YANG DATA MODEL FOR TOPOLOGY FILTER

draft-bestbar-teas-yang-topology-filter-04

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INTRODUCTION

- A topology filter is a data construct that is used to filter network topologies [RFC8345].

  - Applied on either a native topology or a customized topology [RFC8795] to produce a filtered set of topological elements.

- A topology filter-set is a union of multiple topology filters that can be applied in tandem on a topology.

- This document defines a YANG data model for the management of topology filters/filter-sets on network elements and controllers.

- *Note: An implementation may maintain network topologies that are learnt via routing protocols in a Routing Information Base (RIB) [RFC8431] and use routing policies [RFC9067] to filter the entries in the RIB.*

  - *Such an implementation is not the target of this document.*

USE-CASES

- Specification of topology related constraints for TE Path Computation -
- Examples:
  - Compute a path within a specified topology.
  - Compute a path within the topology. associated with a specific IGP domain.
  - Compute a path within the topology learnt from a specific TE Information Source.
  - Compute a path within the topology defined by the application of one or more topology filters:
    - Use a topology with elements learnt via ISIS Level-2 and include resource-affinity "RED"
    - Use a topology with elements associated with ISIS Flexible Algorithm 128 and exclude resource-affinity "BLUE"

- Specification of topology associated with an Network Resource Partition (NRP) -
- Examples:
  - All the elements in the specified topology are part of the NRP topology.
  - All the topological elements associated with a specific IGP domain are part of the NRP topology.
  - All the topological elements that include resource-affinity "RED" and exclude resource-affinity "BLUE" are part of the NRP topology.

MODEL STRUCTURE

- The top-level 'networks' container [RFC8435] is augmented with a set of topology filters and a set of topology filter-sets

```
module: ietf-topology-filter
    augment /nw:networks:
      +--rw topology-filters!
      |  +--rw topology-filter* [name]
      |     +--rw name            string
      |     +--rw topology-ref
      |     |  .........
      |     +--rw include-any
      |     |  .........
      |     +--rw include-all
      |     |  .........
      |     +--rw exclude
      |        .........
      +--rw topology-filter-sets!
         +--rw topology-filter-set* [name]
            +--rw name             string
            +  .........
```

TOPOLOGY FILTERS

- The 'topology-filters' container carries a list of topology filters.

- Each topology-filter entry specifies a set of include-any, include- all and exclude filtering rules that can be applied on either the native topology or a user specified topology.

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TOPOLOGY REFERENCE

- The 'topology-reference' container indicates the topology on which the filtering rules need to be applied.

- The referenced topology could be a predefined TE topology and/or a specific IGP domain.

- The absence of the 'topology-reference' indicates that the filtering rules are to be applied on the native topology.

```
+--rw topology-ref
   +--rw igp-domain-identifier
   |  +--rw protocol-id?   igp-protocol
   |  +--rw instance-id?   uint32
   |  +--rw division-id?   uint32
   |  +--rw algo-id?       uint8
   |  +--rw mt-id?         uint16
   +--rw te-topology-identifier
      +--rw provider-id?   te-global-id
      +--rw client-id?     te-global-id
      +--rw topology-id?   te-topology-id
```

FILTERS

- The 'include-any', 'include-all' and 'exclude' containers carry a varied set of attributes that can be used as rules to filter the topology.

- If the topology-filter entry carries no filtering rules and only references a specific topology, then the set of filtered topological elements produced is the same as the one defined by the referenced topology.

```
+--rw include-any
|  +--rw link-affinity*    string
|  +--rw link-name*        string
|  +--rw node-prefix*      inet:ip-prefix
|  +--rw as*               inet:as-number
|  +--rw info-source* [source-id instance-id division-id]
|     +--rw source-id      tet:te-info-source
|     +--rw instance-id    uint32
|     +--rw division-id    uint32
+--rw include-all
|  +--rw link-affinity*    string
|  +--rw link-name*        string
|  +--rw node-prefix*      inet:ip-prefix
|  +--rw as*               inet:as-number
|  +--rw info-source* [source-id instance-id division-id]
|     +--rw source-id      tet:te-info-source
|     +--rw instance-id    uint32
|     +--rw division-id    uint32
+--rw exclude
    +--rw link-affinity*    string
    +--rw link-name*        string
    +--rw node-prefix*      inet:ip-prefix
    +--rw as*               inet:as-number
    +--rw info-source* [source-id instance-id division-id]
        +--rw source-id      tet:te-info-source
        +--rw instance-id    uint32
        +--rw division-id    uint32
```

TOPOLOGY FILTER-SETS

- The 'topology-filter-sets' container carries a list of topology filter-sets.

- Each topology-filter-set entry constitutes a list of topology-filter references.

- This is used when there is a need to create a union of multiple topology filters.

```
+--rw topology-filter-sets!
   +--rw topology-filter-set* [name]
      +--rw name                string
      +--rw topology-filter*
           -> ../../../topology-filters/topology-filter/name
```

NEXT STEP

Request review and feedback

THANK YOU

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