A YANG Data Model for Multipath Traffic Engineering Directed Acyclic Graph (MPTED) Tunnels and Junctions

draft-beeram-teas-yang-mpted-00

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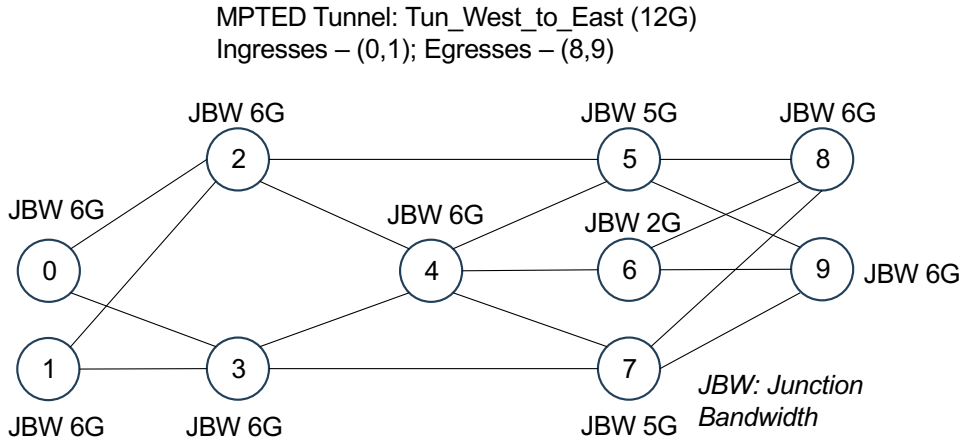
Introduction

- An MPTED tunnel [I-D.draft-kompella-teas-mpte] is a Traffic Engineering (TE) construct that contains a constrained set of paths representing an optimized Directed Acyclic Graph (DAG) from one or more ingresses to one or more egresses.
  - The paths that make up an MPTED tunnel traverse a set of junction no2des.
  - An MPTED junction refers to the construct associated with the MPTED tunnel at each junction node and constitutes a set of previous-hops (JCT-PHOPs) and a set of next-hops (JCT-NHOPs) over which traffic is load-balanced in a weighted fashion.
  - Provisioning an MPTED tunnel in a TE network involves provisioning the control and forwarding plane state associated with the MPTED junction at each junction node.

- An MPTED tunnel is instantiated and managed on a tunnel originator node, while an MPTED junction is instantiated and managed on a junction node.
  - A tunnel originator node MAY also be a junction node.



- [I-D.draft-beeram-teas-yang-mpted] defines a YANG data model for representing, retrieving, and manipulating Multipath Traffic Engineering Directed Acyclic Graph (MPTED) Tunnels and Junctions.
  - The model includes two YANG modules, one for managing MPTED Tunnels on a tunnel originator node and the other for managing MPTED Junctions on a junction node.

MPTED YANG Module: High-Level Model Structure

```
module: ietf-mpted

  augment /te:te:
    +--rw mpted-tunnels
      +--rw tunnel* [originator identifier]
         +--rw originator                  inet:ip-address
         +--rw identifier                  uint32
         +  ..
         +--ro junctions
            +--ro junction* [node-id]
               +--ro node-id               inet:ip-address
               +  ..
               +--ro phops
               |  +--ro phop* [hop-address hop-index]
               |     +--ro hop-address     inet:ip-address
               |     +--ro hop-index       uint32
               |     +  ..
               +--ro nhops
               |  +--ro nhop* [hop-address hop-index]
               |     +--ro hop-address     inet:ip-address
               |     +--ro hop-index       uint32
               |     +  ..
               +--ro phops-pending-deletion
               |  +--ro phop* [hop-address hop-index]
               |     +--ro hop-address     inet:ip-address
               |     +--ro hop-index       uint32
               |     +  ..
               +--ro nhops-pending-deletion
                  +--ro nhop* [hop-address hop-index]
                     +--ro hop-address     inet:ip-address
                     +--ro hop-index       uint32
```

- The top-level 'te' container [I-D.draft-ietf-teas-yang-te] is augmented with a set of MPTED tunnels.
- The 'mpted-tunnels' container carries a list of tunnel entries.
  - Each tunnel entry includes the set of parameters required to produce a list of junctions that need to programmed in the network.
    - The state for each junction entry consists of the set of previous-hops ('phops' container) and next- hops ('nhops' container) associated with the current version, as well as those that are pending deletion ('phops-pending-deletion' and 'nhops-pending-deletion' containers).

MPTED-JCT YANG Module: High-Level Model Structure

```
module: ietf-mpted-jct

    augment /te:te:
      +--rw mpted-junctions
         +--rw junction* [node-id originator identifier]
            +--rw node-id                inet:ip-address
            +--rw originator             inet:ip-address
            +--rw identifier             uint32
            +  ..
            +--rw phops
            |  +--rw phop* [hop-address hop-index]
            |     +--rw hop-address      inet:ip-address
            |     +--rw hop-index        uint32
            |     +  ..
            +--rw nhops
               +--rw nhop* [hop-address hop-index]
                  +--rw hop-address      inet:ip-address
                  +--rw hop-index        uint32
```

- The top-level 'te' container [I-D.draft-ietf-teas-yang-te] is augmented with a set of MPTED junctions.
- The 'mpted-junctions' container carries a list of junction entries.
  - Each junction entry includes information about the associated set of previous-hops ('phops' container) and next-hops ('nhops' container).

Next Steps

- Continue to evolve the model in sync with the architecture and the signaling protocol documents.

- Request feedback.

Thank You

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