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Applicability of RFC8795 YANG data model to SIMAP
draft-busi-nmop-simap-rfc8795-applicability-01

Abstract

This document analyses the applicability of the RFC 8795 YANG data model to Service & Infrastructure Maps (SIMAP) and in particular analysis which requirements can be supported by the existing YANG data model defined in RFC 8795.

About This Document

This note is to be removed before publishing as an RFC.

The latest revision of this draft can be found at <https://italobusi.github.io/simap-yang/draft-xyz-nmop-simap-yang-applicability.html>. Status information for this document may be found at <https://datatracker.ietf.org/doc/draft-busi-nmop-simap-rfc8795-applicability/>.

Discussion of this document takes place on the Network Management Operations Working Group mailing list (<mailto:nmop@ietf.org>), which is archived at <https://mailarchive.ietf.org/arch/browse/nmop/>. Subscribe at <https://www.ietf.org/mailman/listinfo/nmop/>.

Source for this draft and an issue tracker can be found at <https://github.com/italobusi/simap-yang>.

Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

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1. Introduction

The concept of Service & Infrastructure Maps (SIMAP) is being defined in [I-D.ietf-nmop-simap-concept] together with a set of SIMP requirements and use cases.

SIMAP is defined in [I-D.ietf-nmop-simap-concept], as:

SIMAP is a data model that provides a topological view of the operator's networks and services, including how it is connected to other models (e.g., inventory) and external data sources (e.g., observability data, and operational knowledge). This model represents a multi-layered topology and offers mechanisms to navigate amongst layers and correlate between them. This includes layers from physical topology to service topology. This model is applicable to multiple domains (access, core, data center, etc.) and technologies (Optical, IP, etc.).

It is worth noting that the YANG data model in [RFC8795] defines a topology model which:

- * represents a multi-layered topology;
- * offers mechanisms to navigate amongst layers and correlate between them;
- * is applicable to multiple domains (access, core, data center, etc.) and technologies (Optical, IP, etc.).

[I-D.ietf-teas-te-topology-profiles] clarifies that

It is therefore worthwhile analyzing the applicability of the YANG data model in [RFC8795] to meet the SIMAP requirements and identify any gaps that need to be addressed before starting the work on new YANG data models to meet the SIMAP requirements, as outlined in [I-D.ietf-nmop-simap-concept].

Understanding the degree of standardization and identifying potential gaps are crucial for supporting the SIMAP applications while ensuring multi-vendor interoperability and compatibility with other applications which can run on top of the same network controller.

2. Conventions and Definitions

TODO Conventions and Definitions

3. Gap Analysis

3.1. Bidirectional Links

Bidirectional links can be modelled as two unidirectional links, one for each direction, terminated on the same two termination points, as described in Section 4.4.5 of [RFC8345].

It is worth noting that a bidirectional link can be unambiguously distinguished from two unidirectional links between the same two nodes since the two unidirectional links will be terminated on different termination points, as shown in Figure 1.

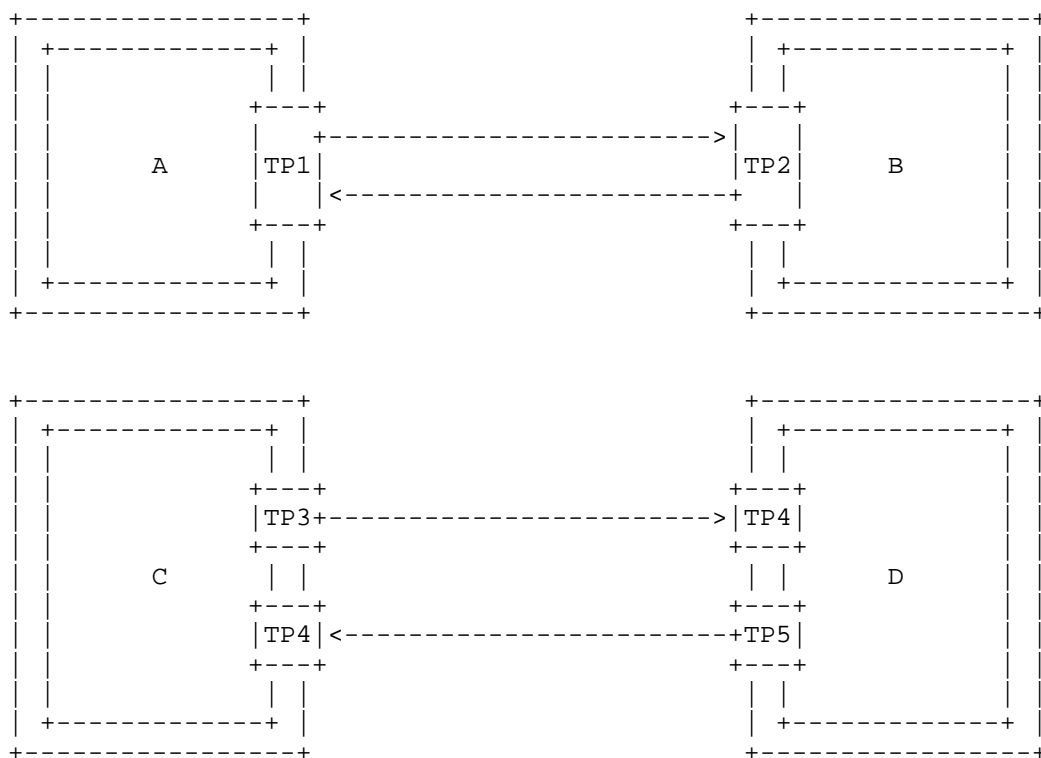


Figure 1: Difference between one bidirectional link and two unidirectional links

3.2. Multipoint Links

Multipoint links can be modelled as pseudonodes, as described in Section 4.4.5 of [RFC8345].

The type of multipoint link (e.g., point-to-multipoint or multipoint-to-multipoint, as defined in [I-D.ietf-nmop-simap-concept]) and the role of the termination points in the link (e.g., source, destination, hub, spoke, as defined in [I-D.ietf-nmop-simap-concept]) can be unambiguously understood from: - the links entering to or departing from the termination points of the pseudonode, and - the 'is-allowed' attribute of the connectivity matrix of the pseudonode, as defined in [RFC8795].

Note: some examples for multipoint links are described in Section 2.5 of [I-D.ietf-teas-te-topology-profiles]. More examples can be provided in future versions of this document.

3.3. Links and nodes down in topology

[RFC8795] defines the 'oper-status' attribute for nodes, links and termination points, therefore allowing to report links and nodes down in the topology, and to unambiguously distinguishing between nodes and links which are up or down.

3.4. Multi-Layer Topologies

As outlined in Section 2 of [I-D.ietf-nmop-simap-concept]:

[RFC8345] is flexible and can support both the same network topology instance with multiple layers (e.g., Layer 2 and Layer 3) or separate network topology instances with supporting relations between them (e.g., separate Layer 2 and Layer 3). Therefore, multiple topology layers can be grouped into the same network topology instance, if solution requires.

[RFC8795] augments [RFC8345] and therefore provide the same flexibility.

As described in Section 3 of [I-D.havel-nmop-simap-yang]:

- Layering relationships are expressed solely through the supporting construct, without additional semantics such as underlay, primary, backup, load-sharing, path, sequential, or parallel roles.

This issue was taken into account when designing the YANG data model in [RFC8795] and the 'underlay' relationship has been properly defined to support navigation between overlay and underlay layers, as described in Section 2.3 of [I-D.ietf-teas-te-topology-profiles].

Some guidelines on how to unambiguously use the supporting relationship, defined in [RFC8345], and the 'underlay' relationship defined in [RFC8795], have been clarified in Section 2.3.1 of [I-D.ietf-teas-te-topology-profiles].

As outlined in REQ-BIDIR of [I-D.ietf-nmop-simap-concept], a bidirectional link can be supported by two unidirectional links in the lower layer. For example, a Ethernet (bidirectional) link can be supported by two physical layer links associated with two unidirectional fibers.

This relationship can be modelled using the link 'underlay' relationship, as shown in Figure 2:

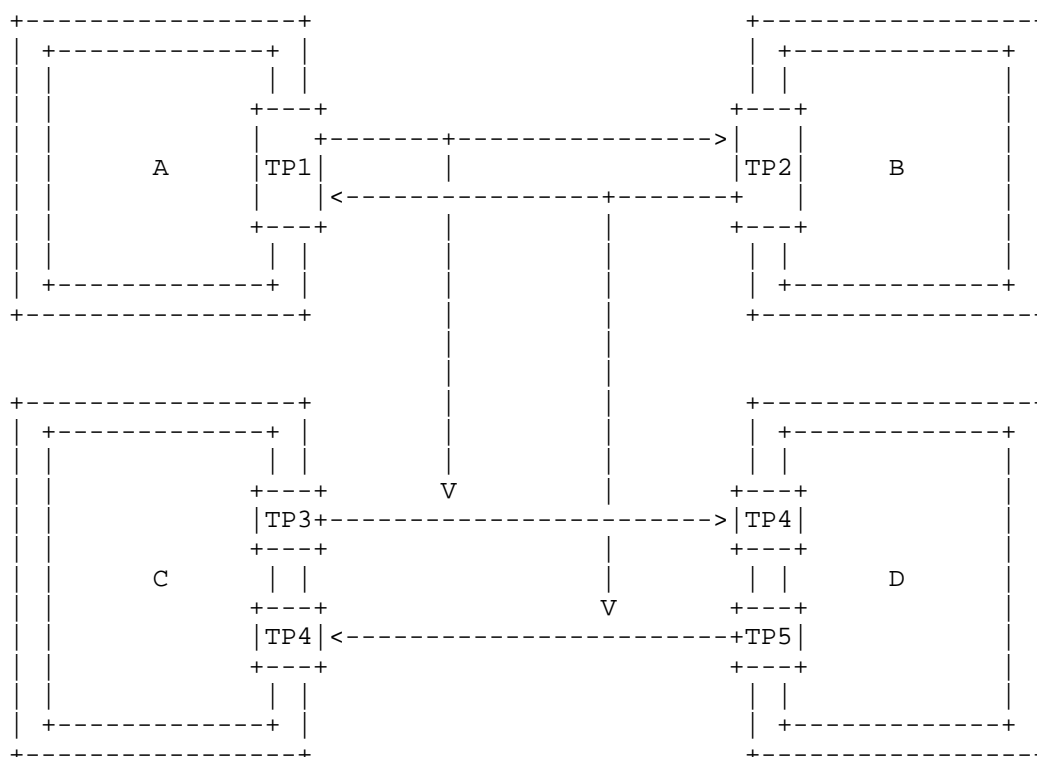


Figure 2: Example of two unidirectional links supporting one bidirectional link

Note: in this case each link is supported by a primary path composed by a single link.

It is worth noting that modelling the bidirectional link is modelled as two unidirectional link instances allows also to unambiguously understand which unidirectional underlay link/path supports which direction (forward or reverse) of the overlay bidirectional link. ls
Multi-domain Links

Multi-domain links can be represented as open-ended links on each topology instance and unambiguously associated as multi-domain links using either the remote node ID / link ID attribute or the inter-domain-plug-id, as described in Section 4.2 of [RFC8795].

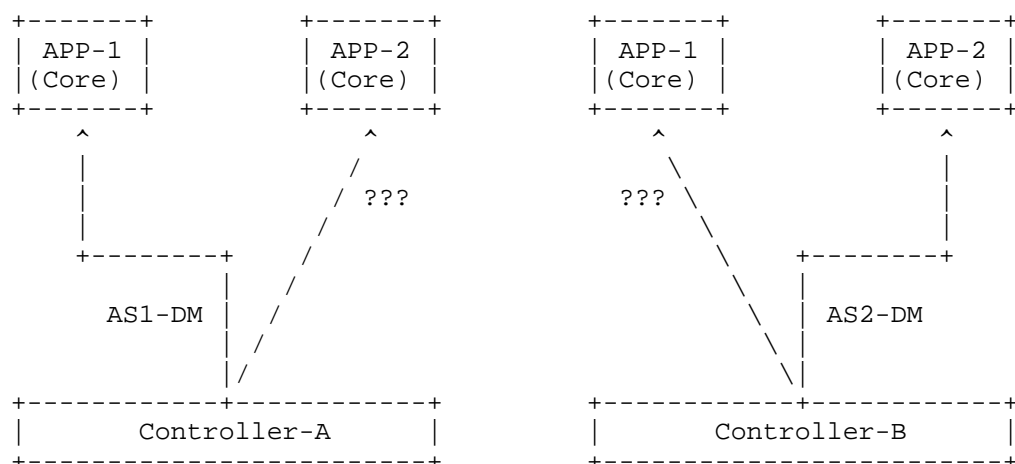
4. Design Considerations

Reusing existing YANG data models to support multiple applications is a key enabler to achieve multi-vendor interoperability.

A network controller needs to support multiple applications (some of which may not be defined at the time the network controller is defined) and different applications have different requirements on the data model they use internally to perform their tasks.

Exposing application-specific data models at the northbound of a network controller appears making the application simpler to implement when it is the only application to be implemented on top of a given controller but results in more complex implementations for network controllers and the applications and increase complexity to achieve multi-vendor interoperability and integration.

Figure 3 shows a case where a controller-A is interfacing an Application-1 through the application-specific data model designed for Application-1 (i.e., AS1-DM) and a controller-B is interfacing another Application-2 through the application-specific data model designed for Application-2 (i.e., AS2-DM).



Notes:

- AS1-DM: Application 1 (APP-1) application-specific data model
- AS2-DM: Application 1 (APP-2) application-specific data model

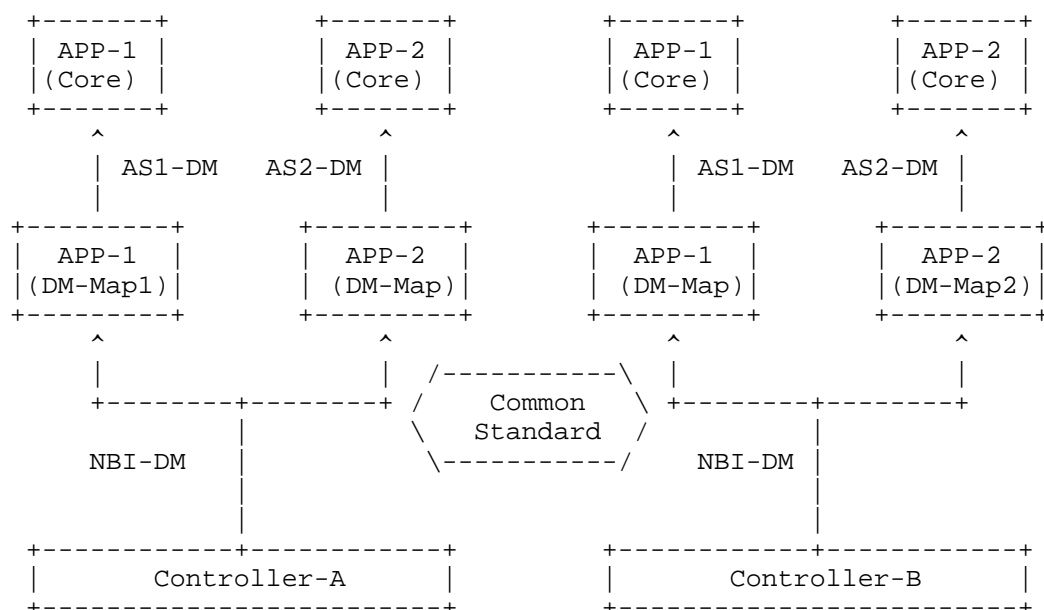
Figure 3: Concerns with defining application-specific data models

The two application-specific data models can provide the same information but with different formatting. For example, Application-1 may need to model bidirectional links as a single entity (link of type bidirectional) while Application-2 may need to model bidirectional links as two unidirectional links.

This solution works well as long as Application-1 and controller-A are deployed in different silos than Application-2 and controller-B. Otherwise, operational and implementation issues have to be faces when there is the need to run Application-1 over network controller-B or, Application-2 over network controller-A.

This would require the operator to negotiate with the vendor and controller vendors customized solutions before integrating a new application or a new controller in the network and increased complexity in the application and network controller implementations.

Figure 4 describes an architecture based on a common and standardized data model to support multi-vendor integration.



Notes:

- AS1-DM: Application 1 (APP-1) application-specific data model
- AS2-DM: Application 1 (APP-2) application-specific data model
- NBI DM: Standard data model exposed by both network controllers
- DM-Map1: Application specific data model mapper between the NBI DM and the AS1-DM
- DM-Map2: Application specific data model mapper between the NBI DM and the AS2-DM

Figure 4: Use of a common and standardized data model to support multi-vendor integration

In this case, the data model exposed by network controllers (e.g., controller-A and controller-B) is the same and each application needs to translate/map the standardized data model exposed by the network controller to its own application-specific data model.

Following this approach an existing application (e.g., Application-1) can be ported from one controller to another controller (e.g., from controller-A to controller-B) ideally with no change and additional testing.

Reusing RFC8795 YANG data model for SIMAP applications will allow TE and SIMAP application to co-exist on top of the same network controller, allowing seamless migration from network scenarios supporting only one of these applications to network scenarios where

both applications are supported at the same time or even scenarios where either or both applications are supported together with new applications not yet defined.

5. Security Considerations

TODO Security

6. IANA Considerations

This document has no IANA actions.

7. References

7.1. Normative References

- [RFC8345] Clemm, A., Medved, J., Varga, R., Bahadur, N., Ananthakrishnan, H., and X. Liu, "A YANG Data Model for Network Topologies", RFC 8345, DOI 10.17487/RFC8345, March 2018, <<https://www.rfc-editor.org/rfc/rfc8345>>.
- [RFC8795] Liu, X., Bryskin, I., Beeram, V., Saad, T., Shah, H., and O. Gonzalez de Dios, "YANG Data Model for Traffic Engineering (TE) Topologies", RFC 8795, DOI 10.17487/RFC8795, August 2020, <<https://www.rfc-editor.org/rfc/rfc8795>>.

7.2. Informative References

- [I-D.havel-nmop-simap-yang] Havel, O., Davis, N., Claise, B., de Dios, O. G., and T. Graf, "A YANG Data Model for SIMAP", Work in Progress, Internet-Draft, draft-havel-nmop-simap-yang-01, 20 October 2025, <<https://datatracker.ietf.org/doc/html/draft-havel-nmop-simap-yang-01>>.
- [I-D.ietf-nmop-simap-concept] Havel, O., Claise, B., de Dios, O. G., and T. Graf, "SIMAP: Concept, Requirements, and Use Cases", Work in Progress, Internet-Draft, draft-ietf-nmop-simap-concept-08, 23 February 2026, <<https://datatracker.ietf.org/doc/html/draft-ietf-nmop-simap-concept-08>>.
- [I-D.ietf-teas-te-topology-profiles] Busi, I., Liu, X., Bryskin, I., Saad, T., and O. G. de Dios, "Profiles for Traffic Engineering (TE) Topology Data Model and Applicability to non-TE-centric Use Cases", Work

in Progress, Internet-Draft, draft-ietf-teas-te-topology-profiles-05, 2 March 2026,
<<https://datatracker.ietf.org/doc/html/draft-ietf-teas-te-topology-profiles-05>>.

Appendix A. Example of deviation statements

[I-D.ietf-teas-te-topology-profiles] notes that existing implementations of [RFC8795] have described the implemented profiled by manually pruning/profiling the YANG tree generated from the YANG module defined in [RFC8795] and those pruned/profiled YANG trees provided sufficient input for the implementers to generate proper APIs.

However, [I-D.ietf-teas-te-topology-profiles] is also exploring the possibility to use the YANG deviation statements to programmatically generate pruned/profiled YANG trees.

An example of a YANG deviation module for SIMAP applications is provided below.

```
module ietf-simap-deviation-example {
  yang-version 1.1;
  namespace "https://example.com/ns/ietf-simap-deviation-example";
  prefix simapd;

  import ietf-network {
    prefix nw;
    reference
      "RFC 8345: A YANG Data Model for Network Topologies";
  }
  import ietf-network-topology {
    prefix nt;
    reference
      "RFC 8345: A YANG Data Model for Network Topologies";
  }
  import ietf-te-topology {
    prefix tet;
    reference
      "RFC 8795: YANG Data Model for Traffic Engineering (TE)
        Topologies";
  }

  organization
    "Network Management Operations (NMOP) Working Group";
  contact
    "WG Web:   <https://datatracker.ietf.org/group/nmop/>
    WG List:  <mailto:nmop@ietf.org>
```

Editor: Italo Busi
<Italo.Busi@huawei.com>;

description

"This module defines an example of a YANG data model containing the YANG deviation statements to support the implementation of the SIMAP YANG data model re-using a sub-set of the TE topology model.

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This version of this YANG module is part of RFC XXXX; see the RFC itself for full legal notices..";

revision 2026-03-02 {

description

"Initial version";

reference

"RFC XXXX: Applicability of existing YANG data models to SIMAP";

}

/*

* Deviations

*/

deviation "/nw:networks/tet:te" {

description

"SIMAP implementations are not required to implement TE templates.";

deviate not-supported;

}

deviation "/nw:networks/nw:network/tet:te-topology-identifier" {

description

"SIMAP implementations are not required to implement TE topology identifiers.";

deviate not-supported;

}

deviation "/nw:networks/nw:network/tet:te" {

```
    description
      "SIMAP implementations are not required to implement the
      augmentation for TE topologies.";
    deviate not-supported;
  }

  deviation "/nw:networks/nw:network/nw:node/tet:te-node-id" {
    description
      "SIMAP implementations are not required to implement TE node
      identifiers.";
    deviate not-supported;
  }

  deviation "/nw:networks/nw:network/nw:node/tet:te" {
    description
      "SIMAP implementations are not required to implement TE node
      identifiers.";
    deviate delete {
      must '../te-node-id';
    }
  }

  deviation "/nw:networks/nw:network/nw:node/tet:te"
    + "/tet:te-node-template" {
    description
      "SIMAP implementations are not required to implement TE node
      templates.";
    deviate not-supported;
  }

  deviation "/nw:networks/nw:network/nw:node/tet:te"
    + "/tet:te-node-attributes/tet:admin-status" {
    description
      "SIMAP implementations are not required to implement the TE
      node administrative status.";
    deviate not-supported;
  }

  deviation "/nw:networks/nw:network/nw:node/tet:te"
    + "/tet:te-node-attributes/tet:connectivity-matrices"
    + "/tet:label-restrictions" {
    description
      "SIMAP implementations are not required to implement the label
      restrictions for the connectivity matrix.";
    deviate not-supported;
  }

  deviation "/nw:networks/nw:network/nw:node/tet:te"
```

```
    + "/tet:te-node-attributes/tet:connectivity-matrices"
    + "/tet:underlay" {
description
  "SIMAP implementations are not required to implement the
  underlay paths for the connectivity matrix.";
deviate not-supported;
}

deviation "/nw:networks/nw:network/nw:node/tet:te"
  + "/tet:te-node-attributes/tet:connectivity-matrices"
  + "/tet:path-constraints" {
description
  "SIMAP implementations are not required to implement the
  path constraints for the connectivity matrix.";
deviate not-supported;
}

deviation "/nw:networks/nw:network/nw:node/tet:te"
  + "/tet:te-node-attributes/tet:connectivity-matrices"
  + "/tet:optimizations" {
description
  "SIMAP implementations are not required to implement the
  path optimizations for the connectivity matrix.";
deviate not-supported;
}

deviation "/nw:networks/nw:network/nw:node/tet:te"
  + "/tet:te-node-attributes/tet:connectivity-matrices"
  + "/tet:tiebreaker" {
description
  "SIMAP implementations are not required to implement the
  tiebreaker for the connectivity matrix.";
deviate not-supported;
}

deviation "/nw:networks/nw:network/nw:node/tet:te"
  + "/tet:te-node-attributes/tet:connectivity-matrices"
  + "/tet:path-properties" {
description
  "SIMAP implementations are not required to implement the
  path properties for the connectivity matrix.";
deviate not-supported;
}

deviation "/nw:networks/nw:network/nw:node/tet:te"
  + "/tet:te-node-attributes/tet:connectivity-matrices"
  + "/tet:connectivity-matrix/tet:from"
  + "/tet:label-restrictions" {
```

```
description
  "SIMAP implementations are not required to implement the label
  restrictions for the connectivity matrix.";
deviate not-supported;
}

deviation "/nw:networks/nw:network/nw:node/tet:te"
  + "/tet:te-node-attributes/tet:connectivity-matrices"
  + "/tet:connectivity-matrix/tet:to"
  + "/tet:label-restrictions" {
  description
    "SIMAP implementations are not required to implement the label
    restrictions for the connectivity matrix.";
  deviate not-supported;
}

deviation "/nw:networks/nw:network/nw:node/tet:te"
  + "/tet:te-node-attributes/tet:connectivity-matrices"
  + "/tet:connectivity-matrix/tet:underlay" {
  description
    "SIMAP implementations are not required to implement the
    underlay paths for the connectivity matrix.";
  deviate not-supported;
}

deviation "/nw:networks/nw:network/nw:node/tet:te"
  + "/tet:te-node-attributes/tet:connectivity-matrices"
  + "/tet:connectivity-matrix/tet:path-constraints" {
  description
    "SIMAP implementations are not required to implement the
    path constraints for the connectivity matrix.";
  deviate not-supported;
}

deviation "/nw:networks/nw:network/nw:node/tet:te"
  + "/tet:te-node-attributes/tet:connectivity-matrices"
  + "/tet:connectivity-matrix/tet:optimizations" {
  description
    "SIMAP implementations are not required to implement the
    path optimizations for the connectivity matrix.";
  deviate not-supported;
}

deviation "/nw:networks/nw:network/nw:node/tet:te"
  + "/tet:te-node-attributes/tet:connectivity-matrices"
  + "/tet:connectivity-matrix/tet:tiebreaker" {
  description
    "SIMAP implementations are not required to implement the
```

```
        tiebreaker for the connectivity matrix.";
    deviate not-supported;
}

deviation "/nw:networks/nw:network/nw:node/tet:te"
    + "/tet:te-node-attributes/tet:connectivity-matrices"
    + "/tet:connectivity-matrix/tet:path-properties" {
    description
        "SIMAP implementations are not required to implement the
        path properties for the connectivity matrix.";
    deviate not-supported;
}

deviation "/nw:networks/nw:network/nw:node/tet:te"
    + "/tet:te-node-attributes/tet:signaling-address" {
    description
        "SIMAP implementations are not required to implement the
        node's signaling address.";
    deviate not-supported;
}

deviation "/nw:networks/nw:network/nw:node/tet:te"
    + "/tet:geolocation" {
    description
        "SIMAP implementations are not required to implement the
        node's geolocation.";
    deviate not-supported;
}

deviation "/nw:networks/nw:network/nw:node/tet:te"
    + "/tet:is-multi-access-dr" {
    description
        "SIMAP implementations are not required to implement the
        designated router information.";
    deviate not-supported;
}

deviation "/nw:networks/nw:network/nw:node/tet:te"
    + "/tet:information-source" {
    description
        "SIMAP implementations are not required to implement the
        node's information source (to be confirmed).";
    deviate not-supported;
}

deviation "/nw:networks/nw:network/nw:node/tet:te"
    + "/tet:information-source-instance" {
    description
```



```
    "SIMAP implementations are not required to implement the
      node's information source (to be confirmed).";
    deviate not-supported;
  }

deviation "/nw:networks/nw:network/nw:node/tet:te"
  + "/tet:information-source-state" {
  description
    "SIMAP implementations are not required to implement the
      node's information source (to be confirmed).";
    deviate not-supported;
  }

deviation "/nw:networks/nw:network/nw:node/tet:te"
  + "/tet:information-source-entry" {
  description
    "SIMAP implementations are not required to implement the
      node's information source (to be confirmed).";
    deviate not-supported;
  }

deviation "/nw:networks/nw:network/nw:node/tet:te"
  + "/tet:statistics" {
  description
    "SIMAP implementations are not required to implement the
      node's statistics (to be confirmed).";
    deviate not-supported;
  }

deviation "/nw:networks/nw:network/nw:node/tet:te"
  + "/tet:tunnel-termination-point" {
  description
    "SIMAP implementations are not required to implement the
      tunnel termination points (to be confirmed).";
    deviate not-supported;
  }

deviation "/nw:networks/nw:network/nt:link/tet:te"
  + "/tet:bundle-stack-level/tet:component" {
  description
    "SIMAP implementations are not required to implement the
      bundle links as a set of component interfaces.";
    deviate not-supported;
  }

deviation "/nw:networks/nw:network/nt:link/tet:te"
  + "/tet:te-link-template" {
  description
```

```
    "SIMAP implementations are not required to implement the
      TE link templates.";
    deviate not-supported;
  }

deviation "/nw:networks/nw:network/nt:link/tet:te"
  + "/tet:te-link-attributes/tet:underlay/tet:primary-path"
  + "/tet:path-element/tet:type/tet:label" {
  description
    "SIMAP implementations are not required to implement the
      label hop.";
  deviate not-supported;
}

deviation "/nw:networks/nw:network/nt:link/tet:te"
  + "/tet:te-link-attributes/tet:underlay/tet:primary-path"
  + "/tet:path-element/tet:type/tet:as-number" {
  description
    "SIMAP implementations are not required to implement the
      AS hop.";
  deviate not-supported;
}

deviation "/nw:networks/nw:network/nt:link/tet:te"
  + "/tet:te-link-attributes/tet:underlay/tet:backup-path"
  + "/tet:path-element/tet:type/tet:label" {
  description
    "SIMAP implementations are not required to implement the
      label hop.";
  deviate not-supported;
}

deviation "/nw:networks/nw:network/nt:link/tet:te"
  + "/tet:te-link-attributes/tet:underlay/tet:backup-path"
  + "/tet:path-element/tet:type/tet:as-number" {
  description
    "SIMAP implementations are not required to implement the
      AS hop.";
  deviate not-supported;
}

deviation "/nw:networks/nw:network/nt:link/tet:te"
  + "/tet:te-link-attributes/tet:underlay/"
  + "tet:protection-type" {
  description
    "SIMAP implementations are not required to implement the
      protection type for the backup paths of a link.";
  deviate not-supported;
}
```

```
}

deviation "/nw:networks/nw:network/nt:link/tet:te"
  + "/tet:te-link-attributes/tet:underlay"
  + "/tet:tunnel-termination-points" {
  description
    "SIMAP implementations are not required to implement the
    underlay tunnel termination points of a link
    (to be confirmed).";
  deviate not-supported;
}

deviation "/nw:networks/nw:network/nt:link/tet:te"
  + "/tet:te-link-attributes/tet:underlay"
  + "/tet:tunnels" {
  description
    "SIMAP implementations are not required to implement the
    underlay tunnels of a link (to be confirmed).";
  deviate not-supported;
}

deviation "/nw:networks/nw:network/nt:link/tet:te"
  + "/tet:te-link-attributes/tet:admin-status" {
  description
    "SIMAP implementations are not required to implement the
    administrative status of a link.";
  deviate not-supported;
}

deviation "/nw:networks/nw:network/nt:link/tet:te"
  + "/tet:te-link-attributes/tet:link-index" {
  description
    "SIMAP implementations are not required to implement the
    link identifier.";
  deviate not-supported;
}

deviation "/nw:networks/nw:network/nt:link/tet:te"
  + "/tet:te-link-attributes/tet:administrative-group" {
  description
    "SIMAP implementations are not required to implement the
    administrative groups of a link.";
  deviate not-supported;
}

deviation "/nw:networks/nw:network/nt:link/tet:te"
  + "/tet:te-link-attributes"
  + "/tet:interface-switching-capability"
```

```
    + "/tet:max-lsp-bandwidth" {
description
  "SIMAP implementations are not required to implement the
  maximum LSP bandwidth.";
deviate not-supported;
}

deviation "/nw:networks/nw:network/nt:link/tet:te"
  + "/tet:te-link-attributes/tet:label-restrictions" {
description
  "SIMAP implementations are not required to implement the
  label restrictions of a link.";
deviate not-supported;
}

deviation "/nw:networks/nw:network/nt:link/tet:te"
  + "/tet:te-link-attributes/tet:link-protection-type" {
description
  "SIMAP implementations are not required to implement the
  link protection type.";
deviate not-supported;
}

deviation "/nw:networks/nw:network/nt:link/tet:te"
  + "/tet:te-link-attributes/tet:max-link-bandwidth" {
description
  "SIMAP implementations are not required to implement the
  bandwidth information (capacity) of a link.";
deviate not-supported;
}

deviation "/nw:networks/nw:network/nt:link/tet:te"
  + "/tet:te-link-attributes/tet:max-resv-link-bandwidth" {
description
  "SIMAP implementations are not required to implement the
  bandwidth information (capacity) of a link.";
deviate not-supported;
}

deviation "/nw:networks/nw:network/nt:link/tet:te"
  + "/tet:te-link-attributes/tet:unreserved-bandwidth" {
description
  "SIMAP implementations are not required to implement the
  bandwidth information (capacity) of a link.";
deviate not-supported;
}

deviation "/nw:networks/nw:network/nt:link/tet:te"
```

```
    + "/tet:te-link-attributes/tet:te-default-metric" {
description
  "SIMAP implementations are not required to implement the
  TE default metric of a link (to be confirmed).";
deviate not-supported;
}

deviation "/nw:networks/nw:network/nt:link/tet:te"
  + "/tet:te-link-attributes/tet:te-delay-metric" {
description
  "SIMAP implementations are not required to implement the
  delay of a link (to be confirmed).";
deviate not-supported;
}

deviation "/nw:networks/nw:network/nt:link/tet:te"
  + "/tet:te-link-attributes/tet:te-igp-metric" {
description
  "SIMAP implementations are not required to implement the
  IGP metric of a link (to be confirmed).";
deviate not-supported;
}

deviation "/nw:networks/nw:network/nt:link/tet:te"
  + "/tet:te-link-attributes/tet:te-srlgs" {
description
  "SIMAP implementations are not required to implement the
  Shared Risk Link Groups (SRLGs) of a link (to be confirmed).";
deviate not-supported;
}

deviation "/nw:networks/nw:network/nt:link/tet:te"
  + "/tet:te-link-attributes/tet:te-nsrlgs" {
description
  "SIMAP implementations are not required to implement the
  Non-Shared Risk Link Groups (NSRLGs) of a link
  (to be confirmed).";
deviate not-supported;
}

deviation "/nw:networks/nw:network/nt:link/tet:te"
  + "/tet:information-source" {
description
  "SIMAP implementations are not required to implement the
  link's information source (to be confirmed).";
deviate not-supported;
}
```

```
deviation "/nw:networks/nw:network/nt:link/tet:te"
  + "/tet:information-source-instance" {
    description
      "SIMAP implementations are not required to implement the
      link's information source (to be confirmed).";
    deviate not-supported;
  }

deviation "/nw:networks/nw:network/nt:link/tet:te"
  + "/tet:information-source-state" {
    description
      "SIMAP implementations are not required to implement the
      link's information source (to be confirmed).";
    deviate not-supported;
  }

deviation "/nw:networks/nw:network/nt:link/tet:te"
  + "/tet:information-source-entry" {
    description
      "SIMAP implementations are not required to implement the
      link's information source (to be confirmed).";
    deviate not-supported;
  }

deviation "/nw:networks/nw:network/nt:link/tet:te"
  + "/tet:recovery" {
    description
      "SIMAP implementations are not required to report the status
      of the recovery process on a link.";
    deviate not-supported;
  }

deviation "/nw:networks/nw:network/nt:link/tet:te"
  + "/tet:underlay" {
    description
      "SIMAP implementations are not required to report the state
      attributes for the TE link underlay.";
    deviate not-supported;
  }

deviation "/nw:networks/nw:network/nt:link/tet:te"
  + "/tet:statistics" {
    description
      "SIMAP implementations are not required to implement the
      link's statistics (to be confirmed).";
    deviate not-supported;
  }
```

```
deviation "/nw:networks/nw:network/nw:node/nt:termination-point"
  + "/tet:te-tp-id" {
  description
    "SIMAP implementations are not required to implement TE
    termination point identifier.";
  deviate not-supported;
}

deviation "/nw:networks/nw:network/nw:node/nt:termination-point"
  + "/tet:te" {
  description
    "SIMAP implementations are not required to implement TE
    termination point identifier.";
  deviate delete {
    must '../te-tp-id';
  }
}

deviation "/nw:networks/nw:network/nw:node/nt:termination-point"
  + "/tet:te/tet:admin-status" {
  description
    "SIMAP implementations are not required to implement the
    administrative status of a termination point.";
  deviate not-supported;
}

deviation "/nw:networks/nw:network/nw:node/nt:termination-point"
  + "/tet:te/tet:interface-switching-capability" {
  description
    "SIMAP implementations are not required to report the
    'interface-switching-capability' on the termination points.";
  deviate not-supported;
}

deviation "/nw:networks/nw:network/nw:node/nt:termination-point"
  + "/tet:te/tet:inter-layer-lock-id" {
  description
    "SIMAP implementations are not required to implement the
    inter-layer lock-id (to be confirmed).";
  deviate not-supported;
}

deviation "/nw:networks/nw:network/nw:node/nt:termination-point"
  + "/tet:te/tet:geolocation" {
  description
    "SIMAP implementations are not required to implement the
    geolocation of a termination point.";
  deviate not-supported;
}
```

```

}
}

```

Figure 5: Example of SIMA deviation YANG module

The pruned/profiled YANG tree, generated using 'pyang' tool, is provided below:

```

module: ietf-network
  +--rw networks
    +--rw network* [network-id]
      +--rw network-id          network-id
      +--rw network-types
      | +--rw tet:te-topology!
      +--rw supporting-network* [network-ref]
      | +--rw network-ref      -> /networks/network/network-id
      +--rw node* [node-id]
      | +--rw node-id          node-id
      | +--rw supporting-node* [network-ref node-ref]
      | | +--rw network-ref
      | | | -> ../../../../supporting-network/network-ref
      | | +--rw node-ref      -> /networks/network/node/node-id
      +--rw nt:termination-point* [tp-id]
      | +--rw nt:tp-id          tp-id
      | +--rw nt:supporting-termination-point*
      | | [network-ref node-ref tp-ref]
      | | +--rw nt:network-ref
      | | | -> ../../../../nw:supporting-node/network-ref
      | | +--rw nt:node-ref
      | | | -> ../../../../nw:supporting-node/node-ref
      | | +--rw nt:tp-ref      leafref
      +--rw tet:te!
      | +--rw tet:name?          string
      | +--rw tet:inter-domain-plug-id?  binary
      | +--ro tet:oper-status?
      | | te-types:te-oper-status
      +--rw tet:te!
      +--rw tet:te-node-attributes
      | +--rw tet:connectivity-matrices
      | | +--rw tet:number-of-entries?  uint16
      | | +--rw tet:is-allowed?          boolean
      | | +--rw tet:connectivity-matrix* [id]
      | | | +--rw tet:id          uint32
      | | | +--rw tet:from
      | | | | +--rw tet:tp-ref?  leafref
      | | | +--rw tet:to
      | | | | +--rw tet:tp-ref?  leafref
      | | | +--rw tet:is-allowed?  boolean

```



```

|         |--rw tet:domain-id?                uint32
|         |--rw tet:is-abstract?              empty
|         |--rw tet:name?                    string
|         |--rw tet:underlay-topology {te-topology-hierarchy}?
|             |--rw tet:network-ref?
|                 -> /nw:networks/network/network-id
|         |--ro tet:oper-status?              te-types:te-oper-status
+--rw nt:link* [link-id]
|   |--rw nt:link-id                        link-id
|   |--rw nt:source
|       |--rw nt:source-node?    -> ../../../../nw:node/node-id
|       |--rw nt:source-tp?      leafref
+--rw nt:destination
|   |--rw nt:dest-node?    -> ../../../../nw:node/node-id
|   |--rw nt:dest-tp?      leafref
+--rw nt:supporting-link* [network-ref link-ref]
|   |--rw nt:network-ref
|       |   -> ../../../../nw:supporting-network/network-ref
|   |--rw nt:link-ref      leafref
+--rw tet:te!
|   |--rw (tet:bundle-stack-level)?
|       |--:(tet:bundle)
|           |--rw tet:bundled-links
|               |--rw tet:bundled-link* [sequence]
|                   |--rw tet:sequence      uint32
|                   |--rw tet:src-tp-ref?    leafref
|                   |--rw tet:des-tp-ref?    leafref
+--rw tet:te-link-attributes
|   |--rw tet:access-type?
|       |   te-types:te-link-access-type
+--rw tet:external-domain
|   |--rw tet:network-ref?
|       |   -> /nw:networks/network/network-id
+--rw tet:remote-te-node-id?
|   |   te-types:te-node-id
+--rw tet:remote-te-link-tp-id?
|   |   te-types:te-tp-id
+--rw tet:is-abstract?                empty
+--rw tet:name?                      string
+--rw tet:underlay {te-topology-hierarchy}?
|   |--rw tet:enabled?                boolean
+--rw tet:primary-path
|   |--rw tet:network-ref?
|       |   -> /nw:networks/network/network-id
+--rw tet:path-element* [path-element-id]
|   |--rw tet:path-element-id
|       |   uint32
+--rw (tet:type)?

```

```

+---:(tet:numbered-node-hop)
|   +--rw tet:numbered-node-hop
|       +--rw tet:node-id-uri?
|           |
|           nw:node-id
|       +--rw tet:node-id?
|           |
|           te-node-id
|       +--rw tet:hop-type?
|           |
|           te-hop-type
+---:(tet:numbered-link-hop)
|   +--rw tet:numbered-link-hop
|       +--rw tet:link-tp-id      te-tp-id
|       +--rw tet:hop-type?
|           |
|           te-hop-type
|       +--rw tet:direction?
|           |
|           te-link-direction
+---:(tet:unnumbered-link-hop)
|   +--rw tet:unnumbered-link-hop
|       +--rw tet:link-tp-id-uri?
|           |
|           nt:tp-id
|       +--rw tet:link-tp-id?
|           |
|           te-tp-id
|       +--rw tet:node-id-uri?
|           |
|           nw:node-id
|       +--rw tet:node-id?
|           |
|           te-node-id
|       +--rw tet:hop-type?
|           |
|           te-hop-type
|       +--rw tet:direction?
|           |
|           te-link-direction
+--rw tet:backup-path* [index]
+--rw tet:index          uint32
+--rw tet:network-ref?
|   -> /nw:networks/network/network-id
+--rw tet:path-element* [path-element-id]
+--rw tet:path-element-id
|   uint32
+--rw (tet:type)?
+---:(tet:numbered-node-hop)
|   +--rw tet:numbered-node-hop
|       +--rw tet:node-id-uri?
|           |
|           nw:node-id
|       +--rw tet:node-id?
|           |
|           te-node-id
|       +--rw tet:hop-type?
|           |
|           te-hop-type
+---:(tet:numbered-link-hop)
|   +--rw tet:numbered-link-hop
|       +--rw tet:link-tp-id      te-tp-id

```

```
| | | | tet:hop-type?
| | | | te-hop-type
| | | +-rw tet:direction?
| | | | te-link-direction
|--:(tet:unnumbered-link-hop)
| +-rw tet:unnumbered-link-hop
| +-rw tet:link-tp-id-uri?
| | nt:tp-id
| +-rw tet:link-tp-id?
| | te-tp-id
| +-rw tet:node-id-uri?
| | nw:node-id
| +-rw tet:node-id?
| | te-node-id
| +-rw tet:hop-type?
| | te-hop-type
| +-rw tet:direction?
| | | te-link-direction
+-rw tet:interface-switching-capability*
    [switching-capability encoding]
    +-rw tet:switching-capability identityref
    +-rw tet"encoding identityref
+--ro tet:oper-status?
|   te-types:te-oper-status
+--ro tet:is-transitional?      empty
```

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