

INTAREA
Internet-Draft
Intended status: Standards Track
Expires: 21 February 2026

F. Zheng
B. Wu, Ed.
Huawei
R. Wilton, Ed.
Cisco Systems
F. Zhang, Ed.
Y. Zhu
China Telecom
X. Ding
20 August 2025

A YANG Data Model for ARP
draft-wz-intarea-arp-yang-model-00

Abstract

This document defines a YANG data model for the management of the Address Resolution Protocol (ARP). It extends the basic ARP functionality contained in the ietf-ip YANG data model, defined in RFC 8344, to provide management of optional ARP features and statistics.

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 21 February 2026.

Copyright Notice

Copyright (c) 2025 IETF Trust and the persons identified as the document authors. All rights reserved.

This document is subject to BCP 78 and the IETF Trust's Legal Provisions Relating to IETF Documents (<https://trustee.ietf.org/license-info>) in effect on the date of publication of this document.

Please review these documents carefully, as they describe your rights and restrictions with respect to this document. Code Components extracted from this document must include Revised BSD License text as described in Section 4.e of the Trust Legal Provisions and are provided without warranty as described in the Revised BSD License.

Table of Contents

1. Introduction	2
1.1. Terminology	3
1.2. Tree Diagrams	4
2. Problem Statement	4
3. Design of the Data Model	4
3.1. ARP Dynamic Learning	4
3.2. Proxy ARP	5
3.3. Gratuitous ARP	5
3.4. ARP Data Model	5
4. ARP YANG Module	6
5. Data Model Examples	11
5.1. Configured static ARP Entry	11
5.2. Configuration of proxy ARP and gratuitous ARP	12
6. IANA Considerations	13
7. Security Considerations	14
8. Acknowledgments	15
9. References	15
9.1. Normative References	15
9.2. Informative References	16
Appendix A. Examples	17
A.1. Configuration of a Static ARP Entry	17
A.2. Configuration of Proxy ARP and Gratuitous ARP	17
Authors' Addresses	18

1. Introduction

Basic ARP functionality is supported by the ietf-ip YANG data model, defined in [RFC8344]. This document defines a YANG [RFC7950] data model that extends the basic ARP YANG support to also cover optional ARP features, and ARP related statistics to aid network monitoring and troubleshooting.

This model defines YANG configuration and operational state data nodes both for ARP related functionality formally specified in other RFCs (such as [RFC8344] and [RFC1027]), and also for common ARP behaviour that is often supported on network devices.

The YANG modules in this document conform to the Network Management Datastore Architecture (NMDA) [RFC8342].

Editorial Note: (To be removed by RFC Editor)

This draft contains several placeholder values that need to be replaced with finalized values at the time of publication. Please apply the following replacements:

- * "XXXX" --> the assigned RFC value for this draft both in this draft and in the YANG models under the revision statement.
- * The "revision" date in model, in the format XXXX-XX-XX, needs to be updated with the date the draft gets approved. The date also needs to get reflected on the line with <CODE BEGINS>.

1.1. Terminology

The key words "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] [RFC8174] when, and only when, they appear in all capitals, as shown here.

The following terms are defined in [RFC8342] and are not redefined here:

- * client
- * server
- * configuration data
- * system state
- * state data
- * intended configuration
- * running configuration datastore
- * operational state datastore

The following terms are defined in [RFC7950] and are not redefined here:

- * augment
- * data model

* data node

The terminology for describing YANG data models is found in [RFC7950].

1.2. Tree Diagrams

Tree diagrams used in this document follow the notation defined in [RFC8340].

2. Problem Statement

Neither ARP [RFC0826] nor Proxy-ARP [RFC1027] defines standard network management configuration models. Instead, network equipment vendors have implemented their own bespoke configuration interfaces and models.

Network operators benefit from having common network management models defined that can be implemented by multiple network equipment manufacturers. This simplifies the operation and management of network devices.

Some, but not all, required ARP functionality has been defined in "ietf-ip" ([RFC8344]). Providing a standard YANG model that models these optional ARP features, which are fairly widely implemented by network equipment manufacturers, and used by network operators, is beneficial to the general goal of interoperability in the networking industry.

3. Design of the Data Model

This data model intends to describe the processing that a protocol finds the hardware address, also known as Media Access Control (MAC) address, of a host from its known IP address. These tasks include, but are not limited to, configuring dynamic ARP learning, proxy ARP, and gratuitous ARP. There are two kinds of ARP configurations: global ARP configuration, which is across all interfaces on the device, and per interface ARP configuration.

3.1. ARP Dynamic Learning

As defined in [RFC0826], ARP caching is the method of storing network addresses and the associated data-link addresses in memory for a period of time as the addresses are learned. This minimizes the use of valuable network resources to broadcast for the same address each time a datagram is sent.

There are static ARP cache entries and dynamic ARP cache entries. Static entries, are manually configured and kept in the cache table on a permanent basis which are defined in the ipv4 neighbor list for each interface in [RFC8344]. Dynamic entries are added by vendor software, kept for a period of time, and then removed. We can specify how long an entry remains in the ARP cache. If we specify a timeout of 0 seconds, entries are never cleared from the ARP cache.

3.2. Proxy ARP

Proxy ARP, defined in [RFC1027], allows a router to respond to ARP requests on behalf of another machine that is not on the same local subnet, offering its own Ethernet media access control (MAC) address. By replying in such a way, the router then takes responsibility for routing packets to the intended destination.

In the case of certain data center network virtualization, as specified in [RFC8014], the proxy ARP can be extended to intercept all ARP requests, including source and target IP addresses in different subnets, and those ARP requests in the same subnet to suppress ARP handling.

3.3. Gratuitous ARP

Gratuitous ARP enables a device to send an ARP Request packet using its own IP address as the destination address. Gratuitous ARP provides the following functions:

- * Checks duplicate IP addresses: [RFC5227] uses gratuitous ARP to help detect IP conflicts. When a device receives an ARP request containing a source IP that matches its own, then it knows there is an IP conflict.
- * Advertises a new MAC address: Also in [RFC5227], if the MAC address of a host changes because its network adapter is replaced, the host sends a gratuitous ARP packet to notify all hosts of the change before the ARP entry is aged out.
- * Notifies an active/standby switchover in a [RFC9568] VRRP backup group: After an active/standby switchover, the master router sends a gratuitous ARP packet in the VRRP backup group to notify the switchover.

3.4. ARP Data Model

This document defines the YANG module "ietf-arp", which has the following structure:

```

module: ietf-arp
  +--rw arp
    +--rw dynamic-learning?  boolean

  augment /if:interfaces/if:interface/ip:ipv4:
    +--rw arp
      +--rw expiry-time?      uint32
      +--rw dynamic-learning?  boolean
      +--rw proxy-arp
        | +--rw mode?  enumeration
      +--rw gratuitous-arp
        | +--rw enable?  boolean
        | +--rw interval?  uint32
      +--ro statistics
        +--ro in-requests-pkts?  yang:counter32
        +--ro in-replies-pkts?   yang:counter32
        +--ro in-gratuitous-pkts? yang:counter32
        +--ro out-requests-pkts?  yang:counter32
        +--ro out-replies-pkts?   yang:counter32
        +--ro out-gratuitous-pkts? yang:counter32
    augment /if:interfaces/if:interface/ip:ipv4/ip:neighbor:
      +--ro remaining-expiry-time?  uint32

```

4. ARP YANG Module

This section presents the ARP YANG module defined in this document.

This module imports definitions from Common YANG Data Types [RFC6991], A YANG Data Model for Interface Management [RFC8343], and A YANG Data Model for IP Management [RFC8344].

```

<CODE BEGINS> file "ietf-arp@2025-07-19.yang"
module ietf-arp {
  yang-version 1.1;
  namespace "urn:ietf:params:xml:ns:yang:ietf-arp";
  prefix arp;

  import ietf-yang-types {
    prefix yang;
    reference
      "RFC 6991: Common YANG Data Types";
  }
  import ietf-interfaces {
    prefix if;
    reference
      "RFC 8343: A Yang Data Model for Interface Management";
  }
  import ietf-ip {

```

```
    prefix ip;
    reference
      "RFC 8344: A Yang Data Model for IP Management";
  }

organization
  "IETF Internet Area Working Group (intarea)";
contact
  "WG Web:  <https://datatracker.ietf.org/wg/intarea/>
  WG List:  <mailto: int-area@ietf.org>

  Author:   Feng Zheng
            <habby.zheng@huawei.com>
  Editor:   Bo Wu
            <lana.wubo@huawei.com>
  Editor:   Robert Wilton
            <rwilton@cisco.com>
  Editor:   Fan Zhang
            <zhangf52@chinatelecom.cn>
  Author:   Yongqing Zhu
            <zhuyq8@chinatelecom.cn>
  Author:   Xiaojian Ding
            <wjswsl@163.com>";

description
  "This YANG module defines Address Resolution Protocol (ARP)
  management, which includes static ARP configuration,
  dynamic ARP learning, ARP entry query, and packet statistics
  collection.

  Copyright (c) 2025 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 Revised BSD License set
  forth in Section 4.c of the IETF Trust's Legal Provisions
  Relating to IETF Documents
  (https://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 2025-07-19 {
  description
    "Init revision";
  reference
    "RFC XXXX: A Yang Data Model for Address
```

```
    Resolution Protocol (ARP)";
}

container arp {
  description
    "Address Resolution Protocol (ARP)";
  leaf dynamic-learning {
    type boolean;
    default "true";
    description
      "Controls the default ARP learning behavior on all
       interfaces on the device, unless explicit overridden by
       the per-interface dynamic-learning leaf:
        true - dynamic learning is enabled on all interfaces by
              default,
        false - dynamic learning is disabled on all interfaces by
              default";
  }
  reference
    "RFC826: An Ethernet Address Resolution Protocol";
}

augment "/if:interfaces/if:interface/ip:ipv4" {
  description
    "Augment interfaces with ARP configuration and state.";
  container arp {
    description
      "Address Resolution Protocol (ARP) related configuration
       and state";
    leaf expiry-time {
      type uint32 {
        range "30..86400";
      }
      units "seconds";
      description
        "Aging time of a received dynamic ARP entry before it is
         removed from the cache.";
    }
    leaf dynamic-learning {
      type boolean;
      description
        "Controls whether dynamic ARP learning is enabled on the
         interface. If not configured, it defaults to the behavior
         specified in the per-device /arp/dynamic-learning leaf.

         true - dynamic learning is enabled
         false - dynamic learning is disabled";
    }
  }
}
```

```
container proxy-arp {
  description
    "Configuration parameters for proxy ARP";
  leaf mode {
    type enumeration {
      enum disabled {
        description
          "The system only responds to ARP requests that
           specify a target address configured on the local
           interface.";
      }
      enum remote-only {
        description
          "The system only responds to ARP requests when the
           sender and target IP addresses are in different
           subnets.";
      }
      enum all {
        description
          "The system responds to ARP requests where the sender
           and target IP addresses are in different subnets, as
           well as those where they are in the same subnet.";
      }
    }
  }
  default "disabled";
  description
    "When set to a value other than 'disabled', the local
     system should respond to ARP requests that are for
     target addresses other than those that are configured on
     the local subinterface using its own MAC address as the
     target hardware address. If the 'remote-only' value is
     specified, replies are only sent when the target address
     falls outside the locally configured subnets on the
     interface, whereas with the 'all' value, all requests,
     regardless of their target address are replied to.";
  reference
    "RFC1027: Using ARP to Implement Transparent Subnet
     Gateways";
}
}
container gratuitous-arp {
  description
    "Configure gratuitous ARP.";
  reference
    "RFC5227: IPv4 Address Conflict Detection";
  leaf enable {
    type boolean;
    description
```

```
"Enable or disable sending gratuitous ARP packet on the
interface.

The default behaviour is device specific, and a
deviation could be used to specify a device specific
default.";
}
leaf interval {
  type uint32 {
    range "1..86400";
  }
  units "seconds";
  description
    "The interval, in seconds, between sending gratuitous ARP
    packet on the interface.

    The default behaviour is device specific, and a
    deviation could be used to specify a device specific
    default.";
}
}
container statistics {
  config false;
  description
    "ARP per-interface packet statistics

    For all ARP interface counters, discontinuities in the
    value can occur at re-initialization of the management
    system and at other times as indicated by the value of
    '../statistics/discontinuity-time' in the
    ietf-interfaces YANG module.";
  leaf in-requests-pkts {
    type yang:counter32;
    description
      "The number of ARP request packets received on this
      interface.";
  }
  leaf in-replies-pkts {
    type yang:counter32;
    description
      "The number of ARP reply packets received on this
      interface.";
  }
  leaf in-gratuitous-pkts {
    type yang:counter32;
    description
      "The number of gratuitous ARP packets received on this
      interface.";
```

```
    }
    leaf out-requests-pkts {
      type yang:counter32;
      description
        "The number of ARP request packets sent on this
        interface.";
    }
    leaf out-replies-pkts {
      type yang:counter32;
      description
        "The number of ARP reply packets sent on this
        interface.";
    }
    leaf out-gratuitous-pkts {
      type yang:counter32;
      description
        "The number of gratuitous ARP packets sent on this
        interface.";
    }
  }
}
}

augment "/if:interfaces/if:interface/ip:ipv4/ip:neighbor" {
  description
    "Augment IPv4 neighbor list with ARP expiry time.";
  leaf remaining-expiry-time {
    type uint32;
    units "seconds";
    config false;
    description
      "The number of seconds until the dynamic ARP entry expires
      and is removed from the ARP cache.";
  }
}
}
}
<CODE ENDS>
```

5. Data Model Examples

This section presents two simple ARP configuration examples:

5.1. Configured static ARP Entry

This example illustrates the configuration for a static ARP entry for peer 192.0.2.1 with MAC address 00:00:5E:00:53:AB using the model defined in [RFC8344].

```
<?xml version="1.0" encoding="utf-8"?>
<interfaces
  xmlns="urn:ietf:params:xml:ns:yang:ietf-interfaces"
  xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-type">
  <interface>
    <name>eth0</name>
    <type>ianaift:ethernetCsmacd</type>
    <!-- other parameters from ietf-interfaces omitted -->

    <ipv4 xmlns="urn:ietf:params:xml:ns:yang:ietf-ip">
      <!-- ipv4 address configuration parameters omitted -->
      <neighbor>
        <ip>192.0.2.1</ip>
        <link-layer-address>00:00:5E:00:53:AB</link-layer-address>
      </neighbor>
    </ipv4>
  </interface>
</interfaces>
```

5.2. Configuration of proxy ARP and gratuitous ARP

This example illustrates the configuration of ARP entry expiry time, proxy ARP in 'remote-only' mode, and enabling gratuitous ARP with an interval of 10 minutes.

```
<?xml version="1.0" encoding="utf-8"?>
<interfaces
  xmlns="urn:ietf:params:xml:ns:yang:ietf-interfaces"
  xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-type">
  <interface>
    <name>eth0</name>
    <type>ianaift:ethernetCsmacd</type>
    <!-- other parameters from ietf-interfaces omitted -->

    <ipv4 xmlns="urn:ietf:params:xml:ns:yang:ietf-ip">
      <!-- ipv4 address configuration parameters omitted -->
      <arp xmlns="urn:ietf:params:xml:ns:yang:ietf-arp">
        <expiry-time>1200</expiry-time>
        <proxy-arp>
          <mode>remote-only</mode>
        </proxy-arp>
        <gratuitous-arp>
          <enable>true</enable>
          <interval>600</interval>
        </gratuitous-arp>
      </arp>
    </ipv4>
  </interface>
</interfaces>
```

6. IANA Considerations

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

URI: urn:ietf:params:xml:ns:yang:ietf-arp
Registrant Contact: The INTAREA 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-arp
Namespace: urn:ietf:params:xml:ns:yang:ietf-arp
Prefix: arp
Reference: RFC XXXX

7. Security Considerations

The YANG module specified in this document defines a schema for data that 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 (NACM) [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.

There are a number of data nodes defined in this YANG module that 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) and delete operations to these data nodes without proper protection or authentication can have a negative effect on network operations. These are the subtrees and data nodes and their sensitivity/vulnerability in the "ietf-arp" module:

- * /ietf-arp/dynamic-learning

This leaf is used to enable ARP dynamic learning on all interfaces. ARP dynamic learning could allow an attacker to inject spoofed traffic into the network, e.g. denial-of-service attack.

- * arp/dynamic-learning

This leaf is used to enable ARP dynamic learning on a single interface. ARP dynamic learning could allow an attacker to inject spoofed traffic into the network, e.g. denial-of-service attack.

- * interface/ipv4/arp/proxy-arp

These leaves are used to enable proxy ARP on an interface. They could allow traffic to be mis-configured (denial-of-service attack).

- * interface/ipv4/arp/gratuitous-arp

These leaves are used to enable sending gratuitous ARP packet on an interface. This configuration could allow an attacker to inject spoofed traffic into the network, e.g. man-in-the-middle attack. The default value for this data node is device specific, and hence users of this model MUST understand whether or not gratuitous ARP is enabled and whether this could constitute a security risk.

8. Acknowledgments

The authors wish to thank Alex Campbell, Reshad Rahman, Qin Wu, Tom Petch, Jeffrey Haas, and others for their helpful comments.

9. References

9.1. Normative References

- [RFC0826] Plummer, D., "An Ethernet Address Resolution Protocol: Or Converting Network Protocol Addresses to 48.bit Ethernet Address for Transmission on Ethernet Hardware", STD 37, RFC 826, DOI 10.17487/RFC0826, November 1982, <<https://www.rfc-editor.org/info/rfc826>>.
- [RFC1027] Carl-Mitchell, S. and J. Quarterman, "Using ARP to implement transparent subnet gateways", RFC 1027, DOI 10.17487/RFC1027, October 1987, <<https://www.rfc-editor.org/info/rfc1027>>.
- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, DOI 10.17487/RFC2119, March 1997, <<https://www.rfc-editor.org/info/rfc2119>>.
- [RFC3688] Mealling, M., "The IETF XML Registry", BCP 81, RFC 3688, DOI 10.17487/RFC3688, January 2004, <<https://www.rfc-editor.org/info/rfc3688>>.
- [RFC5227] Cheshire, S., "IPv4 Address Conflict Detection", RFC 5227, DOI 10.17487/RFC5227, July 2008, <<https://www.rfc-editor.org/info/rfc5227>>.
- [RFC6020] Bjorklund, M., Ed., "YANG - A Data Modeling Language for the Network Configuration Protocol (NETCONF)", RFC 6020, DOI 10.17487/RFC6020, October 2010, <<https://www.rfc-editor.org/info/rfc6020>>.
- [RFC6242] Wasserman, M., "Using the NETCONF Protocol over Secure Shell (SSH)", RFC 6242, DOI 10.17487/RFC6242, June 2011, <<https://www.rfc-editor.org/info/rfc6242>>.

- [RFC6991] Schoenwaelder, J., Ed., "Common YANG Data Types", RFC 6991, DOI 10.17487/RFC6991, July 2013, <<https://www.rfc-editor.org/info/rfc6991>>.
- [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>>.
- [RFC8174] Leiba, B., "Ambiguity of Uppercase vs Lowercase in RFC 2119 Key Words", BCP 14, RFC 8174, DOI 10.17487/RFC8174, May 2017, <<https://www.rfc-editor.org/info/rfc8174>>.
- [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>>.
- [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>>.
- [RFC8344] Bjorklund, M., "A YANG Data Model for IP Management", RFC 8344, DOI 10.17487/RFC8344, March 2018, <<https://www.rfc-editor.org/info/rfc8344>>.
- [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>>.

9.2. Informative References

- [RFC9568] Lindem, A. and A. Dogra, "Virtual Router Redundancy Protocol (VRRP) Version 3 for IPv4 and IPv6", RFC 9568, DOI 10.17487/RFC9568, April 2024, <<https://www.rfc-editor.org/info/rfc9568>>.
- [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>>.
- [RFC8014] Black, D., Hudson, J., Kreeger, L., Lasserre, M., and T. Narten, "An Architecture for Data-Center Network Virtualization over Layer 3 (NVO3)", RFC 8014, DOI 10.17487/RFC8014, December 2016, <<https://www.rfc-editor.org/info/rfc8014>>.

- [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>>.
- [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>>.
- [RFC8341] Bierman, A. and M. Bjorklund, "Network Configuration Access Control Model", STD 91, RFC 8341, DOI 10.17487/RFC8341, March 2018, <<https://www.rfc-editor.org/info/rfc8341>>.

Appendix A. Examples

This section presents two simple ARP configuration examples:

A.1. Configuration of a Static ARP Entry

This example illustrates the configuration for a static ARP entry for peer 192.0.2.1 with MAC address 00:00:5E:00:53:AB using the model defined in [RFC8344].

```
<?xml version="1.0" encoding="utf-8"?>
<interfaces
  xmlns="urn:ietf:params:xml:ns:yang:ietf-interfaces"
  xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-type">
  <interface>
    <name>eth0</name>
    <type>ianaift:ethernetCsmacd</type>
    <!-- other parameters from ietf-interfaces omitted -->

    <ipv4 xmlns="urn:ietf:params:xml:ns:yang:ietf-ip">
      <!-- ipv4 address configuration parameters omitted -->
      <neighbor>
        <ip>192.0.2.1</ip>
        <link-layer-address>00:00:5E:00:53:AB</link-layer-address>
      </neighbor>
    </ipv4>
  </interface>
</interfaces>
```

A.2. Configuration of Proxy ARP and Gratuitous ARP

This example illustrates the configuration of ARP entry expiry time, proxy ARP in 'remote-only' mode, and enabling gratuitous ARP with an interval of 10 minutes.

```
<?xml version="1.0" encoding="utf-8"?>
<interfaces
  xmlns="urn:ietf:params:xml:ns:yang:ietf-interfaces"
  xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-type">
  <interface>
    <name>eth0</name>
    <type>ianaift:ethernetCsmacd</type>
    <!-- other parameters from ietf-interfaces omitted -->

    <ipv4 xmlns="urn:ietf:params:xml:ns:yang:ietf-ip">
      <!-- ipv4 address configuration parameters omitted -->
      <arp xmlns="urn:ietf:params:xml:ns:yang:ietf-arp">
        <expiry-time>1200</expiry-time>
        <proxy-arp>
          <mode>remote-only</mode>
        </proxy-arp>
        <gratuitous-arp>
          <enable>true</enable>
          <interval>600</interval>
        </gratuitous-arp>
      </arp>
    </ipv4>
  </interface>
</interfaces>
```

Authors' Addresses

Feng Zheng
Huawei
101 Software Avenue, Yuhua District
Nanjing
Jiangsu, 210012
China
Email: habby.zheng@huawei.com

Bo Wu (editor)
Huawei
Email: lana.wubo@huawei.com

Robert Wilton (editor)
Cisco Systems
Email: rwilton@cisco.com

Fan Zhang (editor)
China Telecom

Email: zhangf52@chinatelecom.cn

Yongqing Zhu
China Telecom
Email: zhuyq8@chinatelecom.cn

Xiaojian Ding
Email: wjswsl@163.com