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M. Bjorklund
Tail-f Systems

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A YANG Data Model for IP Configuration
draft-ietf-netmod-ip-cfg-01

Abstract

This document defines a YANG data model for configuration of IP addresses on network interfaces.

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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This Internet-Draft will expire on April 30, 2012.

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Table of Contents

1. Introduction

This document defines a YANG [RFC6020] data model for configuration of IP addresses on network interfaces.

The keywords "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in BCP 14, [RFC2119].

2. IP Data Model

The module "ietf-ip" augments the "interface" list defined in the "ietf-interfaces" module [I-D.ietf-netmod-interfaces-cfg] with the following nodes:

```
   +--rw if:interfaces
      +--rw if:interface [name]
         ...
         +--rw ipv4
         |  +--rw address [ip]
         |     +--rw ip               inet:ipv4-address
         |     +--rw (subnet)?
         |        +--:(prefix-length)
         |        |  +--rw ip:prefix-length?   uint8
         |        +--:(netmask)
         |           +--rw ip:netmask?         inet:ipv4-address
         +--rw ipv6
            +--rw address [ip]
               +--rw ip               inet:ipv6-address
               +--rw prefix-length?   uint8
```

The data model defines two containers, "ipv4" and "ipv6", representing the IPv4 and IPv6 address families. In each container, there is a list of manually configured addresses.

3. IP Address YANG Module

This module imports typedefs from [RFC6021] and [I-D.ietf-netmod-interfaces-cfg].

RFC Ed.: update the date below with the date of RFC publication and remove this note.

<CODE BEGINS> file "ietf-ip@2011-10-28.yang"

```
module ietf-ip {

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

  import ietf-interfaces {
    prefix if;
  }
  import ietf-inet-types {
    prefix inet;
  }

  organization
    "IETF NETMOD (NETCONF Data Modeling Language) Working Group";

  contact
    "WG Web:   <http://tools.ietf.org/wg/netmod/>
     WG List:  <mailto:netmod@ietf.org>

     WG Chair: David Kessens
               <mailto:david.kessens@nsn.com>

     WG Chair: Juergen Schoenwaelder
               <mailto:j.schoenwaelder@jacobs-university.de>

     Editor:   Martin Bjorklund
               <mailto:mbj@tail-f.com>";

  description
    "This module contains a collection of YANG definitions for
     configuring IP addresses on network interfaces.

     Copyright (c) 2011 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.";

    // RFC Ed.: replace XXXX with actual RFC number and remove this
    // note.

    // RFC Ed.: update the date below with the date of RFC publication
    // and remove this note.
    revision 2011-10-28 {
      description
        "Initial revision.";
      reference
        "RFC XXXX: A YANG Data Model for IP Configuration";
    }

    /* Features */

    feature non-contiguous-netmasks {
      description
        "Indicates support for configuring non-contiguous
         subnet masks.";
    }

    /* Data nodes */

    augment "/if:interfaces/if:interface" {
      description
        "Parameters for configuring IP addresses on interfaces.";

      container ipv4 {
        description
          "Parameters for the IPv4 address familiy.";
        list address {
          key "ip";
          description
            "The list of manually configured IPv4 addresses
             on the interface.";

          leaf ip {
            type inet:ipv4-address;
            description
              "The IPv4 address on the interface.";
          }
          choice subnet {
```

```
            default prefix-length;
            description
              "The subnet can be specified as a prefix-length, or,
               if the server supports non-contiguous netmasks, as
               a netmask.

               The default subnet is a prefix-length of 32.";
            leaf prefix-length {
              type uint8 {
                range "0..32";
              }
              default 32;
              description
                "The length of the subnet prefix.";
            }
            leaf netmask {
              if-feature non-contiguous-netmasks;
              type inet:ipv4-address;
              description
                "The subnet specified as a netmask.";
            }
          }
        }
      }
      container ipv6 {
        description
          "Parameters for the IPv6 address familiy.";
        list address {
          key "ip";
          description
            "The list of manually configured IPv6 addresses
             on the interface.";

          leaf ip {
            type inet:ipv6-address;
            description
              "The IPv6 address on the interface.";
          }
          leaf prefix-length {
            type uint8 {
              range "0..128";
            }
            default 128;
            description
              "The length of the subnet prefix.";
          }
        }
      }
```

```
    }
  }

  <CODE ENDS>
```

4. IANA Considerations

This document registers a URI in the IETF XML registry [RFC3688]. Following the format in RFC 3688, the following registration is requested to be made.

URI: urn:ietf:params:xml:ns:yang:ietf-ip

Registrant Contact: The NETMOD WG of the IETF.

XML: N/A, the requested URI is an XML namespace.

This document registers a YANG module in the YANG Module Names registry [RFC6020].

```
name:         ietf-ip
namespace:    urn:ietf:params:xml:ns:yang:ietf-ip
prefix:       ip
reference:    RFC XXXX
```

5. Security Considerations

The YANG module defined in this memo is designed to be accessed via the NETCONF protocol [RFC6241]. The lowest NETCONF layer is the secure transport layer and the mandatory-to-implement secure transport is SSH [RFC6242].

There are a number of data nodes defined in the YANG module which are writable/creatable/deletable (i.e., config true, which is the default). These data nodes may be considered sensitive or vulnerable in some network environments. Write operations (e.g., edit-config) to these data nodes without proper protection can have a negative effect on network operations. These are the subtrees and data nodes and their sensitivity/vulnerability:

<list subtrees and data nodes and state why they are sensitive>

Some of the readable data nodes in the YANG module may be considered sensitive or vulnerable in some network environments. It is thus important to control read access (e.g., via get, get-config, or notification) to these data nodes. These are the subtrees and data nodes and their sensitivity/vulnerability:

<list subtrees and data nodes and state why they are sensitive>

6. Normative References

[I-D.ietf-netmod-interfaces-cfg]
Bjorklund, M., "A YANG Data Model for Interface Configuration", draft-ietf-netmod-interfaces-cfg-01 (work in progress), May 2011.

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.

[RFC3688] Mealling, M., "The IETF XML Registry", BCP 81, RFC 3688, January 2004.

[RFC6020] Bjorklund, M., "YANG - A Data Modeling Language for the Network Configuration Protocol (NETCONF)", RFC 6020, October 2010.

[RFC6021] Schoenwaelder, J., "Common YANG Data Types", RFC 6021, October 2010.

[RFC6241] Enns, R., Bjorklund, M., Schoenwaelder, J., and A. Bierman, "Network Configuration Protocol (NETCONF)", RFC 6241, June 2011.

[RFC6242] Wasserman, M., "Using the NETCONF Protocol over Secure Shell (SSH)", RFC 6242, June 2011.

Appendix A. Example: NETCONF <get> reply

This section gives an example of a reply to the NETCONF <get> request for a device that implements the data model defined in this document.

```
<rpc-reply
    xmlns="urn:ietf:params:xml:ns:netconf:base:1.0"
    message-id="101">
  <data>
    <interfaces
        xmlns="urn:ietf:params:xml:ns:yang:ietf-interfaces">
      <interface>
        <name>eth0</name>
        <type>ethernetCsmacd</type>
        <location>0</location>
        <if-index>2</if-index>
        <ipv4 xmlns="urn:ietf:params:xml:ns:yang:ietf-ip">
          <address>
            <ip>192.0.2.1</ip>
            <prefix-length>24</prefix-length>
          </address>
        </ipv4>
      </interface>
    </interfaces>
  </data>
</rpc-reply>
```

Author's Address

Martin Bjorklund
Tail-f Systems

Email: mbj@tail-f.com