YANG Data Model for Network Slice Per-Hop Definition
draft-bestbar-teas-yang-ns-phd-00

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IETF-109, November 2020, Virtual
Overview

- YANG data model for programming Network Slice Per Hop Definition (Slice-PHD) on IP/MPLS devices
  - Multiple Slice Selector options
  - Flexible and hierarchical Slice PHB(s)
  - Covers resource management in control plane and data plane
  - Mapping of a slice to a logical topology
Network Slice Per Hop Definition Model

Model Structure

module: ietf-network-slice-phd
  |--rw network-slicing!
  |  |--rw network-slice-phbs
  |     |--rw network-slice-phb* [id]
  |     ............
  +--rw network-slices
  |  |--rw network-slice* [name]
  |     ............
  |  |--rw slice-resource-reservation
  |     ............
  |  |--rw slice-selectors
  |     |--rw slice-selector* [id]
  |     ............
  |  |--rw slice-phb? ns-phb-ref
  |     ............
  +--rw slice-membership
     ............

Slice-PHDs

- **network-slices** container
  - Key elements
    - Slice Resource Reservation
    - Slice Selectors
    - Slice PHB
    - Slice Membership

Slice-PHBs

- **network-slice-phbs** container
  - Referenced by Slice-PHDs
Network Slice Per Hop Definition Model
Slice Per-Hop-Behaviors

Slice-PHBs container (network-slice-phbs)
- Carries a list of Slice-PHB entries
- Slice-PHB entry
  - Referenced by one or more Slice-PHD
  - Options:
    - Reference to a generic PHB profile
    - Custom PHB profile
Network Slice Per Hop Definition Model

Slic Resource Reservation

.slice-resource-reservation Container
- Slice-aware Bandwidth Engineering
- Preference-based preemption of Slice-aware TE paths
- Sharing of resources amongst a group of slices
- Slice Protection
Network Slice Per Hop Definition Model

Slice Selectors

(slice-selectors) Container
- Set of data plane field selectors
- Slice Selector (SS)
  - Identify packets belonging to the given network slice
  - 16-bit ID
    - SS with the lowest ID is the default used by all the topological elements that are members of the given network slice
    - Other entries are used to override the default on select topological elements
### Slice Membership

#### slice-membership Container
- Set of filtering policies
  - Determine which topological elements belong the specific network slice
- Filtering Policy
  - Reference a predefined topology (or)
  - Specify rules to construct customized topology
- Slice members can optionally override the default Slice-PHB and/or the default slice selector.

---

```
+-rw slice-membership
  +-rw filter-policies
    +-rw filter-policy* [id]
    |   +-rw id
    |     uint16
    +-rw (filter-type)?
    |   +--:(topology-ref)
    |     |   +-rw (topo-ref-type)?
    |     |     +--:(algo-id)
    |     |     |   +--rw algo-id?  uint8
    |     +--:(te-topo-id)
    |        +--rw te-topology-identifier
    |        |   +-rw provider-id?  te-global-id
    |        |   +-rw client-id?  te-global-id
    |        |   +-rw topology-id?  te-topology-id
    |     +--:(custom-topology)
    |     |   +-rw include
    |     |     |   +-rw link-affinity*  string
    |     |     |   +-rw link-name*  string
    |     |     |   +-rw node-prefix*  inet:ip-prefix
    |     |     |   +-rw as*  inet:as-number
    |     |   +-rw exclude
    |     |     |   +-rw link-affinity*  string
    |     |     |   +-rw link-name*  string
    |     |     |   +-rw node-prefix*  inet:ip-prefix
    |     |     |   +-rw as*  inet:as-number
    +-rw slice-selector?
    |   ns-ss-ref
    +-rw slice-phb?
    |   ns-phb-ref
```
Next Steps

- Request review and feedback