Abstract

This document specifies a YANG module containing a collection of IANA maintained YANG identities, used as interface types for tunnel interfaces.

Editorial Note (To be removed by RFC Editor)

Please update these statements in the document with the RFC number to be assigned to this document:

- "This version of this YANG module is part of RFC XXXX;"
- "RFC XXXX: Tunnel Interface Types YANG Module";
- "reference: RFC XXXX"

Please update the "revision" date of the YANG module.

Status of This Memo

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

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF). Note that other groups may also distribute working documents as Internet-Drafts. The list of current Internet-Drafts is at https://datatracker.ietf.org/drafts/current/.

Internet-Drafts are draft documents valid for a maximum of six months and may be updated, replaced, or obsoleted by other documents at any time. It is inappropriate to use Internet-Drafts as reference material or to cite them other than as "work in progress."

This Internet-Draft will expire on June 16, 2019.
1. Introduction

This document specifies the initial version of the iana-tunnel-type YANG module identifying tunnel interface types. The module reflects IANA’s registry maintained at [TUNNELTYPE-IANA-REGISTRY]. The latest revision of this module can be obtained from the IANA web site.

Tunnel-specific extensions may be added to the Interface module [RFC8343] as a function of the tunnel type. An example of this is provided in Appendix A. It is not the intention of this document to define tunnel-specific extensions for every tunnel encapsulation technology; those are discussed in dedicated documents such as [I-D.ietf-softwire-yang].

This document uses the common YANG types defined in [RFC6991] and adopts the Network Management Datastore Architecture (NMDA [RFC8342]).
The terminology for describing YANG modules is defined in [RFC7950]. The meanings of the symbols used in tree diagrams are defined in [RFC8340].

2. IANA Tunnel Type YANG Module

The iana-tunnel-type module imports the ’iana-if-type’ module defined in [RFC7224].

The initial version of the module includes tunnels types defined in [RFC4087], [RFC7856], [RFC7870], and [RFC6346].

<CODE BEGINS> file "iana-tunnel-type@2018-12-14.yang"

module iana-tunnel-type { 
  yang-version 1.1; 
  namespace "urn:ietf:params:xml:ns:yang:iana-tunnel-type"; 
  prefix iana-tunnel-type; 

  import iana-if-type { 
    prefix ift; 
    reference 
      "RFC 7224: IANA Interface Type YANG Module"; 
  }

  organization 
    "IANA"; 
  contact 
    "Internet Assigned Numbers Authority 
      Postal: ICANN 
      12025 Waterfront Drive, Suite 300 
      Los Angeles, CA  90094-2536 
      United States of America 
      Tel:    +1 310 301 5800 
      <mailto:iana@iana.org>";

  description 
    "This module contains a collection of YANG identities defined by IANA and used as interface types for tunnel interfaces. 
     
     Copyright (c) 2018 IETF Trust and the persons identified as authors of the code. All rights reserved. 
     
     Redistribution and use in source and binary forms, with or without modification, is permitted pursuant to, and subject to the license terms contained in, the Simplified BSD License set forth in Section 4.c of the IETF Trust’s Legal Provisions";

}
relating to IETF Documents
(http://trustee.ietf.org/license-info).

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

revision 2018-12-14 {
  description
    "Initial revision.";
  reference
    "RFC XXXX: Tunnel Interface Types YANG Module";
}
identity other {
  base ift:tunnel;
  description
    "None of the following values.";
  reference
    "RFC 4087: IP Tunnel MIB";
}
identity direct {
  base ift:tunnel;
  description
    "No intermediate header.";
  reference
    "RFC 4087: IP Tunnel MIB";
}
identity gre {
  base ift:tunnel;
  description
    "GRE encapsulation.";
  reference
    "RFC 4087: IP Tunnel MIB";
}
identity minimal {
  base ift:tunnel;
  description
    "Minimal encapsulation.";
  reference
    "RFC 4087: IP Tunnel MIB";
}
identity l2tp {
  base ift:tunnel;
  description
    "L2TP encapsulation.";
  reference
    "RFC 4087: IP Tunnel MIB";
}
identity pptp {
base ift:tunnel;
description  "PPTP encapsulation.";
reference    "RFC 4087: IP Tunnel MIB";
}
identity l2f {
  base ift:tunnel;
description  "L2F encapsulation.";
reference    "RFC 4087: IP Tunnel MIB";
}
identity udp {
  base ift:tunnel;
description  "UDP encapsulation.";
reference    "RFC 4087: IP Tunnel MIB";
}
identity atmp {
  base ift:tunnel;
description  "ATMP encapsulation.";
reference    "RFC 4087: IP Tunnel MIB";
}
identity msdp {
  base ift:tunnel;
description  "MSDP encapsulation.";
reference    "RFC 4087: IP Tunnel MIB";
}
identity sixtofour {
  base ift:tunnel;
description  "6to4 encapsulation.";
reference    "RFC 4087: IP Tunnel MIB";
}
identity sixoverfour {
  base ift:tunnel;
description  "6over4 encapsulation.";
reference    "RFC 4087: IP Tunnel MIB";
}
identity isatap {
    base ift:tunnel;
    description
        "ISATAP encapsulation.";
    reference
        "RFC 4087: IP Tunnel MIB";
}

identity teredo {
    base ift:tunnel;
    description
        "Teredo encapsulation.";
    reference
        "RFC 4087: IP Tunnel MIB";
}

identity iphttps {
    base ift:tunnel;
    description
        "IP over HTTPS (IP-HTTPS) Tunneling Protocol.";
}

identity softwiremesh {
    base ift:tunnel;
    description
        "Softwire mesh tunnel.";
    reference
        "RFC 7856: Softwire Mesh Management Information Base (MIB)";
}

identity dslite {
    base ift:tunnel;
    description
        "DS-Lite tunnel.";
    reference
        "RFC 7870: Dual-Stack Lite (DS-Lite) Management Information Base (MIB) for Address Family Transition Routers (AFTRs)";
}

identity aplusp {
    base ift:tunnel;
    description
        "A+P encapsulation.";
    reference
        "RFC 6346: The Address plus Port (A+P) Approach to the IPv4 Address Shortage";
}

}
3. Security Considerations

The YANG module defined in this document is designed to be accessed via network management protocols such as NETCONF [RFC6241] or RESTCONF [RFC8040]. The lowest NETCONF layer is the secure transport layer, and the mandatory-to-implement secure transport is Secure Shell (SSH) [RFC6242]. The lowest RESTCONF layer is HTTPS, and the mandatory-to-implement secure transport is TLS [RFC8446].

The NETCONF access control model [RFC8341] provides the means to restrict access for particular NETCONF or RESTCONF users to a preconfigured subset of all available NETCONF or RESTCONF protocol operations and content.

4. IANA Considerations

This document requests IANA to register the following URI in the "IETF XML Registry" [RFC3688]:

```
URI: urn:ietf:params:xml:ns:yang:iana-tunnel-type
Registrant Contact: IANA.
XML: N/A; the requested URI is an XML namespace.
```

This document requests IANA to register the following YANG module in the "YANG Module Names" registry [RFC7950].

```
name: iana-tunnel-type
namespace: urn:ietf:params:xml:ns:yang:iana-tunnel-type
prefix: iana-tunnel-type
reference: RFC XXXX
```

This document defines the initial version of the IANA-maintained iana-tunnel-type YANG module. IANA is requested to add this note:

```
Tunnel type values must not be directly added to the iana-tunnel-type YANG module. They must instead be respectively added to the "tunnelType" sub-registry (under "ifType definitions" registry).
```

When a tunnel type is added to the "tunnelType" sub-registry, a new "identity" statement must be added to the iana-tunnel-type YANG module. The name of the "identity" is the same as the corresponding enumeration in the IANAifType-MIB (i.e., IANAtunnelType). The "identity" statement should have the following sub-statements defined:

```
"base": Contains the name assigned to the tunnel type, in lowercase.
```
"description": Replicate the description from the registry.

"reference": Replicate the reference from the registry and add the title of the document.

Unassigned or reserved values are not present in the module.

When the iana-tunnel-type YANG module is updated, a new "revision" statement must be added in front of the existing revision statements.

IANA is requested to add this note to "tunnelType" sub-registry:

When this registry is modified, the YANG module iana-tunnel-type must be updated as defined in [RFC XXXX].

5. Acknowledgements

Special thanks to Tom Petch and Martin Bjorklund for the detailed review and suggestions.

6. References

6.1. Normative References


Informative References

[I-D.ietf-softwire-yang]


[TUNNELTYPE-IANA-REGISTRY]
Internet Assigned Numbers Authority, "tunnelType Definitions", <https://www.iana.org/assignments/smi-numbers/smi-numbers.xhtml#smi-numbers-6>.
Appendix A. Example Usage

The following example illustrates how the Interface YANG module can be augmented with tunnel-specific parameters. In this example, the module is augmented with a ‘remote-endpoint’ for the tunnel. A tree structure is provided below:

```
module: ietf-extension-example
  augment /if:interfaces/if:interface:
      +--rw remote-endpoint? inet:ipv6-address
```

The ‘extension-example’ module imports the modules defined in [RFC6991] and [RFC8343] in addition to the "iana-tunnel-type" module defined in this document.

<CODE BEGINS> file "ietf-extension-example@2018-11-30.yang"

module ietf-extension-example {
  yang-version 1.1;

  namespace "urn:ietf:params:xml:ns:yang:ietf-extension-example";
  prefix example;

  import ietf-inet-types {
    prefix inet;
    reference
      "Section 4 of RFC 6991";
  }

  import ietf-interfaces {
    prefix if;
    reference
      "RFC 8343: A YANG Data Model for Interface Management";
  }
```
import iana-tunnel-type {
  prefix iana-tunnel-type;
  reference
    "RFC XXXX:  A Tunnel Extension to the Interface Management
    YANG Module";
}

organization "IETF Softwire Working Group";

contact

  "WG Web:   <https://datatracker.ietf.org/wg/softwire/>
  WG List:  <mailto:softwire@ietf.org>
  Author:  Mohamed Boucadair
            <mailto:mohamed.boucadair@orange.com>";

description

  "This is an example YANG module to extend the Interface YANG
  module with tunnel-specific parameters.

  Copyright (c) 2018 IETF Trust and the persons identified as
  authors of the code. All rights reserved.

  Redistribution and use in source and binary forms, with or
  without modification, is permitted pursuant to, and subject
  to the license terms contained in, the Simplified BSD License
  set forth in Section 4.c of the IETF Trust’s Legal Provisions
  Relating to IETF Documents
  (http://trustee.ietf.org/license-info).

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

revision 2018-11-30 {
  description
    "Initial revision.";
  reference
    "RFC XXXX: Tunnel Interface Types YANG Module";
}

augment "/if:interfaces/if:interface" {
  when "derived-from(if:type, 'iana-tunnel-type:gre')";
  description
    "Augments Interface module with specific tunnel parameters.";

  leaf remote-endpoint {
    type inet:ipv6-address;  
}
description
"IPv6 address of the local GRE endpoint."
}
}
}<CODE ENDS>

Authors' Addresses

Mohamed Boucadair
Orange
Rennes  35000
France
Email: mohamed.boucadair@orange.com

Ian Farrer
Deutsche Telekom AG
CTO-ATI,Landgrabenweg 151
Bonn, NRW  53227
Germany
Email: ian.farrer@telekom.de

Rajiv Asati
Cisco Systems, Inc.
7025 Kit Creek Rd.
RTP, NC  27709
USA
Email: Rajiva@cisco.com