YANG DATA MODEL FOR TOPOLOGY FILTER

draft-bestbar-teas-yang-topology-filter-05

Vishnu Pavan Beeram             Juniper Networks
Tarek Saad                       Cisco Systems
Rakesh Gandhi                    Cisco Systems
Xufeng Liu                       Alef Edge

IETF 119 (Brisbane) - TEAS Working Group – March 2024
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.

- Used in draft-ietf-teas-nrp-yang
The top-level 'networks' container [RFC8435] is augmented with a set of topology filters and a set of topology filter-sets.

```plaintext
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.
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.
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.
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.
NEXT STEP

Request WG Adoption
THANK YOU

draft-bestbar-teas-yang-topology-filter@ietf.org