Adopted as WG draft after IETF 101.
- Relationship between other models clarified
  - Suggest further improvements
- Security & IANA considerations updated

BACKUP!

How: Reference to TE Topology Yang Model

Access	• AP/ VNAP -> LTP • Ltp of type te-types:te-tp-id
Customer's Virtual Network	• VN -> Abstract Node • vn-topology-id of type te-types:te-topology-id • abstract-node -> /nw:networks/network/node/tet:te-node-id (reference)
Customer Site to Site connection	• VN-Member -> Entry in the connectivity matrix of the abstract node • connectivity-matrix-id -> /nw:networks/network/node/tet:te/te- node-attributes/connectivity-matrices/connectivity-matrix/id (reference)

All parameters which are can be set as global attributes to VN are set in the connectivity-matrices (such as bandwidth) and an attribute for a particular VN-member is set in the connectivity-matrix [id] (such as explicit path)! Duplicate parameters in ACTN VN Yang model are removed!