

Definitions of Managed Objects for Very High Speed Digital Subscriber Lines (VDSL)

Status of this Memo

This document specifies an Internet standards track protocol for the Internet community, and requests discussion and suggestions for improvements. Please refer to the current edition of the "Internet Official Protocol Standards" (STD 1) for the standardization state and status of this protocol. Distribution of this memo is unlimited.

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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.

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1. The Internet-Standard Management Framework

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

Managed objects are accessed via a virtual information store, termed the Management Information Base or MIB. MIB objects are generally accessed through the Simple Network Management Protocol (SNMP). Objects in the MIB are defined using the mechanisms defined in the Structure of Management Information (SMI). This memo specifies a MIB module that is compliant to the SMIV2, which is described in STD 58, RFC 2578 [RFC2578], STD 58, RFC 2579 [RFC2579] and STD 58, RFC 2580 [RFC2580].

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 [RFC2119].

2. Overview

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

2.1. Relationship of the VDSL Line MIB Module to other MIB Modules

This section outlines the relationship of this MIB with other MIBs described in RFCs. Specifically, IF-MIB as presented in 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 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),
                  interleave(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].
ifHighSpeed	Set as appropriate.
ifConnectorPresent	Set as appropriate.
ifLinkUpDownTrapEnable	Default to enabled(1).

=====

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 Module

2.2.1. Naming Conventions

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

2.2.2. 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 transceiver
vtur(2)  -- remote site transceiver
```

2.3 Structure

The MIB is structured into the 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 `interleave(124)` and `(fast)`:

- `vdslChanTable`
- `vdslChanPerfDataTable`
- `vdslChanPerfIntervalTable`
- `vdslChanPerf1DayIntervalTable`

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

```

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

vdslLineTableEntry ---> vdslPhysTableEntry 1:(0 to 2)
                   ---> vdslPerfDataTableEntry 1:(0 to 2)
                   ---> vdslLineConfProfileEntry 1:(0 to 1)
                   ---> vdslLineAlarmConfProfileEntry 1:(0 to 1)

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

ifEntry(ifType=124) ---> vdslChanEntry 1:(0 to 2)
                   ---> vdslChanPerfDataTableEntry 1:(0 to 2)

ifEntry(ifType=125) ---> vdslChanEntry 1:(0 to 2)
                   ---> vdslChanPerfDataTableEntry 1:(0 to 2)

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

```

Figure 2: Table Relationships

o `vdslNotificationGroup` :

This group contains definitions of VDSL line notifications. Section 2.6, below, presents greater detail on the notifications defined within the MIB module.

2.3.1. Line Topology

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

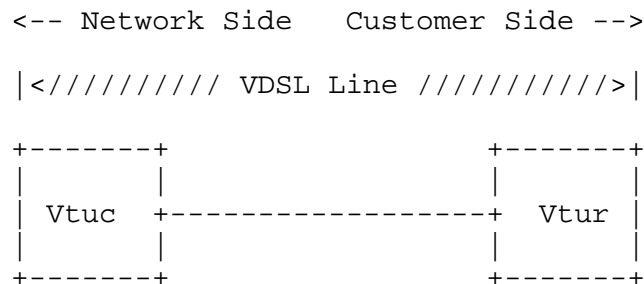


Figure 3: General topology for a VDSL Line

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 [RFC3705]. The HC-PerfHist-TC-MIB defines 64-bit versions of the textual conventions found in RFC 3593 [RFC3593].

There is no requirement for an agent to ensure a fixed relationship between the start of a fifteen minute interval 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 a Vtu is reinitialized, only when the agent is reset or reinitialized (or under specific request outside the scope of this MIB module).

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 module:

- o Line Configuration Profiles - Line configuration profiles contain parameters for configuring VDSL lines. They are defined in the `vdslLineConfProfileTable`.
- o Alarm Configuration Profiles - These profiles contain parameters for configuring alarm thresholds for VDSL transceivers. These profiles are defined in the `vdslLineAlarmConfProfileTable`.

One or more lines may be configured to share parameters of a single profile by setting their `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 'DEFVAL' 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 'DEFVAL' where appropriate. This default profile name, 'DEFVAL', is considered reserved in the context of profiles defined in this MIB module.

Profiles are created, assigned, and deleted dynamically using the profile name and profile row status in each of the ten profile tables (nine line configuration tables and one alarm configuration table).

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 [RFC3418]) 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 module) occurs. The corresponding linkUp notification MAY be sent when all link failure conditions are cleared.

The vdslPhysCurrStatus is a bitmask representing all outstanding error conditions associated with a particular VDSL transceiver. Note that since status of remote transceivers is obtained via the EOC, this information may be unavailable for units that are unreachable via the 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 counters 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 read-write and read-create objects defined in this MIB module SHOULD be stored persistently. Following is an exhaustive list of these persistent objects:

- vdslLineConfProfile
- vdslLineAlarmConfProfile
- vdslLineConfProfileName
- vdslLineConfDownRateMode
- vdslLineConfUpRateMode
- vdslLineConfDownMaxPwr
- vdslLineConfUpMaxPwr
- vdslLineConfDownMaxSnrMgn
- vdslLineConfDownMinSnrMgn
- vdslLineConfDownTargetSnrMgn
- vdslLineConfUpMaxSnrMgn
- vdslLineConfUpMinSnrMgn
- vdslLineConfUpTargetSnrMgn
- vdslLineConfDownFastMaxDataRate
- vdslLineConfDownFastMinDataRate
- vdslLineConfDownSlowMaxDataRate
- vdslLineConfDownSlowMinDataRate
- vdslLineConfUpFastMaxDataRate
- vdslLineConfUpFastMinDataRate
- vdslLineConfUpSlowMaxDataRate
- vdslLineConfUpSlowMinDataRate
- vdslLineConfDownRateRatio
- vdslLineConfUpRateRatio
- vdslLineConfDownMaxInterDelay
- vdslLineConfUpMaxInterDelay
- vdslLineConfDownPboControl
- vdslLineConfUpPboControl
- vdslLineConfDownPboLevel
- vdslLineConfUpPboLevel
- vdslLineConfDeploymentScenario
- vdslLineConfAdslPresence
- vdslLineConfApplicableStandard
- vdslLineConfBandPlan
- vdslLineConfBandPlanFx
- vdslLineConfBandOptUsage
- vdslLineConfUpPsdTemplate
- vdslLineConfDownPsdTemplate
- vdslLineConfHamBandMask
- vdslLineConfCustomNotch1Start
- vdslLineConfCustomNotch1Stop
- vdslLineConfCustomNotch2Start
- vdslLineConfCustomNotch2Stop

- vdslLineConfDownTargetSlowBurst
- vdslLineConfUpTargetSlowBurst
- vdslLineConfDownMaxFastFec
- vdslLineConfUpMaxFastFec
- vdslLineConfLineType
- vdslLineConfProfRowStatus
- vdslLineAlarmConfProfileName
- vdslLineAlarmConfThresh15MinLofs
- vdslLineAlarmConfThresh15MinLoss
- vdslLineAlarmConfThresh15MinLprs
- vdslLineAlarmConfThresh15MinLols
- vdslLineAlarmConfThresh15MinESS
- vdslLineAlarmConfThresh15MinSESS
- vdslLineAlarmConfThresh15MinUASS
- vdslLineAlarmConfInitFailure
- vdslLineAlarmConfProfRowStatus

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 [RFC3415].

3. Conformance and Compliance

For VDSL lines, the following groups are mandatory:

- vdslGroup
- vdslNotificationGroup

4. Definitions

VDSL-LINE-MIB DEFINITIONS ::= BEGIN

IMPORTS

```

MODULE-IDENTITY,
OBJECT-TYPE,
Gauge32,
Integer32,
Unsigned32,
NOTIFICATION-TYPE,
transmission                FROM SNMPv2-SMI                -- [RFC2578]
ZeroBasedCounter64          FROM HCNUM-TC                    -- [RFC2856]
TEXTUAL-CONVENTION,
RowStatus,
TruthValue                   FROM SNMPv2-TC                  -- [RFC2579]
HCPperfValidIntervals,
HCPperfInvalidIntervals,
HCPperfTimeElapsed,

```

HCPperfIntervalThreshold,
 HCPperfCurrentCount,
 HCPperfIntervalCount FROM HC-PerfHist-TC-MIB -- [RFC3705]
 MODULE-COMPLIANCE,
 OBJECT-GROUP,
 NOTIFICATION-GROUP FROM SNMPv2-CONF -- [RFC2580]
 ifIndex FROM IF-MIB -- [RFC2863]
 SnmpAdminString FROM SNMP-FRAMEWORK-MIB; -- [RFC3411]

vdslMIB MODULE-IDENTITY

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DESCRIPTION

"The MIB module defining objects for the management of a pair of VDSL transceivers at each end of the VDSL line. Each such line has an entry in an ifTable which may include multiple transceiver 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) transceiver at near (Central) end of line
Vtur -- (VTUR) transceiver at Remote end of line
Vtu  -- One of either Vtuc or Vtur
Curr -- Current
Prev -- Previous
Atn  -- Attenuation
ES   -- Errored Second.
SES  -- Severely Errored Second
UAS  -- Unavailable Second
LCS  -- Line Code Specific
Lof  -- Loss of Frame
Lol  -- Loss of Link
Los  -- Loss of Signal
Lpr  -- Loss of Power
xxxs -- Sum of Seconds in which xxx has occurred
      (e.g., xxx = Lof, Los, Lpr, Lol)
Max  -- Maximum
Mgn  -- Margin
Min  -- Minimum
Psd  -- Power Spectral Density
Snr  -- Signal to Noise Ratio
Tx   -- Transmit
Blks -- Blocks

```

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REVISION "200402190000Z" -- February 19, 2004

DESCRIPTION "Initial version, published as RFC 3728."

```
::= { transmission 97 }
```

```

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.  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"
    SYNTAX      INTEGER
        {
            other(1),
            mcm(2),
            scm(3)
        }

VdslLineEntity ::= TEXTUAL-CONVENTION
    STATUS      current
    DESCRIPTION
        "Identifies a transceiver as being either Vtuc or Vtur.
        A VDSL line consists of two transceivers, a Vtuc and a
        Vtur.  Attributes with this syntax reference the two sides
        of a line.  Specified as an INTEGER, the two values are:

        vtuc(1)   -- central site transceiver
        vtur(2)   -- remote site transceiver"
    SYNTAX      INTEGER
        {
            vtuc(1),
            vtur(2)
        }

--
-- 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     SnmpAdminString,
    vdslLineAlarmConfProfile SnmpAdminString
}

```

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),           -- only fast channel exists
    interleavedOnly(3),    -- only interleaved channel exists
    fastOrInterleaved(4),  -- either fast or interleaved channel
                           -- exist, but only one at a time
    fastAndInterleaved(5)  -- both fast and interleaved 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. Defined values are:

```
noChannel(1)          -- no channels exist
fastOnly(2)           -- only fast channel exists
interleavedOnly(3)    -- only interleaved channel exists
fastOrInterleaved(4)  -- either fast or interleaved channel
                      -- exist, but only one at a time
fastAndInterleaved(5) -- both fast and interleaved channels
                      -- exist
```

Note that 'slow' and 'interleaved' refer to the same channel. In the case that the line is channelized, the manager can use the ifStackTable to determine the ifIndex for the associated channel(s)."

REFERENCE "T1E1.4/2000-009R3, Part 1, common spec"
 ::= { vdslLineEntry 2 }

vdslLineConfProfile OBJECT-TYPE

SYNTAX SnmpAdminString (SIZE(1..32))

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.

This object MUST be maintained in a persistent manner."

DEFVAL { "DEFVAL" }

::= { vdslLineEntry 3 }

vdslLineAlarmConfProfile OBJECT-TYPE

SYNTAX SnmpAdminString (SIZE(1..32))

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.

This object MUST be maintained in a persistent manner."

DEFVAL { "DEFVAL" }

::= { 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,
    vdslPhysInvSerialNumber     SnmpAdminString,
    vdslPhysInvVendorID        SnmpAdminString,
    vdslPhysInvVersionNumber    SnmpAdminString,
    vdslPhysCurrSnrMgn         Integer32,
    vdslPhysCurrAtn            Gauge32,
    vdslPhysCurrStatus         BITS,
    vdslPhysCurrOutputPwr      Integer32,
    vdslPhysCurrAttainableRate Gauge32,
    vdslPhysCurrLineRate       Gauge32
}
```

vdslPhysSide OBJECT-TYPE

```

SYNTAX          VdslLineEntity
MAX-ACCESS      not-accessible
STATUS          current
DESCRIPTION
    "Identifies whether the transceiver is the Vtuc or Vtur."
 ::= { vdslPhysEntry 1 }
```

vdslPhysInvSerialNumber 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 }

vdslPhysInvVendorID 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
               in hexadecimal notation."
REFERENCE      "T1E1.4/2000-009R3, Part 1, common spec"
::= { vdslPhysEntry 3 }

vdslPhysInvVersionNumber 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 in hexadecimal notation."
REFERENCE      "T1E1.4/2000-009R3, Part 1, common spec"
::= { vdslPhysEntry 4 }

vdslPhysCurrSnrMgn 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 +31.75 dB."
REFERENCE      "T1E1.4/2000-009R3, Part 1, common spec"
::= { vdslPhysEntry 5 }

vdslPhysCurrAtn 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 +63.75 dB."
```

REFERENCE "T1E1.4/2000-009R3, Part 1, common spec"
 ::= { vdslPhysEntry 6 }

vdslPhysCurrStatus 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 are 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. Set whenever the transceiver is in the 'Warm Start' state.
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 }

vdslPhysCurrOutputPwr 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 }

vdslPhysCurrAttainableRate OBJECT-TYPE

SYNTAX Gauge32

UNITS "kbps"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates the maximum currently attainable data rate in steps of 1000 bits/second by the Vtu. This value will be equal to or greater than vdslPhysCurrLineRate. Note that for SCM, the minimum and maximum data rates are equal. Note: 1 kbps = 1000 bps."

REFERENCE "T1E1.4/2000-009R3, Part 1, common spec"
 ::= { vdslPhysEntry 9 }

vdslPhysCurrLineRate OBJECT-TYPE

SYNTAX Gauge32

UNITS "kbps"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates the current data rate in steps of 1000 bits/second by the Vtu. This value will be less than or equal to vdslPhysCurrAttainableRate. Note: 1 kbps = 1000 bps."

REFERENCE "T1E1.4/2000-009R3, Part 1, common spec"
 ::= { vdslPhysEntry 10 }

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,
 vdslChanCurrTxSlowBurstProtect Gauge32,
 vdslChanCurrTxFastFec Gauge32
 }

vdslChanInterleaveDelay OBJECT-TYPE

SYNTAX Gauge32
 UNITS "milliseconds"
 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), return a value of zero."

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

vdslChanCrcBlockLength OBJECT-TYPE

SYNTAX Gauge32
 UNITS "bytes"
 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. Note: 1 kbps = 1000 bps."

::= { vdslChanEntry 3 }

vdslChanCurrTxSlowBurstProtect OBJECT-TYPE

SYNTAX Gauge32 (0..1275)
 UNITS "microseconds"
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION

"Actual level of impulse noise (burst) protection for an interleaved (slow) channel. This parameter is not applicable to fast channels. For fast channels, a value of zero shall be returned."

REFERENCE "ITU-T G.997.1, section 7.3.2.3"
 ::= { vdslChanEntry 4 }

vdslChanCurrTxFastFec OBJECT-TYPE

SYNTAX Gauge32 (0..50)

```

UNITS          "%"
MAX-ACCESS     read-only
STATUS         current
DESCRIPTION
    "Actual Forward Error Correction (FEC) redundancy
    related overhead for a fast channel. This parameter
    is not applicable to an interleaved (slow) channel.
    For interleaved channels, a value of zero shall be
    returned."
 ::= { vdslChanEntry 5 }

```

```

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
    {
        vdslPerfDataValidIntervals      HCPperfValidIntervals,
        vdslPerfDataInvalidIntervals    HCPperfInvalidIntervals,
        vdslPerfDataLofs                 Unsigned32,
        vdslPerfDataLoss                 Unsigned32,
        vdslPerfDataLprs                 Unsigned32,
        vdslPerfDataLols                 Unsigned32,
        vdslPerfDataESS                 Unsigned32,
        vdslPerfDataSESS                 Unsigned32,
        vdslPerfDataUASS                 Unsigned32,
        vdslPerfDataInits                Unsigned32,
        vdslPerfDataCurr15MinTimeElapsed HCPperfTimeElapsed,
        vdslPerfDataCurr15MinLofs        HCPperfCurrentCount,
        vdslPerfDataCurr15MinLoss        HCPperfCurrentCount,
        vdslPerfDataCurr15MinLprs        HCPperfCurrentCount,

```

vdslPerfDataCurr15MinLols	HCPperfCurrentCount,
vdslPerfDataCurr15MinESS	HCPperfCurrentCount,
vdslPerfDataCurr15MinSESS	HCPperfCurrentCount,
vdslPerfDataCurr15MinUASS	HCPperfCurrentCount,
vdslPerfDataCurr15MinInits	HCPperfCurrentCount,
vdslPerfData1DayValidIntervals	HCPperfValidIntervals,
vdslPerfData1DayInvalidIntervals	HCPperfInvalidIntervals,
vdslPerfDataCurr1DayTimeElapsed	HCPperfTimeElapsed,
vdslPerfDataCurr1DayLofs	Unsigned32,
vdslPerfDataCurr1DayLoss	Unsigned32,
vdslPerfDataCurr1DayLprs	Unsigned32,
vdslPerfDataCurr1DayLols	Unsigned32,
vdslPerfDataCurr1DayESS	Unsigned32,
vdslPerfDataCurr1DaySESS	Unsigned32,
vdslPerfDataCurr1DayUASS	Unsigned32,
vdslPerfDataCurr1DayInits	Unsigned32
}	

vdslPerfDataValidIntervals OBJECT-TYPE

SYNTAX HCPperfValidIntervals
 UNITS "intervals"
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "Valid Intervals per definition found in
 HC-PerfHist-TC-MIB."
 ::= { vdslPerfDataEntry 1 }

vdslPerfDataInvalidIntervals OBJECT-TYPE

SYNTAX HCPperfInvalidIntervals
 UNITS "intervals"
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "Invalid Intervals per definition found in
 HC-PerfHist-TC-MIB."
 ::= { vdslPerfDataEntry 2 }

vdslPerfDataLofs OBJECT-TYPE

SYNTAX Unsigned32
 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 }

vdslPerfDataLoss OBJECT-TYPE
SYNTAX Unsigned32
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 }

vdslPerfDataLprs OBJECT-TYPE
SYNTAX Unsigned32
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 }

vdslPerfDataLols OBJECT-TYPE
SYNTAX Unsigned32
UNITS "seconds"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "Count of seconds since the unit was last reset that there
 was Loss of Link."
::= { vdslPerfDataEntry 6 }

vdslPerfDataESSs OBJECT-TYPE
SYNTAX Unsigned32
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 7 }

vdslPerfDataSESSs OBJECT-TYPE
SYNTAX Unsigned32
UNITS "seconds"

```

MAX-ACCESS      read-only
STATUS          current
DESCRIPTION
    "Count of Severely Errored Seconds since the unit was last
    reset."
 ::= { vdslPerfDataEntry 8 }

vdslPerfDataUASS OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "seconds"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Count of Unavailable Seconds since the unit was last
        reset."
    ::= { vdslPerfDataEntry 9 }

vdslPerfDataInits OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "occurrences"
    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 10 }

vdslPerfDataCurr15MinTimeElapsed OBJECT-TYPE
    SYNTAX      HCPperfTimeElapsed
    UNITS       "seconds"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Total elapsed seconds in this interval."
    ::= { vdslPerfDataEntry 11 }

vdslPerfDataCurr15MinLofs OBJECT-TYPE
    SYNTAX      HCPperfCurrentCount
    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 12 }

```

vdslPerfDataCurr15MinLoss 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 13 }

vdslPerfDataCurr15MinLprs 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 14 }

vdslPerfDataCurr15MinLols OBJECT-TYPE

SYNTAX HCPerfCurrentCount
UNITS "seconds"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "Count of seconds during this interval that there
 was Loss of Link."
::= { vdslPerfDataEntry 15 }

vdslPerfDataCurr15MinESS 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 16 }

vdslPerfDataCurr15MinSESS OBJECT-TYPE

SYNTAX HCPerfCurrentCount
UNITS "seconds"
MAX-ACCESS read-only

```

STATUS          current
DESCRIPTION
    "Count of Severely Errored Seconds during this interval."
 ::= { vdslPerfDataEntry 17 }

```

vdslPerfDataCurr15MinUASs OBJECT-TYPE

```

SYNTAX          HCPperfCurrentCount
UNITS           "seconds"
MAX-ACCESS      read-only
STATUS          current
DESCRIPTION
    "Count of Unavailable Seconds during this interval."
 ::= { vdslPerfDataEntry 18 }

```

vdslPerfDataCurr15MinInits OBJECT-TYPE

```

SYNTAX          HCPperfCurrentCount
UNITS           "occurrences"
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 19 }

```

vdslPerfData1DayValidIntervals OBJECT-TYPE

```

SYNTAX          HCPperfValidIntervals
UNITS           "intervals"
MAX-ACCESS      read-only
STATUS          current
DESCRIPTION
    "Valid Intervals per definition found in
     HC-PerfHist-TC-MIB."
 ::= { vdslPerfDataEntry 20 }

```

vdslPerfData1DayInvalidIntervals OBJECT-TYPE

```

SYNTAX          HCPperfInvalidIntervals
UNITS           "intervals"
MAX-ACCESS      read-only
STATUS          current
DESCRIPTION
    "Invalid Intervals per definition found in
     HC-PerfHist-TC-MIB."
 ::= { vdslPerfDataEntry 21 }

```

vdslPerfDataCurr1DayTimeElapsed OBJECT-TYPE

```

SYNTAX          HCPperfTimeElapsed

```

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 22 }

vdslPerfDataCurr1DayLofs OBJECT-TYPE

SYNTAX Unsigned32
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 23 }

vdslPerfDataCurr1DayLoss OBJECT-TYPE

SYNTAX Unsigned32
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 24 }

vdslPerfDataCurr1DayLprs OBJECT-TYPE

SYNTAX Unsigned32
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 25 }

vdslPerfDataCurr1DayLols OBJECT-TYPE

SYNTAX Unsigned32
UNITS "seconds"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Count of Loss of Link (LOL) Seconds since the beginning
of the current 1-day interval."
::= { vdslPerfDataEntry 26 }

vdslPerfDataCurr1DayESs OBJECT-TYPE

SYNTAX Unsigned32

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Count of Errored Seconds (ES) since the beginning of the current 1-day interval."

::= { vdslPerfDataEntry 27 }

vdslPerfDataCurr1DaySESSs OBJECT-TYPE

SYNTAX Unsigned32

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 28 }

vdslPerfDataCurr1DayUASs OBJECT-TYPE

SYNTAX Unsigned32

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Count of Unavailable Seconds (UAS) since the beginning of the current 1-day interval."

::= { vdslPerfDataEntry 29 }

vdslPerfDataCurr1DayInits OBJECT-TYPE

SYNTAX Unsigned32

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 30 }

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,
 vdslPerfIntervalNumber }

::= { vdslPerfIntervalTable 1 }

VdslPerfIntervalEntry ::=

SEQUENCE

{	
vdslPerfIntervalNumber	Unsigned32,
vdslPerfIntervalLoss	HCPerfIntervalCount,
vdslPerfIntervalLprs	HCPerfIntervalCount,
vdslPerfIntervalLols	HCPerfIntervalCount,
vdslPerfIntervalESS	HCPerfIntervalCount,
vdslPerfIntervalSESS	HCPerfIntervalCount,
vdslPerfIntervalUASS	HCPerfIntervalCount,
vdslPerfIntervalInits	HCPerfIntervalCount
}	

vdslPerfIntervalNumber OBJECT-TYPE

SYNTAX Unsigned32 (1..96)

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Performance Data Interval number 1 is the most recent
 previous interval; interval 96 is 24 hours ago.
 Intervals 2 to 96 are optional."

::= { vdslPerfIntervalEntry 1 }

vdslPerfIntervalLoss 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 }

```
vdslPerfIntervalLoss 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 }

vdslPerfIntervalLprs 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 }

vdslPerfIntervalLols OBJECT-TYPE
    SYNTAX      HCPerfIntervalCount
    UNITS       "seconds"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Count of seconds in the interval when there was Loss
         of Link."
    ::= { vdslPerfIntervalEntry 5 }

vdslPerfIntervaleSSs 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 6 }

vdslPerfIntervalSESSs OBJECT-TYPE
    SYNTAX      HCPerfIntervalCount
    UNITS       "seconds"
    MAX-ACCESS  read-only
```



```

    STATUS          current
    DESCRIPTION
        "Count of Severely Errored Seconds in the interval."
    ::= { vdslPerfIntervalEntry 7 }

vdslPerfIntervalUASs OBJECT-TYPE
    SYNTAX          HCPerfIntervalCount
    UNITS           "seconds"
    MAX-ACCESS      read-only
    STATUS          current
    DESCRIPTION
        "Count of Unavailable Seconds in the interval."
    ::= { vdslPerfIntervalEntry 8 }

vdslPerfIntervalInits 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 9 }

vdslPerf1DayIntervalTable OBJECT-TYPE
    SYNTAX          SEQUENCE OF VdslPerf1DayIntervalEntry
    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 }

vdslPerf1DayIntervalEntry OBJECT-TYPE
    SYNTAX          VdslPerf1DayIntervalEntry
    MAX-ACCESS      not-accessible
    STATUS          current
    DESCRIPTION
        "An entry in the vdslPerf1DayIntervalTable."
    INDEX { ifIndex,
            vdslPhysSide,
            vdslPerf1DayIntervalNumber }
    ::= { vdslPerf1DayIntervalTable 1 }

VdslPerf1DayIntervalEntry ::=
    SEQUENCE

```

```

{
vdslPerflDayIntervalNumber          Unsigned32,
vdslPerflDayIntervalMoniSecs        HCPerfTimeElapsed,
vdslPerflDayIntervalLofs            Unsigned32,
vdslPerflDayIntervalLoss            Unsigned32,
vdslPerflDayIntervalLprs            Unsigned32,
vdslPerflDayIntervalLols            Unsigned32,
vdslPerflDayIntervalESS             Unsigned32,
vdslPerflDayIntervalSESS            Unsigned32,
vdslPerflDayIntervalUASS            Unsigned32,
vdslPerflDayIntervalInits           Unsigned32
}

```

vdslPerflDayIntervalNumber OBJECT-TYPE

SYNTAX Unsigned32 (1..30)

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"History Data Interval number. Interval 1 is the most recent previous day; interval 30 is 30 days ago. Intervals 2 to 30 are optional."

::= { vdslPerflDayIntervalEntry 1 }

vdslPerflDayIntervalMoniSecs 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."

::= { vdslPerflDayIntervalEntry 2 }

vdslPerflDayIntervalLofs OBJECT-TYPE

SYNTAX Unsigned32

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Count of Loss of Frame (LOF) Seconds during the 1-day interval as measured by vdslPerflDayIntervalMoniSecs."

REFERENCE "T1E1.4/2000-009R3, Part 1, common spec"

::= { vdslPerflDayIntervalEntry 3 }

vdslPerflDayIntervalLoss OBJECT-TYPE

```

SYNTAX      Unsigned32
UNITS       "seconds"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "Count of Loss of Signal (LOS) Seconds during the 1-day
    interval as measured by vdslPerf1DayIntervalMoniSecs."
REFERENCE   "T1E1.4/2000-009R3, Part 1, common spec"
::= { vdslPerf1DayIntervalEntry 4 }

```

vdslPerf1DayIntervalLprs OBJECT-TYPE

```

SYNTAX      Unsigned32
UNITS       "seconds"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "Count of Loss of Power (LPR) Seconds during the 1-day
    interval as measured by vdslPerf1DayIntervalMoniSecs."
REFERENCE   "T1E1.4/2000-009R3, Part 1, common spec"
::= { vdslPerf1DayIntervalEntry 5 }

```

vdslPerf1DayIntervalLols OBJECT-TYPE

```

SYNTAX      Unsigned32
UNITS       "seconds"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "Count of Loss of Link (LOL) Seconds during the 1-day
    interval as measured by vdslPerf1DayIntervalMoniSecs."
::= { vdslPerf1DayIntervalEntry 6 }

```

vdslPerf1DayIntervalESSs OBJECT-TYPE

```

SYNTAX      Unsigned32
UNITS       "seconds"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "Count of Errored Seconds (ES) during the 1-day
    interval as measured by vdslPerf1DayIntervalMoniSecs."
REFERENCE   "T1E1.4/2000-009R3, Part 1, common spec"
::= { vdslPerf1DayIntervalEntry 7 }

```

vdslPerf1DayIntervalSESSs OBJECT-TYPE

```

SYNTAX      Unsigned32
UNITS       "seconds"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION

```

"Count of Severely Errored Seconds (SES) during the 1-day interval as measured by vdslPerf1DayIntervalMoniSecs."
 ::= { vdslPerf1DayIntervalEntry 8 }

vdslPerf1DayIntervalUASs OBJECT-TYPE

SYNTAX Unsigned32
 UNITS "seconds"
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "Count of Unavailable Seconds (UAS) during the 1-day interval as measured by vdslPerf1DayIntervalMoniSecs."
 ::= { vdslPerf1DayIntervalEntry 9 }

vdslPerf1DayIntervalInits OBJECT-TYPE

SYNTAX Unsigned32
 UNITS "seconds"
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "Count of the line initialization attempts during the 1-day interval as measured by vdslPerf1DayIntervalMoniSecs. This count includes both successful and failed attempts."
 REFERENCE "T1E1.4/2000-009R3, Part 1, common spec"
 ::= { vdslPerf1DayIntervalEntry 10 }

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

```

{
  vdslChanValidIntervals      HCPperfValidIntervals,
  vdslChanInvalidIntervals    HCPperfInvalidIntervals,
  vdslChanFixedOctets         ZeroBasedCounter64,
  vdslChanBadBlks             ZeroBasedCounter64,
  vdslChanCurr15MinTimeElapsed HCPperfTimeElapsed,
  vdslChanCurr15MinFixedOctets HCPperfCurrentCount,
  vdslChanCurr15MinBadBlks     HCPperfCurrentCount,
  vdslChan1DayValidIntervals   HCPperfValidIntervals,
  vdslChan1DayInvalidIntervals HCPperfInvalidIntervals,
  vdslChanCurr1DayTimeElapsed  HCPperfTimeElapsed,
  vdslChanCurr1DayFixedOctets  HCPperfCurrentCount,
  vdslChanCurr1DayBadBlks      HCPperfCurrentCount
}

```

vdslChanValidIntervals OBJECT-TYPE

SYNTAX HCPperfValidIntervals

UNITS "intervals"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Valid Intervals per definition found in
HC-PerfHist-TC-MIB."

::= { vdslChanPerfDataEntry 1 }

vdslChanInvalidIntervals OBJECT-TYPE

SYNTAX HCPperfInvalidIntervals

UNITS "intervals"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Invalid Intervals per definition found in
HC-PerfHist-TC-MIB."

::= { vdslChanPerfDataEntry 2 }

vdslChanFixedOctets OBJECT-TYPE

SYNTAX ZeroBasedCounter64

UNITS "octets"

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 }

vdslChanBadBlks OBJECT-TYPE

SYNTAX ZeroBasedCounter64

UNITS "blocks"

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

vdslChanCurr15MinTimeElapsed OBJECT-TYPE
SYNTAX          HCPperfTimeElapsed
UNITS           "seconds"
MAX-ACCESS      read-only
STATUS          current
DESCRIPTION
    "Total elapsed seconds in this interval."
::= { vdslChanPerfDataEntry 5 }

vdslChanCurr15MinFixedOctets OBJECT-TYPE
SYNTAX          HCPperfCurrentCount
UNITS           "octets"
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 }

vdslChanCurr15MinBadBlks OBJECT-TYPE
SYNTAX          HCPperfCurrentCount
UNITS           "blocks"
MAX-ACCESS      read-only
STATUS          current
DESCRIPTION
    "Count of uncorrectable blocks in this interval."
REFERENCE       "T1E1.4/2000-009R3, Part 1, common spec"
::= { vdslChanPerfDataEntry 7 }

vdslChan1DayValidIntervals OBJECT-TYPE
SYNTAX          HCPperfValidIntervals
MAX-ACCESS      read-only
STATUS          current
DESCRIPTION
    "Valid Intervals per definition found in
    HC-PerfHist-TC-MIB."
::= { vdslChanPerfDataEntry 8 }

vdslChan1DayInvalidIntervals OBJECT-TYPE
SYNTAX          HCPperfInvalidIntervals
```

```

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

```

```

vdslChanCurr1DayTimeElapsed OBJECT-TYPE
SYNTAX          HCPperfTimeElapsed
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 }

```

```

vdslChanCurr1DayFixedOctets OBJECT-TYPE
SYNTAX          HCPperfCurrentCount
UNITS           "octets"
MAX-ACCESS      read-only
STATUS          current
DESCRIPTION
    "Count of corrected octets since the beginning of the
    current 1-day interval."
REFERENCE       "T1E1.4/2000-009R3, Part 1, common spec"
 ::= { vdslChanPerfDataEntry 11 }

```

```

vdslChanCurr1DayBadBlks OBJECT-TYPE
SYNTAX          HCPperfCurrentCount
UNITS           "blocks"
MAX-ACCESS      read-only
STATUS          current
DESCRIPTION
    "Count of uncorrectable blocks since the beginning of the
    current 1-day interval."
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,
        vdslChanIntervalFixedOctets  HCPperfIntervalCount,
        vdslChanIntervalBadBlks      HCPperfIntervalCount
    }

vdslChanIntervalNumber OBJECT-TYPE
    SYNTAX      Unsigned32 (1..96)
    MAX-ACCESS   not-accessible
    STATUS      current
    DESCRIPTION
        "Performance Data Interval number 1 is the most recent
         previous interval; interval 96 is 24 hours ago.
         Intervals 2 to 96 are optional."
    ::= { vdslChanIntervalEntry 1 }

vdslChanIntervalFixedOctets OBJECT-TYPE
    SYNTAX      HCPperfIntervalCount
    UNITS        "octets"
    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 }

vdslChanIntervalBadBlks OBJECT-TYPE
    SYNTAX      HCPperfIntervalCount
    UNITS        "blocks"
    MAX-ACCESS   read-only
    STATUS      current
    DESCRIPTION
        "Count of uncorrectable 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 HCPperfTimeElapsed,
 vdslChan1DayIntervalFixedOctets HCPperfCurrentCount,
 vdslChan1DayIntervalBadBlks HCPperfCurrentCount
 }

vdslChan1DayIntervalNumber OBJECT-TYPE

SYNTAX Unsigned32 (1..30)

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"History Data Interval number. Interval 1 is the most recent previous day; interval 30 is 30 days ago. Intervals 2 to 30 are optional."

::= { vdslChan1DayIntervalEntry 1 }

vdslChan1DayIntervalMoniSecs OBJECT-TYPE

SYNTAX HCPperfTimeElapsed

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 }

vdslChan1DayIntervalFixedOctets OBJECT-TYPE

SYNTAX HCPerfCurrentCount

UNITS "octets"

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 }

vdslChan1DayIntervalBadBlks OBJECT-TYPE

SYNTAX HCPerfCurrentCount

UNITS "blocks"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Count of uncorrectable blocks in this interval."

REFERENCE "T1E1.4/2000-009R3, Part 1, common spec"

::= { vdslChan1DayIntervalEntry 4 }

--

-- 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."

Entries in this table MUST be maintained in a persistent manner."

::= { 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 'DEFVAL', will always exist and its parameters will be set to vendor specific values, unless otherwise specified in this document."

INDEX { vdslLineConfProfileName }
 ::= { vdslLineConfProfileTable 1 }

VdslLineConfProfileEntry ::=

SEQUENCE

{	
vdslLineConfProfileName	SnmpAdminString,
vdslLineConfDownRateMode	INTEGER,
vdslLineConfUpRateMode	INTEGER,
vdslLineConfDownMaxPwr	Unsigned32,
vdslLineConfUpMaxPwr	Unsigned32,
vdslLineConfDownMaxSnrMgn	Unsigned32,
vdslLineConfDownMinSnrMgn	Unsigned32,
vdslLineConfDownTargetSnrMgn	Unsigned32,
vdslLineConfUpMaxSnrMgn	Unsigned32,
vdslLineConfUpMinSnrMgn	Unsigned32,
vdslLineConfUpTargetSnrMgn	Unsigned32,
vdslLineConfDownFastMaxDataRate	Unsigned32,
vdslLineConfDownFastMinDataRate	Unsigned32,
vdslLineConfDownSlowMaxDataRate	Unsigned32,
vdslLineConfDownSlowMinDataRate	Unsigned32,
vdslLineConfUpFastMaxDataRate	Unsigned32,
vdslLineConfUpFastMinDataRate	Unsigned32,
vdslLineConfUpSlowMaxDataRate	Unsigned32,
vdslLineConfUpSlowMinDataRate	Unsigned32,
vdslLineConfDownRateRatio	Unsigned32,
vdslLineConfUpRateRatio	Unsigned32,
vdslLineConfDownMaxInterDelay	Unsigned32,
vdslLineConfUpMaxInterDelay	Unsigned32,
vdslLineConfDownPboControl	INTEGER,
vdslLineConfUpPboControl	INTEGER,
vdslLineConfDownPboLevel	Unsigned32,
vdslLineConfUpPboLevel	Unsigned32,
vdslLineConfDeploymentScenario	INTEGER,
vdslLineConfAdslPresence	INTEGER,
vdslLineConfApplicableStandard	INTEGER,
vdslLineConfBandPlan	INTEGER,
vdslLineConfBandPlanFx	Unsigned32,

```

vdslLineConfBandOptUsage      INTEGER,
vdslLineConfUpPsdTemplate     INTEGER,
vdslLineConfDownPsdTemplate   INTEGER,
vdslLineConfHamBandMask       BITS,
vdslLineConfCustomNotch1Start Unsigned32,
vdslLineConfCustomNotch1Stop  Unsigned32,
vdslLineConfCustomNotch2Start Unsigned32,
vdslLineConfCustomNotch2Stop  Unsigned32,
vdslLineConfDownTargetSlowBurst Unsigned32,
vdslLineConfUpTargetSlowBurst Unsigned32,
vdslLineConfDownMaxFastFec    Unsigned32,
vdslLineConfUpMaxFastFec      Unsigned32,
vdslLineConfLineType          INTEGER,
vdslLineConfProfRowStatus     RowStatus
}

```

vdslLineConfProfileName OBJECT-TYPE

SYNTAX SnmpAdminString (SIZE (1..32))

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This object identifies a row in this table.

A default profile with an index of 'DEFVAL', will always exist and its parameters will be set to vendor specific values, unless otherwise specified in this document."

::= { vdslLineConfProfileEntry 1 }

vdslLineConfDownRateMode OBJECT-TYPE

SYNTAX INTEGER

```

{
    manual(1),
    adaptAtInit(2)
}

```

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"Specifies the rate selection behavior for the line in the downstream direction.

manual(1) forces the rate to the configured rate
 adaptAtInit(2) adapts the line based upon line quality."

DEFVAL { adaptAtInit }

::= { vdslLineConfProfileEntry 2 }

vdslLineConfUpRateMode OBJECT-TYPE

SYNTAX INTEGER

```

        {
            manual(1),
            adaptAtInit(2)
        }
MAX-ACCESS      read-create
STATUS          current
DESCRIPTION
    "Specifies the rate selection behavior for the line
    in the upstream direction.

    manual(1)          forces the rate to the configured rate
    adaptAtInit(2)     adapts the line based upon line quality."
DEFVAL          { adaptAtInit }
::= { vdslLineConfProfileEntry 3 }

```

```

vdslLineConfDownMaxPwr 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 to 14.5 dBm."
REFERENCE       "T1E1.4/2000-009R3, Part 1, common spec"
DEFVAL          { 0 }
::= { vdslLineConfProfileEntry 4 }

```

```

vdslLineConfUpMaxPwr 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 to 14.5 dBm."
REFERENCE       "T1E1.4/2000-009R3, Part 1, common spec"
DEFVAL          { 0 }
::= { vdslLineConfProfileEntry 5 }

```

```

vdslLineConfDownMaxSnrMgn 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 to 31.75 dB."
REFERENCE       "T1E1.4/2000-009R3, Part 1, common spec"

```

```

DEFVAL      { 0 }
 ::= { vdslLineConfProfileEntry 6 }

vdslLineConfDownMinSnrMgn 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 to 31.75 dB."
    REFERENCE   "T1E1.4/2000-009R3, Part 1, common spec"
    DEFVAL      { 0 }
    ::= { vdslLineConfProfileEntry 7 }

vdslLineConfDownTargetSnrMgn 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 to 31.75 dB.
         This is the Noise Margin the transceivers must achieve
         with a BER of 10^-7 or better to successfully complete
         initialization."
    REFERENCE   "T1E1.4/2000-009R3, Part 1, common spec"
    DEFVAL      { 0 }
    ::= { vdslLineConfProfileEntry 8 }

vdslLineConfUpMaxSnrMgn 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 to 31.75 dB."
    REFERENCE   "T1E1.4/2000-009R3, Part 1, common spec"
    DEFVAL      { 0 }
    ::= { vdslLineConfProfileEntry 9 }

vdslLineConfUpMinSnrMgn 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 to 31.75 dB."
 REFERENCE "T1E1.4/2000-009R3, Part 1, common spec"
 DEFVAL { 0 }
 ::= { vdslLineConfProfileEntry 10 }

vdslLineConfUpTargetSnrMgn 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 to 31.75 dB. This is the Noise Margin the transceivers must achieve with a BER of 10^{-7} or better to successfully complete initialization."
 REFERENCE "T1E1.4/2000-009R3, Part 1, common spec"
 DEFVAL { 0 }
 ::= { vdslLineConfProfileEntry 11 }

vdslLineConfDownFastMaxDataRate OBJECT-TYPE

SYNTAX Unsigned32
 UNITS "kbps"
 MAX-ACCESS read-create
 STATUS current
 DESCRIPTION
 "Specifies the maximum downstream fast channel data rate in steps of 1000 bits/second."
 DEFVAL { 0 }
 ::= { vdslLineConfProfileEntry 12 }

vdslLineConfDownFastMinDataRate OBJECT-TYPE

SYNTAX Unsigned32
 UNITS "kbps"
 MAX-ACCESS read-create
 STATUS current
 DESCRIPTION
 "Specifies the minimum downstream fast channel data rate in steps of 1000 bits/second."
 DEFVAL { 0 }
 ::= { vdslLineConfProfileEntry 13 }

vdslLineConfDownSlowMaxDataRate OBJECT-TYPE

SYNTAX Unsigned32
 UNITS "kbps"
 MAX-ACCESS read-create
 STATUS current

DESCRIPTION

"Specifies the maximum downstream slow channel data rate in steps of 1000 bits/second.

The maximum aggregate downstream transmit speed of the line can be derived from the sum of maximum downstream fast and slow channel data rates."

DEFVAL { 0 }

::= { vdslLineConfProfileEntry 14 }

vdslLineConfDownSlowMinDataRate OBJECT-TYPE

SYNTAX Unsigned32

UNITS "kbps"

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"Specifies the minimum downstream slow channel data rate in steps of 1000 bits/second.

The minimum aggregate downstream transmit speed of the line can be derived from the sum of minimum downstream fast and slow channel data rates."

DEFVAL { 0 }

::= { vdslLineConfProfileEntry 15 }

vdslLineConfUpFastMaxDataRate OBJECT-TYPE

SYNTAX Unsigned32

UNITS "kbps"

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"Specifies the maximum upstream fast channel data rate in steps of 1000 bits/second.

The maximum aggregate upstream transmit speed of the line can be derived from the sum of maximum upstream fast and slow channel data rates."

DEFVAL { 0 }

::= { vdslLineConfProfileEntry 16 }

vdslLineConfUpFastMinDataRate OBJECT-TYPE

SYNTAX Unsigned32

UNITS "kbps"

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"Specifies the minimum upstream fast channel data rate in steps of 1000 bits/second.

The minimum aggregate upstream transmit speed of the line can be derived from the sum of minimum upstream fast and slow channel data rates."

DEFVAL { 0 }
 ::= { vdslLineConfProfileEntry 17 }

vdslLineConfUpSlowMaxDataRate OBJECT-TYPE

SYNTAX Unsigned32
 UNITS "kbps"
 MAX-ACCESS read-create
 STATUS current
 DESCRIPTION
 "Specifies the maximum upstream slow channel data rate in steps of 1000 bits/second."
 DEFVAL { 0 }
 ::= { vdslLineConfProfileEntry 18 }

vdslLineConfUpSlowMinDataRate OBJECT-TYPE

SYNTAX Unsigned32
 UNITS "kbps"
 MAX-ACCESS read-create
 STATUS current
 DESCRIPTION
 "Specifies the minimum upstream slow channel data rate in steps of 1000 bits/second."
 DEFVAL { 0 }
 ::= { vdslLineConfProfileEntry 19 }

vdslLineConfDownRateRatio 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 downstream Fast Channel Allocation / Slow Channel Allocation."
 DEFVAL { 0 }
 ::= { vdslLineConfProfileEntry 20 }

vdslLineConfUpRateRatio 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
    upstream Fast Channel Allocation/Slow Channel Allocation."
DEFVAL      { 0 }
::= { vdslLineConfProfileEntry 21 }

```

```

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

```

```

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

```

```

vdslLineConfDownPboControl OBJECT-TYPE
SYNTAX      INTEGER
            {
                disabled(1),
                auto(2),
                manual(3)
            }
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "Downstream power backoff (PBO) control for this
    line. For transceivers which do not support downstream
    PBO control, this object MUST be fixed at disabled(1).
    If auto(2) is selected, the transceiver will automatically
    adjust the power backoff. If manual(3) is selected,

```

```

        then the transceiver will use the value from
        vdslLineConfDownPboLevel."
DEFVAL      { disabled }
::= { vdslLineConfProfileEntry 24 }

vdslLineConfUpPboControl OBJECT-TYPE
    SYNTAX      INTEGER
                {
                    disabled(1),
                    auto(2),
                    manual(3)
                }
    MAX-ACCESS   read-create
    STATUS       current
    DESCRIPTION
        "Upstream power backoff (PBO) control for this
        line. For transceivers which do not support upstream
        PBO control, this object MUST be fixed at disabled(1).
        If auto(2) is selected, the transceiver will automatically
        adjust the power backoff. If manual(3) is selected,
        then the transceiver will use the value from
        vdslLineConfUpPboLevel."
    DEFVAL      { disabled }
    ::= { vdslLineConfProfileEntry 25 }

vdslLineConfDownPboLevel OBJECT-TYPE
    SYNTAX      Unsigned32 (0..160)
    UNITS        "0.25dB"
    MAX-ACCESS   read-create
    STATUS       current
    DESCRIPTION
        "Specifies the downstream backoff level to be used
        when vdslLineConfDownPboControl = manual(3)."
    DEFVAL      { 0 }
    ::= { vdslLineConfProfileEntry 26 }

vdslLineConfUpPboLevel OBJECT-TYPE
    SYNTAX      Unsigned32 (0..160)
    UNITS        "0.25dB"
    MAX-ACCESS   read-create
    STATUS       current
    DESCRIPTION
        "Specifies the upstream backoff level to be used
        when vdslLineConfUpPboControl = manual(3)."
    DEFVAL      { 0 }
    ::= { vdslLineConfProfileEntry 27 }

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.  Changes to this value will have
                no effect on the transceiver."
REFERENCE       "DSL Forum TR-057"
DEFVAL         { fttCab }
::= { vdslLineConfProfileEntry 28 }

```

vdslLineConfAdslPresence OBJECT-TYPE

```

SYNTAX          INTEGER
                {
                    none(1),
                    adslOverPots(2),
                    adslOverISDN(3)
                }
MAX-ACCESS      read-create
STATUS          current
DESCRIPTION     "Indicates presence of ADSL service in the associated
                cable bundle/binder.

                none(1)          indicates no ADSL service in the bundle
                adslOverPots(2) indicates ADSL service over POTS is
                                present in the bundle
                adslOverISDN(3) indicates ADSL service over ISDN is
                                present in the bundle"
DEFVAL         { none }
::= { vdslLineConfProfileEntry 29 }

```

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.

    ansi(1)      indicates ANSI standard
    etsi(2)      indicates ETSI standard
    itu(3)       indicates ITU standard
    other(4)     indicates a standard other than the above."
DEFVAL          { ansi }
::= { vdslLineConfProfileEntry 30 }

```

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."
DEFVAL          { bandPlan997 }
::= { vdslLineConfProfileEntry 31 }

```

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)."
```

DEFVAL { 3750 }

```

::= { vdslLineConfProfileEntry 32 }
```

vdslLineConfBandOptUsage OBJECT-TYPE

```

SYNTAX          INTEGER
                {
                    unused(1),
                    upstream(2),
                    downstream(3)
                }
```

MAX-ACCESS read-create

```

STATUS          current
DESCRIPTION
    "Defines the VDSL link use of the optional frequency
    range [25kHz - 138kHz] (Opt)."
```

unused(1) indicates Opt is unused

upstream(2) indicates Opt usage is for upstream

downstream(3) indicates Opt usage is for downstream."

```

REFERENCE       "ITU-T G.993.1, section 6.1"
DEFVAL          { unused }
::= { vdslLineConfProfileEntry 33 }
```

vdslLineConfUpPsdTemplate 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.
    Here, templateMask1(1) refers to a notched mask that
    limits the transmitted PSD within the internationally
    standardized HAM (Handheld Amateur Radio) radio bands,
    while templateMask2(2) refers to an unnotched mask."
```

The masks themselves depend upon the applicable standard being used (vdslLineConfApplicableStandard)."

```

REFERENCE       "DSL TR-057"
DEFVAL          { templateMask1 }
::= { vdslLineConfProfileEntry 34 }
```

vdslLineConfDownPsdTemplate 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. Here, templateMask1(1) refers to a notched mask that limits the transmitted PSD within the internationally standardized HAM (Handheld Amateur Radio) radio bands, while templateMask2(2) refers to an unnotched mask.

The masks themselves depend upon the applicable standard being used (vdslLineConfApplicableStandard)."

REFERENCE "DSL TR-057"

DEFVAL { templateMask1 }

::= { vdslLineConfProfileEntry 35 }

vdslLineConfHamBandMask OBJECT-TYPE

SYNTAX BITS

```

{
    customNotch1(0),      -- custom (region-specific) notch
    customNotch2(1),      -- custom (region-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, used to avoid interference with HAM (Handheld Amateur Radio) radio bands by introducing power control (notching) in one or more of these bands.

Amateur radio band notching is defined in the VDSL spectrum as follows:

Band	Start Frequency	Stop Frequency
----	-----	-----
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 notches may be specified. If either of these are enabled via the bit mask, then the following objects MUST be specified:

If customNotch1 is enabled, then both
 vdslLineConfCustomNotch1Start
 vdslLineConfCustomNotch1Stop
 MUST be specified.

If customNotch2 is enabled, then both
 vdslLineConfCustomNotch2Start
 vdslLineConfCustomNotch2Stop
 MUST be specified."

REFERENCE "DSL F TR-057, section 2.6"

DEFVAL { { } }

::= { vdslLineConfProfileEntry 36 }

vdslLineConfCustomNotch1Start OBJECT-TYPE

SYNTAX Unsigned32

UNITS "kHz"

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"Specifies the start frequency of custom HAM (Handheld Amateur Radio) notch 1. vdslLineConfCustomNotch1Start MUST be less than or equal to vdslLineConfCustomNotch1Stop."

DEFVAL { 0 }

::= { vdslLineConfProfileEntry 37 }

vdslLineConfCustomNotch1Stop OBJECT-TYPE

SYNTAX Unsigned32

UNITS "kHz"

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"Specifies the stop frequency of custom HAM (Handheld Amateur Radio) notch 1. vdslLineConfCustomNotch1Stop MUST be greater than or equal to vdslLineConfCustomNotch1Start."

DEFVAL { 0 }

::= { vdslLineConfProfileEntry 38 }

vdslLineConfCustomNotch2Start OBJECT-TYPE

SYNTAX Unsigned32

UNITS "kHz"

MAX-ACCESS read-create


```

STATUS          current
DESCRIPTION
    "Specifies the start frequency of custom HAM (Handheld
    Amateur Radio) notch 2. vdslLineConfCustomNotch2Start MUST
    be less than or equal to vdslLineConfCustomNotch2Stop."
DEFVAL          { 0 }
::= { vdslLineConfProfileEntry 39 }

```

vdslLineConfCustomNotch2Stop OBJECT-TYPE

```

SYNTAX          Unsigned32
UNITS           "kHz"
MAX-ACCESS      read-create
STATUS          current
DESCRIPTION
    "Specifies the stop frequency of custom HAM (Handheld
    Amateur Radio) notch 2. vdslLineConfCustomNotch2Stop MUST
    be greater than or equal to vdslLineConfCustomNotch2Start."
DEFVAL          { 0 }
::= { vdslLineConfProfileEntry 40 }

```

vdslLineConfDownTargetSlowBurst OBJECT-TYPE

```

SYNTAX          Unsigned32 (0..1275)
UNITS           "microseconds"
MAX-ACCESS      read-create
STATUS          current
DESCRIPTION
    "Specifies the target level of impulse noise (burst)
    protection for an interleaved (slow) channel."
REFERENCE       "ITU-T G.997.1, section 7.3.2.3"
DEFVAL          { 0 }
::= { vdslLineConfProfileEntry 41 }

```

vdslLineConfUpTargetSlowBurst OBJECT-TYPE

```

SYNTAX          Unsigned32 (0..1275)
UNITS           "microseconds"
MAX-ACCESS      read-create
STATUS          current
DESCRIPTION
    "Specifies the target level of impulse noise (burst)
    protection for an interleaved (slow) channel."
REFERENCE       "ITU-T G.997.1, section 7.3.2.3"
DEFVAL          { 0 }
::= { vdslLineConfProfileEntry 42 }

```

vdslLineConfDownMaxFastFec OBJECT-TYPE

```

SYNTAX          Unsigned32 (0..50)
UNITS           "%"
MAX-ACCESS      read-create

```

```

STATUS      current
DESCRIPTION
    "This parameter provisions the maximum level of Forward
    Error Correction (FEC) redundancy related overhead to
    be maintained for a fast channel."
DEFVAL      { 0 }
::= { vdslLineConfProfileEntry 43 }

```

vdslLineConfUpMaxFastFec OBJECT-TYPE

```

SYNTAX      Unsigned32 (0..50)
UNITS       "%"
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "This parameter provisions the maximum level of Forward
    Error Correction (FEC) redundancy related overhead to
    be maintained for a fast channel."
DEFVAL      { 0 }
::= { vdslLineConfProfileEntry 44 }

```

vdslLineConfLineType OBJECT-TYPE

```

SYNTAX      INTEGER
{
    noChannel(1),          -- no channels exist
    fastOnly(2),           -- only fast channel exists
    interleavedOnly(3),    -- only interleaved channel exists
    fastOrInterleaved(4),  -- either fast or interleaved channel
                           -- exist, but only one at a time
    fastAndInterleaved(5)  -- both fast and interleaved channels
                           -- exist
}
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION

```

"This parameter provisions the VDSL physical entity at start-up by defining whether and how the line will be channelized, i.e., which channel type(s) are supported. If the line is to be channelized, the value will be other than noChannel(1).

This configuration can be activated only during start-up. Afterwards, the value of vdslLineType coincides with the value of vdslLineConfLineType. Depending on this value, the corresponding entries in the ifTable for the interleaved and the fast channels are enabled or disabled according to the value of their ifOperStatus.

Defined values are:

```

noChannel(1)          -- no channels exist
fastOnly(2)           -- only fast channel exists
interleavedOnly(3)    -- only interleaved channel exists
fastOrInterleaved(4)  -- either fast or interleaved channel
                      -- exists, but only one at a time
fastAndInterleaved(5) -- both fast and interleaved channels
                      -- exist

```

Note that 'slow' and 'interleaved' refer to the same channel."

```

REFERENCE      "T1E1.4/2000-009R3, Part 1, common spec"
DEFVAL         { noChannel }
::= { vdslLineConfProfileEntry 45 }

```

vdslLineConfProfRowStatus 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.

An 'active' profile may be modified at any time. Note that some changes may require that any referenced lines be restarted (e.g., vdslLineConfLineType)."

```

::= { vdslLineConfProfileEntry 46 }

```

```

--
-- 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.

Entries in this table MUST be maintained in a persistent manner."
 ::= { 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 'DEFVAL', will always exist and its parameters will be set to vendor specific values, unless otherwise specified in this document."

INDEX { vdslLineAlarmConfProfileName }

::= { vdslLineAlarmConfProfileTable 1 }

VdslLineAlarmConfProfileEntry ::=

SEQUENCE

{	
vdslLineAlarmConfProfileName	SnmpAdminString,
vdslLineAlarmConfThresh15MinLoFs	HCPerfIntervalThreshold,
vdslLineAlarmConfThresh15MinLoss	HCPerfIntervalThreshold,
vdslLineAlarmConfThresh15MinLprs	HCPerfIntervalThreshold,
vdslLineAlarmConfThresh15MinLols	HCPerfIntervalThreshold,
vdslLineAlarmConfThresh15MinESs	HCPerfIntervalThreshold,
vdslLineAlarmConfThresh15MinSESS	HCPerfIntervalThreshold,
vdslLineAlarmConfThresh15MinUASS	HCPerfIntervalThreshold,
vdslLineAlarmConfInitFailure	TruthValue,
vdslLineAlarmConfProfRowStatus	RowStatus
}	

vdslLineAlarmConfProfileName OBJECT-TYPE

SYNTAX SnmpAdminString (SIZE (1..32))

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The name for this profile as specified by an administrator."

::= { vdslLineAlarmConfProfileEntry 1 }

vdslLineAlarmConfThresh15MinLoFs 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."

DEFVAL { 0 }

::= { vdslLineAlarmConfProfileEntry 2 }

vdslLineAlarmConfThresh15MinLoss 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 signal 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."

DEFVAL { 0 }

::= { vdslLineAlarmConfProfileEntry 3 }

vdslLineAlarmConfThresh15MinLprs 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 power 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."

DEFVAL { 0 }

::= { vdslLineAlarmConfProfileEntry 4 }

vdslLineAlarmConfThresh15MinLols OBJECT-TYPE

```

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

```

vdslLineAlarmConfThresh15MinESSs OBJECT-TYPE

```

SYNTAX      HCPperfIntervalThreshold
UNITS       "seconds"
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "This object configures the threshold for the number of
    errored seconds (ESSs) 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
    vdslPerfESSsThreshNotification notification will be
    generated.  No more than one notification will be sent
    per interval."
DEFVAL      { 0 }
::= { vdslLineAlarmConfProfileEntry 6 }

```

vdslLineAlarmConfThresh15MinSESSs OBJECT-TYPE

```

SYNTAX      HCPperfIntervalThreshold
UNITS       "seconds"
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "This object configures the threshold for the number of
    severely errored seconds (SESSs) 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
    vdslPerfSESSsThreshNotification notification will be
    generated.  No more than one notification will be sent
    per interval."
DEFVAL      { 0 }

```

```

 ::= { vdslLineAlarmConfProfileEntry 7 }

vdslLineAlarmConfThresh15MinUASS 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."
    DEFVAL      { 0 }
 ::= { vdslLineAlarmConfProfileEntry 8 }

vdslLineAlarmConfInitFailure 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."
    DEFVAL      { false }
 ::= { vdslLineAlarmConfProfileEntry 9 }

vdslLineAlarmConfProfRowStatus 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.

        An 'active' profile may be modified at any time."
 ::= { vdslLineAlarmConfProfileEntry 10 }

```

-- Notification definitions

vdslNotifications OBJECT IDENTIFIER ::= { vdslLineMib 0 }

vdslPerfLofsThreshNotification NOTIFICATION-TYPE

OBJECTS {
vdslPerfDataCurr15MinLofs
}
STATUS current
DESCRIPTION
"Loss of Framing 15-minute interval threshold
(vdslLineAlarmConfThresh15MinLofs) reached."
::= { vdslNotifications 1 }

vdslPerfLossThreshNotification NOTIFICATION-TYPE

OBJECTS {
vdslPerfDataCurr15MinLoss
}
STATUS current
DESCRIPTION
"Loss of Signal 15-minute interval threshold
(vdslLineAlarmConfThresh15MinLoss) reached."
::= { vdslNotifications 2 }

vdslPerfLprsThreshNotification NOTIFICATION-TYPE

OBJECTS {
vdslPerfDataCurr15MinLprs
}
STATUS current
DESCRIPTION
"Loss of Power 15-minute interval threshold
(vdslLineAlarmConfThresh15MinLprs) reached."
::= { vdslNotifications 3 }

vdslPerfLolsThreshNotification NOTIFICATION-TYPE

OBJECTS {
vdslPerfDataCurr15MinLols
}
STATUS current
DESCRIPTION
"Loss of Link 15-minute interval threshold
(vdslLineAlarmConfThresh15MinLols) reached."
::= { vdslNotifications 4 }

vdslPerfESsThreshNotification NOTIFICATION-TYPE

OBJECTS {
vdslPerfDataCurr15MinESs
}


```

STATUS          current
DESCRIPTION
    "Errored Seconds 15-minute interval threshold
    (vdslLineAlarmConfThresh15MinESs) reached."
 ::= { vdslNotifications 5 }

vdslPerfSESSsThreshNotification NOTIFICATION-TYPE
OBJECTS          {
                  vdslPerfDataCurr15MinSESSs
                }
STATUS          current
DESCRIPTION
    "Severely Errored Seconds 15-minute interval threshold
    (vdslLineAlarmConfThresh15MinSESSs) reached."
 ::= { vdslNotifications 6 }

vdslPerfUASSsThreshNotification NOTIFICATION-TYPE
OBJECTS          {
                  vdslPerfDataCurr15MinUASSs
                }
STATUS          current
DESCRIPTION
    "Unavailable Seconds 15-minute interval threshold
    (vdslLineAlarmConfThresh15MinUASSs) reached."
 ::= { vdslNotifications 7 }

vdslDownMaxSnrMgnNotification NOTIFICATION-TYPE
OBJECTS          {
                  vdslPhysCurrSnrMgn
                }
STATUS          current
DESCRIPTION
    "The downstream Signal to Noise Margin exceeded
    vdslLineConfDownMaxSnrMgn. The object
    vdslPhysCurrSnrMgn will contain the Signal to Noise
    margin as measured by the VTU-R."
 ::= { vdslNotifications 8 }

vdslDownMinSnrMgnNotification NOTIFICATION-TYPE
OBJECTS          {
                  vdslPhysCurrSnrMgn
                }
STATUS          current
DESCRIPTION
    "The downstream Signal to Noise Margin fell below
    vdslLineConfDownMinSnrMgn. The object vdslPhysCurrSnrMgn
    will contain the Signal to Noise margin as measured by
    the VTU-R."

```

```

 ::= { vdslNotifications 9 }

vdslUpMaxSnrMgnNotification NOTIFICATION-TYPE
    OBJECTS      {
                    vdslPhysCurrSnrMgn
                }
    STATUS        current
    DESCRIPTION   "The upstream Signal to Noise Margin exceeded
                    vdslLineConfUpMaxSnrMgn. The object vdslPhysCurrSnrMgn
                    will contain the Signal to Noise margin as measured
                    by the VTU-C."
    ::= { vdslNotifications 10 }

vdslUpMinSnrMgnNotification NOTIFICATION-TYPE
    OBJECTS      {
                    vdslPhysCurrSnrMgn
                }
    STATUS        current
    DESCRIPTION   "The upstream Signal to Noise Margin fell below
                    vdslLineConfUpMinSnrMgn. The object vdslPhysCurrSnrMgn
                    will contain the Signal to Noise margin as measured
                    by the VTU-C."
    ::= { vdslNotifications 11 }

vdslInitFailureNotification NOTIFICATION-TYPE
    OBJECTS      {
                    vdslPhysCurrStatus
                }
    STATUS        current
    DESCRIPTION   "Vtu initialization failed. See vdslPhysCurrStatus for
                    potential reasons."
    ::= { vdslNotifications 12 }

-- 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,
    vdslNotificationGroup
}
:= { vdslCompliances 1 }

-- units of conformance

vdslGroup OBJECT-GROUP
OBJECTS
{
    vdslLineCoding,
    vdslLineType,
    vdslLineConfProfile,
    vdslLineAlarmConfProfile,
    vdslPhysInvSerialNumber,
    vdslPhysInvVendorID,
    vdslPhysInvVersionNumber,
    vdslPhysCurrSnrMgn,
    vdslPhysCurrAtn,
    vdslPhysCurrStatus,
    vdslPhysCurrOutputPwr,
    vdslPhysCurrAttainableRate,
    vdslPhysCurrLineRate,
    vdslChanInterleaveDelay,
    vdslChanCrcBlockLength,
    vdslChanCurrTxRate,
    vdslChanCurrTxSlowBurstProtect,
    vdslChanCurrTxFastFec,
    vdslPerfDataValidIntervals,
    vdslPerfDataInvalidIntervals,
    vdslPerfDataLofs,
    vdslPerfDataLoss,
    vdslPerfDataLprs,
    vdslPerfDataLols,
    vdslPerfDataESs,
    vdslPerfDataSESSs,
    vdslPerfDataUASSs,
    vdslPerfDataInits,
    vdslPerfDataCurr15MinTimeElapsed,
    vdslPerfDataCurr15MinLofs,
    vdslPerfDataCurr15MinLoss,
    vdslPerfDataCurr15MinLprs,
    vdslPerfDataCurr15MinLols,
    vdslPerfDataCurr15MinESs,
    vdslPerfDataCurr15MinSESSs,
```

vdslPerfDataCurr15MinUASS,
vdslPerfDataCurr15MinInits,
vdslPerfData1DayValidIntervals,
vdslPerfData1DayInvalidIntervals,
vdslPerfDataCurr1DayTimeElapsed,
vdslPerfDataCurr1DayLofs,
vdslPerfDataCurr1DayLoss,
vdslPerfDataCurr1DayLprs,
vdslPerfDataCurr1DayLols,
vdslPerfDataCurr1DayESS,
vdslPerfDataCurr1DaySESS,
vdslPerfDataCurr1DayUASS,
vdslPerfDataCurr1DayInits,
vdslPerfIntervalLofs,
vdslPerfIntervalLoss,
vdslPerfIntervalLprs,
vdslPerfIntervalLols,
vdslPerfIntervalESS,
vdslPerfIntervalSESS,
vdslPerfIntervalUASS,
vdslPerfIntervalInits,
vdslPerf1DayIntervalMoniSecs,
vdslPerf1DayIntervalLofs,
vdslPerf1DayIntervalLoss,
vdslPerf1DayIntervalLprs,
vdslPerf1DayIntervalLols,
vdslPerf1DayIntervalESS,
vdslPerf1DayIntervalSESS,
vdslPerf1DayIntervalUASS,
vdslPerf1DayIntervalInits,
vdslChanValidIntervals,
vdslChanInvalidIntervals,
vdslChanFixedOctets,
vdslChanBadBlks,
vdslChanCurr15MinTimeElapsed,
vdslChanCurr15MinFixedOctets,
vdslChanCurr15MinBadBlks,
vdslChan1DayValidIntervals,
vdslChan1DayInvalidIntervals,
vdslChanCurr1DayTimeElapsed,
vdslChanCurr1DayFixedOctets,
vdslChanCurr1DayBadBlks,
vdslChanIntervalFixedOctets,
vdslChanIntervalBadBlks,
vdslChan1DayIntervalMoniSecs,
vdslChan1DayIntervalFixedOctets,
vdslChan1DayIntervalBadBlks,
vdslLineConfDownRateMode,

vdslLineConfUpRateMode,
vdslLineConfDownMaxPwr,
vdslLineConfUpMaxPwr,
vdslLineConfDownMaxSnrMgn,
vdslLineConfDownMinSnrMgn,
vdslLineConfDownTargetSnrMgn,
vdslLineConfUpMaxSnrMgn,
vdslLineConfUpMinSnrMgn,
vdslLineConfUpTargetSnrMgn,
vdslLineConfDownFastMaxDataRate,
vdslLineConfDownFastMinDataRate,
vdslLineConfDownSlowMaxDataRate,
vdslLineConfDownSlowMinDataRate,
vdslLineConfUpFastMaxDataRate,
vdslLineConfUpFastMinDataRate,
vdslLineConfUpSlowMaxDataRate,
vdslLineConfUpSlowMinDataRate,
vdslLineConfDownRateRatio,
vdslLineConfUpRateRatio,
vdslLineConfDownMaxInterDelay,
vdslLineConfUpMaxInterDelay,
vdslLineConfDownPboControl,
vdslLineConfUpPboControl,
vdslLineConfDownPboLevel,
vdslLineConfUpPboLevel,
vdslLineConfDeploymentScenario,
vdslLineConfAdslPresence,
vdslLineConfApplicableStandard,
vdslLineConfBandPlan,
vdslLineConfBandPlanFx,
vdslLineConfBandOptUsage,
vdslLineConfUpPsdTemplate,
vdslLineConfDownPsdTemplate,
vdslLineConfHamBandMask,
vdslLineConfCustomNotch1Start,
vdslLineConfCustomNotch1Stop,
vdslLineConfCustomNotch2Start,
vdslLineConfCustomNotch2Stop,
vdslLineConfDownTargetSlowBurst,
vdslLineConfUpTargetSlowBurst,
vdslLineConfDownMaxFastFec,
vdslLineConfUpMaxFastFec,
vdslLineConfLineType,
vdslLineConfProfRowStatus,
vdslLineAlarmConfThresh15MinLofs,
vdslLineAlarmConfThresh15MinLoss,
vdslLineAlarmConfThresh15MinLprs,
vdslLineAlarmConfThresh15MinLols,

```

        vdslLineAlarmConfThresh15MinESs,
        vdslLineAlarmConfThresh15MinSESSs,
        vdslLineAlarmConfThresh15MinUASs,
        vdslLineAlarmConfInitFailure,
        vdslLineAlarmConfProfRowStatus
    }
    STATUS          current
    DESCRIPTION
        "A collection of objects providing information about
         a VDSL Line."
    ::= { vdslGroups 1 }

    vdslNotificationGroup      NOTIFICATION-GROUP
    NOTIFICATIONS
        {
            vdslPerfLofsThreshNotification,
            vdslPerfLossThreshNotification,
            vdslPerfLprsThreshNotification,
            vdslPerfLolsThreshNotification,
            vdslPerfESsThreshNotification,
            vdslPerfSESSsThreshNotification,
            vdslPerfUASsThreshNotification,
            vdslDownMaxSnrMgnNotification,
            vdslDownMinSnrMgnNotification,
            vdslUpMaxSnrMgnNotification,
            vdslUpMinSnrMgnNotification,
            vdslInitFailureNotification
        }
    STATUS          current
    DESCRIPTION
        "This group supports notifications of significant
         conditions associated with VDSL Lines."
    ::= { vdslGroups 2 }

```

END

5. Security Considerations

There are a number of management objects defined in this MIB module with 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.

Some of the readable objects in this MIB module (i.e., objects with a MAX-ACCESS other than not-accessible) may be considered sensitive or vulnerable in some network environments. It is thus important to control even GET and/or NOTIFY access to these objects and possibly to even encrypt the values of these objects when sending them over the network via SNMP.

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.

Additionally, allowing write access to configuration data may allow an end-user to increase their service levels or affect other end-users in either a positive or negative manner. For this reason, the following tables should be considered to contain sensitive information:

- vdslLineTable
- vdslLineConfProfileTable
- vdslLineAlarmConfProfileTable

Individual line utilization information, available via the performance tables, may be considered sensitive. For example, if an end-user has a far lower line utilization during certain periods of the day, it may indicate an empty office or residence. For these reasons, the following tables should be considered to contain sensitive information:

- vdslPerfDataTable
- vdslPerfIntervalTable
- vdslPerf1DayIntervalTable

Further, notifications generated by agents implementing this MIB will contain threshold and performance information.

It is thus important to control even GET access to the objects within these tables 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.

SNMP versions prior to SNMPv3 did not include adequate security. Even if the network itself is secure (for example by using IPsec), even then, there is no control as to who on the secure network is allowed to access and GET/SET (read/change/create/delete) the objects in this MIB module.

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

Further, deployment of SNMP versions prior to SNMPv3 is NOT RECOMMENDED. Instead, it is RECOMMENDED to deploy SNMPv3 and to enable cryptographic security. It is then a customer/operator responsibility to ensure that the SNMP entity giving access to an instance of this MIB module is properly configured to give access to the objects only to those principals (users) that have legitimate rights to indeed GET or SET (change/create/delete) them.

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