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Definitions of Managed Objects for VDSL Lines
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Status of this Memo

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1. 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 Very high speed Digital Subscriber Line (VDSL) interfaces
[18, 19, 20].

This document specifies a MIB module in a manner that is compliant
to the SMIv2 (STD 58 [5, 6, 7]).

2. The SNMP Management Framework

The SNMP Management Framework presently consists of five major
components:

o   An overall architecture, described in RFC 2571 [1].

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 [2], STD 16, RFC 1212 [3] and RFC 1215 [4].
     The second version, called SMIv2, is described in STD 58, RFC
     2578 [5], STD 58, RFC 2579 [6] and STD 58, RFC 2580 [7].

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 [8]. A second version of the SNMP
message protocol, which is not an Internet standards track

protocol, is called SNMPv2c and described in RFC 1901 [9] and
RFC 1906 [10]. The third version of the message protocol is
called SNMPv3 and described in RFC 1906 [10], RFC 2572 [11] and
RFC 2574 [12].

o   Protocol operations for accessing management information. The
     first set of protocol operations and associated PDU formats is
     described in STD 15, RFC 1157 [8]. A second set of protocol
     operations and associated PDU formats is described in RFC 1905
     [13].

o   A set of fundamental applications described in RFC 2573 [14]
     and the view-based access control mechanism described in RFC
     2575 [15].

A more detailed introduction to the current SNMP Management Framework
can be found in RFC 2570 [16].

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.

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 [17].

3. Introduction

This document describes an SNMP MIB for managing VDSL Lines. These
definitions are based upon the specifications for VDSL as defined
in [18, 19, 20].

The MIB is located in the MIB tree under MIB 2 transmission, as
discussed in the MIB-2 Integration (RFC 2863 [23]) section of this
document.

3.1 IANA Considerations

The SNMPv2-TM MIB module requires the allocation of a single object
identifier for its MODULE-IDENTITY. IANA should allocate this object

identifier in the snmpModules subtree, defined in the SNMPv2-SMI MIB
module.

3.2. Relationship of the VDSL Line MIB to other MIBs

   This section outlines the relationship of this MIB with other MIBs
   described in RFCs. Specifically, IF-MIB as presented RFC 2863 [23]
   is discussed.

3.2.1 General IF-MIB Integration (RFC 2863)

   The VDSL Line MIB specifies the detailed attributes of a data
   interface. As such, it needs to integrate with RFC 2863 [23]. The
   IANA has assigned the following ifType to VDSL:

   IANAifType ::= TEXTUAL-CONVENTION
       ...
   SYNTAX INTEGER {
       ...
       vdsl(97), -- Very H-speed Digital Subscrib. Loop
       ...
       }

3.2.2 Usage of ifTable

   The MIB branch identified by this ifType contains tables appropriate
   for this interface type. Most such tables extend the ifEntry table,
   and are indexed by ifIndex. For interfaces in systems implementing
   this MIB, those table entries indexed by ifIndex MUST be persistent.

   The following attributes are part of the mandatory ifGeneral group in
   RFC 2863 [23], and are not duplicated in the VDSL Line MIB.

       ==
       ifIndex   Interface index.

       ifDescr   See interfaces MIB [21].

       ifType   vdsl(97)

       ifSpeed   Set as appropriate.

       ifPhysAddress   This object MUST have an octet string
                               with zero length.

       ifAdminStatus   See interfaces MIB [21].

       ifOperStatus   See interfaces MIB [21].

       ifLastChange   See interfaces MIB [21].

       ifName   See interfaces MIB [21].

ifLinkUpDownTrapEnable   Default to enabled(1).

        ifHighSpeed   Set as appropriate.

        ifConnectorPresent   Set as appropriate.

    ===
                    Figure 1: Use of ifTable Objects

4. Conventions used in the MIB

4.1. Naming Conventions

    A. Vtuc -- (VTUC) modem at near (Central) end of line
    B. Vtur -- (VTUR) modem 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. LCS -- Line Code Specific
    I. Lof -- Loss of Frame
    J. Lol -- Loss of Link
    K. Los -- Loss of Signal
    L. Lpr -- Loss of Power
    M. xxxs -- interval of Seconds in which xxx occurs
                (e.g., xxx=Lof, Los, Lpr)
    N. Max -- Maximum
    O. Mgn -- Margin
    P. Min -- Minimum
    Q. Psd -- Power Spectral Density
    R. Snr -- Signal to Noise Ratio
    S. Tx   -- Transmit
    T. Blks -- Blocks, a data unit, see vdslVtuXChanCrcBlockLength

4.2. Textual Conventions

    The following textual conventions are defined to reflect the line
    topology in the MIB (further discussed in the following section)
    and to define the behavior of the statistics to be maintained
    by an agent.

    o   VdslLineCodingType :

    Attributes with this syntax identify the line coding used.
    Specified as an INTEGER, the three values are:

    other(1) -- none of the following
    mcm(2)   -- Multiple Carrier Modulation
    scm(3)   -- Single Carrier Modulation

    o   VdslLineEntity :

Attributes with this syntax reference the two sides of a line.

Specified as an INTEGER, the two values are:

vtuc(1) -- central site modem
vtur(2) -- remote site modem

4.3. Structure

The MIB is structured into following MIB groups:

o   vdslGroup :

This group supports all line code independent MIB objects found
in this MIB. It contains the following tables:

    - vdslLineTable
    - vdslPhysTable
    - vdslChanTable
    - vdslPerfDataTable
    - vdslPerfIntervalTable
    - vdslChanPerfDataTable
    - vdslChanPerfIntervalTable
    - vdslLineConfProfileTable
    - vdslLineAlarmConfProfileTable

o   vdslMCMGroup :

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

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

Objects in this group MUST be implemented for MCM VDSL lines.

o   vdslSCMGroup :

This group supports MIB objects for defining configuration profiles
for Single Carrier Modulation (SCM) VDSL modems. It contains the
following tables:

    - vdslLineSCMConfProfileTable

Objects in this group MUST be implemented for SCM VDSL lines.

[4.3.1](#) Line Topology

A VDSL Line consists of a two units - Vtuc (the central termination
unit) and a Vtur (the remote termination unit).

```
         <-- Network Side   Customer Side -->

         |<////////// VDSL Line ///////////>|

         +-------+                 +-------+
         |       |                 |       |
         | Vtuc  +-----------------+  Vtur |
         |       |                 |       |
         +-------+                 +-------+
```
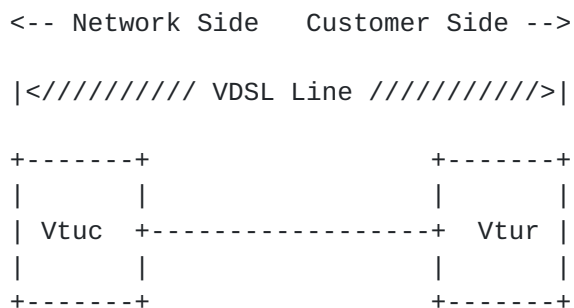
           Figure 2: General topology for a VDSL Line

4.4. Counters, Interval Buckets and Thresholds

   For Loss of Frame (lof), Loss of Link (lol), Loss of Signal (los),
   and Loss of Power (lpr), there are event counters, current 15-minute
   and 0 to 96 15-minute history bucket(s) of "interval-counters".
   Each current 15-minute event bucket has an associated threshold
   notification.

   Each of these counters uses the textual conventions defined in the
   HC-PerfHist-TC-MIB. The HC-PerfHist-TC-MIB is a work-in-progress,
   but simply defines 64-bit versions of the textual conventions
   found in RFC 2493 [21].

   Unlike RFC 2493 [21] and RFC 2662 [22], there is no representation
   in the MIB for invalid buckets. In those cases where the data for
   an interval is suspect or known to be invalid, the agent MUST NOT
   report the interval. If the current 15-minute event bucket is
   determined to be invalid, notifications based upon the value of the
   event bucket MUST NOT be generated.

   Not reporting an interval will result in holes in the associated
   table. For example, the table, vdslPerfIntervalTable, is indexed
   by { ifIndex, vdslPhysSide, vdslIntervalNumber }. If interval 12
   is determined to be invalid but intervals 11 and 13 are valid, a
   Get Next operation on the indices .1.1.11 would return indices
   .1.1.13.

   There is no requirement for an agent to ensure a fixed relationship
   between the start of a fifteen minute and any wall clock; however
   some implementations may align the fifteen minute intervals with
   quarter hours. Likewise, an implementation may choose to align one
   day intervals with the start of a day.

   Counters are not reset when an Vtu is reinitialized, only when the
   agent is reset or reinitialized (or under specific request outside

the scope of this MIB).

4.5. Profiles

   As a managed node can handle a large number of Vtus, (e.g., hundreds
   or perhaps thousands of lines), provisioning every parameter on every
   Vtu may become burdensome. Moreover, most lines are provisioned
   identically with the same set of parameters. To simplify the
   provisioning process, this MIB makes use of profiles. A profile is a
   set of parameters that can be shared by multiple lines using the same
   configuration.

   The following profiles are used in this MIB:

   o   Line Configuration Profiles - Line configuration profiles contain
       parameters for configuring VDSL lines. They are defined in eight
       tables:

       - vdslLineConfProfileTable
       - vdslLineMCMConfProfileTable
       - vdslLineMCMConfProfileTxBandTable
       - vdslLineMCMConfProfileRxBandTable
       - vdslLineMCMConfProfileTxPSDTable
       - vdslLineMCMConfProfileMaxTxPSDTable
       - vdslLineMCMConfProfileMaxRxPSDTable
       - vdslLineSCMConfProfileTable

       As noted above, the latter seven tables in the above list are
       line code specific.

   o   Alarm Configuration Profiles - These profiles contain parameters
       for configuring alarm thresholds for VDSL modems. These profiles
       are defined in the vdslLineAlarmConfProfileTable.

   One or more lines may be configured to share parameters of a single
   profile by setting its vdslLineConfProfile objects to the value of
   this profile. If a change is made to the profile, all lines that
   refer to it will be reconfigured to the changed parameters. Before
   a profile can be deleted or taken out of service it must be first
   unreferenced from all associated lines.

   Implementations MUST provide a default profile with an index value
   of 1 for each profile type. The values of the associated parameters
   will be vendor specific unless otherwise indicated in this document.
   Before a line's profiles have been set, these profiles will be
   automatically used by setting vdslLineConfProfile and
   vdslLineAlarmConfProfile to 1 where appropriate. This default
   profile entry is considered reserved in the context of profiles
   defined in this MIB.

   Profiles are created, assigned, and deleted dynamically using the
   profile name and profile row status in each of the four profile

tables.

   Profile changes MUST take effect immediately. These changes MAY
   result in a restart (hard reset or soft restart) of the units on the
   line.

4.6. Notifications

   The ability to generate the SNMP notifications coldStart/WarmStart
   (per [21]) which are per agent (e.g., per Digital Subscriber Line
   Access Multiplexer, or DSLAM, in such a device), and linkUp/linkDown
   (per [21]) which are per interface (i.e., VDSL line) is required.

   For Loss of Frame (lof), Loss of Link (lol), Loss of Signal (los),
   and Loss of Power (lpr),

   A linkDown notification MAY be generated whenever any of lof, lol,
   los, or lpr event occurs. The corresponding linkUp notification MAY
   be sent when all link failure conditions are cleared.

   The notifications defined in this MIB are for initialization failure
   and for the threshold crossings associated with the following events:
   lof, lol, los, and lpr. Each threshold has its own enable/threshold
   value. When that value is 0, the notification is disabled.

   The vdslCurrStatus is a bitmask representing all outstanding error
   conditions associated with a particular VDSL modem. Note that since
   status of remote modems is obtained via the EOC, this information
   may be unavailable for units that are unreachable via EOC during a
   line error condition. Therefore, not all conditions may always be
   included in its current status. Notifications corresponding to the
   bit fields in this object are defined.

   A threshold notification occurs whenever the corresponding current
   15-minute interval error counter becomes equal to, or exceeds the
   threshold value. One notification may be sent per interval per
   interface. Since the current 15-minute counter are reset to 0 every
   15 minutes, if the condition persists, the notification may recur as
   often as every 15 minutes. For example, to get a notification
   whenever a "loss of" event occurs (but at most once every 15
   minutes), set the corresponding threshold to 1. The agent will
   generate a notification when the event originally occurs.

   Note that the Network Management System, or NMS, may receive a
   linkDown notification, as well, if enabled (via
   ifLinkUpDownTrapEnable [23]). At the beginning of the next 15 minute
   interval, the counter is reset. When the first second goes by and
   the event occurs, the current interval bucket will be 1, which
   equals the threshold and the notification will be sent again.

5. Conformance and Compliance

For VDSL lines, the following group is mandatory:

          - vdslGroup

     For MCM VDSL lines, the following group is optional:

          - vdslSCMGroup

     For SCM VDSL lines, the following group is optional:

          - vdslMCMGroup

[6](). **Definitions**

     VDSL-LINE-MIB DEFINITIONS ::= BEGIN

     IMPORTS

     MODULE-IDENTITY,
     OBJECT-TYPE,
     Counter64,
     Gauge32,
     NOTIFICATION-TYPE,
     transmission   FROM SNMPv2-SMI
     TEXTUAL-CONVENTION,
     RowStatus,
     TruthValue   FROM SNMPv2-TC
     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;

     vdslMIB MODULE-IDENTITY
        LAST-UPDATED "200204090000Z" -- April 9, 2002
        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 MIB module defining objects for the management of a pair of
          VDSL modems at each end of the VDSL line. Each such line has
          an entry in an ifTable which may include multiple modem lines.
          An agent may reside at either end of the VDSL line however the
          MIB is designed to require no management communication between
          them beyond that inherent in the low-level VDSL line protocol.
          The agent may monitor and control this protocol for its needs.

          VDSL lines may support optional Fast or Interleaved channels.
          If these are supported, additional entries corresponding to the
          supported channels must be created in the ifTable. Thus a VDSL
          line that supports both channels will have three entries in the
          ifTable, one for each physical, fast, and interleaved, whose
          ifType values are equal to vdsl(97), fast(125), and
          interleaved(124), respectively. The ifStackTable is used to
          represent the relationship between the entries.

          Naming Conventions:
              Vtuc -- (VTUC) modem at near (Central) end of line
              Vtur -- (VTUR) modem at Remote end of line
              Vtu -- One of either Vtuc or Vtur
              Curr -- Current
              Prev -- Previous
              Atn -- Attenuation
              ES   -- Errored 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, a data unit, see vdslVtuXChanCrcBlockLength
              "
      REVISION "200111010000Z" -- November 1, 2001
      DESCRIPTION "Initial draft."

```
REVISION "200203310000Z" -- March 31, 2002
DESCRIPTION "Added R. Abbi as co-author."
```

```
     REVISION "200204090000Z" -- April 9, 2002
     DESCRIPTION "Removed use of IMPLIED profile indices."

     ::= { transmission xxxx }

     vdslLineMib    OBJECT IDENTIFIER ::= { vdslMIB 1 }
     vdslMibObjects OBJECT IDENTIFIER ::= { vdslLineMib 1 }

     --
     -- textual conventions used in this MIB
     --

     VdslLineCodingType ::= TEXTUAL-CONVENTION
         STATUS        current
         DESCRIPTION
             "This data type is used as the syntax for the VDSL
              Line Code."
         SYNTAX  INTEGER
             {
             other(1), -- none of the following
             mcm(2),   -- Multiple Carrier Modulation
             scm(3)    -- Single Carrier Modulation
             }

     VdslLineEntity ::= TEXTUAL-CONVENTION
         STATUS        current
         DESCRIPTION
             "Identifies a modem as being either Vtuc or Vtur.  A
             VDSL line consists of two modems, a Vtuc and a Vtur."
         SYNTAX  INTEGER
             {
             vtuc(1), -- central site modem
             vtur(2)  -- remote site modem
             }

     --
     -- objects
     --

     vdslLineTable OBJECT-TYPE
         SYNTAX        SEQUENCE OF VdslLineEntry
         MAX-ACCESS    not-accessible
         STATUS        current
         DESCRIPTION
             "This table includes common attributes describing
             both ends of the line.  It is required for all VDSL
             physical interfaces.  VDSL physical interfaces are
             those ifEntries where ifType is equal to vdsl(97)."
         ::= { vdslMibObjects 1 }
```

```
vdslLineEntry OBJECT-TYPE
    SYNTAX        VdslLineEntry
```

```
        MAX-ACCESS    not-accessible
        STATUS        current
        DESCRIPTION  "An entry in the vdslLineTable."
        INDEX { ifIndex }
        ::= { vdslLineTable 1 }

    VdslLineEntry ::=
        SEQUENCE
            {
            vdslLineCoding                        VdslLineCodingType,
            vdslLineType                          INTEGER,
            vdslLineConfProfile                   Integer32,
            vdslLineAlarmConfProfile              Integer32
            }

    vdslLineCoding OBJECT-TYPE
        SYNTAX        VdslLineCodingType
        MAX-ACCESS    read-only
        STATUS        current
        DESCRIPTION
            "Specifies the VDSL coding type used on this line."
        REFERENCE    "T1E1.4/2000-009R3"    -- Part 1, common spec
        ::= { vdslLineEntry 1 }

    vdslLineType OBJECT-TYPE
        SYNTAX        INTEGER
            {
            noChannel(1),        -- no channels exist
            fastOnly(2),         -- fast channel only
            slowOnly(3),         -- slow channel only
            either(4),           -- either fast or slow channel exist
            both(5)              -- both fast and slow channels exist
            }
        MAX-ACCESS    read-only
        STATUS        current
        DESCRIPTION
            "Defines the type of VDSL physical line
            entity that exists, by defining whether and how
            the line is channelized.  If the line is channelized,
            the value will be other than noChannel(1).  This
            object defines which channel type(s) are supported.

            In the case that the line is channelized, the manager
            can use the ifStackTable to determine the ifIndex for
            the associated channel(s)."
        REFERENCE    "T1E1.4/2000-009R3"    -- Part 1, common spec
        ::= { vdslLineEntry 2 }

    vdslLineConfProfile OBJECT-TYPE
```

```
SYNTAX        Integer32
MAX-ACCESS    read-write
STATUS        current
```

```
        DESCRIPTION
            "The value of this object identifies the row
            in the VDSL Line Configuration Profile Table,
            ( vdslLineConfProfileTable ), which applies for this
            VDSL line, and channels if applicable."
        ::= { vdslLineEntry 3 }

    vdslLineAlarmConfProfile OBJECT-TYPE
        SYNTAX      Integer32
        MAX-ACCESS  read-write
        STATUS      current
        DESCRIPTION
            "The value of this object identifies the row in the VDSL
            Line Alarm Configuration Profile Table,
            ( vdslLineAlarmConfProfileTable ), which applies to this
            VDSL line, and channels if applicable."
        ::= { vdslLineEntry 4 }

    vdslPhysTable OBJECT-TYPE
        SYNTAX      SEQUENCE OF VdslPhysEntry
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
            "This table provides one row for each Vtu.  Each row
            contains the Physical Layer Parameters table for that
            Vtu.  VDSL physical interfaces are those ifEntries where
            ifType is equal to vdsl(97)."
        ::= { vdslMibObjects 2 }

    vdslPhysEntry OBJECT-TYPE
        SYNTAX      VdslPhysEntry
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION  "An entry in the vdslPhysTable."
        INDEX { ifIndex,
                vdslPhysSide }
        ::= { vdslPhysTable 1 }

    VdslPhysEntry ::=
        SEQUENCE
            {
            vdslPhysSide                         VdslLineEntity,
            vdslInvSerialNumber                  SnmpAdminString,
            vdslInvVendorID                      SnmpAdminString,
            vdslInvVersionNumber                 SnmpAdminString,
            vdslCurrSnrMgn                       INTEGER,
            vdslCurrAtn                          Gauge32,
            vdslCurrStatus                       BITS,
            vdslCurrOutputPwr                    INTEGER,
```

```
        vdslCurrAttainableRate                Gauge32
        }
```

```
     vdslPhysSide OBJECT-TYPE
         SYNTAX        VdslLineEntity
         MAX-ACCESS    read-only
         STATUS        current
         DESCRIPTION
             "Identifies whether the modem is the Vtuc or Vtur."
         ::= { vdslPhysEntry 1 }

     vdslInvSerialNumber OBJECT-TYPE
         SYNTAX        SnmpAdminString(SIZE (0..32))
         MAX-ACCESS    read-only
         STATUS        current
         DESCRIPTION
             "The vendor specific string that identifies the
             vendor equipment."
         REFERENCE     "T1E1.4/2000-009R3"    -- Part 1, common spec
         ::= { vdslPhysEntry 2 }

     vdslInvVendorID OBJECT-TYPE
         SYNTAX        SnmpAdminString (SIZE (0..16))
         MAX-ACCESS    read-only
         STATUS        current
         DESCRIPTION
             "The vendor ID code is a copy of the binary vendor
             identification field defined by the PHY[10] and
             expressed as readable characters."
         REFERENCE     "T1E1.4/2000-009R3"    -- Part 1, common spec
         ::= { vdslPhysEntry 3 }

     vdslInvVersionNumber OBJECT-TYPE
         SYNTAX        SnmpAdminString (SIZE (0..16))
         MAX-ACCESS    read-only
         STATUS        current
         DESCRIPTION
             "The vendor specific version number sent by this Vtu
             as part of the initialization messages.  It is a copy
             of the binary version number field defined by the
             PHY[10] and expressed as readable characters."
         REFERENCE     "T1E1.4/2000-009R3"    -- Part 1, common spec
         ::= { vdslPhysEntry 4 }

     vdslCurrSnrMgn OBJECT-TYPE
         SYNTAX        INTEGER(-640..640)
         UNITS         "tenth dB"
         MAX-ACCESS    read-only
         STATUS        current
         DESCRIPTION
             "Noise Margin as seen by this Vtu with respect to its
             received signal in tenth dB."
```

```
        REFERENCE    "T1E1.4/2000-009R3"    -- Part 1, common spec
         ::= { vdslPhysEntry 5 }
```

```
vdslCurrAtn OBJECT-TYPE
    SYNTAX        Gauge32(0..630)
    UNITS         "tenth dB"
    MAX-ACCESS    read-only
    STATUS        current
    DESCRIPTION
        "Measured difference in the total power transmitted by
        the peer Vtu and the total power received by this Vtu."
    REFERENCE     "T1E1.4/2000-009R3"    -- Part 1, common spec
     ::= { vdslPhysEntry 6 }


vdslCurrStatus OBJECT-TYPE
    SYNTAX        BITS
        {
        noDefect(0),
        lossOfFraming(1),
        lossOfSignal(2),
        lossOfPower(3),
        lossOfSignalQuality(4),
        lossOfLink(5),
        dataInitFailure(6),
        configInitFailure(7),
        protocolInitFailure(8),
        noPeerVtuPresent(9)
        }
    MAX-ACCESS    read-only
    STATUS        current
    DESCRIPTION
        "Indicates current state of the Vtu line.  This is a
        bit-map of possible conditions.  The various bit
        positions are:

        0   noDefect             There no defects on the line

        1   lossOfFraming        Vtu failure due to not receiving
                                 valid frame.

        2   lossOfSignal         Vtu failure due to not receiving
                                 signal.

        3   lossOfPower          Vtu failure due to loss of power.

        4   lossOfSignalQuality  Loss of Signal Quality is declared
                                 when the Noise Margin falls below
                                 the Minimum Noise Margin, or the
                                 bit-error-rate exceeds 10^-7.

        5   lossOfLink           Vtu failure due to inability to
                                 link with peer Vtu.
```

```
          6   dataInitFailure      Vtu failure during initialization
                                   due to bit errors corrupting
                                   startup exchange data.
```

```
      7   configInitFailure   Vtu failure during initialization
                              due to peer Vtu not able to support
                              requested configuration.

      8   protocolInitFailure Vtu failure during initialization
                              due to incompatible protocol used
                              by the peer Vtu.

      9   noPeerVtuPresent    Vtu failure during initialization
                              due to no activation sequence
                              detected from peer Vtu.

    This is intended to supplement ifOperStatus."
REFERENCE    "T1E1.4/2000-009R3"   -- Part 1, common spec
 ::= { vdslPhysEntry 7 }

vdslCurrOutputPwr OBJECT-TYPE
    SYNTAX       INTEGER (-310..310)
    UNITS        "tenth dBm"
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "Measured total output power transmitted by this ATU.
        This is the measurement that was reported during
        the last activation sequence."
    REFERENCE    "T1E1.4/2000-009R3"   -- Part 1, common spec
    ::= { vdslPhysEntry 8 }

vdslCurrAttainableRate OBJECT-TYPE
    SYNTAX       Gauge32
    UNITS        "bps"
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "Indicates the maximum currently attainable data rate
        by the Vtu.  This value will be equal or greater than
        the current line rate."
    REFERENCE    "T1E1.4/2000-009R3"   -- Part 1, common spec
    ::= { vdslPhysEntry 9 }

vdslChanTable OBJECT-TYPE
    SYNTAX       SEQUENCE OF VdslChanEntry
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
        "This table provides one row for each Vtu channel.
        VDSL channel interfaces are those ifEntries where
        ifType is equal to interleave(124) or fast(125)."
```

```
          ::= { vdslMibObjects 3 }

     vdslChanEntry OBJECT-TYPE
          SYNTAX        VdslChanEntry
```

```
        MAX-ACCESS    not-accessible
        STATUS        current
        DESCRIPTION
            "An entry in the vdslChanTable."
        INDEX { ifIndex,
               vdslPhysSide }
        ::= { vdslChanTable 1 }

    VdslChanEntry ::=
        SEQUENCE
            {
            vdslChanInterleaveDelay                 Gauge32,
            vdslChanCrcBlockLength                  Gauge32
            }

    vdslChanInterleaveDelay OBJECT-TYPE
        SYNTAX        Gauge32
        UNITS         "milli-seconds"
        MAX-ACCESS    read-only
        STATUS        current
        DESCRIPTION
            "Interleave Delay for this channel.

            Interleave delay applies only to the interleave
            (slow) channel and defines the mapping (relative
            spacing) between subsequent input bytes at the
            interleaver input and their placement in the bit
            stream at the interleaver output.  Larger numbers
            provide greater separation between consecutive
            input bytes in the output bit stream allowing for
            improved impulse noise immunity at the expense of
            payload latency.

            In the case where the ifType is fast(125), use
            noSuchObject."
        REFERENCE     "T1E1.4/2000-009R3"    -- Part 1, common spec
        ::= { vdslChanEntry 1 }

    vdslChanCrcBlockLength OBJECT-TYPE
        SYNTAX        Gauge32
        UNITS         "byte"
        MAX-ACCESS    read-only
        STATUS        current
        DESCRIPTION
            "Indicates the length of the channel data-block
            on which the CRC operates."
        REFERENCE     "T1E1.4/2000-009R3"    -- Part 1, common spec
        ::= { vdslChanEntry 2 }
```

```
vdslPerfDataTable       OBJECT-TYPE
    SYNTAX       SEQUENCE OF VdslPerfDataEntry
    MAX-ACCESS   not-accessible
    STATUS       current
```

```
         DESCRIPTION
             "This table provides one row for each VDSL physical
             interface.  VDSL physical interfaces are those ifEntries
             where ifType is equal to vdsl(97)."
          ::= { vdslMibObjects 4 }

    vdslPerfDataEntry       OBJECT-TYPE
        SYNTAX         VdslPerfDataEntry
        MAX-ACCESS     not-accessible
        STATUS         current
        DESCRIPTION
             "An entry in the vdslPerfDataTable."
        INDEX { ifIndex,
                vdslPhysSide }
        ::= { vdslPerfDataTable 1 }

    VdslPerfDataEntry ::=
        SEQUENCE
            {
            vdslPerfValidIntervals              INTEGER,
            vdslPerfInvalidIntervals            INTEGER,
            vdslPerfLofs                        Counter64,
            vdslPerfLoss                        Counter64,
            vdslPerfLprs                        Counter64,
            vdslPerfESs                         Counter64,
            vdslPerfInits                       Counter64,
            vdslPerfCurr15MinTimeElapsed        INTEGER,
            vdslPerfCurr15MinLofs               HCPerfCurrentCount,
            vdslPerfCurr15MinLoss               HCPerfCurrentCount,
            vdslPerfCurr15MinLprs               HCPerfCurrentCount,
            vdslPerfCurr15MinESs                HCPerfCurrentCount,
            vdslPerfCurr15MinInits              HCPerfCurrentCount
            }

    vdslPerfValidIntervals OBJECT-TYPE
        SYNTAX         INTEGER(0..96)
        MAX-ACCESS     read-only
        STATUS         current
        DESCRIPTION
             "Valid Intervals per xxxValidInterval definition
             found in HC-PerfHist-TC-MIB."
        ::= { vdslPerfDataEntry 1 }

    vdslPerfInvalidIntervals OBJECT-TYPE
        SYNTAX         INTEGER(0..96)
        MAX-ACCESS     read-only
        STATUS         current
        DESCRIPTION
             "Invalid Intervals per xxxInvalidInterval definition
```

```
        found in HC-PerfHist-TC-MIB."
     ::= { vdslPerfDataEntry 2 }

  vdslPerfLofs OBJECT-TYPE
```

```
        SYNTAX       Counter64
        UNITS        "seconds"
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
            "Count of seconds since the unit was last reset that there
            was Loss of Framing."
        REFERENCE    "T1E1.4/2000-009R3"    -- Part 1, common spec
        ::= { vdslPerfDataEntry 3 }

    vdslPerfLoss OBJECT-TYPE
        SYNTAX       Counter64
        UNITS        "seconds"
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
            "Count of seconds since the unit was last reset that there
            was Loss of Signal."
        REFERENCE    "T1E1.4/2000-009R3"    -- Part 1, common spec
        ::= { vdslPerfDataEntry 4 }

    vdslPerfLprs OBJECT-TYPE
        SYNTAX       Counter64
        UNITS        "seconds"
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
            "Count of seconds since the unit was last reset that there
            was Loss of Power."
        REFERENCE    "T1E1.4/2000-009R3"    -- Part 1, common spec
        ::= { vdslPerfDataEntry 5 }

    vdslPerfESs OBJECT-TYPE
        SYNTAX       Counter64
        UNITS        "seconds"
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
            "Count of Errored Seconds since the unit was last reset.
            An Errored Second is a one-second interval containing one
            or more crc anomalies, or one or more los defects."
        REFERENCE    "T1E1.4/2000-009R3"    -- Part 1, common spec
        ::= { vdslPerfDataEntry 6 }

    vdslPerfInits OBJECT-TYPE
        SYNTAX       Counter64
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
```

"Count of the line initialization attempts since the unit
was last reset. This count includes both successful and
failed attempts."

```
        REFERENCE    "T1E1.4/2000-009R3"    -- Part 1, common spec
        ::= { vdslPerfDataEntry 7 }


    vdslPerfCurr15MinTimeElapsed OBJECT-TYPE
        SYNTAX       INTEGER(0..899)
        UNITS        "seconds"
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
            "Total elapsed seconds in this interval."
        REFERENCE    "T1E1.4/2000-009R3"    -- Part 1, common spec
        ::= { vdslPerfDataEntry 8 }


    vdslPerfCurr15MinLofs OBJECT-TYPE
        SYNTAX       HCPerfCurrentCount
        UNITS        "seconds"
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
            "Count of seconds during this interval that there
            was Loss of Framing."
        REFERENCE    "T1E1.4/2000-009R3"    -- Part 1, common spec
        ::= { vdslPerfDataEntry 9 }


    vdslPerfCurr15MinLoss OBJECT-TYPE
        SYNTAX       HCPerfCurrentCount
        UNITS        "seconds"
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
            "Count of seconds during this interval that there
            was Loss of Signal."
        REFERENCE    "T1E1.4/2000-009R3"    -- Part 1, common spec
        ::= { vdslPerfDataEntry 10 }


    vdslPerfCurr15MinLprs OBJECT-TYPE
        SYNTAX       HCPerfCurrentCount
        UNITS        "seconds"
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
            "Count of seconds during this interval that there
            was Loss of Power."
        REFERENCE    "T1E1.4/2000-009R3"    -- Part 1, common spec
        ::= { vdslPerfDataEntry 11 }


    vdslPerfCurr15MinESs OBJECT-TYPE
        SYNTAX       HCPerfCurrentCount
        UNITS        "seconds"
```

```
     MAX-ACCESS    read-only
     STATUS        current
     DESCRIPTION
         "Count of Errored Seconds during this interval.  An Errored
```

            Second is a one-second interval containing one or more crc
            anomalies, or one or more los defects."
        REFERENCE   "T1E1.4/2000-009R3"   -- Part 1, common spec
        ::= { vdslPerfDataEntry 12 }

    vdslPerfCurr15MinInits OBJECT-TYPE
        SYNTAX   HCPerfCurrentCount
        MAX-ACCESS   read-only
        STATUS   current
        DESCRIPTION
            "Count of the line initialization attempts during this
            interval. This count includes both successful and
            failed attempts."
        REFERENCE   "T1E1.4/2000-009R3"   -- Part 1, common spec
        ::= { vdslPerfDataEntry 13 }

    vdslPerfIntervalTable   OBJECT-TYPE
        SYNTAX   SEQUENCE OF VdslPerfIntervalEntry
        MAX-ACCESS   not-accessible
        STATUS   current
        DESCRIPTION
            "This table provides one row for each Vtu performance
            data collection interval. VDSL physical interfaces are
            those ifEntries where ifType is equal to vdsl(97)."
         ::= { vdslMibObjects 5 }

    vdslPerfIntervalEntry   OBJECT-TYPE
        SYNTAX   VdslPerfIntervalEntry
        MAX-ACCESS   not-accessible
        STATUS   current
        DESCRIPTION
            "An entry in the vdslPerfIntervalTable."
        INDEX { ifIndex,
                vdslPhysSide,
                vdslIntervalNumber }
        ::= { vdslPerfIntervalTable 1 }

    VdslPerfIntervalEntry ::=
        SEQUENCE
            {
            vdslIntervalNumber   INTEGER,
            vdslIntervalLofs   HCPerfIntervalCount,
            vdslIntervalLoss   HCPerfIntervalCount,
            vdslIntervalLprs   HCPerfIntervalCount,
            vdslIntervalESs   HCPerfIntervalCount,
            vdslIntervalInits   HCPerfIntervalCount
            }

    vdslIntervalNumber OBJECT-TYPE

```
SYNTAX          INTEGER(1..96)
MAX-ACCESS   not-accessible
STATUS          current
DESCRIPTION
```

```
                "Performance Data Interval number 1 is the the most
                recent previous interval; interval 96 is 24 hours ago.
                Intervals 2..96 are optional."
            ::= { vdslPerfIntervalEntry 1 }

    vdslIntervalLofs OBJECT-TYPE
        SYNTAX        HCPerfIntervalCount
        UNITS         "seconds"
        MAX-ACCESS    read-only
        STATUS        current
        DESCRIPTION
            "Count of seconds in the interval when there was Loss
            of Framing."
        REFERENCE    "T1E1.4/2000-009R3"    -- Part 1, common spec
        ::= { vdslPerfIntervalEntry 2 }

    vdslIntervalLoss OBJECT-TYPE
        SYNTAX        HCPerfIntervalCount
        UNITS         "seconds"
        MAX-ACCESS    read-only
        STATUS        current
        DESCRIPTION
            "Count of seconds in the interval when there was Loss
            of Signal."
        REFERENCE    "T1E1.4/2000-009R3"    -- Part 1, common spec
        ::= { vdslPerfIntervalEntry 3 }

    vdslIntervalLprs OBJECT-TYPE
        SYNTAX        HCPerfIntervalCount
        UNITS         "seconds"
        MAX-ACCESS    read-only
        STATUS        current
        DESCRIPTION
            "Count of seconds in the interval when there was Loss
            of Power."
        REFERENCE    "T1E1.4/2000-009R3"    -- Part 1, common spec
        ::= { vdslPerfIntervalEntry 4 }

    vdslIntervalESs OBJECT-TYPE
        SYNTAX        HCPerfIntervalCount
        UNITS         "seconds"
        MAX-ACCESS    read-only
        STATUS        current
        DESCRIPTION
            "Count of Errored Seconds in the interval.  An Errored
            Second is a one-second interval containing one or more crc
            anomalies, or one or more los defects."
        REFERENCE    "T1E1.4/2000-009R3"    -- Part 1, common spec
        ::= { vdslPerfIntervalEntry 5 }
```

```
vdslIntervalInits OBJECT-TYPE
    SYNTAX        HCPerfIntervalCount
    MAX-ACCESS    read-only
```

```
        STATUS        current
        DESCRIPTION
            "Count of the line initialization attempts during this
            interval.  This count includes both successful and
            failed attempts."
        REFERENCE     "T1E1.4/2000-009R3"    -- Part 1, common spec
        ::= { vdslPerfIntervalEntry 6 }

    vdslChanPerfDataTable       OBJECT-TYPE
        SYNTAX        SEQUENCE OF VdslChanPerfDataEntry
        MAX-ACCESS    not-accessible
        STATUS        current
        DESCRIPTION
            "This table provides one row for each Vtu channel.
            VDSL channel interfaces are those ifEntries where
            ifType is equal to interleave(124) or fast(125)."
         ::= { vdslMibObjects 6 }

    vdslChanPerfDataEntry OBJECT-TYPE
        SYNTAX        VdslChanPerfDataEntry
        MAX-ACCESS    not-accessible
        STATUS        current
        DESCRIPTION
            "An entry in the vdslChanPerfDataTable."
        INDEX { ifIndex,
              vdslPhysSide }
        ::= { vdslChanPerfDataTable 1 }

    VdslChanPerfDataEntry ::=
        SEQUENCE
            {
            vdslChanPerfValidIntervals           INTEGER,
            vdslChanPerfInvalidIntervals         INTEGER,
            vdslChanCorrectedOctets              Counter64,
            vdslChanUncorrectBlks                Counter64,
            vdslChanPerfCurr15MinTimeElapsed     INTEGER,
            vdslChanPerfCurr15MinCorrectedOctets HCPerfCurrentCount,
            vdslChanPerfCurr15MinUncorrectBlks   HCPerfCurrentCount
            }

    vdslChanPerfValidIntervals OBJECT-TYPE
        SYNTAX        INTEGER(0..96)
        MAX-ACCESS    read-only
        STATUS        current
        DESCRIPTION
            "Valid Intervals per xxxValidInterval definition
            found in HC-PerfHist-TC-MIB."
        ::= { vdslChanPerfDataEntry 1 }
```

```
vdslChanPerfInvalidIntervals OBJECT-TYPE
    SYNTAX        INTEGER(0..96)
    MAX-ACCESS    read-only
    STATUS        current
```

```
        DESCRIPTION
            "Invalid Intervals per xxxInvalidInterval definition
            found in HC-PerfHist-TC-MIB."
        ::= { vdslChanPerfDataEntry 2 }

    vdslChanCorrectedOctets OBJECT-TYPE
        SYNTAX        Counter64
        MAX-ACCESS    read-only
        STATUS        current
        DESCRIPTION
            "Count of corrected octets since the unit was last reset."
        REFERENCE    "T1E1.4/2000-009R3"    -- Part 1, common spec
        ::= { vdslChanPerfDataEntry 3 }

    vdslChanUncorrectBlks OBJECT-TYPE
        SYNTAX        Counter64
        MAX-ACCESS    read-only
        STATUS        current
        DESCRIPTION
            "Count of uncorrected blocks since the unit was last reset."
        REFERENCE    "T1E1.4/2000-009R3"    -- Part 1, common spec
        ::= { vdslChanPerfDataEntry 4 }

    vdslChanPerfCurr15MinTimeElapsed OBJECT-TYPE
        SYNTAX        INTEGER(0..899)
        UNITS         "seconds"
        MAX-ACCESS    read-only
        STATUS        current
        DESCRIPTION
            "Total elapsed seconds in this interval."
        ::= { vdslChanPerfDataEntry 5 }

    vdslChanPerfCurr15MinCorrectedOctets OBJECT-TYPE
        SYNTAX        HCPerfCurrentCount
        MAX-ACCESS    read-only
        STATUS        current
        DESCRIPTION
            "Count of corrected octets in this interval."
        REFERENCE    "T1E1.4/2000-009R3"    -- Part 1, common spec
        ::= { vdslChanPerfDataEntry 6 }

    vdslChanPerfCurr15MinUncorrectBlks OBJECT-TYPE
        SYNTAX        HCPerfCurrentCount
        MAX-ACCESS    read-only
        STATUS        current
        DESCRIPTION
            "Count of uncorrected blocks in this interval."
        REFERENCE    "T1E1.4/2000-009R3"    -- Part 1, common spec
        ::= { vdslChanPerfDataEntry 7 }
```

```
vdslChanIntervalTable       OBJECT-TYPE
    SYNTAX      SEQUENCE OF VdslChanIntervalEntry
    MAX-ACCESS   not-accessible
```

```
      STATUS        current
      DESCRIPTION
          "This table provides one row for each Vtu channel data
          collection interval.  VDSL channel interfaces are those
          ifEntries where ifType is equal to interleave(124) or
          fast(125)."
       ::= { vdslMibObjects 7 }

  vdslChanIntervalEntry OBJECT-TYPE
      SYNTAX         VdslChanIntervalEntry
      MAX-ACCESS     not-accessible
      STATUS         current
      DESCRIPTION
          "An entry in the vdslChanIntervalTable."
      INDEX { ifIndex,
              vdslPhysSide,
              vdslChanIntervalNumber }
      ::= { vdslChanIntervalTable 1 }

  VdslChanIntervalEntry ::=
      SEQUENCE
          {
          vdslChanIntervalNumber               INTEGER,
          vdslChanIntervalCorrectedOctets      HCPerfIntervalCount,
          vdslChanIntervalUncorrectBlks        HCPerfIntervalCount
          }

  vdslChanIntervalNumber OBJECT-TYPE
      SYNTAX         INTEGER(1..96)
      MAX-ACCESS     not-accessible
      STATUS         current
      DESCRIPTION
          "Performance Data Interval number 1 is the the most
          recent previous interval; interval 96 is 24 hours ago.
          Intervals 2..96 are optional."
      ::= { vdslChanIntervalEntry 1 }

  vdslChanIntervalCorrectedOctets OBJECT-TYPE
      SYNTAX         HCPerfIntervalCount
      MAX-ACCESS     read-only
      STATUS         current
      DESCRIPTION
          "Count of corrected octets in this interval."
      REFERENCE     "T1E1.4/2000-009R3"    -- Part 1, common spec
      ::= { vdslChanIntervalEntry 2 }

  vdslChanIntervalUncorrectBlks OBJECT-TYPE
      SYNTAX         HCPerfIntervalCount
      MAX-ACCESS     read-only
```

```
        STATUS          current
        DESCRIPTION
            "Count of uncorrected blocks in this interval."
        REFERENCE    "T1E1.4/2000-009R3"     -- Part 1, common spec
```

```
        ::= { vdslChanIntervalEntry 3 }

    vdslLineConfProfileTable OBJECT-TYPE
        SYNTAX          SEQUENCE OF VdslLineConfProfileEntry
        MAX-ACCESS      not-accessible
        STATUS          current
        DESCRIPTION
            "This table contains information on the VDSL line
            configuration.  One entry in this table reflects a
            profile defined by a manager which can be used to
            configure the VDSL line."
        ::= { vdslMibObjects 8 }

    vdslLineConfProfileEntry OBJECT-TYPE
        SYNTAX          VdslLineConfProfileEntry
        MAX-ACCESS      not-accessible
        STATUS          current
        DESCRIPTION
            "Each entry consists of a list of parameters that
            represents the configuration of a VDSL modem.  A
            default profile with an index of 1 will always exist
            and its parameters will be set to vendor specific
            values, unless otherwise specified in this document."
        INDEX { vdslLineConfProfileNameIndex,
                vdslPhysSide }
        ::= { vdslLineConfProfileTable 1 }

    VdslLineConfProfileEntry ::=
        SEQUENCE
            {
            vdslLineConfProfileIndex            Integer32,
            vdslLineConfProfileName             SnmpAdminString,
            vdslLineConfTargetSnrMgn            INTEGER,
            vdslLineConfTxSpeed                 INTEGER,
            vdslLineConfRxSpeed                 INTEGER,
            vdslLineConfProfileRowStatus        RowStatus
            }

    vdslLineConfProfileIndex OBJECT-TYPE
        SYNTAX      Integer32
        MAX-ACCESS  read-create
        STATUS      current
        DESCRIPTION
            "This object is used by the line configuration table
            in order to identify a row in that table.  The system
            will always provide a default profile whose value is 1."
        ::= { vdslLineConfProfileEntry 1 }

    vdslLineConfProfileName OBJECT-TYPE
```

```
SYNTAX       SnmpAdminString (SIZE (1..32))
MAX-ACCESS   read-create
STATUS       current
DESCRIPTION
```

            "The name for this profile as specified by a user."
        ::= { vdslLineConfProfileEntry 2 }

    vdslLineConfTargetSnrMgn OBJECT-TYPE
        SYNTAX   INTEGER (0..310)
        UNITS   "tenth dB"
        MAX-ACCESS   read-create
        STATUS   current
        DESCRIPTION
            "Configured Target Signal/Noise Margin. This is the
            Noise Margin the modem must achieve with a BER of 10-7
            or better to successfully complete initialization."
        REFERENCE   "T1E1.4/2000-009R3"   -- Part 1, common spec
        ::= { vdslLineConfProfileEntry 3 }

    vdslLineConfTxSpeed OBJECT-TYPE
        SYNTAX   INTEGER
        UNITS   "bits per second"
        MAX-ACCESS   read-create
        STATUS   current
        DESCRIPTION
            "Transmit speed for this modem. The corresponding modem
            on the other end of the VDSL line will have an equal
            vdslLineConfRxSpeed value."
        REFERENCE   "T1E1.4/2000-009R3"   -- Part 1, common spec
        ::= { vdslLineConfProfileEntry 4 }

    vdslLineConfRxSpeed OBJECT-TYPE
        SYNTAX   INTEGER
        UNITS   "bits per second"
        MAX-ACCESS   read-create
        STATUS   current
        DESCRIPTION
            "Receive speed for this modem. The corresponding modem
            on the other end of the VDSL line will have an equal
            vdslLineConfTxSpeed value."
        REFERENCE   "T1E1.4/2000-009R3"   -- Part 1, common spec
        ::= { vdslLineConfProfileEntry 5 }

    vdslLineConfProfileRowStatus 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."
          ::= { vdslLineConfProfileEntry 6 }

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

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

             This table MUST be implemented for multiple carrier VDSL
             lines. This table MUST NOT be implemented for Single
             carrier VDSL lines."
         ::= { vdslMibObjects 9 }

     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 1 will always exist and its parameters will
             be set to vendor specific values, unless otherwise
             specified in this document."
         INDEX { vdslLineConfProfileIndex,
                 vdslPhysSide }
         ::= { vdslLineMCMConfProfileTable 1 }

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

     vdslMCMConfProfileTxWindowLength OBJECT-TYPE
         SYNTAX   INTEGER(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.

            This table MUST be implemented for multiple carrier
            modulation (MCM) VDSL lines.  This table MUST NOT be
            implemented for single carrier modulation VDSL lines."
        ::= { vdslMibObjects 10 }

   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 1 will always exist and
            its parameters will be set to vendor specific values,
            unless otherwise specified in this document."
        INDEX { vdslLineConfProfileIndex,
```

```
            vdslPhysSide,
            vdslMCMConfProfileTxBandNumber }
    ::= { vdslLineMCMConfProfileTxBandTable 1 }
```

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

     vdslMCMConfProfileTxBandNumber OBJECT-TYPE
         SYNTAX       INTEGER
         MAX-ACCESS   read-create
         STATUS       current
         DESCRIPTION
             "The index for this band descriptor entry."
         ::= { vdslLineMCMConfProfileTxBandEntry 1 }

     vdslMCMConfProfileTxBandStart OBJECT-TYPE
         SYNTAX       INTEGER
         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       INTEGER
         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.

            This table MUST be implemented for multiple carrier
            modulation (MCM) VDSL lines.  This table MUST NOT be
            implemented for single carrier modulation VDSL lines."
        ::= { vdslMibObjects 11 }

    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 1 will always exist and
            its parameters will be set to vendor specific values,
            unless otherwise specified in this document."
        INDEX { vdslLineConfProfileIndex,
                vdslPhysSide,
                vdslMCMConfProfileRxBandNumber }
        ::= { vdslLineMCMConfProfileRxBandTable 1 }

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

    vdslMCMConfProfileRxBandNumber OBJECT-TYPE
        SYNTAX       INTEGER
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "The index for this band descriptor entry."
        ::= { vdslLineMCMConfProfileRxBandEntry 1 }
```

```
vdslMCMConfProfileRxBandStart OBJECT-TYPE
    SYNTAX        INTEGER
    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        INTEGER
        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.

            This table MUST be implemented for multiple carrier
            modulation (MCM) VDSL lines.  This table MUST NOT be
            implemented for single carrier modulation VDSL lines."
        ::= { vdslMibObjects 12 }

    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 1 will always exist and
             its parameters will be set to vendor specific values,
             unless otherwise specified in this document."
         INDEX { vdslLineConfProfileIndex,
                 vdslPhysSide,
                 vdslMCMConfProfileTxPSDNumber }
         ::= { vdslLineMCMConfProfileTxPSDTable 1 }

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

     vdslMCMConfProfileTxPSDNumber OBJECT-TYPE
         SYNTAX        INTEGER
         MAX-ACCESS    read-create
         STATUS        current
         DESCRIPTION
             "The index for this mask descriptor entry."
         ::= { vdslLineMCMConfProfileTxPSDEntry 1 }

     vdslMCMConfProfileTxPSDTone OBJECT-TYPE
         SYNTAX        INTEGER
         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        INTEGER
         UNITS         "0.5dB"
         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.

        This table MUST be implemented for multiple carrier
        modulation (MCM) VDSL lines.  This table MUST NOT be
        implemented for single carrier modulation VDSL lines."
    ::= { vdslMibObjects 13 }

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 1 will always exist and
        its parameters will be set to vendor specific values,
        unless otherwise specified in this document."
        will be set to `DEFVAL' and its parameters will be set to
    INDEX { vdslLineConfProfileIndex,
            vdslPhysSide,
            vdslMCMConfProfileMaxTxPSDNumber }
    ::= { vdslLineMCMConfProfileMaxTxPSDTable 1 }

VdslLineMCMConfProfileMaxTxPSDEntry ::=
    SEQUENCE
```

```
        {
        vdslMCMConfProfileMaxTxPSDNumber              INTEGER,
        vdslMCMConfProfileMaxTxPSDTone                INTEGER,
        vdslMCMConfProfileMaxTxPSDPSD                 INTEGER,
```

```
          vdslMCMConfProfileMaxTxPSDRowStatus        RowStatus
          }

    vdslMCMConfProfileMaxTxPSDNumber OBJECT-TYPE
        SYNTAX        INTEGER
        MAX-ACCESS    read-create
        STATUS        current
        DESCRIPTION
            "The index for this band descriptor entry."
        ::= { vdslLineMCMConfProfileMaxTxPSDEntry 1 }

    vdslMCMConfProfileMaxTxPSDTone OBJECT-TYPE
        SYNTAX        INTEGER
        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        INTEGER
        UNITS         "0.5dB"
        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.

             This table MUST be implemented for multiple carrier
             modulation (MCM) VDSL lines. This table MUST NOT be
             implemented for single carrier modulation VDSL lines."
         ::= { vdslMibObjects 14 }

     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 1 will always exist and
             its parameters will be set to vendor specific values,
             unless otherwise specified in this document."
         INDEX { vdslLineConfProfileIndex,
                 vdslPhysSide,
                 vdslMCMConfProfileMaxRxPSDNumber }
         ::= { vdslLineMCMConfProfileMaxRxPSDTable 1 }

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

     vdslMCMConfProfileMaxRxPSDNumber OBJECT-TYPE
         SYNTAX   INTEGER
         MAX-ACCESS   read-create
         STATUS   current
         DESCRIPTION
             "The index for this band descriptor entry."
         ::= { vdslLineMCMConfProfileMaxRxPSDEntry 1 }

     vdslMCMConfProfileMaxRxPSDTone OBJECT-TYPE
         SYNTAX   INTEGER
         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       INTEGER
      UNITS        "0.5dB"
      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 }

  --
  -- Single carrier modulation (SCM) configuration profile table
  --

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

          This table MUST be implemented for single carrier
          modulation (SCM) VDSL lines.  This table MUST NOT be
          implemented for multiple carrier modulation (MCM) VDSL
          lines."
      ::= { vdslMibObjects 15 }
```

```
vdslLineSCMConfProfileEntry OBJECT-TYPE
    SYNTAX        VdslLineSCMConfProfileEntry
    MAX-ACCESS    not-accessible
```

```
        STATUS      current
        DESCRIPTION
            "Each entry consists of a list of parameters that
            represents the configuration of a single carrier
            modulation VDSL modem.

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

    VdslLineSCMConfProfileEntry ::=
        SEQUENCE
            {
            vdslSCMConfProfileInterleaveDepth      INTEGER,
            vdslSCMConfProfileFastCodewordSize     INTEGER,
            vdslSCMConfProfileTransmitPSDMask      BITS,
            vdslSCMConfProfileTransmitPSDLevel     INTEGER,
            vdslSCMConfProfileSymbolRateProfile    INTEGER,
            vdslSCMConfProfileConstellationSize    INTEGER,
            vdslSCMConfProfileCenterFrequency      INTEGER,
            vdslSCMConfProfileRowStatus            RowStatus
            }

    vdslSCMConfProfileInterleaveDepth OBJECT-TYPE
        SYNTAX      INTEGER
        UNITS       "octets"
        MAX-ACCESS  read-create
        STATUS      current
        DESCRIPTION
            "Specifies the interleaving depth."
        REFERENCE   "T1E1.4/2000-011R3"    -- Part 2, SCM
        ::= { vdslLineSCMConfProfileEntry 1 }

    vdslSCMConfProfileFastCodewordSize OBJECT-TYPE
        SYNTAX      INTEGER(0..180)
        UNITS       "octets"
        MAX-ACCESS  read-create
        STATUS      current
        DESCRIPTION
            "Specifies the length in octets of the fast codeword.
            A value of 0 indicates that the single latency transport
            class is to be utilized."
        REFERENCE   "T1E1.4/2000-011R3"    -- Part 2, SCM
        ::= { vdslLineSCMConfProfileEntry 2 }

    vdslSCMConfProfileTransmitPSDMask OBJECT-TYPE
```

```
SYNTAX        BITS
    {
    vendorNotch1(0),      -- vendor specific notch
    vendorNotch2(1),      -- vendor specific notch
```

```
         amateurBand30m(2),   -- amateur radio band notch
         amateurBand40m(3),   -- amateur radio band notch
         amateurBand80m(4),   -- amateur radio band notch
         amateurBand160m(5)   -- amateur radio band notch
         }
     MAX-ACCESS   read-create
     STATUS       current
     DESCRIPTION
         "The transmit power spectral density mask code."
     REFERENCE    "T1E1.4/2000-011R3"    -- Part 2, SCM
     ::= { vdslLineSCMConfProfileEntry 3 }

 vdslSCMConfProfileTransmitPSDLevel OBJECT-TYPE
     SYNTAX       INTEGER
     UNITS        "dBm/Hz"
     MAX-ACCESS   read-create
     STATUS       current
     DESCRIPTION
         "The transmit power spectral density for the VDSL modem."
     REFERENCE    "T1E1.4/2000-011R3"    -- Part 2, SCM
     ::= { vdslLineSCMConfProfileEntry 4 }

 vdslSCMConfProfileSymbolRateProfile OBJECT-TYPE
     SYNTAX       INTEGER
     UNITS        "kbaud"
     MAX-ACCESS   read-create
     STATUS       current
     DESCRIPTION
         "The symbol rate profile calculated as S = SR/BSR, where
         SR is the required symbol rate in kbaud, BSR  = 67.5."
     REFERENCE    "T1E1.4/2000-011R3"    -- Part 2, SCM
     ::= { vdslLineSCMConfProfileEntry 5 }

 vdslSCMConfProfileConstellationSize OBJECT-TYPE
     SYNTAX       INTEGER(0..15)
     UNITS        "log2"
     MAX-ACCESS   read-create
     STATUS       current
     DESCRIPTION
         "Specifies the constellation size."
     REFERENCE    "T1E1.4/2000-011R3"    -- Part 2, SCM
     ::= { vdslLineSCMConfProfileEntry 6 }

 vdslSCMConfProfileCenterFrequency OBJECT-TYPE
     SYNTAX       INTEGER(0..511)
     UNITS        "kHz"
     MAX-ACCESS   read-create
     STATUS       current
     DESCRIPTION
```

```
        "Specifies the center frequency profile K."
    REFERENCE    "T1E1.4/2000-011R3"    -- Part 2, SCM
    ::= { vdslLineSCMConfProfileEntry 7 }
```

```
     vdslSCMConfProfileRowStatus 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."
         ::= { vdslLineSCMConfProfileEntry 8 }

     --
     -- Alarm configuration profile table
     --

     vdslLineAlarmConfProfileTable OBJECT-TYPE
         SYNTAX        SEQUENCE OF VdslLineAlarmConfProfileEntry
         MAX-ACCESS    not-accessible
         STATUS        current
         DESCRIPTION
             "This table contains information on the VDSL line alarm
             configuration.  One entry in this table reflects a profile
             defined by a manager which can be used to configure the
             VDSL line alarm thresholds."
         ::= { vdslMibObjects 16 }

     vdslLineAlarmConfProfileEntry OBJECT-TYPE
         SYNTAX        VdslLineAlarmConfProfileEntry
         MAX-ACCESS    not-accessible
         STATUS        current
         DESCRIPTION
             "Each entry consists of a list of parameters that
             represents the configuration of a VDSL line alarm
             profile.

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

     VdslLineAlarmConfProfileEntry ::=
```

```
SEQUENCE
    {
    vdslLineAlarmConfProfileIndex        Integer32,
    vdslLineAlarmConfProfileName         SnmpAdminString,
```

```
          vdslThresh15MinLofs                    INTEGER,
          vdslThresh15MinLoss                    INTEGER,
          vdslThresh15MinLprs                    INTEGER,
          vdslThresh15MinESs                     INTEGER,
          vdslInitFailureNotificationEnable      TruthValue,
          vdslLineAlarmConfProfileRowStatus      RowStatus
          }

   vdslLineAlarmConfProfileIndex OBJECT-TYPE
       SYNTAX        Integer32
       MAX-ACCESS    read-create
       STATUS        current
       DESCRIPTION
           "This object is used by the line alarm configuration table
           in order to identify a row in that table.  The system will
           always provide a default profile whose index is 1."
       ::= { vdslLineAlarmConfProfileEntry 1 }

   vdslLineAlarmConfProfileName OBJECT-TYPE
       SYNTAX        SnmpAdminString (SIZE (1..32))
       MAX-ACCESS    read-create
       STATUS        current
       DESCRIPTION
           "The name for this profile as specified by a user."
       ::= { vdslLineAlarmConfProfileEntry 2 }

   vdslThresh15MinLofs OBJECT-TYPE
       SYNTAX        INTEGER(0..899)
       UNITS         "seconds"
       MAX-ACCESS    read-create
       STATUS        current
       DESCRIPTION
           "This object configures the threshold for the number of
            loss of frame seconds (lofs) within any given 15-minute
            performance data collection interval.  If the value of
            loss of frame seconds in a particular 15-minute collection
            interval reaches/exceeds this value, a
            vdslPerfLofsThreshNotification notification will be
            generated.  No more than one notification will be sent
            per interval."
       ::= { vdslLineAlarmConfProfileEntry 3 }

   vdslThresh15MinLoss OBJECT-TYPE
       SYNTAX        INTEGER(0..899)
       UNITS         "seconds"
       MAX-ACCESS    read-create
       STATUS        current
       DESCRIPTION
           "This object configures the threshold for the number of
```

loss of signal seconds (loss) within any given 15-minute
performance data collection interval. If the value of
loss of frame seconds in a particular 15-minute collection
interval reaches/exceeds this value, a

```
          vdslPerfLossThreshNotification notification will be
          generated.  One notification will be sent per interval
          per endpoint."
     ::= { vdslLineAlarmConfProfileEntry 4 }

 vdslThresh15MinLprs OBJECT-TYPE
     SYNTAX       INTEGER(0..899)
     UNITS        "seconds"
     MAX-ACCESS   read-create
     STATUS       current
     DESCRIPTION
         "This object configures the threshold for the number of
          loss of power seconds (lprs) within any given 15-minute
          performance data collection interval.  If the value of
          loss of frame seconds in a particular 15-minute collection
          interval reaches/exceeds this value, a
          vdslPerfLprsThreshNotification notification will be
          generated.  No more than one notification will be sent
          per interval."
     ::= { vdslLineAlarmConfProfileEntry 5 }

 vdslThresh15MinESs OBJECT-TYPE
     SYNTAX       INTEGER(0..899)
     UNITS        "seconds"
     MAX-ACCESS   read-create
     STATUS       current
     DESCRIPTION
         "This object configures the threshold for the number of
          errored seconds (lofs) within any given 15-minute
          performance data collection interval.  If the value of
          loss of frame seconds in a particular 15-minute collection
          interval reaches/exceeds this value, a
          vdslPerfESsThreshNotification notification will be
          generated.  No more than one notification will be sent
          per interval."
     ::= { vdslLineAlarmConfProfileEntry 6 }

 vdslInitFailureNotificationEnable OBJECT-TYPE
     SYNTAX       TruthValue
     MAX-ACCESS   read-create
     STATUS       current
     DESCRIPTION
         "This object specifies if a vdslInitFailureNotification
          notification will be generated if an initialization
          failure occurs."
     ::= { vdslLineAlarmConfProfileEntry 7 }

 vdslLineAlarmConfProfileRowStatus 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."
    ::= { vdslLineAlarmConfProfileEntry 8 }

-- Notification definitions

vdslNotifications OBJECT IDENTIFIER ::= { vdslLineMib 0 }

vdslPerfLofsThreshNotification NOTIFICATION-TYPE
    OBJECTS         {
                    vdslPerfCurr15MinLofs,
                    vdslThresh15MinLofs
                    }
    STATUS          current
    DESCRIPTION
        "Loss of Framing 15-minute interval threshold reached."
    ::= { vdslNotifications 1 }

vdslPerfLossThreshNotification NOTIFICATION-TYPE
    OBJECTS         {
                    vdslPerfCurr15MinLoss,
                    vdslThresh15MinLoss
                    }
    STATUS          current
    DESCRIPTION
        "Loss of Signal 15-minute interval threshold reached."
    ::= { vdslNotifications 2 }

vdslPerfLprsThreshNotification NOTIFICATION-TYPE
    OBJECTS         {
                    vdslPerfCurr15MinLprs,
                    vdslThresh15MinLprs
                    }
    STATUS          current
    DESCRIPTION
        "Loss of Power 15-minute interval threshold reached."
    ::= { vdslNotifications 3 }

vdslPerfESsThreshNotification NOTIFICATION-TYPE
    OBJECTS         {
                    vdslPerfCurr15MinESs,
                    vdslThresh15MinESs
```

```
                }
        STATUS          current
        DESCRIPTION
            "Errored Second 15-minute interval threshold reached."
```

```
        ::= { vdslNotifications 4 }

    vdslInitFailureNotification NOTIFICATION-TYPE
        OBJECTS         {
                        vdslCurrStatus
                        }
        STATUS          current
        DESCRIPTION
            "Vtu initialization failed.  See vdslCurrStatus for
            potential reasons."
        ::= { vdslNotifications 5 }

    -- conformance information

    vdslConformance OBJECT IDENTIFIER ::= { vdslLineMib 3 }
    vdslGroups OBJECT IDENTIFIER ::= { vdslConformance 1 }
    vdslCompliances OBJECT IDENTIFIER ::= { vdslConformance 2 }

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

        MODULE  -- this module
        MANDATORY-GROUPS
            {
            vdslGroup
            }

        GROUP       vdslMCMGroup
        DESCRIPTION
            "This group is mandatory for VDSL Lines which
            utilize multiple carrier modulation.

            This group should not be implemented for VDSL lines
            which utilize single carrier modulation."

        GROUP       vdslSCMGroup
        DESCRIPTION
            "This group is mandatory for VDSL lines which
            utilize single carrier modulation.

            This group should not be implemented for VDSL lines
            which utilize multiple carrier modulation"
        ::= { vdslCompliances 1 }

    -- units of conformance

        vdslGroup OBJECT-GROUP
```

```
        OBJECTS
            {
            vdslLineCoding,
```

```
                vdslLineType,
                vdslLineConfProfile,
                vdslLineAlarmConfProfile,
                vdslPhysSide,
                vdslInvSerialNumber,
                vdslInvVendorID,
                vdslInvVersionNumber,
                vdslCurrSnrMgn,
                vdslCurrAtn,
                vdslCurrStatus,
                vdslCurrOutputPwr,
                vdslCurrAttainableRate,
                vdslChanInterleaveDelay,
                vdslChanCrcBlockLength,
                vdslPerfValidIntervals,
                vdslPerfInvalidIntervals,
                vdslPerfLofs,
                vdslPerfLoss,
                vdslPerfLprs,
                vdslPerfESs,
                vdslPerfInits,
                vdslPerfCurr15MinTimeElapsed,
                vdslPerfCurr15MinLofs,
                vdslPerfCurr15MinLoss,
                vdslPerfCurr15MinLprs,
                vdslPerfCurr15MinESs,
                vdslPerfCurr15MinInits,
                vdslIntervalLofs,
                vdslIntervalLoss,
                vdslIntervalLprs,
                vdslIntervalESs,
                vdslIntervalInits,
                vdslChanPerfValidIntervals,
                vdslChanPerfInvalidIntervals,
                vdslChanCorrectedOctets,
                vdslChanUncorrectBlks,
                vdslChanPerfCurr15MinTimeElapsed,
                vdslChanPerfCurr15MinCorrectedOctets,
                vdslChanPerfCurr15MinUncorrectBlks,
                vdslChanIntervalCorrectedOctets,
                vdslChanIntervalUncorrectBlks,
                vdslLineConfProfileIndex,
                vdslLineConfProfileName,
                vdslLineConfTargetSnrMgn,
                vdslLineConfTxSpeed,
                vdslLineConfRxSpeed,
                vdslLineConfProfileRowStatus,
                vdslLineAlarmConfProfileIndex,
                vdslLineAlarmConfProfileName,
```

```
                    vdslThresh15MinLofs,
                    vdslThresh15MinLoss,
                    vdslThresh15MinLprs,
                    vdslThresh15MinESs,
```

```
                vdslInitFailureNotificationEnable,
                vdslLineAlarmConfProfileRowStatus
                }
            STATUS      current
            DESCRIPTION
                "A collection of objects providing information about
                 a VDSL Line."
            ::= { vdslGroups 1 }


        vdslMCMGroup OBJECT-GROUP
             OBJECTS
                {
                vdslMCMConfProfileTxWindowLength,
                vdslMCMConfProfileRowStatus,
                vdslMCMConfProfileTxBandNumber,
                vdslMCMConfProfileTxBandStart,
                vdslMCMConfProfileTxBandStop,
                vdslMCMConfProfileTxBandRowStatus,
                vdslMCMConfProfileRxBandNumber,
                vdslMCMConfProfileRxBandStart,
                vdslMCMConfProfileRxBandStop,
                vdslMCMConfProfileRxBandRowStatus,
                vdslMCMConfProfileTxPSDNumber,
                vdslMCMConfProfileTxPSDTone,
                vdslMCMConfProfileTxPSDPSD,
                vdslMCMConfProfileTxPSDRowStatus,
                vdslMCMConfProfileMaxTxPSDNumber,
                vdslMCMConfProfileMaxTxPSDTone,
                vdslMCMConfProfileMaxTxPSDPSD,
                vdslMCMConfProfileMaxTxPSDRowStatus,
                vdslMCMConfProfileMaxRxPSDNumber,
                vdslMCMConfProfileMaxRxPSDTone,
                vdslMCMConfProfileMaxRxPSDPSD,
                vdslMCMConfProfileMaxRxPSDRowStatus
                }
            STATUS      current
            DESCRIPTION
                "A collection of objects providing configuration
                 information for a VDSL line based upon multiple carrier
                 modulation modem."
         ::= { vdslGroups 2 }


        vdslSCMGroup    OBJECT-GROUP
            OBJECTS
                {
                vdslSCMConfProfileInterleaveDepth,
                vdslSCMConfProfileFastCodewordSize,
                vdslSCMConfProfileTransmitPSDMask,
                vdslSCMConfProfileTransmitPSDLevel,
```

```
                vdslSCMConfProfileSymbolRateProfile,
                vdslSCMConfProfileConstellationSize,
                vdslSCMConfProfileCenterFrequency,
                vdslSCMConfProfileRowStatus
```

```
                  }
            STATUS      current
            DESCRIPTION
                "A collection of objects providing configuration
                information for a VDSL line based upon single carrier
                modulation modem."
        ::= { vdslGroups 3 }

        vdslNotificationGroup    NOTIFICATION-GROUP
            NOTIFICATIONS
                {
                vdslPerfLofsThreshNotification,
                vdslPerfLossThreshNotification,
                vdslPerfLprsThreshNotification,
                vdslPerfESsThreshNotification,
                vdslInitFailureNotification
                }
            STATUS      current
            DESCRIPTION
                "This group supports notifications of significant
                conditions associated with VDSL Lines."
        ::= { vdslGroups 4 }

     END
```

7. Security Considerations

1) Blocking unauthorized access to the VDSL MIB via the element
management system is outside the scope of this document. It should
be noted that access to the MIB permits the unauthorized entity to
modify the profiles (section 6.4) such that both subscriber service
and network operations can be interfered with. Subscriber service
can be altered by modifying any of a number of service
characteristics such as rate partitioning and maximum transmission
rates. Network operations can be impacted by modification of
notification thresholds such as lof thresholds.

2) There are a number of managed objects in this MIB that may be
considered to contain sensitive information. In particular, the
certain objects may be considered sensitive in many environments,
since it would allow an intruder to obtain information about which
vendor's equipment is in use on the network. Therefore, it may be
important in some environments to control read access to these
objects and possibly to even encrypt the values of these object
when sending them over the network via SNMP. Not all versions of
SNMP provide features for such a secure environment.

It is recommended that the implementors consider the security
features as provided by the SNMPv3 framework. Specifically, the

use of the User-based Security Model RFC 2574 [12] and the
View-based Access Control Model RFC 2575 [15] 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 those objects only to those principals
(users) that have legitimate rights to access them.

3) 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.

It should be noted that interface indices in this MIB are maintained
persistently. VACM data relating to these should be stored
persistently.

8. Acknowledgments

   David Horton (CiTR)

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