

Tunnel Interface Types YANG Module
draft-ietf-softwire-iftunnel-00

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:

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

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

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[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 modules includes tunnels types defined in [\[RFC4087\]](#), [\[RFC7856\]](#), [\[RFC7870\]](#), and [\[RFC6346\]](#).

```
<CODE BEGINS> file "iana-tunnel-type@2018-11-30.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."

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```


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```
revision 2018-10-23 {
  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";
}
}
<CODE ENDS>
```


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

- [RFC3688] Mealling, M., "The IETF XML Registry", [BCP 81](#), [RFC 3688](#), DOI 10.17487/RFC3688, January 2004, <<https://www.rfc-editor.org/info/rfc3688>>.
- [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>>.
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- [RFC7224] Bjorklund, M., "IANA Interface Type YANG Module", [RFC 7224](#), DOI 10.17487/RFC7224, May 2014, <<https://www.rfc-editor.org/info/rfc7224>>.
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- [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>>.
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- [RFC8342] Bjorklund, M., Schoenwaelder, J., Shafer, P., Watsen, K., and R. Wilton, "Network Management Datastore Architecture (NMDA)", [RFC 8342](#), DOI 10.17487/RFC8342, March 2018, <<https://www.rfc-editor.org/info/rfc8342>>.
- [RFC8446] Rescorla, E., "The Transport Layer Security (TLS) Protocol Version 1.3", [RFC 8446](#), DOI 10.17487/RFC8446, August 2018, <<https://www.rfc-editor.org/info/rfc8446>>.
- [TUNNELTYPE-IANA-REGISTRY]
Internet Assigned Numbers Authority, "tunnelType Definitions", <<https://www.iana.org/assignments/smi-numbers/smi-numbers.xhtml#smi-numbers-6>>.

6.2. Informative References

- [I-D.ietf-softwire-yang]
Cui, Y., Farrer, I., Boucadair, M., Sun, Q., Sun, L., Zechlin, S., and R. Asati, "YANG Modules for IPv4-in-IPv6 Address plus Port (A+P) Softwires", [draft-ietf-softwire-yang-12](#) (work in progress), November 2018.
- [RFC4087] Thaler, D., "IP Tunnel MIB", [RFC 4087](#), DOI 10.17487/RFC4087, June 2005, <<https://www.rfc-editor.org/info/rfc4087>>.
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- [RFC7856] Cui, Y., Dong, J., Wu, P., Xu, M., and A. Yla-Jaaski, "Softwire Mesh Management Information Base (MIB)", [RFC 7856](#), DOI 10.17487/RFC7856, May 2016, <<https://www.rfc-editor.org/info/rfc7856>>.

- [RFC7870] Fu, Y., Jiang, S., Dong, J., and Y. Chen, "Dual-Stack Lite (DS-Lite) Management Information Base (MIB) for Address Family Transition Routers (AFTRs)", [RFC 7870](#), DOI 10.17487/RFC7870, June 2016, <<https://www.rfc-editor.org/info/rfc7870>>.
- [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>>.
- [RFC8343] Bjorklund, M., "A YANG Data Model for Interface Management", [RFC 8343](#), DOI 10.17487/RFC8343, March 2018, <<https://www.rfc-editor.org/info/rfc8343>>.

[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.

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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>
```

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