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         **A YANG Data Model for Client-layer Tunnel**

## Abstract

A transport network is a server-layer network to provide connectivity services to its client. In this draft the tunnel of client is described, with the definition of client tunnel YANG model.

## Status of This Memo

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## 1. Introduction

A transport network is a server-layer network designed to provide connectivity services for a client-layer network to carry the client traffic transparently across the server-layer network resources. The tunnel model in Traffic-Engineered network has been defined in both generic way and technology-specific way. The generic model, which is the base TE tunnel YANG model, can be found at [[I-D.ietf-teas-yang-te](#)]. Technology-specific models, such as OTN/WSN tunnel model, have also been defined in [[I-D.ietf-ccamp-otn-tunnel-model](#)] and [[I-D.ietf-ccamp-wson-tunnel-model](#)] respectively. Corresponding tunnel on client-layer is also required, to have a complete topology view from the perspective of network controllers.

This document defines a data model of all client-layer tunnel, using YANG language defined in [[RFC7950](#)]. The model is augmenting the generic TE tunnel model, and can be used by applications exposing to a network controller via a REST interface. Furthermore, it can be used by an application to describe the client tunnel that constructed above the server-layer network. It is also worth noting that the client layer network will only need the tunnel model when there is a demand for switching techniques, such as Carrier Ethernet and MPLS-TP. The transparent signals do not need this model.

## 2. Terminology and Notations

A simplified graphical representation of the data model is used in this document. The meaning of the symbols in the YANG data tree presented later in this document is defined in [[RFC8340](#)]. They are provided below for reference.

\*Brackets "[" and "]" enclose list keys.

\*Abbreviations before data node names: "rw" means configuration (read-write) and "ro" state data (read-only).

\*Symbols after data node names: "?" means an optional node, "!" means a presence container, and "\*" denotes a list and leaf-list.

\*Parentheses enclose choice and case nodes, and case nodes are also marked with a colon (":").

\*Ellipsis ("...") stands for contents of subtrees that are not shown.

## 3. YANG Model for Client-layer Tunnel

### 3.1. YANG Tree for Ethernet Tunnel

```
module: ietf-eth-te-tunnel
augment /te:te/te:tunnels/te:tunnel:
  +--rw src-eth-tunnel-endpoint
  |   +--rw vlanid?      etht-types:vlanid
  |   +--rw tag-type?    etht-types:eth-tag-type
  +--rw dst-eth-tunnel-endpoint
  |   +--rw vlanid?      etht-types:vlanid
  |   +--rw tag-type?    etht-types:eth-tag-type
  +--rw bandwidth-profile
      +--rw bandwidth-profile-name?    string
      +--rw bandwidth-profile-type?    etht-types:bandwidth-profile-type
      +--rw CIR?                        uint64
      +--rw CBS?                        uint64
      +--rw EIR?                        uint64
      +--rw EBS?                        uint64
      +--rw color-aware?                boolean
      +--rw coupling-flag?              boolean
```

### **3.2. YANG Tree for Tunnel of other Client Signal Model**

This section will be completed later.

#### 4. YANG Code for Client-layer Tunnel

#### 4.1. The ETH Tunnel YANG Code

<CODE BEGINS> file "ietf-eth-te-tunnel@2018-03-01.yang"

```
module ietf-eth-te-tunnel {

    namespace "urn:ietf:params:xml:ns:yang:ietf-eth-te-tunnel";

    prefix "eth-tunnel";

    import ietf-te {
        prefix "te";
    }

    import ietf-eth-tran-types {
        prefix "eth-t-types";
    }

    organization
        "Internet Engineering Task Force (IETF) CCAMP WG";
    contact
        "
        WG List: <mailto:ccamp@ietf.org>

        ID-draft editor:
        Haomian Zheng (zhenghaomian@huawei.com);
        Italo Busi (italo.busi@huawei.com);
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        ";

    description
        "This module defines a model for ETH transport tunnel";

    revision 2018-03-01 {
        description
            "Initial revision";
        reference
            "draft-zheng-ccamp-client-tunnel-yang";
    }

    grouping eth-tunnel-endpoint {
        description "Parameters for ETH tunnel.";

        leaf vlanid {
            type eth-t-types:vlanid;
            description
                "VLAN tag id.";
        }
    }
}
```

```

    leaf tag-type {
        type etht-types:eth-tag-type;
        description "VLAN tag type.";
    }
}

augment "/te:te/te:tunnels/te:tunnel" {
    description
        "Augment with additional parameters required for ETH
        service.";

    container src-eth-tunnel-endpoint {
        description
            "Source ETH tunnel endpoint.";

        uses eth-tunnel-endpoint;
    }

    container dst-eth-tunnel-endpoint {
        description
            "Destination ETH tunnel endpoint.";

        uses eth-tunnel-endpoint;
    }

    container bandwidth-profile {
        description
            "ETH tunnel bandwidth profile specification.";

        uses etht-types:etht-bandwidth-profiles;
    }
}
}

```

<CODE ENDS>

#### 4.2. Other Client-layer Tunnel YANG Code

TBD.

#### 5. Considerations and Open Issue

Editor Notes: This section is used to note temporary discussion/ conclusion that to be fixed in the future version, and will be removed before publication. This is a part of L2 work, need to



discuss how to go with other L2 network models. The expectation is to include all potential L2 TE part in this work.

## 6. IANA Considerations

TBD.

## 7. Manageability Considerations

TBD.

## 8. Security Considerations

The data following the model defined in this document is exchanged via, for example, the interface between an orchestrator and a transport network controller. The security concerns mentioned in [[I-D.ietf-teas-yang-te](#)] also applies to this document.

The YANG module defined in this document can be accessed via the RESTCONF protocol defined in [[RFC8040](#)], or maybe via the NETCONF protocol [[RFC6241](#)].

## 9. Acknowledgements

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## 11. References

### 11.1. Normative References

[[I-D.ietf-teas-yang-te](#)] Saad, T., Gandhi, R., Liu, X., Beeram, V. P., Bryskin, I., and O. G. D. Dios, "A YANG Data Model for Traffic Engineering Tunnels, Label Switched Paths and Interfaces", Work in Progress, Internet-Draft, draft-ietf-teas-yang-te-30, 11 July 2022, <<https://www.ietf.org/archive/id/draft-ietf-teas-yang-te-30.txt>>.

**[RFC6241]**

Enns, R., Ed., Bjorklund, M., Ed., Schoenwaelder, J., Ed., and A. Bierman, Ed., "Network Configuration Protocol (NETCONF)", RFC 6241, DOI 10.17487/RFC6241, June 2011, <<https://www.rfc-editor.org/info/rfc6241>>.

**[RFC7950]**

Bjorklund, M., Ed., "The YANG 1.1 Data Modeling Language", RFC 7950, DOI 10.17487/RFC7950, August 2016, <<https://www.rfc-editor.org/info/rfc7950>>.

**[RFC8040]**

Bierman, A., Bjorklund, M., and K. Watsen, "RESTCONF Protocol", RFC 8040, DOI 10.17487/RFC8040, January 2017, <<https://www.rfc-editor.org/info/rfc8040>>.

## **11.2. Informative References**

**[I-D.ietf-ccamp-otn-tunnel-model]** Zheng, H., Busi, I., Belotti, S., Lopez, V., and Y. Xu, "OTN Tunnel YANG Model", Work in Progress, Internet-Draft, draft-ietf-ccamp-otn-tunnel-model-16, 8 April 2022, <<https://www.ietf.org/archive/id/draft-ietf-ccamp-otn-tunnel-model-16.txt>>.

**[I-D.ietf-ccamp-wson-tunnel-model]**

Lee, Y., Zheng, H., Guo, A., Lopez, V., King, D., Yoon, B. Y., and R. Vilalta, "A Yang Data Model for WSON Tunnel", Work in Progress, Internet-Draft, draft-ietf-ccamp-wson-tunnel-model-07, 11 July 2022, <<https://www.ietf.org/archive/id/draft-ietf-ccamp-wson-tunnel-model-07.txt>>.

**[RFC8340]**

Bjorklund, M. and L. Berger, Ed., "YANG Tree Diagrams", BCP 215, RFC 8340, DOI 10.17487/RFC8340, March 2018, <<https://www.rfc-editor.org/info/rfc8340>>.

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