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**VPLS with Point-To-Multipoint LSPs Management Information Base
draft-mcast-vpls-mib-00**

Abstract

This memo defines an experimental portion of the Management Information Base for use with network management protocols in the Internet community.

In particular, it describes managed objects to configure and/or monitor multicast in VPLS using Point-to-Multipoint LSPs or VPLS-MCAST [[I-D.ietf-l2vpn-vpls-mcast](#)].

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1. Introduction

VPLS using Point-to-Multipoint LSPs or [VPLS-MCAST] describes procedures for VPLS multicast that utilize multicast trees in the service provider (SP) network. The multicast tree is typically formed using point-to-multipoint LSPs and is used to flood broadcast, multicast, and unknown unicast traffic across a VPLS core network to all the PE routers.

This memo describes managed objects to configure and/or monitor multicast in VPLS using Point-to-Multipoint LSPs or VPLS-MCAST [[I-D.ietf-l2vpn-vpls-mcast](#)].

In the current version of this memo does not address MIB Objects for Inter-AS VPLS Multicast. Objects related to this would be addressed in subsequent updates of this proposal.

2. The Internet-Standard Management Framework

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

Managed objects are accessed via a virtual information store, termed the Management Information Base or MIB. MIB objects are generally accessed through the Simple Network Management Protocol (SNMP). Objects in the MIB are defined using the mechanisms defined in the Structure of Management Information (SMI). This memo specifies a MIB module that is compliant to the SMIV2, which is described in STD 58, [RFC 2578](#) [[RFC2578](#)], STD 58, [RFC 2579](#) [[RFC2579](#)] and STD 58, [RFC 2580](#) [[RFC2580](#)].

3. Conventions

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

4. Terminology

Terminology used in this document:

VPLS : Virtual Provider LAN Service.

P2MP : Point-to-Multipoint.

MLDP : Multicast Label Distribution Protocol.

SNMP : Simple Network Management Protocol.

MIB : Management Information Base.

PE Router: Provider Edge Router.

P Router : Provider Core Router.

I-PMSI : Inclusive-Provider Multicast Service Interface.

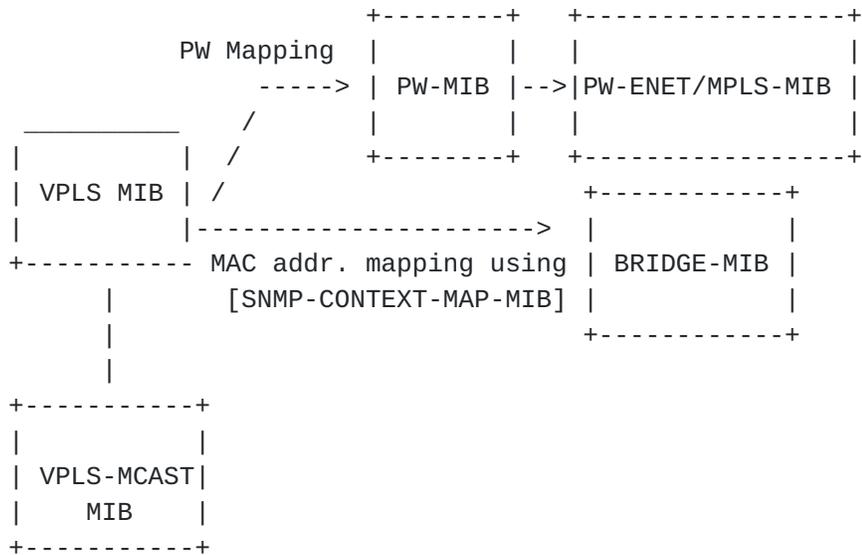
S-PMSI : Selective-Provider Multicast Service Interface.

MVPN : Multicast Virtual Private Networks.

5. Structure of the MIB Module

The MIB Structure for defining VPLS using Point-to-Multipoint LSPs or [VPLS-MCAST] would be based off the existing VPLS-MIB [I-D.ietf-l2vpn-vpls-mib] defination.

Following is the relation of the VPLS-MCAST MIB with existing VPLS-MIB



5.1. Summary of MIB Module

The configuration and states specific to an VPLS-MCAST include the following:

- C-multicast routing exchange protocol BGP
- I-PMSI, S-PMSI and corresponding provider tunnels
- Mapping of c-multicast states to PMSI/tunnels

To represent them, the following tables defined.

```
VplsMcastGeneral ----> VplsPmsiConfig      <----- VplsSpmsiConfig
```

```
VplsIpmsi          ----> VplsPmsiTunnelAttribute <----- VplsSpmsi
                        |
                        +-VplsIpmsiBgpADAttribute
                        +-VplsIpmsiBgpVplsAttribute
```

- vplsMcastGeneralTable

An entry in this table contains general informaion about VPLS-PMSI created on the device.

- vplsPmsiConfigTable

An entry in this table is created for each PMSI configured on this router. It can be referred to by base VPLS configuration (in vplsConfigEntry) or S-PMSI configuration (in vplsSpmsiConfigEntry).

- vplsIpmsiBgpADTable

This table specifies all advertised and received I-PMSI advertisements. An entry is created in this table for each IPMSI attribute advertised/ received in BGP-AD

- vplsIpmsiBgpVplsTable

An entry is created in this table for each IPMSI attribute advertised/ received in BGP-VPLS

- vplsPmsiTunnelAttributeTable

This table is specified for advertised/received PMSI attributes to be referred to by I-PMSI or S-PMSI table entries.

- vplsSpmsiConfigTable

This table specifies S-PMSI configuration for each VPLS entry

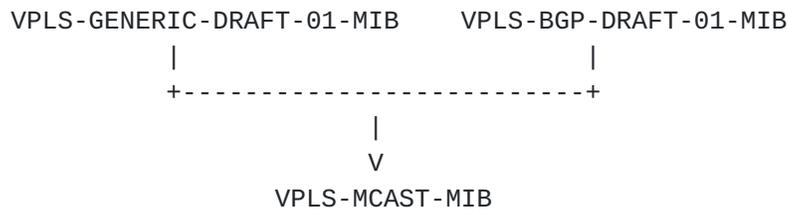
- vplsSpmsiTable

This table contains information about the VPLS S-PMSIs advertised/received for a given VPLS instance

6. Relationship to Other MIB Modules

This section provides an overview of the relationship between the VPLS-MCAST MIB module and other VPLS MIB modules.

The arrows in the following diagram show a 'depends on' relationship. A relationship "MIB module A depends on MIB module B" means that MIB module A uses an object, object identifier, or textual convention defined in MIB module B, or that MIB module A contains a pointer (index or RowPointer) to an object in MIB module B.



7. Definitions

```
VPLS-MCAST-MIB DEFINITIONS ::= BEGIN
```

```
IMPORTS
```

```
  MODULE-IDENTITY, OBJECT-TYPE, NOTIFICATION-TYPE,
  experimental, Unsigned32
  FROM SNMPv2-SMI
```

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

```
  TruthValue, RowPointer, RowStatus, TimeStamp, TimeInterval
  FROM SNMPv2-TC
```

```
  SnmpAdminString
  FROM SNMP-FRAMEWORK-MIB
```


InetAddress, InetAddressType
FROM INET-ADDRESS-MIB

MplsLabel
FROM MPLS-TC-STD-MIB

vplsConfigIndex,
vplsBgpADConfigRouteDistinguisher,
vplsBgpADConfigPrefix,
vplsBgpADConfigVplsId
FROM VPLS-GENERIC-DRAFT-01-MIB

vplsBgpVename
FROM VPLS-BGP-DRAFT-01-MIB;

vplsMcastMIB MODULE-IDENTITY

LAST-UPDATED "201203141200Z" -- 14 March 2012 12:00:00 GMT
ORGANIZATION "IETF Layer-2 Virtual Private
Networks Working Group."

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"

DESCRIPTION


```
"This MIB contains managed object definitions for
multicast in Layer 2 VPLS defined by [L2VPN].
Copyright (C) The Internet Society (2012)."
```

```
-- Revision history.
```

```
REVISION "201203141200Z" -- 14 March 2012 12:00:00 GMT
```

```
DESCRIPTION
```

```
    "Initial version of the draft."
```

```
::= { experimental 99 } -- number to be assigned
```

```
-- Top level components of this MIB.
```

```
-- Traps
```

```
    vplsMcastNotifications OBJECT IDENTIFIER ::= { vplsMcastMIB 0 }
```

```
-- tables, scalars
```

```
    vplsMcastObjects          OBJECT IDENTIFIER ::= { vplsMcastMIB 1 }
```

```
-- conformance
```

```
    vplsMcastConformance     OBJECT IDENTIFIER ::= { vplsMcastMIB 2 }
```

```
    vplsMcastScalars         OBJECT IDENTIFIER ::= { vplsMcastObjects 1 }
```

```
    vplsMcastGeneral         OBJECT IDENTIFIER ::= { vplsMcastObjects 2 }
```

```
    vplsMcastConfig          OBJECT IDENTIFIER ::= { vplsMcastObjects 3 }
```

```
    vplsMcastStates          OBJECT IDENTIFIER ::= { vplsMcastObjects 4 }
```

```
-- Scalar Objects
```

```
vplsMcastNotificationEnable OBJECT-TYPE
```

```
    SYNTAX          TruthValue
```

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

```
    STATUS          current
```

```
    DESCRIPTION
```

```
        "If this object is TRUE, then the generation of all
        notifications defined in this MIB is enabled."
```

```
    DEFVAL { false }
```

```
    ::= { vplsMcastScalars 1 }
```

```
vplsMcastGeneralTable OBJECT-TYPE
```

```
    SYNTAX          SEQUENCE OF VplsMcastGeneralEntry
```

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

```
    STATUS          current
```

```
    DESCRIPTION
```

```
        "This table specifies the general information about the VPLS-PMSI
        present in this device."
```

```
    ::= { vplsMcastGeneral 1 }
```


vplsMcastGeneralEntry OBJECT-TYPE

SYNTAX VplsMcastGeneralEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"An entry in this table is created for every MVRF in the device."

INDEX { vplsConfigIndex }

::= { vplsMcastGeneralTable 1 }

VplsMcastGeneralEntry ::= SEQUENCE {

vplsMcastGenOperStatusChange	INTEGER,
vplsMcastGenOperChangeTime	TimeStamp,
vplsMcastGenIpmsiConfig	RowPointer,
vplsMcastGenInterasPmsiConfig	RowPointer,
vplsMcastGenRowStatus	RowStatus

}

vplsMcastGenOperStatusChange OBJECT-TYPE

SYNTAX INTEGER { createdVplsPmsi(1),
 deletedVplsPmsi(2),
 modifiedVplsIpmsiConfig(3),
 modifiedVplsSpmsiConfig(4)
 }

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This object describes the last operational change that happened for the given VPLS-PMSI.

createdVplsPmsi - indicates that VPLS PMSI was created in the device.

deletedVplsPmsi - indicates that the VPLS PMSI was deleted from the device. A row in this table will never have vplsMcastGenOperStatusChange equal to deletedVplsPmsi(2), because in that case the row itself will be deleted from the table. This value for vplsMcastGenOperStatusChange is defined mainly for use in vplsMcastPmsiChange notification.

modifiedVplsIpmsiConfig - indicates that the I-PMSI for the VPLS was configured, deleted or changed.

modifiedVplsSpmsiConfig - indicates that the S-PMSI for the VPLS was configured, deleted or changed."

DEFVAL { createdVplsPmsi }

::= { vplsMcastGeneralEntry 1 }

vplsMcastGenOperChangeTime OBJECT-TYPE

SYNTAX TimeStamp
MAX-ACCESS read-only
STATUS current

DESCRIPTION

"The time at which the last operational change for the VPLS-PMSI in question took place. The last operational change is specified by vplsMcastGenOperStatusChange."

::= { vplsMcastGeneralEntry 2 }

vplsMcastGenIpmsiConfig OBJECT-TYPE

SYNTAX RowPointer
MAX-ACCESS read-create
STATUS current

DESCRIPTION

"This points to a row in vplsMcastPmsiConfigTable, for I-PMSI configuration."

::= { vplsMcastGeneralEntry 3 }

vplsMcastGenInterasPmsiConfig OBJECT-TYPE

SYNTAX RowPointer
MAX-ACCESS read-create
STATUS current

DESCRIPTION

"This points to a row in vplsMcastPmsiConfigTable, for inter-as I-PMSI configuration in case of segmented inter-as provider tunnels."

::= { vplsMcastGeneralEntry 4 }

vplsMcastGenRowStatus OBJECT-TYPE

SYNTAX RowStatus
MAX-ACCESS read-create
STATUS current

DESCRIPTION

"This is used to create or delete a row in this table."

::= { vplsMcastGeneralEntry 5 }

-- VPLS PMSI Configuration Table

vplsPmsiConfigTable OBJECT-TYPE

SYNTAX SEQUENCE OF VplsPmsiConfigEntry
MAX-ACCESS not-accessible
STATUS current

DESCRIPTION

"An entry in this table is created for each PMSI configured on this router. It can be referred to by base VPLS configuration (in vplsConfigEntry) or S-PMSI configuration (in vplsSpmsiConfigEntry)"


```
 ::= { vplsMcastConfig 1 }
```

```
vplsPmsiConfigEntry OBJECT-TYPE
```

```
SYNTAX          VplsPmsiConfigEntry
```

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

```
STATUS          current
```

```
DESCRIPTION
```

```
    "An entry in this table is created for each PMSI configured
    on this router under VPLS Service"
```

```
INDEX           { vplsConfigIndex }
```

```
 ::= { vplsPmsiConfigTable 1 }
```

```
VplsPmsiConfigEntry ::= SEQUENCE {
```

```
    vplsPmsiCfgTunnelType          INTEGER,
```

```
    vplsPmsiCfgTunnelAuxInfo       Unsigned32,
```

```
    vplsPmsiCfgTunnelOrTemplateName SnmpAdminString,
```

```
    vplsPmsiCfgEncapsType          INTEGER,
```

```
    vplsPmsiCfgSiteType           INTEGER,
```

```
    vplsPmsiCfgExcludeUnknownUnicast TruthValue,
```

```
    vplsPmsiCfgRowStatus          RowStatus
```

```
}
```

```
vplsPmsiCfgTunnelType OBJECT-TYPE
```

```
SYNTAX          INTEGER { rsvpP2mp (1),
                          ldpP2mp (2),
                          ingressReplication (3)
                          }
```

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

```
STATUS          current
```

```
DESCRIPTION
```

```
    "Type of tunnel used to instantiate the PMSI."
```

```
 ::= { vplsPmsiConfigEntry 1 }
```

```
vplsPmsiCfgTunnelAuxInfo OBJECT-TYPE
```

```
SYNTAX          Unsigned32
```

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

```
STATUS          current
```

```
DESCRIPTION
```

```
    "Additional tunnel information depending on the type.
```

```
    rsvp-p2mp:  1 for statically specified rsvp-p2mp tunnel
                2 for dynamically created rsvp-p2mp tunnel
```

```
    ingress-replication:
```

```
                1 for using any existing p2p/mp2p lsp
```

```
                2 for dynamically creating new p2p lsp"
```

```
 ::= { vplsPmsiConfigEntry 2 }
```

```
vplsPmsiCfgTunnelOrTemplateName OBJECT-TYPE
```



```

SYNTAX      SnmpAdminString
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
    "The tunnel name or template name used to create tunnels.
    Depending on vplsPmsiCfgTunnelType and
    vplsPmsiCfgTunnelAuxInfo:

        dynamically created rsvp-p2mp tunnel:      template name
        statically specified rsvp-p2mp tunnel:     tunnel name
        ingress-replication using
        dynamically created lsps:                  template name
        other:                                     null"
 ::= { vplsPmsiConfigEntry 3 }

```

vplsPmsiCfgEncapType OBJECT-TYPE

```

SYNTAX      INTEGER { greIp (1),
                    ipIp  (2),
                    mpls  (3)
                    }
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "The encapsulation type to be used, in case of
    ingress-replication."
 ::= { vplsPmsiConfigEntry 4 }

```

vplsPmsiCfgSiteType OBJECT-TYPE

```

SYNTAX      INTEGER {
                    senderReceiver (1),
                    receiverOnly   (2),
                    senderOnly     (3)
                    }
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
    "Whether this site is a receiver-only site or not.
    sender-receiver (1):  both sender and receiver site.
    receiver-only   (2):  receiver-only site.
    sender-only     (3):  sender only site."
 ::= { vplsPmsiConfigEntry 5 }

```

vplsPmsiCfgExcludeUnknownUnicast OBJECT-TYPE

```

SYNTAX      TruthValue
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
    "If this object is TRUE, then Unknown Unicast will not

```


be mapped to the provider tunnel.

If this object is FALSE, then Unknown Unicast will be mapped to the provider tunnel."

DEFVAL { false }

::= { vplsPmsiConfigEntry 6 }

vplsPmsiCfgRowStatus OBJECT-TYPE

SYNTAX RowStatus

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"Used to create/modify/delete a row in this table."

::= { vplsPmsiConfigEntry 7 }

-- Table of IPMSI BGP-AD Advertised/Received.

vplsIpmsiBgpADTable OBJECT-TYPE

SYNTAX SEQUENCE OF VplsIpmsiBgpADEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This table specifies all advertised and received IPMSI advertisements."

::= { vplsMcastStates 1 }

vplsIpmsiBgpADEntry OBJECT-TYPE

SYNTAX VplsIpmsiBgpADEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"An entry is created in this table for each IPMSI attribute advertised/received in BGP-AD"

INDEX { vplsConfigIndex,
vplsBgpADConfigRouteDistinguisher,
vplsBgpADConfigPrefix,
vplsBgpADConfigVplsId }

::= { vplsIpmsiBgpADTable 1 }

VplsIpmsiBgpADEntry ::= SEQUENCE {

vplsIpmsiBgpADAttribute

RowPointer

}

vplsIpmsiBgpADAttribute OBJECT-TYPE

SYNTAX RowPointer

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Points to a row in the vplsIpmsiTunnelAttributeTable."

::= { vplsIpmsiBgpADEntry 1 }

-- Table of IPMSI BGP-VPLS Advertised/Received.

```
vplsIpmsiBgpVplsTable OBJECT-TYPE
    SYNTAX          SEQUENCE OF VplsIpmsiBgpVplsEntry
    MAX-ACCESS      not-accessible
    STATUS          current
```

DESCRIPTION

"This table specifies the all advertised and received IPmsi advertisements."

```
::= { vplsMcastStates 2 }
```

```
vplsIpmsiBgpVplsEntry OBJECT-TYPE
    SYNTAX          VplsIpmsiBgpVplsEntry
    MAX-ACCESS      not-accessible
    STATUS          current
```

DESCRIPTION

"An entry is created in this table for each IPMSI attribute advertised/received in BGP-VPLS"

```
INDEX      { vplsConfigIndex,
             vplsBgpVName }
```

```
::= { vplsIpmsiBgpVplsTable 1 }
```

```
VplsIpmsiBgpVplsEntry ::= SEQUENCE {
    vplsIpmsiBgpVplsAttribute      RowPointer
}
```

```
vplsIpmsiBgpVplsAttribute OBJECT-TYPE
    SYNTAX          RowPointer
    MAX-ACCESS      read-only
    STATUS          current
```

DESCRIPTION

"Points to a row in the vplsIpmsiTunnelAttributeTable."

```
::= { vplsIpmsiBgpVplsEntry 1 }
```

-- Table of VPLS PMSI attributes

```
vplsPmsiTunnelAttributeTable OBJECT-TYPE
    SYNTAX          SEQUENCE OF VplsPmsiTunnelAttributeEntry
    MAX-ACCESS      not-accessible
    STATUS          current
```

DESCRIPTION

"This table is for advertised/received PMSI attributes, to be referred to by I-PMSI or S-PMSI table entries"

```
::= { vplsMcastStates 3 }
```

```
vplsPmsiTunnelAttributeEntry OBJECT-TYPE
    SYNTAX          VplsPmsiTunnelAttributeEntry
    MAX-ACCESS      not-accessible
```

STATUS

current

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DESCRIPTION

"An entry in this table corresponds to an PMSI attribute that is advertised/received on this router.

For BGP-based signaling (for I-PMSI via auto-discovery procedure, or for S-PMSI via S-PMSI A-D routes), they are just as signaled by BGP."

INDEX {

```

    vplsPmsiTunnelAttributeType,
    vplsPmsiTunnelAttributeLabel,
    vplsPmsiTunnelAttributeFlags,
    vplsPmsiTunnelAttributeId
  }
```

```
 ::= { vplsPmsiTunnelAttributeTable 1 }
```

```
VplsPmsiTunnelAttributeEntry ::= SEQUENCE {
```

```

  vplsPmsiTunnelAttributeType      Unsigned32,
  vplsPmsiTunnelAttributeLabel     MplsLabel,
  vplsPmsiTunnelAttributeFlags     OCTET STRING,
  vplsPmsiTunnelAttributeId        OCTET STRING,
  vplsPmsiTunnelPointer             RowPointer,
  vplsPmsiTunnelIf                 RowPointer
}
```

```
vplsPmsiTunnelAttributeType OBJECT-TYPE
```

```

SYNTAX      Unsigned32
MAX-ACCESS  not-accessible
STATUS      current
```

DESCRIPTION

"The tunnel type identifies the type of tunneling technology used to establish the PMSI tunnel. This document discusses the following tunnel types:

- 0 - No tunnel information present
- 1 - RSVP-TE P2MP LSP
- 2 - mLDP P2MP LSP

"

```
 ::= { vplsPmsiTunnelAttributeEntry 1 }
```

```
vplsPmsiTunnelAttributeLabel OBJECT-TYPE
```

```

SYNTAX      MplsLabel
MAX-ACCESS  not-accessible
STATUS      current
```

DESCRIPTION

"If the MPLS Label field is non-zero, then it contains an MPLS label encoded as 3 octets, where the high-order 20 bits contain the value. Absence of MPLS Label is indicated by setting the MPLS Label field to zero."

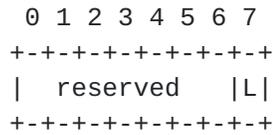
```
 ::= { vplsPmsiTunnelAttributeEntry 2 }
```

label

vplsPmsiTunnelAttributeFlags OBJECT-TYPE

SYNTAX OCTET STRING (SIZE (1))
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION

"The Flags field has the following format:



This document defines the following flags:

+ Leaf Information Required (L)"

::= { vplsPmsiTunnelAttributeEntry 3 }

vplsPmsiTunnelAttributeId OBJECT-TYPE

SYNTAX OCTET STRING (SIZE (4|8|12))
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION

"When the type is set to 'No tunnel information present', the PMSI Tunnel attribute carries no tunnel information (no Tunnel Identifier). This type is to be used only in the following case: to enable explicit tracking for a particular customer multicast flow

(by
binding

setting the Leaf Information Required flag to 1), but without

this flow to a particular provider tunnel (by omitting any tunnel information).

When the type is set to RSVP-TE P2MP LSP, the Tunnel Identifier is (Extended Tunnel ID, Reserved, Tunnel ID, P2MP ID) as carried in

the

RSVP-TE P2MP LSP SESSION Object [RFC4875].

When the type is set to mLDP P2MP LSP, the Tunnel Identifier is a P2MP FEC Element [mLDP]."

::= { vplsPmsiTunnelAttributeEntry 4 }

vplsPmsiTunnelPointer OBJECT-TYPE

SYNTAX RowPointer
MAX-ACCESS read-only
STATUS current
DESCRIPTION

"If the tunnel exists in some MIB table, this is the row pointer to it."

::= { vplsPmsiTunnelAttributeEntry 5 }

vplsPmsiTunnelIf OBJECT-TYPE

SYNTAX	RowPointer
MAX-ACCESS	read-only
STATUS	current

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DESCRIPTION

"If the tunnel has a corresponding interface, this is the row pointer to the ifName table."
 ::= { vplsPmsiTunnelAttributeEntry 6 }

-- S-PMSI configuration table

vplsSpmsiConfigTable OBJECT-TYPE
 SYNTAX SEQUENCE OF VplsSpmsiConfigEntry
 MAX-ACCESS not-accessible
 STATUS current
 DESCRIPTION
 "This table specifies S-PMSI configuration."
 ::= { vplsMcastConfig 2 }

vplsSpmsiConfigEntry OBJECT-TYPE
 SYNTAX VplsSpmsiConfigEntry
 MAX-ACCESS not-accessible
 STATUS current
 DESCRIPTION
 "An entry is created for each S-PMSI configuration."
 INDEX { vplsConfigIndex,
 vplsSpmsiCfgCmcastAddressType,
 vplsSpmsiCfgCmcastGroupAddress,
 vplsSpmsiCfgCmcastGroupPrefixLen,
 vplsSpmsiCfgCmcastSrcAddress,
 vplsSpmsiCfgCmcastSrcPrefixLen }
 ::= { vplsSpmsiConfigTable 1 }

VplsSpmsiConfigEntry ::= SEQUENCE {
 vplsSpmsiCfgCmcastAddressType InetAddressType,
 vplsSpmsiCfgCmcastGroupAddress InetAddress,
 vplsSpmsiCfgCmcastGroupPrefixLen Unsigned32,
 vplsSpmsiCfgCmcastSrcAddress InetAddress,
 vplsSpmsiCfgCmcastSrcPrefixLen Unsigned32,
 vplsSpmsiCfgThreshold Unsigned32,
 vplsSpmsiCfgPmsiPointer RowPointer,
 vplsSpmsiCfgRowStatus RowStatus
 }

vplsSpmsiCfgCmcastAddressType OBJECT-TYPE
 SYNTAX InetAddressType
 MAX-ACCESS not-accessible
 STATUS current
 DESCRIPTION
 "Type of C-multicast address"
 ::= { vplsSpmsiConfigEntry 1 }

vplsSpmsiCfgCmcastGroupAddress OBJECT-TYPE

SYNTAX InetAddress
MAX-ACCESS not-accessible
STATUS current

DESCRIPTION

"C-multicast group address"

::= { vplsSpmsiConfigEntry 2 }

vplsSpmsiCfgCmcastGroupPrefixLen OBJECT-TYPE

SYNTAX Unsigned32
MAX-ACCESS not-accessible
STATUS current

DESCRIPTION

"C-multicast group address prefix length.

A group 0 (or ::0) with prefix length 32 (or 128)
indicates wildcard group, while a group 0 (or ::0)
with prefix length 0 indicates any group."

::= { vplsSpmsiConfigEntry 3 }

vplsSpmsiCfgCmcastSrcAddress OBJECT-TYPE

SYNTAX InetAddress
MAX-ACCESS not-accessible
STATUS current

DESCRIPTION

"C-multicast source address"

::= { vplsSpmsiConfigEntry 4 }

vplsSpmsiCfgCmcastSrcPrefixLen OBJECT-TYPE

SYNTAX Unsigned32
MAX-ACCESS not-accessible
STATUS current

DESCRIPTION

"C-multicast source address prefix length.

A source 0 (or ::0) with prefix length 32 (or 128)
indicates a wildcard source, while a source 0 (or ::0)
with prefix length 0 indicates any source."

::= { vplsSpmsiConfigEntry 5 }

vplsSpmsiCfgThreshold OBJECT-TYPE

SYNTAX Unsigned32 (0..4294967295)
UNITS "kilobits per second"
MAX-ACCESS read-create
STATUS current

DESCRIPTION

"The bandwidth threshold value which when exceeded for a
multicast routing entry in the given VPLS, triggers usage
of S-PMSI."

::= { vplsSpmsiConfigEntry 6 }

vplsSpmsiCfgPmsiPointer OBJECT-TYPE

SYNTAX RowPointer

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"This points to a row in vplsPmsiConfigTable,
to specify tunnel attributes."

::= { vplsSpmsiConfigEntry 7 }

vplsSpmsiCfgRowStatus OBJECT-TYPE

SYNTAX RowStatus

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"Used to create/modify/delete a row in this table."

::= { vplsSpmsiConfigEntry 8 }

-- Table of S-PMSIs advertised/received

vplsSpmsiTable OBJECT-TYPE

SYNTAX SEQUENCE OF VplsSpmsiEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This table has information about the S-PMSIs sent/received
by a device."

::= { vplsMcastStates 4 }

vplsSpmsiEntry OBJECT-TYPE

SYNTAX VplsSpmsiEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"An entry in this table is created or updated for every S-PMSI
advertised/received in a particular VPLS."

INDEX { vplsConfigIndex,
vplsSpmsiCmcastAddrType,
vplsSpmsiCmcastGroup,
vplsSpmsiCmcastGroupPrefixLen,
vplsSpmsiCmcastSource,
vplsSpmsiCmcastSourcePrefixLen,
vplsSpmsiOrigAddrType,
vplsSpmsiOrigAddress}

::= { vplsSpmsiTable 1 }

VplsSpmsiEntry ::= SEQUENCE {


```
vplsSpmsiCmcastAddrType      InetAddressType,
vplsSpmsiCmcastGroup         InetAddress,
vplsSpmsiCmcastGroupPrefixLen Unsigned32,
vplsSpmsiCmcastSource        InetAddress,
vplsSpmsiCmcastSourcePrefixLen InetAddress,
vplsSpmsiOrigAddrType        InetAddressType,
vplsSpmsiOrigAddress         InetAddress,
vplsSpmsiTunnelAttribute     RowPointer,
vplsSpmsiUpTime              TimeInterval,
vplsSpmsiExpTime             TimeInterval,
vplsSpmsiRefCnt              Unsigned32
}
```

vplsSpmsiCmcastAddrType OBJECT-TYPE

```
SYNTAX      InetAddressType
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "The Internet address type of vplsSpmsiCmcastGroup/Source."
 ::= { vplsSpmsiEntry 1 }
```

vplsSpmsiCmcastGroup OBJECT-TYPE

```
SYNTAX      InetAddress (SIZE (4|16|20))
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "S-PMSI C-multicast group address.
     If it is 0 (or ::0), this is a wildcard group,
     and vplsSpmsiCmcastGroupPrefixLen must be 32 (or 128)."
```

```
 ::= { vplsSpmsiEntry 2 }
```

vplsSpmsiCmcastGroupPrefixLen OBJECT-TYPE

```
SYNTAX      Unsigned32
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "S-PMSI C-multicast group address prefix length."
 ::= { vplsSpmsiEntry 3 }
```

vplsSpmsiCmcastSource OBJECT-TYPE

```
SYNTAX      InetAddress (SIZE (4|16|20))
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "S-PMSI C-multicast source address
     If it is 0 (or ::0), this is a wildcard source,
     and vplsSpmsiCmcastSourcePrefixLen must be 32 (or 128)."
```

```
 ::= { vplsSpmsiEntry 4 }
```


vplsSpmsiCmcastSourcePrefixLen OBJECT-TYPE

SYNTAX InetAddress (SIZE (4|16|20))

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"S-PMSI C-multicast source address prefix length."

::= { vplsSpmsiEntry 5 }

vplsSpmsiOrigAddrType OBJECT-TYPE

SYNTAX InetAddressType

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The Internet address type of vplsSpmsiOrigAddress."

::= { vplsSpmsiEntry 6 }

vplsSpmsiOrigAddress OBJECT-TYPE

SYNTAX InetAddress

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The BGP address of the device that originated the S-PMSI."

::= { vplsSpmsiEntry 7 }

vplsSpmsiTunnelAttribute OBJECT-TYPE

SYNTAX RowPointer

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A row pointer to the vplsPmsiTunnelAttributeTable"

::= { vplsSpmsiEntry 8 }

vplsSpmsiUpTime OBJECT-TYPE

SYNTAX TimeInterval

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The time since this S-PMSI
was first advertised/received by the device."

::= { vplsSpmsiEntry 9 }

vplsSpmsiExpTime OBJECT-TYPE

SYNTAX TimeInterval

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"For UDP-based S-PMSI signaling for VPLS,
the amount of time remaining before this


```
        received S-PMSI Join Message expires,
        or the next S-PMSI Join Message refresh is to be
        advertised again from the device."
 ::= { vplsSpmsiEntry 10 }

vplsSpmsiRefCnt OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The number of c-multicast routes that are mapped to
        this S-PMSI."
 ::= { vplsSpmsiEntry 11 }

-- Module compliance.
vplsMcastCompliances
    OBJECT IDENTIFIER ::= { vplsMcastConformance 1 }

vplsMcastModuleFullCompliance MODULE-COMPLIANCE
    STATUS current
    DESCRIPTION
        "Compliance requirement for implementations that
        provide full support for VPLS-LDP-DRAFT-01-MIB.
        Such devices can then be monitored and configured using
        this MIB module."

    MODULE -- this module

    MANDATORY-GROUPS {
        vplsMcastGroup,
        vplsMcastNotificationGroup
    }

    ::= { vplsMcastCompliances 1 }

-- Units of conformance.

vplsMcastGroups
    OBJECT IDENTIFIER ::= { vplsMcastConformance 2 }

vplsMcastGroup OBJECT-GROUP
    OBJECTS {
        vplsMcastGenOperStatusChange,
        vplsMcastGenOperChangeTime,
        vplsMcastGenIpmsiConfig,
        vplsMcastGenInterasPmsiConfig,
```



```
    vplsMcastGenRowStatus,
    vplsPmsiCfgTunnelType,
    vplsPmsiCfgTunnelAuxInfo,
    vplsPmsiCfgTunnelOrTemplateName,
    vplsPmsiCfgEncapsType,
    vplsPmsiCfgSiteType,
    vplsPmsiCfgExcludeUnknownUnicast,
    vplsPmsiCfgRowStatus,
    vplsIpmsiBgpADAttribute,
    vplsIpmsiBgpVplsAttribute,
    vplsPmsiTunnelPointer,
    vplsPmsiTunnelIf,
    vplsSpmsiCfgThreshold,
    vplsSpmsiCfgPmsiPointer,
    vplsSpmsiCfgRowStatus,
    vplsSpmsiTunnelAttribute,
    vplsSpmsiUpTime,
    vplsSpmsiExpTime,
    vplsSpmsiRefCnt
}
STATUS current
DESCRIPTION
    "TODO"
 ::= { vplsMcastGroups 1 }

vplsMcastNotificationGroup OBJECT-GROUP
OBJECTS { vplsMcastNotificationEnable
}
STATUS current
DESCRIPTION
    "TODO"
 ::= { vplsMcastGroups 2 }

END
```

8. Security Considerations

TODO

9. IANA Considerations

IANA is requested to root MIB objects in the MIB module contained in this document under the transmission subtree.

[10. Contributors](#)

TODO.

[11. Acknowledgements](#)

[TODO].

[12. References](#)

[12.1. Normative References](#)

- [RFC2629] Rose, M., "Writing I-Ds and RFCs using XML", [RFC 2629](#), June 1999.
- [RFC2863] McCloghrie, K. and F. Kastenholz, "The Interfaces Group MIB", [RFC 2863](#), June 2000.
- [RFC3418] Presuhn, R., "Management Information Base (MIB) for the Simple Network Management Protocol (SNMP)", STD 62, [RFC 3418](#), December 2002.
- [RFC4181] Heard, C., "Guidelines for Authors and Reviewers of MIB Documents", [BCP 111](#), [RFC 4181](#), September 2005.
- [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.

- [I-D.ietf-l2vpn-vpls-mcast] Aggarwal, R., Rekhter, Y., Kamite, Y., and L. Fang, "Multicast in VPLS", [draft-ietf-l2vpn-vpls-mcast-10](#) (work in progress), February 2012.
- [I-D.ietf-l2vpn-vpls-mib] Koushik, K., Mediratta, R., and T. Nadeau, "Virtual Private Lan Services (VPLS) Management Information Base", [draft-ietf-l2vpn-vpls-mib-06](#) (work in progress), October 2011.

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.
- [RFC4761] Kompella, K. and Y. Rekhter, "Virtual Private LAN Service (VPLS) Using BGP for Auto-Discovery and Signaling", [RFC 4761](#), January 2007.
- [RFC4762] Lasserre, M. and V. Kompella, "Virtual Private LAN Service (VPLS) Using Label Distribution Protocol (LDP) Signaling", [RFC 4762](#), January 2007.
- [RFC3468] Andersson, L. and G. Swallow, "The Multiprotocol Label Switching (MPLS) Working Group decision on MPLS signaling protocols", [RFC 3468](#), February 2003.
- [RFC4875] Aggarwal, R., Papadimitriou, D., and S. Yasukawa, "Extensions to Resource Reservation Protocol - Traffic Engineering (RSVP-TE) for Point-to-Multipoint TE Label Switched Paths (LSPs)", [RFC 4875](#), May 2007.

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