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Definitions of Managed Object Extensions for Very High Speed Digital Subscriber Lines (VDSL) Using Multiple Carrier Modulation (MCM) Line Coding.

Status of this Memo

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Abstract

This document defines a portion of the Management Information Base (MIB) module for use with network management protocols in the Internet community. In particular, it describes objects used for managing the Line Code Specific parameters of Very High Speed Digital Subscriber Line (VDSL) interfaces using Multiple Carrier Modulation (MCM) Line Coding. It is an optional extension to the VDSL-LINE CORE MIB RFC XXXX [RFCXXXX] which handles the line code independent objects.

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1. The Internet-Standard Management Framework

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

Managed objects are accessed via a virtual information store, termed the Management Information Base or MIB. MIB objects are generally accessed through the Simple Network Management Protocol (SNMP). Objects in the MIB are defined using the mechanisms defined in the Structure of Management Information (SMI). This memo specifies a MIB module that is compliant to the SMIv2, which is described in STD 58, RFC 2578 [RFC2578], STD 58, RFC 2579 [RFC2579] and STD 58, RFC 2580 [RFC2580].

2. Overview

This document describes an SNMP MIB module for managing the line code dependent (Physical Medium Dependent) Layer of MCM VDSL Lines. These definitions are based upon the specifications for VDSL as defined in T1E1, ETSI, and ITU documentation [T1E1311, T1E1011, T1E1013, ETSI2701, ETSI2702, ITU9931, ITU9971]. Additionally the protocol-dependent (and line-code dependent) management framework for VDSL lines specified by DSLF has been taken into consideration [DSLFXXXXXX].

The MIB module is located in the MIB tree under MIB 2 transmission, as discussed in the MIB-2 Integration (RFC 2863 [RFC2863]) section of this document.

2.1 Relationship of this MIB Module to other MIB Modules

The relationship of the VDSL Line MIB to other MIBS and in particular to the IF-MIB, as presented in RFC 2863 [RFC2863], is discussed in the VDSL-LINE CORE MIB RFC XXXX [RFCXXXX]. This section outlines the

relationship of this VDSL Line Extension MIB to the VDSL-LINE CORE MIB RFC XXXX [RFCXXXX].

2.2 Conventions used in the MIB Module

2.2.1 Naming Conventions

A. Vtuc -- (VTUC) transceiver at near (Central) end of line
B. Vtur -- (VTUR) transceiver at Remote end of line
C. Vtu -- One of either Vtuc or Vtur
D. Curr -- Current
E. Prev -- Previous
F. Atn -- Attenuation
G. ES -- Errored Second
H. SES -- Severely Errored Second
I. UAS -- Unavailable Second
J. LCS -- Line Code Specific
K. Lof -- Loss of Frame
L. Lol -- Loss of Link
M. Los -- Loss of Signal
N. Lpr -- Loss of Power
O. xxxs -- Sum of Seconds in which xxx has occurs (e.g., xxx=Lof, Los, Lpr, Lol)
P. Max -- Maximum
Q. Mgn -- Margin
R. Min -- Minimum
S. Psd -- Power Spectral Density
T. Snr -- Signal to Noise Ratio
U. Tx -- Transmit
V. Blks -- Blocks

2.3 Structure

The MCM VDSL Line Extension MIB contains the following MIB group:

o vdslMCMGroup :

This group supports MIB objects for defining configuration profiles and for montioring individual bands of Multiple Carrier Modulation (MCM) VDSL modems. It contains the following tables:

- vdslLineMCMConfProfileTable
- vdslLineMCMConfProfileTxBandTable
- vdslLineMCMConfProfileRxBandTable
- vdslLineMCMConfProfileTxPSDTable
- vdslLineMCMConfProfileMaxTxPSDTable
- vdslLineMCMConfProfileMaxRxPSDTable

Either none, some or all of the objects in this group MAY be implemented for MCM VDSL lines.

Figure 1, below, displays the relationship of the tables in the vdslMCMGroup to the vdslGroup and to the ifEntry:

```
     ifEntry(ifType=97)  ----> vdslLineTableEntry 1:(0..1)

      vdslLineTableEntry (vdslLineCoding=MCM)

      vdslLineConfProfileEntry(vdslLineConfProfileName)
                    ----> vdslLineMCMConfProfileTable 1:(0..1)
                    ----> vdslLineMCMConfProfileTxBandTable 1:(0..1)
                    ----> vdslLineMCMConfProfileRxBandTable 1:(0..1)
                    ----> vdslLineMCMConfProfileTxPSDTable 1:(0..1)
                    ----> vdslLineMCMConfProfileMaxTxPSDTable 1:(0..1)
                    ----> vdslLineMCMConfProfileMaxRxPSDTable 1:(0..1)
```

Figure 1: Table Relationships

When the vdslLineCoding is set to MCM, the vdslLineConfProfileName which is the index of the vdslLineConfProfileEntry is also used as the index to the vdslLineMCMConfProfileTxBandTable of the vdslMCMGroup. The existence of an entry in any of the tables of the vdslMCMGroup is optional. Either none, some or all of the vdslMCMGroup tables MAY be implemented for a particular VDSL line entity using MCM line coding.

2.4 Persistence

All read-write and read-create objects defined in this MIB module SHOULD be stored persistently. Following is an exhaustive list of these persistent objects:

- vdslMCMConfProfileTxWindowLength
- vdslMCMConfProfileRowStatus
- vdslMCMConfProfileTxBandNumber
- vdslMCMConfProfileTxBandStart
- vdslMCMConfProfileTxBandStop
- vdslMCMConfProfileTxBandRowStatus
- vdslMCMConfProfileRxBandStart
- vdslMCMConfProfileRxBandStop
- vdslMCMConfProfileRxBandRowStatus
- vdslMCMConfProfileTxPSDTone
- vdslMCMConfProfileTxPSDPSD
- vdslMCMConfProfileTxPSDRowStatus
- vdslMCMConfProfileMaxTxPSDTone
- vdslMCMConfProfileMaxTxPSDPSD
- vdslMCMConfProfileMaxTxPSDRowStatus
- vdslMCMConfProfileMaxRxPSDTone
- vdslMCMConfProfileMaxRxPSDPSD
- vdslMCMConfProfileMaxRxPSDRowStatus

It SHOULD also be noted that interface indices in this MIB are

maintained persistently. VACM data relating to these SHOULD be stored persistently as well [RFC2575].

3. Conformance and Compliance

For MCM VDSL lines, the following group is optional:

- vdslMCMGroup

4. Definitions

```
VDSL-LINE-EXT-MCM MIB DEFINITIONS ::= BEGIN

IMPORTS

MODULE-IDENTITY,
OBJECT-TYPE,
Counter64,
Gauge32,
Integer32,
Unsigned32,
NOTIFICATION-TYPE,
transmission                    FROM SNMPv2-SMI
TEXTUAL-CONVENTION,
RowStatus,
TruthValue                      FROM SNMPv2-TC
HCPerfValidIntervals,
HCPerfInvalidIntervals,
HCPerfTimeElapsed,
HCPerfIntervalThreshold,
HCPerfCurrentCount,
HCPerfIntervalCount             FROM HC-PerfHist-TC-MIB
MODULE-COMPLIANCE,
OBJECT-GROUP,
NOTIFICATION-GROUP              FROM SNMPv2-CONF
ifIndex                         FROM IF-MIB
SnmpAdminString                 FROM SNMP-FRAMEWORK-MIB;
vdslLineConfProfileName         FROM VDSL-LINE-MIB

vdslExtMCMMIB MODULE-IDENTITY
   LAST-UPDATED "200309230000Z" -- September 23, 2003
   ORGANIZATION "ADSLMIB Working Group"
   CONTACT-INFO "WG-email:  adslmib@ietf.org
         Info:      https://www1.ietf.org/mailman/listinfo/adslmib

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```

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"

DESCRIPTION
"The VDSL Line core MIB found in RFC XXXX defines objects for the management of a pair of VDSL transceivers at each end of the VDSL line. The core MIB configures and monitors the line code independent parameters (TC layer) of the VDSL line. This MIB module is an optional extension of the core MIB and defines objects for configuration and monitoring of the line code specific (LCS) elements (PMD layer) for VDSL lines using MCM coding. The objects in this extension MIB MUST NOT be used for VDSL lines using SCM line coding.

Naming Conventions:
Vtuc -- (VTUC) transceiver at near (Central) end of line
Vtur -- (VTUR) transceiver at Remote end of line
Vtu -- One of either Vtuc or Vtur
Curr -- Current
Prev -- Previous
Atn -- Attenuation
ES -- Errored Second.
SES -- Severely Errored Second
UAS -- Unavailable Second
LCS -- Line Code Specific
Lof -- Loss of Frame
Lol -- Loss of Link
Los -- Loss of Signal
Lpr -- Loss of Power
xxxs -- Interval of Seconds in which xxx occurs
(e.g., xxx=Lof, Los, Lpr)
Max -- Maximum
Mgn -- Margin
Min -- Minimum
Psd -- Power Spectral Density

```
            Snr  -- Signal to Noise Ratio
            Tx   -- Transmit
            Blks -- Blocks
     "
```

```
    vdslLineExtMCMMib    OBJECT IDENTIFIER ::= { vdslEXTMCMMIB 1 }
    vdslEXTMCMMibObjects OBJECT IDENTIFIER ::= { vdslLineExtMCMMib 1 }

    --
    -- Multiple carrier modulation (MCM) configuration profile tables
    --

    vdslLineMCMConfProfileTable OBJECT-TYPE
        SYNTAX       SEQUENCE OF VdslLineMCMConfProfileEntry
        MAX-ACCESS   not-accessible
        STATUS       current
        DESCRIPTION
            "This table contains additional information on
            multiple carrier VDSL lines.  One entry in this table
            reflects a profile defined by a manager which can be used
            to configure the VDSL line.

            The entries in this table MUST NOT be used for single
            carrier (SCM) VDSL lines."
        ::= { vdslEXTMCMMibObjects  1 }

    vdslLineMCMConfProfileEntry OBJECT-TYPE
        SYNTAX       VdslLineMCMConfProfileEntry
        MAX-ACCESS   not-accessible
        STATUS       current
        DESCRIPTION
            "Each entry consists of a list of parameters that
            represents the configuration of a multiple carrier
            modulation VDSL modem.

            A default profile with an index of 'DEFVAL', will always
            exist and its parameters will be set to vendor specific
            values, unless otherwise specified in this document."
        INDEX { vdslLineConfProfileName }
        ::= { vdslLineMCMConfProfileTable 1 }

    VdslLineMCMConfProfileEntry ::=
        SEQUENCE
            {
            vdslMCMConfProfileTxWindowLength       Unsigned32,
            vdslMCMConfProfileRowStatus            RowStatus
            }

    vdslMCMConfProfileTxWindowLength OBJECT-TYPE
        SYNTAX       Unsigned32 (1..255)
        UNITS        "samples"
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
```

```
            "Specifies the length of the transmit window, counted
            in samples at the sampling rate corresponding to the
            negotiated value of N."
        REFERENCE    "T1E1.4/2000-013R4"    -- Part 3, MCM
        ::= { vdslLineMCMConfProfileEntry 1 }
```

```
    vdslMCMConfProfileRowStatus OBJECT-TYPE
        SYNTAX       RowStatus
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "This object is used to create a new row or modify or
            delete an existing row in this table.

            A profile activated by setting this object to `active'.
            When `active' is set, the system will validate the profile.

            Before a profile can be deleted or taken out of
            service, (by setting this object to `destroy' or
            `outOfService') it must be first unreferenced
            from all associated lines."
        ::= { vdslLineMCMConfProfileEntry 2 }

    vdslLineMCMConfProfileTxBandTable OBJECT-TYPE
        SYNTAX       SEQUENCE OF VdslLineMCMConfProfileTxBandEntry
        MAX-ACCESS   not-accessible
        STATUS       current
        DESCRIPTION
            "This table contains transmit band descriptor configuration
            information for a VDSL line.  Each entry in this table
            reflects the configuration for one of possibly many bands
            with a multiple carrier modulation (MCM) VDSL line.
            These entries are defined by a manager and can be used to
            configure the VDSL line.

            The entries in this table MUST NOT be used for single
            carrier (SCM) VDSL lines."
        ::= { vdslEXTMCMMibObjects  2 }

    vdslLineMCMConfProfileTxBandEntry OBJECT-TYPE
        SYNTAX       VdslLineMCMConfProfileTxBandEntry
        MAX-ACCESS   not-accessible
        STATUS       current
        DESCRIPTION
            "Each entry consists of a transmit band descriptor, which
            is defined by a start and a stop tone index.
            A default profile with an index of 'DEFVAL', will
            always exist and its parameters will be set to vendor
            specific values, unless otherwise specified in this
            document."
        INDEX { vdslLineConfProfileName,
                vdslMCMConfProfileTxBandNumber }
        ::= { vdslLineMCMConfProfileTxBandTable 1 }
```

```
    VdslLineMCMConfProfileTxBandEntry ::=
        SEQUENCE
            {
            vdslMCMConfProfileTxBandNumber          Unsigned32,
            vdslMCMConfProfileTxBandStart           Unsigned32,
            vdslMCMConfProfileTxBandStop            Unsigned32,
            vdslMCMConfProfileTxBandRowStatus       RowStatus
            }

    vdslMCMConfProfileTxBandNumber OBJECT-TYPE
        SYNTAX       Unsigned32
        MAX-ACCESS   not-accessible
        STATUS       current
        DESCRIPTION
            "The index for this band descriptor entry."
        ::= { vdslLineMCMConfProfileTxBandEntry 1 }

    vdslMCMConfProfileTxBandStart OBJECT-TYPE
        SYNTAX       Unsigned32
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "Start tone index for this band."
        REFERENCE    "T1E1.4/2000-013R4"    -- Part 3, MCM
        ::= { vdslLineMCMConfProfileTxBandEntry 2 }

    vdslMCMConfProfileTxBandStop OBJECT-TYPE
        SYNTAX       Unsigned32
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "Stop tone index for this band."
        REFERENCE    "T1E1.4/2000-013R4"    -- Part 3, MCM
        ::= { vdslLineMCMConfProfileTxBandEntry 3 }

    vdslMCMConfProfileTxBandRowStatus OBJECT-TYPE
        SYNTAX       RowStatus
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "This object is used to create a new row or modify or
            delete an existing row in this table.
            A profile activated by setting this object to `active'.
            When `active' is set, the system will validate the profile.

            Before a profile can be deleted or taken out of
            service, (by setting this object to `destroy' or
            `outOfService') it must be first unreferenced
            from all associated lines."
```

```
        ::= { vdslLineMCMConfProfileTxBandEntry 4 }
```

```
    vdslLineMCMConfProfileRxBandTable OBJECT-TYPE
        SYNTAX       SEQUENCE OF VdslLineMCMConfProfileRxBandEntry
        MAX-ACCESS   not-accessible
        STATUS       current
        DESCRIPTION
            "This table contains receive band descriptor configuration
            information for a VDSL line.  Each entry in this table
            reflects the configuration for one of possibly many bands
            with a multiple carrier modulation (MCM) VDSL line.
            These entries are defined by a manager and can be used to
            configure the VDSL line.

            The entries in this table MUST NOT be used for single
            carrier (SCM) VDSL lines."
        ::= { vdslEXTMCMMibObjects 3 }

    vdslLineMCMConfProfileRxBandEntry OBJECT-TYPE
        SYNTAX       VdslLineMCMConfProfileRxBandEntry
        MAX-ACCESS   not-accessible
        STATUS       current
        DESCRIPTION
            "Each entry consists of a transmit band descriptor, which
            is defined by a start and a stop tone index.

            A default profile with an index of 'DEFVAL', will
            always exist and its parameters will be set to vendor
            specific values, unless otherwise specified in this
            document."
        INDEX { vdslLineConfProfileName,
                vdslMCMConfProfileRxBandNumber }
        ::= { vdslLineMCMConfProfileRxBandTable 1 }

    VdslLineMCMConfProfileRxBandEntry ::=
        SEQUENCE
            {
            vdslMCMConfProfileRxBandNumber          Unsigned32,
            vdslMCMConfProfileRxBandStart           Unsigned32,
            vdslMCMConfProfileRxBandStop            Unsigned32,
            vdslMCMConfProfileRxBandRowStatus       RowStatus
            }

    vdslMCMConfProfileRxBandNumber OBJECT-TYPE
        SYNTAX       Unsigned32
        MAX-ACCESS   not-accessible
        STATUS       current
        DESCRIPTION
            "The index for this band descriptor entry."
        ::= { vdslLineMCMConfProfileRxBandEntry 1 }
```

```
    vdslMCMConfProfileRxBandStart OBJECT-TYPE
        SYNTAX       Unsigned32
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "Start tone index for this band."
        REFERENCE    "T1E1.4/2000-013R4"    -- Part 3, MCM
        ::= { vdslLineMCMConfProfileRxBandEntry 2 }

    vdslMCMConfProfileRxBandStop OBJECT-TYPE
        SYNTAX       Unsigned32
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "Stop tone index for this band."
        REFERENCE    "T1E1.4/2000-013R4"    -- Part 3, MCM
        ::= { vdslLineMCMConfProfileRxBandEntry 3 }

    vdslMCMConfProfileRxBandRowStatus OBJECT-TYPE
        SYNTAX       RowStatus
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "This object is used to create a new row or modify or
            delete an existing row in this table.

            A profile activated by setting this object to `active'.
            When `active' is set, the system will validate the profile.

            Before a profile can be deleted or taken out of
            service, (by setting this object to `destroy' or
            `outOfService') it must be first unreferenced
            from all associated lines."
        ::= { vdslLineMCMConfProfileRxBandEntry 4 }

    vdslLineMCMConfProfileTxPSDTable OBJECT-TYPE
        SYNTAX       SEQUENCE OF VdslLineMCMConfProfileTxPSDEntry
        MAX-ACCESS   not-accessible
        STATUS       current
        DESCRIPTION
            "This table contains transmit PSD mask descriptor
            configuration information for a VDSL line.  Each entry in
            this table reflects the configuration for one tone within
            a multiple carrier modulation (MCM) VDSL line.  These
            entries are defined by a manager and can be used to
            configure the VDSL line.

            The entries in this table MUST NOT be used for single
            carrier (SCM) VDSL lines."
```

```
        ::= { vdslEXTMCMMibObjects 4 }
```

```
    vdslLineMCMConfProfileTxPSDEntry OBJECT-TYPE
        SYNTAX       VdslLineMCMConfProfileTxPSDEntry
        MAX-ACCESS   not-accessible
        STATUS       current
        DESCRIPTION
            "Each entry consists of a transmit PSD mask descriptor,
            which defines the power spectral density (PSD) for a tone.

            A default profile with an index of 'DEFVAL', will
            always exist and its parameters will be set to vendor
            specific values, unless otherwise specified in this
            document."
        INDEX { vdslLineConfProfileName,
                vdslMCMConfProfileTxPSDNumber }
        ::= { vdslLineMCMConfProfileTxPSDTable 1 }

    VdslLineMCMConfProfileTxPSDEntry ::=
        SEQUENCE
            {
            vdslMCMConfProfileTxPSDNumber            Unsigned32,
            vdslMCMConfProfileTxPSDTone              Unsigned32,
            vdslMCMConfProfileTxPSDPSD               Unsigned32,
            vdslMCMConfProfileTxPSDRowStatus         RowStatus
            }

    vdslMCMConfProfileTxPSDNumber OBJECT-TYPE
        SYNTAX       Unsigned32
        MAX-ACCESS   not-accessible
        STATUS       current
        DESCRIPTION
            "The index for this mask descriptor entry."
        ::= { vdslLineMCMConfProfileTxPSDEntry 1 }

    vdslMCMConfProfileTxPSDTone OBJECT-TYPE
        SYNTAX       Unsigned32
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "The tone index for which the PSD is being specified."
        REFERENCE    "T1E1.4/2000-013R4"    -- Part 3, MCM
        ::= { vdslLineMCMConfProfileTxPSDEntry 2 }

    vdslMCMConfProfileTxPSDPSD OBJECT-TYPE
        SYNTAX       Unsigned32
        UNITS        "0.5dBm"
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "Power Spectral Density level in steps of 0.5dB with
```

```
            an offset of -140dbm/Hz."
        REFERENCE    "T1E1.4/2000-013R4"    -- Part 3, MCM
        ::= { vdslLineMCMConfProfileTxPSDEntry 3 }
```

```
    vdslMCMConfProfileTxPSDRowStatus OBJECT-TYPE
        SYNTAX       RowStatus
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "This object is used to create a new row or modify or
            delete an existing row in this table.

            A profile activated by setting this object to `active'.
            When `active' is set, the system will validate the profile.

            Before a profile can be deleted or taken out of
            service, (by setting this object to `destroy' or
            `outOfService') it must be first unreferenced
            from all associated lines."
        ::= { vdslLineMCMConfProfileTxPSDEntry 4 }

    vdslLineMCMConfProfileMaxTxPSDTable OBJECT-TYPE
        SYNTAX       SEQUENCE OF VdslLineMCMConfProfileMaxTxPSDEntry
        MAX-ACCESS   not-accessible
        STATUS       current
        DESCRIPTION
            "This table contains transmit maximum PSD mask descriptor
            configuration information for a VDSL line.  Each entry in
            this table reflects the configuration for one tone within
            a multiple carrier modulation (MCM) VDSL modem.  These
            entries are defined by a manager and can be used to
            configure the VDSL line.

            The entries in this table MUST NOT be used for single
            carrier (SCM) VDSL lines."
        ::= { vdslEXTMCMMibObjects 5 }

    vdslLineMCMConfProfileMaxTxPSDEntry OBJECT-TYPE
        SYNTAX       VdslLineMCMConfProfileMaxTxPSDEntry
        MAX-ACCESS   not-accessible
        STATUS       current
        DESCRIPTION
            "Each entry consists of a transmit PSD mask descriptor,
            which defines the maximum power spectral density (PSD)
            for a tone.

            A default profile with an index of 'DEFVAL', will
            always exist and its parameters will be set to vendor
            specific values, unless otherwise specified in this
            document."
        INDEX { vdslLineConfProfileName,
                vdslMCMConfProfileMaxTxPSDNumber }
        ::= { vdslLineMCMConfProfileMaxTxPSDTable 1 }
```

```
    VdslLineMCMConfProfileMaxTxPSDEntry ::=
        SEQUENCE
            {
            vdslMCMConfProfileMaxTxPSDNumber            Unsigned32,
            vdslMCMConfProfileMaxTxPSDTone              Unsigned32,
            vdslMCMConfProfileMaxTxPSDPSD               Unsigned32,
            vdslMCMConfProfileMaxTxPSDRowStatus         RowStatus
            }

    vdslMCMConfProfileMaxTxPSDNumber OBJECT-TYPE
        SYNTAX       Unsigned32
        MAX-ACCESS   not-accessible
        STATUS       current
        DESCRIPTION
            "The index for this band descriptor entry."
        ::= { vdslLineMCMConfProfileMaxTxPSDEntry 1 }

    vdslMCMConfProfileMaxTxPSDTone OBJECT-TYPE
        SYNTAX       Unsigned32
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "The tone index for which the PSD is being specified."
        REFERENCE    "T1E1.4/2000-013R4"    -- Part 3, MCM
        ::= { vdslLineMCMConfProfileMaxTxPSDEntry 2 }

    vdslMCMConfProfileMaxTxPSDPSD OBJECT-TYPE
        SYNTAX       Unsigned32
        UNITS        "0.5dBm"
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "Power Spectral Density level in steps of 0.5dB with
            an offset of -140dbm/Hz."
        REFERENCE    "T1E1.4/2000-013R4"    -- Part 3, MCM
        ::= { vdslLineMCMConfProfileMaxTxPSDEntry 3 }

    vdslMCMConfProfileMaxTxPSDRowStatus OBJECT-TYPE
        SYNTAX       RowStatus
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "This object is used to create a new row or modify or
            delete an existing row in this table.

            A profile activated by setting this object to `active'.
            When `active' is set, the system will validate the profile.

            Before a profile can be deleted or taken out of
```

```
            service, (by setting this object to `destroy' or
            `outOfService') it must be first unreferenced
            from all associated lines."
        ::= { vdslLineMCMConfProfileMaxTxPSDEntry 4 }
```

```
    vdslLineMCMConfProfileMaxRxPSDTable OBJECT-TYPE
        SYNTAX       SEQUENCE OF VdslLineMCMConfProfileMaxRxPSDEntry
        MAX-ACCESS   not-accessible
        STATUS       current
        DESCRIPTION
            "This table contains maximum receive PSD mask descriptor
            configuration information for a VDSL line.  Each entry in
            this table reflects the configuration for one tone within
            a multiple carrier modulation (MCM) VDSL modem.  These
            entries are defined by a manager and can be used to
            configure the VDSL line.

            The entries in this table MUST NOT be used for single
            carrier (SCM) VDSL lines."
        ::= { vdslEXTMCMMibObjects 6 }

    vdslLineMCMConfProfileMaxRxPSDEntry OBJECT-TYPE
        SYNTAX       VdslLineMCMConfProfileMaxRxPSDEntry
        MAX-ACCESS   not-accessible
        STATUS       current
        DESCRIPTION
            "Each entry consists of a transmit PSD mask descriptor,
            which defines the power spectral density (PSD) for a
            tone.

            A default profile with an index of 'DEFVAL', will
            always exist and its parameters will be set to vendor
            specific values, unless otherwise specified in this
            document."
        INDEX { vdslLineConfProfileName,
                vdslMCMConfProfileMaxRxPSDNumber }
        ::= { vdslLineMCMConfProfileMaxRxPSDTable 1 }

    VdslLineMCMConfProfileMaxRxPSDEntry ::=
        SEQUENCE
            {
            vdslMCMConfProfileMaxRxPSDNumber            Unsigned32,
            vdslMCMConfProfileMaxRxPSDTone              Unsigned32,
            vdslMCMConfProfileMaxRxPSDPSD               Unsigned32,
            vdslMCMConfProfileMaxRxPSDRowStatus         RowStatus
            }

    vdslMCMConfProfileMaxRxPSDNumber OBJECT-TYPE
        SYNTAX       Unsigned32
        MAX-ACCESS   not-accessible
        STATUS       current
        DESCRIPTION
            "The index for this band descriptor entry."
        ::= { vdslLineMCMConfProfileMaxRxPSDEntry 1 }
```

```
    vdslMCMConfProfileMaxRxPSDTone OBJECT-TYPE
        SYNTAX       Unsigned32
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "The tone index for which the PSD is being specified."
        REFERENCE    "T1E1.4/2000-013R4"    -- Part 3, MCM
        ::= { vdslLineMCMConfProfileMaxRxPSDEntry 2 }

    vdslMCMConfProfileMaxRxPSDPSD OBJECT-TYPE
        SYNTAX       Unsigned32
        UNITS        "0.5dBm"
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "Power Spectral Density level in steps of 0.5dB with
            an offset of -140dbm/Hz."
        REFERENCE    "T1E1.4/2000-013R4"    -- Part 3, MCM
        ::= { vdslLineMCMConfProfileMaxRxPSDEntry 3 }

    vdslMCMConfProfileMaxRxPSDRowStatus OBJECT-TYPE
        SYNTAX       RowStatus
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "This object is used to create a new row or modify or
            delete an existing row in this table.

            A profile activated by setting this object to `active'.
            When `active' is set, the system will validate the profile.

            Before a profile can be deleted or taken out of
            service, (by setting this object to `destroy' or
            `outOfService') it must be first unreferenced
            from all associated lines."
        ::= { vdslLineMCMConfProfileMaxRxPSDEntry 4 }




     -- conformance information

    vdslExtMCMConformance OBJECT IDENTIFIER ::= { vdslLineExtMCMMib 2 }
    vdslExtMCMGroups OBJECT IDENTIFIER ::= { vdslExtMCMConformance 1 }
    vdslExtMCMCompliances OBJECT IDENTIFIER ::=
                                { vdslExtMCMConformance 2 }
```

```
    vdslLineExtMCMMibCompliance MODULE-COMPLIANCE
        STATUS  current
        DESCRIPTION
            "The compliance statement for SNMP entities which
            manage VDSL interfaces."

        MODULE  -- this module

        GROUP       vdslMCMGroup
        DESCRIPTION
            "This group is an optional extension for VDSL lines which
            utilize Multiple Carrier Modulation (MCM)."

        ::= { vdslCompliances 1 }

    -- units of conformance

        vdslMCMGroup OBJECT-GROUP
             OBJECTS
                {
                vdslMCMConfProfileTxWindowLength,
                vdslMCMConfProfileRowStatus,
                vdslMCMConfProfileTxBandStart,
                vdslMCMConfProfileTxBandStop,
                vdslMCMConfProfileTxBandRowStatus,
                vdslMCMConfProfileRxBandStart,
                vdslMCMConfProfileRxBandStop,
                vdslMCMConfProfileRxBandRowStatus,
                vdslMCMConfProfileTxPSDTone,
                vdslMCMConfProfileTxPSDPSD,
                vdslMCMConfProfileTxPSDRowStatus,
                vdslMCMConfProfileMaxTxPSDTone,
                vdslMCMConfProfileMaxTxPSDPSD,
                vdslMCMConfProfileMaxTxPSDRowStatus,
                vdslMCMConfProfileMaxRxPSDTone,
                vdslMCMConfProfileMaxRxPSDPSD,
                vdslMCMConfProfileMaxRxPSDRowStatus
                }
             STATUS     current
             DESCRIPTION
                 "A collection of objects providing configuration
                 information for a VDSL line based upon multiple
                 carrier modulation modem."
          ::= { vdslGroups 1 }




    END
```

5. Intellectual Property Notice

The IETF takes no position regarding the validity or scope of any intellectual property or other rights that might be claimed to pertain to the implementation or use of the technology described in this document or the extent to which any license under such rights might or might not be available; neither does it represent that it has made any effort to identify any such rights. Information on the IETF's procedures with respect to rights in standards-track and standards-related documentation can be found in BCP-11. Copies of claims of rights made available for publication and any assurances of licenses to be made available, or the result of an attempt made to obtain a general license or permission for the use of such proprietary rights by implementors or users of this specification can be obtained from the IETF Secretariat.

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6. Normative References

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7. Informative References

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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.

VDSL layer connectivity from the Vtur will permit the subscriber to manipulate both the VDSL link directly and the VDSL embedded operations channel (EOC) for their own loop. For example, unchecked or unfiltered fluctuations initiated by the subscriber could generate sufficient notifications to potentially overwhelm either the management interface to the network or the element manager.

For this reason, there are a number of managed objects in this MIB that may contain sensitive information.

It is thus important to control even GET access to these objects and possibly to even encrypt the values of these objects when sending them over the network via SNMP. Not all versions of SNMP provide features for such a secure environment.

Further, notifications generated by agents implementing this MIB will contain the above threshold information.

SNMP versions prior to SNMPv3 did not include adequate security. 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) objects which utilize the textual conventions defined in this MIB module.

It is RECOMMENDED that implementers consider the security features as provided by the SNMPv3 framework (see [RFC3410], section 8), including full support for the SNMPv3 cryptographic mechanisms (for authentication and privacy).

Further, deployment of SNMP versions prior to SNMPv3 is NOT RECOMMENDED. Instead, it is RECOMMENDED to deploy SNMPv3 and to enable cryptographic security. It is then a customer/operator responsibility to ensure that the SNMP entity giving access to an instance of a MIB module which utilizes the textual conventions defined in this MIB module 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. Acknowledgments

This document contains many definitions taken from draft-ietf-adslmib-vdsl-07.txt. As such any credit for the text found within should be full attributed to the authors of that document.

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