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Definition of Managed Objects for the MANET Optimized Link State Routing
Protocol version 2
draft-ietf-manet-olsrv2-mib-01

Abstract

This memo defines a portion of the Management Information Base (MIB) for use with network management protocols in the Internet community. In particular, it describes objects for configuring and managing aspects of the Optimized Link State Routing protocol version 2. The Optimized Link State Routing MIB also reports state information, performance metrics, and notifications. In addition to configuration, this additional state and performance information is useful to management stations troubleshooting Mobile Ad-Hoc Networks routing problems.

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Table of Contents

1. Introduction	3
2. The Internet-Standard Management Framework	3
3. Conventions	3
4. Overview	3
4.1. Terms	4
5. Structure of the MIB Module	4
5.1. Textual Conventions	5
5.2. The Configuration Group	5
5.3. The State Group	6
5.4. The Performance Group	8
5.4.1. Recalculation Performance Objects	8
5.4.2. Message-related Performance Objects	11
5.5. The Notifications Group	14
6. Relationship to Other MIB Modules	15
6.1. Relationship to the SNMPv2-MIB	15
6.2. Relationship to the IF-MIB	15
6.3. MIB modules required for IMPORTS	15
7. Definitions	15
8. Security Considerations	61
9. IANA Considerations	63
10. Contributors	64
11. Acknowledgements	64
12. References	64
12.1. Normative References	64
12.2. Informative References	64
Appendix A. Change Log	65
Appendix B. Open Issues	65
Appendix C.	66

1. Introduction

This memo defines a portion of the Management Information Base (MIB) for use with network management protocols in the Internet community. In particular, it describes objects for configuring aspects of a process implementing the Optimized Link State Routing Protocol version 2 (OLSRv2) [OLSRv2].

2. The Internet-Standard Management Framework

For a detailed overview of the documents that describe the current Internet-Standard Management Framework, please refer to section 7 of RFC 3410 [RFC3410].

Managed objects are accessed via a virtual information store, termed the Management Information Base or MIB. MIB objects are generally accessed through the Simple Network Management Protocol (SNMP). Objects in the MIB are defined using the mechanisms defined in the Structure of Management Information (SMI). This memo specifies a MIB module that is compliant to the SMIv2, which is described in STD 58, RFC 2578 [RFC2578], STD 58, RFC 2579 [RFC2579] and STD 58, RFC 2580 [RFC2580].

3. Conventions

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC 2119 [RFC2119].

4. Overview

The Optimized Link State Routing (OLSR) protocol version 2 (OLSRv2) is a table driven, proactive routing protocol, i.e. it exchanges topology information with other routers in the network regularly. OLSRv2 is an optimization of the classical link state routing protocol. Its key concept is that of MultiPoint Relays (MPRs). Each router selects a set of its neighbor routers (which "cover" all of its symmetrically connected 2-hop neighbor routers) as MPRs. MPRs are then used to achieve both flooding reduction and topology reduction.

This MIB document provides management and control capabilities of an OLSRv2 instance, allowing to monitor the state and performance of an OLSRV2 router, as well as to change settings of the deployment.

4.1. Terms

The following definitions apply throughout this document:

- o Configuration Objects - switches, tables, objects which are initialized to default settings or set through the management interface defined by this MIB.
- o State Objects - automatically generated values which define the current operating state of the OLSRv2 routing process in the router.
- o Performance Objects - automatically generated values which help an administrator or automated tool to assess the performance of the OLSRv2 routing process on the router and the overall packet forwarding performance within the MANET routing domain.

5. Structure of the MIB Module

This section presents the structure of the Optimized Link State Routing version 2 Management Information Base (OLSRv2-MIB) module. The objects are arranged into the following groups:

- o `olsrMIBNotifications` - defines the notifications associated with the OLSRv2-MIB.
- o `olsrMIBObjects` - defines the objects forming the basis for the OLSRv2-MIB. These objects are divided up by function into the following groups:
 - * Configuration Group - This group contains the OLSRv2 objects that configure specific options that determine the overall operation of the OLSRv2 routing process and the unicast packet forwarding performance.
 - * State Group - Contains information describing the current state of the OLSRv2 routing process, in particular the Information Bases of OLSRv2.
 - * Performance Group - Contains objects which help to characterize the performance of the OLSRv2 routing process, typically statistics counters.
- o `olsrMIBConformance` - defines minimal and full conformance of implementations to this OLSRv2-MIB.

5.1. Textual Conventions

The textual conventions used in the OLSRv2-MIB are as follows. The RowStatus textual convention is imported from RFC 2579 [RFC2579].

5.2. The Configuration Group

The OLSRv2 device is configured with a set of controls. The list of configuration controls for the OLSRv2 device follows.

o Local History Times

- * O_HOLD_TIME - is used to define the time for which a recently used and replaced originator address is used to recognize the router's own messages.

o Message Intervals

- * TC_INTERVAL - is the maximum time between the transmission of two successive TC messages by this router.
- * TC_MIN_INTERVAL - is the minimum interval between transmission of two successive TC messages by this router.

o Advertised Information Validity Times

- * T_HOLD_TIME - is used to define the minimum Value in the VALIDITY_TIME TLV included in all TC messages sent by this router.
- * A_HOLD_TIME - is the period during which TC messages are sent after they no longer have any advertised information to report, but are sent in order to accelerate outdated information removal by other routers.

o Received Message Validity Times

- * RX_HOLD_TIME - is an interface parameter, and is the period after receipt of a message by the appropriate OLSRv2 interface of this router for which that information is recorded, in order that the message is recognized as having been previously received on this OLSRv2 interface.
- * P_HOLD_TIME - is a router parameter, and is the period after receipt of a message which is processed by this router for which that information is recorded, in order that the message is not processed again if received again.

- * F_HOLD_TIME - is a router parameter, and is the period after receipt of a message which is forwarded by this router for which that information is recorded, in order that the message is not forwarded again if received again.
- o Jitter
 - * TP_MAXJITTER - represents the value of MAXJITTER used in [RFC5148] for periodically generated TC messages sent by this router.
 - * TT_MAXJITTER - represents the value of MAXJITTER used in [RFC5148] for externally triggered TC messages sent by this router.
 - * F_MAXJITTER - represents the default value of MAXJITTER used in [RFC5148] for messages forwarded by this router.
- o Hop Limit Parameter
 - * TC_HOP_LIMIT - is the hop limit set in each TC message.
- o Willingness
 - * WILLINGNESS - represents the router's willingness to be an MPR, and hence its willingness to forward messages and be an intermediate router on routes.

5.3. The State Group

The State Subtree reports current state information. In OLSRv2, the state is stored in Information Bases. These are separately discussed below.

The Local Information Base (LIB), contains a router's local configuration, as defined by NHDP. It is extended in the OLSRv2 specification to also record an originator address and to include a router's:

- o "Originator Set", which consists of Originator Tuples, each of which contains addresses that were recently used as this router's originator address.
- o "Local Attached Network Set", which consists of Local Attached Network Set Tuples, each of which contains addresses of networks to which this router can act as a gateway.

The Interface Information Based (IIB), recording information

regarding links on each MANET interface and symmetric 2-hop neighbors which can be reached through such links. In addition to the uses in NHDP, information recorded in the Interface Information Bases is used for completing the Routing Set. The IIB contains two tables:

- o A "Link Set", which records links from other routers which are, or recently were, 1-hop neighbors. It consists of Link Tuples, each representing a single link.
- o A "Two-Hop Set", which records network addresses of symmetric 2-hop neighbors, and the symmetric links to symmetric 1-hop neighbors through which these symmetric 2-hop neighbors can be reached. It consists of 2-Hop Tuples, each representing a single network address of a symmetric 2-hop neighbor, and a single MANET interface of a symmetric 1-hop neighbor

The Neighbor Information Base (NIB), records information regarding current and recently lost 1-hop neighbors of this router. The NIB contains two tables:

- o The "Neighbor Set", which records all network addresses of each 1-hop neighbor. It consists of Neighbor Tuples, each representing a single 1-hop neighbor.
- o The "Lost Neighbor Set", which records network addresses of routers which recently were symmetric 1-hop neighbors, but which are now advertised as lost. It consists of Lost Neighbor Tuples, each representing a single such network address.

The Topology Information Base (TIB), records information used for the calculation of the Routing Set. The TIB contains five tables:

- o The "Advertising Remote Router Set", which records information describing each remote router in the network that transmits TC messages, allowing outdated TC messages to be recognized and discarded. It consists of Advertising Remote Router Tuples.
- o The "Router Topology Set", which records topology information about the links between routers in the MANET, allowing a "backbone" graph of all routers to be constructed using a minimum distance algorithm. It consists of Router Topology Tuples.
- o The "Routable Address Topology Set", which records topology information about the routable addresses within the MANET, and via which routers they may be reached. It consists of Routable Address Topology Tuples.

- o The "Attached Network Set", which records information about networks (which may be outside the MANET) attached to other routers and their routable addresses. It consists of Attached Network Tuples.
- o The "Routing Set", which records the first hop along a selected path to each destination for which any such path is known. It consists of Routing Tuples.

The Received Message Information Base (RMIB), records information regarding messages, that have been previously received, processed, or forwarded by this router. The RMIB contains three tables:

- o The "Received Set", which records the signatures of messages which have been received over that OLSRv2 interface. Each consists of Received Tuples.
- o The "Processed Set", which records signatures of messages which have been processed by the router. It consists of Processed Tuples.
- o The "Forwarded Set", which records signatures of messages which have been forwarded by the router. It consists of Forwarded Tuples.

5.4. The Performance Group

The Performance Group reports values relevant to system performance. This section lists objects for OLSRv2 performance monitoring, some of which explicitly appear in the OLSRv2-MIB and others which are obtainable through a combination of base objects from this MIB and reports available through the REPORT-MIB [REPORT]. Throughout this section, those objects will be pointed out that are intended as base objects which will be explicitly defined within this MIB and those objects which are derived through a combination of the base objects and capabilities afforded by the REPORT-MIB.

The objects in this group can be used to examine stability of the Routing Set, the selected MPRs, as well as message scheduling of this router.

5.4.1. Recalculation Performance Objects

The following objects return statistics to the frequency of Routing Set recalculations.

- o Number of Routing Set recalculations

This object counts each recalculation of the Routing Set.

This is a Base Object.

Object name: olsrv2RoutingSetRecalculationCount

Object type: Counter32

o Acquire history of Routing Set recalculations

This object returns the history of the exact timestamps of each time the Routing Set has been recalculated.

This is a Derived Object to be pulled from the REPORT-MIB. It is derived from the XXX Base Object.

Object name: olsrv2RoutingSetRecalculationHistory

Object type: SEQUENCE OF TimeStamp

o Histogram of the intervals between Routing Set recalculations

Returns the values that represent a histogram of intervals between Routing Set recalculations.

This is a Derived Object to be pulled from the REPORT-MIB. It is derived from the XXX Base Object.

Object name: olsrv2RoutingSetRecalculationHistogram

Object type: SEQUENCE OF (TimeTicks, Unsigned32)

o Changes of the frequency of the Routing Set recalculations

This object will divide the given time interval from t0 to t1 into a given number of equal parts. It then creates a histogram for each part and calculate the distances (using the Bhattacharyya distance) between each two adjacent histograms in time. A higher value between two histograms means more difference between the histograms.

This is a Derived Object to be pulled from the REPORT-MIB. It is derived from the XXX Base Object.

Object name: olsrv2RoutingSetRecalculationFrequencyChanges

Object type: SEQUENCE OF (TimeStamp, Float32)

The following objects return statistics to the frequency of recalculating the MPRs of this router.

o Number of MPR recalculations

This object counts each recalculation of the MPRs of the router.

This is a Base Object.

Object name: olsrv2MPRSetRecalculationCount

Object type: Counter32

o Acquire history of MPR recalculations

This object returns the history of the exact timestamps of each time the MPRs have been recalculated.

This is a Derived Object to be pulled from the REPORT-MIB. It is derived from the XXX Base Object.

Object name: olsrv2MPRSetRecalculationHistory

Object type: SEQUENCE OF TimeStamp

o Histogram of the intervals between MPR recalculations

Returns the values that represent a histogram of intervals between MPR recalculations. The histogram includes all changes that have been made after the given time t0 and before the given time t1.

This is a Derived Object to be pulled from the REPORT-MIB. It is derived from the XXX Base Object.

Object name: olsrv2MPRSetRecalculationHistogram

Object type: SEQUENCE OF (TimeTicks, Unsigned32)

o Changes of the frequency of MPR recalculations

This object will divide the given time interval from t0 to t1 into a given number of equal parts. It then creates a histogram for each part and calculate the distances (using the Bhattacharyya distance) between each two adjacent histograms in

time. A higher value between two histograms means more difference between the histograms.

This is a Derived Object to be pulled from the REPORT-MIB. It is derived from the XXX Base Object.

Object name: olsrv2MPRSetRecalculationFrequencyChanges

Object type: SEQUENCE OF (TimeStamp, Float32)

5.4.2. Message-related Performance Objects

The following objects return some of the statistics related to TC messages:

- o Total number of sent TC messages on an interface

This is a Base Object.

Object name: olsrv2IfTcMessageXmits

Object type: Counter32

- o Total number of received TC messages on an interface

This is a Base Object.

Object name: olsrv2IfTcMessageRecvd

Object type: Counter32

- o Total number of sent periodic TC messages on an interface

This is a Base Object.

Object name: olsrv2IfTcMessagePeriodicXmits

Object type: Counter32

- o Total number of sent triggered TC messages on an interface

This is a Base Object.

Object name: olsrv2IfTcMessageTriggeredXmits

Object type: Counter32

- o Total number of forwarded TC messages on an interface

This is a Base Object.

Object name: olsrv2IfTcMessageForwardedXmits

Object type: Counter32

- o Acquire history of TC message scheduling instance for the given time duration on an interface

This object returns the history of the exact timestamps of each TC message that has been sent as well as the type of the message (triggered or periodical). The list of events starts at the given point of time t0 and ends at the given time t1.

This is a Derived Object to be pulled from the REPORT-MIB. It is derived from the XXX Base Object.

Object name: olsrv2MessageSchedulingHistory

Object type: SEQUENCE OF (TimeStamp, olsrv2MessageType)

- o Histogram of the intervals between TC messages on an interface

Returns the values (in a 2-dimensional array) that represent a histogram of intervals between TC messages, separated by periodic and triggered TC. The histogram displays the distribution of intervals between two consecutive TC of the same type (triggered or periodical) using a given bin size. It includes all TC that have been sent after the given time t0 and before the given time t1.

This is a Derived Object to be pulled from the REPORT-MIB. It is derived from the XXX Base Object.

Object name: olsrv2MessageSchedulingHistogram

Object type: SEQUENCE OF (olsrv2MessageType, TimeTicks, Unsigned32)

- o Changes of the frequency of the message scheduling on an interface

This object will divide the given time interval from t0 to t1 into a given number of equal parts. It then creates a histogram for each part and calculate the distances (using the Bhattacharyya distance) between each two adjacent histograms in time. A higher value between two histograms means more difference between the histograms. For instance, that could happen if suddenly many triggered TC messages are sent, whereas before there have been only very few such triggered messages.

This is a Derived Object to be pulled from the REPORT-MIB. It is derived from the XXX Base Object.

Object name: olsrv2MessageSchedulingFrequencyChanges

Object type: SEQUENCE OF (olsrv2MessageType, TimeStamp, Float32)

- o Average number of sent TC messages per second between the given time t0 and t1 on an interface

This is a Derived Object to be pulled from the REPORT-MIB. It is derived from the XXX Base Object.

Object name: olsrv2HelloSentPerSecondCount

Object type: Float32

- o Average number of received TC messages per second between the given time t0 and t1 on an interface

This is a Derived Object to be pulled from the REPORT-MIB. It is derived from the XXX Base Object.

Object name: olsrv2HelloReceivedPerSecondCount

Object type: Float32

- o Total accumulated size in octets of sent TC messages on an interface

This is a Base Object.

Object name: olsrv2IfHelloMessageXmitAccumulatedSize

Object type: Counter32

- o Total accumulated size in octets of received TC messages on an interface

This is a Base Object.

Object name: olsrv2IfHelloMessageRecvdAccumulatedSize

Object type: Counter32

- o Average size in octets of sent TC messages per second between the given time t0 and t1 on an interface

This is a Derived Object to be pulled from the REPORT-MIB. It is derived from the XXX Base Object.

Object name: olsrv2HelloSentPerSecondOctets

Object type: Float32

- o Average size in octets of received TC messages per second between the given time t0 and t1 on an interface

This is a Derived Object to be pulled from the REPORT-MIB. It is derived from the XXX Base Object.

Object name: olsrv2HelloReceivedPerSecondOctets

Object type: Float32

- o Total accumulated number of advertized MPR selectors in TC messages on an interface

This is a Base Object.

Object name:
olsrv2IfHelloMessageXmitAccumulatedSymmetricNeighborCount

Object type: Counter32

5.5. The Notifications Group

The Notifications Subtree contains the list of notifications supported within the OLSRv2-MIB and their intended purpose or utility. This group is currently empty.

6. Relationship to Other MIB Modules

[TODO]: The text of this section specifies the relationship of the MIB modules contained in this document to other standards, particularly to standards containing other MIB modules. Definitions imported from other MIB modules and other MIB modules that SHOULD be implemented in conjunction with the MIB module contained within this document are identified in this section.

6.1. Relationship to the SNMPv2-MIB

The 'system' group in the SNMPv2-MIB [RFC3418] is defined as being mandatory for all systems, and the objects apply to the entity as a whole. The 'system' group provides identification of the management entity and certain other system-wide data. The OLSRv2-MIB does not duplicate those objects.

6.2. Relationship to the IF-MIB

[TODO] This section is included as an example; If the MIB module is not an adjunct of the Interface MIB, then this section should be removed.

6.3. MIB modules required for IMPORTS

[TODO]: Citations are not permitted within a MIB module, but any module mentioned in an IMPORTS clause or document mentioned in a REFERENCE clause is a Normative reference, and must be cited someplace within the narrative sections. If there are imported items in the MIB module, such as Textual Conventions, that are not already cited, they can be cited in text here. Since relationships to other MIB modules should be described in the narrative text, this section is typically used to cite modules from which Textual Conventions are imported.

The following OLSRv2-MIB module IMPORTS objects from SNMPv2-SMI [RFC2578], SNMPv2-TC [RFC2579], SNMPv2-CONF [RFC2580], and IF-MIB [RFC2863]

7. Definitions

```
MANET-OLSRv2-MIB DEFINITIONS ::= BEGIN
```

```
IMPORTS
```

```
Float32
```

```
FROM SMIng --[RFC3781]
```

```
MODULE-IDENTITY, OBJECT-TYPE, Counter32,  
Integer32, Unsigned32, mib-2  
FROM SNMPv2-SMI --[RFC2578]
```

```
TEXTUAL-CONVENTION, StorageType, TimeStamp,  
TruthValue, RowStatus  
FROM SNMPv2-TC --[RFC2579]
```

```
MODULE-COMPLIANCE, OBJECT-GROUP  
FROM SNMPv2-CONF --[STD58]
```

```
InetAddressType, InetAddress,  
InetAddressPrefixLength  
FROM INET-ADDRESS-MIB --[RFC3291]
```

```
InterfaceIndexOrZero  
FROM IF-MIB --[RFC2863]
```

```
NeighborRouterId  
FROM NHDP-MIB -- [draft nhdp-mib]  
;
```

```
manetOlsrv2MIB MODULE-IDENTITY  
LAST-UPDATED "200911091000Z" -- Nov 9, 2009  
ORGANIZATION "IETF MANET Working Group"  
CONTACT-INFO  
"WG E-Mail: manet@ietf.org
```

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DESCRIPTION

"This MIB module contains managed object definitions for the Manet OLSRv2 routing process defined in: Clausen, T. et.al., Optimized Link State Routing version 2 draft-ietf-manet-olsrv2-10, September 25, 2009.

Copyright (C) The IETF Trust (2009). This version of this MIB module is part of RFC xxxx; see the RFC itself for full legal notices."

-- Revision History

REVISION "200911091000Z" -- Nov 9, 2009

DESCRIPTION

"The fourth version of this MIB module, published as draft-ietf-manet-olsrv2-mib-01.txt. Added Performance objects, and updated to newest OLSRv2 draft."

REVISION "200905031300Z" -- May 3, 2009

DESCRIPTION

"Third draft of this MIB module published as draft-ietf-manet-olsrv2-mib-00.txt. Rev'd as a new MANET WG document. Cleaned up SYNTAX errors and other typos found by 'smilint'."

REVISION "200902151300Z" -- February 15, 2009

DESCRIPTION

"Second draft of this MIB module published as draft-cole-manet-olsrv2-mib-01.txt. Cleaned up table indexing and aligned with the NHDP-MIB draft (draft-cole-manet-nhdp-mib-01.txt)."

REVISION "200810241300Z" -- October 24, 2008

DESCRIPTION

"Initial draft of this MIB module published as draft-cole-manet-olsrv2-mib-00.txt."

-- RFC-Editor assigns XXXX

::= { mib-2 998 } -- to be assigned by IANA

--

```
-- TEXTUAL CONVENTIONS
--
-- none

--
-- Top-Level Object Identifier Assignments
--
olsrv2MIBNotifications OBJECT IDENTIFIER ::= { manetOlsrv2MIB 0 }
olsrv2MIBObjects       OBJECT IDENTIFIER ::= { manetOlsrv2MIB 1 }
olsrv2MIBConformance  OBJECT IDENTIFIER ::= { manetOlsrv2MIB 2 }

--
-- olsrv2ConfigurationGroup
--
-- This group contains the OLSRv2 objects that configure specific
-- options that determine the overall performance and operation
-- of the unicast routing process for the router device
-- and its interfaces.
--
olsrv2ConfigurationGroup OBJECT IDENTIFIER ::= {olsrv2MIBObjects 1}

-- Protocol Parameters for the OLSRv2 routing process.
-- These are categorized following Section 5 of the
-- OLSRv2 draft.

--
-- Local history times
--
olsrv2OHoldTime OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "milliseconds"
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "The O_HOLD_TIME is used to define the time
        for which a recently used and replaced
        originator address is used to recognize
        the router's own messages.

        The following constraint applies to this
```

```
        parameter: olsrv2OHoldTime >= 0"
REFERENCE
  "The OLSRv2 draft.
  Section 5 on Protocol Parameters."
DEFVAL { 30000 }
 ::= { olsrv2ConfigurationGroup 1 }

--
-- Message intervals
--

olsrv2TcInterval OBJECT-TYPE
SYNTAX      Unsigned32
UNITS       "milliseconds"
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
  "The TC_INTERVAL - is the maximum time
  between the transmission of two successive
  TC messages by this router.  When no TC
  messages are sent in response to local
  network changes (by design, or because the
  local network is not changing) then TC
  messages SHOULD be sent at a regular
  interval TC_INTERVAL, possibly modified
  by jitter as specified in [RFC5148].

  The following constraint applies to this
  parameter:

        olsrv2TcInterval > 0
        olsrv2TcInterval >= olsrv2TcMinInterval"
REFERENCE
  "The OLSRv2 draft.
  Section 5 on Protocol Parameters."
DEFVAL { 5000 }
 ::= { olsrv2ConfigurationGroup 2 }

olsrv2TcMinInterval OBJECT-TYPE
SYNTAX      Unsigned32
UNITS       "milliseconds"
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
  "The TC_MIN_INTERVAL is the minimum
  interval between transmission of two
  successive TC messages by this router.
```

(This minimum interval MAY be modified by jitter, as specified in [RFC5148].)

The following constraint applies to this parameter:

```
        olsrv2TcMinInterval >= 0
        olsrv2TcInterval >= olsrv2TcMinInterval"
REFERENCE
    "The OLSRv2 draft.
    Section 5 on Protocol Parameters."
DEFVAL { 1250 }
 ::= { olsrv2ConfigurationGroup 3 }
```

```
--
-- Advertised information validity times
--
```

```
olsrv2THoldTime OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "milliseconds"
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "The olsrv2THoldTime is used to define the
        minimum value in the VALIDITY_TIME TLV
        included in all TC messages sent by this router.
```

The following constraint applies to this parameter:

```
        olsrv2THoldTime > 0
        olsrv2THoldTime >= olsrv2TcInterval
```

If TC messages can be lost, then olsrv2THoldTime SHOULD be significantly greater than olsrv2TcInterval; a value $\geq 3 \times$ olsrv2TcInterval is RECOMMENDED.

olsrv2THoldTime MUST be representable as described in [timetlv]."

```
REFERENCE
    "The OLSRv2 draft.
    Section 5 on Protocol Parameters."
DEFVAL { 15000 }
 ::= { olsrv2ConfigurationGroup 4 }
```

```
olsrv2AHoldTime OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "milliseconds"
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "The olsrv2AHoldTime is the period during
         which TC messages are sent after they no
         longer have any advertised information
         to report, but are sent in order to
         accelerate outdated information removal by
         other routers.

         The following constraint applies to this
         parameter:

             olsrv2AHoldTime >= 0

         If TC messages can be lost, then
         olsrv2AHoldTime SHOULD be
         significantly greater than olsrv2TcInterval;
         a value >= 3 x olsrv2TcInterval is
         RECOMMENDED.

         olsrv2AHoldTime MUST be representable as
         described in [timetlv]."
```

REFERENCE

```
    "The OLSRv2 draft.
     Section 5 on Protocol Parameters."
    DEFVAL { 15000 }
 ::= { olsrv2ConfigurationGroup 5 }
```

```
--
-- Received message validity times
--
```

```
olsrv2RxHoldTime OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "milliseconds"
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "The olsrv2RxHoldTime is an interface parameter,
         and is the period after receipt of a message
         by the appropriate OLSRv2 interface of this
         router for which that information is recorded,
         in order that the message is recognized as
         having been previously received on this
```

OLSRv2 interface.

The following constraint applies to this parameter:

```
olsrv2RxHoldTime > 0
```

This parameter SHOULD be greater than the maximum difference in time that a message may take to traverse the MANET, taking into account any message forwarding jitter as well as propagation, queuing, and processing delays."

REFERENCE

"The OLSRv2 draft.
Section 5 on Protocol Parameters."

```
DEFVAL { 30000 }
```

```
::= { olsrv2ConfigurationGroup 6 }
```

olsrv2PHoldTime OBJECT-TYPE

```
SYNTAX      Unsigned32  
UNITS       "milliseconds"  
MAX-ACCESS  read-write  
STATUS      current
```

DESCRIPTION

"The olsrv2PHoldTime is a router parameter, and is the period after receipt of a message which is processed by this router for which that information is recorded, in order that the message is not processed again if received again.

The following constraint applies to this parameter:

```
olsrv2PHoldTime > 0
```

This parameter SHOULD be greater than the maximum difference in time that a message may take to traverse the MANET, taking into account any message forwarding jitter as well as propagation, queuing, and processing delays."

REFERENCE

"The OLSRv2 draft.
Section 5 on Protocol Parameters."

```
DEFVAL { 30000 }
```

```
::= { olsrv2ConfigurationGroup 7 }
```

```
olsrv2FHoldTime OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "milliseconds"
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "The olsrv2FHoldTime is a router parameter,
        and is the period after
        receipt of a message which is forwarded
        by this router for which that information
        is recorded, in order that the message
        is not forwarded again if received again.

        The following constraint applies to this
        parameter:

            olsrv2FHoldTime > 0

        This parameter SHOULD be greater
        than the maximum difference in time that a
        message may take to traverse the MANET,
        taking into account any message forwarding
        jitter as well as propagation, queuing,
        and processing delays."
    REFERENCE
        "The OLSRv2 draft.
        Section 5 on Protocol Parameters."
    DEFVAL { 30000 }
 ::= { olsrv2ConfigurationGroup 8 }

--
-- Jitter times
--

olsrv2TpMaxJitter OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "milliseconds"
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "If jitter, as defined in [RFC5148], is used
        then the jitter parameters are as follows:

            olsrv2TpMaxJitter represents the value of
            MAXJITTER used in [RFC5148] for periodically
            generated TC messages sent by this router.
```

For constraints on these parameters,
see [RFC5148]."

REFERENCE
"The OLSRv2 draft.
Section 5 on Protocol Parameters."
DEFVAL { 500 }
 ::= { olsrv2ConfigurationGroup 9 }

olsrv2TtMaxJitter OBJECT-TYPE
SYNTAX Unsigned32
UNITS "milliseconds"
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"If jitter, as defined in [RFC5148], is used
then the jitter parameters are as follows:

olsrv2TtMaxJitter represents the value of
MAXJITTER used in [RFC5148] for externally
triggered TC messages sent by this router.

For constraints on these parameters,
see [RFC5148]."

REFERENCE
"The OLSRv2 draft.
Section 5 on Protocol Parameters."
DEFVAL { 500 }
 ::= { olsrv2ConfigurationGroup 10 }

olsrv2FMaxJitter OBJECT-TYPE
SYNTAX Unsigned32
UNITS "milliseconds"
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"If jitter, as defined in [RFC5148], is used
then the jitter parameters are as follows:

olsrv2FMaxJitter represents the default
value of MAXJITTER used in [RFC5148] for
messages forwarded by this router.

For constraints on these parameters,
see [RFC5148]."

REFERENCE
"The OLSRv2 draft.
Section 5 on Protocol Parameters."
DEFVAL { 500 }

```
::= { olsrv2ConfigurationGroup 11 }

--
-- Hop limits
--

olsrv2TcHopLimit OBJECT-TYPE
    SYNTAX      Unsigned32 (0..255)
    UNITS       "hops"
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "The parameter olsrv2TcHopLimit is the
         hop limit set in each TC message.

         The following constraint applies to this
         parameter:

             The maximum value of
             olsrv2TcHopLimit >= the network diameter
             in hops, a value of 255 is RECOMMENDED.

             All values of olsrv2TcHopLimit >= 2."
    REFERENCE
        "The OLSRv2 draft.
         Section 5 on Protocol Parameters."
    DEFVAL { 255 }
::= { olsrv2ConfigurationGroup 12 }

--
-- Willingness
--

olsrv2Willingness OBJECT-TYPE
    SYNTAX      Unsigned32 (0..255)
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "The olsrv2Willingness MUST be in the range
         WILL_NEVER (0) to WILL_ALWAYS (7), inclusive,
         and represents its willingness to be an MPR,
         and hence its willingness to forward messages
         and be an intermediate router on routes."
    REFERENCE
        "The OLSRv2 draft.
         Section 5 on Protocol Parameters."
```

```
    DEFVAL { 3 }
 ::= { olsrv2ConfigurationGroup 13 }

--
-- olsrv2StateGroup
--
-- Contains information describing the current state of the
-- OLSRv2 routing process.
-- The OLSRv2 draft defines several information bases
-- to be maintained by the OLSRv2 compliant routers.
-- They are listed in the order defined in the OLSRv2
-- draft.

olsrv2StateGroup OBJECT IDENTIFIER ::= { olsrv2MIBObjects 2 }

olsrv2RouterStatus OBJECT-TYPE
    SYNTAX      TruthValue
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The current status of the OLSRv2 router
        routing process."
 ::= { olsrv2StateGroup 1 }

--
-- Local Information Base - as defined in [nhdp],
-- extended by the addition of an Originator Set,
-- defined in Section 6.1.1 and a Local Attached
-- Network Set, defined in Section 6.1.2.
--

--
-- Originator Set
--

olsrv2LibOrigSetTable OBJECT-TYPE
```

```
SYNTAX          SEQUENCE OF Olsrv2LibOrigSetEntry
MAX-ACCESS      not-accessible
STATUS          obsolete
DESCRIPTION
    "A router's Originator Set records addresses
    that were recently used as originator addresses
    by this router.  If a router's originator
    address is immutable then this set is always
    empty and MAY be omitted."
REFERENCE
    "The OLSRv2 draft."
 ::= { olsrv2StateGroup 2 }

olsrv2LibOrigSetEntry OBJECT-TYPE
SYNTAX          Olsrv2LibOrigSetEntry
MAX-ACCESS      not-accessible
STATUS          current
DESCRIPTION
    "A router's Originator Set consists of
    Originator Tuples:
    (O_orig_addr, O_time)."
```

```
REFERENCE
    "The OLSRv2 draft."
INDEX { olsrv2LibOrigSetIpAddress }
 ::= { olsrv2LibOrigSetTable 1 }
```

```
Olsrv2LibOrigSetEntry ::=
SEQUENCE {
    olsrv2LibOrigSetIpAddressType
        InetAddressType,
    olsrv2LibOrigSetIpAddress
        InetAddress,
    olsrv2LibOrigSetExpireTime
        Unsigned32
}
```

```
olsrv2LibOrigSetIpAddressType OBJECT-TYPE
SYNTAX          InetAddressType
MAX-ACCESS      read-only
STATUS          current
DESCRIPTION
    "The type of the olsrv2LibOrigSetIpAddress, as defined
    in the InetAddress MIB [RFC 4001]."
```

```
REFERENCE
    "The OLSRv2 draft."
 ::= { olsrv2LibOrigSetEntry 1 }
```

```
olsrv2LibOrigSetIpAddress OBJECT-TYPE
```

```
SYNTAX      InetAddress
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "A recently used originator address
    by this router."
REFERENCE
    "The OLSRv2 draft."
 ::= { olsrv2LibOrigSetEntry 2 }

-- Note:  need to change the type here to a time/date
--        type, not a time in seconds left to expire.
olsrv2LibOrigSetExpireTime OBJECT-TYPE
SYNTAX      Unsigned32 (0..65535)
UNITS       "milliseconds"
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "This object specifies the time at which this
    entry expires and MUST be removed."
REFERENCE
    "The OLSRv2 draft."
 ::= { olsrv2LibOrigSetEntry 3 }

--
-- Local Attached Network Set
--

olsrv2LibLocAttNetSetTable OBJECT-TYPE
SYNTAX      SEQUENCE OF Olsrv2LibLocAttNetSetEntry
MAX-ACCESS  not-accessible
STATUS      obsolete
DESCRIPTION
    "A router's Local Attached Network Set records
    its local non-OLSRv2 interfaces via which it
    can act as gateways to other networks. The
    Local Attached Network Set is not modified by
    this protocol."
REFERENCE
    "The OLSRv2 draft."
 ::= { olsrv2StateGroup 3 }

olsrv2LibLocAttNetSetEntry OBJECT-TYPE
SYNTAX      Olsrv2LibLocAttNetSetEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
```

"The entries include the Local Attached Network Tuples:

(AL_net_addr, AL_dist)

where:

AL_net_addr is the network address of an attached network which can be reached via this router.

AL_dist is the number of hops to the network with address AL_net_addr from this router."

REFERENCE

"The OLSRv2 draft."

INDEX { olsrv2LibLocAttNetSetIpAddress,
 olsrv2LibLocAttNetSetIpAddressPrefixLen }
 ::= { olsrv2LibLocAttNetSetTable 1 }

Olsrv2LibLocAttNetSetEntry ::=

SEQUENCE {
 olsrv2LibLocAttNetSetIpAddressType
 InetAddressType,
 olsrv2LibLocAttNetSetIpAddress
 InetAddress,
 olsrv2LibLocAttNetSetIpAddressPrefixLen
 InetAddressPrefixLength,
 olsrv2LibLocAttNetSetDistance
 Unsigned32,
 olsrv2LibLocAttNetSetRowStatus
 RowStatus
}

olsrv2LibLocAttNetSetIpAddressType OBJECT-TYPE

SYNTAX InetAddressType

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The type of the olsrv2LibLocAttNetSetIpAddress, as defined in the InetAddress MIB [RFC 4001]."

REFERENCE

"The OLSRv2 draft."

::= { olsrv2LibLocAttNetSetEntry 1 }

olsrv2LibLocAttNetSetIpAddress OBJECT-TYPE

SYNTAX InetAddress

MAX-ACCESS read-only

```
STATUS          current
DESCRIPTION
  "This is the network address of an attached
  network which can be reached via this router."
REFERENCE
  "The OLSRv2 draft."
 ::= { olsrv2LibLocAttNetSetEntry 2 }

olsrv2LibLocAttNetSetIpAddressPrefixLen OBJECT-TYPE
SYNTAX          InetAddressPrefixLength
MAX-ACCESS     read-only
STATUS         current
DESCRIPTION
  "Indicates the number of leading one bits that form the
  mask to be logical-ANDed with the destination address
  before being compared to the value in the
  olsrv2LibLocAttNetSetIpAddress field."
REFERENCE
  "The OLSRv2 draft."
 ::= { olsrv2LibLocAttNetSetEntry 3 }

olsrv2LibLocAttNetSetDistance OBJECT-TYPE
SYNTAX          Unsigned32 (1..255)
UNITS          "hops"
MAX-ACCESS     read-write
STATUS         current
DESCRIPTION
  "This object specifies the number of hops
  to the network with address
  olsrv2LibLocAttNetSetIpAddress from this router."
REFERENCE
  "The OLSRv2 draft."
 ::= { olsrv2LibLocAttNetSetEntry 4 }

olsrv2LibLocAttNetSetRowStatus OBJECT-TYPE
SYNTAX          RowStatus
MAX-ACCESS     read-create
STATUS         current
DESCRIPTION
  "This object permits management of the table
  by facilitating actions such as row creation,
  construction, and destruction. The value of
  this object has no effect on whether other
  objects in this conceptual row can be
  modified."
 ::= { olsrv2LibLocAttNetSetEntry 5 }
```

```
--
-- Interface Information Bases - as defined in
-- [nhdp], one Interface Information Base for
-- each OLSRv2 interface.
--
-- Note: The IIB is fully defined in the NHDP
-- specification and its associated MIB.
--
-- Neighbor Information Base - as defined in [nhdp],
-- extended by the addition of five elements to
-- each Neighbor Tuple, as defined in Section 6.2.
--
--
-- Neighbor Set
--
olsrv2NibNeighborSetTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF Olsrv2NibNeighborSetEntry
    MAX-ACCESS  not-accessible
    STATUS      obsolete
    DESCRIPTION
        "A router's Neighbor Set records all network
        addresses of each 1-hop neighbor. It consists
        of Neighbor Tuples, each representing a single
        1-hop neighbor. "
    REFERENCE
        "The OLSRv2 draft."
 ::= { olsrv2StateGroup 4 }

olsrv2NibNeighborSetEntry OBJECT-TYPE
    SYNTAX      Olsrv2NibNeighborSetEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Each Neighbor Tuple in the Neighbor Set, defined
        in [nhdp], has these additional elements:
            N_orig_addr
            N_willingness
            N_mpr
            N_mpr_selector
            N_advertised
        defined here as extensions."
```

```

REFERENCE
    "The OLSRv2 draft."
INDEX { olsrv2NibNeighborSetRouterId }
 ::= { olsrv2NibNeighborSetTable 1 }

Olsrv2NibNeighborSetEntry ::=
SEQUENCE {
    olsrv2NibNeighborSetRouterId
        NeighborRouterId,
    olsrv2NibNeighborSetNIpAddrType
        InetAddressType,
    olsrv2NibNeighborSetNOrigAddr
        InetAddress,
    olsrv2NibNeighborSetNWilliness
        Unsigned32,
    olsrv2NibNeighborSetNMpr
        TruthValue,
    olsrv2NibNeighborSetNMprSelector
        TruthValue,
    olsrv2NibNeighborSetNAdvertised
        TruthValue
}

olsrv2NibNeighborSetRouterId OBJECT-TYPE
SYNTAX      NeighborRouterId
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "The object olsrv2NibNeighborSetRouterId is
    the locally assigned ID of the remote router
    referenced in this row. The IP addr
    associated with this router is contained
    in the NHDP-MIB's 'nhdpDiscIfSetTable'."
REFERENCE
    "The OLSRv2 draft."
 ::= { olsrv2NibNeighborSetEntry 1 }

olsrv2NibNeighborSetNIpAddrType OBJECT-TYPE
SYNTAX      InetAddressType
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
    "The type of the olsrv2NibNeighborSetNOrigAddr, as defined
    in the InetAddress MIB [RFC 4001]."
REFERENCE
    "The OLSRv2 draft."
 ::= { olsrv2NibNeighborSetEntry 2 }

```

```
olsrv2NibNeighborSetNOrigAddr OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This is the originator IP address of that
        neighbor."
    REFERENCE
        "The OLSRv2 draft."
 ::= { olsrv2NibNeighborSetEntry 3 }

olsrv2NibNeighborSetNWilliness OBJECT-TYPE
    SYNTAX      Unsigned32 (1..7)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This object, N_willingness, is the neighbor
        router's willingness to be selected as an MPR, in
        the range from WILL_NEVER (0) to WILL_ALWAYS
        (7), both inclusive."
    REFERENCE
        "The OLSRv2 draft."
 ::= { olsrv2NibNeighborSetEntry 4 }

olsrv2NibNeighborSetNMpr OBJECT-TYPE
    SYNTAX      TruthValue
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This object, N_mpr, is a boolean flag,
        describing if this neighbor is selected as
        an MPR by this router.

        When set to 'true', this neighbor is selected
        as an MPR by this router. When set to 'false',
        it is not selected by this router as an MPR."
    REFERENCE
        "The OLSRv2 draft."
 ::= { olsrv2NibNeighborSetEntry 5 }

olsrv2NibNeighborSetNMprSelector OBJECT-TYPE
    SYNTAX      TruthValue
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This object, N_mpr_selector, is a boolean flag,
        describing if this neighbor has selected this router
        as an MPR, i.e. is an MPR selector of this router."
```

```

    When set to 'true', then this router is selected as
    an MPR by the neighbor router.  When set to 'false',
    then this router is not selected by the neighbor
    as an MPR"
REFERENCE
    "The OLSRv2 draft."
 ::= { olsrv2NibNeighborSetEntry 6 }

olsrv2NibNeighborSetNAdvertised OBJECT-TYPE
SYNTAX      TruthValue
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "This object, N_mpr_selector, is a boolean flag, describing if
    this router has elected to advertise a link to this neighbor
    in its TC messages."
REFERENCE
    "The OLSRv2 draft."
 ::= { olsrv2NibNeighborSetEntry 7 }

olsrv2NibNeighborSetTableAnsn OBJECT-TYPE
SYNTAX      Unsigned32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "Advertised Neighbor Sequence Number (ANSN), is
    a variable, whose value is included in TC messages to
    indicate the freshness of the information transmitted."
REFERENCE
    "The OLSRv2 draft."
 ::= { olsrv2StateGroup 5 }

--
-- Topology Information Base - this Information
-- Base is specific to OLSRv2, and is defined in
-- Section 6.3.
--

--
-- Advertising Remote Router Set
--

olsrv2TibAdRemoteRouterSetTable OBJECT-TYPE
SYNTAX      SEQUENCE OF Olsrv2TibAdRemoteRouterSetEntry
```

```

MAX-ACCESS    not-accessible
STATUS        obsolete
DESCRIPTION
    "A router's Advertising Remote Router Set records
    information describing each remote router in the
    network that transmits TC messages."
REFERENCE
    "The OLSRv2 draft."
 ::= { olsrv2StateGroup 6 }

```

```

olsrv2TibAdRemoteRouterSetEntry  OBJECT-TYPE
SYNTAX      Olsrv2TibAdRemoteRouterSetEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "A router's Advertised Neighbor Set Table entry
    consists of Advertising Remote Router Tuples:

        (AR_orig_addr, AR_seq_number, AR_time)

    Addresses associated with this router are
    found in the NHDP-MIB's 'nhdpDiscIfSetTable'."
REFERENCE
    "The OLSRv2 draft."
INDEX { olsrv2TibAdRemoteRouterSetRouterId }
 ::= { olsrv2TibAdRemoteRouterSetTable 1 }

```

```

Olsrv2TibAdRemoteRouterSetEntry ::=
SEQUENCE {
    olsrv2TibAdRemoteRouterSetIpAddrType
        InetAddressType,
    olsrv2TibAdRemoteRouterSetIpAddr
        InetAddress,
    olsrv2TibAdRemoteRouterSetRouterId
        NeighborRouterId,
    olsrv2TibAdRemoteRouterSetMaxSeqNo
        Unsigned32,
    olsrv2TibAdRemoteRouterSetExpireTime
        Unsigned32
}

```

```

olsrv2TibAdRemoteRouterSetIpAddrType  OBJECT-TYPE
SYNTAX      InetAddressType
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The type of the olsrv2TibAdRemoteRouterSetIpAddr,
    as defined in the InetAddress MIB [RFC 4001]."

```

```
REFERENCE
    "The OLSRv2 draft."
 ::= { olsrv2TibAdRemoteRouterSetEntry 1 }

olsrv2TibAdRemoteRouterSetIpAddress OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This is the originator address of a received
         TC message."
    REFERENCE
        "The OLSRv2 draft."
 ::= { olsrv2TibAdRemoteRouterSetEntry 2 }

olsrv2TibAdRemoteRouterSetRouterId OBJECT-TYPE
    SYNTAX      NeighborRouterId
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This object is an additional index for each
         Remote Router's IfAddr associated with the
         olsrv2TibAdRemoteRouterSetIpAddress."
    REFERENCE
        "The OLSRv2 draft."
 ::= { olsrv2TibAdRemoteRouterSetEntry 3 }

olsrv2TibAdRemoteRouterSetMaxSeqNo OBJECT-TYPE
    SYNTAX      Unsigned32 (0..65535)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This is the greatest ANSN in any TC message
         received which originated from the router
         with originator address
         olsrv2TibAdRemoteRouterSetIpAddress."
    REFERENCE
        "The OLSRv2 draft."
 ::= { olsrv2TibAdRemoteRouterSetEntry 4 }

-- Need to change this type to a time syntax.
olsrv2TibAdRemoteRouterSetExpireTime OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "milliseconds"
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This is the time at which this
```

```
        Tuple expires and MUST be removed."
REFERENCE
    "The OLSRv2 draft."
 ::= { olsrv2TibAdRemoteRouterSetEntry 5 }

--
-- Router Topology Set
--

olsrv2TibRouterTopologySetTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF Olsrv2TibTopologySetEntry
    MAX-ACCESS  not-accessible
    STATUS      obsolete
    DESCRIPTION
        "A router's Router Topology Set records topology
        information about the network."
    REFERENCE
        "The OLSRv2 draft."
 ::= { olsrv2StateGroup 7 }

olsrv2TibRouterTopologySetEntry OBJECT-TYPE
    SYNTAX      Olsrv2TibTopologySetEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "It consists of Router Topology Tuples:

            (TR_from_orig_addr, TR_to_orig_addr,
             TR_seq_number, TR_time)"
    REFERENCE
        "The OLSRv2 draft."
    INDEX { olsrv2TibRouterTopologySetFromOrigIpAddress }
 ::= { olsrv2TibRouterTopologySetTable 1 }

Olsrv2TibTopologySetEntry ::=
    SEQUENCE {
        olsrv2TibRouterTopologySetFromOrigIpAddressType
            InetAddressType,
        olsrv2TibRouterTopologySetFromOrigIpAddress
            InetAddress,
        olsrv2TibRouterTopologySetToOrigIpAddressType
            InetAddressType,
        olsrv2TibRouterTopologySetToOrigIpAddress
            InetAddress,
        olsrv2TibRouterTopologySetSeqNo
            Unsigned32,
```

```
        olsrv2TibRouterTopologySetExpireTime
            Unsigned32
    }

olsrv2TibRouterTopologySetFromOrigIpAddressType OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The type of the olsrv2TibRouterTopologySetFromOrigIpAddress,
         as defined in the InetAddress MIB [RFC 4001]."
```

REFERENCE

```
        "The OLSRv2 draft."
 ::= { olsrv2TibRouterTopologySetEntry 1 }
```

```
olsrv2TibRouterTopologySetFromOrigIpAddress OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This is the originator address of a router which can
         reach the router with originator address TR_to_orig_addr
         in one hop, note that this does not include a prefix length"
```

REFERENCE

```
        "The OLSRv2 draft."
 ::= { olsrv2TibRouterTopologySetEntry 2 }
```

```
olsrv2TibRouterTopologySetToOrigIpAddressType OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The type of the olsrv2TibRouterTopologySetToOrigIpAddress,
         as defined in the InetAddress MIB [RFC 4001]."
```

REFERENCE

```
        "The OLSRv2 draft."
 ::= { olsrv2TibRouterTopologySetEntry 3 }
```

```
olsrv2TibRouterTopologySetToOrigIpAddress OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This is the originator address of a router which can be
         reached by the router with originator address
         TR_to_orig_addr in one hop, note that this does
         not include a prefix length."
```

REFERENCE

```
    "The OLSRv2 draft."
 ::= { olsrv2TibRouterTopologySetEntry 4 }

olsrv2TibRouterTopologySetSeqNo OBJECT-TYPE
    SYNTAX      Unsigned32 (0..65535)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This is the greatest ANSN in any TC message
        received which originated from the router
        with originator address TR_from_orig_addr
        (i.e., which contributed to the information
        contained in this Tuple)."
    REFERENCE
        "The OLSRv2 draft."
 ::= { olsrv2TibRouterTopologySetEntry 5 }

-- Need to change this type to a time syntax.
olsrv2TibRouterTopologySetExpireTime OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "milliseconds"
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This is the time at which this
        Tuple expires and MUST be removed."
    REFERENCE
        "The OLSRv2 draft."
 ::= { olsrv2TibRouterTopologySetEntry 6 }

--
-- Routable Address Topology Set
--

olsrv2TibRoutableAddressTopologySetTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF Olsrv2TibRoutableAddressTopologySetEntry
    MAX-ACCESS  not-accessible
    STATUS      obsolete
    DESCRIPTION
        "A router's Routable Address Topology Set records topology
        information about the routable addresses within the MANET,
        and via which routers they may be reached."
    REFERENCE
        "The OLSRv2 draft."
 ::= { olsrv2StateGroup 8 }
```

```

olsrv2TibRoutableAddressTopologySetEntry OBJECT-TYPE
    SYNTAX      Olsrv2TibRoutableAddressTopologySetEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "It consists of Router Topology Tuples:

            (TA_from_orig_addr, TA_to_orig_addr,
             TA_seq_number, TA_time)"
    REFERENCE
        "The OLSRv2 draft."
    INDEX { olsrv2TibRouterTopologySetFromOrigIpAddr }
 ::= { olsrv2TibRoutableAddressTopologySetTable 1 }

Olsrv2TibRoutableAddressTopologySetEntry ::=
    SEQUENCE {
        olsrv2TibRoutableAddressTopologySetFromOrigIpAddrType
            InetAddressType,
        olsrv2TibRoutableAddressTopologySetFromOrigIpAddr
            InetAddress,
        olsrv2TibRoutableAddressTopologySetToOrigIpAddrType
            InetAddressType,
        olsrv2TibRoutableAddressTopologySetToOrigIpAddr
            InetAddress,
        olsrv2TibRoutableAddressTopologySetSeqNo
            Unsigned32,
        olsrv2TibRoutableAddressTopologySetExpireTime
            Unsigned32
    }

olsrv2TibRoutableAddressTopologySetFromOrigIpAddrType OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The type of the
         olsrv2TibRoutableAddressTopologySetFromOrigIpAddr,
         as defined in the InetAddress MIB [RFC 4001]."
    REFERENCE
        "The OLSRv2 draft."
 ::= { olsrv2TibRoutableAddressTopologySetEntry 1 }

olsrv2TibRoutableAddressTopologySetFromOrigIpAddr OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This is the originator address of a router which can

```

```
        reach the router with routable address TA_dest_addr
        in one hop."
REFERENCE
    "The OLSRv2 draft."
 ::= { olsrv2TibRoutableAddressTopologySetEntry 2 }

olsrv2TibRoutableAddressTopologySetToOrigIpAddrType OBJECT-TYPE
SYNTAX      InetAddressType
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The type of the olsrv2TibRouterTopologySetToOrigIpAddr,
    as defined in the InetAddress MIB [RFC 4001]."
REFERENCE
    "The OLSRv2 draft."
 ::= { olsrv2TibRoutableAddressTopologySetEntry 3 }

olsrv2TibRoutableAddressTopologySetToOrigIpAddr OBJECT-TYPE
SYNTAX      InetAddress
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "This is a routable address of a router which can be
    reached by the router with originator address
    TA_from_orig_addr in one hop."
REFERENCE
    "The OLSRv2 draft."
 ::= { olsrv2TibRoutableAddressTopologySetEntry 4 }

olsrv2TibRoutableAddressTopologySetSeqNo OBJECT-TYPE
SYNTAX      Unsigned32 (0..65535)
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "This is the greatest ANSN in any TC message
    received which originated from the router
    with originator address TA_from_orig_addr
    (i.e., which contributed to the information
    contained in this Tuple)."
REFERENCE
    "The OLSRv2 draft."
 ::= { olsrv2TibRoutableAddressTopologySetEntry 5 }

-- Need to change this type to a time syntax.
olsrv2TibRoutableAddressTopologySetExpireTime OBJECT-TYPE
SYNTAX      Unsigned32
UNITS       "milliseconds"
MAX-ACCESS  read-only
```

```
STATUS          current
DESCRIPTION
  "This is the time at which this
  Tuple expires and MUST be removed."
REFERENCE
  "The OLSRv2 draft."
 ::= { olsrv2TibRoutableAddressTopologySetEntry 6 }

--
-- Attached Network Set
--

olsrv2TibAttNetworksSetTable OBJECT-TYPE
SYNTAX          SEQUENCE OF Olsrv2TibAttNetworksSetEntry
MAX-ACCESS     not-accessible
STATUS         obsolete
DESCRIPTION
  "A router's Attached Network Set records information
  about networks (which may be outside the MANET)
  attached to other routers and their routable addresses."
REFERENCE
  "The OLSRv2 draft."
 ::= { olsrv2StateGroup 9 }

olsrv2TibAttNetworksSetEntry OBJECT-TYPE
SYNTAX          Olsrv2TibAttNetworksSetEntry
MAX-ACCESS     not-accessible
STATUS         current
DESCRIPTION
  "It consists of Attached Network Tuples:

          (AN_orig_addr, AN_net_addr,
           AN_dist, AN_seq_number, AN_time)"

REFERENCE
  "The OLSRv2 draft."
INDEX { olsrv2TibAttNetworksSetNetIpAddressType,
        olsrv2TibAttNetworksSetNetIpAddress,
        olsrv2TibAttNetworksSetNetIpAddressPrefixLen }
 ::= { olsrv2TibAttNetworksSetTable 1 }

Olsrv2TibAttNetworksSetEntry ::=
SEQUENCE {
  olsrv2TibAttNetworksSetOrigIpAddress
    InetAddress,
  olsrv2TibAttNetworksSetNetIpAddressType
```

```
        InetAddressType,
    olsrv2TibAttNetworksSetNetIpAddr
        InetAddress,
    olsrv2TibAttNetworksSetNetIpAddrPrefixLen
        InetAddressPrefixLength,
    olsrv2TibAttNetworksSetSeqNo
        Unsigned32,
    olsrv2TibAttNetworksSetDist
        Unsigned32,
    olsrv2TibAttNetworksSetExpireTime
        Unsigned32
    }

olsrv2TibAttNetworksSetOrigIpAddr OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This is the originator address of a
        router which can act as gateway to the
        network with address AN_net_addr,
        note that this does not include a
        prefix length."
    REFERENCE
        "The OLSRv2 draft."
 ::= { olsrv2TibAttNetworksSetEntry 1 }

olsrv2TibAttNetworksSetNetIpAddrType OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The type of the olsrv2TibAttNetworksSetNetIpAddr,
        as defined in the InetAddress MIB [RFC 4001]."
    REFERENCE
        "The OLSRv2 draft."
 ::= { olsrv2TibAttNetworksSetEntry 2 }

olsrv2TibAttNetworksSetNetIpAddr OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This is is the network address of an
        attached network, which may be reached via
        the router with originator address AN_orig_addr."
    REFERENCE
        "The OLSRv2 draft."
```

```
 ::= { olsrv2TibAttNetworksSetEntry 3 }

olsrv2TibAttNetworksSetNetIpAddrPrefixLen OBJECT-TYPE
    SYNTAX      InetAddressPrefixLength
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Indicates the number of leading one bits that form the
         mask to be logical-ANDed with the destination address
         before being compared to the value in the
         olsrv2TibAttNetworksSetNetIpAddr field."
    REFERENCE
        "The OLSRv2 draft."
 ::= { olsrv2TibAttNetworksSetEntry 4 }

olsrv2TibAttNetworksSetSeqNo OBJECT-TYPE
    SYNTAX      Unsigned32 (0..65535)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The is the greatest ANSN in any TC
         message received which originated from the
         router with originator address AN_orig_addr
         (i.e. which contributed to the information
         contained in this Tuple)."
    REFERENCE
        "The OLSRv2 draft."
 ::= { olsrv2TibAttNetworksSetEntry 5 }

olsrv2TibAttNetworksSetDist OBJECT-TYPE
    SYNTAX      Unsigned32 (0..255)
    UNITS       "hops"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The is the number of hops to the network
         with address AN_net_addr from the router with
         originator address AN_orig_addr."
    REFERENCE
        "The OLSRv2 draft."
 ::= { olsrv2TibAttNetworksSetEntry 6 }

-- Need to change this type to a time syntax.
olsrv2TibAttNetworksSetExpireTime OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "milliseconds"
    MAX-ACCESS  read-only
    STATUS      current
```

```
DESCRIPTION
    "This is the time at which this
      Tuple expires and MUST be removed."
REFERENCE
    "The OLSRv2 draft."
 ::= { olsrv2TibAttNetworksSetEntry 7 }

--
-- Routing Set
--

-- Note: Does this RoutingSetTable overlap too much with the
-- information already available in the latest standard MIB
-- forwarding table?

-- Note: Do all of these addresses contained in a single
-- entry in the Routing Set have to have the same addrType?

olsrv2TibRoutingSetTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF Olsrv2TibRoutingSetEntry
    MAX-ACCESS  not-accessible
    STATUS      obsolete
    DESCRIPTION
        "A router's Routing Set records the first hop along a
         selected path to each destination for which any such
         path is known."
    REFERENCE
        "The OLSRv2 draft."
 ::= { olsrv2StateGroup 10 }

olsrv2TibRoutingSetEntry OBJECT-TYPE
    SYNTAX      Olsrv2TibRoutingSetEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "It consists of Routing Tuples:

         (R_dest_addr, R_next_iface_addr,
          R_local_iface_addr, R_dist)"
    REFERENCE
        "The OLSRv2 draft."
    INDEX { olsrv2TibRoutingSetDestIpAddressType,
            olsrv2TibRoutingSetDestIpAddress,
            olsrv2TibRoutingSetDestIpAddressPrefLen }
 ::= { olsrv2TibRoutingSetTable 1 }
```

```
Olsrv2TibRoutingSetEntry ::=
    SEQUENCE {
        olsrv2TibRoutingSetDestIpAddressType
            InetAddressType,
        olsrv2TibRoutingSetDestIpAddress
            InetAddress,
        olsrv2TibRoutingSetDestIpAddressPrefLen
            InetAddressPrefixLength,
        olsrv2TibRoutingSetNextIfIpAddress
            InetAddress,
        olsrv2TibRoutingSetLocalIfIpAddress
            InetAddress,
        olsrv2TibRoutingSetDist
            Unsigned32
    }

olsrv2TibRoutingSetDestIpAddressType OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The type of the olsrv2TibRoutingSetDestIpAddress
        and olsrv2TibRoutingSetNextIfIpAddress,
        as defined in the InetAddress MIB [RFC 4001]."
    REFERENCE
        "The OLSRv2 draft."
    ::= { olsrv2TibRoutingSetEntry 1 }

olsrv2TibRoutingSetDestIpAddress OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This is the address of the destination,
        either the address of an interface of
        a destination router, or the network
        address of an attached network."
    REFERENCE
        "The OLSRv2 draft."
    ::= { olsrv2TibRoutingSetEntry 2 }

olsrv2TibRoutingSetDestIpAddressPrefLen OBJECT-TYPE
    SYNTAX      InetAddressPrefixLength
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Indicates the number of leading one bits that form the
        mask to be logical-ANDed with the destination address
```

before being compared to the value in the
olsrv2TibRoutingSetDestNetIpAddress field.

Note: This definition needs to be consistent
with the current forwarding table MIB description.
Specifically, it should allow for longest prefix
matching of network addresses."

REFERENCE

"The OLSRv2 draft."

::= { olsrv2TibRoutingSetEntry 3 }

olsrv2TibRoutingSetNextIfIpAddress OBJECT-TYPE

SYNTAX InetAddress

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This is the OLSRv2 interface address of the
'next hop' on the selected path to the
destination."

REFERENCE

"The OLSRv2 draft."

::= { olsrv2TibRoutingSetEntry 4 }

olsrv2TibRoutingSetLocalIfIpAddress OBJECT-TYPE

SYNTAX InetAddress

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This is the address of the local OLSRv2
interface over which a packet MUST be
sent to reach the destination by the
selected path."

REFERENCE

"The OLSRv2 draft."

::= { olsrv2TibRoutingSetEntry 5 }

olsrv2TibRoutingSetDist OBJECT-TYPE

SYNTAX Unsigned32 (0..255)

UNITS "hops"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The is the number of hops on the selected
path to the destination."

REFERENCE

"The OLSRv2 draft."

::= { olsrv2TibRoutingSetEntry 6 }

```
--  
-- Received Message Information Base (RMIB) - records information  
-- required to ensure that a message is processed at most  
-- once and is forwarded at most once per OLSRv2 interface  
-- of a router, using MPR flooding.  
--
```

```
-- Note: Is it appropriate or necessary to put the  
-- level of detail found in the Processing and  
-- Forwarding Information Base into the OLSRv2-MIB?
```

```
--  
-- Received Set  
--
```

```
olsrv2RmibReceivedSetTable OBJECT-TYPE  
    SYNTAX      SEQUENCE OF Olsrv2RmibReceivedSetEntry  
    MAX-ACCESS  not-accessible  
    STATUS      obsolete  
    DESCRIPTION  
        "A router has a Received Set per OLSRv2 interface.  
        Each Received Set records the signatures of messages  
        which have been received over that OLSRv2 interface."  
    REFERENCE  
        "The OLSRv2 draft."  
 ::= { olsrv2StateGroup 11 }
```

```
olsrv2RmibReceivedSetEntry OBJECT-TYPE  
    SYNTAX      Olsrv2RmibReceivedSetEntry  
    MAX-ACCESS  not-accessible  
    STATUS      current  
    DESCRIPTION  
        "Each consists of Received Tuples:  
  
        (RX_type, RX_orig_addr, RX_seq_number, RX_time)"  
    REFERENCE  
        "The OLSRv2 draft."  
    INDEX { olsrv2RmibReceivedIfIndex,  
            olsrv2RmibReceivedSetOrigAddr,  
            olsrv2RmibReceivedSetSeqNo }  
 ::= { olsrv2RmibReceivedSetTable 1 }
```

```
Olsrv2RmibReceivedSetEntry ::=  
    SEQUENCE {  
        olsrv2RmibReceivedIfIndex  
            InterfaceIndexOrZero,  
        olsrv2RmibReceivedSetMsgType  
            Unsigned32,
```

```
    olsrv2RmibReceivedSetOrigIpAddrType
        InetAddressType,
    olsrv2RmibReceivedSetOrigAddr
        InetAddress,
    olsrv2RmibReceivedSetSeqNo
        Unsigned32,
    olsrv2RmibReceivedSetExpireTime
        Unsigned32
}

olsrv2RmibReceivedIfIndex OBJECT-TYPE
    SYNTAX      InterfaceIndexOrZero
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The ID of an interface.  Used for cross
        indexing into other OLSRv2 tables and other
        MIBs."
 ::= { olsrv2RmibReceivedSetEntry 1 }

olsrv2RmibReceivedSetMsgType OBJECT-TYPE
    SYNTAX      Unsigned32 (1..255)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This is the received Message Type."
    REFERENCE
        "The OLSRv2 draft."
 ::= { olsrv2RmibReceivedSetEntry 2 }

olsrv2RmibReceivedSetOrigIpAddrType OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "The type of the olsrv2RmibReceivedSetOrigAddr, as defined
        in the InetAddress MIB [RFC 4001]."
    REFERENCE
        "The OLSRv2 draft."
 ::= { olsrv2RmibReceivedSetEntry 3 }

olsrv2RmibReceivedSetOrigAddr OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This is the originator address of the received
        message, note that this does not include a
```

```
        prefix length."
REFERENCE
    "The OLSRv2 draft."
 ::= { olsrv2RmibReceivedSetEntry 4 }

olsrv2RmibReceivedSetSeqNo OBJECT-TYPE
SYNTAX      Unsigned32 (0..65535)
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "This is the message sequence number of the received
    message."
REFERENCE
    "The OLSRv2 draft."
 ::= { olsrv2RmibReceivedSetEntry 5 }

olsrv2RmibReceivedSetExpireTime OBJECT-TYPE
SYNTAX      Unsigned32
UNITS       "milliseconds"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "This specifies the time at which this Tuple
    expires and MUST be removed."
REFERENCE
    "The OLSRv2 draft."
 ::= { olsrv2RmibReceivedSetEntry 6 }

--
-- Processed Set
--

olsrv2RmibProcessedSetTable OBJECT-TYPE
SYNTAX      SEQUENCE OF Olsrv2RmibProcessedSetEntry
MAX-ACCESS  not-accessible
STATUS      obsolete
DESCRIPTION
    "A router has a single Processed Set which
    records signatures of messages which have
    been processed by the router."
REFERENCE
    "The OLSRv2 draft."
 ::= { olsrv2StateGroup 12 }

olsrv2RmibProcessedSetEntry OBJECT-TYPE
SYNTAX      Olsrv2RmibProcessedSetEntry
```

```
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
    "Each consists of Processed Tuples:

    (P_type, P_orig_addr, P_seq_number, P_time)"
REFERENCE
    "The OLSRv2 draft."
INDEX { olsrv2RmibProcessedSetOrigAddr,
        olsrv2RmibProcessedSetSeqNo }
 ::= { olsrv2RmibProcessedSetTable 1 }

Olsrv2RmibProcessedSetEntry ::=
SEQUENCE {
    olsrv2RmibProcessedSetMsgType
        Unsigned32,
    olsrv2RmibProcessedSetOrigIpAddressType
        InetAddressType,
    olsrv2RmibProcessedSetOrigAddr
        InetAddress,
    olsrv2RmibProcessedSetSeqNo
        Unsigned32,
    olsrv2RmibProcessedSetExpireTime
        Unsigned32
}

olsrv2RmibProcessedSetMsgType OBJECT-TYPE
SYNTAX Unsigned32 (1..255)
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "This is the processed Message Type."
REFERENCE
    "The OLSRv2 draft."
 ::= { olsrv2RmibProcessedSetEntry 1 }

olsrv2RmibProcessedSetOrigIpAddressType OBJECT-TYPE
SYNTAX InetAddressType
MAX-ACCESS read-write
STATUS current
DESCRIPTION
    "The type of the olsrv2RmibProcessedSetOrigAddr, as defined
    in the InetAddress MIB [RFC 4001]."
REFERENCE
    "The OLSRv2 draft."
 ::= { olsrv2RmibProcessedSetEntry 2 }

olsrv2RmibProcessedSetOrigAddr OBJECT-TYPE
```

```
SYNTAX      InetAddress
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "This is the originator address of the processed
    message, note that this does not include a
    prefix length."
REFERENCE
    "The OLSRv2 draft."
 ::= { olsrv2RmibProcessedSetEntry 3 }

olsrv2RmibProcessedSetSeqNo OBJECT-TYPE
SYNTAX      Unsigned32 (0..65535)
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "This is the message sequence number of the processed
    message."
REFERENCE
    "The OLSRv2 draft."
 ::= { olsrv2RmibProcessedSetEntry 4 }

olsrv2RmibProcessedSetExpireTime OBJECT-TYPE
SYNTAX      Unsigned32
UNITS       "milliseconds"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "This specifies the time at which this Tuple
    expires and MUST be removed."
REFERENCE
    "The OLSRv2 draft."
 ::= { olsrv2RmibProcessedSetEntry 5 }

--
-- Forwarded Set
--

olsrv2RmibForwardedSetTable OBJECT-TYPE
SYNTAX      SEQUENCE OF Olsrv2RmibForwardedSetEntry
MAX-ACCESS  not-accessible
STATUS      obsolete
DESCRIPTION
    "A router has a single Forwarded Set which records
    signatures of messages which have been forwarded by
    the router."
REFERENCE
```

```
    "The OLSRv2 draft."
 ::= { olsrv2StateGroup 13 }

olsrv2RmibForwardedSetEntry OBJECT-TYPE
    SYNTAX      Olsrv2RmibForwardedSetEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Each consists of Forwarded Tuples:

        (F_type, F_orig_addr, F_seq_number, F_time)"
    REFERENCE
        "The OLSRv2 draft."
    INDEX { olsrv2RmibReceivedSetOrigAddr,
            olsrv2RmibReceivedSetSeqNo }
 ::= { olsrv2RmibForwardedSetTable 1 }

Olsrv2RmibForwardedSetEntry ::=
    SEQUENCE {
        olsrv2RmibForwardedSetMsgType
            Unsigned32,
        olsrv2RmibForwardedSetOrigIpAddressType
            InetAddressType,
        olsrv2RmibForwardedSetOrigAddr
            InetAddress,
        olsrv2RmibForwardedSetSeqNo
            Unsigned32,
        olsrv2RmibForwardedSetExpireTime
            Unsigned32
    }

olsrv2RmibForwardedSetMsgType OBJECT-TYPE
    SYNTAX      Unsigned32 (1..255)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This is the forwarded Message Type."
    REFERENCE
        "The OLSRv2 draft."
 ::= { olsrv2RmibForwardedSetEntry 1 }

olsrv2RmibForwardedSetOrigIpAddressType OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "The type of the olsrv2RmibForwardedSetOrigAddr, as defined
        in the InetAddress MIB [RFC 4001]."
```

```
REFERENCE
    "The OLSRv2 draft."
 ::= { olsrv2RmibForwardedSetEntry 2 }

olsrv2RmibForwardedSetOrigAddr OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This is the originator address of the forwarded
        message, note that this does not include a
        prefix length."
    REFERENCE
        "The OLSRv2 draft."
 ::= { olsrv2RmibForwardedSetEntry 3 }

olsrv2RmibForwardedSetSeqNo OBJECT-TYPE
    SYNTAX      Unsigned32 (0..65535)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This is the message sequence number of the forwarded
        message."
    REFERENCE
        "The OLSRv2 draft."
 ::= { olsrv2RmibForwardedSetEntry 4 }

olsrv2RmibForwardedSetExpireTime OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "milliseconds"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This specifies the time at which this Tuple
        expires and MUST be removed."
    REFERENCE
        "The OLSRv2 draft."
 ::= { olsrv2RmibForwardedSetEntry 5 }
```

```
--
-- OLSRv2 Performance Group
--
--     Contains objects which help to characterize the
--     performance of the OLSRv2 routing process.
--
```

```
olsrv2PerformanceObjGrp OBJECT IDENTIFIER ::= { olsrv2MIBObjects 3 }

--
-- Objects per local interface
--

olsrv2InterfacePerfTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF Olsrv2InterfacePerfEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This table summarizes performance objects that are
         measured per local OLSRv2 interface."
    REFERENCE
        "The OLSRv2 draft."
 ::= { olsrv2PerformanceObjGrp 1 }

olsrv2InterfacePerfEntry OBJECT-TYPE
    SYNTAX      Olsrv2InterfacePerfEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A single entry contains performance counters for
         a local OLSRv2 interface."
    INDEX { olsrv2IfPerfIndex }
 ::= { olsrv2InterfacePerfTable 1 }

Olsrv2InterfacePerfEntry ::=
    SEQUENCE {
        olsrv2IfPerfIndex
            InterfaceIndexOrZero,
        olsrv2IfTcMessageXmits
            Counter32,
        olsrv2IfTcMessageRecvd
            Counter32,
        olsrv2IfTcMessageXmitAccumulatedSize
            Counter32,
        olsrv2IfTcMessageRecvdAccumulatedSize
            Counter32,
        olsrv2IfTcMessageTriggeredXmits
            Counter32,
        olsrv2IfTcMessagePeriodicXmits
            Counter32,
        olsrv2IfTcMessageForwardedXmits
            Counter32,
        olsrv2IfTcMessageXmitAccumulatedMPRSelectorCount
            Counter32
    }
```

```
    }

olsrv2IfPerfIndex OBJECT-TYPE
    SYNTAX      InterfaceIndexOrZero
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The ID of an interface.  Used for cross
        indexing into other OLSRv2 tables and other
        MIBs."
 ::= { olsrv2InterfacePerfEntry 1 }

olsrv2IfTcMessageXmits OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "A counter is incremented each time a TC
        message has been transmitted on that interface."
 ::= { olsrv2InterfacePerfEntry 2 }

olsrv2IfTcMessageRecvd OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "A counter is incremented each time a
        TC message has been received on that interface."
 ::= { olsrv2InterfacePerfEntry 3 }

olsrv2IfTcMessageXmitAccumulatedSize OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "A counter is incremented by the number of octets in
        a TC message each time a
        TC message has been sent."
 ::= { olsrv2InterfacePerfEntry 4 }

olsrv2IfTcMessageRecvdAccumulatedSize OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "A counter is incremented by the number of octets in
        a TC message each time a
        TC message has been received."
```

```
::= { olsrv2InterfacePerfEntry 5 }

olsrv2IfTcMessageTriggeredXmits OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "A counter is incremented each time a triggered
        TC message has been sent."
 ::= { olsrv2InterfacePerfEntry 6 }

olsrv2IfTcMessagePeriodicXmits OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "A counter is incremented each time a periodic
        TC message has been sent."
 ::= { olsrv2InterfacePerfEntry 7 }

olsrv2IfTcMessageForwardedXmits OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "A counter is incremented each time a
        TC message has been forwarded."
 ::= { olsrv2InterfacePerfEntry 8 }

olsrv2IfTcMessageXmitAccumulatedMPRSelectorCount OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "A counter is incremented by the number of advertized
        MPR selectors in a TC each time a TC
        message has been sent."
 ::= { olsrv2InterfacePerfEntry 9 }

--
-- Objects concerning the Routing set
--

olsrv2RoutingSetRecalculationCount OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
```

```
STATUS      current
DESCRIPTION
    "This counter increments each time the Routing Set has
    been recalculated."
 ::= { olsrv2PerformanceObjGrp 2 }

--
-- Objects concerning the MPR set
--

olsrv2MPRSetRecalculationCount  OBJECT-TYPE
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "This counter increments each time the MPRs
    of this router have been recalculated."
 ::= { olsrv2PerformanceObjGrp 3 }

--
-- Notifications
--

-- Note:  What notifications do we want for this MIB?

--
-- Compliance Statements
--

-- Note:  need to update the Compliance section once the mib
--        objects stabilize.

olsrv2Compliances  OBJECT IDENTIFIER ::= { olsrv2MIBConformance 1 }
olsrv2MIBGroups    OBJECT IDENTIFIER ::= { olsrv2MIBConformance 2 }

olsrv2BasicCompliance  MODULE-COMPLIANCE
STATUS current
DESCRIPTION "The basic implementation requirements for
            managed network entities that implement
            the OLSRv2 routing process."
```

```
MODULE -- this module
MANDATORY-GROUPS { olsrv2ConfigObjectsGroup }
 ::= { olsrv2Compliances 1 }

olsrv2FullCompliance MODULE-COMPLIANCE
STATUS current
DESCRIPTION "The full implementation requirements for
              managed network entities that implement
              the OLSRv2 routing process."
MODULE -- this module
MANDATORY-GROUPS { olsrv2ConfigObjectsGroup,
                   olsrv2StateObjectsGroup,
                   olsrv2PerfObjectsGroup }
 ::= { olsrv2Compliances 2 }

--
-- Units of Conformance
--

olsrv2ConfigObjectsGroup OBJECT-GROUP
OBJECTS {
    olsrv2OperationalMode,
    olsrv2OHoldTime,
    olsrv2TcInterval,
    olsrv2TcMinInterval,
    olsrv2THoldTime,
    olsrv2AHoldTime,
    olsrv2RxHoldTime,
    olsrv2PHoldTime,
    olsrv2FHoldTime,
    olsrv2TpMaxJitter,
    olsrv2TtMaxJitter,
    olsrv2FMaxJitter,
    olsrv2TcHopLimit,
    olsrv2Willingness
}
STATUS current
DESCRIPTION
    "Set of OLSRv2 configuration objects implemented
    in this module."
 ::= { olsrv2MIBGroups 1 }

olsrv2StateObjectsGroup OBJECT-GROUP
OBJECTS {
    olsrv2RouterStatus,
    olsrv2LibOrigSetIpAddrType,
    olsrv2LibOrigSetIpAddr,
    olsrv2LibLocAttNetSetIpAddrType,
```

```
    olsrv2LibLocAttNetSetIpAddress,
    olsrv2LibLocAttNetSetIpAddressPrefixLen,
    olsrv2LibLocAttNetSetDistance,
    olsrv2LibLocAttNetSetRowStatus,
    olsrv2NibNeighborSetNIpAddressType,
    olsrv2NibNeighborSetNOrigAddr,
    olsrv2NibNeighborSetNWilliness,
    olsrv2NibNeighborSetNMpr,
    olsrv2NibNeighborSetNMprSelector,
    olsrv2NibNeighborSetNAdvertised,
    olsrv2TibAdRemoteRouterSetIpAddressType,
    olsrv2TibAdRemoteRouterSetIpAddress,
    olsrv2TibAdRemoteRouterSetMaxSeqNo,
    olsrv2TibRouterTopologySetFromOrigIpAddressType,
    olsrv2TibRouterTopologySetFromOrigIpAddress,
    olsrv2TibRouterTopologySetToOrigIpAddressType,
    olsrv2TibRouterTopologySetToOrigIpAddress,
    olsrv2TibRouterTopologySetSeqNo,
    olsrv2TibRoutableAddressTopologySetFromOrigIpAddressType,
    olsrv2TibRoutableAddressTopologySetFromOrigIpAddress,
    olsrv2TibRoutableAddressTopologySetToOrigIpAddressType,
    olsrv2TibRoutableAddressTopologySetToOrigIpAddress,
    olsrv2TibRoutableAddressTopologySetSeqNo,
    olsrv2TibAttNetworksSetOrigIpAddress,
    olsrv2TibAttNetworksSetNetIpAddress,
    olsrv2TibAttNetworksSetNetIpAddressPrefixLen,
    olsrv2TibAttNetworksSetSeqNo,
    olsrv2TibAttNetworksSetDist,
    olsrv2TibRoutingSetDestIpAddress,
    olsrv2TibRoutingSetDestIpAddressPrefLen,
    olsrv2TibRoutingSetNextIfIpAddress,
    olsrv2TibRoutingSetLocalIfIpAddress,
    olsrv2RmibReceivedSetMsgType,
    olsrv2RmibReceivedSetOrigAddr,
    olsrv2RmibReceivedSetSeqNo,
    olsrv2RmibProcessedSetMsgType,
    olsrv2RmibProcessedSetOrigAddr,
    olsrv2RmibProcessedSetSeqNo,
    olsrv2RmibForwardedSetMsgType,
    olsrv2RmibForwardedSetOrigAddr,
    olsrv2RmibForwardedSetSeqNo
}
STATUS current
DESCRIPTION
    "Set of OLSRv2 state objects implemented
    in this module."
 ::= { olsrv2MIBGroups 2 }
```

```
olsrv2PerfObjectsGroup OBJECT-GROUP
  OBJECTS {
    olsrv2IfTcMessageXmits,
    olsrv2IfTcMessageRecvd,
    olsrv2IfTcMessageRecvdAccumulatedSize,
    olsrv2IfTcMessageTriggeredXmits,
    olsrv2IfTcMessagePeriodicXmits,
    olsrv2IfTcMessageForwardedXmits,
    olsrv2IfTcMessageXmitAccumulatedMPRSelectorCount,
    olsrv2RoutingSetRecalculationCount,
    olsrv2MPRSetRecalculationCount
  }
  STATUS current
  DESCRIPTION
    "Set of OLSRv2 performance objects implemented
    in this module by total and per interface."
 ::= { olsrv2MIBGroups 3 }

END
```

8. Security Considerations

[TODO] Each specification that defines one or more MIB modules MUST contain a section that discusses security considerations relevant to those modules. This section MUST be patterned after the latest approved template (available at <http://www.ops.ietf.org/mib-security.html>). Remember that the objective is not to blindly copy text from the template, but rather to think and evaluate the risks/vulnerabilities and then state/document the result of this evaluation.

[TODO] if you have any read-write and/or read-create objects, please include the following boilerplate paragraph.

There are a number of management objects defined in this MIB module with a MAX-ACCESS clause of read-write and/or read-create. Such objects may be considered sensitive or vulnerable in some network environments. The support for SET operations in a non-secure environment without proper protection can have a negative effect on network operations. These are the tables and objects and their sensitivity/vulnerability:

- o [TODO] writable MIB objects that could be especially disruptive if abused MUST be explicitly listed by name and the associated security risks MUST be spelled out; RFC 2669 has a very good example.

- o [TODO] list the writable tables and objects and state why they are sensitive.

[TODO] else if there are no read-write objects in your MIB module, use the following boilerplate paragraph.

There are no management objects defined in this MIB module that have a MAX-ACCESS clause of read-write and/or read-create. So, if this MIB module is implemented correctly, then there is no risk that an intruder can alter or create any management objects of this MIB module via direct SNMP SET operations.

[TODO] if you have any sensitive readable objects, please include the following boilerplate paragraph.

Some of the readable objects in this MIB module (i.e., objects with a MAX-ACCESS other than not-accessible) may be considered sensitive or vulnerable in some network environments. It is thus important to control even GET and/or NOTIFY access to these objects and possibly to even encrypt the values of these objects when sending them over the network via SNMP. These are the tables and objects and their sensitivity/vulnerability:

- o [TODO] you must explicitly list by name any readable objects that are sensitive or vulnerable and the associated security risks MUST be spelled out (for instance, if they might reveal customer information or violate personal privacy laws such as those of the European Union if exposed to unauthorized parties)
- o [TODO] list the tables and objects and state why they are sensitive.

[TODO] discuss what security the protocol used to carry the information should have. The following three boilerplate paragraphs should not be changed without very good reason. Changes will almost certainly require justification during IESG review.

SNMP versions prior to SNMPv3 did not include adequate security. Even if the network itself is secure (for example by using IPSec), even then, there is no control as to who on the secure network is allowed to access and GET/SET (read/change/create/delete) the objects in this MIB module.

It is RECOMMENDED that implementers consider the security features as provided by the SNMPv3 framework (see [RFC3410], section 8), including full support for the SNMPv3 cryptographic mechanisms (for authentication and privacy).

Further, deployment of SNMP versions prior to SNMPv3 is NOT RECOMMENDED. Instead, it is RECOMMENDED to deploy SNMPv3 and to enable cryptographic security. It is then a customer/operator responsibility to ensure that the SNMP entity giving access to an instance of this MIB module is properly configured to give access to the objects only to those principals (users) that have legitimate rights to indeed GET or SET (change/create/delete) them.

9. IANA Considerations

[TODO] In order to comply with IESG policy as set forth in <http://www.ietf.org/ID-Checklist.html>, every Internet-Draft that is submitted to the IESG for publication MUST contain an IANA Considerations section. The requirements for this section vary depending what actions are required of the IANA. see RFC4181 section 3.5 for more information on writing an IANA clause for a MIB module document.

[TODO] select an option and provide the necessary details.

Option #1:

The MIB module in this document uses the following IANA-assigned OBJECT IDENTIFIER values recorded in the SMI Numbers registry:

Descriptor -----	OBJECT IDENTIFIER value -----
sampleMIB	{ mib-2 XXX }

Option #2:

Editor's Note (to be removed prior to publication): the IANA is requested to assign a value for "XXX" under the 'mib-2' subtree and to record the assignment in the SMI Numbers registry. When the assignment has been made, the RFC Editor is asked to replace "XXX" (here and in the MIB module) with the assigned value and to remove this note.

Note well: prior to official assignment by the IANA, a draft document MUST use place holders (such as "XXX" above) rather than actual numbers. See RFC4181 Section 4.5 for an example of how this is done in a draft MIB module.

Option #3:

This memo includes no request to IANA.

10. Contributors

This MIB document uses the template authored by D. Harrington which is based on contributions from the MIB Doctors, especially Juergen Schoenwaelder, Dave Perkins, C.M.Heard and Randy Presuhn.

11. Acknowledgements

12. References

12.1. Normative References

- [RFC2863] McCloghrie, K. and F. Kastenholz, "The Interfaces Group MIB", RFC 2863, June 2000.
- [RFC3418] Presuhn, R., "Management Information Base (MIB) for the Simple Network Management Protocol (SNMP)", STD 62, RFC 3418, December 2002.
- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.
- [RFC2578] McCloghrie, K., Ed., Perkins, D., Ed., and J. Schoenwaelder, Ed., "Structure of Management Information Version 2 (SMIv2)", STD 58, RFC 2578, April 1999.
- [RFC2579] McCloghrie, K., Ed., Perkins, D., Ed., and J. Schoenwaelder, Ed., "Textual Conventions for SMIv2", STD 58, RFC 2579, April 1999.
- [RFC2580] McCloghrie, K., Perkins, D., and J. Schoenwaelder, "Conformance Statements for SMIv2", STD 58, RFC 2580, April 1999.
- [OLSRv2] Clausen, T., Dearlove, C., and P. Jacquet, "The Optimized Link State Routing Protocol version 2", draft-ietf-manet-olsr-10 (work in progress), September 2009.
- [REPORT] Cole, R., Macker, J., and A. Morton, "The MANET Report MIB", June 2009.

12.2. Informative References

- [RFC3410] Case, J., Mundy, R., Partain, D., and B. Stewart, "Introduction and Applicability Statements for Internet-Standard Management Framework", RFC 3410, December 2002.

Appendix A. Change Log

This section identifies the changes made during the development of this MIB.

Here we list the changes made in developing draft-ietf-manet-olsrv2-mib-01.

1. Added Performance Group objects
2. Updated draft to adhere to the current version of the OLSRv2 draft.
3. Cleaned up errors.
4. Added U. Herberg as new author.

Here we list the changes made in developing draft-ietf-manet-olsrv2-mib-00.

1. Rev'd the draft as a new working group document.
2. Ran 'smilint' against the module and cleaned up syntax errors and other issues discovered by the checker.

Here we list the changes made in developing draft-cole-manet-olsr-mib-01.

1. Completely reworked the entire Configuration Objects group in order to align with the newly developed NHDP-MIB draft.

Appendix B. Open Issues

This section contains the set of open issues related to the development and design of the OLSRv2-MIB. This section will not be present in the final version of the MIB and will be removed once all the open issues have been resolved.

1. Look into possible redundancy between the TIB Routing Set and the latest standard MIB forwarding table.
2. Fill out the performance objects group.
3. Complete notification group.
4. Complete conformance group.

5. Work on the relationship to other MIBs, IF-MIB, NHDP-MIB.
6. Identify all objects requiring non-volatile storage in their DESCRIPTION clauses.
7. Incorporate parameter relationship conditions into their DESCRIPTION clauses.
8. Also, specify specific SNMP response to the snmp set request, i.e., 'generic error', 'bad value', etc.
9. Fill in all of the DEFVAL within the configuration group objects with their correct values.
10. Run through the MIB checker.
11. Complete the security analysis and section.
12. Clean up all of the 'Note:' statements within the body of the MIB.
13. Cleanup all the [TODOs] from the MIB template.

Appendix C.

```
*****
* Note to the RFC Editor (to be removed prior to publication) *
*
* 1) The reference to RFCXXXX within the DESCRIPTION clauses *
* of the MIB module point to this draft and are to be *
* assigned by the RFC Editor. *
*
* 2) The reference to RFCXXX2 throughout this document point *
* to the current draft-ietf-manet-olsrv2-xx.txt. This *
* need to be replaced with the XXX RFC number. *
*
*****
```

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