

Network Working Group
Internet-Draft
Category: Standards Track
<[draft-ietf-l2tpext-l2tpmib-base-02.txt](#)>

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August 2006

Layer Two Tunneling Protocol (Version 3) "L2TPv3" Management Information Base

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Abstract

This document describes a portion of the Management Information Base (MIB) to manage the Layer Two Tunneling Protocol, Version 3 (L2TPv3).

Acknowledgments

The original L2TP MIB, [[L2TP-MIB](#)], was authored by Evan Caves, Pat Calhoun, and Ross Wheeler.

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[1.](#) Introduction

The Managed Information Base (MIB) for the Layer Two Tunneling Protocol, Version 3 (L2TPv3) describes a model for managing the common attributes of L2TP control connections and sessions. L2TP provides a dynamic tunneling mechanism for multiple Layer 2 (L2) circuits across a packet-oriented data network. This MIB supports the base L2TP mechanism as specified in [[L2TP-BASE](#)].

[1.1](#) Changes from the L2TPv2 MIB

Most of the MIB objects defined in this document are carried over from [[L2TP-MIB](#)]. Changes include the following:

- o Separation of all payload-specific (namely PPP) and transport-specific (e.g. IP/UDP) objects. Payload- and transport-specific constructs are defined in companion documents.
- o Transition from a 16-bit Session ID and Tunnel ID to a 32-bit Session ID and Control Connection ID, respectively.

The MIB defined in [[L2TP-MIB](#)] will be referred to as the "L2TPv2 MIB", while the MIB defined in this document will be referred to as the "L2TPv3 MIB" or, more simply, as the "L2TP MIB" when the distinction is clear. Note that the L2TPv3 MIB supports both L2TPv2 and L2TPv3 implementations.

[1.2](#) Specification of Requirements

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

[1.3](#) Terminology

See also the "Terminology" section in [[L2TP-BASE](#)].

[2.](#) The SNMP Management Framework

The SNMP Management Framework presently consists of five major components:

- o An overall architecture, described in [RFC 2571](#).
- o Mechanisms for describing and naming objects and events for the purpose of management. The first version of this Structure of Management Information (SMI) is called SMIV1 and is described in STD 16 / [RFC 1155](#), STD 16 / [RFC 1212](#), and [RFC 1215](#). The second version, called SMIV2, is described in STD 58 / [RFC 2578](#), STD 58 / [RFC 2579](#), and STD 58 / [RFC 2580](#).
- o Message protocols for transferring management information. The first version of the SNMP message protocol is called SNMPv1 and is described in STD 15 / [RFC 1157](#). A second version of the SNMP message protocol, which is not an Internet standards track protocol, is called SNMPv2c and is described in [RFC 1901](#) and [RFC 1906](#). The third version of the message protocol is called SNMPv3 and is described in [RFC 1906](#), [RFC 2572](#), and [RFC 2574](#).
- o Protocol operations for accessing management information. The first set of protocol operations and associated PDU formats is described in STD 15 / [RFC 1157](#). A second set of protocol operations and associated PDU formats is described in [RFC 1905](#).

- o A set of fundamental applications described in [RFC 2573](#) and the view-based access control mechanism described in [RFC 2575](#).

A more detailed introduction to the current SNMP Management Framework can be found in [RFC 2570](#).

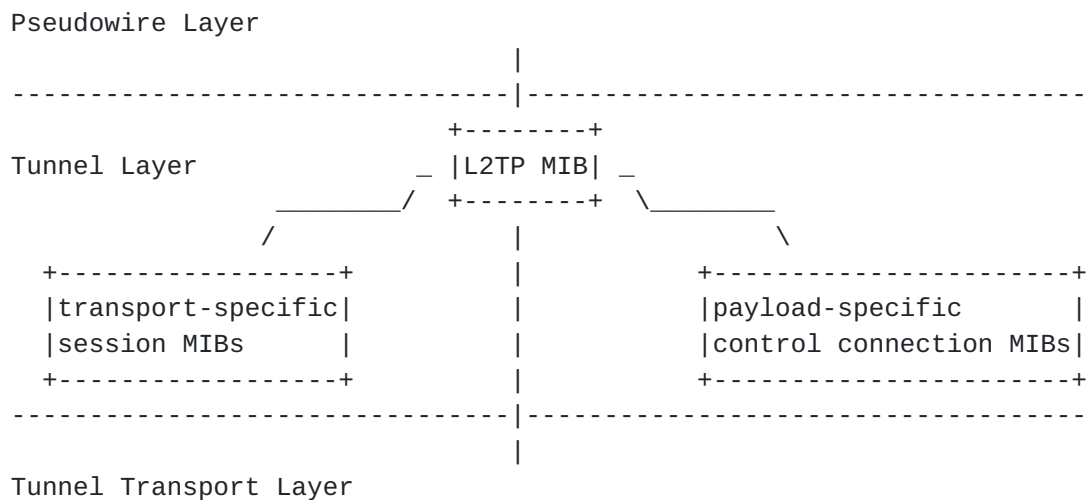
Managed objects are accessed via a virtual information store, termed the "Management Information Base" (MIB). Objects in the MIB are defined using the mechanisms defined in the SMI.

This memo specifies a MIB module that is compliant to the SMIV2. A MIB conforming to the SMIV1 can be produced through the appropriate translations. The resulting translated MIB must be semantically equivalent, except cases in which objects or events are omitted because no translation is possible (e.g. use of Counter64). Some machine-readable information in SMIV2 will be converted into textual descriptions in SMIV1 during the translation process. However, this loss of machine-readable information is not considered to change the semantics of the MIB.

3. Overview

The L2TP MIB defines the attributes that are common across all L2TP control connections and sessions, supporting at least L2TPv2 and L2TPv3. Other companion MIBs convey more specific characteristics about the tunneled link, such as the transport (e.g. IP, MPLS, ATM, etc.) or the payload (e.g. PPP, Ethernet, Frame Relay, etc.). The following reference model is suggested, but not required, as a framework in which the L2TP MIB may reside:

Figure 3.0: Sample MIB Layering with the L2TP MIB



In the diagram above, the Tunnel Layer comprises the MIBs that are specific to the tunneling protocol. For L2TP, this layer includes the L2TP MIB plus any payload-specific control connection MIBs or transport-specific session MIBs. The Pseudowire Layer contains MIBs that characterize the L2 payloads being forwarded by the tunneling protocol (e.g. the PWE3 Pseudowire MIB, see [[PWE3-PW-MIB](#)]). The Tunnel Transport Layer consists of MIBs that describe the transport-

level characteristics of a connection between two tunnel endpoints
(e.g. the IP Tunnel MIB, see [RFC 2667](#)).

The interaction of the L2TP MIB with other MIBs in different layers may require intermediate MIBs to map one MIB instance to another.

These intermediate MIBs are defined in companion documents.

3.1 Organization of the L2TP MIB

This MIB consists of the following seven groups:

l2tpConfigGroup

l2tpStatsGroup

These two groups provide information on the configuration, states, and statistics of the L2TP stack, its control connections, and its sessions. These groups are mandatory for implementors of this MIB.

l2tpCtrlDomainGroup

This optional group of objects provides configuration, states, and statistical information for L2TP control domains. An L2TP control domain is defined as a collection of L2TP LCCEs typically belonging to a common administrative domain or geographic location.

l2tpMappingGroup

This optional group contains mapping tables to assist management applications to map between protocol identifiers and table indices.

l2tpSecurityGroup

This optional group is for SNMP agents that support both authentication and privacy of SNMP messages for the management of L2TP keys.

l2tpTrapGroup

This group contains the notifications that could be generated by an L2TP stack.

l2tpHCPacketGroup

This group is optional for L2TP implementations that could potentially overflow the L2TP control domain tables 32-bit statistics counters in less than an hour.

3.2 Relationship to the Interface MIB

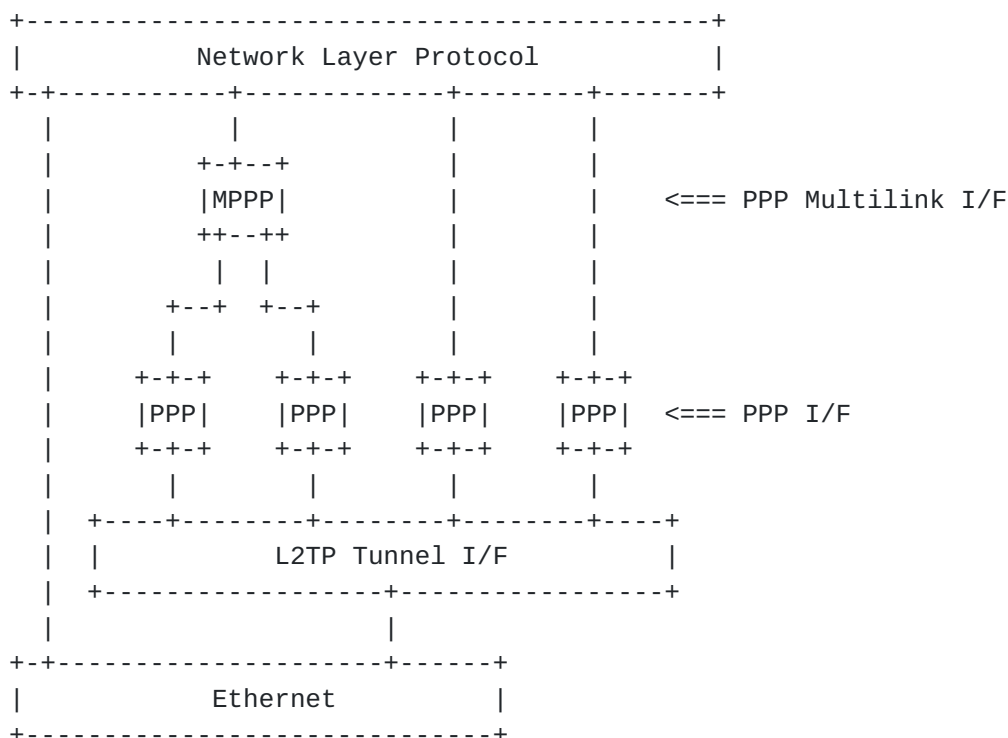
This section clarifies the relationship of this MIB to the Interfaces MIB [[RFC2863](#)]. Several areas of correlation are addressed in the following subsections. The implementor is referred to the Interfaces MIB document in order to understand the general intent of these areas.

3.2.1 Layering Model

This MIB contains several tables which are extensions to the IP Tunnel MIB described in [RFC2667] which itself defines extensions to the Interface MIB [RFC2863]. An L2TP tunnel is represented as a separate identifiable logical interface sub-layer. The tunnel stack layering model is described in [RFC2667].

In addition to that described in [RFC2667] an L2TP tunnel will not be at the top of the ifStack on a L2TP device that is acting as a L2TP Network Server (LNS). In this case PPP interfaces will be layered on top of the tunnel interface.

In the example diagram below, the interface layering is shown as it might appear at the LNS.



The ifStackTable is used to describe the layering of the interface sub-layers. For the example given above the ifTable and ifStackTable may appear as follows:

ifIndex	ifType	Tunnel MIB tables	Description
1	ethernetCsmacd(6)		Ethernet interface
2	tunnel(131)	tunnelIfTable l2tpTunnelConfigTable l2tpTunnelStatsTable	Tunnel interface

3	ppp(23)	PPP interface #1
4	ppp(23)	PPP interface #2
5	ppp(23)	PPP interface #3

6	ppp(23)	PPP interface #4
7	mlppp(108)	MLPPP interface

The corresponding ifStack table entries would then be:

ifStackTable Entries

HigherLayer	LowerLayer
0	5
0	6
0	7
1	0
2	1
3	2
4	2
5	2
6	2
7	3
7	4

L2TP Access Concentrator (LAC) tunnel interfaces on the other hand appear at the top of the interface layering stack. In this case the layering model is as described in [[RFC2667](#)].

However in order to support the tunneling of packets received from interfaces carrying framed PPP packets on the LAC to the LNS (and the propagation of decapsulated PPP packets to that interface) additional configuration is required. This is further described in [section 3.4](#).

[3.2.2](#) Interface MIB Objects

Except where noted in the tables below, all objects MUST be supported from the ifGeneralInformationGroup and one of the following three groups:

- o ifPacketGroup OR
- o ifHCPacketGroup OR
- o ifVHCPacketGroup

depending on the particular implementation.

The following tables describe how objects from the ifGeneralInformationGroup and ifPacketGroup (similar support should be provided for the high and very high capacity packet groups) are to be interpreted and supported for L2TP tunnel interfaces.

[3.2.2.1](#) L2TP Tunnel Interfaces

All Interface MIB objects not listed in the above groups for L2TP tunnel interfaces MUST be supported as described in [[RFC2863](#)].

Interface MIB Object =====	Support Description =====
ifTable.ifDescr	Refer to the Interface MIB.
ifTable.ifType	tunnel(131).
ifTable.ifMtu	Dependent on the tunnel transport layer. For UDP/IP transports the MTU should be 65467 (65535-60(IP)-8(UDP)).
ifTable.ifSpeed	Return zero.
ifTable.ifPhyAddress	The assigned tunnel identifier.
ifTable.ifAdminStatus	Setting ifAdminStatus to 'up' injects a 'Local Open' request into the tunnel FSM. Setting ifAdminStatus to 'down' injects a 'Tunnel Close' event into the tunnel FSM. Setting ifAdminStatus to 'testing' is not currently defined but could be used to test tunnel connectivity.
ifTable.ifOperStatus	The ifOperStatus values are to be interpreted as follows: 'up' - tunnel is established. 'down' - administratively down or peer unreachable. 'testing' - in some test mode. 'unknown' - status cannot be determined for some reason. 'dormant' - operational but waiting for local or remote trigger to bring up the tunnel. 'notPresent' - configuration missing. 'lowerLayerDown' - down due to state of lower-layer interface(s).
ifTable.ifInOctets	The total number of octets received on the tunnel including control and payload octets.
ifTable.ifInUcastPkts	The total number of packets received on

	the tunnel including control and payload packets.
ifTable.ifInDiscards	The total number of received packets that were discarded on both control and payload channels.
ifTable.ifInErrors	The total number of packets received in error including control and payload packets.
ifTable.ifInUnknownProtos	Return zero.
ifTable.ifOutOctets	The total number of octets transmitted from the tunnel including control and payload octets.
ifTable.ifOutUcastPkts	The total number of packets transmitted from the tunnel including control and payload packets.
ifTable.ifOutDiscards	The total number of discarded packets that were requested to be transmitted including control and payload packets.
ifTable.ifOutErrors	The total number of packets that were requested to be transmitted that were in error including control and payload packets.
ifXTable.ifName	Refer to the Interface MIB.
ifXTable.ifInMulticastPkts	Return zero.
ifXTable.ifInBroadcastPkts	Return zero.
ifXTable.ifOutMulticastPkts	Return zero.
ifXTable.ifOutBroadcastPkts	Return zero.
ifXTable.ifOutBroadcastPkts	Return zero.

ifXTable.ifLinkUpDownTrapEnable
Default set to enabled(1).

ifXTable.ifHighSpeed Return zero.

ifXTable.ifPromiscuousMode
Set to false(2).

ifXTable.ifConnectorPresent
Set to false(2).

[3.3](#) Relationship to other MIBs

[3.3.1](#) Relationship to the IP Tunnel MIB

The IP Tunnel MIB [[RFC2667](#)] describes tunnel interfaces that have an ifType of tunnel(131). The IP Tunnel MIB is considered to contain a collection of objects common to all IP tunneling protocols, including L2TP. In addition to the IP Tunnel MIB, tunnel encapsulation specific MIBs (like this MIB) extend the IP Tunnel MIB to further describe encapsulation specific information. Implementation of the IP Tunnel MIB is required for L2TP tunnels over IP.

[3.4](#) L2TP Tunnel Creation

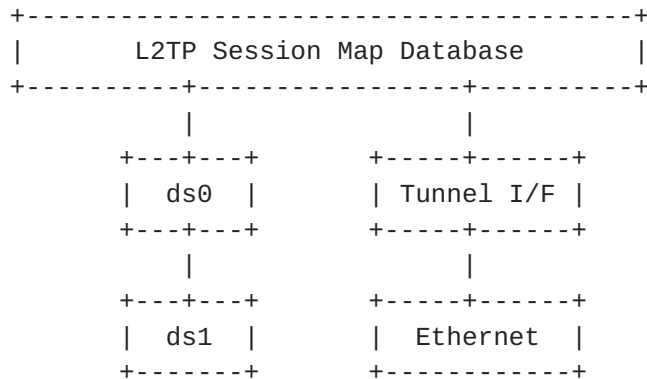
Tunnel creation is detailed for tunnels over IP in the IP Tunnel MIB. The creation of a tunnelIfEntry in [[RFC2667](#)] when the encapsulation method is "l2tp" will have the side effect of creating entries in the l2tpTunnelConfigTable, l2tpTunnelStatsTable and the l2tpUdpStatsTable's.

The creation of L2TP tunnel interfaces over transports other than IP is expected to be defined in the MIB definition for that specific L2TP tunnel transport.

[3.5](#) L2TP Session Mapping

The l2tpSessionMapTable table allows management applications to determine which session within a tunnel a particular interface (either a PPP or DS0 interface) is mapped to. On the LAC it also provides a management application the ability to map a particular physical or virtual interface terminating a PPP link to a particular L2TP tunnel. This is required since the interface stacking as performed (and instrumented by the ifStackTable) on the LNS cannot be applied at the LAC.

The following diagram illustrates the conceptual binding that occurs.



The stacking of the individual interface stacks would be described by the ifStackTable.

4. L2TPv3 MIB Object Definitions

L2TPv3-MIB DEFINITIONS ::= BEGIN

IMPORTS

MODULE-IDENTITY,
 NOTIFICATION-TYPE,
 OBJECT-TYPE,
 Counter32,
 Counter64,
 Gauge32,
 Integer32,
 Unsigned32
 FROM SNMPv2-SMI

TEXTUAL-CONVENTION,
 DisplayString,
 RowStatus,
 TruthValue
 FROM SNMPv2-TC

SnmAdminString
 FROM SNMP-FRAMEWORK-MIB

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

InterfaceIndex
 FROM IF-MIB;

l2tpv3 MODULE-IDENTITY

LAST-UPDATED "200608230000Z" -- 23 August 2006

ORGANIZATION "IETF L2TP Working Group"

CONTACT-INFO

"Layer Two Tunneling Protocol Extensions WG

Working Group Area: Internet

Working Group Name: l2tpext

General Discussion: l2tp@l2tp.net"

DESCRIPTION

"The MIB module that describes managed objects of general use by the Layer Two Tunneling Protocol, Version 3 (L2TPv3)."

--

-- Revision log

--

REVISION "200608230000Z" -- 23 August 2006

DESCRIPTION

"Editorial changes."

REVISION "200211030000Z" -- 3 November 2002

DESCRIPTION

"First revision."

::= { transmission XXX } -- To be assigned by IANA

--

-- Textual Conventions

--

L2tpv3MilliSeconds ::= TEXTUAL-CONVENTION

DISPLAY-HINT "d-3"

STATUS current

DESCRIPTION

"A period of time, measured in units of .001 seconds.

When used in conjunction with the DISPLAY-HINT, shows seconds and fractions of a second with a resolution of .001 of a second."

SYNTAX Integer32 (0..2147483646)

L2tpv3TransportType ::= TEXTUAL-CONVENTION

DISPLAY-HINT ""

STATUS current

DESCRIPTION

"Supported L2TP transport types. Different transports may define MIB extensions to the L2TP control connection table to fully describe the transport layer. Objects of this type may be used to determine which MIB extensions

to reference."

```
SYNTAX          INTEGER {
                    other(1),
                    none(2),
                    ipv4(3),
                    udpIpv4(4),
                    ipv6(5),
                    udpIpv6(6),
                    mpls(7),
                    frameRelay(8),
                    atm(9)
                }

L2tpv3PWType ::= TEXTUAL-CONVENTION
    DISPLAY-HINT  ""
    STATUS        current
    DESCRIPTION
        "Supported L2TP pseudowire types."
    SYNTAX        INTEGER {
                    frameRelay(1),
                    atmAAL5(2),
                    atmTransCell(3),
                    ethernetVLAN(4),
                    ethernet(5),
                    hdlc(6),
                    ppp(7),
                    cem(8),
                    atmVCCCell(9),
                    atmVPCCell(10)
                }

L2tpv3DataSequencing ::= TEXTUAL-CONVENTION
    DISPLAY-HINT  ""
    STATUS        current
    DESCRIPTION
        "L2TP data sequencing levels.  A value of 'none'
        indicates that no received data packets require
        sequencing.  A value of 'nonIP' indicates that only
        non-IP data packets require sequencing.  A value of
        'all' indicates that all received data packets require
        sequencing.  The appropriate sequencing level is
        communicated to the peer via the Data Sequencing AVP."
    SYNTAX        INTEGER {
                    none(0),
                    nonIP(1),
                    all(2)
                }
```

--

```
--      Definitions of significant branches
--
l2tpv3Notifications      OBJECT IDENTIFIER ::= { l2tpv3 0 }
l2tpv3Objects            OBJECT IDENTIFIER ::= { l2tpv3 1 }
l2tpv3Conformance        OBJECT IDENTIFIER ::= { l2tpv3 2 }

--
--      The L2TP Stack Configuration Group
--
--      This group of objects is used to manage configuration
--      of the L2TP stack.
--
l2tpv3StackCfg           OBJECT IDENTIFIER ::= { l2tpv3Objects 1 }

l2tpv3StackCfgAdminState OBJECT-TYPE
    SYNTAX      INTEGER {
                    enabled(1),
                    disabled(2)
                }
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        "The administrative state of the L2TP stack. Setting
        this object to 'disabled' causes all control connections
        to be immediately disconnected. After this point, no
        further control connections or session may be initiated
        or accepted. The value of this object must be
        maintained in non-volatile memory."
        ::= { l2tpv3StackCfg 1 }

l2tpv3StackCfgDrain      OBJECT-TYPE
    SYNTAX      TruthValue
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        "Setting this object to 'true' prevents any new control
        connections and/or sessions from being initiated or
        accepted. However, it does not disconnect any active
        control connections and/or sessions. The
        'l2tpv3StackStatsIsDraining' object and the
        'l2tpv3CtrlStatsIsDraining' object of each control
        connection is set to 'true'. To cancel a drain, this
        object is set to 'false'. The value of this object must
        be maintained in non-volatile memory."
        ::= { l2tpv3StackCfg 2 }

--
```

-- The L2TP Status and Statistics Group

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```
--
--      This group of objects describe the current state and
--      statistics of the L2TP stack.
--
l2tpv3StackStats          OBJECT IDENTIFIER ::= { l2tpv3Objects 2 }

l2tpv3StackStatsVersion OBJECT-TYPE
    SYNTAX      Integer32 (1..65535)
    MAX-ACCESS   read-only
    STATUS      current
    DESCRIPTION
        "The highest protocol version number supported by this
        L2TP stack."
    ::= { l2tpv3StackStats 1 }

l2tpv3StackStatsRevision OBJECT-TYPE
    SYNTAX      Integer32 (1..65535)
    MAX-ACCESS   read-only
    STATUS      current
    DESCRIPTION
        "The revision number of the L2TP stack."
    ::= { l2tpv3StackStats 2 }

l2tpv3StackStatsVendorName OBJECT-TYPE
    SYNTAX      SnmpAdminString
    MAX-ACCESS   read-only
    STATUS      current
    DESCRIPTION
        "The vendor name of the L2TP stack."
    ::= { l2tpv3StackStats 3 }

l2tpv3StackStatsAdminState OBJECT-TYPE
    SYNTAX      INTEGER {
                    enabled(1),
                    disabled(2)
                }
    MAX-ACCESS   read-only
    STATUS      current
    DESCRIPTION
        "The administrative state of the L2TP stack. It reflects
        the value of the l2tpv3StackCfgAdminState object."
    ::= { l2tpv3StackStats 4 }

l2tpv3StackStatsIsDraining OBJECT-TYPE
    SYNTAX      TruthValue
    MAX-ACCESS   read-only
    STATUS      current
```

DESCRIPTION

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```
        "Indicates whether the L2TP stack is draining sessions
        from all control connections."
 ::= { l2tpv3StackStats 5 }

l2tpv3StackStatsNumCtrlEst OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The total number of control connections that are
        currently established."
 ::= { l2tpv3StackStats 6 }

l2tpv3StackStatsNumSessEst OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The total number of sessions that are currently
        established."
 ::= { l2tpv3StackStats 7 }

--
--      The L2TP Control Connection Configuration Table
--
l2tpv3CtrlCfgTable      OBJECT-TYPE
    SYNTAX      SEQUENCE OF L2tpv3CtrlCfgEntry
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
        "Table used to (re)configure the operational
        characteristics of a single L2TP control connection.
        There is a 1:1 correspondence between conceptual rows of
        this table and conceptual rows of the
        l2tpv3CtrlStatsTable. Entries in this table have the
        same persistency characteristics as that of the
        l2tpv3CtrlStatsTable."
 ::= { l2tpv3Objects 3 }

l2tpv3CtrlCfgEntry      OBJECT-TYPE
    SYNTAX      L2tpv3CtrlCfgEntry
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
        "An L2TP control connection configuration entry. Entries
        in this table are added and deleted as a result of
        protocol interactions or management operations. The
```

latter occurs when a row is instantiated in the

l2tpv3CtrlCfgTable row and the encapsulation method is
'l2tp'."

INDEX { l2tpv3CtrlCfgIfIndex }
::= { l2tpv3CtrlCfgTable 1 }

L2tpv3CtrlCfgEntry ::=

SEQUENCE {
 l2tpv3CtrlCfgIfIndex InterfaceIndex,
 l2tpv3CtrlCfgRouterID SnmpAdminString,
 l2tpv3CtrlCfgTransport L2tpv3TransportType,
 l2tpv3CtrlCfgPWCap OCTET STRING,
 l2tpv3CtrlCfgFallback TruthValue,
 l2tpv3CtrlCfgDrain TruthValue,
 l2tpv3CtrlCfgAuth INTEGER,
 l2tpv3CtrlCfgSecret SnmpAdminString,
 l2tpv3CtrlCfgSecurity INTEGER,
 l2tpv3CtrlCfgHelloInt Integer32,
 l2tpv3CtrlCfgRWS Integer32,
 l2tpv3CtrlCfgMaxRetrans Integer32,
 l2tpv3CtrlCfgMaxRetransTO Integer32,
 l2tpv3CtrlCfgReassemblyTO L2tpv3Milliseconds,
 l2tpv3CtrlCfgIdleTO Integer32
}

l2tpv3CtrlCfgIfIndex OBJECT-TYPE
 SYNTAX InterfaceIndex
 MAX-ACCESS not-accessible
 STATUS current
 DESCRIPTION
 "Value equal to the ifIndex value of the Interfaces Group
 MIB for an interface of type L2TP."
 ::= { l2tpv3CtrlCfgEntry 1 }

l2tpv3CtrlCfgRouterID OBJECT-TYPE
 SYNTAX SnmpAdminString
 MAX-ACCESS read-write
 STATUS current
 DESCRIPTION
 "The local router ID of this peer, as communicated via
 the Router ID AVP for this control connection."
 ::= { l2tpv3CtrlCfgEntry 2 }

l2tpv3CtrlCfgTransport OBJECT-TYPE
 SYNTAX L2tpv3TransportType
 MAX-ACCESS read-write
 STATUS current
 DESCRIPTION

"The transport type of this control connection entry.

MAX-ACCESS read-write

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STATUS current

DESCRIPTION

"Describes how a pair of LCCs are to be authenticated. The value 'simple' indicates that peers are authenticated by their host name as described in the Host Name AVP. The value 'challenge' indicates that all peers are challenged to prove their identification. This object cannot be modified when the control connection is in a connecting or connected state."

DEFVAL { none }

::= { l2tpv3CtrlCfgEntry 7 }

l2tpv3CtrlCfgSecret OBJECT-TYPE

SYNTAX SnmpAdminString (SIZE (0..255))

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The shared secret used during the authentication phase of control connection establishment. This object cannot be modified when the control connection is in a connecting or connected state. This object MUST be accessible only via requests using both authentication and privacy. The agent MUST report an empty string in response to get, get-next, and get-bulk requests."

::= { l2tpv3CtrlCfgEntry 8 }

l2tpv3CtrlCfgSecurity OBJECT-TYPE

SYNTAX INTEGER {
 none(1),
 other(2),
 ipsec(3)
}

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Sets whether this control connection is to be secured. The value of 'ipsec' indicates that all control packets have IPsec headers. The types of IPsec headers (e.g. AH, ESP, etc.) and their usage are outside the scope of this document. This object cannot be modified when the control connection is in a connecting or connected state."

DEFVAL { none }

::= { l2tpv3CtrlCfgEntry 9 }

l2tpv3CtrlCfgHelloInt OBJECT-TYPE

SYNTAX Integer32 (0..3600)

UNITS

"seconds"

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MAX-ACCESS read-write
STATUS current
DESCRIPTION
 "The interval in which Hello (keepalive) packets are sent
 by a local peer. The value zero effectively disables
 the sending of Hello packets. Modifications to this
 object have immediate effect."
DEFVAL { 60 }
::= { l2tpv3CtrlCfgEntry 10 }

l2tpv3CtrlCfgRWS OBJECT-TYPE
SYNTAX Integer32 (1..65535)
MAX-ACCESS read-write
STATUS current
DESCRIPTION
 "The control packet receive window size. It specifies
 the maximum number of control packets an LCCE can send
 for the control connection without waiting for an
 acknowledgement from the peer. This object cannot be
 modified when the control connection is in a connecting
 or connected state."
DEFVAL { 4 }
::= { l2tpv3CtrlCfgEntry 11 }

l2tpv3CtrlCfgMaxRetrans OBJECT-TYPE
SYNTAX Integer32 (0..32)
MAX-ACCESS read-write
STATUS current
DESCRIPTION
 "The number of control packet retransmissions that the
 L2TP stack attempts for this control connection before
 assuming that the peer is no longer responding. A value
 of zero indicates that this peer does not attempt to
 retransmit an unacknowledged control packet.
 Modifications to this object have immediate effect."
DEFVAL { 5 }
::= { l2tpv3CtrlCfgEntry 12 }

l2tpv3CtrlCfgMaxRetransTO OBJECT-TYPE
SYNTAX Integer32 (1..32)
UNITS "seconds"
MAX-ACCESS read-write
STATUS current
DESCRIPTION
 "The maximum retransmission timeout interval that the
 control connection waits before retransmitting an
 unacknowledged control packet. Modifications to this

object have immediate effect."

```
DEFVAL { 16 }
::= { l2tpv3CtrlCfgEntry 13 }
```

```
l2tpv3CtrlCfgReassemblyTO OBJECT-TYPE
```

```
SYNTAX          L2tpv3MilliSeconds
```

```
MAX-ACCESS      read-write
```

```
STATUS          current
```

```
DESCRIPTION
```

"The number of milliseconds that this control connection waits before processing data packets that were received out of sequence (and that are being held for processing in sequence). A low value increases the chance of delayed packets being discarded, while a high value may cause more queueing and possibly degrade throughput if packets are truly lost. The default value for this object is zero, which means that delayed packets are considered lost, and received packets are processed in increasing order, despite any sequence number gaps."

```
DEFVAL { 0 }
::= { l2tpv3CtrlCfgEntry 14 }
```

```
l2tpv3CtrlCfgIdleTO      OBJECT-TYPE
```

```
SYNTAX          Integer32 (-1..86400)
```

```
UNITS           "seconds"
```

```
MAX-ACCESS      read-write
```

```
STATUS          current
```

```
DESCRIPTION
```

"The period of time that an established control connection with no sessions waits before disconnecting the control connection. A value of zero indicates that the control connection disconnects immediately after the last session disconnects. A value of -1 leaves the control connection up indefinitely. Modifications to this object have immediate effect."

```
DEFVAL { 0 }
::= { l2tpv3CtrlCfgEntry 15 }
```

```
--
```

```
--      The L2TP Control Connection Status and Statistics Table
```

```
--
```

```
l2tpv3CtrlStatsTable     OBJECT-TYPE
```

```
SYNTAX          SEQUENCE OF L2tpv3CtrlStatsEntry
```

```
MAX-ACCESS      not-accessible
```

```
STATUS          current
```

```
DESCRIPTION
```

"Table describing the current status and statistics of a single L2TP control connection. There is a 1:1

correspondence between conceptual rows of this table and

conceptual rows of the l2tpv3CtrlCfgTable."
 ::= { l2tpv3Objects 4 }

l2tpv3CtrlStatsEntry OBJECT-TYPE
 SYNTAX L2tpv3CtrlStatsEntry
 MAX-ACCESS not-accessible
 STATUS current
 DESCRIPTION
 "An L2TP control connection interface statistics entry."
 AUGMENTS { l2tpv3CtrlCfgEntry }
 ::= { l2tpv3CtrlStatsTable 1 }

L2tpv3CtrlStatsEntry ::=

SEQUENCE {	
l2tpv3CtrlStatsLocalID	Unsigned32,
l2tpv3CtrlStatsRemoteID	Unsigned32,
l2tpv3CtrlStatsRemoteRouterID	SnmpAdminString,
l2tpv3CtrlStatsState	INTEGER,
l2tpv3CtrlStatsIsDraining	TruthValue,
l2tpv3CtrlStatsInitiated	INTEGER,
l2tpv3CtrlStatsRemoteHostName	SnmpAdminString,
l2tpv3CtrlStatsRemoteVendorName	SnmpAdminString,
l2tpv3CtrlStatsRemoteVersion	OCTET STRING,
l2tpv3CtrlStatsRemotePWCap	OCTET STRING,
l2tpv3CtrlStatsInitialRemoteRWS	Integer32,
l2tpv3CtrlStatsCtrlRxZLB	Counter32,
l2tpv3CtrlStatsCtrlOutOfSeq	Counter32,
l2tpv3CtrlStatsCtrlOutOfWindow	Counter32,
l2tpv3CtrlStatsCtrlTxZLB	Counter32,
l2tpv3CtrlStatsCtrlAckTO	Counter32,
l2tpv3CtrlStatsCurrentRemoteRWS	Gauge32,
l2tpv3CtrlStatsTxSeq	Integer32,
l2tpv3CtrlStatsRxSeq	Integer32,
l2tpv3CtrlStatsNumSessCumEst	Counter32,
l2tpv3CtrlStatsNumSessCurrentEst	Gauge32,
l2tpv3CtrlStatsNumSessFailed	Counter32,
l2tpv3CtrlStatsLastResultCode	Integer32,
l2tpv3CtrlStatsLastErrorCode	Integer32,
l2tpv3CtrlStatsLastErrorMessage	SnmpAdminString,
l2tpv3CtrlStatsCtrlRxOctets	Counter32,
l2tpv3CtrlStatsCtrlRxPkts	Counter32,
l2tpv3CtrlStatsCtrlTxOctets	Counter32,
l2tpv3CtrlStatsCtrlTxPkts	Counter32,
l2tpv3CtrlStatsDataRxOctets	Counter32,
l2tpv3CtrlStatsDataRxPkts	Counter32,
l2tpv3CtrlStatsDataRxDrops	Counter32,
l2tpv3CtrlStatsDataTxOctets	Counter32,

l2tpv3CtrlStatsDataTxPkts

Counter32,

```
        l2tpv3CtrlStatsCtrlHCRxOctets      Counter64,  
        l2tpv3CtrlStatsCtrlHCRxPkts       Counter64,  
        l2tpv3CtrlStatsCtrlHCTxOctets      Counter64,  
        l2tpv3CtrlStatsCtrlHCTxPkts       Counter64,  
        l2tpv3CtrlStatsDataHCRxOctets      Counter64,  
        l2tpv3CtrlStatsDataHCRxPkts       Counter64,  
        l2tpv3CtrlStatsDataHCRxDrops      Counter64,  
        l2tpv3CtrlStatsDataHCTxOctets      Counter64,  
        l2tpv3CtrlStatsDataHCTxPkts       Counter64  
    }  
}
```

```
l2tpv3CtrlStatsLocalID OBJECT-TYPE  
    SYNTAX      Unsigned32  
    MAX-ACCESS  read-only  
    STATUS      current  
    DESCRIPTION  
        "The local control connection ID."  
    ::= { l2tpv3CtrlStatsEntry 1 }
```

```
l2tpv3CtrlStatsRemoteID OBJECT-TYPE  
    SYNTAX      Unsigned32  
    MAX-ACCESS  read-only  
    STATUS      current  
    DESCRIPTION  
        "The remote control connection ID."  
    ::= { l2tpv3CtrlStatsEntry 2 }
```

```
l2tpv3CtrlStatsRemoteRouterID OBJECT-TYPE  
    SYNTAX      SnmpAdminString  
    MAX-ACCESS  read-only  
    STATUS      current  
    DESCRIPTION  
        "The remote router ID for this control connection, as  
        communicated by the peer via the Router ID AVP."  
    ::= { l2tpv3CtrlStatsEntry 3 }
```

```
l2tpv3CtrlStatsState OBJECT-TYPE  
    SYNTAX      INTEGER {  
        ctrlIdle(1),  
        ctrlConnecting(2),  
        ctrlEstablished(3),  
        ctrlDisconnecting(4)  
    }  
    MAX-ACCESS  read-only  
    STATUS      current  
    DESCRIPTION  
        "The current state of the control connection."
```

::= { l2tpv3CtrlStatsEntry 4 }

l2tpv3CtrlStatsIsDraining OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates whether the control connection is draining sessions. This object is set to 'true' if either 'l2tpv3StackCfgDrain' or 'l2tpv3CtrlCfgDrain' is set to 'true', and is only set to 'false' if both configuration objects are 'false'."

::= { l2tpv3CtrlStatsEntry 5 }

l2tpv3CtrlStatsInitiated OBJECT-TYPESYNTAX INTEGER {
 locally(1),
 remotely(2)
}

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates whether the control connection was initiated locally or remotely."

::= { l2tpv3CtrlStatsEntry 6 }

l2tpv3CtrlStatsRemoteHostName OBJECT-TYPE

SYNTAX SnmpAdminString

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The peer's host name as discovered during the control connection establishment (via the Host Name AVP). If the control connection is idle, this object should maintain its value from the last time it was connected."

::= { l2tpv3CtrlStatsEntry 7 }

l2tpv3CtrlStatsRemoteVendorName OBJECT-TYPE

SYNTAX SnmpAdminString

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The vendor name of the peer. If the control connection is idle, this object should maintain its value from the last time it was connected."

::= { l2tpv3CtrlStatsEntry 8 }

l2tpv3CtrlStatsRemotePwCap OBJECT-TYPE

SYNTAX

OCTET STRING (SIZE(1..256))

MAX-ACCESS read-write
STATUS current
DESCRIPTION
 "The peer's pseudowire capabilities for this control
 connection. Each octet must be a value within the range
 specified by the L2tpv3PWType textual convention."
::= { l2tpv3CtrlStatsEntry 9 }

l2tpv3CtrlStatsRemoteVersion OBJECT-TYPE

SYNTAX OCTET STRING (SIZE(2))
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "The peer implementation's protocol version number and
 revision number. The first octet contains the protocol
 version number. The second octet contains the protocol
 revision number."
::= { l2tpv3CtrlStatsEntry 10 }

l2tpv3CtrlStatsInitialRemoteRWS OBJECT-TYPE

SYNTAX Integer32 (0..65535)
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "The peer's receive window size as conveyed during
 control connection establishment (via the Remote Window
 Size AVP). If the control connection is idle, this
 object should maintain its value from the last time it
 was connected."
::= { l2tpv3CtrlStatsEntry 11 }

l2tpv3CtrlStatsCtrlRxZLB OBJECT-TYPE

SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "The number of Zero-Length-Body (acknowledgement) control
 packets that have been received on the control
 connection."
::= { l2tpv3CtrlStatsEntry 12 }

l2tpv3CtrlStatsCtrlOutOfSeq OBJECT-TYPE

SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "The number of control packets that have been received

out of order (per the sequence numbers) on this control

connection, including out of window packets."
 ::= { l2tpv3CtrlStatsEntry 13 }

l2tpv3CtrlStatsCtrlOutOfWindow OBJECT-TYPE

SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "The number of control packets that have been received
 outside of the offered receive window for the control
 connection. Whether these packets are queued or
 discarded is implementation-specific."
 ::= { l2tpv3CtrlStatsEntry 14 }

l2tpv3CtrlStatsCtrlTxZLB OBJECT-TYPE

SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "The number of Zero-Length-Body (acknowledgement) control
 packets that have been sent to the peer for this control
 connection."
 ::= { l2tpv3CtrlStatsEntry 15 }

l2tpv3CtrlStatsCtrlAckT0 OBJECT-TYPE

SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "The number of control packet timeouts due to late
 acknowledgements from the peer for this control
 connection."
 ::= { l2tpv3CtrlStatsEntry 16 }

l2tpv3CtrlStatsCurrentRemoteRWS OBJECT-TYPE

SYNTAX Gauge32 (0..65535)
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "The current remote receive window size as determined by
 the local flow control mechanism employed."
 ::= { l2tpv3CtrlStatsEntry 17 }

l2tpv3CtrlStatsTxSeq OBJECT-TYPE

SYNTAX Integer32 (0..65535)
MAX-ACCESS read-only
STATUS current

DESCRIPTION

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```
        "The next send (Ns) sequence number for the control
        connection."
 ::= { l2tpv3CtrlStatsEntry 18 }

l2tpv3CtrlStatsRxSeq      OBJECT-TYPE
    SYNTAX                Integer32 (0..65535)
    MAX-ACCESS             read-only
    STATUS                 current
    DESCRIPTION
        "The next receive (Nr) sequence number for the control
        connection."
 ::= { l2tpv3CtrlStatsEntry 19 }

l2tpv3CtrlStatsNumSessCumEst OBJECT-TYPE
    SYNTAX                Counter32
    MAX-ACCESS             read-only
    STATUS                 current
    DESCRIPTION
        "The cumulative number of sessions that this control
        connection has established during its lifetime."
 ::= { l2tpv3CtrlStatsEntry 20 }

l2tpv3CtrlStatsNumSessCurrentEst OBJECT-TYPE
    SYNTAX                Gauge32
    MAX-ACCESS             read-only
    STATUS                 current
    DESCRIPTION
        "The number of sessions currently in the established
        state for this control connection."
 ::= { l2tpv3CtrlStatsEntry 21 }

l2tpv3CtrlStatsNumSessFailed OBJECT-TYPE
    SYNTAX                Counter32
    MAX-ACCESS             read-only
    STATUS                 current
    DESCRIPTION
        "The total number of sessions that were negotiated but
        failed to be established by this control connection."
 ::= { l2tpv3CtrlStatsEntry 22 }

l2tpv3CtrlStatsLastResultCode OBJECT-TYPE
    SYNTAX                Integer32 (0..65535)
    MAX-ACCESS             read-only
    STATUS                 current
    DESCRIPTION
        "The result code as conveyed by the Result Code AVP from
        the most recent session to be torn down."
```

::= { l2tpv3CtrlStatsEntry 23 }

l2tpv3CtrlStatsLastErrorCode OBJECT-TYPE

SYNTAX Integer32 (0..65535)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The error code as conveyed by the Result Code AVP from the most recent session to be torn down."

::= { l2tpv3CtrlStatsEntry 24 }

l2tpv3CtrlStatsLastErrorMessage OBJECT-TYPE

SYNTAX SnmpAdminString

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The optional message as conveyed by the Result Code AVP from the most recent session to be torn down."

::= { l2tpv3CtrlStatsEntry 25 }

l2tpv3CtrlStatsCtrlRxOctets OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of control octets that have been received by this control connection."

::= { l2tpv3CtrlStatsEntry 26 }

l2tpv3CtrlStatsCtrlRxPkts OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of control packets that have been received by this control connection."

::= { l2tpv3CtrlStatsEntry 27 }

l2tpv3CtrlStatsCtrlTxOctets OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of control octets that have been sent by this control connection."

::= { l2tpv3CtrlStatsEntry 28 }

l2tpv3CtrlStatsCtrlTxPkts OBJECT-TYPE

SYNTAX

Counter32

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MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "The number of control packets that have been sent by
 this control connection."
::= { l2tpv3CtrlStatsEntry 29 }

l2tpv3CtrlStatsDataRxOctets OBJECT-TYPE

SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "The number of data octets that have been received by
 sessions negotiated by this control connection."
::= { l2tpv3CtrlStatsEntry 30 }

l2tpv3CtrlStatsDataRxPkts OBJECT-TYPE

SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "The number of data packets that have been received by
 sessions negotiated by this control connection."
::= { l2tpv3CtrlStatsEntry 31 }

l2tpv3CtrlStatsDataRxDrops OBJECT-TYPE

SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "The number of received data packets that have been
 dropped by sessions negotiated by this control
 connection."
::= { l2tpv3CtrlStatsEntry 32 }

l2tpv3CtrlStatsDataTxOctets OBJECT-TYPE

SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "The number of data octets that have been sent by
 sessions negotiated by this control connection."
::= { l2tpv3CtrlStatsEntry 33 }

l2tpv3CtrlStatsDataTxPkts OBJECT-TYPE

SYNTAX Counter32
MAX-ACCESS read-only

STATUS

current

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DESCRIPTION

"The number of data packets that have been sent by sessions negotiated by this control connection."

::= { l2tpv3CtrlStatsEntry 34 }

--

-- High-capacity counter objects. These objects are all 64-bit

-- versions of the above 32-bit counters. They have the same

-- basic semantics as their 32-bit counterparts.

--

l2tpv3CtrlStatsCtrlHCRxOctets OBJECT-TYPE

SYNTAX Counter64

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The 64-bit version of l2tpv3CtrlStatsCtrlRxOctets."

::= { l2tpv3CtrlStatsEntry 35 }

l2tpv3CtrlStatsCtrlHCRxPkts OBJECT-TYPE

SYNTAX Counter64

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The 64-bit version of l2tpv3CtrlStatsCtrlRxPkts."

::= { l2tpv3CtrlStatsEntry 36 }

l2tpv3CtrlStatsCtrlHCTxOctets OBJECT-TYPE

SYNTAX Counter64

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The 64-bit version of l2tpv3CtrlStatsCtrlTxOctets."

::= { l2tpv3CtrlStatsEntry 37 }

l2tpv3CtrlStatsCtrlHCTxPkts OBJECT-TYPE

SYNTAX Counter64

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The 64-bit version of l2tpv3CtrlStatsCtrlTxPkts."

::= { l2tpv3CtrlStatsEntry 38 }

l2tpv3CtrlStatsDataHCRxOctets OBJECT-TYPE

SYNTAX Counter64

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The 64-bit version of l2tpv3CtrlStatsDataRxOctets."

```
 ::= { l2tpv3CtrlStatsEntry 39 }

l2tpv3CtrlStatsDataHCRxPkts OBJECT-TYPE
    SYNTAX          Counter64
    MAX-ACCESS      read-only
    STATUS          current
    DESCRIPTION
        "The 64-bit version of l2tpv3CtrlStatsDataRxPkts."
    ::= { l2tpv3CtrlStatsEntry 40 }

l2tpv3CtrlStatsDataHCRxDrops OBJECT-TYPE
    SYNTAX          Counter64
    MAX-ACCESS      read-only
    STATUS          current
    DESCRIPTION
        "The 64-bit version of l2tpv3CtrlStatsDataRxDrops."
    ::= { l2tpv3CtrlStatsEntry 41 }

l2tpv3CtrlStatsDataHCTxOctets OBJECT-TYPE
    SYNTAX          Counter64
    MAX-ACCESS      read-only
    STATUS          current
    DESCRIPTION
        "The 64-bit version of l2tpv3CtrlStatsDataTxOctets."
    ::= { l2tpv3CtrlStatsEntry 42 }

l2tpv3CtrlStatsDataHCTxPkts OBJECT-TYPE
    SYNTAX          Counter64
    MAX-ACCESS      read-only
    STATUS          current
    DESCRIPTION
        "The 64-bit version of l2tpv3CtrlStatsDataTxPkts."
    ::= { l2tpv3CtrlStatsEntry 43 }

--
--      The L2TP Control Connection Mapping Table
--
l2tpv3CtrlMapTable      OBJECT-TYPE
    SYNTAX          SEQUENCE OF L2tpv3CtrlMapEntry
    MAX-ACCESS      not-accessible
    STATUS          current
    DESCRIPTION
        "Table intended to assist management applications to
         quickly determine the ifIndex value for a given local
         control connection ID."
    ::= { l2tpv3Objects 5 }
```

l2tpv3CtrlMapEntry

OBJECT-TYPE

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SYNTAX L2tpv3CtrlMapEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
 "An L2TP control connection index map entry."
INDEX { l2tpv3CtrlMapLocalID }
::= { l2tpv3CtrlMapTable 1 }

L2tpv3CtrlMapEntry ::=

SEQUENCE {	
l2tpv3CtrlMapLocalID	Unsigned32,
l2tpv3CtrlMapIfIndex	InterfaceIndex
}	

l2tpv3CtrlMapLocalID OBJECT-TYPE
SYNTAX Unsigned32
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
 "The local control connection ID."
::= { l2tpv3CtrlMapEntry 1 }

l2tpv3CtrlMapIfIndex OBJECT-TYPE
SYNTAX InterfaceIndex
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "The ifIndex value of a control connection interface,
 represented in the Interfaces Group MIB as an entry with
 an interface type of L2TP."
::= { l2tpv3CtrlMapEntry 2 }

--
-- The L2TP Session Configuration Table
--

l2tpv3SessionCfgTable OBJECT-TYPE
SYNTAX SEQUENCE OF L2tpv3SessionCfgEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
 "Table used to (re)configure the operational
 characteristics of a single L2TP session. There is a
 1:1 correspondence between conceptual rows of this table
 and conceptual rows of the l2tpv3SessionStatsTable.
 Entries in this table have the same persistency
 characteristics as that of the l2tpv3SessionStatsTable."
::= { l2tpv3Objects 6 }

l2tpv3SessionCfgEntry OBJECT-TYPE
SYNTAX L2tpv3SessionCfgEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
 "An L2TP session configuration entry. Entries in this
 table are added and deleted as a result of protocol
 interactions or management operations."
INDEX { l2tpv3SessionCfgIfIndex }
::= { l2tpv3SessionCfgTable 1 }

L2tpv3SessionCfgEntry ::=

SEQUENCE {	
l2tpv3SessionCfgIfIndex	InterfaceIndex,
l2tpv3SessionCfgLocalID	Unsigned32,
l2tpv3SessionCfgRemoteID	Unsigned32,
l2tpv3SessionCfgCtrlLocalID	Unsigned32,
l2tpv3SessionCfgPWType	L2tpv3PWType,
l2tpv3SessionCfgEndID	DisplayString,
l2tpv3SessionCfgAppID	DisplayString,
l2tpv3SessionCfgPWEncap	INTEGER,
l2tpv3SessionCfgSeq	L2tpv3DataSequencing,
l2tpv3SessionCfgLocalCookie	DisplayString,
l2tpv3SessionCfgRemoteCookie	DisplayString,
l2tpv3SessionCfgCallType	INTEGER
}	

l2tpv3SessionCfgIfIndex OBJECT-TYPE
SYNTAX InterfaceIndex
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
 "The ifIndex value of the interface from which L2 frames
 are being forwarded. For example, the ifIndex could be
 a DS0 on an LAC or a virtual PPP interface on an LNS."
::= { l2tpv3SessionCfgEntry 1 }

l2tpv3SessionCfgLocalID OBJECT-TYPE
SYNTAX Unsigned32
MAX-ACCESS read-create
STATUS current
DESCRIPTION
 "Sets the local session ID."
::= { l2tpv3SessionCfgEntry 2 }

l2tpv3SessionCfgRemoteID OBJECT-TYPE
SYNTAX Unsigned32

MAX-ACCESS

read-create

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STATUS current
DESCRIPTION
"Sets the remote session ID."
::= { l2tpv3SessionCfgEntry 3 }

l2tpv3SessionCfgCtrlLocalID OBJECT-TYPE

SYNTAX Unsigned32
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"Sets the local control connection ID of the control
connection with which this session may be associated.
If the session is not associated with a control
connection, the value of this object is 0."
::= { l2tpv3SessionCfgEntry 4 }

l2tpv3SessionCfgPWType OBJECT-TYPE

SYNTAX L2tpv3PWType
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"Sets the pseudowire type of the session, which is sent
to the peer via the Pseudowire Type AVP."
::= { l2tpv3SessionCfgEntry 5 }

l2tpv3SessionCfgEndID OBJECT-TYPE

SYNTAX DisplayString (SIZE(0..255))
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"Sets the End Identifier that is sent to the peer via the
End ID AVP."
::= { l2tpv3SessionCfgEntry 6 }

l2tpv3SessionCfgAppID OBJECT-TYPE

SYNTAX DisplayString (SIZE(0..255))
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"Sets the Application Code and Application Info that are
sent to the peer via the Application ID AVP."
::= { l2tpv3SessionCfgEntry 7 }

l2tpv3SessionCfgPWEncap OBJECT-TYPE

SYNTAX INTEGER {
none(0),
default(1)

}

MAX-ACCESS read-create
STATUS current
DESCRIPTION
 "Sets the Control Encapsulation Type that is sent to the
 peer via the Pseudowire Control Encapsulation AVP."
DEFVAL { none }
::= { l2tpv3SessionCfgEntry 8 }

l2tpv3SessionCfgSeq OBJECT-TYPE
SYNTAX L2tpv3DataSequencing
MAX-ACCESS read-create
STATUS current
DESCRIPTION
 "Sets the Data Sequencing Level that is required of the
 peer. Sent to the peer via the Data Sequencing AVP."
DEFVAL { none }
::= { l2tpv3SessionCfgEntry 9 }

l2tpv3SessionCfgLocalCookie OBJECT-TYPE
SYNTAX DisplayString (SIZE(0..8))
MAX-ACCESS read-create
STATUS current
DESCRIPTION
 "Sets the local cookie that is included in outgoing data
 packets."
::= { l2tpv3SessionCfgEntry 10 }

l2tpv3SessionCfgRemoteCookie OBJECT-TYPE
SYNTAX DisplayString (SIZE(0..8))
MAX-ACCESS read-create
STATUS current
DESCRIPTION
 "Sets the remote cookie that is expected in incoming data
 packets."
::= { l2tpv3SessionCfgEntry 11 }

l2tpv3SessionCfgCallType OBJECT-TYPE
SYNTAX INTEGER {
 lacInitiator(1),
 lacResponder(2),
 lnsInitiator(3),
 lnsResponder(4)
}
MAX-ACCESS read-create
STATUS current
DESCRIPTION
 "The role this LCCE is playing for this session. For

example, 'lacInitiator' indicates that this control

```
        connection peer is acting as an LAC and generated an
        call request (ICRQ or OCRQ) to its peer."
 ::= { l2tpv3SessionCfgEntry 12 }

--
--      The L2TP Session Status and Statistics Table
--
l2tpv3SessionStatsTable OBJECT-TYPE
    SYNTAX          SEQUENCE OF L2tpv3SessionStatsEntry
    MAX-ACCESS      not-accessible
    STATUS          current
    DESCRIPTION
        "Table that describes the current status and statistics
        of a single L2TP session."
    ::= { l2tpv3Objects 7 }

l2tpv3SessionStatsEntry OBJECT-TYPE
    SYNTAX          L2tpv3SessionStatsEntry
    MAX-ACCESS      not-accessible
    STATUS          current
    DESCRIPTION
        "An L2TP session interface statistics entry."
    AUGMENTS { l2tpv3SessionCfgEntry }
    ::= { l2tpv3SessionStatsTable 1 }

L2tpv3SessionStatsEntry ::=
    SEQUENCE {
        l2tpv3SessionStatsRemoteEndID      DisplayString,
        l2tpv3SessionStatsRemoteAppID      DisplayString,
        l2tpv3SessionStatsRemotePWEncap    INTEGER,
        l2tpv3SessionStatsRemoteSeq        L2tpv3DataSequencing,
        l2tpv3SessionStatsState             INTEGER,
        l2tpv3SessionStatsCircuitStatus     Unsigned32,
        l2tpv3SessionStatsSerialNumber      Unsigned32,
        l2tpv3SessionStatsRxConnectSpeed    Unsigned32,
        l2tpv3SessionStatsTxConnectSpeed    Unsigned32,
        l2tpv3SessionStatsPhysChannelID     Unsigned32,
        l2tpv3SessionStatsPrivateGroupID    SnmpAdminString,
        l2tpv3SessionStatsOutOfSeq          Counter32,
        l2tpv3SessionStatsReassemblyTO      Counter32,
        l2tpv3SessionStatsTxSeq             Counter32,
        l2tpv3SessionStatsRxSeq             Counter32,
        l2tpv3SessionStatsRxOctets          Counter32,
        l2tpv3SessionStatsRxPkts            Counter32,
        l2tpv3SessionStatsRxDrops           Counter32,
        l2tpv3SessionStatsTxOctets          Counter32,
        l2tpv3SessionStatsTxPkts            Counter32,
```

l2tpv3SessionStatsHCRxOctets

Counter64,

```
        l2tpv3SessionStatsHCRxPkts          Counter64,  
        l2tpv3SessionStatsHCRxDrops         Counter64,  
        l2tpv3SessionStatsHCTxOctets        Counter64,  
        l2tpv3SessionStatsHCTxPkts          Counter64  
    }
```

l2tpv3SessionStatsRemoteEndID OBJECT-TYPE

```
SYNTAX          DisplayString (SIZE(0..255))  
MAX-ACCESS      read-only  
STATUS          current  
DESCRIPTION  
    "The peer's End Identifier, as communicated via the End  
    ID AVP."  
 ::= { l2tpv3SessionStatsEntry 1 }
```

l2tpv3SessionStatsRemoteAppID OBJECT-TYPE

```
SYNTAX          DisplayString (SIZE(0..255))  
MAX-ACCESS      read-only  
STATUS          current  
DESCRIPTION  
    "The peer's Application Code and Application Info, as  
    communicated via the Application ID AVP."  
 ::= { l2tpv3SessionStatsEntry 2 }
```

l2tpv3SessionStatsRemotePWEncap OBJECT-TYPE

```
SYNTAX          INTEGER {  
                    none(0),  
                    default(1)  
                }  
MAX-ACCESS      read-only  
STATUS          current  
DESCRIPTION  
    "The peer's Control Encapsulation Type, as communicated  
    via the Pseudowire Control Encapsulation AVP."  
 ::= { l2tpv3SessionStatsEntry 3 }
```

l2tpv3SessionStatsRemoteSeq OBJECT-TYPE

```
SYNTAX          L2tpv3DataSequencing  
MAX-ACCESS      read-create  
STATUS          current  
DESCRIPTION  
    "The peer's Data Sequencing Level, as communicated via  
    the Data Sequencing AVP."  
DEFVAL { none }  
 ::= { l2tpv3SessionStatsEntry 4 }
```

l2tpv3SessionStatsState OBJECT-TYPE

SYNTAX

INTEGER {

```
        sessionIdle(1),
        sessionConnecting(2),
        sessionEstablished(3),
        sessionDisconnecting(4)
    }
MAX-ACCESS      read-only
STATUS          current
DESCRIPTION
    "The current state of the session."
 ::= { l2tpv3SessionStatsEntry 5 }
```

l2tpv3SessionStatsCircuitStatus OBJECT-TYPE

```
SYNTAX          Unsigned32
MAX-ACCESS      read-only
STATUS          current
DESCRIPTION
    "The current status of the circuit forwarded by the
    session."
 ::= { l2tpv3SessionStatsEntry 6 }
```

l2tpv3SessionStatsSerialNumber OBJECT-TYPE

```
SYNTAX          Unsigned32
MAX-ACCESS      read-only
STATUS          current
DESCRIPTION
    "The serial number that has been assigned to this
    session."
 ::= { l2tpv3SessionStatsEntry 7 }
```

l2tpv3SessionStatsRxConnectSpeed OBJECT-TYPE

```
SYNTAX          Unsigned32
UNITS           "bits per second"
MAX-ACCESS      read-only
STATUS          current
DESCRIPTION
    "The last known receive baud rate for this session."
 ::= { l2tpv3SessionStatsEntry 8 }
```

l2tpv3SessionStatsTxConnectSpeed OBJECT-TYPE

```
SYNTAX          Unsigned32
UNITS           "bits per second"
MAX-ACCESS      read-only
STATUS          current
DESCRIPTION
    "The last known transmit baud rate for this session."
 ::= { l2tpv3SessionStatsEntry 9 }
```

l2tpv3SessionStatsPhysChannelID OBJECT-TYPE

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SYNTAX Unsigned32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "The physical channel identifier for the session."
 ::= { l2tpv3SessionStatsEntry 10 }

l2tpv3SessionStatsPrivateGroupID OBJECT-TYPE

SYNTAX SnmpAdminString
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "The private group ID used for this L2TP session. If no
 private group ID is found, then a null string is
 returned."
 ::= { l2tpv3SessionStatsEntry 11 }

l2tpv3SessionStatsOutOfSeq OBJECT-TYPE

SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "The total number of data packets received out of
 sequence for this session."
 ::= { l2tpv3SessionStatsEntry 12 }

l2tpv3SessionStatsReassemblyTO OBJECT-TYPE

SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "The number of reassembly timeouts that have occurred for
 this session."
 ::= { l2tpv3SessionStatsEntry 13 }

l2tpv3SessionStatsTxSeq OBJECT-TYPE

SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "The current sequence number for outgoing data packets
 for this session."
 ::= { l2tpv3SessionStatsEntry 14 }

l2tpv3SessionStatsRxSeq OBJECT-TYPE

SYNTAX Counter32
MAX-ACCESS read-only

STATUS

current

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DESCRIPTION

"The current sequence number for incoming data packets for this session."

::= { l2tpv3SessionStatsEntry 15 }

l2tpv3SessionStatsRxOctets OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of data octets that have been received by this session."

::= { l2tpv3SessionStatsEntry 16 }

l2tpv3SessionStatsRxPkts OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of data packets that have been received by this session."

::= { l2tpv3SessionStatsEntry 17 }

l2tpv3SessionStatsRxDrops OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of received data packets that have been dropped by this session."

::= { l2tpv3SessionStatsEntry 18 }

l2tpv3SessionStatsTxOctets OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of data octets that have been sent by this session."

::= { l2tpv3SessionStatsEntry 19 }

l2tpv3SessionStatsTxPkts OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of data packets that have been sent by this

session."

```
 ::= { l2tpv3SessionStatsEntry 20 }

l2tpv3SessionStatsHCRxOctets OBJECT-TYPE
    SYNTAX          Counter64
    MAX-ACCESS      read-only
    STATUS          current
    DESCRIPTION
        "The 64-bit version of l2tpv3SessionStatsRxOctets."
    ::= { l2tpv3SessionStatsEntry 21 }

l2tpv3SessionStatsHCRxPkts OBJECT-TYPE
    SYNTAX          Counter64
    MAX-ACCESS      read-only
    STATUS          current
    DESCRIPTION
        "The 64-bit version of l2tpv3SessionStatsRxPkts."
    ::= { l2tpv3SessionStatsEntry 22 }

l2tpv3SessionStatsHCRxDrops OBJECT-TYPE
    SYNTAX          Counter64
    MAX-ACCESS      read-only
    STATUS          current
    DESCRIPTION
        "The 64-bit version of l2tpv3SessionStatsRxDrops."
    ::= { l2tpv3SessionStatsEntry 23 }

l2tpv3SessionStatsHCTxOctets OBJECT-TYPE
    SYNTAX          Counter64
    MAX-ACCESS      read-only
    STATUS          current
    DESCRIPTION
        "The 64-bit version of l2tpv3SessionStatsTxOctets."
    ::= { l2tpv3SessionStatsEntry 24 }

l2tpv3SessionStatsHCTxPkts OBJECT-TYPE
    SYNTAX          Counter64
    MAX-ACCESS      read-only
    STATUS          current
    DESCRIPTION
        "The 64-bit version of l2tpv3SessionStatsTxPkts."
    ::= { l2tpv3SessionStatsEntry 25 }

--
--      The L2TP Session Mapping Table
--
l2tpv3SessionMapTable OBJECT-TYPE
    SYNTAX          SEQUENCE OF L2tpv3SessionMapEntry
```

MAX-ACCESS not-accessible

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STATUS current
DESCRIPTION
"Table intended to assist management applications to map
interfaces to control connection and session IDs."
::= { l2tpv3Objects 8 }

l2tpv3SessionMapEntry OBJECT-TYPE
SYNTAX L2tpv3SessionMapEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"An L2TP session index map entry."
INDEX { l2tpv3SessionMapIfIndex }
::= { l2tpv3SessionMapTable 1 }

L2tpv3SessionMapEntry ::=

SEQUENCE {
 l2tpv3SessionMapIfIndex InterfaceIndex,
 l2tpv3SessionMapCtrlIfIndex InterfaceIndex,
 l2tpv3SessionMapLocalID Unsigned32,
 l2tpv3SessionMapStatus RowStatus
}

l2tpv3SessionMapIfIndex OBJECT-TYPE
SYNTAX InterfaceIndex
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The ifIndex value of the interface being forwarded via
an L2TP session. For example, the interface could be an
Ethernet interface on an LAC or a virtual PPP interface
on the LNS."
::= { l2tpv3SessionMapEntry 1 }

l2tpv3SessionMapCtrlIfIndex OBJECT-TYPE
SYNTAX InterfaceIndex
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"The ifIndex value of the session's control connection.
The object establishes a binding between a particular
interface identified by l2tpv3SessionMapIfIndex to a
particular control connection."
::= { l2tpv3SessionMapEntry 2 }

l2tpv3SessionMapLocalID OBJECT-TYPE
SYNTAX Unsigned32

MAX-ACCESS read-only

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```

        STATUS          current
        DESCRIPTION
            "The local session ID for this session."
        ::= { l2tpv3SessionMapEntry 3 }

l2tpv3SessionMapStatus OBJECT-TYPE
    SYNTAX               RowStatus
    MAX-ACCESS            read-create
    STATUS                current
    DESCRIPTION
        "The status of this session map entry."
    ::= { l2tpv3SessionMapEntry 4 }

--
--      Definition of generic L2TP notifications
--
l2tpv3CtrlAuthFailure  NOTIFICATION-TYPE
    OBJECTS {
        l2tpv3CtrlStatsInitiated,
        l2tpv3CtrlStatsRemoteHostName
    }
    STATUS                current
    DESCRIPTION
        "Trap signifying that an attempt to establish a control
        connection to a remote peer has failed authentication."
    ::= { l2tpv3Notifications 1 }

--
--      Conformance information
--
l2tpv3Groups           OBJECT IDENTIFIER ::= { l2tpv3Conformance 1 }
l2tpv3Compliances      OBJECT IDENTIFIER ::= { l2tpv3Conformance 2 }

--
--      Compliance statements
--
l2tpv3MIBFullCompliance MODULE-COMPLIANCE
    STATUS                current
    DESCRIPTION
        "An implementation claims full compliance when this MIB
        is implemented with support for read-create and read-
        write operations, thereby allowing configuration and
        monitoring, respectively."

    MODULE               -- this module

-- unconditionally mandatory groups
```

MANDATORY-GROUPS {

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```
        l2tpv3CfgGroup,
        l2tpv3StatsGroup,
        l2tpv3TrapGroup
    }

-- optional Mapping Group
GROUP          l2tpv3MappingGroup
DESCRIPTION
    "Optional group for L2TP devices that provide index
    mapping."

-- optional Security Group
GROUP          l2tpv3SecurityGroup
DESCRIPTION
    "Optional group for SNMP agents that support both
    authentication and privacy of SNMP messages for the
    management of L2TP keys."

-- optional High Capacity Group
GROUP          l2tpv3HCPacketGroup
DESCRIPTION
    "Optional group for implementations that cannot overflow
    the 32-bit packet and byte counters in less than one
    hour.  Mandatory otherwise."

::= { l2tpv3Compliances 1 }

l2tpv3MIBReadOnlyCompliance MODULE-COMPLIANCE
    STATUS      current
    DESCRIPTION
        "An implementation claims read-only compliance when this
        MIB is implemented without support for read-create and
        read-write operations (i.e. operates in read-only mode),
        thereby allowing monitoring but not configuration."

    MODULE      -- this module

-- unconditionally mandatory groups
MANDATORY-GROUPS {
    l2tpv3CfgGroup,
    l2tpv3StatsGroup,
    l2tpv3TrapGroup
}

OBJECT          l2tpv3StackCfgAdminState
MIN-ACCESS      read-only
DESCRIPTION
    "Write access is not required."
```


OBJECT l2tpv3StackCfgDrain
MIN-ACCESS read-only
DESCRIPTION
 "Write access is not required."

OBJECT l2tpv3CtrlCfgRouterID
MIN-ACCESS read-only
DESCRIPTION
 "Write access is not required."

OBJECT l2tpv3CtrlCfgTransport
MIN-ACCESS read-only
DESCRIPTION
 "Write access is not required."

OBJECT l2tpv3CtrlCfgPWCap
MIN-ACCESS read-only
DESCRIPTION
 "Write access is not required."

OBJECT l2tpv3CtrlCfgFallback
MIN-ACCESS read-only
DESCRIPTION
 "Write access is not required."

OBJECT l2tpv3CtrlCfgDrain
MIN-ACCESS read-only
DESCRIPTION
 "Write access is not required."

OBJECT l2tpv3CtrlCfgAuth
MIN-ACCESS read-only
DESCRIPTION
 "Write access is not required."

OBJECT l2tpv3CtrlCfgSecret
MIN-ACCESS read-only
DESCRIPTION
 "Write access is not required."

OBJECT l2tpv3CtrlCfgSecurity
MIN-ACCESS read-only
DESCRIPTION
 "Write access is not required."

OBJECT l2tpv3CtrlCfgHelloInt
MIN-ACCESS read-only

DESCRIPTION

"Write access is not required."

OBJECT l2tpv3CtrlCfgRWS

MIN-ACCESS read-only

DESCRIPTION

"Write access is not required."

OBJECT l2tpv3CtrlCfgMaxRetrans

MIN-ACCESS read-only

DESCRIPTION

"Write access is not required."

OBJECT l2tpv3CtrlCfgMaxRetransTO

MIN-ACCESS read-only

DESCRIPTION

"Write access is not required."

OBJECT l2tpv3CtrlCfgReassemblyTO

MIN-ACCESS read-only

DESCRIPTION

"Write access is not required."

OBJECT l2tpv3CtrlCfgIdleTO

MIN-ACCESS read-only

DESCRIPTION

"Write access is not required."

OBJECT l2tpv3SessionCfgLocalID

MIN-ACCESS read-only

DESCRIPTION

"Write/create access is not required."

OBJECT l2tpv3SessionCfgRemoteID

MIN-ACCESS read-only

DESCRIPTION

"Write/create access is not required."

OBJECT l2tpv3SessionCfgCtrlLocalID

MIN-ACCESS read-only

DESCRIPTION

"Write/create access is not required."

OBJECT l2tpv3SessionCfgPWType

MIN-ACCESS read-only

DESCRIPTION

"Write/create access is not required."

OBJECT l2tpv3SessionCfgEndID
MIN-ACCESS read-only
DESCRIPTION
 "Write/create access is not required."

OBJECT l2tpv3SessionCfgAppID
MIN-ACCESS read-only
DESCRIPTION
 "Write/create access is not required."

OBJECT l2tpv3SessionCfgPWEncap
MIN-ACCESS read-only
DESCRIPTION
 "Write/create access is not required."

OBJECT l2tpv3SessionCfgSeq
MIN-ACCESS read-only
DESCRIPTION
 "Write/create access is not required."

OBJECT l2tpv3SessionCfgLocalCookie
MIN-ACCESS read-only
DESCRIPTION
 "Write/create access is not required."

OBJECT l2tpv3SessionCfgRemoteCookie
MIN-ACCESS read-only
DESCRIPTION
 "Write/create access is not required."

OBJECT l2tpv3SessionCfgCallType
MIN-ACCESS read-only
DESCRIPTION
 "Write/create access is not required."

-- optional Mapping Group

GROUP l2tpv3MappingGroup
DESCRIPTION
 "Optional group for L2TP devices that provide index
 mapping."

OBJECT l2tpv3SessionMapCtrlIfIndex
MIN-ACCESS read-only
DESCRIPTION
 "Write access is not required."

OBJECT l2tpv3SessionMapStatus
MIN-ACCESS read-only

DESCRIPTION

"Write access is not required."

-- optional Security Group

GROUP l2tpv3SecurityGroup

DESCRIPTION

"Optional group for SNMP agents that support both authentication and privacy of SNMP messages for the management of L2TP keys."

-- optional High Capacity Group

GROUP l2tpv3HCPacketGroup

DESCRIPTION

"Optional group for implementations that cannot overflow the 32-bit packet and byte counters in less than one hour. Mandatory otherwise."

::= { l2tpv3Compliances 2 }

--

-- Units of conformance

--

l2tpv3CfgGroup OBJECT-GROUP

OBJECTS {

l2tpv3StackCfgAdminState,
l2tpv3StackCfgDrain,
l2tpv3CtrlCfgRouterID,
l2tpv3CtrlCfgTransport,
l2tpv3CtrlCfgPwCap,
l2tpv3CtrlCfgFallback,
l2tpv3CtrlCfgDrain,
l2tpv3CtrlCfgAuth,
l2tpv3CtrlCfgSecret,
l2tpv3CtrlCfgSecurity,
l2tpv3CtrlCfgHelloInt,
l2tpv3CtrlCfgRWS,
l2tpv3CtrlCfgMaxRetrans,
l2tpv3CtrlCfgMaxRetransTO,
l2tpv3CtrlCfgReassemblyTO,
l2tpv3CtrlCfgIdleTO,
l2tpv3SessionCfgLocalID,
l2tpv3SessionCfgRemoteID,
l2tpv3SessionCfgCtrlLocalID,
l2tpv3SessionCfgPWType,
l2tpv3SessionCfgEndID,
l2tpv3SessionCfgAppID,
l2tpv3SessionCfgPWEncap,
l2tpv3SessionCfgSeq,

l2tpv3SessionCfgLocalCookie,

```
    l2tpv3SessionCfgRemoteCookie,
    l2tpv3SessionCfgCallType
}
STATUS          current
DESCRIPTION
    "A collection of objects providing configuration
    information of the L2TP stack, its control connections,
    and its sessions."
 ::= { l2tpv3Groups 1 }
```

l2tpv3StatsGroup OBJECT-GROUP

```
OBJECTS {
    l2tpv3StackStatsVersion,
    l2tpv3StackStatsRevision,
    l2tpv3StackStatsVendorName,
    l2tpv3StackStatsAdminState,
    l2tpv3StackStatsIsDraining,
    l2tpv3StackStatsNumCtrlEst,
    l2tpv3StackStatsNumSessEst,
    l2tpv3CtrlStatsLocalID,
    l2tpv3CtrlStatsRemoteID,
    l2tpv3CtrlStatsState,
    l2tpv3CtrlStatsIsDraining,
    l2tpv3CtrlStatsInitiated,
    l2tpv3CtrlStatsRemoteRouterID,
    l2tpv3CtrlStatsRemoteHostName,
    l2tpv3CtrlStatsRemoteVendorName,
    l2tpv3CtrlStatsRemoteVersion,
    l2tpv3CtrlStatsRemotePWCap,
    l2tpv3CtrlStatsInitialRemoteRWS,
    l2tpv3CtrlStatsCtrlRxZLB,
    l2tpv3CtrlStatsCtrlOutOfSeq,
    l2tpv3CtrlStatsCtrlOutOfWindow,
    l2tpv3CtrlStatsCtrlTxZLB,
    l2tpv3CtrlStatsCtrlAckTO,
    l2tpv3CtrlStatsCurrentRemoteRWS,
    l2tpv3CtrlStatsTxSeq,
    l2tpv3CtrlStatsRxSeq,
    l2tpv3CtrlStatsNumSessCumEst,
    l2tpv3CtrlStatsNumSessCurrentEst,
    l2tpv3CtrlStatsNumSessFailed,
    l2tpv3CtrlStatsLastResultCode,
    l2tpv3CtrlStatsLastErrorCode,
    l2tpv3CtrlStatsLastErrorMessage,
    l2tpv3CtrlStatsCtrlRxOctets,
    l2tpv3CtrlStatsCtrlRxPkts,
    l2tpv3CtrlStatsCtrlTxOctets,
```

l2tpv3CtrlStatsCtrlTxPkts,

```
        l2tpv3CtrlStatsDataRxOctets,
        l2tpv3CtrlStatsDataRxPkts,
        l2tpv3CtrlStatsDataRxDrops,
        l2tpv3CtrlStatsDataTxOctets,
        l2tpv3CtrlStatsDataTxPkts,
        l2tpv3SessionStatsRemoteEndID,
        l2tpv3SessionStatsRemoteAppID,
        l2tpv3SessionStatsRemotePWEncap,
        l2tpv3SessionStatsRemoteSeq,
        l2tpv3SessionStatsState,
        l2tpv3SessionStatsCircuitStatus,
        l2tpv3SessionStatsSerialNumber,
        l2tpv3SessionStatsRxConnectSpeed,
        l2tpv3SessionStatsTxConnectSpeed,
        l2tpv3SessionStatsPhysChannelID,
        l2tpv3SessionStatsPrivateGroupID,
        l2tpv3SessionStatsOutOfSeq,
        l2tpv3SessionStatsReassemblyT0,
        l2tpv3SessionStatsTxSeq,
        l2tpv3SessionStatsRxSeq,
        l2tpv3SessionStatsRxOctets,
        l2tpv3SessionStatsRxPkts,
        l2tpv3SessionStatsRxDrops,
        l2tpv3SessionStatsTxOctets,
        l2tpv3SessionStatsTxPkts
    }
    STATUS          current
    DESCRIPTION
        "A collection of objects providing status and statistics
        of the L2TP stack, its control connections, and its
        sessions."
    ::= { l2tpv3Groups 2 }

l2tpv3MappingGroup      OBJECT-GROUP
    OBJECTS {
        l2tpv3CtrlMapIfIndex,
        l2tpv3SessionMapCtrlIfIndex,
        l2tpv3SessionMapLocalID,
        l2tpv3SessionMapStatus
    }
    STATUS          current
    DESCRIPTION
        "A collection of objects providing index mapping."
    ::= { l2tpv3Groups 3 }

l2tpv3SecurityGroup     OBJECT-GROUP
    OBJECTS {
```

l2tpv3CtrlCfgAuth,

```
        l2tpv3CtrlCfgSecret,
        l2tpv3CtrlCfgSecurity
    }
    STATUS          current
    DESCRIPTION
        "A collection of objects providing L2TP security
        configuration."
    ::= { l2tpv3Groups 4 }

l2tpv3TrapGroup          NOTIFICATION-GROUP
    NOTIFICATIONS {
        l2tpv3CtrlAuthFailure
    }
    STATUS          current
    DESCRIPTION
        "A collection of L2TP trap events as specified in
        NOTIFICATION-TYPE constructs."
    ::= { l2tpv3Groups 5 }

l2tpv3HCPacketGroup      OBJECT-GROUP
    OBJECTS {
        l2tpv3CtrlStatsCtrlHCRxOctets,
        l2tpv3CtrlStatsCtrlHCRxPkts,
        l2tpv3CtrlStatsCtrlHCTxOctets,
        l2tpv3CtrlStatsCtrlHCTxPkts,
        l2tpv3CtrlStatsDataHCRxOctets,
        l2tpv3CtrlStatsDataHCRxPkts,
        l2tpv3CtrlStatsDataHCRxDrops,
        l2tpv3CtrlStatsDataHCTxOctets,
        l2tpv3CtrlStatsDataHCTxPkts,
        l2tpv3SessionStatsHCRxOctets,
        l2tpv3SessionStatsHCRxPkts,
        l2tpv3SessionStatsHCRxDrops,
        l2tpv3SessionStatsHCTxOctets,
        l2tpv3SessionStatsHCTxPkts
    }
    STATUS          current
    DESCRIPTION
        "A collection of objects providing high-capacity 64-bit
        counter objects."
    ::= { l2tpv3Groups 6 }

END
```

5. Security Considerations

It is clear that the MIB modules described in this document in useful for monitoring of L2TPv3 routers. These MIB modules can also be used for configuration of certain objects, and anything that can be configured can be incorrectly configured, with potentially disastrous results.

There are a number of management objects defined in these MIB modules 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:

6. IANA Considerations

```
-- (Note to RFC-Editor:)
-- We request that you assign contiguous RFC numbers to the
--   IANA is requested to root MIB objects in the MIB module
--   contained in this document under the transmission subtree.
--
```

7. References

7.1 Normative Referneces

- [L2TP-BASE] Townsley, et. al. "Layer Two Tunneling Protocol (Version 3) 'L2TPv3'", STD 15, [RFC 3931](#), March 2005.
- [L2TP-MIB] Caves, E., Calhoun, P., and Wheeler, R., "Layer Two Tunneling Protocol 'L2TP' Management Information Base", STD 4, [RFC 3371](#), August 2002.
- [PWE3-PW-MIB] Zelig, D., Nadeau, T., Danenberg, D., and Mantin, S., "Pseudo Wire (PW) Management Information Base", [<draft-ietf-pwe3-pw-mib-08.txt>](#), June 2006.
- [RFC2863] McCloghrie, K. and F. Kastenholtz, "The Interfaces Group MIB", [RFC 2863](#), June 2000.

7.2. Informative References

- [RFC1155] Rose, M., and McCloghrie, K., "Structure and Identification of Management Information for TCP/IP-Based Internets", STD 16, [RFC 1155](#), May 1990.
- [RFC1157] Case, J., Fedor, M., Schoffstall, M., and Davin, J., "Simple Network Management Protocol", STD 15, [RFC 1157](#), May 1990.

[RFC1212] Rose, M., and McCloghrie, K., "Concise MIB Definitions",

STD 16, [RFC 1212](#), March 1991.

- [RFC1215] Rose, M., "A Convention for Defining Traps for use with the SNMP", [RFC 1215](#), March 1991.
- [RFC1901] Case, J., McCloghrie, K., Rose, M., and Waldbusser, S., "Introduction to Community-based SNMPv2", [RFC 1901](#), January 1996.
- [RFC1905] Case, J., McCloghrie, K., Rose, M., and Waldbusser, S., "Protocol Operations for Version 2 of the Simple Network Management Protocol (SNMPv2)", [RFC 1905](#), January 1996.
- [RFC1906] Case, J., McCloghrie, K., Rose, M., and Waldbusser, S., "Transport Mappings for Version 2 of the Simple Network Management Protocol (SNMPv2)", [RFC 1906](#), January 1996.
- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.
- [RFC2570] Case, J., Mundy, R., Partain, D., and Stewart, B., "Introduction to Version 3 of the Internet-standard Network Management Framework", [RFC 2570](#), April 1999.
- [RFC2571] Harrington, D., Presuhn, R., and Wijnen, B., "An Architecture for Describing SNMP Management Frameworks", [RFC 2571](#), April 1999.
- [RFC2572] Case, J., Harrington D., Presuhn R., and Wijnen, B., "Message Processing and Dispatching for the Simple Network Management Protocol (SNMP)", [RFC 2572](#), April 1999.
- [RFC2573] Levi, D., Meyer, P., and Stewart, B., "SNMPv3 Applications", [RFC 2573](#), April 1999.
- [RFC2574] Blumenthal, U., and Wijnen, B., "User-based Security Model (USM) for version 3 of the Simple Network Management Protocol (SNMPv3)", [RFC 2574](#), April 1999.
- [RFC2575] Wijnen, B., Presuhn, R., and McCloghrie, K., "View-based Access Control Model (VACM) for the Simple Network Management Protocol (SNMP)", [RFC 2575](#), April 1999.
- [RFC2578] McCloghrie, K., Perkins, D., Schoenwaelder, J., Case, J., Rose, M., and Waldbusser, S., "Structure of Management Information Version 2 (SMIv2)", STD 58, [RFC 2578](#), April 1999.

- [RFC2579] McCloghrie, K., Perkins, D., Schoenwaelder, J., Case, J., Rose, M., and Waldbusser, S., "Textual Conventions for SMIV2", STD 58, [RFC 2579](#), April 1999.
- [RFC2580] McCloghrie, K., Perkins, D., Schoenwaelder, J., Case, J., Rose, M., and Waldbusser, S., "Conformance Statements for SMIV2", STD 58, [RFC 2580](#), April 1999.
- [RFC2667] Thaler, D., "IP Tunnel MIB", [RFC 2667](#), Microsoft, August 1999.

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