A YANG DATA MODEL FOR ACTN VN OPERATION

draft-lee-teas-actn-vn-yang-03

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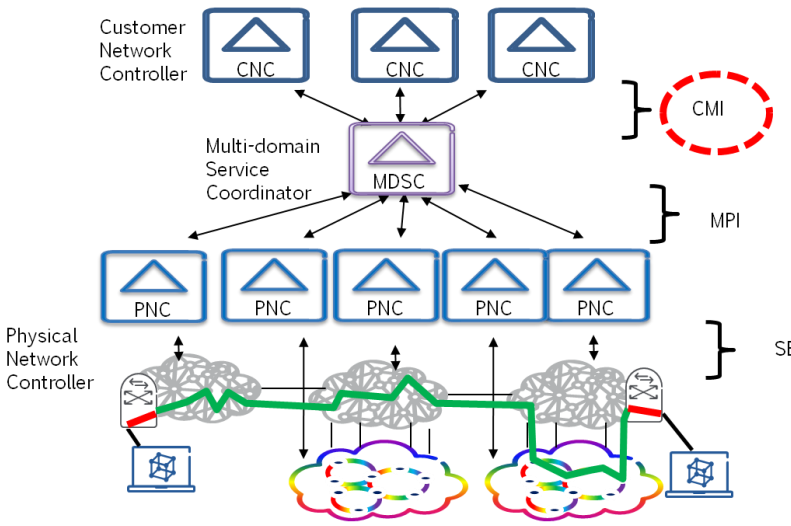
INTRODUCTION

- A Yang Data Model for ACTN VN operations
- This is for CMI i.e. CNC – MDSC Interface
  - Maps to Customer Service Model
- Support for VN views
  - As set of E2E tunnels (VN-Member)
  - As abstract topology
- Support for Access Point (AP) as per the ACTN framework
- MDSC translates and maps the VN request into specific network centric-models
  - e.g., TE-tunnels [TE-Tunnel], TE-topology [TE-TOPO], etc. and its augmented models
  - Coordinate the multi-domain network operations with PNCs.

ACTN Architectural Context:



This draft fulfills Requirements 4-6 from ACTN Requirement draft

- VN Compute
- VN Instantiate
- VN Dynamic Control
- VN Lifecycle M&O

WHY?

- Virtual Network groups multiple E2E tunnels as a VN.
  - VN is a unit for concurrency.
  - TE-tunnel model deals each VN member as a separate entity, so it loses concurrent allocation of TE resources. TE-tunnel model is a sequential provisioning approach.
- It is easier for some customers to work on VN level (Network slice) rather than individual TE tunnels.
- ACTN VN supports multi-source and multi-destination use-case.
  - *Doing this without this model, would require multiple requests and a sophisticated client to look out for changes.*
- ACTN VN supports VN compute (pre-instantiation mode) for the whole VN.
- There are certain advantages to keep a set of TE-tunnels as one VN unit for applying policy, reroute, protection, restoration, etc. rather than treating each TE-tunnel as individual unit.

UPDATES IN THIS VERSION

Added Justifications for this Yang Model

Reference to TE-Topology's TP for the ACTN's AP

- src-tp-id? binary
- dst-tp-id? binary

Bandwidth

- bandwidth? tet:te-bandwidth

Reference to the abstract te topology

- network-ref? -> /nw:networks/network/network-id

ACTN VN YANG

- List of AP
- List of VN
  - VN-member list
  - Support for multi-src and multi-dest
  - Objective Functions
  - Metrics
    - Limit
    - Optimizations
  - Other attributes

```
module: ietf-actn-vn
    +--rw actn
       +--rw ap
       |  +--rw access-point-list* [access-point-id]
       |     +--rw access-point-id      uint32
       |     +--rw access-point-name?   string
       |     +--rw src-tp-id?           binary
       |     +--rw dst-tp-id?           binary
       |     +--rw max-bandwidth?       tet:te-bandwidth
       |     +--rw avl-bandwidth?       tet:te-bandwidth
       +--rw vn
          +--rw vn-list* [vn-id]
             +--rw vn-id                  uint32
             +--rw vn-name?               string
             +--rw vn-member-list* [vn-member-id]
             |  +--rw vn-member-id    uint32
             |  +--rw src
             |  |  +--rw src?            -> /actn/ap/access-point-list/access-point-id
             |  |  +--rw src-vn-ap-id?   uint32
             |  |  +--rw multi-src?      boolean
             |  +--rw dest
             |     +--rw dest?            -> /actn/ap/access-point-list/access-point-id
             |     +--rw dest-vn-ap-id?   uint32
             |     +--rw multi-dest?      boolean
             +--rw objective-function?   pcep:objective-function
             +--rw metric* [metric-type]
             |  +--rw metric-type    identityref
             |  +--rw limit
             |  |  +--rw enabled?   boolean
             |  |  +--rw value?     uint32
             |  +--rw optimize
             |     +--rw enabled?   boolean
             |     +--rw value?     uint32
             +--rw bandwidth?             tet:te-bandwidth
             +--rw protection?            identityref
             +--rw local-reroute?         boolean
             +--rw push-allowed?          boolean
             +--rw incremental-update?    boolean
             +--rw admin-status?          identityref
```

ACTN VN YANG

- RPC: VN-Compute
  - Pre-Instantiation
  - Input
    - VN-Members with source, destinations
    - OF and metric etc
  - output
    - VN

```
rpcs:
  +---x vn-compute
     +---w input
     |  +---w vn-member-list* [vn-member-id]
     |  |  +---w vn-member-id    uint32
     |  |  +---w src
     |  |  |  +---w src?            -> /actn/ap/access-point-list/access-point-id
     |  |  |  +---w src-vn-ap-id?   uint32
     |  |  |  +---w multi-src?      boolean
     |  |  +---w dest
     |  |     +---w dest?            -> /actn/ap/access-point-list/access-point-id
     |  |     +---w dest-vn-ap-id?   uint32
     |  |     +---w multi-dest?      boolean
     |  +---w objective-function?   pcep:objective-function
     |  +---w metric* [metric-type]
     |  |  +---w metric-type    identityref
     |  |  +---w limit
     |  |  |  +---w enabled?   boolean
     |  |  |  +---w value?     uint32
     |  |  +---w optimize
     |  |     +---w enabled?   boolean
     |  |     +---w value?     uint32
     |  +---w bandwidth?            tet:te-bandwidth
     |  +---w protection?           identityref
     |  +---w local-reroute?        boolean
     |  +---w push-allowed?         boolean
     |  +---w incremental-update?   boolean
     +--ro output
        +--ro vn-member-list* [vn-member-id]
        |  +--ro vn-member-id    uint32
        |  +--ro src
        |  |  +--ro src?            -> /actn/ap/access-point-list/access-point-id
        |  |  +--ro src-vn-ap-id?   uint32
        |  |  +--ro multi-src?      boolean
        |  +--ro dest
        |  |  +--ro dest?            -> /actn/ap/access-point-list/access-point-id
        |  |  +--ro dest-vn-ap-id?   uint32
        |  |  +--ro multi-dest?      boolean
        |  +--ro metric* [metric-type]
        |  |  +--ro metric-type    identityref
        |  |  +--ro limit
        |  |  |  +--ro enabled?   boolean
        |  |  |  +--ro value?     uint32
        |  |  +--ro optimize
        |  |     +--ro enabled?   boolean
        |  |     +--ro value?     uint32
        |  +--ro oper-status?    identityref
        +--ro multi-src-dest
           +--ro selected-vn-member-id?   uint32
```

NEXT STEPS

- Continue to enhance the VN Model to meet all requirements of ACTN
  - *VN-Compute RPC output can be enhanced*
- Keep align with all ACTN documents including [Info-Model]
- Comments?
- WG adoption!

THANK YOU!