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Category: Internet Draft   Infineon Technologies
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                                                       February 2004

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

Status of this Memo

Copyright Notice

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 "200402120000Z" -- February 12, 2004
      ORGANIZATION "ADSLMIB Working Group"
      CONTACT-INFO "WG-email: adslmib@ietf.org
           Info: https://www1.ietf.org/mailman/listinfo/adslmib

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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
```

-- RFC Ed.: replace XXXX with assigned number & remove this note
          REVISION "200402120000Z" -- February 12, 2004
          DESCRIPTION "Initial version, published as RFC XXXX."
-- RFC Ed.: replace XXXX with assigned number & remove this note
     ::= { vdslMIB XX }   -- To be assigned by IANA
-- RFC Ed.: we suggest to put it under { vdslMIB 3 } because
--   vdslMIB 1 is the VDSL core MIB, vdslMIB 2 is the SCM
--   extension MIB, while vdslMIB 3 is the MCM extension MIB.

    vdslLineExtMCMMib   OBJECT IDENTIFIER ::= { vdslExtMCMMIB 1 }
    vdslLineExtMCMMibObjects 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."
        ::= { vdslLineExtMCMMibObjects 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
    {
    vdslLineMCMConfProfileTxWindowLength      Unsigned32,
    vdslLineMCMConfProfileRowStatus           RowStatus
    }
```

```
vdslLineMCMConfProfileTxWindowLength 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 }

vdslLineMCMConfProfileRowStatus 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."
    ::= { vdslLineExtMCMMibObjects  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,
                 vdslLineMCMConfProfileTxBandNumber }
         ::= { vdslLineMCMConfProfileTxBandTable 1 }


     VdslLineMCMConfProfileTxBandEntry ::=
         SEQUENCE
             {
             vdslLineMCMConfProfileTxBandNumber         Unsigned32,
             vdslLineMCMConfProfileTxBandStart          Unsigned32,
             vdslLineMCMConfProfileTxBandStop           Unsigned32,
             vdslLineMCMConfProfileTxBandRowStatus      RowStatus
             }

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

     vdslLineMCMConfProfileTxBandStart 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 }

     vdslLineMCMConfProfileTxBandStop 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 }
```

```
    vdslLineMCMConfProfileTxBandRowStatus 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."
        ::= { vdslLineExtMCMMibObjects 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,
                vdslLineMCMConfProfileRxBandNumber }
```

```
        ::= { vdslLineMCMConfProfileRxBandTable 1 }
```

```
     VdslLineMCMConfProfileRxBandEntry ::=
         SEQUENCE
             {
             vdslLineMCMConfProfileRxBandNumber          Unsigned32,
             vdslLineMCMConfProfileRxBandStart           Unsigned32,
             vdslLineMCMConfProfileRxBandStop            Unsigned32,
             vdslLineMCMConfProfileRxBandRowStatus       RowStatus
             }

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


     vdslLineMCMConfProfileRxBandStart 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 }

     vdslLineMCMConfProfileRxBandStop 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 }

     vdslLineMCMConfProfileRxBandRowStatus 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."
        ::= { vdslLineExtMCMMibObjects 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,
                vdslLineMCMConfProfileTxPSDNumber }
        ::= { vdslLineMCMConfProfileTxPSDTable 1 }

    VdslLineMCMConfProfileTxPSDEntry ::=
        SEQUENCE
            {
            vdslLineMCMConfProfileTxPSDNumber           Unsigned32,
            vdslLineMCMConfProfileTxPSDTone             Unsigned32,
            vdslLineMCMConfProfileTxPSDPSD              Unsigned32,
            vdslLineMCMConfProfileTxPSDRowStatus        RowStatus
            }

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

```
    vdslLineMCMConfProfileTxPSDTone 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 }


    vdslLineMCMConfProfileTxPSDPSD 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 }



    vdslLineMCMConfProfileTxPSDRowStatus 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."
     ::= { vdslLineExtMCMMibObjects 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,
                vdslLineMCMConfProfileMaxTxPSDNumber }
        ::= { vdslLineMCMConfProfileMaxTxPSDTable 1 }



    VdslLineMCMConfProfileMaxTxPSDEntry ::=
        SEQUENCE
            {
            vdslLineMCMConfProfileMaxTxPSDNumber          Unsigned32,
            vdslLineMCMConfProfileMaxTxPSDTone            Unsigned32,
            vdslLineMCMConfProfileMaxTxPSDPSD            Unsigned32,
            vdslLineMCMConfProfileMaxTxPSDRowStatus      RowStatus
            }

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

    vdslLineMCMConfProfileMaxTxPSDTone 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 }
```

```
vdslLineMCMConfProfileMaxTxPSDPSD 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 }

vdslLineMCMConfProfileMaxTxPSDRowStatus 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."
    ::= { vdslLineExtMCMMibObjects 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,
                 vdslLineMCMConfProfileMaxRxPSDNumber }
         ::= { vdslLineMCMConfProfileMaxRxPSDTable 1 }

     VdslLineMCMConfProfileMaxRxPSDEntry ::=
         SEQUENCE
             {
             vdslLineMCMConfProfileMaxRxPSDNumber          Unsigned32,
             vdslLineMCMConfProfileMaxRxPSDTone            Unsigned32,
             vdslLineMCMConfProfileMaxRxPSDPSD             Unsigned32,
             vdslLineMCMConfProfileMaxRxPSDRowStatus       RowStatus
             }

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



     vdslLineMCMConfProfileMaxRxPSDTone 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 }
```

```
vdslLineMCMConfProfileMaxRxPSDPSD 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 }

vdslLineMCMConfProfileMaxRxPSDRowStatus 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

vdslLineExtMCMConformance OBJECT IDENTIFIER ::=
                                      {vdslLineExtMCMMib 2}
vdslLineExtMCMGroups OBJECT IDENTIFIER ::=
                              { vdslLineExtMCMConformance 1 }
vdslLineExtMCMCompliances OBJECT IDENTIFIER ::=
                              { vdslLineExtMCMConformance 2 }



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

MODULE -- this module

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

        ::= { vdslLineExtMCMCompliances 1 }

    -- units of conformance

        vdslLineExtMCMGroup OBJECT-GROUP
            OBJECTS
                {
                vdslLineMCMConfProfileTxWindowLength,
                vdslLineMCMConfProfileRowStatus,
                vdslLineMCMConfProfileTxBandStart,
                vdslLineMCMConfProfileTxBandStop,
                vdslLineMCMConfProfileTxBandRowStatus,
                vdslLineMCMConfProfileRxBandStart,
                vdslLineMCMConfProfileRxBandStop,
                vdslLineMCMConfProfileRxBandRowStatus,
                vdslLineMCMConfProfileTxPSDTone,
                vdslLineMCMConfProfileTxPSDPSD,
                vdslLineMCMConfProfileTxPSDRowStatus,
                vdslLineMCMConfProfileMaxTxPSDTone,
                vdslLineMCMConfProfileMaxTxPSDPSD,
                vdslLineMCMConfProfileMaxTxPSDRowStatus,
                vdslLineMCMConfProfileMaxRxPSDTone,
                vdslLineMCMConfProfileMaxRxPSDPSD,
                vdslLineMCMConfProfileMaxRxPSDRowStatus
                }
            STATUS     current
            DESCRIPTION
                "A collection of objects providing configuration
                information for a VDSL line based upon multiple
                carrier modulation modem."
        ::= { vdslLineExtMCMGroup 1 }


    END
```

5. **Intellectual Property Notice**

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   Director.

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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 fully attributed to the authors of that
document.

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