Network Working Group
Category: Internet Draft

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October 2002

Definitions of Managed Objects for Very High Speed Digital Subscriber Lines (VDSL) draft-ietf-adslmib-vdsl-06.txt

Status of this Memo

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Abstract

This document defines a 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 [T1E1311, T1E1011, T1E1013, ETSI2701, ETSI2702, ITU9931, ITU9971].

This document specifies a MIB module in a manner that is compliant to the SMIv2 (STD 58 [RFC2578, RFC2579, RFC2580]).

Table of Contents

1. The SNMP Management Framework

The SNMP Management Framework presently consists of five major components:

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

- 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 [RFC1155, RFC1212] and RFC 1215 [RFC1215]. The second version, called SMIv2, is described in STD 58 [RFC2578, RFC2579, RFC2580].

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

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

[RFC1905].

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

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

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

This memo specifies a MIB module that is compliant to the SMIv2. A MIB conforming to the SMIv1 can be produced through the appropriate translations. The resulting translated MIB must be semantically equivalent, except where objects or events are omitted because no translation is possible (use of Counter64). Some machine readable information in SMIv2 will be converted into textual descriptions in SMIv1 during the translation process. However, this loss of machine readable information is not considered to change the semantics of the MIB.

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 [RFC2119].

2. Overview

This document describes an SNMP MIB for managing VDSL Lines. These definitions are based upon the specifications for VDSL as defined in T1E1, ETSI, and ITU documentation [T1E1311, T1E1011, T1E1013, ETSI2701, ETSI2702, ITU9931, ITU9971].

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

2.1 Relationship of 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 [RFC2863] is discussed.

2.1.1 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 [RFC2863]. The IANA has assigned the following ifType to VDSL:

```
IANAifType ::= TEXTUAL-CONVENTION
```

...

```
SYNTAX INTEGER {
    ...
    vdsl(97), -- Very H-speed Digital Subscrib. Loop
    ...
    }
```

Additionally, a VDSL line may contain an optional fast channel and an optional interleaved channel which also integrate into RFC 2863 [RFC2863]. The IANA has assigned the following ifTypes to these channels:

```
IANAifType ::= TEXTUAL-CONVENTION
    ...
SYNTAX INTEGER {
    ...
    interleave (124), -- Interleave channel
    fast (125),       -- Fast channel
    ...
    }
```

2.1.2 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 [RFC2863], and are not duplicated in the VDSL Line MIB.

ifIndex	Interface index.
ifDescr	See interfaces MIB [RFC2863].
ifType	vdsl(97), interleaved(124), or fast(125)
ifSpeed	Set as appropriate.
ifPhysAddress	This object MUST have an octet string with zero length.
ifAdminStatus	See interfaces MIB [RFC2863].
ifOperStatus	See interfaces MIB [RFC2863].
ifLastChange	See interfaces MIB [RFC2863].

ifName	See interfaces MIB [RFC2863].

ifLinkUpDownTrapEnable	Default to enabled(1).
ifHighSpeed	Set as appropriate.
ifConnectorPresent	Set as appropriate.

Figure 1: Use of ifTable Objects

Section 2.3, below, describes the structure of this MIB in relation to ifEntry in greater detail.

2.2 Conventions used in the MIB

2.2.1 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. SES -- Severely Errored Second
I. UAS -- Unavailable Second
J. LCS -- Line Code Specific
K. Lof -- Loss of Frame
L. Lol -- Loss of Link
M. Los -- Loss of Signal
N. Lpr -- Loss of Power
O. xxxs -- interval of Seconds in which xxx occurs
(e.g., xxx=Lof, Los, Lpr)
P. Max -- Maximum
Q. Mgn -- Margin
R. Min -- Minimum
S. Psd -- Power Spectral Density
T. Snr -- Signal to Noise Ratio
U. Tx -- Transmit
V. Blks -- Blocks

2.2.2 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

2.3 Structure

The MIB is structured into following MIB groups:

o vdslGroup :

This group supports all line code independent MIB objects found in this MIB. The following tables contain objects permitted for ifType vdsl(97):

- vdslLineTable
- vdslPhysTable
- vdslPerfDataTable
- vdslPerfIntervalTable
- vdslPerf1DayIntervalTable
- vdslLineConfProfileTable
- vdslLineAlarmConfProfileTable

The following tables contain objects permitted for ifTypes interleaved(124) and (fast):

- vdslChanTable
- vdslChanPerfDataTable
- vdslChanPerfIntervalTable
- vdslChanPerf1DayIntervalTable

o vdslMCMGroup :

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

- 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
- vdslLineSCMConfProfileTxBandTable

This group also supports the following line code dependent tables:

- vdslSCMPhysBandTable

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

Figure 2, below, displays the relationship of the tables in the vdslGroup to ifEntry (and each other):

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

vdslLineTableEntry  ----> vdslPhysTableEntry 1:(0..2)
                    ----> vdslPerfDataEntry 1:(0..2)
                    ----> vdslLineConfProfileEntry 1:(0..1)
                    ----> vdslLineAlarmConfProfileEntry 1:(0..1)

vdslPhysTableEntry  ----> vdslPerfIntervalEntry 1:(0..96)
                    ----> vdslPerf1DayIntervalEntry 1:(0..30)

ifEntry(ifType=124) ----> vdslChanEntry 1:(0..2)
                    ----> vdslChanPerfDataEntry 1:(0..2)

ifEntry(ifType=125) ----> vdslChanEntry 1:(0..2)
                    ----> vdslChanPerfDataEntry 1:(0..2)

vdslChanEntry       ----> vdslchanPerfIntervalEntry 1:(0..96)
                    ----> vdslchan1DayPerfIntervalEntry 1:(0..30)
```

Figure 2: Table Relationships

2.3.1 Line Topology

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

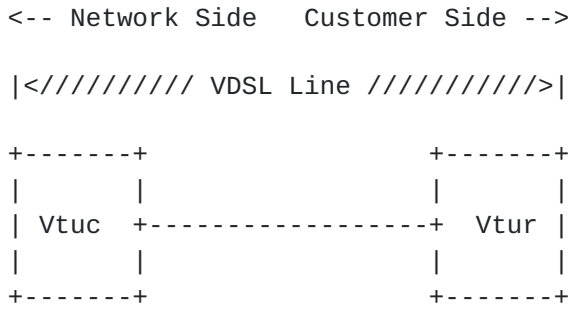

Figure 3: General topology for a VDSL Line

2.4 Counters, Interval Buckets and Thresholds

For Loss of Frame (lof), Loss of Link (lol), Loss of Signal (los), and Loss of Power (lpr), Errored Seconds (ES), Severely Errored Seconds (SES), and Unavailable Seconds (UAS) there are event counters, current 15-minute, 0 to 96 15-minute history bucket(s), and 0 to 30 1-day 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 [RFC2493].

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).

2.5 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:

- Line Configuration Profiles - Line configuration profiles contain parameters for configuring VDSL lines. They are defined in nine

tables:

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

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

The object, vdslLineConfProfileIndex, is used as a common index for all of the above tables. A profile, then, consists of the combination of a line code independent configuration (i.e. an entry in vdslLineConfProfileTable) and a set of line code dependent configurations (i.e. entries in either vdslLineMCMConfProfilexxx or vdslLineSCMConfProfilexxx).

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.

2.6 Notifications

The ability to generate the SNMP notifications coldStart/WarmStart

(per [RFC2863]) which are per agent (e.g., per Digital Subscriber Line Access Multiplexer, or DSLAM, in such a device), and linkUp/linkDown (per [RFC2863]) which are per interface (i.e., VDSL line) is required.

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

A linkDown notification MAY be generated whenever any of lof, lol, los, lpr, ES, SES, or UAS threshold crossing event (as defined in this MIB) occurs. The corresponding linkUp notification MAY be sent when all link failure conditions are cleared.

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 [RFC2863]). 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.

2.7 Persistence

All objects defined in this MIB which may be set (read-write or

read-create), should be stored persistently. Following is an exhaustive list of these persistent objects:

vdslLineConfProfile
vdslLineAlarmConfProfile
vdslLineConfProfileIndex

vdslLineConfProfileName

vdslLineConfDownstreamMaxPwr
vdslLineConfUpstreamMaxPwr
vdslLineConfDownstreamMaxSnrMgn
vdslLineConfDownstreamMinSnrMgn
vdslLineConfDownstreamTargetSnrMgn
vdslLineConfUpstreamMaxSnrMgn
vdslLineConfUpstreamMinSnrMgn
vdslLineConfUpstreamTargetSnrMgn
vdslLineConfDownstreamFastMaxDataRate
vdslLineConfDownstreamFastMinDataRate
vdslLineConfDownstreamSlowMaxDataRate
vdslLineConfDownstreamSlowMinDataRate
vdslLineConfUpstreamFastMaxDataRate
vdslLineConfUpstreamFastMinDataRate
vdslLineConfUpstreamSlowMaxDataRate
vdslLineConfUpstreamSlowMinDataRate
vdslLineConfRateAdaptationRatio
vdslLineConfUpstreamDataRate
vdslLineConfDownstreamDataRate
vdslLineConfDownstreamMaxInterDelay
vdslLineConfUpstreamMaxInterDelay
vdslLineConfUpstreamPboControl
vdslLineConfDownstreamPboControl
vdslLineConfDeploymentScenario
vdslLineConfAdslOccupy
vdslLineConfApplicableStandard
vdslLineConfBandPlan
vdslLineConfBandPlanFx
vdslLineConfBandU0Usage
vdslLineConfUpstreamPsdTemplate
vdslLineConfDownstreamPsdTemplate
vdslLineConfProfileRowStatus
vdslMCMConfProfileTxWindowLength
vdslMCMConfProfileRowStatus
vdslMCMConfProfileTxBandNumber
vdslMCMConfProfileTxBandStart
vdslMCMConfProfileTxBandStop
vdslMCMConfProfileTxBandRowStatus
vdslMCMConfProfileRxBandStart
vdslMCMConfProfileRxBandStop
vdslMCMConfProfileRxBandRowStatus
vdslMCMConfProfileTxPSDTone
vdslMCMConfProfileTxPSDPSD
vdslMCMConfProfileTxPSDRowStatus
vdslMCMConfProfileMaxTxPSDTone
vdslMCMConfProfileMaxTxPSDPSD
vdslMCMConfProfileMaxTxPSDRowStatus
vdslMCMConfProfileMaxRxPSDTone
vdslMCMConfProfileMaxRxPSDPSD

vdslMCMConfProfileMaxRxPSDRowStatus
vdslSCMConfProfileInterleaveDepth

vdslSCMConfProfileNumCarriers
vdslSCMConfProfileFastCodewordSize
vdslSCMConfProfileTransmitPSDMask
vdslSCMConfProfileVendorNotch1Start
vdslSCMConfProfileVendorNotch1Stop
vdslSCMConfProfileVendorNotch2Start
vdslSCMConfProfileVendorNotch2Stop
vdslSCMConfProfileFastFecSize
vdslSCMConfProfileSlowBlockSize
vdslSCMConfProfileRowStatus
vdslSCMConfProfileTxBandTransmitPSDLevel
vdslSCMConfProfileTxBandSymbolRateProfile
vdslSCMConfProfileTxBandConstellationSize
vdslSCMConfProfileTxBandCenterFrequency
vdslSCMConfProfileTxBandRowStatus
vdslLineAlarmConfProfileName
vdslThresh15MinLofs
vdslThresh15MinLoss
vdslThresh15MinLprs
vdslThresh15MinESs
vdslThresh15MinSESs
vdslThresh15MinUASs
vdslInitFailureNotificationEnable
vdslLineAlarmConfProfileRowStatus

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

3. 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

4. Definitions

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

    IMPORTS

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

    vdslMIB MODULE-IDENTITY
       LAST-UPDATED "200210300000Z" -- October 30, 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
            "
    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."

    REVISION "200206160000Z" -- June 16, 2002
    DESCRIPTION "Revised per input from DSL Forum."

    REVISION "200209230000Z" -- September 23, 2002
    DESCRIPTION "Revised per more input from DSL Forum."

    REVISION "200210150000Z" -- October 15, 2002
    DESCRIPTION "Modified per input from Randy Presuhn and
                 Moti Morgenstern."

    REVISION "200210300000Z" -- October 30, 2002
    DESCRIPTION "Modified per input from Umberto Bonollo
                 and Travis Levin."

    ::= { 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                 Unsigned32,
            vdslLineAlarmConfProfile            Unsigned32
            }

    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).

            Note that slow and interleaved refer to the same
            channel."
        REFERENCE    "T1E1.4/2000-009R3"    -- Part 1, common spec
        ::= { vdslLineEntry 2 }

    vdslLineConfProfile OBJECT-TYPE
        SYNTAX       Unsigned32
        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       Unsigned32
        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                      Integer32,
            vdslCurrAtn                         Gauge32,
            vdslCurrStatus                      BITS,
            vdslCurrOutputPwr                   Integer32,
            vdslCurrAttainableRate              Gauge32
            }

    vdslPhysSide OBJECT-TYPE
        SYNTAX       VdslLineEntity
        MAX-ACCESS   not-accessible
        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 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 expressed as
            readable characters."
        REFERENCE    "T1E1.4/2000-009R3"    -- Part 1, common spec
        ::= { vdslPhysEntry 4 }

    vdslCurrSnrMgn OBJECT-TYPE
        SYNTAX       Integer32 (-127..127)
        UNITS        "0.25dBm"
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
            "Noise Margin as seen by this Vtu with respect to its
            received signal in 0.25dB.  The effective range is
            -31.75 to +31.75dB."
        REFERENCE    "T1E1.4/2000-009R3"    -- Part 1, common spec
         ::= { vdslPhysEntry 5 }

    vdslCurrAtn OBJECT-TYPE
        SYNTAX       Gauge32 (0..255)
        UNITS        "0.25dBm"
        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.
            The effective range is 0 to +63.75dB."
        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
                                     a 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       Integer32 (0..160)
        UNITS        "0.1dBm"
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
            "Measured total output power transmitted by this VTU.
            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        "kbps"
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
            "Indicates the maximum currently attainable data rate
            in steps of 1024 bits/second by the Vtu.  This value
            will be equal or greater than the current line rate.
            Note that for SCM, the minimum and maximum data rates
            are equal."
        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,
            vdslChanCurrTxRate                    Gauge32
            }

    vdslChanInterleaveDelay OBJECT-TYPE
        SYNTAX       Gauge32
        UNITS        "ms"
        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 }

    vdslChanCurrTxRate OBJECT-TYPE
        SYNTAX       Gauge32
        UNITS        "kbps"
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
            "Actual transmit data rate on this channel."
        ::= { vdslChanEntry 3 }

    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            HCPerfValidIntervals,
            vdslPerfInvalidIntervals          HCPerfInvalidIntervals,
            vdslPerfLofs                      Counter64,
            vdslPerfLoss                      Counter64,
            vdslPerfLprs                      Counter64,
            vdslPerfESs                       Counter64,
            vdslPerfSESs                      Counter64,
            vdslPerfUASs                      Counter64,
            vdslPerfInits                     Counter64,
            vdslPerfCurr15MinTimeElapsed      HCPerfTimeElapsed,
            vdslPerfCurr15MinLofs             HCPerfCurrentCount,
            vdslPerfCurr15MinLoss             HCPerfCurrentCount,
            vdslPerfCurr15MinLprs             HCPerfCurrentCount,
            vdslPerfCurr15MinESs              HCPerfCurrentCount,
            vdslPerfCurr15MinSESs             HCPerfCurrentCount,
            vdslPerfCurr15MinUASs             HCPerfCurrentCount,
            vdslPerfCurr15MinInits            HCPerfCurrentCount,
            vdslPerf1DayValidIntervals        HCPerfValidIntervals,
            vdslPerf1DayInvalidIntervals      HCPerfInvalidIntervals,
            vdslPerfCurr1DayTimeElapsed       HCPerfTimeElapsed,
            vdslPerfCurr1DayLofs              Counter64,
            vdslPerfCurr1DayLoss              Counter64,
            vdslPerfCurr1DayLprs              Counter64,
            vdslPerfCurr1DayESs               Counter64,
            vdslPerfCurr1DaySESs              Counter64,
            vdslPerfCurr1DayUASs              Counter64,
            vdslPerfCurr1DayInits             Counter64
            }

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

    vdslPerfInvalidIntervals OBJECT-TYPE
        SYNTAX       HCPerfInvalidIntervals
```

```
        MAX-ACCESS   read-only
        STATUS       current
```

```
        DESCRIPTION
            "Invalid Intervals per 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 or lof defects."
        REFERENCE    "T1E1.4/2000-009R3"    -- Part 1, common spec
        ::= { vdslPerfDataEntry 6 }
```

```
    vdslPerfSESs OBJECT-TYPE
```

```
        SYNTAX       Counter64
        UNITS        "seconds"
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
            "Count of Severely Errored Seconds since the unit was last
            reset."
        ::= { vdslPerfDataEntry 7 }

    vdslPerfUASs OBJECT-TYPE
        SYNTAX       Counter64
        UNITS        "seconds"
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
            "Count of Unavailable Seconds since the unit was last
            reset."
        ::= { vdslPerfDataEntry 8 }

    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 9 }

    vdslPerfCurr15MinTimeElapsed OBJECT-TYPE
        SYNTAX       HCPerfTimeElapsed
        UNITS        "seconds"
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
            "Total elapsed seconds in this interval."
        ::= { vdslPerfDataEntry 10 }

    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 11 }
```

```
    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 12 }

    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 13 }

    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 or lof defects."
        REFERENCE    "T1E1.4/2000-009R3"    -- Part 1, common spec
        ::= { vdslPerfDataEntry 14 }

    vdslPerfCurr15MinSESs OBJECT-TYPE
        SYNTAX       HCPerfCurrentCount
        UNITS        "seconds"
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
            "Count of Severely Errored Seconds during this interval."
        ::= { vdslPerfDataEntry 15 }

    vdslPerfCurr15MinUASs OBJECT-TYPE
        SYNTAX       HCPerfCurrentCount
        UNITS        "seconds"
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
            "Count of Unavailable Seconds during this interval."
```

```
        ::= { vdslPerfDataEntry 16 }
```

```
    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 17 }

    vdslPerf1DayValidIntervals OBJECT-TYPE
        SYNTAX        HCPerfValidIntervals
        MAX-ACCESS    read-only
        STATUS        current
        DESCRIPTION
            "Valid Intervals per definition found in
            HC-PerfHist-TC-MIB."
        ::= { vdslPerfDataEntry 18 }

    vdslPerf1DayInvalidIntervals OBJECT-TYPE
        SYNTAX        HCPerfInvalidIntervals
        MAX-ACCESS    read-only
        STATUS        current
        DESCRIPTION
            "Invalid Intervals per definition found in
            HC-PerfHist-TC-MIB."
        ::= { vdslPerfDataEntry 19 }

    vdslPerfCurr1DayTimeElapsed OBJECT-TYPE
        SYNTAX       HCPerfTimeElapsed
        UNITS        "seconds"
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
             "Number of seconds that have elapsed since the beginning
             of the current 1-day interval."
        ::= { vdslPerfDataEntry 20 }

    vdslPerfCurr1DayLofs OBJECT-TYPE
        SYNTAX       Counter64
        UNITS        "seconds"
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
            "Count of Loss of Framing (LOF) Seconds since the
            beginning of the current 1-day interval."
        ::= { vdslPerfDataEntry 21 }
```

```
    vdslPerfCurr1DayLoss OBJECT-TYPE
        SYNTAX       Counter64
```

```
        UNITS        "seconds"
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
            "Count of Loss of Signal (LOS) Seconds since the beginning
            of the current 1-day interval."
        ::= { vdslPerfDataEntry 22 }

    vdslPerfCurr1DayLprs OBJECT-TYPE
        SYNTAX       Counter64
        UNITS        "seconds"
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
            "Count of Loss of Power (LPR) Seconds since the beginning
            of the current 1-day interval."
        ::= { vdslPerfDataEntry 23 }

    vdslPerfCurr1DayESs OBJECT-TYPE
        SYNTAX       Counter64
        UNITS        "seconds"
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
            "Count of Errored Seconds (ES) since the beginning
            of the current 1-day interval."
        ::= { vdslPerfDataEntry 24 }

    vdslPerfCurr1DaySESs OBJECT-TYPE
        SYNTAX       Counter64
        UNITS        "seconds"
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
            "Count of Severely Errored Seconds (SES) since the
            beginning of the current 1-day interval."
        ::= { vdslPerfDataEntry 25 }

    vdslPerfCurr1DayUASs OBJECT-TYPE
        SYNTAX       Counter64
        UNITS        "seconds"
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
            "Count of Unavailable Seconds (UAS) since the beginning
            of the current 1-day interval."
        ::= { vdslPerfDataEntry 26 }

    vdslPerfCurr1DayInits OBJECT-TYPE
```

```
        SYNTAX       Counter64
        UNITS        "seconds"
```

```
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
            "Count of the line initialization attempts since the
            beginning of the current 1-day interval.  This count
            includes both successful and failed attempts."
        ::= { vdslPerfDataEntry 27 }

    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                    Unsigned32,
            vdslIntervalLofs                      HCPerfIntervalCount,
            vdslIntervalLoss                      HCPerfIntervalCount,
            vdslIntervalLprs                      HCPerfIntervalCount,
            vdslIntervalESs                       HCPerfIntervalCount,
            vdslIntervalSESs                      HCPerfIntervalCount,
            vdslIntervalUASs                      HCPerfIntervalCount,
            vdslIntervalInits                     HCPerfIntervalCount
            }

    vdslIntervalNumber OBJECT-TYPE
        SYNTAX       Unsigned32 (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 (ES) in the interval.  An Errored
            Second is a one-second interval containing one or more crc
            anomalies, one or more los or lof defects."
        REFERENCE    "T1E1.4/2000-009R3"    -- Part 1, common spec
        ::= { vdslPerfIntervalEntry 5 }

    vdslIntervalSESs OBJECT-TYPE
        SYNTAX       HCPerfIntervalCount
        UNITS        "seconds"
```

```
        MAX-ACCESS   read-only
        STATUS       current
```

```
        DESCRIPTION
            "Count of Severely Errored Seconds in the interval."
        ::= { vdslPerfIntervalEntry 6 }

    vdslIntervalUASs OBJECT-TYPE
        SYNTAX       HCPerfIntervalCount
        UNITS        "seconds"
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
            "Count of Unavailable Seconds in the interval."
        ::= { vdslPerfIntervalEntry 7 }

    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 8 }

    vdsl1DayIntervalTable OBJECT-TYPE
        SYNTAX       SEQUENCE OF Vdsl1DayIntervalEntry
        MAX-ACCESS   not-accessible
        STATUS       current
        DESCRIPTION
            "This table provides one row for each VDSL performance
            data collection interval.  This table contains live data
            from equipment.  As such, it is NOT persistent."
        ::= { vdslMibObjects 6 }

    vdsl1DayIntervalEntry OBJECT-TYPE
        SYNTAX       Vdsl1DayIntervalEntry
        MAX-ACCESS   not-accessible
        STATUS       current
        DESCRIPTION
            "An entry in the vdsl1DayIntervalTable."
        INDEX { ifIndex,
                vdslPhysSide,
                vdsl1DayIntervalNumber }
        ::= { vdsl1DayIntervalTable 1 }

    Vdsl1DayIntervalEntry ::=
        SEQUENCE
        {
        vdsl1DayIntervalNumber                Unsigned32,
```

```
        vdsl1DayIntervalMoniSecs              HCPerfTimeElapsed,
        vdsl1DayIntervalLofs                  Counter64,
```

```
        vdsl1DayIntervalLoss                    Counter64,
        vdsl1DayIntervalLprs                    Counter64,
        vdsl1DayIntervalESs                     Counter64,
        vdsl1DayIntervalSESs                    Counter64,
        vdsl1DayIntervalUASs                    Counter64,
        vdsl1DayIntervalInits                   Counter64
        }

    vdsl1DayIntervalNumber OBJECT-TYPE
        SYNTAX       Unsigned32 (1..30)
        MAX-ACCESS   not-accessible
        STATUS       current
        DESCRIPTION
            "History Data Interval number. Interval 1 is the the most
            recent previous day; interval 30 is 30 days ago. Intervals
            2..30 are optional."
        ::= { vdsl1DayIntervalEntry 1 }

    vdsl1DayIntervalMoniSecs OBJECT-TYPE
        SYNTAX       HCPerfTimeElapsed
        UNITS        "seconds"
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
            "The amount of time in the 1-day interval over which the
            performance monitoring information is actually counted.
            This value will be the same as the interval duration except
            in a situation where performance monitoring data could not
            be collected for any reason."
        ::= { vdsl1DayIntervalEntry 2 }

    vdsl1DayIntervalLofs OBJECT-TYPE
        SYNTAX       Counter64
        UNITS        "seconds"
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
             "Count of Loss of Frame (LOF) Seconds during the 1-day
             interval as measured by vdsl1DayIntervalMoniSecs."
        REFERENCE    "T1E1.4/2000-009R3"    -- Part 1, common spec
        ::= { vdsl1DayIntervalEntry 3 }

    vdsl1DayIntervalLoss OBJECT-TYPE
        SYNTAX       Counter64
        UNITS        "seconds"
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
             "Count of Loss of Signal (LOS) Seconds during the 1-day
```

```
            interval as measured by vdsl1DayIntervalMoniSecs."
        REFERENCE    "T1E1.4/2000-009R3"    -- Part 1, common spec
```

```
        ::= { vdsl1DayIntervalEntry 4 }

    vdsl1DayIntervalLprs OBJECT-TYPE
        SYNTAX       Counter64
        UNITS        "seconds"
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
             "Count of Loss of Power (LPR) Seconds during the 1-day
             interval as measured by vdsl1DayIntervalMoniSecs."
        REFERENCE    "T1E1.4/2000-009R3"    -- Part 1, common spec
        ::= { vdsl1DayIntervalEntry 5 }

    vdsl1DayIntervalESs OBJECT-TYPE
        SYNTAX       Counter64
        UNITS        "seconds"
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
             "Count of Errored Seconds (ES) during the 1-day
             interval as measured by vdsl1DayIntervalMoniSecs."
        REFERENCE    "T1E1.4/2000-009R3"    -- Part 1, common spec
        ::= { vdsl1DayIntervalEntry 6 }

    vdsl1DayIntervalSESs OBJECT-TYPE
        SYNTAX       Counter64
        UNITS        "seconds"
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
             "Count of Severely Errored Seconds (SES) during the 1-day
             interval as measured by vdsl1DayIntervalMoniSecs."
        ::= { vdsl1DayIntervalEntry 7 }

    vdsl1DayIntervalUASs OBJECT-TYPE
        SYNTAX       Counter64
        UNITS        "seconds"
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
             "Count of Unavailable Seconds (UAS) during the 1-day
             interval as measured by vdsl1DayIntervalMoniSecs."
        ::= { vdsl1DayIntervalEntry 8 }

    vdsl1DayIntervalInits OBJECT-TYPE
        SYNTAX       Counter64
        UNITS        "seconds"
        MAX-ACCESS   read-only
        STATUS       current
```

```
        DESCRIPTION
            "Count of the line initialization attempts during the
```

```
            1-day interval as measured by vdsl1DayIntervalMoniSecs.
            This count includes both successful and failed attempts."
        REFERENCE    "T1E1.4/2000-009R3"    -- Part 1, common spec
        ::= { vdsl1DayIntervalEntry 9 }

    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 7 }

    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          HCPerfValidIntervals,
            vdslChanPerfInvalidIntervals        HCPerfInvalidIntervals,
            vdslChanCorrectedOctets             Counter64,
            vdslChanUncorrectBlks               Counter64,
            vdslChanPerfCurr15MinTimeElapsed    HCPerfTimeElapsed,
            vdslChanPerfCurr15MinCorrectedOctets HCPerfCurrentCount,
            vdslChanPerfCurr15MinUncorrectBlks  HCPerfCurrentCount,
            vdslChanPerf1DayValidIntervals      HCPerfValidIntervals,
            vdslChanPerf1DayInvalidIntervals    HCPerfInvalidIntervals,
            vdslChanPerfCurr1DayTimeElapsed     HCPerfTimeElapsed,
            vdslChanPerfCurr1DayCorrectedOctets HCPerfCurrentCount,
            vdslChanPerfCurr1DayUncorrectBlks   HCPerfCurrentCount
            }

    vdslChanPerfValidIntervals OBJECT-TYPE
        SYNTAX        HCPerfValidIntervals
        MAX-ACCESS    read-only
        STATUS        current
        DESCRIPTION
            "Valid Intervals per definition found in
            HC-PerfHist-TC-MIB."
```

```
        ::= { vdslChanPerfDataEntry 1 }
```

```
    vdslChanPerfInvalidIntervals OBJECT-TYPE
        SYNTAX        HCPerfInvalidIntervals
        MAX-ACCESS    read-only
        STATUS        current
        DESCRIPTION
            "Invalid Intervals per 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        HCPerfTimeElapsed
        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 }

    vdslChanPerf1DayValidIntervals OBJECT-TYPE
        SYNTAX        HCPerfValidIntervals
        MAX-ACCESS    read-only
        STATUS        current
        DESCRIPTION
            "Valid Intervals per definition found in
            HC-PerfHist-TC-MIB."
        ::= { vdslChanPerfDataEntry 8 }

    vdslChanPerf1DayInvalidIntervals OBJECT-TYPE
        SYNTAX        HCPerfInvalidIntervals
        MAX-ACCESS    read-only
        STATUS        current
        DESCRIPTION
            "Invalid Intervals per definition found in
            HC-PerfHist-TC-MIB."
        ::= { vdslChanPerfDataEntry 9 }

    vdslChanPerfCurr1DayTimeElapsed OBJECT-TYPE
        SYNTAX       HCPerfTimeElapsed
        UNITS        "seconds"
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
             "Number of seconds that have elapsed since the beginning
             of the current 1-day interval."
        ::= { vdslChanPerfDataEntry 10 }

    vdslChanPerfCurr1DayCorrectedOctets OBJECT-TYPE
        SYNTAX        HCPerfCurrentCount
        MAX-ACCESS    read-only
        STATUS        current
        DESCRIPTION
            "Count of corrected octets since the beginning of the
            current 1-day interva."
        REFERENCE    "T1E1.4/2000-009R3"    -- Part 1, common spec
        ::= { vdslChanPerfDataEntry 11 }

    vdslChanPerfCurr1DayUncorrectBlks OBJECT-TYPE
        SYNTAX        HCPerfCurrentCount
        MAX-ACCESS    read-only
        STATUS        current
        DESCRIPTION
            "Count of uncorrected blocks since the beginning of the
            current 1-day interva."
        REFERENCE    "T1E1.4/2000-009R3"    -- Part 1, common spec
```

```
        ::= { vdslChanPerfDataEntry 12 }
```

```
    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 8 }

    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                Unsigned32,
            vdslChanIntervalCorrectedOctets       HCPerfIntervalCount,
            vdslChanIntervalUncorrectBlks         HCPerfIntervalCount
            }

    vdslChanIntervalNumber OBJECT-TYPE
        SYNTAX        Unsigned32 (0..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 }

    vdslChan1DayIntervalTable OBJECT-TYPE
        SYNTAX       SEQUENCE OF VdslChan1DayIntervalEntry
        MAX-ACCESS   not-accessible
        STATUS       current
        DESCRIPTION
            "This table provides one row for each VDSL performance
            data collection interval.  This table contains live data
            from equipment.  As such, it is NOT persistent."
        ::= { vdslMibObjects 9 }

    vdslChan1DayIntervalEntry OBJECT-TYPE
        SYNTAX       VdslChan1DayIntervalEntry
        MAX-ACCESS   not-accessible
        STATUS       current
        DESCRIPTION
            "An entry in the vdslChan1DayIntervalTable."
        INDEX { ifIndex,
                vdslPhysSide,
                vdslChan1DayIntervalNumber }
        ::= { vdslChan1DayIntervalTable 1 }

    VdslChan1DayIntervalEntry ::=
        SEQUENCE
        {
        vdslChan1DayIntervalNumber             Unsigned32,
        vdslChan1DayIntervalMoniSecs           HCPerfTimeElapsed,
        vdslChan1DayIntervalCorrectedOctets    HCPerfCurrentCount,
        vdslChan1DayIntervalUncorrectBlks      HCPerfCurrentCount
        }

    vdslChan1DayIntervalNumber OBJECT-TYPE
        SYNTAX       Unsigned32 (1..30)
        MAX-ACCESS   not-accessible
        STATUS       current
        DESCRIPTION
            "History Data Interval number. Interval 1 is the the most
            recent previous day; interval 30 is 30 days ago. Intervals
            2..30 are optional."
        ::= { vdslChan1DayIntervalEntry 1 }

    vdslChan1DayIntervalMoniSecs OBJECT-TYPE
        SYNTAX       HCPerfTimeElapsed
```

```
        UNITS        "seconds"
        MAX-ACCESS   read-only
```

```
        STATUS       current
        DESCRIPTION
            "The amount of time in the 1-day interval over which the
            performance monitoring information is actually counted.
            This value will be the same as the interval duration except
            in a situation where performance monitoring data could not
            be collected for any reason."
        ::= { vdslChan1DayIntervalEntry 2 }

    vdslChan1DayIntervalCorrectedOctets 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
        ::= { vdslChan1DayIntervalEntry 3 }

    vdslChan1DayIntervalUncorrectBlks 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
        ::= { vdslChan1DayIntervalEntry 4 }

    --
    -- SCM physical band status
    --

    vdslSCMPhysBandTable OBJECT-TYPE
        SYNTAX       SEQUENCE OF VdslSCMPhysBandEntry
        MAX-ACCESS   not-accessible
        STATUS       current
        DESCRIPTION
            "This table provides one row for each SCM Vtu band."
        ::= { vdslMibObjects 10 }

    vdslSCMPhysBandEntry OBJECT-TYPE
        SYNTAX        VdslSCMPhysBandEntry
        MAX-ACCESS    not-accessible
        STATUS        current
        DESCRIPTION
            "An entry in the vdslSCMPhysBandTable."
        INDEX { ifIndex,
                vdslPhysSide,
                vdslSCMPhysTxBandNumber }
        ::= { vdslSCMPhysBandTable 1 }
```

```
    VdslSCMPhysBandEntry ::=
```

```
        SEQUENCE
            {
            vdslSCMPhysTxBandNumber        INTEGER,
            vdslSCMPhysBandSnrMgn          Integer32,
            vdslSCMPhysBandAtn             Unsigned32
            }

    vdslSCMPhysTxBandNumber OBJECT-TYPE
        SYNTAX        INTEGER
                      {
                      band1(1),
                      band2(2),
                      upstreamU0(3)
                      }
        MAX-ACCESS    not-accessible
        STATUS        current
        DESCRIPTION
            "The SCM transmit band number for this entry."
        ::= { vdslSCMPhysBandEntry 1 }

    vdslSCMPhysBandSnrMgn OBJECT-TYPE
        SYNTAX        Integer32 (-127..127)
        UNITS         "0.25 dBm"
        MAX-ACCESS    read-only
        STATUS        current
        DESCRIPTION
            "Noise margin as seen by this Vtu and band with respect
            to its received signal in 0.25 dB."
        ::= { vdslSCMPhysBandEntry 2 }

    vdslSCMPhysBandAtn OBJECT-TYPE
        SYNTAX        Unsigned32 (0..255)
        UNITS         "0.25 dBm"
        MAX-ACCESS    read-only
        STATUS        current
        DESCRIPTION
            "Measured difference in the total power transmitted by
            the peer Vtu on this band and the total power received
            by this Vtu on this band in 0.25 dB."
        ::= { vdslSCMPhysBandEntry 3 }

    --
    -- profile tables
    --

    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 11 }

    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 line.  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 }
        ::= { vdslLineConfProfileTable 1 }

    VdslLineConfProfileEntry ::=
        SEQUENCE
            {
            vdslLineConfProfileIndex              Unsigned32,
            vdslLineConfProfileName               SnmpAdminString,
            vdslLineConfDownstreamMaxPwr          Unsigned32,
            vdslLineConfUpstreamMaxPwr            Unsigned32,
            vdslLineConfDownstreamMaxSnrMgn       Unsigned32,
            vdslLineConfDownstreamMinSnrMgn       Unsigned32,
            vdslLineConfDownstreamTargetSnrMgn    Unsigned32,
            vdslLineConfUpstreamMaxSnrMgn         Unsigned32,
            vdslLineConfUpstreamMinSnrMgn         Unsigned32,
            vdslLineConfUpstreamTargetSnrMgn      Unsigned32,
            vdslLineConfDownstreamFastMaxDataRate Unsigned32,
            vdslLineConfDownstreamFastMinDataRate Unsigned32,
            vdslLineConfDownstreamSlowMaxDataRate Unsigned32,
            vdslLineConfDownstreamSlowMinDataRate Unsigned32,
            vdslLineConfUpstreamFastMaxDataRate   Unsigned32,
            vdslLineConfUpstreamFastMinDataRate   Unsigned32,
            vdslLineConfUpstreamSlowMaxDataRate   Unsigned32,
            vdslLineConfUpstreamSlowMinDataRate   Unsigned32,
            vdslLineConfRateAdaptationRatio       Unsigned32,
            vdslLineConfUpstreamDataRate          Unsigned32,
            vdslLineConfDownstreamDataRate        Unsigned32,
            vdslLineConfDownstreamMaxInterDelay   Unsigned32,
            vdslLineConfUpstreamMaxInterDelay     Unsigned32,
            vdslLineConfUpstreamPboControl        INTEGER,
            vdslLineConfDownstreamPboControl      INTEGER,
            vdslLineConfDeploymentScenario        INTEGER,
            vdslLineConfAdslOccupy                TruthValue,
            vdslLineConfApplicableStandard        INTEGER,
```

```
            vdslLineConfBandPlan                INTEGER,
            vdslLineConfBandPlanFx              Unsigned32,
```

```
            vdslLineConfBandU0Usage                INTEGER,
            vdslLineConfUpstreamPsdTemplate        INTEGER,
            vdslLineConfDownstreamPsdTemplate      INTEGER,
            vdslLineConfProfileRowStatus           RowStatus
            }

    vdslLineConfProfileIndex OBJECT-TYPE
        SYNTAX       Unsigned32
        MAX-ACCESS   read-only
        STATUS       current
        DESCRIPTION
            "This object identifies a row in this table.  A
            default profile with an index of 1 MUST always
            exist and its parameters will be set to vendor
            specific values, unless otherwise specified in
            this document."
        ::= { 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 }

    vdslLineConfDownstreamMaxPwr OBJECT-TYPE
        SYNTAX       Unsigned32 (0..58)
        UNITS        "0.25dBm"
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "Specifies the maximum aggregate downstream power
            level in the range 0..14.5dBm."
        REFERENCE    "T1E1.4/2000-009R3"    -- Part 1, common spec
        ::= { vdslLineConfProfileEntry 3 }

    vdslLineConfUpstreamMaxPwr OBJECT-TYPE
        SYNTAX       Unsigned32 (0..58)
        UNITS        "0.25dBm"
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "Specifies the maximum aggregate upstream power
            level in the range 0..14.5dBm."
        REFERENCE    "T1E1.4/2000-009R3"    -- Part 1, common spec
        ::= { vdslLineConfProfileEntry 4 }

    vdslLineConfDownstreamMaxSnrMgn OBJECT-TYPE
```

```
        SYNTAX       Unsigned32 (0..127)
        UNITS        "0.25dBm"
```

```
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "Specifies the maximum downstream Signal/Noise Margin
            in units of 0.25 dB, for a range of 0..31.75 dB."
        REFERENCE    "T1E1.4/2000-009R3"    -- Part 1, common spec
        ::= { vdslLineConfProfileEntry 5 }

    vdslLineConfDownstreamMinSnrMgn OBJECT-TYPE
        SYNTAX       Unsigned32 (0..127)
        UNITS        "0.25dBm"
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "Specifies the minimum downstream Signal/Noise Margin
            in units of 0.25 dB, for a range of 0..31.75 dB."
        REFERENCE    "T1E1.4/2000-009R3"    -- Part 1, common spec
        ::= { vdslLineConfProfileEntry 6 }

    vdslLineConfDownstreamTargetSnrMgn OBJECT-TYPE
        SYNTAX       Unsigned32 (0..127)
        UNITS        "0.25dBm"
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "Specifies the target downstream Signal/Noise Margin
            in units of 0.25 dB, for a range of 0..31.75 dB.
            This is the Noise Margin the modems must achieve with a
            BER of 10-7 or better to successfully complete
            initialization."
        REFERENCE    "T1E1.4/2000-009R3"    -- Part 1, common spec
        ::= { vdslLineConfProfileEntry 7 }

    vdslLineConfUpstreamMaxSnrMgn OBJECT-TYPE
        SYNTAX       Unsigned32 (0..127)
        UNITS        "0.25dBm"
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "Specifies the maximum upstream Signal/Noise Margin
            in units of 0.25 dB, for a range of 0..31.75 dB."
        REFERENCE    "T1E1.4/2000-009R3"    -- Part 1, common spec
        ::= { vdslLineConfProfileEntry 8 }

    vdslLineConfUpstreamMinSnrMgn OBJECT-TYPE
        SYNTAX       Unsigned32 (0..127)
        UNITS        "0.25dBm"
        MAX-ACCESS   read-create
        STATUS       current
```

```
        DESCRIPTION
            "Specifies the minimum upstream Signal/Noise Margin
```

```
            in units of 0.25 dB, for a range of 0..31.75 dB."
        REFERENCE    "T1E1.4/2000-009R3"    -- Part 1, common spec
        ::= { vdslLineConfProfileEntry 9 }

    vdslLineConfUpstreamTargetSnrMgn OBJECT-TYPE
        SYNTAX       Unsigned32 (0..127)
        UNITS        "0.25dBm"
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "Specifies the target upstream Signal/Noise Margin in
            units of 0.25 dB, for a range of 0..31.75 dB.  This
            is the Noise Margin the modems must achieve with a BER of
            10-7 or better to successfully complete initialization."
        REFERENCE    "T1E1.4/2000-009R3"    -- Part 1, common spec
        ::= { vdslLineConfProfileEntry 10 }

    vdslLineConfDownstreamFastMaxDataRate OBJECT-TYPE
        SYNTAX       Unsigned32
        UNITS        "kbps"
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "Specifies the maximum downstream fast channel
            data rate in steps of 1024 bits/second."
        ::= { vdslLineConfProfileEntry 11 }

    vdslLineConfDownstreamFastMinDataRate OBJECT-TYPE
        SYNTAX       Unsigned32
        UNITS        "kbps"
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "Specifies the minimum downstream fast channel
            data rate in steps of 1024 bits/second."
        ::= { vdslLineConfProfileEntry 12 }

    vdslLineConfDownstreamSlowMaxDataRate OBJECT-TYPE
        SYNTAX       Unsigned32
        UNITS        "kbps"
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "Specifies the maximum downstream slow channel
            data rate in steps of 1024 bits/second."
        ::= { vdslLineConfProfileEntry 13 }

    vdslLineConfDownstreamSlowMinDataRate OBJECT-TYPE
        SYNTAX       Unsigned32
```

```
        UNITS        "kbps"
        MAX-ACCESS   read-create
```

```
        STATUS       current
        DESCRIPTION
            "Specifies the minimum downstream slow channel
            data rate in steps of 1024 bits/second."
        ::= { vdslLineConfProfileEntry 14 }

    vdslLineConfUpstreamFastMaxDataRate OBJECT-TYPE
        SYNTAX       Unsigned32
        UNITS        "kbps"
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "Specifies the maximum upstream fast channel
            data rate in steps of 1024 bits/second."
        ::= { vdslLineConfProfileEntry 15 }

    vdslLineConfUpstreamFastMinDataRate OBJECT-TYPE
        SYNTAX       Unsigned32
        UNITS        "kbps"
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "Specifies the minimum upstream fast channel
            data rate in steps of 1024 bits/second."
        ::= { vdslLineConfProfileEntry 16 }

    vdslLineConfUpstreamSlowMaxDataRate OBJECT-TYPE
        SYNTAX       Unsigned32
        UNITS        "kbps"
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "Specifies the maximum upstream slow channel
            data rate in steps of 1024 bits/second."
        ::= { vdslLineConfProfileEntry 17 }

    vdslLineConfUpstreamSlowMinDataRate OBJECT-TYPE
        SYNTAX       Unsigned32
        UNITS        "kbps"
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "Specifies the minimum upstream slow channel
            data rate in steps of 1024 bits/second."
        ::= { vdslLineConfProfileEntry 18 }

    vdslLineConfRateAdaptationRatio OBJECT-TYPE
        SYNTAX       Unsigned32 (0..100)
        UNITS        "percent"
```

```
        MAX-ACCESS   read-create
        STATUS       current
```

```
        DESCRIPTION
            "For dynamic rate adaptation at startup, the allocation
            of data rate in excess of the minimum data rate for each
            channel is controlled by the object.  This object specifies
            the ratio of the allocation of the excess data rate between
            the fast and the slow channels.  This allocation represents
            Fast Channel Allocation / Slow Channel Allocation."
        ::= { vdslLineConfProfileEntry 19 }

    vdslLineConfUpstreamDataRate OBJECT-TYPE
        SYNTAX       Unsigned32
        UNITS        "kbps"
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "Aggregate upstream transmit speed for this line
            in steps of 1024 bits/second."
        ::= { vdslLineConfProfileEntry 20 }

    vdslLineConfDownstreamDataRate OBJECT-TYPE
        SYNTAX       Unsigned32
        UNITS        "kbps"
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "Aggregate downstream transmit speed for this line
            in steps of 1024 bits/second."
        ::= { vdslLineConfProfileEntry 21 }

    vdslLineConfDownstreamMaxInterDelay OBJECT-TYPE
        SYNTAX       Unsigned32 (0..255)
        UNITS        "ms"
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "Specifies the maximum interleave delay for the
            downstream slow channel."
        ::= { vdslLineConfProfileEntry 22 }

    vdslLineConfUpstreamMaxInterDelay OBJECT-TYPE
        SYNTAX       Unsigned32 (0..255)
        UNITS        "ms"
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "Specifies the maximum interleave delay for the
            upstream slow channel."
        ::= { vdslLineConfProfileEntry 23 }
```

```
    vdslLineConfUpstreamPboControl OBJECT-TYPE
        SYNTAX       INTEGER
```

```
                    {
                    disabled(1),
                    enabled(2)
                    }
        MAX-ACCESS  read-create
        STATUS      current
        DESCRIPTION
            "Upstream power backoff (PBO) control for this
            line.  For modems which do not support upstream
            PBO control, this object MUST be fixed at disabled(1)."
        ::= { vdslLineConfProfileEntry 24 }

    vdslLineConfDownstreamPboControl OBJECT-TYPE
        SYNTAX      INTEGER
                    {
                    disabled(1),
                    enabled(2)
                    }
        MAX-ACCESS  read-create
        STATUS      current
        DESCRIPTION
            "Downstream power backoff (PBO) control for this
            line.  For modems which do not support downstream
            PBO control, this object MUST be fixed at disabled(1)."
        ::= { vdslLineConfProfileEntry 25 }

    vdslLineConfDeploymentScenario OBJECT-TYPE
        SYNTAX      INTEGER
                    {
                    fttCab(1),
                    fttEx(2),
                    other(3)
                    }
        MAX-ACCESS  read-create
        STATUS      current
        DESCRIPTION
            "The VDSL line deployment scenario.  When using
            fttCab(1), the VTU-C is located in a street cabinet.
            When using fttEx(2), the VTU-C is located at the
            central office."
        ::= { vdslLineConfProfileEntry 26 }

    vdslLineConfAdslOccupy OBJECT-TYPE
        SYNTAX      TruthValue
        MAX-ACCESS  read-create
        STATUS      current
        DESCRIPTION
            "Indicates if the VDSL line can occupy the ADSL
            frequency range."
```

```
        ::= { vdslLineConfProfileEntry 27 }
```

```
    vdslLineConfApplicableStandard OBJECT-TYPE
        SYNTAX       INTEGER
                     {
                     ansi(1),
                     etsi(2),
                     itu(3),
                     other(4)
                     }
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "The VDSL standard to be used for the line."
        ::= { vdslLineConfProfileEntry 28 }

    vdslLineConfBandPlan OBJECT-TYPE
        SYNTAX       INTEGER
                     {
                     bandPlan997(1),
                     bandPlan998(2),
                     bandPlanFx(3),
                     other(4)
                     }
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "The VDSL band plan to be used for the line.

             bandPlan997(1) is to be used for
                  ITU-T G.993.1 Bandplan-B
                  ETSI Bandplan
                  ANSI Plan 997

             bandPlan998(2) is to be used for
                  ITU-T G.993.1 Bandplan-A
                  ANSI Plan 998

             bandPlanFx(3) is to be used for
                  ITU-T G.993.1 Bandplan-C.

             other(4) is to be used for
                  non-standard bandplans.

             If this object is set to bandPlanFx(3), then
             the object vdslLineConfBandPlanFx MUST also be
             set."
        ::= { vdslLineConfProfileEntry 29 }

    vdslLineConfBandPlanFx OBJECT-TYPE
        SYNTAX       Unsigned32 (3750..12000)
```

```
        UNITS        "kHz"
        MAX-ACCESS   read-create
```

```
        STATUS       current
        DESCRIPTION
            "The frequency limit between bands D2 and U2 when
            vdslLineConfBandPlan is set to bandPlanFx(3)."
        ::= { vdslLineConfProfileEntry 30 }

    vdslLineConfBandU0Usage OBJECT-TYPE
        SYNTAX       INTEGER
                     {
                     unused(1),
                     upstream(2),
                     downstream(3)
                     }
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "Defines the VDSL link use of the frequency range
            [25kHz - 138kHz] (U0)."
        ::= { vdslLineConfProfileEntry 31 }

    vdslLineConfUpstreamPsdTemplate OBJECT-TYPE
        SYNTAX       INTEGER
                     {
                     templateMask1(1),
                     templateMask2(2)
                     }
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "The upstream PSD template to be used for the line."
        ::= { vdslLineConfProfileEntry 32 }

    vdslLineConfDownstreamPsdTemplate OBJECT-TYPE
        SYNTAX       INTEGER
                     {
                     templateMask1(1),
                     templateMask2(2)
                     }
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "The downstream PSD template to be used for the line."
        ::= { vdslLineConfProfileEntry 33 }

    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 34 }

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

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

            The entries in this table MUST NOT be used for single
            carrier (SCM) VDSL lines."
        ::= { vdslMibObjects 12 }

    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 }
        ::= { vdslLineMCMConfProfileTable 1 }

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

```
    vdslMCMConfProfileTxWindowLength OBJECT-TYPE
        SYNTAX       Unsigned32 (1..255)
```

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

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

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

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

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

            The entries in this table MUST NOT be used for single
            carrier (SCM) VDSL lines."
        ::= { vdslMibObjects 13 }

    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,
                vdslMCMConfProfileTxBandNumber }
        ::= { vdslLineMCMConfProfileTxBandTable 1 }

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

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

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

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

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

A profile activated by setting this object to `active'.

```
            When `active' is set, the system will validate the profile.

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

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

            The entries in this table MUST NOT be used for single
            carrier (SCM) VDSL lines."
        ::= { vdslMibObjects 14 }

    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,
                vdslMCMConfProfileRxBandNumber }
        ::= { vdslLineMCMConfProfileRxBandTable 1 }

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

    vdslMCMConfProfileRxBandNumber OBJECT-TYPE
```

```
        SYNTAX       Unsigned32
        MAX-ACCESS   not-accessible
```

```
        STATUS       current
        DESCRIPTION
            "The index for this band descriptor entry."
        ::= { vdslLineMCMConfProfileRxBandEntry 1 }

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

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

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

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

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

    vdslLineMCMConfProfileTxPSDTable OBJECT-TYPE
        SYNTAX       SEQUENCE OF VdslLineMCMConfProfileTxPSDEntry
        MAX-ACCESS   not-accessible
        STATUS       current
        DESCRIPTION
            "This table contains transmit PSD mask descriptor
            configuration information for a VDSL line.  Each entry in
            this table reflects the configuration for one tone within
            a multiple carrier modulation (MCM) VDSL line.  These
```

entries are defined by a manager and can be used to
configure the VDSL line.

```
            The entries in this table MUST NOT be used for single
            carrier (SCM) VDSL lines."
        ::= { vdslMibObjects 15 }

    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,
                vdslMCMConfProfileTxPSDNumber }
        ::= { vdslLineMCMConfProfileTxPSDTable 1 }

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

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

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

    vdslMCMConfProfileTxPSDPSD OBJECT-TYPE
        SYNTAX       Unsigned32
        UNITS        "0.5dBm"
        MAX-ACCESS   read-create
```

```
        STATUS       current
        DESCRIPTION
```

```
            "Power Spectral Density level in steps of 0.5dB with
            an offset of -140dbm/Hz."
        REFERENCE    "T1E1.4/2000-013R4"    -- Part 3, MCM
        ::= { vdslLineMCMConfProfileTxPSDEntry 3 }

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

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

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

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

            The entries in this table MUST NOT be used for single
            carrier (SCM) VDSL lines."
        ::= { vdslMibObjects 16 }

    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 MUST always exist and
            its parameters will be set to vendor specific values,
```

```
            unless otherwise specified in this document."
        INDEX { vdslLineConfProfileIndex,
```

```
                vdslMCMConfProfileMaxTxPSDNumber }
        ::= { vdslLineMCMConfProfileMaxTxPSDTable 1 }

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

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

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

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

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

            A profile activated by setting this object to `active'.
```

When `active' is set, the system will validate the profile.

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

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

            The entries in this table MUST NOT be used for single
            carrier (SCM) VDSL lines."
        ::= { vdslMibObjects 17 }

    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,
                vdslMCMConfProfileMaxRxPSDNumber }
        ::= { vdslLineMCMConfProfileMaxRxPSDTable 1 }

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

    vdslMCMConfProfileMaxRxPSDNumber OBJECT-TYPE
        SYNTAX       Unsigned32
```

```
        MAX-ACCESS   not-accessible
        STATUS       current
```

```
        DESCRIPTION
            "The index for this band descriptor entry."
        ::= { vdslLineMCMConfProfileMaxRxPSDEntry 1 }

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

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

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

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

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

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

    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.

            The entries in this table MUST NOT be used for
            multiple carrier (MCM) VDSL lines."
        ::= { vdslMibObjects 18 }

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

    VdslLineSCMConfProfileEntry ::=
        SEQUENCE
            {
            vdslSCMConfProfileSide               VdslLineEntity,
            vdslSCMConfProfileInterleaveDepth    Unsigned32,
            vdslSCMConfProfileNumCarriers        INTEGER,
            vdslSCMConfProfileFastCodewordSize   Unsigned32,
            vdslSCMConfProfileTransmitPSDMask    BITS,
            vdslSCMConfProfileVendorNotch1Start  Unsigned32,
            vdslSCMConfProfileVendorNotch1Stop   Unsigned32,
            vdslSCMConfProfileVendorNotch2Start  Unsigned32,
            vdslSCMConfProfileVendorNotch2Stop   Unsigned32,
            vdslSCMConfProfileFastFecSize        INTEGER,
            vdslSCMConfProfileSlowBlockSize      INTEGER,
            vdslSCMConfProfileRowStatus          RowStatus
            }

    vdslSCMConfProfileSide OBJECT-TYPE
        SYNTAX      VdslLineEntity
        MAX-ACCESS  not-accessible
        STATUS  current
        DESCRIPTION
            "Identifies whether this entry describes downstream
            or upstream transmission."
        ::= { vdslLineSCMConfProfileEntry 1 }
```

```
    vdslSCMConfProfileInterleaveDepth OBJECT-TYPE
```

```
        SYNTAX       Unsigned32 (0..64)
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "Specifies the interleaving depth."
        REFERENCE    "T1E1.4/2000-011R3"    -- Part 2, SCM
        ::= { vdslLineSCMConfProfileEntry 2 }

    vdslSCMConfProfileNumCarriers OBJECT-TYPE
        SYNTAX       INTEGER
                     {
                     oneCarrier(1),
                     twoCarriers(2)
                     }
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "Specifies the number of carriers."
        REFERENCE    "T1E1.4/2000-011R3"    -- Part 2, SCM
        ::= { vdslLineSCMConfProfileEntry 3 }

    vdslSCMConfProfileFastCodewordSize OBJECT-TYPE
        SYNTAX       Unsigned32 (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 4 }

    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.

            Amateur radio band notching is defined in the VDSL
```

spectrum as follows:

```
            Band  Start Frequency     Stop Frequecy
            ----  ------------------  --------------------------------
            30m   1810 kHz            2000 kHz
            40m   3500 kHz            3800 kHz (ETSI); 4000 kHz (ANSI)
            80m   7000 kHz            7100 kHz (ETSI); 7300 kHz (ANSI)
            160m  10100 kHz           10150 kHz

            Notching for each standard band can be enabled or disabled
            via the bit mask.

            Two custom, or vendor specific, notches may be specified.
            If either of these are enabled via the bit mask, then the
            following objects MUST be specified:

            If vendorNotch1 is enabled, then both
                vdslSCMConfProfileVendorNotch1Start
                vdslSCMConfProfileVendorNotch1Stop
            MUST be specified.

            If vendorNotch2 is enabled, then both
                vdslSCMConfProfileVendorNotch2Start
                vdslSCMConfProfileVendorNotch2Stop
            MUST be specified."
        REFERENCE    "T1E1.4/2000-011R3"    -- Part 2, SCM
        ::= { vdslLineSCMConfProfileEntry 5 }

    vdslSCMConfProfileVendorNotch1Start OBJECT-TYPE
        SYNTAX       Unsigned32
        UNITS        "kHz"
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "Specifies the start frequency of the vendor-specific
            amateur radio notch 1."
        REFERENCE    "T1E1.4/2000-011R3"    -- Part 2, SCM
        ::= { vdslLineSCMConfProfileEntry 6 }

    vdslSCMConfProfileVendorNotch1Stop OBJECT-TYPE
        SYNTAX       Unsigned32
        UNITS        "kHz"
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "Specifies the stop frequency of the vendor-specific
            amateur radio notch 1."
        REFERENCE    "T1E1.4/2000-011R3"    -- Part 2, SCM
        ::= { vdslLineSCMConfProfileEntry 7 }

    vdslSCMConfProfileVendorNotch2Start OBJECT-TYPE
```

```
        SYNTAX       Unsigned32
        UNITS        "kHz"
```

```
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "Specifies the start frequency of the vendor-specific
            amateur radio notch 2."
        REFERENCE    "T1E1.4/2000-011R3"    -- Part 2, SCM
        ::= { vdslLineSCMConfProfileEntry 8 }

    vdslSCMConfProfileVendorNotch2Stop OBJECT-TYPE
        SYNTAX       Unsigned32
        UNITS        "kHz"
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "Specifies the stop frequency of the vendor-specific
            amateur radio notch 2."
        REFERENCE    "T1E1.4/2000-011R3"    -- Part 2, SCM
        ::= { vdslLineSCMConfProfileEntry 9 }

    vdslSCMConfProfileFastFecSize OBJECT-TYPE
        SYNTAX       INTEGER
                     {
                     noFEC(1),
                     fecSize2(2),
                     fecSize4(3),
                     fecSize16(4)
                     }
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "When fast channel is being used, this object specifies
            the size of the forward error correction (FEC) codeword."
        REFERENCE    "T1E1.4/2000-011R3"    -- Part 2, SCM
        ::= { vdslLineSCMConfProfileEntry 10 }

    vdslSCMConfProfileSlowBlockSize OBJECT-TYPE
        SYNTAX       INTEGER
                     {
                     s8(1),
                     s4(2),
                     s2(3)
                     }
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "Specifies the slow channel interleaved block size.
            Options are s/8, s/4, or s/2."
        REFERENCE    "T1E1.4/2000-011R3"    -- Part 2, SCM
        ::= { vdslLineSCMConfProfileEntry 11 }
```

```
    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 12 }

    vdslLineSCMConfProfileTxBandTable OBJECT-TYPE
        SYNTAX       SEQUENCE OF VdslLineSCMConfProfileTxBandEntry
        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 three bands
            with a single carrier modulation (SCM) VDSL line.  These
            entries are defined by a manager and can be used to configure
            the VDSL line.

            The entries in this table MUST NOT be used for
            multiple carrier (MCM) VDSL lines."
        ::= { vdslMibObjects 19 }

    vdslLineSCMConfProfileTxBandEntry OBJECT-TYPE
        SYNTAX       VdslLineSCMConfProfileTxBandEntry
        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 transmit band.

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

```
    VdslLineSCMConfProfileTxBandEntry ::=
        SEQUENCE
```

```
            {
            vdslSCMConfProfileTxBandSide              VdslLineEntity,
            vdslSCMConfProfileTxBandNumber            INTEGER,
            vdslSCMConfProfileTxBandTransmitPSDLevel  Unsigned32,
            vdslSCMConfProfileTxBandSymbolRateProfile Unsigned32,
            vdslSCMConfProfileTxBandConstellationSize Unsigned32,
            vdslSCMConfProfileTxBandCenterFrequency   Unsigned32,
            vdslSCMConfProfileTxBandRowStatus         RowStatus
            }

    vdslSCMConfProfileTxBandSide OBJECT-TYPE
        SYNTAX      VdslLineEntity
        MAX-ACCESS  not-accessible
        STATUS  current
        DESCRIPTION
            "Identifies whether this band entry describes
            downstream or upstream transmission."
        ::= { vdslLineSCMConfProfileTxBandEntry 1 }

    vdslSCMConfProfileTxBandNumber OBJECT-TYPE
        SYNTAX       INTEGER
                     {
                     band1(1),
                     band2(2),
                     upstreamU0(3)
                     }
        MAX-ACCESS  not-accessible
        STATUS  current
        DESCRIPTION
            "The SCN transmit band number for this entry."
        ::= { vdslLineSCMConfProfileTxBandEntry 2 }

    vdslSCMConfProfileTxBandTransmitPSDLevel OBJECT-TYPE
        SYNTAX       Unsigned32
        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
        ::= { vdslLineSCMConfProfileTxBandEntry 3  }

    vdslSCMConfProfileTxBandSymbolRateProfile OBJECT-TYPE
        SYNTAX       Unsigned32
        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
```

```
        ::= { vdslLineSCMConfProfileTxBandEntry 4 }

    vdslSCMConfProfileTxBandConstellationSize OBJECT-TYPE
        SYNTAX       Unsigned32 (0..8)
        UNITS        "log2"
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "Specifies the constellation size."
        REFERENCE    "T1E1.4/2000-011R3"    -- Part 2, SCM
        ::= { vdslLineSCMConfProfileTxBandEntry 5 }

    vdslSCMConfProfileTxBandCenterFrequency OBJECT-TYPE
        SYNTAX       Unsigned32 (0..511)
        UNITS        "33.75kHz"
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "Specifies the center frequency profile K."
        REFERENCE    "T1E1.4/2000-011R3"    -- Part 2, SCM
        ::= { vdslLineSCMConfProfileTxBandEntry 6 }

    vdslSCMConfProfileTxBandRowStatus 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."
        ::= { vdslLineSCMConfProfileTxBandEntry 7 }

    --
    -- 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 20 }

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

    VdslLineAlarmConfProfileEntry ::=
        SEQUENCE
            {
            vdslLineAlarmConfProfileIndex      Unsigned32,
            vdslLineAlarmConfProfileName       SnmpAdminString,
            vdslThresh15MinLofs                HCPerfIntervalThreshold,
            vdslThresh15MinLoss                HCPerfIntervalThreshold,
            vdslThresh15MinLprs                HCPerfIntervalThreshold,
            vdslThresh15MinESs                 HCPerfIntervalThreshold,
            vdslThresh15MinSESs                HCPerfIntervalThreshold,
            vdslThresh15MinUASs                HCPerfIntervalThreshold,
            vdslInitFailureNotificationEnable  TruthValue,
            vdslLineAlarmConfProfileRowStatus  RowStatus
            }

    vdslLineAlarmConfProfileIndex OBJECT-TYPE
        SYNTAX       Unsigned32
        MAX-ACCESS   not-accessible
        STATUS       current
        DESCRIPTION
            "This object is used by the line alarm configuration table
            in order to identify a row in that table.  The system MUST
            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       HCPerfIntervalThreshold
        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       HCPerfIntervalThreshold
        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       HCPerfIntervalThreshold
        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       HCPerfIntervalThreshold
        UNITS        "seconds"
```

```
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "This object configures the threshold for the number of
             errored seconds (ESs) within any given 15-minute
             performance data collection interval.  If the value of
             errored 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 }

    vdslThresh15MinSESs OBJECT-TYPE
        SYNTAX       HCPerfIntervalThreshold
        UNITS        "seconds"
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "This object configures the threshold for the number of
             severely errored seconds (SESs) within any given 15-minute
             performance data collection interval.  If the value of
             severely errored seconds in a particular 15-minute
             collection interval reaches/exceeds this value, a
             vdslPerfSESsThreshNotification notification will be
             generated.  No more than one notification will be sent
             per interval."
        ::= { vdslLineAlarmConfProfileEntry 7 }

    vdslThresh15MinUASs OBJECT-TYPE
        SYNTAX       HCPerfIntervalThreshold
        UNITS        "seconds"
        MAX-ACCESS   read-create
        STATUS       current
        DESCRIPTION
            "This object configures the threshold for the number of
             unavailable seconds (UASs) within any given 15-minute
             performance data collection interval.  If the value of
             unavailable seconds in a particular 15-minute collection
             interval reaches/exceeds this value, a
             vdslPerfUASsThreshNotification notification will be
             generated.  No more than one notification will be sent
             per interval."
        ::= { vdslLineAlarmConfProfileEntry 8 }

    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 9 }

    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 10 }

    -- 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 Seconds 15-minute interval threshold reached."
        ::= { vdslNotifications 4 }

    vdslPerfSESsThreshNotification NOTIFICATION-TYPE
        OBJECTS       {
                      vdslPerfCurr15MinSESs,
                      vdslThresh15MinSESs
                      }
        STATUS        current
        DESCRIPTION
            "Severely Errored Seconds 15-minute interval threshold
            reached."
        ::= { vdslNotifications 5 }

    vdslPerfUASsThreshNotification NOTIFICATION-TYPE
        OBJECTS       {
                      vdslPerfCurr15MinUASs,
                      vdslThresh15MinUASs
                      }
        STATUS        current
        DESCRIPTION
            "Unavailable Seconds 15-minute interval threshold reached."
        ::= { vdslNotifications 6 }

    vdslDownMaxSnrMgnExceededNotification NOTIFICATION-TYPE
        OBJECTS       {
                      vdslCurrSnrMgn,
                      vdslLineConfDownstreamMaxSnrMgn
                      }
        STATUS        current
        DESCRIPTION
            "The downstream Signal to Noise Margin exceeded
            vdslLineConfDownstreamMaxSnrMgn.  The object
            vdslCurrSnrMgn will contain the Signal to Noise
            margin as measured by the VTU-R."
        ::= { vdslNotifications 7 }

    vdslDownMinSnrMgnExceededNotification NOTIFICATION-TYPE
        OBJECTS       {
```

```
                    vdslCurrSnrMgn,
                    vdslLineConfDownstreamMinSnrMgn
```

```
                    }
        STATUS      current
        DESCRIPTION
            "The downstream Signal to Noise Margin fell below
            vdslLineConfDownstreamMinSnrMgn.    The object
            vdslCurrSnrMgn will contain the Signal to Noise
            margin as measured by the VTU-R."
        ::= { vdslNotifications 8 }

    vdslUpMaxSnrMgnExceededNotification NOTIFICATION-TYPE
        OBJECTS     {
                    vdslCurrSnrMgn,
                    vdslLineConfUpstreamMaxSnrMgn
                    }
        STATUS      current
        DESCRIPTION
            "The upstream Signal to Noise Margin exceeded
            vdslLineConfDownstreamMaxSnrMgn.    The object
            vdslCurrSnrMgn will contain the Signal to Noise
            margin as measured by the VTU-C."
        ::= { vdslNotifications 9 }

    vdslUpMinSnrMgnExceededNotification NOTIFICATION-TYPE
        OBJECTS     {
                    vdslCurrSnrMgn,
                    vdslLineConfUpstreamMinSnrMgn
                    }
        STATUS      current
        DESCRIPTION
            "The upstream Signal to Noise Margin fell below
            vdslLineConfDownstreamMinSnrMgn.    The object
            vdslCurrSnrMgn will contain the Signal to Noise
            margin as measured by the VTU-C."
        ::= { vdslNotifications 10 }

    vdslInitFailureNotification NOTIFICATION-TYPE
        OBJECTS     {
                    vdslCurrStatus
                    }
        STATUS      current
        DESCRIPTION
            "Vtu initialization failed.  See vdslCurrStatus for
            potential reasons."
        ::= { vdslNotifications 11 }

    -- 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 (MCM)."
        GROUP       vdslSCMGroup
        DESCRIPTION
            "This group is mandatory for VDSL lines which
            utilize single carrier modulation (SCM)."

        ::= { vdslCompliances 1 }

    -- units of conformance

        vdslGroup OBJECT-GROUP
            OBJECTS
                {
                vdslLineCoding,
                vdslLineType,
                vdslLineConfProfile,
                vdslLineAlarmConfProfile,
                vdslInvSerialNumber,
                vdslInvVendorID,
                vdslInvVersionNumber,
                vdslCurrSnrMgn,
                vdslCurrAtn,
                vdslCurrStatus,
                vdslCurrOutputPwr,
                vdslCurrAttainableRate,
                vdslChanInterleaveDelay,
                vdslChanCrcBlockLength,
                vdslChanCurrTxRate,
                vdslPerfValidIntervals,
                vdslPerfInvalidIntervals,
                vdslPerfLofs,
                vdslPerfLoss,
                vdslPerfLprs,
                vdslPerfESs,
```

```
                vdslPerfSESs,
                vdslPerfUASs,
```

```
                vdslPerfInits,
                vdslPerfCurr15MinTimeElapsed,
                vdslPerfCurr15MinLofs,
                vdslPerfCurr15MinLoss,
                vdslPerfCurr15MinLprs,
                vdslPerfCurr15MinESs,
                vdslPerfCurr15MinSESs,
                vdslPerfCurr15MinUASs,
                vdslPerfCurr15MinInits,
                vdslPerf1DayValidIntervals,
                vdslPerf1DayInvalidIntervals,
                vdslPerfCurr1DayTimeElapsed,
                vdslPerfCurr1DayLofs,
                vdslPerfCurr1DayLoss,
                vdslPerfCurr1DayLprs,
                vdslPerfCurr1DayESs,
                vdslPerfCurr1DaySESs,
                vdslPerfCurr1DayUASs,
                vdslPerfCurr1DayInits,
                vdslIntervalLofs,
                vdslIntervalLoss,
                vdslIntervalLprs,
                vdslIntervalESs,
                vdslIntervalSESs,
                vdslIntervalUASs,
                vdslIntervalInits,
                vdsl1DayIntervalMoniSecs,
                vdsl1DayIntervalLofs,
                vdsl1DayIntervalLoss,
                vdsl1DayIntervalLprs,
                vdsl1DayIntervalESs,
                vdsl1DayIntervalSESs,
                vdsl1DayIntervalUASs,
                vdsl1DayIntervalInits,
                vdslChanPerfValidIntervals,
                vdslChanPerfInvalidIntervals,
                vdslChanCorrectedOctets,
                vdslChanUncorrectBlks,
                vdslChanPerfCurr15MinTimeElapsed,
                vdslChanPerfCurr15MinCorrectedOctets,
                vdslChanPerfCurr15MinUncorrectBlks,
                vdslChanPerf1DayValidIntervals,
                vdslChanPerf1DayInvalidIntervals,
                vdslChanPerfCurr1DayTimeElapsed,
                vdslChanPerfCurr1DayCorrectedOctets,
                vdslChanPerfCurr1DayUncorrectBlks,
                vdslChanIntervalCorrectedOctets,
                vdslChanIntervalUncorrectBlks,
                vdslChan1DayIntervalMoniSecs,
```

```
                vdslChan1DayIntervalCorrectedOctets,
                vdslChan1DayIntervalUncorrectBlks,
```

```
                vdslLineConfProfileIndex,
                vdslLineConfProfileName,
                vdslLineConfDownstreamMaxPwr,
                vdslLineConfUpstreamMaxPwr,
                vdslLineConfDownstreamMaxSnrMgn,
                vdslLineConfDownstreamMinSnrMgn,
                vdslLineConfDownstreamTargetSnrMgn,
                vdslLineConfUpstreamMaxSnrMgn,
                vdslLineConfUpstreamMinSnrMgn,
                vdslLineConfUpstreamTargetSnrMgn,
                vdslLineConfDownstreamFastMaxDataRate,
                vdslLineConfDownstreamFastMinDataRate,
                vdslLineConfDownstreamSlowMaxDataRate,
                vdslLineConfDownstreamSlowMinDataRate,
                vdslLineConfUpstreamFastMaxDataRate,
                vdslLineConfUpstreamFastMinDataRate,
                vdslLineConfUpstreamSlowMaxDataRate,
                vdslLineConfUpstreamSlowMinDataRate,
                vdslLineConfRateAdaptationRatio,
                vdslLineConfUpstreamDataRate,
                vdslLineConfDownstreamDataRate,
                vdslLineConfDownstreamMaxInterDelay,
                vdslLineConfUpstreamMaxInterDelay,
                vdslLineConfUpstreamPboControl,
                vdslLineConfDownstreamPboControl,
                vdslLineConfDeploymentScenario,
                vdslLineConfAdslOccupy,
                vdslLineConfApplicableStandard,
                vdslLineConfBandPlan,
                vdslLineConfBandPlanFx,
                vdslLineConfBandU0Usage,
                vdslLineConfUpstreamPsdTemplate,
                vdslLineConfDownstreamPsdTemplate,
                vdslLineConfProfileRowStatus,
                vdslLineAlarmConfProfileName,
                vdslThresh15MinLofs,
                vdslThresh15MinLoss,
                vdslThresh15MinLprs,
                vdslThresh15MinESs,
                vdslThresh15MinSESs,
                vdslThresh15MinUASs,
                vdslInitFailureNotificationEnable,
                vdslLineAlarmConfProfileRowStatus
                }
            STATUS     current
            DESCRIPTION
                "A collection of objects providing information about
                 a VDSL Line."
            ::= { vdslGroups 1 }
```

```
        vdslMCMGroup OBJECT-GROUP
```

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

        vdslSCMGroup    OBJECT-GROUP
            OBJECTS
               {
               vdslSCMPhysBandSnrMgn,
               vdslSCMPhysBandAtn,
               vdslSCMConfProfileInterleaveDepth,
               vdslSCMConfProfileNumCarriers,
               vdslSCMConfProfileFastCodewordSize,
               vdslSCMConfProfileTransmitPSDMask,
               vdslSCMConfProfileVendorNotch1Start,
               vdslSCMConfProfileVendorNotch1Stop,
               vdslSCMConfProfileVendorNotch2Start,
               vdslSCMConfProfileVendorNotch2Stop,
               vdslSCMConfProfileFastFecSize,
               vdslSCMConfProfileSlowBlockSize,
               vdslSCMConfProfileRowStatus,
               vdslSCMConfProfileTxBandTransmitPSDLevel,
               vdslSCMConfProfileTxBandSymbolRateProfile,
               vdslSCMConfProfileTxBandConstellationSize,
               vdslSCMConfProfileTxBandCenterFrequency,
               vdslSCMConfProfileTxBandRowStatus
               }
```

```
            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,
                vdslPerfSESsThreshNotification,
                vdslPerfUASsThreshNotification,
                vdslDownMaxSnrMgnExceededNotification,
                vdslDownMinSnrMgnExceededNotification,
                vdslUpMaxSnrMgnExceededNotification,
                vdslUpMinSnrMgnExceededNotification,
                vdslInitFailureNotification
                }
            STATUS      current
            DESCRIPTION
                 "This group supports notifications of significant
                 conditions associated with VDSL Lines."
        ::= { vdslGroups 4 }

    END
```

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Security Considerations

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

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

For this reason, there are a number of managed objects in this MIB

that may contain sensitive information. These are:

vdslThresh15MinLofs
vdslThresh15MinLoss
vdslThresh15MinLprs
vdslThresh15MinESs
vdslThresh15MinSESs
vdslThresh15MinUASs

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

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

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

It is recommended that the implementers consider the security features as provided by the SNMPv3 framework. Specifically, the use of the User-based Security Model RFC 2574 [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 the objects only to those principals (users) that have legitimate rights to indeed GET or SET (change/create/delete) them.

IANA Considerations

The VDSL-LINE-MIB MIB module requires the allocation of a single object identifier for its MODULE-IDENTITY. IANA should allocate this object identifier in the transmission subtree.

Acknowledgments

Umberto Bonollo (NEC)

Andrew Cheers (NEC)

David Horton (CiTR)

Travis Levin (Paradyne)

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