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Virtual Private Lan Services (VPLS) Management Information Base

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Abstract

This memo defines a portion of the Management Information Base (MIB) for use with network management protocols in the Internet community. In particular, it describes managed objects for to configure and/or monitor Virtual Private LAN services. It needs to be used in conjunction with The Pseudowire (PW) Management Information Base.

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[1.](#) Introduction

This memo defines a portion of the Management Information Base (MIB) for use with network management protocols in the Internet community. In particular, it defines a MIB module that can be used to manage VPLS (Virtual Private LAN Services) for transmission over a packet Switched Network (PSN) using LDP [[RFC4762](#)] or BGP [[RFC4761](#)] signaling. This MIB module provides generic management of VPLS services as defined by the IETF L2VPN Working Group. Additional MIB modules are also defined for management of LDP VPLS and BGP VPLS services as defined by the IETF L2VPN Working Group.

[2.](#) Terminology

This document adopts the definitions, acronyms and mechanisms described in [[RFC3985](#)]. Unless otherwise stated, the mechanisms of [[RFC3985](#)] apply and will not be re-described here.

[2.1.](#) Conventions used in this document

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](#)].

[3.](#) 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 set of MIB modules that are compliant to the SMIV2, which is described in STD 58 [[RFC2578](#)] [[RFC2579](#)] [[RFC2580](#)].

[4.](#) VPLS MIB Module Architecture

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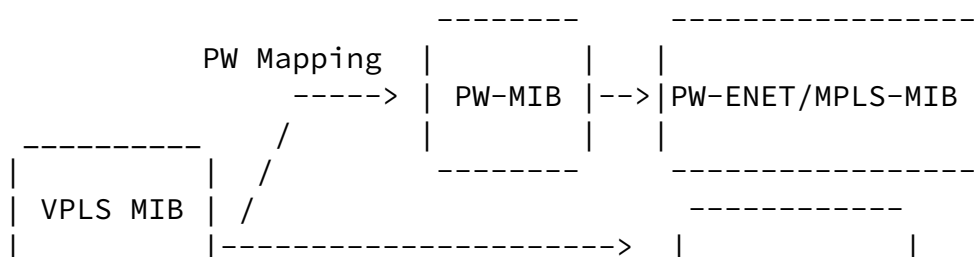
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The MIB structure for defining a VPLS service is composed from three MIB modules.

The first is the VPLS-GENERIC-MIB module, which configures general parameters of the VPLS service that are common to all types of VPLS services.

The second is the VPLS-LDP-MIB module, which configures VPLS-LDP [[RFC4762](#)] specific parameters of the VPLS service.

The third is the VPLS-BGP-MIB module, which configures VPLS-BGP [[RFC4761](#)] specific parameters of the VPLS service.



-----	MAC addr. mapping using		BRIDGE-MIB	
	[SNMP-CONTEXT-MAP-MIB]			

Figure A

Additionally service-specific modules may be defined in other documents.

[4.1.](#) VPLS-GENERIC-MIB Module Usage

An entry in the vplsConfigTable MUST exist for every VPLS service. This table holds generic parameters which apply to a VPLS service which can be signaled via LDP or BGP.

A conceptual row can be created in the vplsConfigTable in one of the following ways:

- 1) An NMS creates a row in the vplsConfigTable using SNMP Set requests which causes the node to create and start a new VPLS service. The agent MUST support the creation of VPLS services in this way.
- 2) The agent MAY create a row in the vplsConfigTable automatically due to some auto discovery application, or based on

configuration that is done through non-SNMP applications. This mode is OPTIONAL.

At least one entry in the vplsPwBindTable MUST exist for each VPLS service. This binding table links one VPLS service with one or many pseudowires (defined in [[RFC5601](#)]). Each pseudowire may be used as a spoke or as part of a mesh based on the parameters defined in this table.

For each VPLS service, an entry in the vplsBgpAdConfigTable MUST exist if Auto-discovery has been enabled for that service. This table stores the information required for auto-discovery.

For each VPLS service, at least one entry in the `vplsBgpRteTargetTable` MUST exist if auto-discovery has been configured for that service. One service can import and export multiple Route Targets.

[4.2.](#) VPLS-LDP-MIB Module Usage

An entry in the `vplsLdpConfigTable` MUST be created by the agent for a VPLS service signaled using LDP.

[4.3.](#) VPLS-BGP-MIB Module Usage

An entry in the `vplsBgpConfigTable` MUST be created by the agent for a VPLS service signaled using BGP.

[4.4.](#) Relations to other MIB modules

- The `vplsPwBindTable` links the VPLS entry to the `pwTable` in [\[RFC5601\]](#)
- The association of MAC addresses to VPLS entries is possible by adding a turnstile function to interpret the entries in [\[SNMP-CONTEXT-MAP-MIB\]](#). In [\[SNMP-CONTEXT-MAP-MIB\]](#) there is a mapping between the `vacmContextName` [\[RFC3415\]](#) to `dot1dBasePort` [\[RFC4188\]](#) and `vplsConfigIndex`. This mapping can be used to map the `vplsConfigIndex` to a `dot1dBasePort` in the BRIDGE-MIB. This resulting value of `dot1dBasePort` can be used to access corresponding MAC addresses that belong to a particular `vplsConfigIndex`.
- Unless all the necessary entries in the applicable tables have been created and all the parameters have been consistently configured in those tables, signaling cannot be performed

from the local node, and the `vplsConfigRowStatus` should report 'notReady'.

- Statistics can be gathered from the Pseudowire performance tables in [\[RFC5601\]](#)

5. Example of the VPLS MIB modules usage

In this section we provide an example of using the MIB objects described in [section 7](#) to set up a VPLS service over MPLS. While this example is not meant to illustrate every permutation of the MIB, it is intended as an aid to understanding some of the key concepts. It is meant to be read after going through the MIB itself.

In this example a VPLS service (VPLS-A) is setup using LDP for signaling the pseudowire. The binding between the VPLS service and the pseudowire is reflected in the VplsPwBindTable. The pseudowire configuration is defined in [RFC 5601](#).

In the VPLS-GENERIC-MIB module:

Row in vplsConfigTable:

```
{
    vplsConfigIndex          10,
    vplsConfigName           "VPLS-A"
    vplsConfigAdminStatus    1(up),
    vplsConfigMacLearning    1(true),
    vplsConfigDiscardUnknownDest 2(false),
    vplsConfigMacAging        1(true),
    vplsConfigVpnId          "100:10"
    vplsConfigRowStatus      1(active)
}
```

Row in vplsStatusTable:

```
{
    vplsStatusOperStatus    1(up),
    vplsStatusPeerCount      1
}
```

Row in VplsPwBindTable :

```
{
    vplsPwBindConfigType    manual,
    vplsPwBindType          spoke,
    vplsPwBindRowStatus      1(active),
    vplsPwBindStorageType    volatile
}
```

In the VPLS-LDP-MIB module:

Row in vplsLdpConfigTable:

```
{
    vplsLdpConfigMacAddrWithdraw          1(true),

}
```

Row in vplsLdpPwBindTable:

```
{
    vplsLdpPwBindType                      1(mesh),
    vplsLdpPwBindMacAddressLimit          100
}
```

[6.](#) Object definitions

[6.1.](#) VPLS-GENERIC-MIB

This MIB module makes references to the following documents.

[\[RFC2578\]](#), [\[RFC2579\]](#), [\[RFC2580\]](#), [\[RFC3411\]](#),
[\[RFC2863\]](#), [\[RFC4265\]](#) and [\[RFC3813\]](#).

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

```
IMPORTS
```

```
NOTIFICATION-TYPE, MODULE-IDENTITY, OBJECT-TYPE,
Unsigned32, Counter32, transmission
    FROM SNMPv2-SMI                                -- RFC2578
```

```
MODULE-COMPLIANCE, OBJECT-GROUP, NOTIFICATION-GROUP
    FROM SNMPv2-CONF                                -- RFC2580
```

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

```
SnmpAdminString
    FROM SNMP-FRAMEWORK-MIB                         -- RFC3411
```

```
pwIndex
    FROM PW-STD-MIB
```

```
VPNIdOrZero
    FROM VPN-TC-STD-MIB                            -- RFC4265
```


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;

vpplsGenericDraft01MIB MODULE-IDENTITY

-- RFC Editor: Please replace vpplsGenericDraft01MIB with
-- vpplsGenericMIB throughout the MIB and remove
-- this note.

LAST-UPDATED "201401301200Z" -- 30 Jan 2014 12:00:00 GMT

ORGANIZATION "Layer 2 Virtual Private Networks (L2VPN)
Working Group"

CONTACT-INFO

"

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The L2VPN Working Group (email distribution l2vpn@ietf.org,
<http://www.ietf.org/html.charters/l2vpn-charter.html>)

"

DESCRIPTION

"Copyright (C) The IETF Trust (2014). The initial
version of this MIB module was published in RFC XXXX.

-- RFC Editor: Please replace XXXX with RFC number & remove
-- this note.

For full legal notices see the RFC itself or see:

<http://www.ietf.org/copyrights/ianamib.html>

This MIB module contains generic managed object definitions
for Virtual Private LAN Services as define in [[RFC4762](#)] and
[[RFC4761](#)]

This MIB module enables the use of any underlying Pseudowire
network."

-- Revision history.

REVISION

"201401301200Z" -- 30 Jan 2014 12:00:00 GMT

DESCRIPTION

"1) Changed the OID for vpplsBgpRteTargetTable from vpplsObjects.6
to vpplsObjects.5

2) Index to VplsPwBindTable is now pwIndex, not vplsPwBindIndex.
3) vplsConfigMtu increased to 9192
4) Default value for vplsConfigStorageType changed to nonvolatile.
5) vplsConfigServiceType should be a property of each PW. Deleting this object and adjusting the corresponding object indexes."
REVISION

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"200608301200Z" -- 30 August 2006 12:00:00 GMT

DESCRIPTION

"Changes from previous version:

- 1) Moved LDP Specific information to VPLS-LDP-MIB
 - 2) Created the vplsStatusTable to store status information.
- "

REVISION

"200606041200Z" -- 4 June 2006 12:00:00 GMT

DESCRIPTION "Initial version published as part of RFC YYYY."
-- RFC Editor: please replace YYYY with IANA assigned value, and
-- delete this note.

::= { transmission XXXX }

-- RFC Editor: please replace XXXX with IANA assigned value, and
-- delete this note.

-- VPLS BGP Auto-Discovery specific Textual Convention

VplsBgpRouteDistinguisher ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"Syntax for a route distinguisher. For a complete definition of a route distinguisher, see [[RFC4364](#)]. For more details on use of a route distinguisher for a VPLS service, see [[RFC4761](#)]"

REFERENCE

"[[RFC4364](#)]"

SYNTAX OCTET STRING(SIZE (0..256))

VplsBgpRouteTarget ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"Syntax for a route target. For a complete definition of a route target, see [[RFC4364](#)]."

REFERENCE

"[[RFC4364](#)]"

SYNTAX OCTET STRING(SIZE (0..256))

VplsBgpRouteTargetType ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"Used to define the type of a route target usage. Route targets can be specified to be imported, exported, or both. For a complete definition of a route target, see [[RFC4364](#)]."

REFERENCE

"[[RFC4364](#)]"

SYNTAX INTEGER { import(1), export(2), both(3) }

-- Top-level components of this MIB.

-- Notifications

vplsNotifications OBJECT IDENTIFIER
::= { vplsGenericDraft01MIB 0 }

-- Tables, Scalars

vplsObjects OBJECT IDENTIFIER
::= { vplsGenericDraft01MIB 1 }

-- Conformance

vplsConformance OBJECT IDENTIFIER
::= { vplsGenericDraft01MIB 2 }

-- PW Virtual Connection Table

vplsConfigIndexNext OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This object contains an appropriate value to be used for vplsConfigIndex when creating entries in the vplsConfigTable. The value 0 indicates that no

unassigned entries are available. To obtain the value of vplsConfigIndex for a new entry in the vplsConfigTable, the manager issues a management protocol retrieval operation to obtain the current value of vplsConfigIndex. After each retrieval operation, the agent should modify the value to reflect the next unassigned index. After a manager retrieves a value the agent will determine through its local policy when this index value will be made available for reuse."

::= { vplsObjects 1 }

vplsConfigTable OBJECT-TYPE

SYNTAX SEQUENCE OF VplsConfigEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This table specifies information for configuring and monitoring Virtual Private Lan Services(VPLS)."

::= { vplsObjects 2 }

vplsConfigEntry OBJECT-TYPE

SYNTAX VplsConfigEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A row in this table represents a Virtual Private Lan Service(VPLS) in a packet network. It is indexed by vplsConfigIndex, which uniquely identifies a single VPLS.

A row is created via SNMP or by the agent if a VPLS service is created by a non-SNMP application or due to the Auto-Discovery process.

All of the read-create objects values except vplsConfigSignalingType can be changed when vplsConfigRowStatus is in the active(1) state. Changes for vplsConfigSignalingType are only allowed

```

        when the vplsConfigRowStatus is in notInService(2) or
        notReady(3) states.
    "
INDEX          { vplsConfigIndex }
::= { vplsConfigTable 1 }

VplsConfigEntry ::=
    SEQUENCE {
        vplsConfigIndex          Unsigned32,
        vplsConfigName           SnmpAdminString,
        vplsConfigDescr         SnmpAdminString,
        vplsConfigAdminStatus    INTEGER,
        vplsConfigMacLearning    TruthValue,
        vplsConfigDiscardUnknownDest TruthValue,
        vplsConfigMacAging       TruthValue,
        vplsConfigFwdFullHighWatermark Unsigned32,
        vplsConfigFwdFullLowWatermark Unsigned32,
        vplsConfigRowStatus      RowStatus,
        vplsConfigMtu            Unsigned32,
        vplsConfigVpnId          VPNIIdOrZero,
        vplsConfigStorageType    StorageType,
        vplsConfigSignalingType  INTEGER
    }

vplsConfigIndex OBJECT-TYPE
    SYNTAX      Unsigned32 (1..2147483647)
    MAX-ACCESS  not-accessible

```

```

STATUS          current
DESCRIPTION
    "Unique index for the conceptual row identifying
    a VPLS service."
::= { vplsConfigEntry 1 }

vplsConfigName OBJECT-TYPE
    SYNTAX      SnmpAdminString
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "A textual name of the VPLS.
        If there is no local name, or this object is

```

otherwise not applicable, then this object MUST
contain a zero-length octet string."
DEFVAL { "" }
::= { vplsConfigEntry 2 }

vplsConfigDescr OBJECT-TYPE
SYNTAX SnmpAdminString
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"A textual string containing information about the
VPLS service. If there is no information for this VPLS
service, then this object MUST contain a zero-length
octet string."
DEFVAL { "" }
::= { vplsConfigEntry 3 }

vplsConfigAdminStatus OBJECT-TYPE
SYNTAX INTEGER {
up(1),
down(2),
testing(3) -- in some test mode
}
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"The desired administrative state of the VPLS
service. If the administrative status of the
VPLS service is changed to enabled then this
service is able to utilize pseudowires to
perform the tasks of a VPLS service.
The testing(3) state indicates that no operational
packets can be passed. "
DEFVAL { down }

::= { vplsConfigEntry 4 }

vplsConfigMacLearning OBJECT-TYPE
SYNTAX TruthValue
MAX-ACCESS read-create

```

STATUS          current
DESCRIPTION
    "This object specifies if MAC Learning is enabled
    in this service. If this object is true then MAC
    Learning is enabled. If false, then MAC Learning is
    disabled."
DEFVAL          { true }
::= { vplsConfigEntry 6 }

vplsConfigDiscardUnknownDest OBJECT-TYPE
SYNTAX          TruthValue
MAX-ACCESS      read-create
STATUS          current
DESCRIPTION
    "If the value of this object is 'true', then frames
    received with an unknown destination MAC are discarded
    in this VPLS. If 'false', then the packets are
    processed."
DEFVAL          { false }
::= { vplsConfigEntry 7 }

vplsConfigMacAging OBJECT-TYPE
SYNTAX          TruthValue
MAX-ACCESS      read-create
STATUS          current
DESCRIPTION
    "If the value of this object is 'true'
    then the MAC aging process is enabled in
    this VPLS. If 'false', then the MAC aging process
    is disabled"
DEFVAL          { true }
::= { vplsConfigEntry 8 }

vplsConfigFwdFullHighWatermark OBJECT-TYPE
SYNTAX          Unsigned32 (0..100)
UNITS           "percentage"
MAX-ACCESS      read-create
STATUS          current
DESCRIPTION
    "This object specifies the utilization of the
    forwarding database for this VPLS instance at
    which the vplsFwdFullAlarmRaised notification
    will be sent."

```

```
DEFVAL          { 95 }  
::= { vplsConfigEntry 10 }
```

vplsConfigFwdFullLowWatermark OBJECT-TYPE

```
SYNTAX          Unsigned32 (0..100)
```

```
UNITS           "percentage"
```

```
MAX-ACCESS      read-create
```

```
STATUS          current
```

DESCRIPTION

"This object specifies the utilization of the forwarding database for this VPLS instance at which the vplsFwdFullAlarmCleared notification will be sent."

```
DEFVAL          { 90 }
```

```
::= { vplsConfigEntry 11 }
```

vplsConfigRowStatus OBJECT-TYPE

```
SYNTAX          RowStatus
```

```
MAX-ACCESS      read-create
```

```
STATUS          current
```

DESCRIPTION

"For creating, modifying, and deleting this row.

All other objects in this row must be set to valid values before this object can be set to active(1).

None of the read-create objects in the conceptual rows may be changed when this object is in the active(1) state.

If this object is set to destroy(6) or deleted by the agent, all associated entries in the vplsPWBindTable, vplsBGPRTeTargetTable and vplsBgpVETable shall be deleted."

```
::= { vplsConfigEntry 12 }
```

vplsConfigMtu OBJECT-TYPE

```
SYNTAX          Unsigned32 (64..9192)
```

```
MAX-ACCESS      read-create
```

```
STATUS          current
```

DESCRIPTION

"The value of this object specifies the MTU of this vpls instance. This can be used to limit the MTU to a value lower than the MTU supported by the associated Pseudowires"

```
DEFVAL          { 1518 }
```

```
::= { vplsConfigEntry 13 }
```


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vplsConfigVpnId OBJECT-TYPE

SYNTAX VPNIIdOrZero

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"This objects indicates the IEEE 802-1990
VPN ID of the associated VPLS service."

::= { vplsConfigEntry 14 }

vplsConfigStorageType OBJECT-TYPE

SYNTAX StorageType

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"This variable indicates the storage type for this row."

DEFVAL { nonVolatile }

::= { vplsConfigEntry 15 }

vplsConfigSignalingType OBJECT-TYPE

SYNTAX INTEGER {
ldp(1),
bgp(2),
none(3)

}

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"Desired signaling type of the VPLS service.

If the value of this object is ldp(1), then a
corresponding entry in vplsLdpConfigTable is required.

If the value of this object is bgp(2), then a
corresponding entry in vplsBgpConfigTable is required.

If the value of this object is none(3), then it
indicates a static configuration of PW labels."

DEFVAL { none }

```
::= { vplsConfigEntry 16 }
```

```
-- VPLS Status table
```

```
vplsStatusTable OBJECT-TYPE
```

```
    SYNTAX          SEQUENCE OF VplsStatusEntry
    MAX-ACCESS      not-accessible
    STATUS           current
```

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```
DESCRIPTION
```

```
    "This table provides information for monitoring
    Virtual Private Lan Services (VPLS).
    "
```

```
::= { vplsObjects 3 }
```

```
vplsStatusEntry OBJECT-TYPE
```

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

```
DESCRIPTION
```

```
    "A row in this table represents a Virtual Private Lan
    Service(VPLS) in a packet network. It is indexed by
    vplsConfigIndex, which uniquely identifies a single VPLS.
```

```
    A row in this table is automatically created by the agent
    when a VPLS service is first set to active.
```

```
    "
```

```
AUGMENTS          { vplsConfigEntry }
```

```
::= { vplsStatusTable 1 }
```

```
VplsStatusEntry ::=
```

```
    SEQUENCE {
        vplsStatusOperStatus          INTEGER,
        vplsStatusPeerCount           Counter32
    }
```

```
vplsStatusOperStatus OBJECT-TYPE
```

```
    SYNTAX          INTEGER {
                        other(0),
                        up(1),
                        down(2)
    }
```

```

    }
    MAX-ACCESS      read-only
    STATUS          current
    DESCRIPTION
        "The current operational state of this VPLS Service."
    ::= { vplsStatusEntry 1 }

vplsStatusPeerCount OBJECT-TYPE
    SYNTAX          Counter32
    MAX-ACCESS      read-only
    STATUS          current
    DESCRIPTION
        "This objects specifies the number of peers
        (pseudowires) present in this VPLS instance."
    ::= { vplsStatusEntry 2 }

```

-- VPLS PW Binding Table

```

vplsPwBindTable OBJECT-TYPE
    SYNTAX          SEQUENCE OF VplsPwBindEntry
    MAX-ACCESS      not-accessible
    STATUS          current
    DESCRIPTION
        "This table provides an association between a
        VPLS service and the corresponding pseudowires.
        A service can have more than one pseudowire
        association. Pseudowires are defined in
        the pwTable"
    ::= { vplsObjects 4 }

vplsPwBindEntry OBJECT-TYPE
    SYNTAX          VplsPwBindEntry
    MAX-ACCESS      not-accessible
    STATUS          current
    DESCRIPTION
        "Each row represents an association between a
        VPLS instance and a pseudowire
        defined in the pwTable. Each index is unique
        in describing an entry in this table. However
        both indexes are required to define the one

```

to many association of service to pseudowire.

Entries in this table may be created or deleted through SNMP, as side-effects of console or other non-SNMP management commands, or upon learning via autodiscovery.

It is optional for the agent to allow entries to be created that point to non-existent entries in vplsConfigTable."

```
INDEX { vplsConfigIndex, pwIndex }  
::= { vplsPwBindTable 1 }
```

```
VplsPwBindEntry ::=  
  SEQUENCE {  
    vplsPwBindConfigType      INTEGER,  
    vplsPwBindType            INTEGER,  
    vplsPwBindRowStatus       RowStatus,  
    vplsPwBindStorageType     StorageType  
  }
```

```
vplsPwBindConfigType OBJECT-TYPE  
SYNTAX                INTEGER {
```

```
                                manual      (1),  
                                autodiscovery (2)  
                                }  
MAX-ACCESS      read-create  
STATUS          current  
DESCRIPTION  
  "The value of this object indicates  
  whether the Pseudo Wire binding was created  
  via SNMP/Console or via Auto-Discovery.  
  
  The value of this object must be  
  specified when the row is created and cannot  
  be changed while the row status is active(1)"  
::= { vplsPwBindEntry 1 }
```

```
vplsPwBindType OBJECT-TYPE
```

```

SYNTAX          INTEGER {
                        mesh (1),
                        spoke (2)
                    }
MAX-ACCESS      read-create
STATUS          current
DESCRIPTION
    "The value of this object indicates
    whether the pseudowire binding is of
    type mesh or spoke.

    The value of this object must be
    specified when the row is created and cannot
    be changed while the row status is active(1)"
::= { vplsPwBindEntry 2 }

```

vplsPwBindRowStatus OBJECT-TYPE

```

SYNTAX          RowStatus
MAX-ACCESS      read-create
STATUS          current
DESCRIPTION

```

"For creating, modifying, and deleting this row.

All other objects in this row must be set to valid values before this object can be set to active(1).

None of the read-create objects in the conceptual rows may be changed when this object is in the active(1) state.

If autodiscovered entries are deleted they would likely re-appear in the next autodiscovery interval."

```

::= { vplsPwBindEntry 3 }

```

vplsPwBindStorageType OBJECT-TYPE

```

SYNTAX          StorageType
MAX-ACCESS      read-create
STATUS          current
DESCRIPTION

```

"This variable indicates the storage type for this row."

```

DEFVAL { volatile }
::= { vplsPwBindEntry 4 }

```

```
-- vplsBgpADConfigTable
```

```

vplsBgpADConfigTable OBJECT-TYPE
    SYNTAX          SEQUENCE OF VplsBgpADConfigEntry
    MAX-ACCESS      not-accessible
    STATUS          current
    DESCRIPTION
        "This table specifies information for configuring
        BGP Auto-Discovery parameters for a given VPLS service.
        "
    ::= { vplsObjects 5 }

```

```

vplsBgpADConfigEntry OBJECT-TYPE
    SYNTAX          VplsBgpADConfigEntry
    MAX-ACCESS      not-accessible
    STATUS          current
    DESCRIPTION
        "A row in this table indicates that BGP based Auto-
        Discovery is in use for this instance of VPLS.
        A row in this table is indexed by vplsConfigIndex, which
        uniquely identifies a single VPLS.

```

Entries in this table may be created or deleted through SNMP, as side-effects of console or other non-SNMP management commands, or upon learning via autodiscovery.

All of the read-create objects can be changed when vplsBGPADConfigRowStatus is in active(1) state."

```

INDEX          { vplsConfigIndex }
::= { vplsBgpADConfigTable 1 }

```

```

VplsBgpADConfigEntry ::=
    SEQUENCE {
        vplsBgpADConfigRouteDistinguisher VplsBgpRouteDistinguisher,
        vplsBgpADConfigPrefix              Unsigned32,
        vplsBgpADConfigVplsId              VplsBgpRouteDistinguisher,

```

```

    vplsBgpADConfigRowStatus          RowStatus,
    vplsBgpADConfigStorageType        StorageType
}

vplsBgpADConfigRouteDistinguisher OBJECT-TYPE
    SYNTAX          VplsBgpRouteDistinguisher
    MAX-ACCESS      read-create
    STATUS          current
    DESCRIPTION
        " The route distinguisher for this VPLS. See [RFC4364]
        for a complete definition of a route distinguisher.
        for more details on use of a route distinguisher
        for a VPLS service, see [RFC4761]. When not configured, the
        value is derived from the lower 6 bytes of
        vplsBgpADConfigVplsId.
        "
        ::= { vplsBgpADConfigEntry 1 }

vplsBgpADConfigPrefix          OBJECT-TYPE
    SYNTAX          Unsigned32
    MAX-ACCESS      read-create
    STATUS          current
    DESCRIPTION
        " In case of auto-discovery the default prefix advertised
        is the IP address of the loopback. In case the user wants
        to override the loopback address, vplsBgpADConfigPrefix
        should be set. When this value is non-zero this value is
        used along with vplsBgpADConfigRouteDistinguisher in the
        NLRI, see [RFC6074]
        "
    DEFVAL { 0 }
    ::= { vplsBgpADConfigEntry 2 }

vplsBgpADConfigVplsId          OBJECT-TYPE
    SYNTAX          VplsBgpRouteDistinguisher
    MAX-ACCESS      read-create
    STATUS          current
    DESCRIPTION
        " VplsId is a unique identifier for all VSIs belonging to

```

```

"
::= { vplsBgpADConfigEntry 3 }

vplsBgpADConfigRowStatus OBJECT-TYPE
    SYNTAX          RowStatus
    MAX-ACCESS      read-create
    STATUS          current
    DESCRIPTION
        "For creating, modifying, and deleting this row.

        All other objects in this row must be set to valid
        values before this object can be set to active(1).

        None of the read-create objects in the
        conceptual rows may be changed when this
        object is in the active(1) state."
    ::= { vplsBgpADConfigEntry 4 }

vplsBgpADConfigStorageType OBJECT-TYPE
    SYNTAX          StorageType
    MAX-ACCESS      read-create
    STATUS          current
    DESCRIPTION
        "This variable indicates the storage type for this row."
    DEFVAL { nonVolatile }
    ::= { vplsBgpADConfigEntry 5 }

-- vplsBgpRteTargetTable

vplsBgpRteTargetTable OBJECT-TYPE
    SYNTAX          SEQUENCE OF VplsBgpRteTargetEntry
    MAX-ACCESS      not-accessible
    STATUS          current
    DESCRIPTION
        " This table specifies the list of Route Targets
        imported or exported by BGP during auto-discovery of VPLS.
        "
    ::= { vplsObjects 6 }

vplsBgpRteTargetEntry OBJECT-TYPE
    SYNTAX          VplsBgpRteTargetEntry
    MAX-ACCESS      not-accessible
    STATUS          current
    DESCRIPTION
        "An entry in this table specifies the value of the
        Route Target being used by BGP. Depending on the value
        of vplsBgpRteTargetType a Route Target might be exported or

```


imported or both. Every VPLS which uses auto-discovery for finding peer nodes can import and export multiple Route Targets. This representation allows support for hierarchical VPLS.

Entries in this table may be created or deleted through SNMP, as side-effects of console or other non-SNMP management commands, or upon learning via autodiscovery.

It is optional for the agent to allow entries to be created that point to non-existent entries in vplsConfigTable."

```
INDEX      { vplsConfigIndex, vplsBgpRteTargetIndex }
 ::= { vplsBgpRteTargetTable 1 }
```

```
VplsBgpRteTargetEntry ::=
```

```
SEQUENCE {
    vplsBgpRteTargetIndex      Unsigned32,
    vplsBgpRteTargetRTType    VplsBgpRouteTargetType,
    vplsBgpRteTargetRT        VplsBgpRouteTarget,
    vplsBgpRteTargetRowStatus  RowStatus,
    vplsBgpRteTargetStorageType StorageType
}
```

```
vplsBgpRteTargetIndex  OBJECT-TYPE
```

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

```
DESCRIPTION
```

```
"This index along with vplsConfigIndex, identifies one
entry in the vplsBgpRteTargetTable. By keeping
vplsConfigIndex constant and using new value of
vplsBgpRteTargetIndex users can configure multiple Route
Targets for the same VPLS.
"
```

```
::= { vplsBgpRteTargetEntry 1 }
```

```
vplsBgpRteTargetRTType OBJECT-TYPE
```

```
SYNTAX      VplsBgpRouteTargetType
MAX-ACCESS  read-create
STATUS      current
```

```
DESCRIPTION
```

```
" Used to define the type of a route target usage.
Route targets can be specified to be imported,
```

exported, or both. For a complete definition of a route target, see [[RFC4364](#)]."
::= { vplsBgpRteTargetEntry 2 }

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vplsBgpRteTargetRT OBJECT-TYPE
SYNTAX VplsBgpRouteTarget
MAX-ACCESS read-create
STATUS current
DESCRIPTION
" The route target associated with the VPLS service.
For more details on use of route targets
for a VPLS service, see [[RFC4761](#)]
"
::= { vplsBgpRteTargetEntry 3 }

vplsBgpRteTargetRowStatus OBJECT-TYPE
SYNTAX RowStatus
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"This variable is used to create, modify, and/or
delete a row in this table.

All other objects in this row must be set to valid
values before this object can be set to active(1).

When a row in this table is in active(1) state, no
objects in that row can be modified.

If autodiscovered entries are deleted they would
likely re-appear in the next autodiscovery interval."
::= { vplsBgpRteTargetEntry 4 }

vplsBgpRteTargetStorageType OBJECT-TYPE
SYNTAX StorageType
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"This variable indicates the storage type for this row."
DEFVAL { volatile }

```
::= { vplsBgpRteTargetEntry 5 }
```

vplsStatusNotifEnable OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"If this object is set to true(1), then it enables the emission of vplsStatusChanged notification, otherwise this notification is not

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emitted."

REFERENCE

"See also [[RFC3413](#)] for explanation that notifications are under the ultimate control of the MIB module in this document."

DEFVAL { false }

::= { vplsObjects 7 }

vplsNotificationMaxRate OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"This object indicates the maximum number of notifications issued per second. If events occur more rapidly, the implementation may simply fail to emit these notifications during that period, or may queue them until an appropriate time. A value of 0 means no throttling is applied and events may be notified at the rate at which they occur."

DEFVAL { 0 }

::= { vplsObjects 8 }

-- VPLS Service Notifications

vplsStatusChanged NOTIFICATION-TYPE

OBJECTS {

vplsConfigVpnId,

vplsConfigAdminStatus,

vplsStatusOperStatus

```

}
STATUS          current
DESCRIPTION
    "The vplsStatusChanged notification is generated
    when there is a change in the administrative or
    operating status of a VPLS service.

    The object instances included in the notification are
    the ones associated with the VPLS service whose
    status has changed."
::= { vplsNotifications 1 }

vplsFwdFullAlarmRaised NOTIFICATION-TYPE
OBJECTS {
    vplsConfigVpnId,
    vplsConfigFwdFullHighWatermark,
    vplsConfigFwdFullLowWatermark
}
STATUS          current

```

```

DESCRIPTION
    "The vplsFwdFullAlarmRaised notification is
    generated when the utilization of the Forwarding
    database is above the value specified by
    vplsConfigFwdFullHighWatermark.
    The object instances included in the notification are
    the ones associated with the VPLS service which has
    exceeded the threshold."
::= { vplsNotifications 2 }

vplsFwdFullAlarmCleared NOTIFICATION-TYPE
OBJECTS {
    vplsConfigVpnId,
    vplsConfigFwdFullHighWatermark,
    vplsConfigFwdFullLowWatermark
}
STATUS          current
DESCRIPTION
    "The vplsFwdFullAlarmCleared notification is
    generated when the utilization of the Forwarding
    database is below the value specified by

```

```
vplsConfigFwdFullLowWatermark.
```

```
The object instances included in the notification are  
the ones associated with the VPLS service which has  
fallen below the threshold."
```

```
::= { vplsNotifications 3 }
```

```
-- Conformance Section
```

```
vplsCompliances
```

```
OBJECT IDENTIFIER ::= { vplsConformance 1 }
```

```
-- Compliance requirement for fully compliant implementations
```

```
vplsModuleFullCompliance MODULE-COMPLIANCE
```

```
STATUS current
```

```
DESCRIPTION
```

```
"Compliance requirement for implementations that  
provide full support for VPLS-GENERIC-MIB.  
Such devices can then be monitored and configured using  
this MIB module."
```

```
MODULE -- this module
```

```
MANDATORY-GROUPS {  
    vplsGroup,  
    vplsPwBindGroup,  
    vplsNotificationGroup  
}
```

```
::= { vplsCompliances 1 }
```

```
-- Compliance requirement for read-only implementations.
```

```
vplsModuleReadOnlyCompliance MODULE-COMPLIANCE
```

```
STATUS current
```

```
DESCRIPTION
```

```
"Compliance requirement for implementations that only  
provide read-only support for VPLS-GENERIC-MIB.  
Such devices can then be monitored but cannot be  
configured using this MIB modules."
```

MODULE -- this module

```
MANDATORY-GROUPS {
    vplsGroup,
    vplsPwBindGroup,
    vplsNotificationGroup
}

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

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

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

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

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

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

OBJECT vplsConfigFwdFullHighWatermark
MIN-ACCESS read-only
DESCRIPTION

 "Write access is not required."

OBJECT vplsConfigFwdFullLowWatermark
MIN-ACCESS read-only
DESCRIPTION

 "Write access is not required."

OBJECT vplsConfigRowStatus
MIN-ACCESS read-only
DESCRIPTION

 "Write access is not required."

OBJECT vplsConfigMtu
MIN-ACCESS read-only
DESCRIPTION

 "Write access is not required."

OBJECT vplsPwBindConfigType
MIN-ACCESS read-only
DESCRIPTION

 "Write access is not required."

OBJECT vplsPwBindType
MIN-ACCESS read-only
DESCRIPTION

 "Write access is not required."

OBJECT vplsPwBindRowStatus
MIN-ACCESS read-only
DESCRIPTION

 "Write access is not required."

::= { vplsCompliances 2 }

-- Units of conformance.

vplsGroups

 OBJECT IDENTIFIER ::= { vplsConformance 2 }

```

vplsGroup OBJECT-GROUP
    OBJECTS {
        vplsConfigName,
        vplsBgpADConfigRouteDistinguisher,
        vplsBgpRteTargetRTType,
        vplsBgpRteTargetRT,
        vplsBgpRteTargetRowStatus,
        vplsBgpRteTargetStorageType,
        vplsBgpADConfigPrefix,
        vplsBgpADConfigVplsId,
        vplsBgpADConfigRowStatus,
        vplsBgpADConfigStorageType,
        vplsConfigDescr,
        vplsConfigAdminStatus,
        vplsConfigMacLearning,
        vplsConfigDiscardUnknownDest,
        vplsConfigMacAging,
        vplsConfigVpnId,
        vplsConfigFwdFullHighWatermark,
        vplsConfigFwdFullLowWatermark,
        vplsConfigRowStatus,
        vplsConfigIndexNext,
        vplsConfigMtu,
        vplsConfigStorageType,
        vplsConfigSignalingType,
        vplsStatusOperStatus,
        vplsStatusPeerCount,
        vplsStatusNotifEnable,
        vplsNotificationMaxRate
    }
    STATUS current
    DESCRIPTION
        "The group of objects supporting
        management of L2VPN VPLS services"
    ::= { vplsGroups 1 }

```

```

vplsPwBindGroup OBJECT-GROUP
    OBJECTS {
        vplsPwBindConfigType,
        vplsPwBindType,
        vplsPwBindRowStatus,
        vplsPwBindStorageType
    }
    STATUS current
    DESCRIPTION
        "The group of objects supporting
        management of

```


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```
        Pseudo Wire (PW) Binding to VPLS."
 ::= { vplsGroups 2 }

vplsNotificationGroup NOTIFICATION-GROUP
    NOTIFICATIONS {
        vplsStatusChanged,
        vplsFwdFullAlarmRaised,
        vplsFwdFullAlarmCleared
    }
    STATUS          current
    DESCRIPTION
        "The group of notifications supporting
         the Notifications generated for
         VPLS Services"
 ::= { vplsGroups 3 }

END
```

6.2. VPLS-LDP-MIB Object definitions

This MIB module makes references to the following documents.
[[RFC2578](#)], [[RFC2579](#)], [[RFC2580](#)], [[RFC3411](#)],
[[RFC2863](#)], [[RFC4265](#)] and [[RFC3813](#)].

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

IMPORTS
    MODULE-IDENTITY, OBJECT-TYPE, NOTIFICATION-TYPE,
    Unsigned32, transmission
        FROM SNMPv2-SMI
        -- RFC2578

    MODULE-COMPLIANCE, OBJECT-GROUP, NOTIFICATION-GROUP
        FROM SNMPv2-CONF
        -- RFC2580

    TruthValue
        FROM SNMPv2-TC
        -- RFC2579

    pwIndex, pwID
        FROM PW-STD-MIB
```

```
vpplsConfigIndex, vpplsConfigName
FROM VPLS-GENERIC-MIB;
```

```
vpplsLdpDraft01MIB MODULE-IDENTITY
-- RFC Editor: Please replace vpplsLdpDraft01MIB with
--          vpplsLdpMIB throughout the MIB and remove
--          this note.
```

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```
LAST-UPDATED "201401301200Z" -- 30 Jan 2014 12:00:00 GMT
ORGANIZATION "Layer 2 Virtual Private Networks (L2VPN)
              Working Group"
```

CONTACT-INFO

"

```
Rohit Mediratta
Email: Rohit.mediratta@alcatel-lucent.com
```

```
The L2VPN Working Group (email distribution l2vpn@ietf.org,
http://www.ietf.org/html.charters/l2vpn-charter.html)
```

"

DESCRIPTION

```
"Copyright (C) The IETF Trust (2014). The initial
version of this MIB module was published in RFC XXXX.
```

```
-- RFC Editor: Please replace XXXX with RFC number & remove
--          this note.
```

```
For full legal notices see the RFC itself or see:
http://www.ietf.org/copyrights/ianamib.html
```

```
This MIB module contains managed object definitions for
LDP signaled Virtual Private LAN Services as in
[RFC4762]
```

```
This MIB module enables the use of any underlying pseudowire
network. "
```

```
-- Revision history.
REVISION
```

"201401230200Z" -- 30 Jan 2014 12:00:00 GMT

DESCRIPTION "Editorial changes."

REVISION

"200608301200Z" -- 30 Aug 2006 12:00:00 GMT

DESCRIPTION "Initial version published as part of RFC YYYY."

-- RFC Editor: please replace YYYY with IANA assigned value, and
-- delete this note.

::= { transmission XXXX }

-- RFC Editor: please replace XXXX with IANA assigned value, and
-- delete this note.

-- Top-level components of this MIB.

-- Notifications

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vpplsLdpNotifications OBJECT IDENTIFIER

::= { vpplsLdpDraft01MIB 0 }

-- Tables, Scalars

vpplsLdpObjects OBJECT IDENTIFIER

::= { vpplsLdpDraft01MIB 1 }

-- Conformance

vpplsLdpConformance OBJECT IDENTIFIER

::= { vpplsLdpDraft01MIB 2 }

vpplsLdpConfigTable OBJECT-TYPE

SYNTAX SEQUENCE OF VpplsLdpConfigEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This table specifies information for configuring
and monitoring LDP specific parameters for
Virtual Private Lan Services (VPLS)."

::= { vpplsLdpObjects 1 }

vpplsLdpConfigEntry OBJECT-TYPE

SYNTAX VpplsLdpConfigEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A row in this table represents LDP specific information for Virtual Private Lan Services (VPLS) in a packet network. It is indexed by vplsConfigIndex, which uniquely identifies a single VPLS.

A row is automatically created when a VPLS service is configured using LDP signaling.

All of the writable objects values can be changed when vplsConfigRowStatus is in the active(1) state.

"

INDEX { vplsConfigIndex }
::= { vplsLdpConfigTable 1 }

```
VplsLdpConfigEntry ::=
    SEQUENCE {
        vplsLdpConfigMacAddrWithdraw          TruthValue
    }

vplsLdpConfigMacAddrWithdraw OBJECT-TYPE
    SYNTAX          TruthValue
    MAX-ACCESS      read-write
    STATUS          current
    DESCRIPTION
        "This object specifies if MAC address withdrawal
         is enabled in this service. If this object is true then
         MAC address withdrawal is enabled. If false,
         then MAC address withdrawal is disabled."
    DEFVAL          { true }
    ::= { vplsLdpConfigEntry 1 }

-- VPLS LDP PW Binding Table

vplsLdpPwBindTable OBJECT-TYPE
    SYNTAX          SEQUENCE OF VplsLdpPwBindEntry
    MAX-ACCESS      not-accessible
    STATUS          current
    DESCRIPTION
```

"This table provides LDP specific information for an association between a VPLS service and the corresponding pseudowires. A service can have more than one pseudowire association. Pseudowires are defined in the pwTable."

```
::= { vplsLdpObjects 2 }
```

vplsLdpPwBindEntry OBJECT-TYPE

SYNTAX VplsLdpPwBindEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Each row represents an association between a VPLS instance and one or more pseudowires defined in the pwTable. Each index is unique in describing an entry in this table. However both indexes are required to define the one to many association of service to pseudowire.

An entry in this table is instantiated only when LDP signaling is used to configure VPLS service.

Each entry in this table provides LDP specific information for the VPLS represented by

vplsConfigIndex."

INDEX { vplsConfigIndex, pwIndex }

```
::= { vplsLdpPwBindTable 1 }
```

VplsLdpPwBindEntry ::=

SEQUENCE {

vplsLdpPwBindMacAddressLimit Unsigned32

}

vplsLdpPwBindMacAddressLimit OBJECT-TYPE

SYNTAX Unsigned32 (0..4294967295)

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The value of this object specifies the maximum number of learned and static entries allowed in the

```

        Forwarding database for this PW Binding. The value 0
        means there is no limit for this PW Binding."
    DEFVAL          { 0 }
    ::= { vplsLdpPwBindEntry 1 }

-- VPLS LDP Service Notifications

vplsLdpPwBindMacTableFull NOTIFICATION-TYPE
    OBJECTS {
        vplsConfigName,
        pwID
    }
    STATUS          current
    DESCRIPTION
        "The vplsLdpPwBindMacTableFull notification is generated
        when the number of learned MAC-Addresses increases to
        the value specified in vplsLdpPwBindMacAddressLimit."
    ::= { vplsLdpNotifications 1 }

-- Conformance Section

vplsLdpCompliances
    OBJECT IDENTIFIER ::= { vplsLdpConformance 1 }

-- Compliance requirement for fully compliant implementations

vplsLdpModuleFullCompliance MODULE-COMPLIANCE
    STATUS current
    DESCRIPTION
        "Compliance requirement for implementations that

```

provide full support for VPLS-LDP-MIB.
Such devices can then be monitored and configured using
this MIB module."

MODULE -- this module

```

MANDATORY-GROUPS {
    vplsLdpGroup,

```

```

        vplsLdpNotificationGroup
    }

    ::= { vplsLdpCompliances 1 }

-- Compliance requirement for read-only implementations.

vplsLdpModuleReadOnlyCompliance MODULE-COMPLIANCE
    STATUS current
    DESCRIPTION
        "Compliance requirement for implementations that only
        provide read-only support for VPLS-LDP-MIB.
        Such devices can then be monitored but cannot be
        configured using this MIB modules."

    MODULE -- this module

        MANDATORY-GROUPS {
            vplsLdpGroup,
            vplsLdpNotificationGroup
        }

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

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

    ::= { vplsLdpCompliances 2 }

-- Units of conformance.

vplsLdpGroups
    OBJECT IDENTIFIER ::= { vplsLdpConformance 2 }

```

```

vplsLdpGroup OBJECT-GROUP
    OBJECTS {
        vplsLdpConfigMacAddrWithdraw,
        vplsLdpPwBindMacAddressLimit
    }
    STATUS current
    DESCRIPTION
        "The group of objects supporting
        management of L2VPN VPLS services using LDP."
    ::= { vplsLdpGroups 1 }

vplsLdpNotificationGroup NOTIFICATION-GROUP
    NOTIFICATIONS {
        vplsLdpPwBindMacTableFull
    }
    STATUS current
    DESCRIPTION
        "The group of notifications supporting
        the Notifications generated for
        VPLS Ldp Service"
    ::= { vplsLdpGroups 2 }

END

```

6.3. VPLS-BGP-MIB Object definitions

```

VPLS-BGP-MIB DEFINITIONS ::= BEGIN

IMPORTS
MODULE-IDENTITY, OBJECT-TYPE,
    Unsigned32, transmission
    FROM SNMPv2-SMI
    FROM SNMPv2-CONF
    RowStatus, StorageType
    FROM SNMPv2-TC
    SnmpAdminString
    FROM SNMP-FRAMEWORK-MIB
    pwIndex
    FROM PW-STD-MIB

vplsConfigIndex

```

-- [RFC2578](#)

-- [RFC2580](#)

-- [RFC2579](#)

-- [RFC3411](#)

-- [RFC5601](#)

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FROM VPLS-GENERIC-MIB

;

vplsBgpDraft01MIB MODULE-IDENTITY

-- RFC Editor: Please replace vplsBgpDraft01MIB with
-- vplsBgpMIB throughout the MIB and remove
-- this note.

LAST-UPDATED "201401301200Z" -- 30 Jan 2014 12:00:00 GMT

ORGANIZATION "Layer 2 Virtual Private Networks (L2VPN)
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"

DESCRIPTION

"Copyright (C) The IETF Trust (2014). The initial
version of this MIB module was published in RFC XXXX.

-- RFC Editor: Please replace XXXX with RFC number & remove
-- this note.

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This MIB module contains managed object definitions for
BGP signaled Virtual Private LAN Services as in
[[RFC4761](#)]

This MIB module enables the use of any underlying pseudowire
network. "

-- Revision history.

REVISION

"201401301200Z" -- 30 Jan 2014 12:00:00 GMT

DESCRIPTION "Initial version published as part of RFC YYYY."

-- RFC Editor: please replace YYYY with IANA assigned value, and
-- delete this note.

```

::= { transmission XXXX }
-- RFC Editor: please replace XXXX with IANA assigned value, and
-- delete this note.

-- Top-level components of this MIB.

```

VPLS Management Information Base

Jan, 2014

```

-- Tables, Scalars
vplsBgpObjects      OBJECT IDENTIFIER
                    ::= { vplsBgpDraft01MIB 1 }

-- Conformance
vplsBgpConformance  OBJECT IDENTIFIER
                    ::= { vplsBgpDraft01MIB 2 }

-- Vpls Bgp Config Table

vplsBgpConfigTable  OBJECT-TYPE
    SYNTAX           SEQUENCE OF VplsBgpConfigEntry
    MAX-ACCESS       not-accessible
    STATUS            current
    DESCRIPTION
        "This table specifies information for configuring
         and monitoring BGP specific parameters for
         Virtual Private LAN Services (VPLS)."
    ::= { vplsBgpObjects 1 }

vplsBgpConfigEntry  OBJECT-TYPE
    SYNTAX           VplsBgpConfigEntry
    MAX-ACCESS       not-accessible
    STATUS            current
    DESCRIPTION
        "A row in this table represents BGP specific information
         for Virtual Private LAN Services (VPLS) in a packet network.
         It is indexed by vplsConfigIndex, which uniquely
         identifies a single instance of a VPLS service.

         A row is automatically created when a VPLS service is
         created that is configured to use BGP signaling.
         All of the writable objects values can be
         changed when vplsConfigRowStatus is in the active(1)
         state.

```

```

"
INDEX          { vplsConfigIndex }
::= { vplsBgpConfigTable 1 }

```

VplsBgpConfigEntry ::=

```

SEQUENCE {
    vplsBgpConfigVERangeSize      Unsigned32
}

vplsBgpConfigVERangeSize  OBJECT-TYPE
    SYNTAX      Unsigned32 (0..65535)
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        "Specifies the size of the range of VE ids in this
        VPLS service. This number controls the size of the
        label block advertised for this VE by the PE.
        A value of 0 indicates that the range is not
        configured and the PE derives the range value
        from received advertisements from other PEs."
    DEFVAL       { 0 }
    ::= { vplsBgpConfigEntry 1 }

-- Vpls Edge Device (VE) Identifier Table

vplsBgpVETable OBJECT-TYPE
    SYNTAX      SEQUENCE OF VplsBgpVEEntry
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
        "This table associates VPLS Edge devices to a VPLS service"
    ::= { vplsBgpObjects 2 }

vplsBgpVEEntry OBJECT-TYPE
    SYNTAX      VplsBgpVEEntry
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
        "An entry in this table is created for each VE Id

```

configured on a PE for a particular VPLS service instance.

Entries in this table may be created or deleted through SNMP, as side-effects of console or other non-SNMP management commands, or upon learning via autodiscovery.

It is optional for the agent to allow entries to be created that point to non-existent entries in vplsConfigTable."

```
INDEX { vplsConfigIndex, vplsBgpVEId }  
::= { vplsBgpVETable 1 }
```

```
VplsBgpVEEntry ::= SEQUENCE {  
    vplsBgpVEId          Unsigned32,  
    vplsBgpVEName        SnmpAdminString,  
    vplsBgpVEPreference  Unsigned32,  
    vplsBgpVERowStatus   RowStatus,  
    vplsBgpVEStorageType StorageType  
}
```

vplsBgpVEId OBJECT-TYPE

SYNTAX Unsigned32 (1..65535)

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A secondary index identifying a VE within an instance of a VPLS service."

::= { vplsBgpVEEntry 1 }

vplsBgpVEName OBJECT-TYPE

SYNTAX SnmpAdminString

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"Descriptive name for the site or u-PE associated with this VE Id."

DEFVAL { "" }

::= { vplsBgpVEEntry 2 }

```

vplsBgpVEPreference OBJECT-TYPE
    SYNTAX      Unsigned32 (0..65535)
    MAX-ACCESS   read-create
    STATUS       current
    DESCRIPTION
        "Specifies the preference of the VE Id on this PE
         if the site is multi-homed and VE Id is re-used."
    DEFVAL       { 0 }
    ::= { vplsBgpVEEntry 3 }

```

```

vplsBgpVERowStatus OBJECT-TYPE
    SYNTAX      RowStatus
    MAX-ACCESS   read-create
    STATUS       current
    DESCRIPTION
        "This variable is used to create, modify, and/or
         delete a row in this table.

        All other objects in this row must be set to valid
        values before this object can be set to active(1).

```

```

        When a row in this table is in active(1) state, no
        objects in that row can be modified except
        vplsBgpSiteRowStatus."
    ::= { vplsBgpVEEntry 5 }

```

```

vplsBgpVEStorageType OBJECT-TYPE
    SYNTAX      StorageType
    MAX-ACCESS   read-create
    STATUS       current
    DESCRIPTION
        "This variable indicates the storage type for this row."
    DEFVAL { volatile }
    ::= { vplsBgpVEEntry 6 }

```

-- VPLS BGP PW Binding Table

```

vplsBgpPwBindTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF VplsBgpPwBindEntry

```

```

MAX-ACCESS      not-accessible
STATUS          current
DESCRIPTION
    "This table provides BGP specific information for
    an association between a VPLS service and the
    corresponding pseudowires. A service can have more
    than one pseudowire association. Pseudowires are
    defined in the pwTable."
::= { vplsBgpObjects 3 }

```

```

vplsBgpPwBindEntry OBJECT-TYPE
    SYNTAX          VplsBgpPwBindEntry
    MAX-ACCESS      not-accessible
    STATUS          current
    DESCRIPTION
        "Each row represents an association between a
        VPLS instance and one or more Pseudowires
        defined in the pwTable. Each index is unique
        in describing an entry in this table. However
        both indexes are required to define the one
        to many association of service to pseudowire.

        An entry in this table is instantiated only when
        BGP signaling is used to configure VPLS service.

        Each entry in this table provides BGP specific
        information for the VPLS represented by
        vplsConfigIndex."
    INDEX { vplsConfigIndex, pwIndex }
    ::= { vplsBgpPwBindTable 1 }

```

```

VplsBgpPwBindEntry ::=
    SEQUENCE {
        vplsBgpPwBindLocalVEId      Unsigned32,
        vplsBgpPwBindRemoteVEId     Unsigned32
    }
vplsBgpPwBindLocalVEId OBJECT-TYPE
    SYNTAX          Unsigned32 (1..65535)
    MAX-ACCESS      read-only
    STATUS          current

```

DESCRIPTION

"Identifies the local VE that this pseudowire
is associated with."

::= { vplsBgpPwBindEntry 1 }

vplsBgpPwBindRemoteVEId OBJECT-TYPE

SYNTAX Unsigned32 (1..65535)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Identifies the remote VE that this pseudowire
is associated with."

::= { vplsBgpPwBindEntry 2 }

-- Conformance Section

-- Compliance requirement for fully compliant implementations

vplsBgpCompliances

OBJECT IDENTIFIER ::= { vplsBgpConformance 1 }

vplsBgpModuleFullCompliance MODULE-COMPLIANCE

STATUS current

DESCRIPTION

"Compliance requirement for implementations that
provide full support for VPLS-BGP-MIB.
Such devices can then be monitored and configured using
this MIB module."

MODULE -- this module

MANDATORY-GROUPS {

vplsBgpConfigGroup,

vplsBgpVEGroup,

vplsBgpPwBindGroup

}
::= { vplsBgpCompliances 1 }

-- Compliance requirement for read-only implementations.

vplsBgpModuleReadOnlyCompliance MODULE-COMPLIANCE

STATUS current

DESCRIPTION

"Compliance requirement for implementations that only provide read-only support for VPLS-BGP-MIB. Such devices can then be monitored but cannot be configured using this MIB modules."

MODULE -- this module

MANDATORY-GROUPS {
 vplsBgpConfigGroup,
 vplsBgpVEGroup,
 vplsBgpPwBindGroup
}

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

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

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

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

::= { vplsBgpCompliances 2 }

-- Units of conformance.

vplsBgpGroups


```
OBJECT IDENTIFIER ::= { vplsBgpConformance 2 }

vplsBgpConfigGroup OBJECT-GROUP
    OBJECTS {
        vplsBgpConfigVERangeSize
    }
    STATUS          current
    DESCRIPTION
        "The group of objects supporting configuration
        of L2VPN VPLS services using BGP"
    ::= { vplsBgpGroups 1 }

vplsBgpVEGroup OBJECT-GROUP
    OBJECTS {
        vplsBgpVEName,
        vplsBgpVEPreference,
        vplsBgpVERowStatus,
        vplsBgpVEStorageType
    }
    STATUS          current
    DESCRIPTION
        "The group of objects supporting management of VPLS
        Edge devices for L2VPN VPLS services using BGP"
    ::= { vplsBgpGroups 2 }

vplsBgpPwBindGroup OBJECT-GROUP
    OBJECTS {
        vplsBgpPwBindLocalVEId,
        vplsBgpPwBindRemoteVEId
    }
    STATUS          current
    DESCRIPTION
        "The group of objects supporting management of
        Pseudo Wires for L2VPN VPLS services using BGP"
    ::= { vplsBgpGroups 3 }

END
```

7. Security Considerations

It is clear that the MIB modules described in this document in association with the PW-STD-MIB [[RFC5601](#)] are potentially useful for monitoring of VPLS capable LERs. These MIB modules can also be used for configuration of certain objects, and anything that can be configured can be incorrectly configured, with potentially undesirable results.

While the read-write and read-create objects must be protected by

secure SNMP, none of them are especially disruptive. Similarly, while the read-only objects might present privacy concerns and due consideration should be given to protecting them with secure SNMP, none of these objects contain especially sensitive information.

[8.](#) IANA Considerations

```
-- (Note to RFC-Editor:)
--   IANA is requested to root the MIB modules
--   contained in this document under the transmission subtree.
--
```

[9.](#) References

[9.1.](#) Normative References

- [RFC2119] S. Bradner, "Key Words for use in RFCs to Indicate Requirement Levels", [RFC 2119](#), [BCP 14](#), March 1997.
- [RFC2578] McCloghrie, K., Perkins, D., Schoenwaelder, J., Case, J., Rose, M., and S. Waldbusser, "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 S. Waldbusser, "Textual Conventions for SMIv2", STD 58, [RFC 2579](#), April 1999.
- [RFC2580] McCloghrie, K., Perkins, D., Schoenwaelder, J., Case, J., Rose, M., and S. Waldbusser, "Conformance Statements for SMIv2", STD 58, [RFC 2580](#), April 1999.
- [RFC3413] Levi, D., Meyer, P., and B. Stewart, "Simple Network Management Protocol (SNMP) Applications", STD 62, [RFC 3413](#), December 2002.
- [RFC3415] Wijnen, B., Presuhn, R. and K. McCloghrie, "View-based Access Control Model (VACM) for the Simple

Network Management Protocol (SNMP)", STD 62, [RFC 3415](#), December 2002.

[RFC4188] Norseth, K., and Bell, E., "Definitions of Managed Objects for Bridges", [RFC 4188](#), Sept 2006.

[RFC4265] Schliesser, B. and T. Nadeau, "Definition of Textual Conventions for Virtual Private Network (VPN) Management", [RFC 4265](#), November 2005.

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[RFC4364] Rosen, E. and Y. Rekhter, "BGP/MPLS IP Virtual Private Networks (VPNs)", [RFC 4364](#), February 2006.

[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 Kompella, V. (Editors), "Virtual Private LAN Service (VPLS) Using Label Distribution Protocol (LDP) Signaling", [RFC 4762](#), January 2007.

[RFC5601] T. Nadeau, Ed., D. Zelig, Ed., "Pseudowire (PW) Management Information Base (MIB)", [RFC 5601](#), July 2009.

[9.2](#). Informative References

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

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

[RFC3411] Harrington, D., Presuhn, R., and B. Wijnen, "An Architecture for Describing Simple Network Management Protocol (SNMP) Management Frameworks", STD 62, [RFC 3411](#),

December 2002.

[RFC3813] Srinivasan, C., Viswanathan, A. and Nadeau, T.,
"Multiprotocol Label Switching (MPLS) Label Switching
Router (LSR) Management Information Base",
[RFC 3813](#), June 2004

[SNMP-CONTEXT-MAP-MIB] SNMP Context Mapping MIB, AS, Kiran Koushik,
Nadeau, T, [draft-kkoushik-snmp-context-map-mib](#).

[RFC3985] Bryant, S. and P. Pate, "Pseudo Wire Emulation Edge-to-
Edge (PWE3) Architecture", [RFC 3985](#), March 2005.

[RFC6074] E. Rosen et. al., "Provisioning, Autodiscovery, and
Signaling in L2VPNs", [RFC 6074](#), January 2011.

[10](#). Acknowledgments

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