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Definition of Managed Objects for the Optimized Link State Routing Protocol version 2
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Abstract

This document defines the Management Information Base (MIB) module for configuring and managing the Optimized Link State Routing protocol version 2 (OLSRv2). The OLSRv2-MIB module is structured into configuration information, state information, performance information, and notifications. This additional state and performance information is useful to troubleshoot problems and performance issues of the routing protocol. Two levels of compliance allow this MIB module to be deployed on constrained routers.

Status of This Memo

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Table of Contents

1. Introduction

This document defines the Management Information Base (MIB) module for configuring and managing the Optimized Link State Routing protocol version 2 (OLSRv2). The OLSRv2-MIB module is structured into configuration information, state information, performance information, and notifications. In addition to configuration, this additional state and performance information is useful to troubleshoot problems and performance issues of the routing protocol. Different levels of compliance allow implementers to use smaller subsets of all defined objects, allowing for this MIB module to be deployed on more constrained routers.

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 [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 module are defined using the mechanisms defined in the Structure of Management Information (SMI). This document specifies a MIB module that is compliant to the SMIv2, which is described in [RFC2578], [RFC2579], and [RFC2580].

3. Conventions

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 [RFC2119].

4. Overview

The Optimized Link State Routing Protocol version 2 (OLSRv2) [OLSRv2] is a table driven, proactive routing protocol, i.e., it exchanges topology information with other routers in the network periodically. 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 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 OLSRv2 instance (e.g., router or interface parameters such as message intervals etc.).

As OLSRv2 relies on the neighborhood information discovered by the "Mobile Ad Hoc Network (MANET) Neighborhood Discovery Protocol (NHDP)" [RFC6130], the OLSRv2-MIB module is aligned with the NHDP-MIB [RFC6779] module and augments several of the tables and objects in the NHDP-MIB. In particular, common indexes for router interfaces and discovered neighbors are used, as described in Section 5.2.

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 module.

o State Objects - automatically generated values which define the current operating state of the OLSRv2 protocol 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.

o Notification Objects - define triggers and associated notification messages allowing for asynchronous tracking of pre-defined events on the managed router.

5. Structure of the MIB Module

This section presents the structure of the OLSRv2-MIB module. The objects are arranged into the following structure:

o olsrv2MIBObjects - defines objects forming the basis for the OLSRv2-MIB module. These objects are divided up by function into the following groups:

  * Configuration Group - defining objects related to the configuration of the OLSRv2 instance on the router.

  * State Group - defining objects which reflect the current state of the OLSRv2 instance running on the router.

  * Performance Group -defining objects which are useful to a management station when characterizing the performance of

OLSRv2 on the router and in the MANET.

- o olsrv2MIBNotifications - objects defining OLSRv2-MIB module notifications.

- o olsrv2MIBConformance - defining the minimal and maximal conformance requirements for implementations of this MIB module.

5.1. The Configuration Group

The OLSRv2 router is configured with a set of controls. The authoritative list of configuration controls within the OLSRv2-MIB module are found within the MIB module itself. Generally, an attempt was made in developing the OLSRv2-MIB module to support all configuration objects defined in [OLSRv2]. For all of the configuration parameters, the same constraints and default values of these parameters as defined in [OLSRv2] are followed.

5.2. The State Group

The State Group reports current state information of a router running [OLSRv2]. The OLSRv2-MIB module State Group tables were designed to contain the complete set of state information defined within the information bases in [OLSRv2].

The OLSRv2-MIB module State Group tables are constructed as extensions to the corresponding tables within the State Group of the NHDP-MIB [RFC6779] module. Use of the AUGMENTS clause is made, when possible, to accomplish these table extensions. Further, the State Group tables defined in this MIB module are aligned with the according tables in the NHDP-MIB [RFC6779] module, as described in Section 6.2.

5.3. The Performance Group

The Performance Group reports values relevant to system performance. Frequent changes of sets or frequent recalculation of the routing set or the MPRs can have a negative influence on the performance of OLSRv2. This MIB module defines several objects that can be polled in order to, e.g., calculate histories or monitor frequencies of changes. This may help the network administrator to determine unusual topology changes or other changes that affect stability and reliability of the MANET. One such framework is specified in REPORT-MIB [REPORT-MIB].

5.4. The Notifications Group

The Notifications Group contains Control (olsrv2NotificationsControl), Objects (olsrv2NotificationsObjects) and States (olsrv2NotificationsStates), where the Control contains definitions of objects to control the frequency of notifications being generated. The Objects define the supported notifications and the State is used to define additional information to be carried within the notifications.

The olsrv2NotificationsObjects sub-tree contains the list of notifications supported within the OLSRv2-MIB module and their intended purpose or utility.

The same mechanisms for improving the network performance by reducing the number of notifications apply as defined in Section 5.1 of [RFC6779]. The following objects are used to define the thresholds and time windows for specific notifications defined in the NHDP-MIB module: olsrv2RoutingSetRecalculationCountThreshold, olsrv2RoutingSetRecalculationCountWindow, olsrv2MPRSetRecalculationCountThreshold, and olsrv2MPRSetRecalculationCountWindow.

5.5. Tables and Indexing

The OLSRv2-MIB module's tables are indexed by the following constructs:

- nhdpIfIndex - the ifIndex of the local router on which NHDP is configured. This is defined in the NHDP-MIB.

- nhdpDiscIfIndex - a locally managed index representing a known interface on a neighboring router. This is defined in the NHDP-MIB.

- nhdpDiscRouterIndex - a locally managed index representing an ID of a known neighboring router. This is defined in the NHDP-MIB.

- olsrv2LibOrigSetIndex - an incrementing number representing a distinct index for the olsrv2LibOrigSetTable.

- olsrv2LibLocAttNetSetIndex - an incrementing number representing a distinct index for the olsrv2LibLocAttNetSetTable.

- olsrv2TibAdRemoteRouterSetRouterId - this is an additional index for each Remote Router's interface address associated with the olsrv2TibAdRemoteRouterSetIpAddr.

o olsrv2TibRouterTopologySetIndex - an incrementing number representing a distinct index for the olsrv2TibRouterTopologySetTable.

o olsrv2TibAttNetworksSetIndex - an incrementing number representing a distinct index for the olsrv2TibAttNetworksSetTable.

o olsrv2TibRoutingSetDestIpAddrType, olsrv2TibRoutingSetDestIpAddr and olsrv2TibRoutingSetDestIpAddrPrefixLen - 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.

These tables and their indexing are:

o olsrv2InterfaceTable - describes the OLSRv2 status on the NHDP interfaces of this router. This table augments nhdpInterfaceEntry and as such it is indexed by the nhdpIfIndex from the NHDP-MIB.

o olsrv2IibLinkSetTable - records all links from other routers which are, or recently were, 1-hop neighbors. This table augments nhdpIibLinkSetEntry and as such it is indexed by nhdpIfIndex and nhdpDiscIfIndex.

o olsrv2Iib2HopSetTable - records network addresses of symmetric 2-hop neighbors and the links to the associated 1-hop neighbors. This table augments nhdpIib2HopSetEntry and as such it is indexed by nhdpIfIndex, nhdpDiscIfIndex, nhdpIib2HopSetIpAddressType and nhdpIib2HopSetIpAddress.

o olsrv2LibOrigSetTable - records addresses that were recently used as originator addresses by this router. This table is indexed by olsrv2LibOrigSetIndex.

o olsrv2LibLocAttNetSetTable - records its local non-OLSRv2 interfaces via which it can act as gateways to other networks. This table is indexed by olsrv2LibLocAttNetSetIndex.

o olsrv2NibNeighborSetTable - records all network addresses of each 1-hop neighbor. This table augments nhdpNibNeighborSetEntry and as such it is indexed by the nhdpDiscRouterIndex.

o olsrv2TibAdRemoteRouterSetTable - records information describing each remote router in the network that transmits TC messages. This table is indexed by olsrv2TibAdRemoteRouterSetRouterId.

o olsrv2TibRouterTopologySetTable - records topology information about the network. This table is indexed by olsrv2TibRouterTopologySetIndex.

o olsrv2TibRoutableAddressTopologySetTable - records topology information about the routable addresses within the MANET, and via which routers they may be reached. This table is indexed by olsrv2TibRoutableAddressTopologySetIndex.

o olsrv2TibAttNetworksSetTable - records information about networks (which may be outside the MANET) attached to other routers and their routable addresses. This table is indexed by olsrv2TibAttNetworksSetIndex.

o olsrv2TibRoutingSetTable - records the first hop along a selected path to each destination for which any such path is known. This table is indexed by olsrv2TibRoutingSetDestIpAddrType, olsrv2TibRoutingSetDestIpAddr, and olsrv2TibRoutingSetDestIpAddrPrefixLen.

o olsrv2InterfacePerfTable - records performance counters for each active OLSRv2 interface on this device. This table augments nhdpInterfacePerfEntry and as such it is indexed by nhdpIfIndex from the NHDP-MIB.

6. Relationship to Other MIB Modules

This section specifies the relationship of the MIB modules contained in this document to other standards, particularly to standards containing other MIB modules. MIB modules and specific definitions imported from 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] module 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 module does not duplicate those objects.

6.2. Relationship to the NHDP-MIB

OLSRv2 depends on the neighborhood information that is discovered by [RFC6130]. In order to access the Objects relating to discovered neighbors, the State Group tables of the NHDP-MIB [RFC6779] module are aligned with this MIB module. This is accomplished through the use of the AUGMENTS capability of SMIv2 and the definition of TEXTUAL-CONVENTIONS in the NHDP-MIB module: specifically the NeighborRouterIndex. These object types are used to develop indexes into common NHDP-MIB module and routing protocol State Group tables.

The values of these objects and the semantics of each individual value SHOULD be identical for the two MIB modules within a given SNMP context. This will allow for improved cross referencing of information across the two MIB modules within a given SNMP context.

6.3. MIB modules required for IMPORTS

The following OLSRv2-MIB module IMPORTS objects from NHDP-MIB [RFC6779], SNMPv2-SMI [RFC2578], SNMPv2-TC [RFC2579], SNMPv2-CONF [RFC2580], IF-MIB [RFC2863] and INET-ADDRESS-MIB [RFC4001].

7. Definitions

This section contains the OLSRv2-MIB module defined by the specification.

```
OLSRv2-MIB DEFINITIONS ::= BEGIN

IMPORTS

   MODULE-IDENTITY, OBJECT-TYPE, Counter32, Counter64,
   Integer32, Unsigned32, mib-2, TimeTicks,
   NOTIFICATION-TYPE
            FROM SNMPv2-SMI -- RFC 2578

   TEXTUAL-CONVENTION, TimeStamp, TruthValue
            FROM SNMPv2-TC -- RFC 2579

   MODULE-COMPLIANCE, OBJECT-GROUP, NOTIFICATION-GROUP
            FROM SNMPv2-CONF -- STD 58

   InetAddressType, InetAddress,
   InetAddressPrefixLength
            FROM INET-ADDRESS-MIB -- RFC 3291

   NeighborRouterIndex, nhdpInterfaceEntry,
   nhdpIibLinkSetEntry, nhdpIib2HopSetEntry,
   nhdpNibNeighborSetEntry, nhdpInterfacePerfEntry
            FROM NHDP-MIB -- RFC 6779
   ;

manetOlsrv2MIB MODULE-IDENTITY
   LAST-UPDATED "201305251800Z"   --25 May 2013
   ORGANIZATION "IETF MANET Working Group"
   CONTACT-INFO
      "WG E-Mail: manet@ietf.org
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       DESCRIPTION
          "This OLSRv2-MIB module is applicable to routers
           implementing the Optimized Link State Routing Protocol
           version 2 (OLSRv2) defined in RFC XXXX.

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           identified as authors of the code.  All rights reserved.

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

           This version of this MIB module is part of RFC YYYY; see
           the RFC itself for full legal notices."
```

```
        -- Revision History
        REVISION    "201305251800Z"   -- 25 May 2013
        DESCRIPTION
         "Initial version of this MIB module,
          published as RFC YYYY."

        -- RFC-Editor assigns ZZZZ (this comment can be removed)
        ::= { mib-2 ZZZZ }


  --
  -- TEXTUAL CONVENTIONS
  --

  Olsrv2MetricCompressedFormTC ::= TEXTUAL-CONVENTION
     DISPLAY-HINT "x"
     STATUS      current
     DESCRIPTION
        "OLSRv2 Mertics are expressed in terms of a Link Metric
         Compressed Form.  This textual convention defines
         the syntax of the metric objects consistent with
         the definitions of the OLSRv2 Link Metric Compressed Form.

         The 12-bit compressed form of a link metric uses a modified
         form of a representation with an 8-bit mantissa (denoted a)
         and a 4-bit exponent (denoted b).  Note that if represented
         as the 12 bit value 256b+a then the ordering of those 12 bit
         values is identical to the ordering of the represented values.

         The value so represented is (257+a)2^b - 256, where ^ denotes
         exponentiation.  This has a minimum value
         (when a = 0 and b = 0) of MINIMUM_METRIC = 1 and a maximum
         value (when a = 255 and b = 15) of MAXIMUM_METRIC = 2^24 - 256.

         Hence the compressed form metric values range from 1 to
         16776960.  The special value of 0 is reserved for the
         UNKNOWN_METRIC value."
     SYNTAX      Unsigned32 (0..16776960)

  Olsrv2StatusTC ::= TEXTUAL-CONVENTION
     STATUS      current
     DESCRIPTION
        "Controls the operation of the OLSRv2
         protocol on the device or a specific interface.
         For example, for an interface: 'enabled' indicates
         that OLSRv2 is permitted to operate,
         and 'disabled' indicates that it is not."
     SYNTAX      INTEGER {
```

```
        enabled (1),
        disabled (2)
     }

  WillingnessTC ::= TEXTUAL-CONVENTION
     DISPLAY-HINT "x"
     STATUS    current
     DESCRIPTION
        "A willingness value which evaluates to the
         device's interest in participating in
         a particular function, process or behavior.

         The williness ranges from a low value of
         WILL_NEVER(0) to a high value of
         WILL_ALWAYS(15).  For each parameter x,
         there is an associated willingness value
         W(x) such that WILL_NEVER < W(x) <= WILL_ALWAYS."
     SYNTAX      Unsigned32 (0..15)


  --
  -- Top-Level Object Identifier Assignments
  --

  olsrv2MIBNotifications OBJECT IDENTIFIER ::= { manetOlsrv2MIB 0 }
  olsrv2MIBObjects       OBJECT IDENTIFIER ::= { manetOlsrv2MIB 1 }
  olsrv2MIBConformance   OBJECT IDENTIFIER ::= { manetOlsrv2MIB 2 }

  --
  -- olsrv2ConfigurationGroup
  --

  --    Contains the OLSRv2 objects that configure specific
  --    options that determine the overall performance and operation
  --    of the OLSRv2 routing process.

  olsrv2ConfigurationGroup OBJECT IDENTIFIER ::= {olsrv2MIBObjects 1}


     olsrv2AdminStatus  OBJECT-TYPE
        SYNTAX      Olsrv2StatusTC
        MAX-ACCESS  read-write
        STATUS      current
        DESCRIPTION
           "The configured status of the OLSRv2 process
            on this device.  'enabled(1)' means that
            OLSRv2 is configured to run on this device.
            'disabled(2)' mean that the OLSRv2 process
```

```
            is configured off.

            Operation of the OLSRv2 routing protocol
            requires the operation of the Neighborhood
            Discovery Protocol (RFC 6130).  Hence, this
            object cannot have a status of 'enabled'
            unless at least one interface on the device
            is a MANET interface with NHDP enabled on that
            interface.  If a network manager attempts to
            set this object to 'enabled' when no interfaces
            on this device have HNDP enabled, the device
            MUST fail the set with inconsistentValue.
            If all device interfaces running NHDP become
            disabled or removed, then the
            olsrv2AdminStatus MUST be 'disabled'.

            If the network manager, or other means, sets
            this object to 'disabled', then the associated
            interface specific objects, i.e., the
            olsrv2InterfaceAdminStatus objects MUST all
            be 'disabled'.

            This object is persistent and when written
            the entity SHOULD save the change to
            non-volatile storage."
        DEFVAL { 2 }
     ::= { olsrv2ConfigurationGroup 1 }

     olsrv2InterfaceTable  OBJECT-TYPE
        SYNTAX      SEQUENCE OF Olsrv2InterfaceEntry
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
           "The olsrv2InterfaceTable describes the OLSRv2
            status on the NHDP interfaces of this router.
            As such, this table augments the nhdpInterfaceTable
            defined in the NHDP-MIB (RFC 6779). NHDP interfaces
            are explicitly defined by network management, CLI,
            or other means for interfaces on the device that are
            intended to run MANET protocols.  The
            olsrv2InterfaceTable contains a single object, the
            olsrv2InterfaceAdminStatus object.  This
            object is set either by network management, or by
            other means, e.g., CLI.

            A conceptual row in this table exists if and only
            if a corresponding entry in the nhdpInterfaceTable
            exists. If the corresponding entry with nhdpIfIndex
```

```
             value is deleted from the nhdpInterfaceTable, then
             the entry in this table is automatically deleted and
             OLSRv2 is disabled on this interface,
             and all configuration and state information
             related to this interface is to be removed
             from memory.

             The olsrv2InterfaceAdminStatus can only be
             'enabled' if the corresponding olsrv2AdminStatus
             object is also set to 'enabled'."
       REFERENCE
          "RFC XXXX - The Optimized Link State Routing Protocol
             version 2, Clausen, T., Dearlove, C., Jacquet, P.
             and U. Herberg, March 2013."
    ::= { olsrv2ConfigurationGroup 2 }

    olsrv2InterfaceEntry OBJECT-TYPE
       SYNTAX      Olsrv2InterfaceEntry
       MAX-ACCESS  not-accessible
       STATUS      current
       DESCRIPTION
          "The olsrv2InterfaceEntry describes one OLSRv2
           local interface configuration as indexed by
           its nhdpIfIndex as defined in the
           NHDP-MIB (RFC 6779).

           The objects in this table are persistent and when
           written the device SHOULD save the change to
           non-volatile storage.  For further information
           on the storage behavior for these objects, refer
           to the description for the nhdpIfRowStatus
           object in the NHDP-MIB (RFC6779)."
       REFERENCE
          "RFC 6779 - The Neighborhood Discovery Protocol MIB,
           Herberg, U., Cole, R.G. and I. Chakeres,
           October 2012"
       AUGMENTS { nhdpInterfaceEntry }
    ::= { olsrv2InterfaceTable 1 }

    Olsrv2InterfaceEntry ::=
       SEQUENCE {
          olsrv2InterfaceAdminStatus
             Olsrv2StatusTC
       }

    olsrv2InterfaceAdminStatus OBJECT-TYPE
       SYNTAX      Olsrv2StatusTC
       MAX-ACCESS  read-create
```

```
        STATUS      current
        DESCRIPTION
           "The OLSRv2 interface's administrative status.
            The value 'enabled(1)' denotes that the interface
            is permitted to participate in the OLSRv2 routing
            process.  The value 'disabled(2)' denotes that
            the interface is not permitted to participate
            in the OLSRv2 routing process.

            The configuration objects for the OLSRv2 routing
            process, other than the administrative status objects,
            are common to all interfaces on this device.
            As such, the OLSRv2 configuration objects are globally
            defined for the device and are not contained within
            the olsrv2InterfaceTable."
        DEFVAL { 2 }
     ::= { olsrv2InterfaceEntry 1 }

     olsrv2OrigIpAddrType  OBJECT-TYPE
         SYNTAX      InetAddressType { ipv4(1) , ipv6(2) }
         MAX-ACCESS  read-write
         STATUS      current
         DESCRIPTION
            "The type of the olsrv2OrigIpAddr, as defined
             in the InetAddress MIB module (RFC 4001).

             Only the values 'ipv4(1)' and
             'ipv6(2)' are supported."
         REFERENCE
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
     ::= { olsrv2ConfigurationGroup 3 }

     olsrv2OrigIpAddr  OBJECT-TYPE
         SYNTAX      InetAddress (SIZE(4|16))
         MAX-ACCESS  read-write
         STATUS      current
         DESCRIPTION
            "The router's originator address. An address that
             is unique (within the MANET) to this router.

             This object is persistent and when written
             the entity SHOULD save the change to
             non-volatile storage."
         REFERENCE
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
```

```
            and U. Herberg, March 2013."
     ::= { olsrv2ConfigurationGroup 4 }

     --
     -- Local History Times
     --

     olsrv2OHoldTime  OBJECT-TYPE
        SYNTAX      Unsigned32
        UNITS       "milliseconds"
        MAX-ACCESS  read-write
        STATUS      current
        DESCRIPTION
           "olsrv2OHoldTime corresponds to
           O_HOLD_TIME of OLSRv2 and represents the
           time for which a recently used and replaced
           originator address is used to recognize the router's
           own messages.

           Guidance for setting this object may be found
           in Section 5 of the OLSRv2 specification (RFC XXXX),
           which indicates that:
               o  olsrv2OHoldTime > 0

           This object is persistent and when written
           the entity SHOULD save the change to
           non-volatile storage."
        REFERENCE
           "Section 5 on Protocol Parameters.
            RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
        DEFVAL { 30000 }
     ::= { olsrv2ConfigurationGroup 5 }


     --
     -- Message intervals
     --

     olsrv2TcInterval  OBJECT-TYPE
        SYNTAX      Unsigned32
        UNITS       "centiseconds"
        MAX-ACCESS  read-write
        STATUS      current
        DESCRIPTION
           "olsrv2TcInterval corresponds to
           TC_INTERVAL of OLSRv2 and represents the
```

```
          maximum time between the transmission of
          two successive TC messages by this router.

          Guidance for setting this object may be found
          in Section 5 of the OLSRv2 specification (RFC XXXX),
          which indicates that:

              o olsrv2TcInterval > 0
              o olsrv2TcInterval >= olsrv2TcMinInterval

          This object is persistent and when written
          the entity SHOULD save the change to
          non-volatile storage."
       REFERENCE
          "Section 5 on Protocol Parameters.
           RFC XXXX - The Optimized Link State Routing Protocol
           version 2, Clausen, T., Dearlove, C., Jacquet, P.
           and U. Herberg, March 2013."
       DEFVAL { 5000 }
    ::= { olsrv2ConfigurationGroup 6 }

    olsrv2TcMinInterval  OBJECT-TYPE
       SYNTAX      Unsigned32
       UNITS       "centiseconds"
       MAX-ACCESS  read-write
       STATUS      current
       DESCRIPTION
          "olsrv2TcMinInterval corresponds to
          TC_MIN_INTERVAL of OLSRv2 and represents
          the minimum interval between transmission of
          two successive TC messages by this router.

          Guidance for setting this object may be found
          in Section 5 of the OLSRv2 specification (RFC XXXX),
          which indicates that:
              o olsrv2TcInterval >= olsrv2TcMinInterval

          This object is persistent and when written
          the entity SHOULD save the change to
          non-volatile storage."
       REFERENCE
          "Section 5 on Protocol Parameters.
           RFC XXXX - The Optimized Link State Routing Protocol
           version 2, Clausen, T., Dearlove, C., Jacquet, P.
           and U. Herberg, March 2013."
       DEFVAL { 1250 }
    ::= { olsrv2ConfigurationGroup 7 }
```

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

      olsrv2THoldTime  OBJECT-TYPE
         SYNTAX      Unsigned32
         UNITS       "milliseconds"
         MAX-ACCESS  read-write
         STATUS      current
         DESCRIPTION
            "olsrv2THoldTime corresponds to
            T_HOLD_TIME of OLSRv2 and is used as the
            minimum value in the TLV with
            Type = VALIDITY_TIME included in all
            TC messages sent by this router.

            Guidance for setting this object may be found
            in Section 5 of the OLSRv2 specification (RFC XXXX),
            which indicates that:
                o olsrv2THoldTime >= olsrv2TcInterval
                o If TC messages can be lost, then
                  olsrv2THoldTime SHOULD be
                  significantly greater than olsrv2TcInterval;
                  a value >= 3 x olsrv2TcInterval is RECOMMENDED.

            olsrv2THoldTime MUST be representable by way of the
            exponent-mantissa notation as described in RFC 5497.

            This object is persistent and when written
            the entity SHOULD save the change to
            non-volatile storage."
         REFERENCE
            "Section 5 on Protocol Parameters.
             RFC XXXX - The Optimized Link State Routing Protocol
             version 2, Clausen, T., Dearlove, C., Jacquet, P.
             and U. Herberg, March 2013."
         DEFVAL { 15000 }
      ::= { olsrv2ConfigurationGroup 8 }

      olsrv2AHoldTime  OBJECT-TYPE
         SYNTAX      Unsigned32
         UNITS       "milliseconds"
         MAX-ACCESS  read-write
         STATUS      current
         DESCRIPTION
            "olsrv2AHoldTime corresponds to
            A_HOLD_TIME of OLSRv2 and represents
            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.

           Guidance for setting this object may be found
           in Section 5 of the OLSRv2 specification (RFC XXXX),
           which indicates that:
              o 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 by way
           of the exponent-mantissa notation as
           described in RFC 5497.

           This object is persistent and when written
           the entity SHOULD save the change to
           non-volatile storage."
        REFERENCE
           "Section 5 on Protocol Parameters.
            RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
        DEFVAL { 15000 }
     ::= { olsrv2ConfigurationGroup 9 }

     --
     -- Received message validity times
     --

     olsrv2RxHoldTime  OBJECT-TYPE
        SYNTAX      Unsigned32
        UNITS       "milliseconds"
        MAX-ACCESS  read-write
        STATUS      current
        DESCRIPTION
           "olsrv2RxHoldTime corresponds to
            RX_HOLD_TIME of OLSRv2 and represents 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.

            Guidance for setting this object may be found
            in Section 5 of the OLSRv2 specification (RFC XXXX),
```

```
            which indicates that:
               o olsrv2RxHoldTime > 0
               o 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.

            This object is persistent and when written
            the entity SHOULD save the change to
            non-volatile storage."
        REFERENCE
           "Section 5 on Protocol Parameters.
            RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
        DEFVAL { 30000 }
     ::= { olsrv2ConfigurationGroup 10 }

     olsrv2PHoldTime  OBJECT-TYPE
        SYNTAX      Unsigned32
        UNITS       "milliseconds"
        MAX-ACCESS  read-write
        STATUS      current
        DESCRIPTION
           "olsrv2PHoldTime corresponds to
            P_HOLD_TIME of OLSRv2 and represents the period
            after receipt of a message that is processed by
            this router for which that information is recorded,
            in order that the message is not processed again
            if received again.

            Guidance for setting this object may be found
            in Section 5 of the OLSRv2 specification (RFC XXXX),
            which indicates that:
               o olsrv2PHoldTime > 0
               o 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.

            This object is persistent and when written
            the entity SHOULD save the change to
            non-volatile storage."
        REFERENCE
```

```
          "Section 5 on Protocol Parameters.
           RFC XXXX - The Optimized Link State Routing Protocol
           version 2, Clausen, T., Dearlove, C., Jacquet, P.
           and U. Herberg, March 2013."
        DEFVAL { 30000 }
     ::= { olsrv2ConfigurationGroup 11 }

     olsrv2FHoldTime  OBJECT-TYPE
        SYNTAX      Unsigned32
        UNITS       "milliseconds"
        MAX-ACCESS  read-write
        STATUS      current
        DESCRIPTION
          "olsrv2FHoldTime corresponds to
           F_HOLD_TIME of OLSRv2 and represents the period
           after receipt of a message that is forwarded by this
           router for which that information is recorded, in order
           that the message is not forwarded again if received again.

           Guidance for setting this object may be found
           in Section 5 of the OLSRv2 specification (RFC XXXX),
           which indicates that:
              o olsrv2FHoldTime > 0
              o 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.

           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.

           This object is persistent and when written
           the entity SHOULD save the change to
           non-volatile storage."
        REFERENCE
          "Section 5 on Protocol Parameters.
           RFC XXXX - The Optimized Link State Routing Protocol
           version 2, Clausen, T., Dearlove, C., Jacquet, P.
           and U. Herberg, March 2013."
        DEFVAL { 30000 }
     ::= { olsrv2ConfigurationGroup 12 }
```

```
   --
   -- Jitter times
   --

   olsrv2TpMaxJitter  OBJECT-TYPE
      SYNTAX      Unsigned32
      UNITS       "centiseconds"
      MAX-ACCESS  read-write
      STATUS      current
      DESCRIPTION
         "olsrv2TpMaxJitter corresponds to
          TP_MAXJITTER of OLSRv2 and represents the value
          of MAXJITTER used in RFC5148 for periodically
          generated TC messages sent by this router.

          For constraints on these parameters see RFC 5148.

          This object is persistent and when written
          the entity SHOULD save the change to
          non-volatile storage."
      REFERENCE
         "Section 5 on Protocol Parameters.
          RFC XXXX - The Optimized Link State Routing Protocol
          version 2, Clausen, T., Dearlove, C., Jacquet, P.
          and U. Herberg, March 2013."
      DEFVAL { 500 }
   ::= { olsrv2ConfigurationGroup 13 }

   olsrv2TtMaxJitter  OBJECT-TYPE
      SYNTAX      Unsigned32
      UNITS       "centiseconds"
      MAX-ACCESS  read-write
      STATUS      current
      DESCRIPTION
         "olsrv2TtMaxJitter corresponds to
          TT_MAXJITTER of OLSRv2 and represents the value
          of MAXJITTER used in RFC5148 for externally
          triggered TC messages sent by this router.

          For constraints on these parameters see RFC 5148.

          This object is persistent and when written
          the entity SHOULD save the change to
          non-volatile storage."
      REFERENCE
         "Section 5 on Protocol Parameters.
          RFC XXXX - The Optimized Link State Routing Protocol
          version 2, Clausen, T., Dearlove, C., Jacquet, P.
```

```
            and U. Herberg, March 2013."
         DEFVAL { 500 }
      ::= { olsrv2ConfigurationGroup 14 }


      olsrv2FMaxJitter  OBJECT-TYPE
         SYNTAX      Unsigned32
         UNITS       "centiseconds"
         MAX-ACCESS  read-write
         STATUS      current
         DESCRIPTION
            "olsrv2FMaxJitter corresponds to
             F_MAXJITTER of OLSRv2 and represents the
             default value of MAXJITTER used in RFC 5148 for
             messages forwarded by this router.

             For constraints on these parameters see RFC 5148.

             This object is persistent and when written
             the entity SHOULD save the change to
             non-volatile storage."
         REFERENCE
            "Section 5 on Protocol Parameters.
             RFC XXXX - The Optimized Link State Routing Protocol
             version 2, Clausen, T., Dearlove, C., Jacquet, P.
             and U. Herberg, March 2013."
         DEFVAL { 500 }
      ::= { olsrv2ConfigurationGroup 15 }


      --
      -- Hop limits
      --

      olsrv2TcHopLimit  OBJECT-TYPE
         SYNTAX      Unsigned32 (0..255)
         UNITS       "hops"
         MAX-ACCESS  read-write
         STATUS      current
         DESCRIPTION
            "olsrv2TcHopLimit corresponds to
             TC_HOP_LIMIT of OLSRv2.

             Guidance for setting this object may be found
             in Section 5 of the OLSRv2 specification (RFC XXXX),
             which indicates that:
                o The maximum value of
                  olsrv2TcHopLimit >= the network diameter
```

```
               in hops, a value of 255 is RECOMMENDED.
             o All values of olsrv2TcHopLimit >= 2.

          This object is persistent and when written
          the entity SHOULD save the change to
          non-volatile storage."
       REFERENCE
         "Section 5 on Protocol Parameters.
          RFC XXXX - The Optimized Link State Routing Protocol
          version 2, Clausen, T., Dearlove, C., Jacquet, P.
          and U. Herberg, March 2013."
       DEFVAL { 255 }
   ::= { olsrv2ConfigurationGroup 16 }


   --
   -- Willingness
   --

   olsrv2WillRouting  OBJECT-TYPE
      SYNTAX      WillingnessTC
      MAX-ACCESS  read-write
      STATUS      current
      DESCRIPTION
         "olsrv2WillRouting corresponds to
          WILL_ROUTING of OLSRv2.

          Guidance for setting this object may be found
          in Section 5 of the OLSRv2 specification (RFC XXXX),
          which indicates that:
             o WILL_NEVER (0) <= olsrv2WillRouting <=
                                 WILL_ALWAYS (15)

          This object is persistent and when written
          the entity SHOULD save the change to
          non-volatile storage."
      REFERENCE
         "Section 5 on Protocol Parameters.
          RFC XXXX - The Optimized Link State Routing Protocol
          version 2, Clausen, T., Dearlove, C., Jacquet, P.
          and U. Herberg, March 2013."
      DEFVAL { 7 }
   ::= { olsrv2ConfigurationGroup 17 }


   olsrv2WillFlooding     OBJECT-TYPE
      SYNTAX      WillingnessTC
      MAX-ACCESS  read-write
```

```
        STATUS      current
        DESCRIPTION
           "olsrv2WillFlooding corresponds to
            WILL_FLOODING of OLSRv2.

            Guidance for setting this object may be found
            in Section 5 of the OLSRv2 specification (RFC XXXX),
            which indicates that:
               o WILL_NEVER (0) <= olsrv2WillFlooding <=
                                    WILL_ALWAYS (15)

            This object is persistent and when written
            the entity SHOULD save the change to
            non-volatile storage."
        REFERENCE
           "Section 5 on Protocol Parameters.
            RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
        DEFVAL { 7 }
     ::= { olsrv2ConfigurationGroup 18 }


     olsrv2LinkMetricType  OBJECT-TYPE
        SYNTAX      Unsigned32 (0..255)
        MAX-ACCESS  read-write
        STATUS      current
        DESCRIPTION
           "olsrv2LinkMetricType corresponds to
            LINK_METRIC_TYPE of OLSRv2.

            This object is persistent and when written
            the entity SHOULD save the change to
            non-volatile storage."
        REFERENCE
           "Section 5 on Protocol Parameters.
            RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
        DEFVAL { 0 }
     ::= { olsrv2ConfigurationGroup 19 }



  --
  -- olsrv2StateGroup
  --
```

```
  --
  -- Contains information describing the current state of
  -- the OLSRv2 process.
  --

  olsrv2StateGroup  OBJECT IDENTIFIER ::= { olsrv2MIBObjects 2 }

     --
     -- Interface Information Base (IIB)
     --

     --
     -- Link Set from RFC 6130, extended by L_in_metric,
     -- L_out_metric, and L_mpr_selector entries for each tuple
     --

     olsrv2IibLinkSetTable OBJECT-TYPE
        SYNTAX       SEQUENCE OF Olsrv2IibLinkSetEntry
        MAX-ACCESS   not-accessible
        STATUS       current
        DESCRIPTION
           "A Link Set of an interface records all links
            from other routers which are, or recently
            were, 1-hop neighbors."
        REFERENCE
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
     ::= { olsrv2StateGroup 1 }

     olsrv2IibLinkSetEntry  OBJECT-TYPE
        SYNTAX      Olsrv2IibLinkSetEntry
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
           "A Link Set consists of Link Tuples, each
            representing a single link indexed by the
            local and remote interface pair. Each Link Set
            from NHDP is extended by OLSRv2 by the following
            fields:

            (L_in_metric, L_out_metric, L_mpr_selector)"
        REFERENCE
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
        AUGMENTS { nhdpIibLinkSetEntry }
     ::= { olsrv2IibLinkSetTable 1 }
```

```
   Olsrv2IibLinkSetEntry ::=
      SEQUENCE {
         olsrv2IibLinkSetInMetric
            Olsrv2MetricCompressedFormTC,
         olsrv2IibLinkSetOutMetric
            Olsrv2MetricCompressedFormTC,
         olsrv2IibLinkSetMprSelector
            TruthValue
      }

   olsrv2IibLinkSetInMetric  OBJECT-TYPE
      SYNTAX      Olsrv2MetricCompressedFormTC
      MAX-ACCESS  read-only
      STATUS      current
      DESCRIPTION
         "olsrv2IibLinkSetInMetric is the metric of the link
          from the OLSRv2 interface with addresses
          L_neighbor_iface_addr_list to this OLSRv2 interface."
      REFERENCE
         "RFC XXXX - The Optimized Link State Routing Protocol
          version 2, Clausen, T., Dearlove, C., Jacquet, P.
          and U. Herberg, March 2013."
   ::= { olsrv2IibLinkSetEntry 1 }

   olsrv2IibLinkSetOutMetric  OBJECT-TYPE
      SYNTAX      Olsrv2MetricCompressedFormTC
      MAX-ACCESS  read-only
      STATUS      current
      DESCRIPTION
         "olsrv2IibLinkSetOutMetric is the metric of the
          link to the OLSRv2 interface with addresses
          L_neighbor_iface_addr_list from this OLSRv2 interface."
      REFERENCE
         "RFC XXXX - The Optimized Link State Routing Protocol
          version 2, Clausen, T., Dearlove, C., Jacquet, P.
          and U. Herberg, March 2013."
   ::= { olsrv2IibLinkSetEntry 2 }

   olsrv2IibLinkSetMprSelector  OBJECT-TYPE
      SYNTAX      TruthValue
      MAX-ACCESS  read-only
      STATUS      current
      DESCRIPTION
         "olsrv2IibLinkSetMprSelector is a boolean flag,
          recording whether this neighbor has selected this router
          as a flooding MPR, i.e., is a flooding MPR selector
          of this router."
      REFERENCE
```

```
            "RFC XXXX - The Optimized Link State Routing Protocol
             version 2, Clausen, T., Dearlove, C., Jacquet, P.
             and U. Herberg, March 2013."
      ::= { olsrv2IibLinkSetEntry 3 }

      --
      -- 2-Hop Set; from RFC 6130, extended by OLSRv2 by the
      -- following fields: N2_in_metric, N2_out_metric
      --

      olsrv2Iib2HopSetTable OBJECT-TYPE
         SYNTAX      SEQUENCE OF Olsrv2Iib2HopSetEntry
         MAX-ACCESS  not-accessible
         STATUS      current
         DESCRIPTION
            "A 2-Hop Set of an interface 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."
         REFERENCE
            "RFC XXXX - The Optimized Link State Routing Protocol
             version 2, Clausen, T., Dearlove, C., Jacquet, P.
             and U. Herberg, March 2013."
      ::= { olsrv2StateGroup 2 }

      olsrv2Iib2HopSetEntry  OBJECT-TYPE
         SYNTAX      Olsrv2Iib2HopSetEntry
         MAX-ACCESS  not-accessible
         STATUS      current
         DESCRIPTION
            "olsrv2Iib2HopSetTable 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.
             Each 2-Hop Set from NHDP is extended by
             OLSRv2 by the following fields:

             (N2_in_metric, N2_out_metric)"
         REFERENCE
            "RFC XXXX - The Optimized Link State Routing Protocol
             version 2, Clausen, T., Dearlove, C., Jacquet, P.
             and U. Herberg, March 2013."
         AUGMENTS { nhdpIib2HopSetEntry }
      ::= { olsrv2Iib2HopSetTable 1 }

      Olsrv2Iib2HopSetEntry ::=
         SEQUENCE {
```

```
           olsrv2Iib2HopSetInMetric
              Olsrv2MetricCompressedFormTC,
           olsrv2Iib2HopSetOutMetric
              Olsrv2MetricCompressedFormTC
        }

     olsrv2Iib2HopSetInMetric  OBJECT-TYPE
        SYNTAX      Olsrv2MetricCompressedFormTC
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
           "olsrv2Iib2HopSetInMetric is the neighbor metric
            from the router with address N2_2hop_iface_addr
            to the router with OLSRv2 interface addresses
            N2_neighbor_iface_addr_list."
        REFERENCE
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
     ::= { olsrv2Iib2HopSetEntry 1 }

     olsrv2Iib2HopSetOutMetric  OBJECT-TYPE
        SYNTAX      Olsrv2MetricCompressedFormTC
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
           "olsrv2Iib2HopSetOutMetric is the neighbor metric
            to the router with address N2_2hop_iface_addr
            from the router with OLSRv2 interface addresses
            N2_neighbor_iface_addr_list."
        REFERENCE
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
     ::= { olsrv2Iib2HopSetEntry 2 }


     --
     -- Local Information Base  - as defined in RFC 6130,
     -- extended by the addition of an Originator Set,
     -- defined in Section 6.1 and a Local Attached
     -- Network Set, defined in Section 6.2.
     --

     --
     -- Originator Set
     --
```

```
olsrv2LibOrigSetTable OBJECT-TYPE
   SYNTAX      SEQUENCE OF Olsrv2LibOrigSetEntry
   MAX-ACCESS  not-accessible
   STATUS      current
   DESCRIPTION
      "A router's Originator Set records addresses
       that were recently used as originator addresses
       by this router."
    REFERENCE
      "RFC XXXX - The Optimized Link State Routing Protocol
       version 2, Clausen, T., Dearlove, C., Jacquet, P.
       and U. Herberg, March 2013."
::= { olsrv2StateGroup 3 }

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
      "RFC XXXX - The Optimized Link State Routing Protocol
       version 2, Clausen, T., Dearlove, C., Jacquet, P.
       and U. Herberg, March 2013."
   INDEX { olsrv2LibOrigSetIndex }
::= { olsrv2LibOrigSetTable 1 }

Olsrv2LibOrigSetEntry ::=
   SEQUENCE {
      olsrv2LibOrigSetIndex
         Unsigned32,
      olsrv2LibOrigSetIpAddrType
         InetAddressType,
      olsrv2LibOrigSetIpAddr
         InetAddress,
      olsrv2LibOrigSetExpireTime
         TimeStamp
   }

olsrv2LibOrigSetIndex  OBJECT-TYPE
   SYNTAX      Unsigned32 (1..65535)
   MAX-ACCESS  not-accessible
   STATUS      current
   DESCRIPTION
      "The index for this table.  The entries in this
```

```
            table expire according to the value of the
            olsrv2LibOrigSetExpireTime object.  Further,
            the lifetime of each entry within this table
            is set by the O_HOLD_TIME parameter of the
            OLSRv2 protocol.  So they timeout in the
            order that they are added to this table.

            The maximum value of this index is set to allow
            for the possibility of an extremely large number
            or addresses to be assigned to this OLSRv2
            router.  This should not be an issue for MANET
            router deployments and configurations in the
            forseeable future.

            The index values assigned to new entries SHOULD
            be assigned in numerical order, beginning from
            1.  New entries should be assigned the next
            available value, until the maximum value is
            assigned.  Following this, the next assigned value
            SHOULD go back to 1 and begin incrementing again.
            If the table is full, then the next entry SHOULD
            be assigned an index value in sequence, replacing
            an existing entry (expiring this entry
            pre-maturely).

            OLSRv2 (RFC XXXX) defines the rules for managing
            entries within this table, e.g., populating
            and purging entries."
        REFERENCE
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
     ::= { olsrv2LibOrigSetEntry 1 }

     olsrv2LibOrigSetIpAddrType  OBJECT-TYPE
        SYNTAX      InetAddressType { ipv4(1) , ipv6(2) }
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
           "The type of the olsrv2LibOrigSetIpAddr,
            as defined in the InetAddress MIB (RFC4001).

            Only the values 'ipv4(1)' and
            'ipv6(2)' are supported."
        REFERENCE
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
```

```
     ::= { olsrv2LibOrigSetEntry 2 }

     olsrv2LibOrigSetIpAddr  OBJECT-TYPE
        SYNTAX      InetAddress (SIZE(4|16))
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
           "An originator address recently employed
            by this router."
        REFERENCE
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
     ::= { olsrv2LibOrigSetEntry 3 }

     olsrv2LibOrigSetExpireTime  OBJECT-TYPE
        SYNTAX      TimeStamp
        UNITS      "centiseconds"
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
           "olsrv2LibOrigSetExpireTime specifies the value
            of sysUptime when this entry SHOULD expire and be
            removed from the olsrv2LibOrigSetTable.  This time
            is determined at the time the entry is added,
            derived from the following expression:

               O_time := current time + O_HOLD_TIME

            where O_time is olsrv2LibOrigSetExpireTime,
            current_time is current sysUpTime and
            O_HOLD_TIME is a parameter of the OLSRv2
            protocol.  In the event that the
            O_HOLD_TIME is changed, then the
            olsrv2LibOrigSetExpireTime needs to be
            recomputed for each of the entries in this Table."
        REFERENCE
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
     ::= { olsrv2LibOrigSetEntry 4 }


     --
     -- Local Attached Network Set
     --

     olsrv2LibLocAttNetSetTable OBJECT-TYPE
```

```
        SYNTAX      SEQUENCE OF Olsrv2LibLocAttNetSetEntry
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
           "A router's Local Attached Network Set records
            its local non-OLSRv2 interfaces via which it
            can act as gateways to other networks."
        REFERENCE
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
     ::= { olsrv2StateGroup 4 }

     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, AL_metric)

            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.

               AL_metric is the metric of the link to
               the attached network with address
               AL_net_addr from this router.

            OLSRv2 (RFC XXXX) defines the rules for managing
            entries within this table, e.g., populating
            and purging entries.  Specific instructions for the
            olsrv2LibLocAttNetSetEntry(s) are found in
            Section 7.2 and Section 17 of OLSRv2 (RFC XXXX)."
        REFERENCE
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
        INDEX { olsrv2LibLocAttNetSetIndex }
     ::= { olsrv2LibLocAttNetSetTable 1 }
```

```
   Olsrv2LibLocAttNetSetEntry ::=
      SEQUENCE {
         olsrv2LibLocAttNetSetIndex
            Unsigned32,
         olsrv2LibLocAttNetSetIpAddrType
            InetAddressType,
         olsrv2LibLocAttNetSetIpAddr
            InetAddress,
         olsrv2LibLocAttNetSetIpAddrPrefixLen
            InetAddressPrefixLength,
         olsrv2LibLocAttNetSetDistance
            Unsigned32,
         olsrv2LibLocAttNetSetMetric
            Olsrv2MetricCompressedFormTC
      }

   olsrv2LibLocAttNetSetIndex  OBJECT-TYPE
      SYNTAX      Unsigned32 (1..65535)
      MAX-ACCESS  not-accessible
      STATUS      current
      DESCRIPTION
         "The index for this table.

          The maximum value of this index is set to allow
          for the possibility of an extremely large number
          interfaces acting as gateways to non-OLSRv2
          networks.  This should allow for anticipated MANET
          router deployments and configurations in the
          forseeable future.

          The index values assigned to new entries should
          be assigned to the lowest available, un-assigned
          index value.  This will keep the assigned index
          set tightly packed near the lowest available
          index value of 1.

          OLSRv2 (RFC XXXX) defines the rules for managing
          entries within this table, e.g., populating
          and purging entries."
      REFERENCE
         "RFC XXXX - The Optimized Link State Routing Protocol
          version 2, Clausen, T., Dearlove, C., Jacquet, P.
          and U. Herberg, March 2013."
   ::= { olsrv2LibLocAttNetSetEntry 1 }

   olsrv2LibLocAttNetSetIpAddrType  OBJECT-TYPE
      SYNTAX      InetAddressType { ipv4(1) , ipv6(2) }
      MAX-ACCESS  read-only
```

```
        STATUS      current
        DESCRIPTION
           "The type of the olsrv2LibLocAttNetSetIpAddr, as defined
            in the InetAddress MIB (RFC 4001).

            Only the values 'ipv4(1)' and
            'ipv6(2)' are supported."
        REFERENCE
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
     ::= { olsrv2LibLocAttNetSetEntry 2 }

     olsrv2LibLocAttNetSetIpAddr  OBJECT-TYPE
        SYNTAX      InetAddress (SIZE(4|16))
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
           "This is the network address of an attached
            network which can be reached via this router."
        REFERENCE
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
     ::= { olsrv2LibLocAttNetSetEntry 3 }

     olsrv2LibLocAttNetSetIpAddrPrefixLen  OBJECT-TYPE
        SYNTAX      InetAddressPrefixLength
        UNITS       "bits"
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
           "Indicates the number of leading one bits that form the
            mask to be logically ANDed with the destination address
            before being compared to the value in the
            olsrv2LibLocAttNetSetIpAddr field."
        REFERENCE
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
     ::= { olsrv2LibLocAttNetSetEntry 4 }

     olsrv2LibLocAttNetSetDistance  OBJECT-TYPE
        SYNTAX      Unsigned32 (1..255)
        UNITS       "hops"
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
```

```
          "This object specifies the number of hops
           to the network with address
           olsrv2LibLocAttNetSetIpAddr from this router."
       REFERENCE
          "RFC XXXX - The Optimized Link State Routing Protocol
           version 2, Clausen, T., Dearlove, C., Jacquet, P.
           and U. Herberg, March 2013."
    ::= { olsrv2LibLocAttNetSetEntry 5 }

    olsrv2LibLocAttNetSetMetric  OBJECT-TYPE
       SYNTAX      Olsrv2MetricCompressedFormTC
       MAX-ACCESS  read-only
       STATUS      current
       DESCRIPTION
          "This object specifies the metric of the
           link to the attached network with
           address AL_net_addr from this router."
       REFERENCE
          "RFC XXXX - The Optimized Link State Routing Protocol
           version 2, Clausen, T., Dearlove, C., Jacquet, P.
           and U. Herberg, March 2013."
    ::= { olsrv2LibLocAttNetSetEntry 6 }


    --
    -- Neighbor Information Base  - as defined in RFC 6130,
    -- extended by OLSRv2 by the addition of the following
    -- elements to each Neighbor Tuple
    --

    --
    -- Neighbor Set
    --

    olsrv2NibNeighborSetTable OBJECT-TYPE
       SYNTAX      SEQUENCE OF Olsrv2NibNeighborSetEntry
       MAX-ACCESS  not-accessible
       STATUS      current
       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
          "RFC XXXX - The Optimized Link State Routing Protocol
           version 2, Clausen, T., Dearlove, C., Jacquet, P.
           and U. Herberg, March 2013."
     ::= { olsrv2StateGroup 5 }
```

```
      olsrv2NibNeighborSetEntry  OBJECT-TYPE
         SYNTAX      Olsrv2NibNeighborSetEntry
         MAX-ACCESS  not-accessible
         STATUS      current
         DESCRIPTION
            "Each Neighbor Tuple in the Neighbor Set, defined
             in RFC 6130, has these additional elements:
                N_orig_addr
                N_in_metric
                N_out_metric
                N_will_flooding
                N_will_routing
                N_flooding_mpr
                N_routing_mpr
                N_mpr_selector
                N_advertised
             defined here as extensions."
         REFERENCE
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
         AUGMENTS { nhdpNibNeighborSetEntry }
     ::= { olsrv2NibNeighborSetTable 1 }

     Olsrv2NibNeighborSetEntry ::=
        SEQUENCE {
           olsrv2NibNeighborSetNOrigIpAddrType
              InetAddressType,
           olsrv2NibNeighborSetNOrigIpAddr
              InetAddress,
           olsrv2NibNeighborSetNInMetric
              Olsrv2MetricCompressedFormTC,
           olsrv2NibNeighborSetNOutMetric
              Olsrv2MetricCompressedFormTC,
           olsrv2NibNeighborSetNWillFlooding
              WillingnessTC,
           olsrv2NibNeighborSetNWillRouting
              WillingnessTC,
           olsrv2NibNeighborSetNFloodingMpr
              TruthValue,
           olsrv2NibNeighborSetNRoutingMpr
              TruthValue,
           olsrv2NibNeighborSetNMprSelector
              TruthValue,
           olsrv2NibNeighborSetNAdvertised
              TruthValue
        }
```

```
olsrv2NibNeighborSetNOrigIpAddrType  OBJECT-TYPE
   SYNTAX      InetAddressType { ipv4(1) , ipv6(2) }
   MAX-ACCESS  read-only
   STATUS      current
   DESCRIPTION
      "The type of the olsrv2NibNeighborSetNOrigIpAddr, as defined
       in the InetAddress MIB module (RFC4001).

       Only the values 'ipv4(1)' and
       'ipv6(2)' are supported."
   REFERENCE
      "RFC XXXX - The Optimized Link State Routing Protocol
       version 2, Clausen, T., Dearlove, C., Jacquet, P.
       and U. Herberg, March 2013."
::= { olsrv2NibNeighborSetEntry 1 }

olsrv2NibNeighborSetNOrigIpAddr  OBJECT-TYPE
   SYNTAX      InetAddress (SIZE(4|16))
   MAX-ACCESS  read-only
   STATUS      current
   DESCRIPTION
      "This is the originator IP address of the neighbor
       represented by this table entry."
   REFERENCE
      "RFC XXXX - The Optimized Link State Routing Protocol
       version 2, Clausen, T., Dearlove, C., Jacquet, P.
       and U. Herberg, March 2013."
::= { olsrv2NibNeighborSetEntry 2 }

olsrv2NibNeighborSetNInMetric  OBJECT-TYPE
   SYNTAX      Olsrv2MetricCompressedFormTC
   MAX-ACCESS  read-only
   STATUS      current
   DESCRIPTION
      "This object is the neighbor metric of any
       link from this neighbor to an OLSRv2 interface
       of this router, i.e., the minimum of all corresponding
       L_in_metric with L_status = SYMMETRIC and
       L_in_metric != UNKNOWN_METRIC, UNKNOWN_METRIC
       if there are no such Link Tuples. UNKNOWN_METRIC
       has a value of 0."
   REFERENCE
      "RFC XXXX - The Optimized Link State Routing Protocol
       version 2, Clausen, T., Dearlove, C., Jacquet, P.
       and U. Herberg, March 2013."
::= { olsrv2NibNeighborSetEntry 3 }

olsrv2NibNeighborSetNOutMetric  OBJECT-TYPE
```

```
        SYNTAX      Olsrv2MetricCompressedFormTC
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
           "This object is is the neighbor metric of any
            link from an OLSRv2 interface of this router
            to this neighbor, i.e., the minimum of
            all corresponding L_out_metric with
            L_status = SYMMETRIC and
            L_out_metric != UNKNOWN_METRIC, UNKNOWN_METRIC
            if there are no such Link Tuples. UNKNOWN_METRIC
            has a value of 0."
        REFERENCE
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
     ::= { olsrv2NibNeighborSetEntry 4 }

     olsrv2NibNeighborSetNWillFlooding  OBJECT-TYPE
        SYNTAX      WillingnessTC
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
           "This object is the neighbor's willingness to be
            selected as a flooding MPR, in the range from
            WILL_NEVER to WILL_ALWAYS, both inclusive, taking
            the value WILL_NEVER if no OLSRv2 specific
            information is received from this neighbor."
        REFERENCE
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
     ::= { olsrv2NibNeighborSetEntry 5 }

     olsrv2NibNeighborSetNWillRouting  OBJECT-TYPE
        SYNTAX      WillingnessTC
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
           "This object is the neighbor's willingness to be
            selected as a routing MPR, in the range from
            WILL_NEVER to WILL_ALWAYS, both inclusive, taking
            the value WILL_NEVER if no OLSRv2 specific
            information is received from this neighbor."
        REFERENCE
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
```

```
     ::= { olsrv2NibNeighborSetEntry 6 }

     olsrv2NibNeighborSetNFloodingMpr  OBJECT-TYPE
        SYNTAX      TruthValue
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
           "This object is a boolean flag, recording whether
            this neighbor is selected as a flooding MPR
            by this router."
        REFERENCE
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
     ::= { olsrv2NibNeighborSetEntry 7 }

     olsrv2NibNeighborSetNRoutingMpr  OBJECT-TYPE
        SYNTAX      TruthValue
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
           "This object is a boolean flag, recording whether
            this neighbor is selected as a routing MPR
            by this router."
        REFERENCE
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
     ::= { olsrv2NibNeighborSetEntry 8 }

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

            When set to 'true', then this router is selected as
            a routing MPR by the neighbor router.
            When set to 'false',
            then this router is not selected by the neighbor
            as a routing MPR."
        REFERENCE
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
```

```
            and U. Herberg, March 2013."
     ::= { olsrv2NibNeighborSetEntry 9 }

     olsrv2NibNeighborSetNAdvertised  OBJECT-TYPE
        SYNTAX      TruthValue
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
           "This object, N_mpr_selector, is a boolean flag,
            recording whether this router has elected to
            advertise a link to this neighbor in its TC messages."
         REFERENCE
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
     ::= { olsrv2NibNeighborSetEntry 10 }


     olsrv2NibNeighborSetTableAnsn OBJECT-TYPE
        SYNTAX      Unsigned32 (0..65535)
        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
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
     ::= { olsrv2StateGroup 6 }


     --
     -- Topology Information Base - this Information
     -- Base is specific to OLSRv2, and is defined in
     -- Section 10 of RFC XXXX.
     --

     --
     -- Advertising Remote Router Set
     --

     olsrv2TibAdRemoteRouterSetTable OBJECT-TYPE
        SYNTAX      SEQUENCE OF Olsrv2TibAdRemoteRouterSetEntry
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
```

```
            "A router's Advertising Remote Router Set records
             information describing each remote router in the
             network that transmits TC messages."
         REFERENCE
            "RFC XXXX - The Optimized Link State Routing Protocol
             version 2, Clausen, T., Dearlove, C., Jacquet, P.
             and U. Herberg, March 2013."
      ::= { olsrv2StateGroup 7 }

      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 module's nhdpDiscIfSetTable.

             OLSRv2 (RFC XXXX) defines the rules for managing
             entries within this table, e.g., populating
             and purging entries.  Specific instructions for the
             olsrv2TibAdRemoteRouterSetEntry(s) are found in
             Section 10.1 and Section 17 of OLSRv2 (RFC XXXX)."
         REFERENCE
            "RFC XXXX - The Optimized Link State Routing Protocol
             version 2, Clausen, T., Dearlove, C., Jacquet, P.
             and U. Herberg, March 2013."
         INDEX { olsrv2TibAdRemoteRouterSetRouterId }
      ::= { olsrv2TibAdRemoteRouterSetTable 1 }

      Olsrv2TibAdRemoteRouterSetEntry ::=
         SEQUENCE {
            olsrv2TibAdRemoteRouterSetIpAddrType
               InetAddressType,
            olsrv2TibAdRemoteRouterSetIpAddr
               InetAddress,
            olsrv2TibAdRemoteRouterSetRouterId
               NeighborRouterIndex,
            olsrv2TibAdRemoteRouterSetMaxSeqNo
               Unsigned32,
            olsrv2TibAdRemoteRouterSetExpireTime
               TimeStamp
         }
```

```
      olsrv2TibAdRemoteRouterSetIpAddrType  OBJECT-TYPE
         SYNTAX      InetAddressType { ipv4(1) , ipv6(2) }
         MAX-ACCESS  read-only
         STATUS      current
         DESCRIPTION
            "The type of the olsrv2TibAdRemoteRouterSetIpAddr,
             as defined in the InetAddress MIB module (RFC4001).

             Only the values 'ipv4(1)' and
             'ipv6(2)' are supported."
         REFERENCE
            "RFC XXXX - The Optimized Link State Routing Protocol
             version 2, Clausen, T., Dearlove, C., Jacquet, P.
             and U. Herberg, March 2013."
      ::= { olsrv2TibAdRemoteRouterSetEntry 1 }

      olsrv2TibAdRemoteRouterSetIpAddr  OBJECT-TYPE
         SYNTAX      InetAddress (SIZE(4|16))
         MAX-ACCESS  read-only
         STATUS      current
         DESCRIPTION
            "This is the originator address of a received
             TC message."
         REFERENCE
            "RFC XXXX - The Optimized Link State Routing Protocol
             version 2, Clausen, T., Dearlove, C., Jacquet, P.
             and U. Herberg, March 2013."
      ::= { olsrv2TibAdRemoteRouterSetEntry 2 }

      olsrv2TibAdRemoteRouterSetRouterId  OBJECT-TYPE
         SYNTAX      NeighborRouterIndex
         MAX-ACCESS  not-accessible
         STATUS      current
         DESCRIPTION
            "This object is an index for each remote router's
             interface address associated with the
             olsrv2TibAdRemoteRouterSetIpAddr.

             The NeighborRouterIndex should be assigned in
             sequence beginning at a value of 1.  The value
             for each discovered remote router's index MUST
             remain constant at least from one re-initialization
             of the entity's network management agent to the next
             re-initialization, except if an application is
             deleted and re-created.

             OLSRv2 (RFC XXXX) defines the rules for managing
             entries within this table, e.g., populating
```

```
             and purging entries."
        REFERENCE
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
     ::= { 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
            olsrv2TibAdRemoteRouterSetIpAddr."
        REFERENCE
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
     ::= { olsrv2TibAdRemoteRouterSetEntry 4 }

     olsrv2TibAdRemoteRouterSetExpireTime  OBJECT-TYPE
        SYNTAX      TimeStamp
        UNITS       "centiseconds"
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
           "olsrv2TibAdRemoteRouterSetExpireTime specifies the value
            of sysUptime when this entry SHOULD expire and be
            removed from the olsrv2TibAdRemoteRouterSetTable."
        REFERENCE
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
     ::= { olsrv2TibAdRemoteRouterSetEntry 5 }



     --
     -- Router Topology Set
     --

     olsrv2TibRouterTopologySetTable OBJECT-TYPE
        SYNTAX       SEQUENCE OF Olsrv2TibTopologySetEntry
        MAX-ACCESS   not-accessible
        STATUS       current
        DESCRIPTION
```

```
            "A router's Router Topology Set records topology
             information about the network."
         REFERENCE
            "RFC XXXX - The Optimized Link State Routing Protocol
             version 2, Clausen, T., Dearlove, C., Jacquet, P.
             and U. Herberg, March 2013."
      ::= { olsrv2StateGroup 8 }

      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_metric, TR_time).

             OLSRv2 (RFC XXXX) defines the rules for managing
             entries within this table, e.g., populating
             and purging entries.  Specific instructions for the
             olsrv2TibRouterTopologySetEntry(s) are found in
             Section 10.2 and Section 17 of OLSRv2 (RFC XXXX)."
         REFERENCE
            "RFC XXXX - The Optimized Link State Routing Protocol
             version 2, Clausen, T., Dearlove, C., Jacquet, P.
             and U. Herberg, March 2013."
         INDEX { olsrv2TibRouterTopologySetIndex }
      ::= { olsrv2TibRouterTopologySetTable 1 }

      Olsrv2TibTopologySetEntry ::=
         SEQUENCE {
            olsrv2TibRouterTopologySetIndex
               Unsigned32,
            olsrv2TibRouterTopologySetFromOrigIpAddrType
               InetAddressType,
            olsrv2TibRouterTopologySetFromOrigIpAddr
               InetAddress,
            olsrv2TibRouterTopologySetToOrigIpAddrType
               InetAddressType,
            olsrv2TibRouterTopologySetToOrigIpAddr
               InetAddress,
            olsrv2TibRouterTopologySetSeqNo
               Unsigned32,
            olsrv2TibRouterTopologySetMetric
               Olsrv2MetricCompressedFormTC,
            olsrv2TibRouterTopologySetExpireTime
               TimeStamp
```

```
      }

    olsrv2TibRouterTopologySetIndex  OBJECT-TYPE
       SYNTAX      Unsigned32 (1..16777215)
       MAX-ACCESS  not-accessible
       STATUS      current
       DESCRIPTION
          "The index for this table.  The entries in this
           table expire according to the value of the
           olsrv2TibRouterTopologySetExpireTime object.
           Further, the lifetime of each entry within this
           table is set by the validity time in the
           OLSRv2 TC message.  As such, they are expected
           to timeout roughly in the order that they are
           added to this table.

           The maximum value of this index is set to allow
           for the possibility of an extremely large number
           Topology Set tuples to be added to this OLSRv2
           router.  This should not be an issue for MANET
           router deployments and configurations in the
           forseeable future.

           The index values assigned to new entries SHOULD
           be assigned in numerical order, beginning from
           1.  New entries should be assigned the next
           available value, until the maximum value is
           assigned.  Following this, the next assigned value
           SHOULD go back to 1 and begin incrementing again.
           If the table is full, then the next entry SHOULD
           be assigned an index value in sequence, replacing
           an existing entry (expiring this entry
           pre-maturely).

           OLSRv2 (RFC XXXX) defines the rules for managing
           entries within this table, e.g., populating
           and purging entries."
       REFERENCE
          "RFC XXXX - The Optimized Link State Routing Protocol
           version 2, Clausen, T., Dearlove, C., Jacquet, P.
           and U. Herberg, March 2013."
    ::= { olsrv2TibRouterTopologySetEntry 1 }

    olsrv2TibRouterTopologySetFromOrigIpAddrType  OBJECT-TYPE
       SYNTAX      InetAddressType { ipv4(1) , ipv6(2) }
       MAX-ACCESS  read-only
       STATUS      current
       DESCRIPTION
```

```
           "The type of the olsrv2TibRouterTopologySetFromOrigIpAddr,
            as defined in the InetAddress MIB module (RFC4001).

            Only the values 'ipv4(1)' and
            'ipv6(2)' are supported."
        REFERENCE
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
     ::= { olsrv2TibRouterTopologySetEntry 2 }

     olsrv2TibRouterTopologySetFromOrigIpAddr  OBJECT-TYPE
        SYNTAX      InetAddress (SIZE(4|16))
        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."
        REFERENCE
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
     ::= { olsrv2TibRouterTopologySetEntry 3 }

     olsrv2TibRouterTopologySetToOrigIpAddrType  OBJECT-TYPE
        SYNTAX      InetAddressType { ipv4(1) , ipv6(2) }
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
           "The type of the olsrv2TibRouterTopologySetToOrigIpAddr,
            as defined in the InetAddress MIB module (RFC4001).

            Only the values 'ipv4(1)' and
            'ipv6(2)' are supported."
        REFERENCE
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
     ::= { olsrv2TibRouterTopologySetEntry 4 }

     olsrv2TibRouterTopologySetToOrigIpAddr  OBJECT-TYPE
        SYNTAX      InetAddress (SIZE(4|16))
        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."
        REFERENCE
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
     ::= { olsrv2TibRouterTopologySetEntry 5 }

     olsrv2TibRouterTopologySetSeqNo  OBJECT-TYPE
        SYNTAX      Unsigned32 (0..65535)
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
           "This is the greatest Assigned Neighbor Sequence
            Number (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).

            Sequence numbers are used in the OLSRv2 protocol
            for the purpose of discarding 'old' information,
            i.e., messages received out of order.  However
            with a limited number of bits for representing
            sequence numbers, wrap-around (that the sequence
            number is incremented from the maximum possible
            value to zero) will occur.  To prevent this from
            interfering with the operation of this protocol,
            the following MUST be observed when determining
            the ordering of sequence numbers.

            The term MAXVALUE designates in the following one
            more than the largest possible value for a sequence
            number.  For a 16 bit sequence number (as are those
            defined in this specification) MAXVALUE is 65536.

            The sequence number S1 is said to be 'greater than'
            the sequence number S2 if:

               o  S1 > S2 AND S1 - S2 < MAXVALUE/2 OR

               o  S2 > S1 AND S2 - S1 > MAXVALUE/2

            When sequence numbers S1 and S2 differ by MAXVALUE/2
            their ordering cannot be determined.  In this case,
            which should not occur, either ordering may be
            assumed.

            Thus when comparing two messages, it is possible
```

```
             - even in the presence of wrap-around - to determine
             which message contains the most recent information."
        REFERENCE
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
     ::= { olsrv2TibRouterTopologySetEntry 6 }

     olsrv2TibRouterTopologySetMetric  OBJECT-TYPE
        SYNTAX      Olsrv2MetricCompressedFormTC
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
           "This is the neighbor metric from the router
            with originator address TR_from_orig_addr to
            the router with originator address
            TR_to_orig_addr."
        REFERENCE
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
     ::= { olsrv2TibRouterTopologySetEntry 7 }

     olsrv2TibRouterTopologySetExpireTime  OBJECT-TYPE
        SYNTAX      TimeStamp
        UNITS       "centiseconds"
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
           "olsrv2TibRouterTopologySetExpireTime specifies the value
            of sysUptime when this entry SHOULD expire and be
            removed from the olsrv2TibRouterTopologySetTable."
        REFERENCE
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
     ::= { olsrv2TibRouterTopologySetEntry 8 }


     --
     -- Routable Address Topology Set
     --

     olsrv2TibRoutableAddressTopologySetTable OBJECT-TYPE
        SYNTAX      SEQUENCE OF Olsrv2TibRoutableAddressTopologySetEntry
        MAX-ACCESS  not-accessible
        STATUS      current
        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
          "RFC XXXX - The Optimized Link State Routing Protocol
           version 2, Clausen, T., Dearlove, C., Jacquet, P.
           and U. Herberg, March 2013."
    ::= { olsrv2StateGroup 9 }

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

           (TA_from_orig_addr, TA_dest_addr,
            TA_seq_number, TA_metric, TA_time)

           OLSRv2 (RFC XXXX) defines the rules for managing
           entries within this table, e.g., populating
           and purging entries.  Specific instructions for the
           olsrv2TibRoutableAddressTopologySetEntry(s) are found
           in Section 10.3 and Section 17 of OLSRv2 (RFC XXXX)."
       REFERENCE
          "RFC XXXX - The Optimized Link State Routing Protocol
           version 2, Clausen, T., Dearlove, C., Jacquet, P.
           and U. Herberg, March 2013."
       INDEX { olsrv2TibRoutableAddressTopologySetIndex }
    ::= { olsrv2TibRoutableAddressTopologySetTable 1 }

     Olsrv2TibRoutableAddressTopologySetEntry ::=
        SEQUENCE {
           olsrv2TibRoutableAddressTopologySetIndex
             Unsigned32,
           olsrv2TibRoutableAddressTopologySetFromOrigIpAddrType
             InetAddressType,
           olsrv2TibRoutableAddressTopologySetFromOrigIpAddr
             InetAddress,
           olsrv2TibRoutableAddressTopologySetDestIpAddrType
             InetAddressType,
           olsrv2TibRoutableAddressTopologySetDestIpAddr
             InetAddress,
           olsrv2TibRoutableAddressTopologySetSeqNo
             Unsigned32,
           olsrv2TibRoutableAddressTopologySetMetric
             Olsrv2MetricCompressedFormTC,
           olsrv2TibRoutableAddressTopologySetExpireTime
```

```
               TimeStamp
          }

      olsrv2TibRoutableAddressTopologySetIndex  OBJECT-TYPE
         SYNTAX      Unsigned32 (1..16777215)
         MAX-ACCESS  not-accessible
         STATUS      current
         DESCRIPTION
            "The index for this table.  The entries in this
             table expire according to the value of the
             olsrv2TibRoutableAddressTopologySetExpireTime object.
             Further, the lifetime of each entry within this
             table is set by the validity time in the
             OLSRv2 TC message.  As such, they are expected
             to timeout roughly in the order that they are
             added to this table.

             The maximum value of this index is set to allow
             for the possibility of an extremely large number
             Routable Address Topology Set tuples to be
             added to this OLSRv2 router.  This should not be
             an issue for MANET router deployments and
             configurations in the foreseeable future.

             The index values assigned to new entries SHOULD
             be assigned in numerical order, beginning from
             1.  New entries should be assigned the next
             available value, until the maximum value is
             assigned.  Following this, the next assigned value
             SHOULD go back to 1 and begin incrementing again.
             If the table is full, then the next entry SHOULD
             be assigned an index value in sequence, replacing
             an existing entry (expiring this entry
             pre-maturely).

             OLSRv2 (RFC XXXX) defines the rules for managing
             entries within this table, e.g., populating
             and purging entries."
         REFERENCE
            "RFC XXXX - The Optimized Link State Routing Protocol
             version 2, Clausen, T., Dearlove, C., Jacquet, P.
             and U. Herberg, March 2013."
      ::= { olsrv2TibRoutableAddressTopologySetEntry 1 }

      olsrv2TibRoutableAddressTopologySetFromOrigIpAddrType  OBJECT-TYPE
         SYNTAX      InetAddressType { ipv4(1) , ipv6(2) }
         MAX-ACCESS  read-only
         STATUS      current
```

```
      DESCRIPTION
         "The type of the
          olsrv2TibRoutableAddressTopologySetFromOrigIpAddr,
          as defined in the InetAddress MIB module (RFC 4001).

          Only the values 'ipv4(1)' and
          'ipv6(2)' are supported."
      REFERENCE
         "RFC XXXX - The Optimized Link State Routing Protocol
          version 2, Clausen, T., Dearlove, C., Jacquet, P.
          and U. Herberg, March 2013."
   ::= { olsrv2TibRoutableAddressTopologySetEntry 2 }

   olsrv2TibRoutableAddressTopologySetFromOrigIpAddr  OBJECT-TYPE
      SYNTAX      InetAddress (SIZE(4|16))
      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
         "RFC XXXX - The Optimized Link State Routing Protocol
          version 2, Clausen, T., Dearlove, C., Jacquet, P.
          and U. Herberg, March 2013."
   ::= { olsrv2TibRoutableAddressTopologySetEntry 3 }

   olsrv2TibRoutableAddressTopologySetDestIpAddrType  OBJECT-TYPE
      SYNTAX      InetAddressType { ipv4(1) , ipv6(2) }
      MAX-ACCESS  read-only
      STATUS      current
      DESCRIPTION
         "The type of the olsrv2TibRouterTopologySetToOrigIpAddr,
          as defined in the InetAddress MIB module (RFC 4001).

          Only the values 'ipv4(1)' and
          'ipv6(2)' are supported."
      REFERENCE
         "RFC XXXX - The Optimized Link State Routing Protocol
          version 2, Clausen, T., Dearlove, C., Jacquet, P.
          and U. Herberg, March 2013."
   ::= { olsrv2TibRoutableAddressTopologySetEntry 4 }

   olsrv2TibRoutableAddressTopologySetDestIpAddr  OBJECT-TYPE
      SYNTAX      InetAddress (SIZE(4|16))
      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
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
      ::= { olsrv2TibRoutableAddressTopologySetEntry 5 }

      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
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
      ::= { olsrv2TibRoutableAddressTopologySetEntry 6 }

      olsrv2TibRoutableAddressTopologySetMetric  OBJECT-TYPE
         SYNTAX      Olsrv2MetricCompressedFormTC
         MAX-ACCESS  read-only
         STATUS      current
         DESCRIPTION
           "This is the neighbor metric from the router
            with originator address TA_from_orig_addr to the
            router with OLSRv2 interface address TA_dest_addr."
         REFERENCE
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
      ::= { olsrv2TibRoutableAddressTopologySetEntry 7 }

      olsrv2TibRoutableAddressTopologySetExpireTime  OBJECT-TYPE
         SYNTAX      TimeStamp
         UNITS       "centiseconds"
         MAX-ACCESS  read-only
         STATUS      current
         DESCRIPTION
           "olsrv2TibRoutableAddressTopologySetExpireTime
            specifies the value of sysUptime when this entry
            SHOULD expire and be removed from the
```

```
            olsrv2TibRoutableAddressTopologySetTable."
         REFERENCE
            "RFC XXXX - The Optimized Link State Routing Protocol
             version 2, Clausen, T., Dearlove, C., Jacquet, P.
             and U. Herberg, March 2013."
      ::= { olsrv2TibRoutableAddressTopologySetEntry 8 }


      --
      -- Attached Network Set
      --

      olsrv2TibAttNetworksSetTable OBJECT-TYPE
         SYNTAX       SEQUENCE OF Olsrv2TibAttNetworksSetEntry
         MAX-ACCESS   not-accessible
         STATUS       current
         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
            "RFC XXXX - The Optimized Link State Routing Protocol
             version 2, Clausen, T., Dearlove, C., Jacquet, P.
             and U. Herberg, March 2013."
      ::= { olsrv2StateGroup 10 }

      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_seq_number,
              AN_dist, AN_metric, AN_time).

             OLSRv2 (RFC XXXX) defines the rules for managing
             entries within this table, e.g., populating
             and purging entries.  Specific instructions for the
             olsrv2TibRoutableAddressTopologySetEntry(s) are found
             in Section 10.4 and Section 17 of OLSRv2 (RFC XXXX)."
         REFERENCE
            "RFC XXXX - The Optimized Link State Routing Protocol
             version 2, Clausen, T., Dearlove, C., Jacquet, P.
             and U. Herberg, March 2013."
         INDEX { olsrv2TibAttNetworksSetIndex }
      ::= { olsrv2TibAttNetworksSetTable 1 }
```

```
      Olsrv2TibAttNetworksSetEntry ::=
         SEQUENCE {
            olsrv2TibAttNetworksSetIndex
               Unsigned32,
            olsrv2TibAttNetworksSetOrigIpAddrType
               InetAddressType,
            olsrv2TibAttNetworksSetOrigIpAddr
               InetAddress,
            olsrv2TibAttNetworksSetNetIpAddrType
               InetAddressType,
            olsrv2TibAttNetworksSetNetIpAddr
               InetAddress,
            olsrv2TibAttNetworksSetNetIpAddrPrefixLen
               InetAddressPrefixLength,
            olsrv2TibAttNetworksSetSeqNo
               Unsigned32,
            olsrv2TibAttNetworksSetDist
               Unsigned32,
            olsrv2TibAttNetworksSetMetric
               Olsrv2MetricCompressedFormTC,
            olsrv2TibAttNetworksSetExpireTime
               TimeStamp
         }

      olsrv2TibAttNetworksSetIndex  OBJECT-TYPE
         SYNTAX      Unsigned32 (1..16777215)
         MAX-ACCESS  not-accessible
         STATUS      current
         DESCRIPTION
            "The index for this table.  The entries in this
             table expire according to the value of the
             olsrv2TibAttNetworksSetExpireTime object.
             Further, the lifetime of each entry within this
             table is set by the validity time in the
             OLSRv2 TC message.  As such, they are expected
             to timeout roughly in the order that they are
             added to this table.

             The maximum value of this index is set to allow
             for the possibility of an extremely large number
             Attached Networks Set tuples to be
             added to this OLSRv2 router.  This should not be
             an issue for MANET router deployments and
             configurations in the foreseeable future.

             The index values assigned to new entries SHOULD
             be assigned in numerical order, beginning from
             1.  New entries should be assigned the next
```

```
            available value, until the maximum value is
            assigned.  Following this, the next assigned value
            SHOULD go back to 1 and begin incrementing again.
            If the table is full, then the next entry SHOULD
            be assigned an index value in sequence, replacing
            an existing entry (expiring this entry
            pre-maturely).

            OLSRv2 (RFC XXXX) defines the rules for managing
            entries within this table, e.g., populating
            and purging entries."
        REFERENCE
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
     ::= { olsrv2TibAttNetworksSetEntry 1 }

     olsrv2TibAttNetworksSetOrigIpAddrType  OBJECT-TYPE
        SYNTAX      InetAddressType { ipv4(1) , ipv6(2) }
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
           "The type of the olsrv2TibAttNetworksSetOrigIpAddr,
            as defined in the InetAddress MIB module (RFC4001).

            Only the values 'ipv4(1)' and
            'ipv6(2)' are supported."
        REFERENCE
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
     ::= { olsrv2TibAttNetworksSetEntry 2 }


     olsrv2TibAttNetworksSetOrigIpAddr  OBJECT-TYPE
        SYNTAX      InetAddress (SIZE(4|16))
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
           "This is the originator address, of type
            olsrv2TibAttNetworksSetOrigIpAddrType, of a
            router which can act as gateway to the
            network with address AN_net_addr."
        REFERENCE
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
     ::= { olsrv2TibAttNetworksSetEntry 3 }
```

```
olsrv2TibAttNetworksSetNetIpAddrType  OBJECT-TYPE
   SYNTAX      InetAddressType { ipv4(1) , ipv6(2) }
   MAX-ACCESS  read-only
   STATUS      current
   DESCRIPTION
      "The type of the olsrv2TibAttNetworksSetNetIpAddr,
       as defined in the InetAddress MIB module (RFC 4001).

       Only the values 'ipv4(1)' and
       'ipv6(2)' are supported."
   REFERENCE
      "RFC XXXX - The Optimized Link State Routing Protocol
       version 2, Clausen, T., Dearlove, C., Jacquet, P.
       and U. Herberg, March 2013."
::= { olsrv2TibAttNetworksSetEntry 4 }

olsrv2TibAttNetworksSetNetIpAddr  OBJECT-TYPE
   SYNTAX      InetAddress (SIZE(4|16))
   MAX-ACCESS  read-only
   STATUS      current
   DESCRIPTION
      "This is is the network address,of type
       olsrv2TibAttNetworksSetNetIpAddrType, of an
       attached network, which may be reached via
       the router with originator address AN_orig_addr."
   REFERENCE
      "RFC XXXX - The Optimized Link State Routing Protocol
       version 2, Clausen, T., Dearlove, C., Jacquet, P.
       and U. Herberg, March 2013."
::= { olsrv2TibAttNetworksSetEntry 5 }

olsrv2TibAttNetworksSetNetIpAddrPrefixLen  OBJECT-TYPE
   SYNTAX      InetAddressPrefixLength
   UNITS       "bits"
   MAX-ACCESS  read-only
   STATUS      current
   DESCRIPTION
      "Indicates the number of leading one bits that form the
       mask to be logically ANDed with the destination address
       before being compared to the value in the
       olsrv2TibAttNetworksSetNetIpAddr field."
   REFERENCE
      "RFC XXXX - The Optimized Link State Routing Protocol
       version 2, Clausen, T., Dearlove, C., Jacquet, P.
       and U. Herberg, March 2013."
::= { olsrv2TibAttNetworksSetEntry 6 }

olsrv2TibAttNetworksSetSeqNo  OBJECT-TYPE
```

```
         SYNTAX      Unsigned32 (0..65535)
         MAX-ACCESS  read-only
         STATUS      current
         DESCRIPTION
            "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
            "RFC XXXX - The Optimized Link State Routing Protocol
             version 2, Clausen, T., Dearlove, C., Jacquet, P.
             and U. Herberg, March 2013."
      ::= { olsrv2TibAttNetworksSetEntry 7 }

      olsrv2TibAttNetworksSetDist  OBJECT-TYPE
         SYNTAX      Unsigned32 (0..255)
         UNITS       "hops"
         MAX-ACCESS  read-only
         STATUS      current
         DESCRIPTION
            "The number of hops to the network
             with address AN_net_addr from the router with
             originator address AN_orig_addr."
         REFERENCE
            "RFC XXXX - The Optimized Link State Routing Protocol
             version 2, Clausen, T., Dearlove, C., Jacquet, P.
             and U. Herberg, March 2013."
      ::= { olsrv2TibAttNetworksSetEntry 8 }

      olsrv2TibAttNetworksSetMetric  OBJECT-TYPE
         SYNTAX      Olsrv2MetricCompressedFormTC
         MAX-ACCESS  read-only
         STATUS      current
         DESCRIPTION
            "The metric of the link from the router with
             originator address AN_orig_addr to the attached
             network with address AN_net_addr."
         REFERENCE
            "RFC XXXX - The Optimized Link State Routing Protocol
             version 2, Clausen, T., Dearlove, C., Jacquet, P.
             and U. Herberg, March 2013."
      ::= { olsrv2TibAttNetworksSetEntry 9 }

      olsrv2TibAttNetworksSetExpireTime  OBJECT-TYPE
         SYNTAX      TimeStamp
         UNITS       "centiseconds"
         MAX-ACCESS  read-only
```

```
   STATUS      current
   DESCRIPTION
      "olsrv2TibAttNetworksSetExpireTime
       specifies the value of sysUptime when this
       entry SHOULD expire and be removed from the
       olsrv2TibAttNetworksSetTable."
   REFERENCE
      "RFC XXXX - The Optimized Link State Routing Protocol
       version 2, Clausen, T., Dearlove, C., Jacquet, P.
       and U. Herberg, March 2013."
::= { olsrv2TibAttNetworksSetEntry 10 }



--
-- Routing Set
--

olsrv2TibRoutingSetTable OBJECT-TYPE
   SYNTAX       SEQUENCE OF Olsrv2TibRoutingSetEntry
   MAX-ACCESS   not-accessible
   STATUS       current
   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
      "RFC XXXX - The Optimized Link State Routing Protocol
       version 2, Clausen, T., Dearlove, C., Jacquet, P.
       and U. Herberg, March 2013."
::= { olsrv2StateGroup 11 }

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, R_metric)"
   REFERENCE
      "RFC XXXX - The Optimized Link State Routing Protocol
       version 2, Clausen, T., Dearlove, C., Jacquet, P.
       and U. Herberg, March 2013."
   INDEX { olsrv2TibRoutingSetDestIpAddrType,
           olsrv2TibRoutingSetDestIpAddr,
           olsrv2TibRoutingSetDestIpAddrPrefixLen }
```

```
     ::= { olsrv2TibRoutingSetTable 1 }

     Olsrv2TibRoutingSetEntry ::=
        SEQUENCE {
           olsrv2TibRoutingSetDestIpAddrType
              InetAddressType,
           olsrv2TibRoutingSetDestIpAddr
              InetAddress,
           olsrv2TibRoutingSetDestIpAddrPrefixLen
              InetAddressPrefixLength,
           olsrv2TibRoutingSetNextIfIpAddrType
              InetAddressType,
           olsrv2TibRoutingSetNextIfIpAddr
              InetAddress,
           olsrv2TibRoutingSetLocalIfIpAddrType
              InetAddressType,
           olsrv2TibRoutingSetLocalIfIpAddr
              InetAddress,
           olsrv2TibRoutingSetDist
              Unsigned32,
           olsrv2TibRoutingSetMetric
              Olsrv2MetricCompressedFormTC
        }

     olsrv2TibRoutingSetDestIpAddrType  OBJECT-TYPE
        SYNTAX      InetAddressType { ipv4(1) , ipv6(2) }
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
           "The type of the olsrv2TibRoutingSetDestIpAddr,
            as defined in the InetAddress MIB module (RFC 4001).

            Only the values 'ipv4(1)' and 'ipv6(2)' are
            supported."
        REFERENCE
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
     ::= { olsrv2TibRoutingSetEntry 1 }

     olsrv2TibRoutingSetDestIpAddr  OBJECT-TYPE
        SYNTAX      InetAddress (SIZE(4|16))
        MAX-ACCESS  not-accessible
        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
            "RFC XXXX - The Optimized Link State Routing Protocol
             version 2, Clausen, T., Dearlove, C., Jacquet, P.
             and U. Herberg, March 2013."
      ::= { olsrv2TibRoutingSetEntry 2 }

      olsrv2TibRoutingSetDestIpAddrPrefixLen  OBJECT-TYPE
         SYNTAX      InetAddressPrefixLength
         UNITS       "bits"
         MAX-ACCESS  not-accessible
         STATUS      current
         DESCRIPTION
            "Indicates the number of leading one bits that form the
             mask to be logically ANDed with the destination address
             before being compared to the value in the
             olsrv2TibRoutingSetDestIpAddr field.

             Note: This definition needs to be consistent
             with the current forwarding table MIB module description.
             Specifically, it SHOULD allow for longest prefix
             matching of network addresses."
         REFERENCE
            "RFC XXXX - The Optimized Link State Routing Protocol
             version 2, Clausen, T., Dearlove, C., Jacquet, P.
             and U. Herberg, March 2013."
      ::= { olsrv2TibRoutingSetEntry 3 }

      olsrv2TibRoutingSetNextIfIpAddrType  OBJECT-TYPE
         SYNTAX      InetAddressType { ipv4(1) , ipv6(2) }
         MAX-ACCESS  read-only
         STATUS      current
         DESCRIPTION
            "The type of the olsrv2TibRoutingSetNextIfIpAddr,
             as defined in the InetAddress MIB module (RFC 4001).

             Only the values 'ipv4(1)' and
             'ipv6(2)' are supported."
         REFERENCE
            "RFC XXXX - The Optimized Link State Routing Protocol
             version 2, Clausen, T., Dearlove, C., Jacquet, P.
             and U. Herberg, March 2013."
      ::= { olsrv2TibRoutingSetEntry 4 }

      olsrv2TibRoutingSetNextIfIpAddr  OBJECT-TYPE
         SYNTAX      InetAddress (SIZE(4|16))
         MAX-ACCESS  read-only
         STATUS      current
```

```
        DESCRIPTION
           "This object is the OLSRv2 interface address of the
            next hop on the selected path to the
            destination."
        REFERENCE
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
     ::= { olsrv2TibRoutingSetEntry 5 }

     olsrv2TibRoutingSetLocalIfIpAddrType  OBJECT-TYPE
        SYNTAX      InetAddressType { ipv4(1) , ipv6(2) }
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
           "The type of the olsrv2TibRoutingSetLocalIfIpAddr
            and olsrv2TibRoutingSetNextIfIpAddr,
            as defined in the InetAddress MIB module (RFC 4001).

            Only the values 'ipv4(1)' and
            'ipv6(2)' are supported."
        REFERENCE
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
     ::= { olsrv2TibRoutingSetEntry 6 }


     olsrv2TibRoutingSetLocalIfIpAddr  OBJECT-TYPE
        SYNTAX      InetAddress (SIZE(4|16))
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
           "This object is the address of the local OLSRv2
            interface over which a packet must be
            sent to reach the destination by the
            selected path."
        REFERENCE
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
     ::= { olsrv2TibRoutingSetEntry 7 }

     olsrv2TibRoutingSetDist  OBJECT-TYPE
        SYNTAX      Unsigned32 (0..255)
        UNITS       "hops"
        MAX-ACCESS  read-only
        STATUS      current
```

```
        DESCRIPTION
           "This object is the number of hops on the selected
            path to the destination."
        REFERENCE
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
     ::= { olsrv2TibRoutingSetEntry 8 }

     olsrv2TibRoutingSetMetric  OBJECT-TYPE
        SYNTAX      Olsrv2MetricCompressedFormTC
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
           "This object is the metric of the route
            to the destination with address R_dest_addr."
        REFERENCE
           "RFC XXXX - The Optimized Link State Routing Protocol
            version 2, Clausen, T., Dearlove, C., Jacquet, P.
            and U. Herberg, March 2013."
     ::= { olsrv2TibRoutingSetEntry 9 }




  --
  -- 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 each active local OLSRv2 interface.
            If the olsrv2InterfaceAdminStatus of the interface
```

```
           changes to 'disabled' then the row associated with this
           interface SHOULD be removed from this table."
       REFERENCE
          "RFC XXXX - The Optimized Link State Routing Protocol
           version 2, Clausen, T., Dearlove, C., Jacquet, P.
           and U. Herberg, March 2013."
    ::= { olsrv2PerformanceObjGrp 1 }

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

    Olsrv2InterfacePerfEntry ::=
       SEQUENCE {
          olsrv2IfTcMessageXmits
             Counter32,
          olsrv2IfTcMessageRecvd
             Counter32,
          olsrv2IfTcMessageXmitAccumulatedSize
             Counter64,
          olsrv2IfTcMessageRecvdAccumulatedSize
             Counter64,
          olsrv2IfTcMessageTriggeredXmits
             Counter32,
          olsrv2IfTcMessagePeriodicXmits
             Counter32,
          olsrv2IfTcMessageForwardedXmits
             Counter32,
          olsrv2IfTcMessageXmitAccumulatedMPRSelectorCount
             Counter32
       }

    olsrv2IfTcMessageXmits  OBJECT-TYPE
       SYNTAX      Counter32
       UNITS       "messages"
       MAX-ACCESS  read-only
       STATUS      current
       DESCRIPTION
          "A counter is incremented each time a TC
           message has been transmitted on that interface."
    ::= { olsrv2InterfacePerfEntry 1 }
```

```
     olsrv2IfTcMessageRecvd  OBJECT-TYPE
        SYNTAX      Counter32
        UNITS       "messages"
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
           "A counter is incremented each time a
            TC message has been received on that interface.
            This excludes all messages that are ignored due to
            OLSRv2 protocol procedures."
     ::= { olsrv2InterfacePerfEntry 2 }

     olsrv2IfTcMessageXmitAccumulatedSize  OBJECT-TYPE
        SYNTAX      Counter64
        UNITS       "octets"
        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 3 }

     olsrv2IfTcMessageRecvdAccumulatedSize  OBJECT-TYPE
        SYNTAX      Counter64
        UNITS       "octets"
        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.
            This excludes all messages that are ignored due to
            OLSRv2 protocol procedures."
     ::= { olsrv2InterfacePerfEntry 4 }

     olsrv2IfTcMessageTriggeredXmits  OBJECT-TYPE
        SYNTAX      Counter32
        UNITS       "messages"
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
           "A counter is incremented each time a triggered
            TC message has been sent."
     ::= { olsrv2InterfacePerfEntry 5 }

     olsrv2IfTcMessagePeriodicXmits  OBJECT-TYPE
        SYNTAX      Counter32
         UNITS      "messages"
        MAX-ACCESS  read-only
```

```
        STATUS      current
        DESCRIPTION
           "A counter is incremented each time a periodic
            TC message has been sent."
     ::= { olsrv2InterfacePerfEntry 6 }

     olsrv2IfTcMessageForwardedXmits  OBJECT-TYPE
        SYNTAX      Counter32
        UNITS       "messages"
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
           "A counter is incremented each time a
            TC message has been forwarded."
     ::= { olsrv2InterfacePerfEntry 7 }

     olsrv2IfTcMessageXmitAccumulatedMPRSelectorCount OBJECT-TYPE
        SYNTAX      Counter32
        UNITS       "advertised MPR selectors"
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
           "A counter is incremented by the number of advertised
            MPR selectors in a TC each time a TC
            message has been sent."
     ::= { olsrv2InterfacePerfEntry 8 }



     --
     -- Objects concerning the Routing set
     --

     olsrv2RoutingSetRecalculationCount  OBJECT-TYPE
        SYNTAX      Counter32
        UNITS       "recalculations"
        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
        UNITS       "recalculations"
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
           "This counter increments each time the MPRs
            of this router have been recalculated for
            any of its interfaces."
     ::= { olsrv2PerformanceObjGrp 3 }




  --
  -- Notifications
  --

  olsrv2NotificationsObjects OBJECT IDENTIFIER ::=
                                     { olsrv2MIBNotifications 0 }
  olsrv2NotificationsControl OBJECT IDENTIFIER ::=
                                     { olsrv2MIBNotifications 1 }
  olsrv2NotificationsStates  OBJECT IDENTIFIER ::=
                                     { olsrv2MIBNotifications 2 }


     -- olsrv2NotificationsObjects

     olsrv2RouterStatusChange NOTIFICATION-TYPE
         OBJECTS { olsrv2OrigIpAddrType, -- The address type of
                                         --    the originator of
                                         --    the notification.
                   olsrv2OrigIpAddr,     -- The originator of
                                         --    the notification.
                   olsrv2AdminStatus     -- The new state.
         }
         STATUS      current
         DESCRIPTION
            "olsrv2RouterStatusChange is a notification generated
             when the OLSRv2 router changes it status.
             The router status is maintained in the
             olsrv2AdminStatus object."
     ::= { olsrv2NotificationsObjects 1 }

     olsrv2OrigIpAddrChange NOTIFICATION-TYPE
        OBJECTS { olsrv2OrigIpAddrType, -- The address type of
                                        --    the originator of
                                        --    the notification.
```

```
                olsrv2OrigIpAddr,     -- The originator of
                                      --    the notification.
                olsrv2PreviousOrigIpAddrType, -- The address
                                      -- type of previous
                                      -- address of
                                      -- the originator of
                                      -- the notification.
                olsrv2PreviousOrigIpAddr  -- The previous
                                      -- address of the
                                      -- originator of
                                      -- the notification.
      }
      STATUS      current
      DESCRIPTION
         "olsrv2OrigIpAddrChange is a notification generated when
          the OLSRv2 router changes it originator IP address.
          The notification includes the new and the previous
          originator IP address of the OLSRv2 router."
   ::= { olsrv2NotificationsObjects 2 }

   olsrv2RoutingSetRecalculationCountChange NOTIFICATION-TYPE
      OBJECTS { olsrv2OrigIpAddrType, -- The address type of
                                      --   the originator of
                                      --   the notification.
                olsrv2OrigIpAddr,     -- The originator of
                                      --   the notification.
                olsrv2RoutingSetRecalculationCount  -- Number
                                          -- of the
                                          -- routing set
                                          -- recalculations.
      }
      STATUS       current
      DESCRIPTION
         "The olsrv2RoutingSetRecalculationCountChange
          notification is generated when a significant number of
          routing set recalculations have occurred in a short time.
          This notification SHOULD be generated no more than once
          per olsrv2RoutingSetRecalculationCountWindow.
          The network administrator SHOULD select
          appropriate values for 'significant number of
          routing set recalculations' and 'short time' through
          the settings of the
          olsrv2RoutingSetRecalculationCountThreshold
          and olsrv2RoutingSetRecalculationCountWindow objects."
   ::= { olsrv2NotificationsObjects 3 }

   olsrv2MPRSetRecalculationCountChange NOTIFICATION-TYPE
      OBJECTS { olsrv2OrigIpAddrType, -- The address type of
```

```
                                    --   the originator of
                                    --   the notification.
               olsrv2OrigIpAddr,    -- The originator of
                                    --   the notification.
               olsrv2MPRSetRecalculationCount  -- Number of
                                    --   MPR set
                                    --   recalculations.
         }
         STATUS       current
         DESCRIPTION
            "The olsrv2MPRSetRecalculationCountChange
             notification is generated when a significant
             number of MPR set recalculations occur in
             a short period of time.  This notification
             SHOULD be generated no more than once
             per olsrv2MPRSetRecalculationCountWindow.
             The network administrator SHOULD select
             appropriate values for 'significant number of
             MPR set recalculations' and 'short period of
             time' through the settings of the
             olsrv2MPRSetRecalculationCountThreshold and
             olsrv2MPRSetRecalculationCountWindow objects."
      ::= { olsrv2NotificationsObjects 4 }


      -- olsrv2NotificationsControl

      olsrv2RoutingSetRecalculationCountThreshold OBJECT-TYPE
         SYNTAX      Integer32 (0..255)
         UNITS       "recalculations"
         MAX-ACCESS  read-write
         STATUS      current
         DESCRIPTION
            "A threshold value for the
             olsrv2RoutingSetRecalculationCount object.
             If the number of occurrences exceeds this
             threshold within the previous
             olsrv2RoutingSetRecalculationCountWindow,
             then the olsrv2RoutingSetRecalculationCountChange
             notification is to be generated.

             It is RECOMMENDED that the value of this
             threshold be set to at least 20 and higher
             in dense topologies with frequent expected
             topology changes."
      ::= { olsrv2NotificationsControl 1 }

      olsrv2RoutingSetRecalculationCountWindow OBJECT-TYPE
```

```
         SYNTAX      TimeTicks
         MAX-ACCESS  read-write
         STATUS      current
         DESCRIPTION
            "This object is used to determine whether to generate
             an olsrv2RoutingSetRecalculationCountChange notification.
             This object represents an interval from the present moment,
             extending into the past, expressed in hundredths of
             a second.  If the change in the value of the
             olsrv2RoutingSetRecalculationCount object during
             this interval has exceeded the value of
             olsrv2RoutingSetRecalculationCountThreshold, then
             an olsrv2RoutingSetRecalculationCountChange notification
             is generated.

             It is RECOMMENDED that the value for this
             window be set to at least 5 times the
             nhdpHelloInterval."
      ::= { olsrv2NotificationsControl 2 }

      olsrv2MPRSetRecalculationCountThreshold OBJECT-TYPE
         SYNTAX      Integer32 (0..255)
         UNITS       "recalculations"
         MAX-ACCESS  read-write
         STATUS      current
         DESCRIPTION
            "A threshold value for the
             olsrv2MPRSetRecalculationCount object.
             If the number of occurrences exceeds this
             threshold within the previous
             olsrv2MPRSetRecalculationCountWindow,
             then the
             olsrv2MPRSetRecalculationCountChange
             notification is to be generated.

             It is RECOMMENDED that the value of this
             threshold be set to at least 20 and higher
             in dense topologies with frequent expected
             topology changes."
      ::= { olsrv2NotificationsControl 3 }

      olsrv2MPRSetRecalculationCountWindow OBJECT-TYPE
         SYNTAX       TimeTicks
         MAX-ACCESS   read-write
         STATUS       current
         DESCRIPTION
            "This object is used to determine whether to generate
             an olsrv2MPRSetRecalculationCountChange notification.
```

```
            This object represents an interval from the present moment,
            extending into the past, expressed in hundredths of
            a second.  If the change in the value of the
            olsrv2MPRSetRecalculationCount object during
            that interval has exceeded the value of
            olsrv2MPRSetRecalculationCountThreshold, then the
            an olsrv2MPRSetRecalculationCountChange notification
            is generated.

            It is RECOMMENDED that the value for this
            window be set to at least 5 times the
            nhdpHelloInterval."
       ::= { olsrv2NotificationsControl 4 }


       olsrv2PreviousOrigIpAddrType  OBJECT-TYPE
          SYNTAX      InetAddressType  { ipv4(1) , ipv6(2) }
          MAX-ACCESS  read-only
          STATUS      current
          DESCRIPTION
             "The type of the olsrv2PreviousOrigIpAddr,
              as defined in the InetAddress MIB module (RFC 4001).

              Only the values 'ipv4(1)' and
              'ipv6(2)' are supported.

              This object MUST have the same persistence
              characteristics as olsrv2PreviousOrigIpAddr."
          REFERENCE
             "RFC XXXX - The Optimized Link State Routing Protocol
              version 2, Clausen, T., Dearlove, C., Jacquet, P.
              and U. Herberg, March 2013."
       ::= { olsrv2NotificationsStates 1 }

       olsrv2PreviousOrigIpAddr  OBJECT-TYPE
          SYNTAX      InetAddress (SIZE(4|16))
          MAX-ACCESS  read-only
          STATUS      current
          DESCRIPTION
             "The previous origination IP address
              of this OLSRv2 router.

              This object SHOULD be updated each time
              the olsrv2OrigIpAddr is modified.

              This object is persistent and when written
              the entity SHOULD save the change to
              non-volatile storage."
```

```
   REFERENCE
      "RFC XXXX - The Optimized Link State Routing Protocol
       version 2, Clausen, T., Dearlove, C., Jacquet, P.
       and U. Herberg, March 2013."
::= { olsrv2NotificationsStates 2 }



--
-- Compliance Statements
--

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,
                      olsrv2NotificationsObjectsGroup,
                      olsrv2NotificationsGroup }
::= { olsrv2Compliances 2 }

--
-- Units of Conformance
--

olsrv2ConfigObjectsGroup OBJECT-GROUP
   OBJECTS {
      olsrv2AdminStatus,
      olsrv2InterfaceAdminStatus,
      olsrv2OrigIpAddrType,
```

```
            olsrv2OrigIpAddr,
            olsrv2OHoldTime,
            olsrv2TcInterval,
            olsrv2TcMinInterval,
            olsrv2THoldTime,
            olsrv2AHoldTime,
            olsrv2RxHoldTime,
            olsrv2PHoldTime,
            olsrv2FHoldTime,
            olsrv2TpMaxJitter,
            olsrv2TtMaxJitter,
            olsrv2FMaxJitter,
            olsrv2TcHopLimit,
            olsrv2WillFlooding,
            olsrv2WillRouting,
            olsrv2LinkMetricType
         }
         STATUS      current
         DESCRIPTION
            "Objects to permit configuration of OLSRv2.
             All of these SHOULD be backed by non-volatile
             storage."
      ::= { olsrv2MIBGroups 1 }

      olsrv2StateObjectsGroup  OBJECT-GROUP
         OBJECTS {
            olsrv2LibOrigSetIpAddrType,
            olsrv2LibOrigSetIpAddr,
            olsrv2LibOrigSetExpireTime,
            olsrv2LibLocAttNetSetIpAddrType,
            olsrv2LibLocAttNetSetIpAddr,
            olsrv2LibLocAttNetSetIpAddrPrefixLen,
            olsrv2LibLocAttNetSetDistance,
            olsrv2LibLocAttNetSetMetric,
            olsrv2IibLinkSetInMetric,
            olsrv2IibLinkSetOutMetric,
            olsrv2IibLinkSetMprSelector,
            olsrv2Iib2HopSetInMetric,
            olsrv2Iib2HopSetOutMetric,
            olsrv2NibNeighborSetNOrigIpAddrType,
            olsrv2NibNeighborSetNOrigIpAddr,
            olsrv2NibNeighborSetNInMetric,
            olsrv2NibNeighborSetNOutMetric,
            olsrv2NibNeighborSetNWillFlooding,
            olsrv2NibNeighborSetNWillRouting,
            olsrv2NibNeighborSetNFloodingMpr,
            olsrv2NibNeighborSetNRoutingMpr,
            olsrv2NibNeighborSetNMprSelector,
```

```
            olsrv2NibNeighborSetNAdvertised,
            olsrv2NibNeighborSetTableAnsn,
            olsrv2TibAdRemoteRouterSetIpAddrType,
            olsrv2TibAdRemoteRouterSetIpAddr,
            olsrv2TibAdRemoteRouterSetMaxSeqNo,
            olsrv2TibRouterTopologySetFromOrigIpAddrType,
            olsrv2TibRouterTopologySetFromOrigIpAddr,
            olsrv2TibRouterTopologySetToOrigIpAddrType,
            olsrv2TibRouterTopologySetToOrigIpAddr,
            olsrv2TibRouterTopologySetSeqNo,
            olsrv2TibRouterTopologySetMetric,
            olsrv2TibRoutableAddressTopologySetExpireTime,
            olsrv2TibRoutableAddressTopologySetFromOrigIpAddrType,
            olsrv2TibRoutableAddressTopologySetFromOrigIpAddr,
            olsrv2TibRoutableAddressTopologySetDestIpAddrType,
            olsrv2TibRoutableAddressTopologySetDestIpAddr,
            olsrv2TibRoutableAddressTopologySetSeqNo,
            olsrv2TibRoutableAddressTopologySetMetric,
            olsrv2TibAttNetworksSetOrigIpAddrType,
            olsrv2TibAttNetworksSetOrigIpAddr,
            olsrv2TibAttNetworksSetNetIpAddrType,
            olsrv2TibAttNetworksSetNetIpAddr,
            olsrv2TibAttNetworksSetNetIpAddrPrefixLen,
            olsrv2TibAttNetworksSetSeqNo,
            olsrv2TibAttNetworksSetDist,
            olsrv2TibAttNetworksSetMetric,
            olsrv2TibAttNetworksSetExpireTime,
            olsrv2TibRoutingSetNextIfIpAddrType,
            olsrv2TibRoutingSetNextIfIpAddr,
            olsrv2TibRoutingSetLocalIfIpAddrType,
            olsrv2TibRoutingSetLocalIfIpAddr,
            olsrv2TibRoutingSetDist,
            olsrv2TibRoutingSetMetric
         }
         STATUS      current
         DESCRIPTION
            "Objects to permit monitoring of OLSRv2 state."
      ::= { olsrv2MIBGroups 2 }

      olsrv2PerfObjectsGroup  OBJECT-GROUP
         OBJECTS {
            olsrv2IfTcMessageXmits,
            olsrv2IfTcMessageRecvd,
            olsrv2IfTcMessageXmitAccumulatedSize,
            olsrv2IfTcMessageRecvdAccumulatedSize,
            olsrv2IfTcMessageTriggeredXmits,
            olsrv2IfTcMessagePeriodicXmits,
            olsrv2IfTcMessageForwardedXmits,
```

```
           olsrv2IfTcMessageXmitAccumulatedMPRSelectorCount,
           olsrv2RoutingSetRecalculationCount,
           olsrv2MPRSetRecalculationCount
        }
        STATUS      current
        DESCRIPTION
           "Objects to support monitoring of OLSRv2 performance."
     ::= { olsrv2MIBGroups 3 }

     olsrv2NotificationsObjectsGroup OBJECT-GROUP
        OBJECTS {
           olsrv2RoutingSetRecalculationCountThreshold,
           olsrv2RoutingSetRecalculationCountWindow,
           olsrv2MPRSetRecalculationCountThreshold,
           olsrv2MPRSetRecalculationCountWindow,
           olsrv2PreviousOrigIpAddrType,
           olsrv2PreviousOrigIpAddr
        }
        STATUS      current
        DESCRIPTION
           "Objects to support the notification types in the
            olsrv2NotificationsGroup.  Some of these appear in
            notification payloads, others serve to control
            notification generation."
     ::= { olsrv2MIBGroups 4 }


     olsrv2NotificationsGroup NOTIFICATION-GROUP
        NOTIFICATIONS {
           olsrv2RouterStatusChange,
           olsrv2OrigIpAddrChange,
           olsrv2RoutingSetRecalculationCountChange,
           olsrv2MPRSetRecalculationCountChange
        }
        STATUS current
        DESCRIPTION
            "Notification types to support management of OLSRv2."
     ::= { olsrv2MIBGroups 5 }

  END
```

8. Security Considerations

This MIB module defines objects for the configuration, monitoring and notification of the Optimized Link State Routing protocol version 2 [OLSRv2]. OLSRv2 allows routers to acquire topological information of the routing domain by virtue of exchanging TC message, to calculate shortest paths to each destination router in the routing domain, to select relays for network-wide transmissions etc.

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 olsrv2TcInterval, olsrv2TcMinInterval - these writable objects control the rate at which TC messages are sent. If set at too high a rate, this could represent a form of DOS attack by overloading interface resources. If set low, OLSRv2 may not converge fast enough to provide accurate routes to all destinations in the routing domain.

o olsrv2TcHopLimit - defines the hop limit for TC messages. If set too low, messages will not be forwarded beyond the defined scope, and thus routers further away from the message originator will not be able to construct appropriate topology graphs.

o olsrv2OHoldTime, olsrv2THoldTime, olsrv2AHoldTime, olsrv2RxHoldTime, olsrv2PHoldTime, olsrv2FHoldTime - define hold times for tuples of different Information Bases of OLSRv2. If set too low, information will expire quickly, and may this harm a correct operation of the routing protocol.

o olsrv2WillFlooding and olsrv2WillRouting - define the willingness of this router to become MPR. If this is set to WILL_NEVER (0), the managed router will not forward any TC messages, nor accept a selection to become MPR by neighboring routers. If set to WILL_ALWAYS (15), the router will be preferred by neighbors during MPR selection, and may thus attract more traffic.

o olsrv2TpMaxJitter, olsrv2TtMaxJitter, olsrv2FMaxJitter - define jitter values for TC message transmission and forwarding. If set too low, control traffic may get lost if the channel is lossy.

o olsrv2LinkMetricType - defines the type of the link metric that a router uses (e.g., ETX or hop-count). Whenever this value changes, all link metric information recorded by the router is invalid, causing a reset of information acquired from other routers in the MANET. Moreover, if olsrv2LinkMetricType on a router is set to a value that is not known to other routers in the MANET, these routers will not be able to establish routes to that router or transiting that router. Existing routes to the router with a olsrv2LinkMetricType unknown to other routers in the MANET will be removed.

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:

- olsrv2TibRouterTopologySetTable - The contains information on the topology of the MANET, specifically the IP address of the routers in the MANET (as identified by olsrv2TibRouterTopologySetFromOrigIpAddr and olsrv2TibRouterTopologySetToOrigIpAddr objects). This information provides an adversary broad information on the members of the MANET, located within this single table. This information can be used to expedite attacks on the other members of the MANET without having to go through a laborious discovery process on their own.

Some of the Tables in this MIB AUGMENT Tables defined in NHDP-MIB [RFC6779]. Hence, care must be taken in configuring access control here in order make sure that the permitted permissions granted for the AUGMENT-ing Tables here are consistent with the access controls permitted within the NHDP-MIB. The below list identifies the AUGMENT-ing Tables and their NHDP-MIB counterparts. It is recommend that access control policies for these Table pairs are consistently set.

- The olsrv2InterfaceTable AUGMENTs the nhdpInterfaceTable.

- The olsrv2IibLinkSetTable AUGMENTs the nhdpIibLinkSetTable.

- The olsrv2Iib2HopSetTable AUGMENTs the nhdpIib2HopSetTable.

- The olsrv2NibNeighborSetTable AUGMENTs the nhdpNibNeighborSetTable.

- The olsrv2InterfacePerfTable AUGMENTs the nhdpInterfacePerfTable.

MANET technology is often deployed to support communications of emergency services or military tactical applications. In these applications, it is imperative to maintain the proper operation of the communications network and to protect sensitive information related to its operation. Therefore, when implementing these capabilities, the full use of SNMPv3 cryptographic mechanisms for authentication and privacy is RECOMMENDED.

SNMP versions prior to SNMPv3 did not include adequate security. Even if the network itself is secure (for example by using IPsec), 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.

Implementations SHOULD provide the security features described by the SNMPv3 framework (see [RFC3410]), and implementations claiming compliance to the SNMPv3 standard MUST include full support for authentication and privacy via the User-based Security Model (USM) [RFC3414] with the AES cipher algorithm [RFC3826]. Implementations MAY also provide support for the Transport Security Model (TSM) [RFC5591] in combination with a secure transport such as SSH [RFC5592] or TLS/DTLS [RFC6353].

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. Applicability Statement

This document describes objects for configuring parameters of the Optimized Link State Routing version 2 (OLSRv2) Protocol [OLSRv2] process on a router. This MIB module, denoted OLSRv2-MIB, also reports state, performance information and notifications. The OLSRv2 protocol relies upon information gathered via the Neighborhood Discovery Protocol [RFC6130] in order to perform its operations. The NHDP protocol is managed via the NHDP-MIB [RFC6779].

MANET deployments can greatly differ in aspects of dynamics of the topology, capacity and loss rates of underlying channels, traffic flow directions, memory and CPU capacity of routers etc. SNMP and therefore this MIB module are only applicable for a subset of MANET deployments, in particular deployments:

o In which routers have enough memory and CPU resources to run SNMP and expose the MIB module.

o Where a network management station (NMS) is defined to which notifications are generated, and from which routers can be managed.

o Where this NMS is reachable from routers in the MANET most of the time (as notifications to the NMS and management information from the NMS to the router will be lost when connectivity is temporarily lost). This requires that the topology of the MANET is only moderately dynamic.

- Where the underlying wireless channel supports enough bandwidth to run SNMP, and where loss rates of the channel are not exhaustive.

Certain MANET deployments, such as community networks with non-mobile routers, dynamic topology because of changing link quality, and a pre-defined gateway (that could also serve as NMS), are examples of networks applicable for this MIB module. Other, more constrained deployments of MANETs may not be able to run SNMP and require different management protocols.

Some level of configuration, i.e., read-write objects, is desirable for OLSRv2 deployments. Topology related configuration such as the ability to enable OLSRv2 on new interfaces or initially configure OLSRv2 on a router's interfaces through the olsrv2InterfaceAdminStatus object is critical to initial system startup. The OLSRv2 protocol allows for some level of performance tuning through various protocol parameters and this MIB module allows for configuration of those protocol parameters through read-write objects such as the olsrv2TcHopLimit or the olsrv2FMaxJitter. Other read-write objects allow for the control of Notification behavior through this MIB module, e.g., the olsrv2RoutingSetRecalculationCountThreshold object. A fuller discussion of MANET network management applicability is to be provided elsewhere [USE-CASES].

10. IANA Considerations

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

```
Descriptor        OBJECT IDENTIFIER value
----------        -----------------------
OLSRv2-MIB          { mib-2 ZZZZ }
IANA EDITOR NOTE: please assign ZZZZ
```

11. Acknowledgements

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12. References

12.1. Normative References

[OLSRv2] Clausen, T., Dearlove, C., Jacquet, P., and U. Herberg, "The Optimized Link State Routing Protocol version 2", draft-ietf-manet-olsrv2-19 (work in progress), March 2013.

[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.

[RFC2863] McCloghrie, K. and F. Kastenholz, "The Interfaces Group MIB", RFC 2863, June 2000.

[RFC3414] Blumenthal, U. and B. Wijnen, "User-based Security Model (USM) for version 3 of the Simple Network Management Protocol (SNMPv3)", December 2002.

[RFC3418] Presuhn, R., "Management Information Base (MIB) for the Simple Network Management Protocol (SNMP)", STD 62, RFC 3418, December 2002.

[RFC3826] Blumenthal, U., Maino, F., and K. McCloghrie, "The Advanced Encryption Standard (AES) Cipher Algorithm in the SNMP User-based Security Model", June 2004.

[RFC4001] Daniele, M., Haberman, B., Routhier, S., and J. Schoenwaelder, "Textual Conventions for Internet Network Addresses", RFC 4001, February 2005.

[RFC5591] Harrington, D. and W. Hardaker, "Transport Security Model for the Simple Network Management Protocol (SNMP)", June 2009.

[RFC5592] Harrington, D., Saloway, J., and W. Hardaker, "Secure Shell Transport Model for the Simple Network Management Protocol (SNMP)", June 2009.

[RFC6130] Clausen, T., Dearlove, C., and J. Dean, "Mobile Ad Hoc Network (MANET) Neighborhood Discovery Protocol (NHDP)", RFC 6130, April 2011.

[RFC6353] Hardaker, W., "Transport Layer Security (TLS) Transport Model for the Simple Network Management Protocol (SNMP)", July 2011.

[RFC6779] Herberg, U., Cole, R., and I. Chakeres, "Definition of Managed Objects for the Neighborhood Discovery Protocol", RFC 6779, May 2012.

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.

[REPORT-MIB] Cole, R., Macker, J., and A. Bierman, "Definition of Managed Objects for Performance Reporting", draft-ietf-manet-report-mib-03 (work in progress), November 2012.

[USE-CASES] Nguyen, J., Cole, R., Herberg, U., Yi, J., and J. Dean, "Network Management of Mobile Ad hoc Networks (MANET): Architecture, Use Cases, and Applicability", draft-nguyen-manet-management-00 (work in progress), February 2013.

Appendix A. Note to the RFC Editor

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*************************************************************
* Note to the RFC Editor (to be removed prior to publication) *
*                                                             *
* 1) The reference to RFCYYYY 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 RFCXXXX throughout this document point  *
* to the current draft-ietf-manet-olsrv2-xx.txt.  This        *
* needs to be replaced with the XXXX RFC number for the       *
* OLSRv2 publication.                                         *
*                                                             *
*************************************************************
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