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Ethernet Pseudo Wire (PW) Management Information Base

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Status of this Memo

1 Abstract

This memo defines an experimental portion of the Management Information Base (MIB) for use with network management protocols in the Internet community. In particular, it describes managed objects for modeling of Ethernet Pseudo Wire (PW) services.

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2 Introduction

This document describes a model for managing Ethernet pseudo wire services for transmission over a packet Switched Network (PSN). This MIB module is generic and common to all types of PSNs supported in the PWE3 Framework [FRMWK], which describes the transport and encapsulation of L1 and L2 services over supported PSN types.

In particular, the MIB module associates a whole port or specific VLANs on top of a physical Ethernet port or a virtual Ethernet interface (for VPLS service) to a point-to-point VC. It is complementary to the [PWMIB], which is used to manage the generic PW parameters common to all service, including all supported PSN types.

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 RFC-2119 [BCP14].

3 Terminology

This document uses terminology from the document describing the PW framework [FRMWK] and from [PW-ENET].

4 The SNMP Management Framework

The SNMP Management Framework presently consists of five major components:

o An overall architecture, described in RFC 2571 [RFC2571].

o Mechanisms for describing and naming objects and events for the purpose of management. The first version of this Structure of Management Information (SMI) is called SMIv1 and described in STD 16, RFC 1155 [RFC1155], STD 16, RFC 1212 [RFC1212] and RFC 1215 [RFC1215]. The second version, called SMIv2, is described in STD 58, RFC 2578 [RFC2578], STD 58, RFC 2579 [RFC2579] and STD 58, RFC 2580 [RFC2580].

o Message protocols for transferring management information. The first version of the SNMP message protocol is called SNMPv1 and described in STD 15, RFC 1157 [RFC1157]. A second version of the SNMP message protocol, which is not an Internet standards track protocol, is called SNMPv2c and described in RFC 1901 [RFC1901] and RFC 1906 [RFC1906]. The third version of the message protocol is called SNMPv3 and described in RFC 1906 [RFC1906], RFC 2572 [RFC2572] and RFC 2574 [RFC2574].

o Protocol operations for accessing management information. The first set of protocol operations and associated PDU formats is described in STD 15, RFC 1157 [RFC1157]. A second set of protocol operations and associated PDU formats is described in RFC 1905 [RFC1905].

o A set of fundamental applications described in RFC 2573 [RFC2573] and the view-based access control mechanism described in RFC 2575 [RFC2575].

A more detailed introduction to the current SNMP Management Framework can be found in RFC 2570 [RFC2570].

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

This memo specifies a MIB module that is compliant to the SMIv2. A

MIB conforming to the SMIv1 can be produced through the appropriate translations. The resulting translated MIB must be semantically equivalent, except where objects or events are omitted because no

translation is possible (use of Counter64). Some machine-readable information in SMIv2 will be converted into textual descriptions in SMIv1 during the translation process. However, this loss of machine-readable information is not considered to change the semantics of the MIB.

4.1 Object Definitions

Managed objects are accessed via a virtual information store, termed the Management Information Base or MIB. Objects in the MIB are defined using the subset of Abstract Syntax Notation One (ASN.1) defined in the SMI. In particular, an OBJECT IDENTIFIER, an administratively assigned name, names each object type. The object type together with an object instance serves to uniquely identify a specific instantiation of the object. For human convenience, we often use a textual string, termed the descriptor, to also refer to the object type.

5 Feature Checklist

The PW Ethernet MIB (PW-ENET-MIB) is designed to satisfy the following requirements and constraints:

- The MIB is designed to be work with the PW-MIB [PW-MIB].

- The MIB is independent of the PSN type.

- The MIB supports various options for selecting Ethernet packets into the PW. These include port-based PW, VLAN-based PW, VLAN range PW, VLAN-change and adding or removing VLAN fields between the port to be emulated and the VC.

- In the case of an MPLS PSN, the MIB support the use of multiple VCs to carry the same Ethernet service. These VCs can be used to support L-LSPs or single COS E-LSPs capable PSN, when mapping of the Ethernet PRI bits to the PSN COS is required.

- The MIB enables both point-to-point Ethernet services and VPLS services such as VPLS [VPLS].

- The MIB allow modeling of the PW as an Ethernet virtual port to be managed via existing Ethernet MIBs like Etherlike-MIB [ENETLIKE].

6 PW-MIB usage

The MIB structure for defining a PW service is composed of three layers of MIB modules functioning together. This general model is defined in the PWE3 Framework [FRMWK]. The layering model is

intended to sufficiently isolate PW services from the underlying PSN layer that carries the emulated service. This is done at the same time as providing a standard means for connecting any supported services to any supported PSNs.

The first layer known as the service layer contains service-specific modules such as the one defined in this document. These modules define service-specific management objects that interface or collaborate with existing MIB modules for the native version of the service. The service-specific module "glues" the standard module to the PWE MIB framework.

The next layer of the PWE MIB framework is comprised of the PW-MIB module [PWMIB]. This module is used to configure general parameters of PW VCs that are common to all types of emulated services and PSNs. This layer is connected to the service-specific layer above, and the PSN layer below.

The PSN layer provides PSN-specific modules for each type of PSN. These modules associate the VC with one or more "tunnels" that carry the service over the PSN. These modules are defined in other documents. This module is used to "glue" the PW service to the underlying PSN-specific MIB modules. In the case of MPLS, for example, the PW-MPLS MIB [PWMPLSMIB] is used to connect the PW service to either the MPLS-LDP [LDPMIB] or MPLS-TE [TEMIB] MIBs.

[PWTC] defines some of the object types used in these modules.

The Etherlike-MIB [ENETLIKE] does not support virtual Ethernet port, however it is sometimes desired to manage the PW VC as an Ethernet port via the Etherlike-MIB. The MIB support an option to recognize the VC as an ifIndex, enabling standard use of the Etherlike-MIB to manage the VC.

6.1 PW-ENET-MIB usage

- The VC table (pwVcTable) is used for all VC types (ATM, FR, Ethernet, SONET, etc.). This table contains high level generic parameters related to the VC creation. A row is created by the operator for each PW service.

- Based on the PSN type defined for the VC, rows are created in PSN specific module (for example [PWMPLSMIB]) and associated to the VC table by a common VC index.

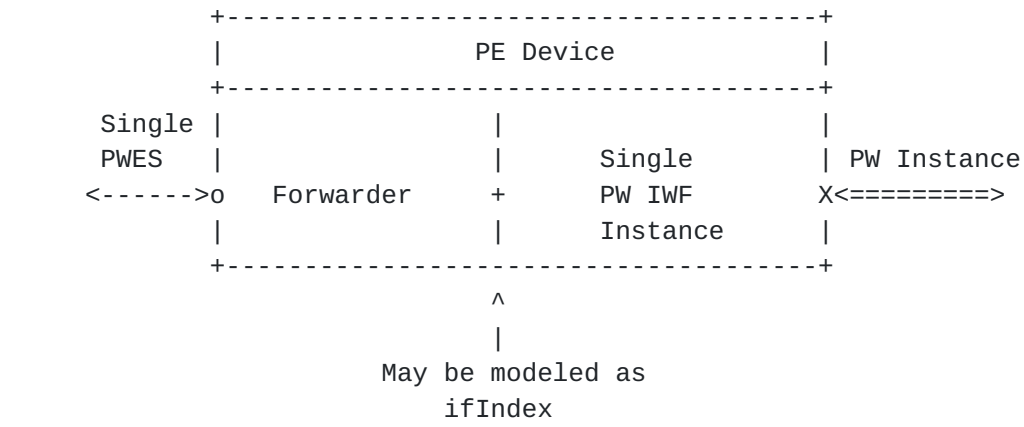
- If the VC type is Ethernet, EthernetVLAN or EthernetVPLS a row is created in pwVcEnetTable.

- When using a MPLS PSN, it may be required to separate the same Ethernet services to multiple PW in order to support multiple COS

on the same service. In this case, multiple VCs, each with the appropriate COS will be created to the same destination, and classification will be based also on the Ethernet PRI bits marking. The MIB allow any combinations of multiple PRI setting to PSN COS mapping (The exact PSN marking (EXP bits, DSCP etc.) is out of scope of this MIB). In these cases, pwVcEnetTable will hold multiple rows with the same Ethernet port and VLAN mapping, each VC will need to be created separately by the signaling process.

6.2 PW-ENET management model

The management model for the Ethernet PW VC is shown in figure 1, and is based on the PW proposed layering [PWLAYRES].



Notation:
o A physical CE-bound PE port
+ A PW IWF instance interface to the forwarder.
X A PE PSN-bound port.

Figure 1: A simple point-to-point service

In the typical point-to-point service, the object pwVcEnetPortIfIndex associate the physical CE-bound PE port ('o') to the PW (it is allowed to have multiple PWs associated to the same physical port). The operations of the forwarder are also managed by this MIB.

In some models it is convenient to model the forwarder virtual interface to a PW IWF instance ('O') as an ifIndex - The object pwVcEnetIfIndex indicate this relation in this case, and the PW instance is managed as virtual Ethernet interface in the PE.

The model for using the VC in non-point to point applications, such as VPLS are done with the same principle in mind, but the details are yet FFS.

6.3 Example of MIB usage

TBD

7 Object definitions

```
--
-- Ethernet PW MIB
--

PW-ENET-MIB DEFINITIONS ::= BEGIN

IMPORTS
    OBJECT-TYPE, MODULE-IDENTITY, experimental,
    Counter64
        FROM SNMPv2-SMI

    MODULE-COMPLIANCE, OBJECT-GROUP
        FROM SNMPv2-CONF

    StorageType, RowStatus
        FROM SNMPv2-TC

    InterfaceIndexOrZero
        FROM IF-MIB

    pwVcIndex
        FROM PW-MIB

    PwVcVlanCfg
        FROM PW-TC-MIB;

pwVcEnetMIB MODULE-IDENTITY
    LAST-UPDATED "200208201200Z" -- 20 August 2002 12:00:00 GMT
    ORGANIZATION
        "IETF PWE3 Working group"
    CONTACT-INFO
        "David Zelig
         Postal: Corrigent Systems
         126, Yigal Alon St.
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         E-mail: davidz@corrigent.com
```

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```
         250 Apollo Drive
         Chelmsford, MA 01824
         Tel:    +1-978-497-3051
         Email:  tnadeau@cisco.com
        "
    DESCRIPTION
        "This MIB describes a model for managing Ethernet
        point-to-point pseudo wire services over a Packet
        Switched Network (PSN)."

   -- Revision history.
   REVISION
       "200208201200Z" -- 20 August 2002 12:00:00 GMT
   DESCRIPTION
       "Changes from previous version:
        1) Add pwVcEnetVcIfIndex - Option for VC as ifIndex.
        2) Change counters to 64 bits.
        3) Add mode for adding/removing VLAN fields between PW and
           CE bound interface.
        4) Referencing draft-martini instead of draft-so.
        5) Editorial changes for some description clauses.
        6) MPLS PRI mapping table to be independent (not augmented).
        7) Adapt descriptions and rules of use to
           dratf-ietf-pw3ei-Ethernet-encap-00.
        "
   REVISION
       "200202031200Z"  -- 03 February 2002 12:00:00 GMT
   DESCRIPTION
       "initial revision as -00 draft"

    ::= { experimental xxx } -- TBD: Get number from IANA


pwVcEnetNotifications  OBJECT IDENTIFIER ::= { pwVcEnetMIB 0 }
pwVcEnetObjects        OBJECT IDENTIFIER ::= { pwVcEnetMIB 1 }
pwVcEnetConformance    OBJECT IDENTIFIER ::= { pwVcEnetMIB 2 }

--
-- VC Ethernet table
--

pwVcEnetTable  OBJECT-TYPE
    SYNTAX SEQUENCE OF PwVcEnetEntry
    MAX-ACCESS  not-accessible
    STATUS     current
    DESCRIPTION
        "This table contains the index to the Ethernet tables
```

```
        associated with this ETH VC, the VLAN configuration and
        VLAN mode."
    ::= { pwVcEnetObjects 1 }
```

```
pwVcEnetEntry  OBJECT-TYPE
    SYNTAX     PwVcEnetEntry
    MAX-ACCESS  not-accessible
    STATUS     current
    DESCRIPTION
        "This table is indexed by the same index that was created
        for the associated entry in the PW VC Table in the PW-MIB.
        The PwVcIndex and the pwVcEnetPwVlan are used as indexes
        to allow multiple VLANs to exist on the same PW.

        An entry is created in this table by the agent for every
        entry in the pwVc table with a VcType of 'ethernetVLAN',
        'ethernet' or 'ethernetVPLS'. Additional rows may be
        created by the operator or the agent if multiple entries
        are required for the same VC.

        This table provides Ethernet port mapping and VLAN
        configuration for each Ethernet VC."

    INDEX { pwVcIndex, pwVcEnetPwVlan }
    ::= { pwVcEnetTable 1 }

PwVcEnetEntry ::= SEQUENCE {
       pwVcEnetPwVlan        PwVcVlanCfg,
       pwVcEnetVlanMode      INTEGER,
       pwVcEnetMaxVlan       PwVcVlanCfg,
       pwVcEnetPortVlan      PwVcVlanCfg,

       pwVcEnetPortIfIndex   InterfaceIndexOrZero,
       pwVcEnetVcIfIndex     InterfaceIndexOrZero,

       pwVcEnetRowStatus     RowStatus,
       pwVcEnetStorageType   StorageType
                 }

pwVcEnetPwVlan  OBJECT-TYPE
    SYNTAX      PwVcVlanCfg
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This Object defines the VLAN on the VC. The value of 4097
        is used if the object is not applicable, for example when
        mapping all packets from an Ethernet port to this VC.
        The value of 4096 is used to indicate untagged frames (at
        least from the PW point of view), for example if
        pwVcEnetVlanMode is equal 'removeVLAN' or when
        pwVcEnetVlanMode equal 'noChange' and pwVcEnetPortVlan
```

```
        is equal 4096."
    ::= { pwVcEnetEntry 1 }

pwVcEnetVlanMode  OBJECT-TYPE
```

```
    SYNTAX     INTEGER {
            portBased(0),
            noChange(1),
            changeVlan(2),
            addVlan(3),
            removeVlan(4),
            rangeVlan(5)
    }
    MAX-ACCESS  read-create
    STATUS     current
    DESCRIPTION
        "Indicate the mode of VLAN handling between the port
        associated to the VC and the VC encapsulation itself.

        - 'portBased' indicates that the forwarder will forward
          packets to the PW independent of their structure,
          based on the incoming port only.

        - 'noChange' indicates that the VC contains the original
           user VLAN, as specified in pwVcEnetPortVlan.

        - 'changeVlan' indicates that the VLAN field on the VC
          may be different than the VLAN field on the user's
          port.

        - 'removeVlan' indicates that the encapsulation on the
          VC does not include the original VLAN field. Note
          that PRI bits transparency is lost in this case.

        - 'addVlan' indicate that a VLAN field will be added
          on the PSN bound direction. pwVcEnetPwVlan indicate
          the value that will be added.

        - 'rangeVlan' indicate that all VLANs between
          pwVcEnetPwVlan and pwVcEnetMaxVlan on the user port
          will be associated to this VC. It is not possible to
          change VLAN values on this mode.

        - 'removeVlan', 'addVlan' and 'rangeVlan' implementation
          is not required.
        "
    DEFVAL { noChange }
    ::= { pwVcEnetEntry 2 }

pwVcEnetMaxVlan  OBJECT-TYPE
    SYNTAX     PwVcVlanCfg
    MAX-ACCESS  read-create
    STATUS     current
```

```
    DESCRIPTION
        "This object is used to define the MAX value of VLAN range
         for this VC, and is in effect if pwVcEnetVlanMode is equal
```

```
          to 'rangeVlan', and must be greater or equal to
          pwVcEnetPwVlan.
          If a range is not used the value must be set to 0."
    DEFVAL  { 0 }
    ::= { pwVcEnetEntry 3 }

pwVcEnetPortVlan  OBJECT-TYPE
    SYNTAX     PwVcVlanCfg
    MAX-ACCESS  read-create
    STATUS     current
    DESCRIPTION
        "This object define the VLAN value on the physical port (or
        VPLS virtual port) if a change is required to the VLAN value
        between the VC and the physical/virtual port.

        This object MUST hold the value of 4097 (not relevant) if
        the whole traffic from the port is forwarded to one VC
        independent of the tagging on the port or if
        pwVcEnetVlanMode is set to rangeVlan.

        It MUST be equal to pwVcEnetPwVlan if 'noChange' mode
        is used.

        The value 4096 indicate that no VLAN (i.e. untagged
        frames) on the port are associated to this VC. This
        allows the same behaviors as assigning 'Default VLAN'
        to un-tagged frames.
        "
    DEFVAL  { 4097 }
    ::= { pwVcEnetEntry 4 }

pwVcEnetVcIfIndex  OBJECT-TYPE
    SYNTAX     InterfaceIndexOrZero
    MAX-ACCESS  read-create
    STATUS     current
    DESCRIPTION
        "It is sometimes convenient to model the VC PW as a
         virtual interface in the ifTable. In these cases this
         object hold the value of the ifIndex in the ifTable
         representing this VC PW. A value of zero indicate no such
         association or association is not yet known."

    ::= { pwVcEnetEntry 5 }

pwVcEnetPortIfIndex  OBJECT-TYPE
SYNTAX     InterfaceIndexOrZero
MAX-ACCESS  read-create
```

```
STATUS     current
DESCRIPTION
    "This object is used to specify the ifIndex of the ETHERNET
     port associated with this VC for point-to-point Ethernet
```

```
     service, or the ifIndex of the virtual interface of the VPLS
     instance associated with the PW if the service is VPLS. Two
     rows in this table can point to the same ifIndex only if:

     1) It is required to support multiple COS on a MPLS PSN
        for the same service (i.e.: a combination of ports and
        VLANs) by the use of multiple VC, each with a different
        COS.

     2) There is no overlap of VLAN values specified in
        pwVcEnetPortVlan that are associated with this port.

     A value of zero indicate that association to an ifIndex is
     not yet known."

::= { pwVcEnetEntry 6 }

pwVcEnetRowStatus  OBJECT-TYPE
    SYNTAX     RowStatus
    MAX-ACCESS  read-create
    STATUS     current
    DESCRIPTION
        "Enable creating, deleting and modifying this row."
-- TBD: Need to specify exact interaction with other tables, and
-- when rows can/cannot be created/deleted/modified.
    ::= { pwVcEnetEntry 7 }

pwVcEnetStorageType  OBJECT-TYPE
    SYNTAX     StorageType
    MAX-ACCESS  read-create
    STATUS     current
    DESCRIPTION
        "Indicates the storage type of this row."
    ::= { pwVcEnetEntry 8 }


--
-- Ethernet Primary Mapping Table
--

pwVcEnetMplsPriMappingTable  OBJECT-TYPE
    SYNTAX SEQUENCE OF PwVcEnetMplsPriMappingTableEntry
    MAX-ACCESS  not-accessible
    STATUS     current
    DESCRIPTION
        "This table may be used for MPLS PSNs if there is a need
        to hold multiple VC, each with different COS, for the same
        user service (port + PW VLAN). Such a need may arise if the
```

MPLS network is capable of L-LSP or E-LSP without multiple
COS capabilities. Each row is indexed by the pwVcIndex
and indicate the PRI bits on the packet recieved from the

```
        user port (or VPLS virtual port) that are
        classified to this VC. Note that the EXP bit value of the VC
        is configured in the PW-MPLS-MIB."
    ::= { pwVcEnetObjects 2 }

pwVcEnetMplsPriMappingTableEntry  OBJECT-TYPE
    SYNTAX     PwVcEnetMplsPriMappingTableEntry
    MAX-ACCESS  not-accessible
    STATUS     current
    DESCRIPTION
        "Each entry is created if special classification based on
         the PRI bits is required for this VC."

    INDEX { pwVcIndex }

    ::= { pwVcEnetMplsPriMappingTable 1 }

PwVcEnetMplsPriMappingTableEntry ::= SEQUENCE {
    pwVcEnetMplsPriMapping             BITS,
    pwVcEnetMplsPriMappingRowStatus    RowStatus,
    pwVcEnetMplsPriMappingStorageType  StorageType
}

pwVcEnetMplsPriMapping  OBJECT-TYPE
    SYNTAX     BITS {
        pri000 (0),
        pri001 (1),
        pri010 (2),
        pri011 (3),
        pri100 (4),
        pri101 (5),
        pri110 (6),
        pri111 (7),
        untagged (8)
    }
    MAX-ACCESS  read-create
    STATUS     current
    DESCRIPTION
        "This object defines the groups of user PRI mapped into
        this VC. Each bit set indicates that this user priority
        is assigned to this VC.

        The value 'untagged' is used to indicate that untagged
        frames are also associated to this VC.

        This object allow the use of different PSN COS based on
        user marking of PRI bits in MPLS PSN with L-LSP or
```

E-LSP without multiple COS support. In all other cases, the default value MUST be used.

It is REQUIRED that there is no overlap on this object

```
        between rows serving the same service (port+ PW VLAN).

        In case of missing BIT configuration between rows to
        the same service, incoming packets with PRI marking not
        configured should be handled by the VC with the lowest
        COS.
        "
    REFERENCE
        "See appendix A of <draft-ietf-pwe3i-ethernet-encap>
         for mapping rules of the PRI bits to PSN COS."

    ::= { pwVcEnetMplsPriMappingTableEntry 1 }

pwVcEnetMplsPriMappingRowStatus  OBJECT-TYPE
    SYNTAX     RowStatus
    MAX-ACCESS  read-create
    STATUS     current
    DESCRIPTION
        "Enable creating, deleting and modifying this row."
-- TBD: Need to specify exact interaction with other tables, and
-- when rows can/cannot be created/deleted/modified.
    ::= { pwVcEnetMplsPriMappingTableEntry 2 }

pwVcEnetMplsPriMappingStorageType  OBJECT-TYPE
    SYNTAX     StorageType
    MAX-ACCESS  read-create
    STATUS     current
    DESCRIPTION
        "Indicates the storage type of this row."
    ::= { pwVcEnetMplsPriMappingTableEntry 3 }


--
-- VC Ethernet Statistics Table
--

pwVcEnetStatsTable  OBJECT-TYPE
    SYNTAX SEQUENCE OF PwVcEnetStatsEntry
    MAX-ACCESS  not-accessible
    STATUS     current
    DESCRIPTION
        "This table contains statistical counters specific for
         Ethernet PW."
    ::= { pwVcEnetObjects 3 }

pwVcEnetStatsEntry  OBJECT-TYPE
    SYNTAX     PwVcEnetStatsEntry
    MAX-ACCESS  not-accessible
```

```
    STATUS     current
    DESCRIPTION
        "Each entry represents the statistics gathered for the
```

```
         VC carrying the Ethernet packets since this VC was
         first created in the pwVcEnetTable."
    INDEX { pwVcIndex }
    ::= { pwVcEnetStatsTable 1 }

PwVcEnetStatsEntry ::= SEQUENCE {
    pwVcEnetStatsIllegalVlan        Counter64,
    pwVcEnetStatsIllegalLength      Counter64
}

pwVcEnetStatsIllegalVlan  OBJECT-TYPE
    SYNTAX     Counter64
    MAX-ACCESS  read-write
    STATUS     current
    DESCRIPTION
    "The number of packets received (from the PSN) on this VC with
    an illegal VLAN field, missing VLAN field that was expected, or
    A VLAN field when it was not expected. This counter is not
    relevant if the VC type is 'ethernet' (i.e. raw mode), and
    should be set to 0 by the agent to indicate this."
    ::= { pwVcEnetStatsEntry 1 }

pwVcEnetStatsIllegalLength  OBJECT-TYPE
    SYNTAX     Counter64
    MAX-ACCESS  read-write
    STATUS     current
    DESCRIPTION
    "The number of packets that were received with an illegal
    Ethernet packet length on this VC. An illegal length is defined
    as being greater than the value in the advertised maximum MTU
    supported, or shorter than the allowed Ethernet packet size."
    ::= { pwVcEnetStatsEntry 2 }

---
--- Conformance description
--- In this version of the draft, only objects level conformance is
--- defined. More detailed conformance specifications is FFS.
---

pwVcEnetGroups      OBJECT IDENTIFIER ::= { pwVcEnetConformance 1 }
pwVcEnetCompliances OBJECT IDENTIFIER ::= { pwVcEnetConformance 2 }


pwVcEnetModuleCompliance MODULE-COMPLIANCE
    STATUS  current
    DESCRIPTION
            "The compliance statement for agent that support
```

```
            Ethernet PW."

    MODULE  -- this module
        MANDATORY-GROUPS { pwVcEnetGroup,
```

```
                        pwVcStatsGroup
                      }

      GROUP pwVcEnetMplsPriGroup
      DESCRIPTION
          "Collection of objects defining classification to
          different PW based on the user's PRI bits mapping.
          This group is optional, and should be implemented
          only for MPLS PSN where only L-LSP or single OA
          E-LSP, exists, and different PSN COS is required
          based on the PRI mapping."

    ::= { pwVcEnetCompliances 1 }

-- Units of conformance.

pwVcEnetGroup OBJECT-GROUP
   OBJECTS {
            pwVcEnetVlanMode,
            pwVcEnetMaxVlan,
            pwVcEnetPortVlan,
            pwVcEnetPortIfIndex,
            pwVcEnetVcIfIndex,
            pwVcEnetRowStatus,
            pwVcEnetStorageType
   }
   STATUS  current
   DESCRIPTION
          "Collection of objects for basic Ethernet PW config."
   ::= { pwVcEnetGroups 1 }

pwVcStatsGroup OBJECT-GROUP
   OBJECTS {
            pwVcEnetStatsIllegalVlan,
            pwVcEnetStatsIllegalLength
   }
   STATUS  current
   DESCRIPTION
          "Collection of objects counting various PW level errors."
   ::= { pwVcEnetGroups 2 }

pwVcEnetMplsPriGroup OBJECT-GROUP
   OBJECTS {
            pwVcEnetMplsPriMapping,
            pwVcEnetMplsPriMappingRowStatus,
            pwVcEnetMplsPriMappingStorageType
   }
```

```
   STATUS  current
   DESCRIPTION
          "Collection of objects defining classification to
          different PW based on the user's PRI bits mapping.
```

```
            This group is optional, and should be implemented
            only for MPLS PSN where only L-LSP or single OA
            E-LSP exists, and different PSN COS is required
            based on the PRI mapping."
    ::= { pwVcEnetGroups 3 }

END
```

8 Security Considerations

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

SNMPv1 by itself is not a secure environment. Even if the network itself is secure (for example by using IPSec), even then, there is no control as to who on the secure network is allowed to access and GET/SET (read/change/create/delete) the objects in this MIB.

It is recommended that the implementers consider the security features as provided by the SNMPv3 framework. Specifically, the use of the User-based Security Model RFC 2574 [RFC2574] and the View-based Access Control Model RFC 2575 [RFC2575] is recommended.

It is then a customer/user responsibility to ensure that the SNMP entity giving access to an instance of this MIB, is properly configured to give access to the objects only to those principals (users) that have legitimate rights to indeed GET or SET (change/create/delete) them.

9 References

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