

L2VPN Working Group
Internet Draft
Intended status: Standards Track
Expires: Aug 2013

Thomas D. Nadeau (Ed.)
Juniper Networks

A S Kiran Koushik (Ed.)
Cisco Systems, Inc.

Rohit Mediratta (Ed.)
Alcatel-Lucent

February 22, 2013

Virtual Private Lan Services (VPLS) Management Information Base

[draft-ietf-l2vpn-vpls-mib-08.txt](#)

Status of this Memo

This Internet-Draft is submitted in full conformance with the provisions of [BCP 78](#) and [BCP 79](#).

This document may contain material from IETF Documents or IETF Contributions published or made publicly available before November 10, 2008. The person(s) controlling the copyright in some of this material may not have granted the IETF Trust the right to allow modifications of such material outside the IETF Standards Process. Without obtaining an adequate license from the person(s) controlling the copyright in such materials, this document may not be modified outside the IETF Standards Process, and derivative works of it may not be created outside the IETF Standards Process, except to format it for publication as an RFC or to translate it into languages other than English.

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF), its areas, and its working groups. Note that other groups may also distribute working documents as Internet-Drafts.

Internet-Drafts are draft documents valid for a maximum of six months and may be updated, replaced, or obsoleted by other documents at any time. It is inappropriate to use Internet-Drafts as reference material or to cite them other than as "work in progress."

The list of current Internet-Drafts can be accessed at
<http://www.ietf.org/ietf/lid-abstracts.txt>

The list of Internet-Draft Shadow Directories can be accessed at
<http://www.ietf.org/shadow.html>

This Internet-Draft will expire on April 2, 2013.

Copyright Notice

Copyright (c) 2013 IETF Trust and the persons identified as the document authors. All rights reserved.

This document is subject to [BCP 78](#) and the IETF Trust's Legal Provisions Relating to IETF Documents (<http://trustee.ietf.org/license-info>) in effect on the date of publication of this document. Please review these documents carefully, as they describe your rights and restrictions with respect to this document. Code Components extracted from this document must include Simplified BSD License text as described in Section 4.e of the [Trust Legal Provisions](#) and are provided without warranty as described in the Simplified BSD License.

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 for modeling of Virtual Private LAN services. It needs to be used in conjunction with Pseudowire (PW) Management Information Base [[RFC5601](#)].

Table of Contents

1.	Introduction.....	3
2.	Terminology.....	3
2.1.	Conventions used in this document.....	3
3.	The Internet-Standard Management Framework.....	4

4.	VPLS MIB Module Architecture.....	4
4.1.	VPLS-GENERIC-MIB Module Usage.....	5
4.2.	VPLS-LDP-MIB Module Usage.....	5
4.3.	VPLS-BGP-MIB Module Usage.....	5
4.4.	Relations to other MIB modules.....	6
5.	Example of the VPLS MIB modules usage.....	6
6.	Object definitions.....	7
6.1.	VPLS-GENERIC-MIB.....	7
6.2.	VPLS-LDP-MIB Object definitions.....	28
6.3.	VPLS-BGP-MIB Object definitions.....	34
7.	Security Considerations.....	42
8.	IANA Considerations.....	43
9.	References.....	43
9.1.	Normative References.....	43
9.2.	Informative References.....	44
10.	Acknowledgments.....	45
11.	Authors' Addresses.....	45
12.	Full Copyright Statement.....	45

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](#)] signalling. 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

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.

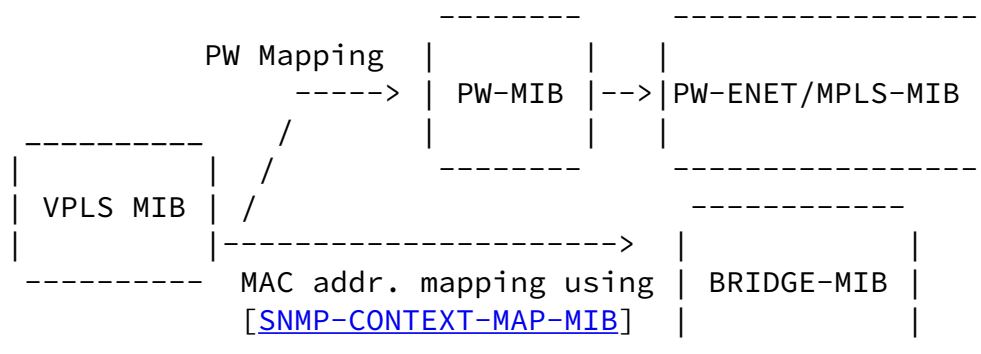


Figure A

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 a 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) The operator creates a row in the `vplsConfigTable` when configuring the node for a new service. This mode MUST be supported by the agent, and MUST be used when creating a manually assigned VPLS service.
- 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.

An entry in the `vplsPwBindTable` MUST exist for a 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.

An entry in the `vplsBgpAdConfigTable` MUST exist if Auto-discovery has been enabled on this service. This table stores the information required for auto-discovery.

An entry in the `vplsBgpRteTargetTable` MUST exist if auto-discovery has been configured on this service. One service can import and export multiple Route Targets.

The agent then creates the rows in the (locally supported) performance tables and reverse mapping tables in VPLS-GENERIC-MIB module.

[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 `vpplsBgpConfigTable` MUST be created by the agent

Nadeau, et. al.

Expires Aug 22, 2013

[Page 5]

Internet-Draft

Vpls Management Information Base

February 2013

for a VPLS service signaled using BGP.

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

- The `vpplsPwBindTable` 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 `vpplsConfigIndex`. This mapping can be used to map the `vpplsConfigIndex` 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 `vpplsConfigIndex`.
- 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 `vpplsConfigRowStatus` 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 `vppls` 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),
}
```

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.

Nadeau, et. al. Expires Aug 22, 2013 [Page 7]

Internet-Draft Vpls Management Information Base February 2013

[[RFC2578](#)], [[RFC2579](#)], [[RFC2580](#)], [[RFC3411](#)],
 [[RFC2863](#)], [[RFC4001](#)], [[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
 FROM SNMPv2-TC -- [RFC2579](#)

SnmpAdminString
 FROM SNMP-FRAMEWORK-MIB -- [RFC3411](#)

pwIndex
 FROM PW-TC-STD-MIB

VPNIdOrZero
 FROM VPN-TC-STD-MIB -- [RFC4265](#)

-- 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) }

;

vplsGenericDraft01MIB MODULE-IDENTITY

-- RFC Editor: Please replace vplsGenericDraft01MIB with
-- vplsGenericMIB throughout the MIB and remove
-- this note.

LAST-UPDATED "201302221200Z" -- 22 Feb 2013 12:00:00 GMT

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

CONTACT-INFO

"

Thomas D. Nadeau
Email: tnadeau@juniper.net

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

DESCRIPTION

"Copyright (C) The IETF Trust (2013). 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

"201302221200Z" -- 22 Feb 2013 12:00:00 GMT

DESCRIPTION

Nadeau, et. al.

Expires Aug 22, 2013

[Page 9]

Internet-Draft

Vpls Management Information Base

February 2013

- 1) Changed the OID for vplsBgpRteTargetTable from vplsObjects.6 to vplsObjects.5
- 2) Index to VplsPwBindTable is now pwIndex, not vplsPwBindIndex.
- 3) vplsConfigMtu increased to upto 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.

"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.
- 3)

"

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.

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

None of the read-create objects values can be changed when vplsConfigRowStatus is in the active(1) state. Changes are allowed when the vplsConfigRowStatus is in notInService(2) or notReady(3) states only. If the operator needs to change one of the values for an active row the vplsConfigRowStatus should be first changed to notInService(2), the objects may

then be changed, and finally the vplsConfigRowStatus should be changed to active(1) in order to re-initiate the signaling process with the new values in effect."
"

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
    }

```

```

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

```

```

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 ageing process is enabled in this VPLS. If 'false', then the MAC ageing 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

Internet-Draft

Vpls Management Information Base

February 2013

```
MAX-ACCESS      read-create
STATUS          current
DESCRIPTION
    "For creating, modifying, and deleting this row.
    None of the read-create objects in the
    conceptual rows may be changed when this
    object is in the active(1) state."
::= { 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 }
```

vplsConfigVpnId OBJECT-TYPE

```
SYNTAX          VPNIIdOrZero
MAX-ACCESS      read-only
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 }
```

-- VPLS Status table


```

vplsStatusTable OBJECT-TYPE
    SYNTAX          SEQUENCE OF VplsStatusEntry
    MAX-ACCESS      not-accessible
    STATUS          current
    DESCRIPTION

```

Nadeau, et. al.

Expires Aug 22, 2013

[Page 15]

Internet-Draft

Vpls Management Information Base

February 2013

```

    "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 configured.
        "

```

```

    INDEX          { vplsConfigIndex }
    ::= { 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 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."
    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

```

Nadeau, et. al.

Expires Aug 22, 2013

[Page 17]

Internet-Draft

Vpls Management Information Base

February 2013

whether the Pseudo Wire binding was created manually 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.
    None of the read-create objects in the
    conceptual rows may be changed when this
    object is in the active(1) state"
::= { 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 VplsBgpADEntry
    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.
        None of the read-create objects can be changed when
        vplsBGPADConfigRowStatus is in active(1) state. Changes
        are allowed when the vplsBGPADConfigRowStatus is in

```

notInService(2) or notReady(3) states only.
 If the operator needs to change one of the values
 for an active row the vplsConfigRowStatus should be
 first changed to notInService(2), the objects may
 then be changed, and finally the vplsConfigRowStatus
 should be changed to active(1) in order to
 re-initiate the signaling process with the new
 values in effect.

```
"
INDEX          { vplsConfigIndex }
::= { vplsBgpADConfigTable 1 }
```

```
VplsBgpADConfigEntry ::=
SEQUENCE {
  vplsBgpADConfigRouteDistinguisher  VplsBgpRouteDistinguisher,
  vplsBgpADConfigPrefix                Unsigned32,
  vplsBgpADConfigVplsId                VplsBgpRouteDistinguisher,
  vplsBgpADConfigRowStatus             RowStatus
}
```

```
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 the same VPLS. It is advertised as an extended community.

"

::= { vplsBgpADConfigEntry 3 }

vplsBgpADConfigRowStatus OBJECT-TYPE

SYNTAX RowStatus

MAX-ACCESS read-create

STATUS current

DESCRIPTION

" For creating, modifying, and deleting this row.

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

"

::= { vplsBgpADConfigEntry 4 }

-- 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.
        "
    INDEX                  { vplsConfigIndex, vplsBgpRteTargetIndex }
    ::= { vplsBgpRteTargetTable 1 }

```

```

VplsBgpRteTargetEntry ::=
    SEQUENCE {
        vplsBgpRteTargetIndex            Unsigned32,
        vplsBgpRteTargetRTType           VplsBgpRouteTargetType,
        vplsBgpRteTargetRT               VplsBgpRouteTarget,
        vplsBgpRteTargetRTRowStatus      RowStatus
    }

```

```

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.
        "

```

```

::= { vplsBgpADConfigEntry 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](#)]."

"

::= { vplsBgpADConfigEntry 2 }

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](#)]

"

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

"

::= { vplsBgpADConfigEntry 4 }

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
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."
    ::= { 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."

```

```
 ::= { 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."
  ::= { 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
```

Internet-Draft

Vpls Management Information Base

February 2013

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."

Nadeau, et. al.

Expires Aug 22, 2013

[Page 25]

Internet-Draft

Vpls Management Information Base

February 2013

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 vplsConfigServiceType
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,
```

Nadeau, et. al.

Expires Aug 22, 2013

[Page 26]

Internet-Draft

Vpls Management Information Base

February 2013

```
    vplsConfigDescr,
    vplsConfigAdminStatus,
    vplsConfigMacLearning,
    vplsConfigDiscardUnknownDest,
    vplsConfigMacAging,
    vplsConfigVpnId,
    vplsConfigFwdFullHighWatermark,
    vplsConfigFwdFullLowWatermark,
    vplsConfigRowStatus,
    vplsConfigIndexNext,
    vplsConfigMtu,
    vplsConfigStorageType,
    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
          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
```

Nadeau, et. al.

Expires Aug 22, 2013

[Page 27]

Internet-Draft

Vpls Management Information Base

February 2013

```
        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](#)], [[RFC4001](#)], [[RFC4265](#)] and [[RFC3813](#)].

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

```
IMPORTS
```

```
MODULE-IDENTITY, OBJECT-TYPE,  
Unsigned32, transmission
```

```
    FROM SNMPv2-SMI -- RFC2578
```

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

```
-- RFC2580
```

```
TruthValue  
    FROM SNMPv2-TC
```

```
-- RFC2579
```

```
pwIndex
```

```
    FROM PW-TC-STD-MIB
```

vpplsConfigIndex
FROM VPLS-GENERIC-MIB;

vpplsLdpDraft01MIB MODULE-IDENTITY

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

LAST-UPDATED "201302221200Z" -- 22 Feb 2013 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 (2013). The initial

Nadeau, et. al.

Expires Aug 22, 2013

[Page 28]

Internet-Draft

Vpls Management Information Base

February 2013

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

"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

vplsLdpNotifications OBJECT IDENTIFIER
 ::= { vplsLdpDraft01MIB 0 }

-- Tables, Scalars
vplsLdpObjects OBJECT IDENTIFIER
 ::= { vplsLdpDraft01MIB 1 }

-- Conformance
vplsLdpConformance OBJECT IDENTIFIER
 ::= { vplsLdpDraft01MIB 2 }

vplsLdpConfigTable OBJECT-TYPE
SYNTAX SEQUENCE OF VplsLdpConfigEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
 "This table specifies information for configuring
 and monitoring LDP specific parameters for
 Virtual Private Lan Services (VPLS)."

::= { vplsLdpObjects 1 }

vplsLdpConfigEntry OBJECT-TYPE
SYNTAX VplsLdpConfigEntry
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.

None of the read-create objects values can be changed when vplsRowStatus is in the active(1) state. Changes are allowed when the vplsRowStatus is in notInService(2) or notReady(3) states only. If the operator needs to change one of the values for an active row the vplsConfigRowStatus should be first changed to notInService(2), the objects may then be changed, and finally the vplsConfigRowStatus should be changed to active(1) in order to re-initiate the signaling process with the new values in effect.

"

```
INDEX          { vplsConfigIndex }
::= { vplsLdpConfigTable 1 }
```

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

```
vplsLdpConfigMacAddrWithdraw OBJECT-TYPE
    SYNTAX          TruthValue
    MAX-ACCESS      read-create
    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-create

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 {
        vplsConfigIndex,
        pwIndex
    }
    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                                -- RFC2578

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

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

SnmpAdminString
    FROM SNMP-FRAMEWORK-MIB                         -- RFC3411

vplsConfigIndex
    FROM VPLS-GENERIC-MIB

;

vplsBgpDraft01MIB MODULE-IDENTITY
-- RFC Editor: Please replace vplsBgpDraft01MIB with
--          vplsBgpMIB throughout the MIB and remove
--          this note.
LAST-UPDATED "201302221200Z" -- 22 Feb 2013 12:00:00 GMT
ORGANIZATION "Layer 2 Virtual Private Networks (L2VPN)
              Working Group"

CONTACT-INFO

    "
    V. J. Shah
    Email: vshah@juniper.net
```

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

Nadeau, et. al.

Expires Aug 22, 2013

[Page 34]

Internet-Draft

Vpls Management Information Base

February 2013

DESCRIPTION

"Copyright (C) The IETF Trust (2013). 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
BGP signaled Virtual Private LAN Services as in
[[RFC4761](#)]

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

-- Revision history.

REVISION

"201302221200Z" -- 22 Feb 2013 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 specific Textual Conventions.

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))
```

Nadeau, et. al.

Expires Aug 22, 2013

[Page 35]

Internet-Draft

Vpls Management Information Base

February 2013

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

```
-- 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
        configured using BGP signaling.
```

None of the read-create objects values can be changed when vplsRowStatus is in the active(1) state. Changes are allowed when the vplsRowStatus is in notInService(2) or notReady(3) states only. If the operator needs to change one of the values for an active row the vplsConfigRowStatus should be first changed to notInService(2), the objects may then be changed, and finally the vplsConfigRowStatus should be changed to active(1) in order to re-initiate the signaling process with the new values in effect.

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

```
VplsBgpConfigEntry ::=
  SEQUENCE {
    vplsBgpConfigVERangeSize      Unsigned32
  }
```

```
vplsBgpConfigVERangeSize  OBJECT-TYPE
  SYNTAX      Unsigned32 (0..65535)
  MAX-ACCESS  read-create
  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."

```
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.  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 disastrous results.

There are a number of management objects defined in these MIB modules with a MAX-ACCESS clause of read-write and/or read-create. Such objects may be considered sensitive or vulnerable in some network environments. The support for SET operations in a non-secure environment without proper protection can have a negative effect on network operation.

[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.
- [RFC2863] McCloghrie, K. and F. Kastenholz, "The Interfaces Group MIB", [RFC 2863](#), June 2000.
- [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.
- [RFC3813] Srinivasan, C., Viswanathan, A. and Nadeau, T., "Multiprotocol Label Switching (MPLS) Label Switching Router (LSR) Management Information Base", [RFC 3813](#), June 2004
- [RFC4001] Daniele, M., Haberman, B., Routhier, S., and J. Schoenwaelder, "Textual Conventions for Internet Network Addresses", [RFC 4001](#), Feb 2005.
- [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.
- [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

- [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.
- [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.
- [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.

Internet-Draft

Vpls Management Information Base

February 2013

10. Acknowledgments

We wish to thank Marcelo Mourier and Reva Bailey for their valuable feedback. Some portion of the work has been referenced from their original Timetra Enterprise MIB work.

We wish to thank Praveen Muley, VJ Shah, Li Wentao, Kong Yong, Luo Jian, Feng Jun, Takeshi Usui for their feedback.

11. Authors' Addresses

Thomas D. Nadeau
Juniper Networks
Email: tnadeau@juniper.net

A S Kiran Koushik
Cisco Systems Inc.
12515 Research Blvd, Bldg 4,
Austin, TX 78759
Email: kkoushik@cisco.com

Rohit Mediratta
Alcatel-Lucent,
701 E Middlefield Rd.
Mountain View, CA 94040
Email: rohit.mediratta@alcatel-lucent.com

12. Full Copyright Statement

Copyright (c) 2013 IETF Trust and the persons identified as the document authors. All rights reserved.

This document is subject to [BCP 78](#) and the IETF Trust's Legal Provisions Relating to IETF Documents (<http://trustee.ietf.org/license-info>) in effect on the date of publication of this document. Please review these documents carefully, as they describe your rights and restrictions with respect to this document. Code Components extracted from this document must include Simplified BSD License text as described in

Section 4.e of the [Trust Legal Provisions](#) and are provided without warranty as described in the Simplified BSD License.

Nadeau, et. al.

Expires Aug 22, 2013

[Page 45]

Internet-Draft

Vpls Management Information Base

February 2013

This document may contain material from IETF Documents or IETF Contributions published or made publicly available before November 10, 2008. The person(s) controlling the copyright in some of this material may not have granted the IETF Trust the right to allow modifications of such material outside the IETF Standards Process. Without obtaining an adequate license from the person(s) controlling the copyright in such materials, this document may not be modified outside the IETF Standards Process, and derivative works of it may not be created outside the IETF Standards Process, except to format it for publication as an RFC or to translate it into languages other than English.

Nadeau, et. al.

Expires Aug 22, 2013

[Page 46]