MPLS / TE YANG Data Model for Service Provider Networks

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draft-openconfig-mpls-consolidated-model-01

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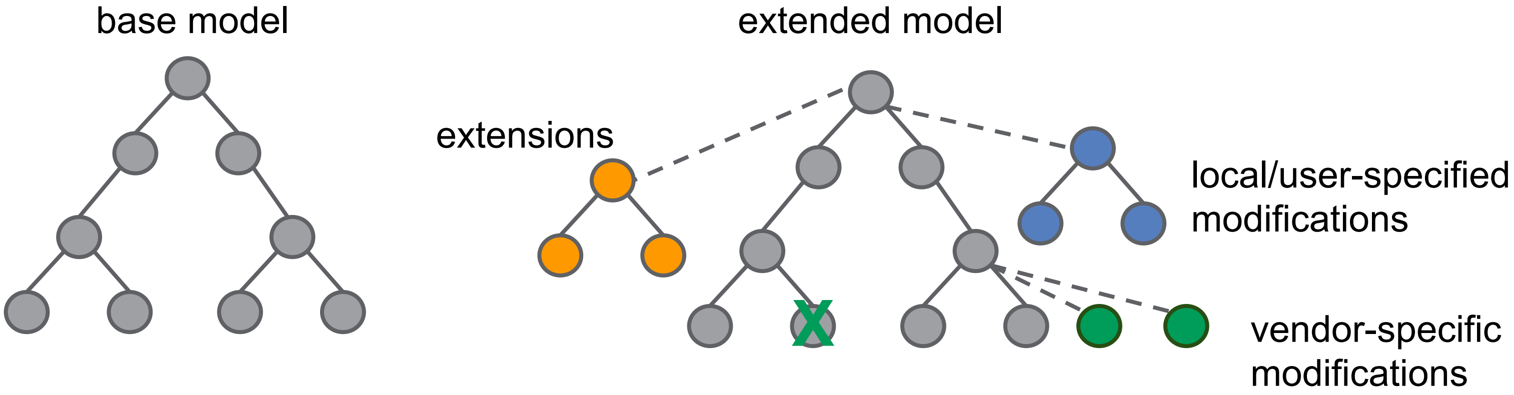
What is OpenConfig driving towards?

- Goal: have a vendor-neutral and programmable network infrastructure - data models are a key component of the solution
    - Data models must
        - cover the common operational use cases
        - be implementable and implemented by the equipment vendors
    - Data models don’t have to be complete and comprehensive
- The OpenConfig model covers a subset of the MPLS functionality
    - complete coverage can be achieved via augmentations and extensions

Extending the model coverage


base model
extended model
extensions
X
local/user-specified modifications
vendor-specific modifications

- base model as a starting point
- other models can augment the base model
- vendors can offer augmentations / deviations
- operators can add locally consumed extensions

How do we get there ?

- Implementable and implemented models- ensure the features in the model are widely supported on major implementations
- What does this mean for the models
  - create groupings that can be leveraged across the IETF (vendor) and OpenConfig models
  - reuse the IETF work where possible

What progress have we made?

- Between last IETF and now, several meetings with the authors of the TEAS and MPLS models
    - Review of the models
    - Alignment on the approach for modeling operational state
    - Agreement on the desire to have reusable groupings across the models.

Changes from version 00

- Add support for operational state (required restructuring groupings)
- Create a stanza for global TE attributes and moved various attributes into it
- Expand model coverage

Changes from version 00 - modeling state

- Operational Structure and Organization of YANG Models
  - draft-openconfig-netmod-model-structure-00
  - follow-on proposal in draft-rtgyangdt-rtgwg-device-model-00
- Following modeling structure described in draft-openconfig-netmod-opstate-01
- For each configuration statement there is a corresponding state statement. Additional state variables for items that are not configured (counters, statistics negotiated values, etc.)
- Each container holds a "config" and "state" sub-container
  - the state container includes a) operational state of configurable leaves, and b) derived counters and statistical information.

Changes from version 00 - te global attributes

- For MPLS-TE items that exist independently of the signaling protocol
  - ted-update threshold
  - timers related to TE LSPs - install and cleanup delays, optimization timer
  - admin-groups (and later SRLG)

```
+--rw te-global-attributes
      |  +--rw ted-update-threshold
      |     ...
      |  +--rw te-interfaces* [interface-name]
      |  |  +--rw interface-name                 string
      |  |  +--rw interface-admin-groups*          leafref
      |  |  +--rw interface-ted-update-threshold?   leafref
      |  +--rw te_lsp_timers
      |  |  +--rw config
      |  |  |  +--rw te-lsp-install-delay?      uint16
      |  |  |  +--rw te-lsp-cleanup-delay?      uint16
      |  |  |  +--rw te-lsp-reoptimize-timer?   uint16
      |  |  +--ro state
      |     ...
      |  +--rw mpls-admin-groups* [admin-group-name]
      |     +--rw admin-group-name     string
      |     +--rw admin-group-value?   uint32
```

Changes from version 00 - expand coverage

- Numerous grouping changes across all stanzas.
- Removed the need to configure interfaces under the top level MPLS group - feedback from Kireeti
- Added a global stanza under the RSVP protocol for protocol-wide configuration (e.g. graceful restart, soft-preemption, protocol statistics)
- Added a hierarchy for protocol options under RSVP interfaces, for keeping track of hello interval and refresh reduction parameters
- Added support for RSVP authentication, reoptimization timers for TE LSPs, reorganize the SR part.

Summary and next steps

Summary

- Progress towards aligning with the TEAS model, goal is to reuse groupings as possible
- Introduction of the global te-attributes stanza
- Operational state support
- Increased coverage
- Model is available in the public YangModels repository https://github.com/YangModels/yang/tree/master/experimental/openconfig

Next steps

- Continue building out the model - in particular LDP and SR