Yang model for requesting Path Computation

draft-ietf-teas-yang-path-computation-10
IETF 108 – Virtual Meeting

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Summary of changes from v07

• Major changes to the YANG model
  – path computation for protected paths (as discussed in IETF 104)
  – path computation for bidirectional paths
  – errors in case path computation fails
  – multi-layer path computation
• Addressed comments from TEAS WG
  – Thanks to Haomian Zheng, Yanlei Zheng and Tom Petch
• Changes described in new sections 5.3 and 5.4
• The *(reference)* case, references either
  – existing tunnel: e.g., when computing the protection path to add protection for an existing tunnel
  – an entry to the new *tunnel-attributes* list when computing multiple paths for a tunnel that does not exist yet: tunnel attributes (e.g. tunnel-name, source/destination TTP, encoding and switching-type) are provided here

• The *(reference)* case also provides information about the role and direction of the path being requesting within tunnel (primary or secondary, forward or reverse)
Basic Yang tree concept (2)

```
+-- path-request* [request-id]
 |  +-- request-id                          uint32
 |  +-- (tunnel-attributes)?
 |      |  +--:(reference)
 |      |      |  ...........
 |      |  +--:(value)
 |      |      |  +-- tunnel-name?          string
 |      |      |  ...........
 |  ...........
```

- The (value) case provides the set of tunnel attributes (e.g. tunnel-name, source/destination TTP, encoding and switching-type) in case there is no need to associated multiple path requests (e.g., path computation for an unprotected tunnel which does not exist yet)

- The server will have all the information to know how to create a tunnel within the operational DS, when requested (alignment with the tunnel model is strengthened)
Basic Yang tree concept (3)

- Support of multi-layer path computation based on the same approach with dependency tunnels as in [TE-TUNNEL] draft
  - Dependency tunnel is either already present in the datastore in the tunnel-attributes list

```
  +-- dependency-tunnels
    |   +-- dependency-tunnel* [name]
    |       +-- name
    |       |   |   +-- encoding? identityref
    |       |   +-- switching-type? identityref
    |   +-- dependency-tunnel-attributes* [name]
    |       +-- name leafref
    |       +-- encoding? identityref
    |       +-- switching-type? identityref
```

- Server-layer tunnel should provide the information regarding the dynamic link in the client layer topology supported by that tunnel.

```
  +-- hierarchical-link
    +-- local-te-node-id? te-types:te-node-id
    +-- local-te-link-tp-id? te-types:te-tp-id
    +-- remote-te-node-id? te-types:te-node-id
    +-- te-topology-identifier
```
Open Issues status

• GitHub Repository
  https://github.com/rvilalta/ietf-te-path-computation

• Tracking Open Issues, discussions and resolutions linked to YANG model
  • Still 9 open, 5 specific for path computation RPC
    – 1 pending feedbacks from YANG experts (#76)
    – 2 editorial (#77: hop cumulative metric, #58: review terminology)
    – 2 pending the YANG model becoming stable (#75: security, #40: example)
YANG Open Issue (#76, 1)

--- path-request* [request-id]
|  +-- request-id                             uint32
|  ...........
|  |  |  |     +-- tunnel-attributes-ref     leafref
|  ...........
--- tunnel-attributes* [tunnel-name]
|  +-- tunnel-name                         string
|  ...........

• How to specify the leafrefs within RPC?

• This code compiles with pyang 1.7.5 while it fails with pyang 2.1:
  leaf tunnel-attributes-ref {
      type leafref {
          path "/te:tunnels-path-compute/te:input/
          + "te:path-compute-info/
          + "te-pc:tunnel-attributes/te-pc:tunnel-name";
      }
  }

• This code compiles with pyang 2.1 while it fails with pyang 1.7.5:
  leaf tunnel-attributes-ref {
      type leafref {
          path "/te:tunnels-path-compute/
          + "te:path-compute-info/
          + "te-pc:tunnel-attributes/te-pc:tunnel-name";
      }
  }
YANG Open Issue (#76, 2)

• How to condition data definition in the RPC output based on the RPC input?

• This when statement compiles only with pyang 1.7.5 while it fails with pyang 2.1

```yang
augment "/te:tunnels-actions/te:output" {
    container path-computed-delete-result {
        when "derived-from-or-self(../../te:input/te:action-info/"
            + "te:action, 'tunnel-action-path-compute-delete')";
    }  // container path-computed-delete-result
}  // path-delete rpc output
```
Next Steps

• Ready for YANG doctor review
• Resolve few open issues
  – Continue cooperation with TE Tunnel model authors
• Plan for WG LC after IETF 109