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 parameters of the "Very High Speed Digital Subscriber Line 2 (VDSL2)" interface type, which are also applicable for managing ADSL, ADSL2, and ADSL2+ interfaces.
Table of Contents

1. The Internet-Standard Management Framework ................. 3
2. Overview ............................................. 3
   2.1. Relationship to other MIBs .......................... 4
   2.2. IANA Considerations ............................... 6
   2.3. Conventions Used in the MIB Module .................. 6
   2.4. Structure ......................................... 20
   2.5. Persistence ....................................... 23
   2.6. Line Topology .................................... 26
   2.7. Counters, Interval Buckets, and Thresholds ............ 26
   2.8. Profiles .......................................... 28
   2.9. Notifications ..................................... 32
3. Definitions ............................................. 33
4. Implementation Analysis .................................... 214
5. Security Considerations ................................ 215
6. Acknowledgments ........................................ 223
7. References ............................................ 224
   7.1. Normative References ............................... 224
   7.2. Informative References .............................. 225
Authors’ Addresses ....................................... 226
Intellectual Property and Copyright Statements ................ 227
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 RFC 2119 [RFC2119].

2. Overview

This document defines a Management Information Base (MIB) module for use with network management protocols in the Internet community for the purpose of managing VDSL2, ADSL, ADSL2, and ADSL2+ lines.

The MIB module described in RFC 2662 [RFC2662] describes objects used for managing Asymmetric Bit-Rate DSL (ADSL) interfaces per [T1E1.413], [G.992.1], and [G.992.2]. These object descriptions are based upon the specifications for the ADSL Embedded Operations Channel (EOC) as defined in American National Standards Institute (ANSI) T1E1.413/1995 [T1E1.413] and International Telecommunication Union (ITU-T) G.992.1 [G.992.1] and G.992.2 [G.992.2].

The MIB module described in RFC 4706 [RFC4706] is a wider management model that includes, in addition to ADSL technology, the ADSL2 and ADSL2+ technologies per G.992.3, G.992.4, and G.992.5 ([G.992.3], [G.992.4], and [G.992.5] respectively).

This document does not obsolete RFC 2662 [RFC2662], or RFC 4706 [RFC4706] but rather provides a more comprehensive management model that addresses the VDSL2 technology per G.993.2 ([G.993.2]) as well as ADSL, ADSL2 and ADSL2+ technologies.

Additionally, the management framework for VDSL2 lines [TR-129] specified by the Digital Subscriber Line Forum (DSLF) has been taken into consideration. That framework is based on ITU-T G.997.1 standard [G.997.1] and its amendment 1 [G.997.1-Am1].
Note that the management model, according to this document, does not allow managing VDSL technology per G.993.1 ([G.993.1]). VDSL lines MUST be managed by RFC 3728 [RFC3728].

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 to other MIBs

This section outlines the relationship of this MIB module with other MIB modules described in RFCs. Specifically, IF-MIB as presented in RFC 2863 [RFC2863] is discussed.

2.1.1. General IF-MIB Integration (RFC 2863)

The VDSL2 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 ifTypes, which may be applicable for VDSL2 lines as well as for ADSL, ADSL2 and ADSL2+ lines:

\[
\text{IANAifType ::= \text{TEXTUAL-CONVENTION}}
\]

\[
\text{SYNTAX INTEGER \{}
\text{\hspace{1cm}channel(70), \hspace{0.5cm}-- Channel}
\text{\hspace{1cm}adsl(94), \hspace{1.5cm}-- Asymmetric Digital Subscriber Loop}
\text{\hspace{1cm}interleave(124), \hspace{0.5cm}-- Interleaved Channel}
\text{\hspace{1cm}fast(125), \hspace{0.5cm}-- Fast Channel}
\text{\hspace{1cm}adsl2plus(238), \hspace{0.5cm}-- Asymmetric Digital Subscriber Loop Version 2, Version 2 Plus, and all variants}
\text{\hspace{1cm}vdsl2(xxx), \hspace{0.5cm}-- Very High Speed Digital Subscriber Loop 2}
\text{\hspace{1cm}...}
\text{\}}
\]

ADSL lines that are identified with ifType=adsl(94) MUST be managed with the MIB specified by RFC2662. ADSL, ADSL2, and ADSL2+ lines identified with ifType=adsl2plus(238) MUST be managed with the MIB specified by RFC 4706 [RFC4706]. VDSL2, ADSL, ADSL2, and ADSL2+ lines identified with ifType=vdsl2(xxx) MUST be managed with the MIB specified by this document.

In any case, the SNMP agent may use either ifType=interleave(124) or fast(125) for each channel, e.g., depending on whether or not it is capable of using an interleaver on that channel. It may use the ifType=channel (70) when all channels are capable of using an
interleaver (e.g., for ADSL2 xTUs).

Note that the ifFixedLengthGroup from RFC 2863 [RFC2863] MUST be supported and that the ifRcvAddressGroup does not apply to this MIB module.

### 2.1.2. Usage of ifTable

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

The following attributes are part of the mandatory ifGeneralInformationGroup in the Interfaces MIB [RFC2863], and are not duplicated in the VDSL2 Line MIB.

- **ifIndex**: Interface index.
- **ifDescr**: See interfaces MIB.
- **ifType**: vdsl2(xxx), channel(70), interleave(124), or fast(125)
- **ifSpeed**: Set as appropriate.
- **ifPhysAddress**: This object MUST have an octet string with zero length.
- **ifAdminStatus**: See interfaces MIB.
- **ifOperStatus**: See interfaces MIB.
- **ifLastChange**: See interfaces MIB.
- **ifName**: See interfaces MIB.
- **ifAlias**: See interfaces MIB.
- **ifLinkUpDownTrapEnable**: Default to enabled(1).
- **ifHighSpeed**: Set as appropriate.
- **ifConnectorPresent**: Set as appropriate.

Figure 1: Use of ifTable Objects
2.1.3. Usage of ifStackTable

Use of the ifStackTable to associate the entries for physical, fast, interleaved channels, and higher layers (e.g., ATM) is shown below. Use of ifStackTable is necessary, because configuration information is stored in profile tables associated with the physical-layer ifEntry only. The channels’ ifEntries need the ifStackTable to find their associated physical-layer entry and thus their configuration parameters. The following example shows the ifStackTable entries for an xDSL line with a single channel that uses an ATM data path.

<table>
<thead>
<tr>
<th>HigherLayer</th>
<th>LowerLayer</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>ATM</td>
</tr>
<tr>
<td>ATM</td>
<td>XdslChannel</td>
</tr>
<tr>
<td>XdslChannel</td>
<td>XdslPhysical</td>
</tr>
<tr>
<td>XdslPhysical</td>
<td>0</td>
</tr>
</tbody>
</table>

Figure 2: ifStackTable entries for ATM path over a single xDSL channel

2.2. IANA Considerations

The VDSL2-LINE-MIB module requires the allocation of a new ifType value for Very High Speed Digital Subscriber Loop Version 2, to distinguish between ADSL lines that are managed with the RFC2662 management model, ADSL/ADSL2 and ADSL2+ lines that are managed with the RFC 4706 [RFC4706] management model, and VDSL2/ADSL/ADSL2 and ADSL2+ lines that are managed with the model defined in this document.

Also, the VDSL2-LINE-MIB module requires the allocation of a single object identifier for its MODULE-IDENTITY. The IANA should allocate this object identifier in the transmission subtree.

As performed in the past for the ADSL2-LINE-MIB module, the IANA is kindly requested to ensure that the allocated ifType value is the same as the allocated branch number in the transmission subtree.

2.3. Conventions Used in the MIB Module

2.3.1. Naming Conventions
The following textual conventions are defined to reflect the line topology in the MIB module (further discussed in the following section), the various transmission modes, power states, synchronization states, possible values for various configuration parameters, status parameters, and other parameter types.

- **Xdsl2Unit**: Attributes with this syntax uniquely identify each unit in the VDSL2/ADSL/ADSL2+ link. This mirrors the EOC addressing mechanism:

  - `xtuc(1)` - Central Office (CO) line termination unit.
  - `xtur(2)` - Remote site line termination unit.

- **Xdsl2Direction**: Attributes with this syntax uniquely identify a transmission direction:

  - `vduc` VDSL2 line termination unit - Central office
  - `vtur` VDSL2 line termination unit - Remote site
  - `xTU-C` ADSL2+ or VDSL2 line termination unit - Central office
  - `xTU-R` ADSL2+ or VDSL2 line termination unit - Remote site
  - `xTU` A line termination unit; either an `xTU-C` or `xTU-R`
direction in a VDSL2/ADSL/ADSL2/ADSL2+ link. The upstream
direction is a transmission from the remote end (xTU-R) towards
the central office end (xTU-C). The upstream direction is
indicated by upstream(1). The downstream direction is a
transmission from the xTU-C towards the xTU-R. The downstream
direction is indicated by downstream(2).

- upstream(1) - Transmission from the xTU-R to the xTU-C.
- downstream(2) - Transmission from the xTU-C to the xTU-R.

Xdsl2Band:

Attributes with this syntax uniquely identify a band in an ADSL,
ADSL2, ADSL2+ or VDSL2 link. For a band in the upstream
direction, transmission is from the remote end (xTU-R) towards
the central office end (xTU-C). For a band in the downstream
direction, transmission is from the xTU-C towards the xTU-R. For
ADSL, ADSL2 and ADSL2+ which use a single band in the upstream
direction and a single band in the downstream direction, the only
relevant values are upstream(1) and downstream(2). For VDSL2,
which uses multiple bands in each transmission direction, a band
in the upstream direction is indicated by any of us0(3), us1(5),
us2(7), us3(9), or us4(11) and a band in the downstream direction
is indicated by any of ds1(4), ds2(6), ds3(8), or ds4(10). For
VDSL2, the values upstream(1) and downstream(2) may be used when
there is a need to refer to the whole upstream or whole downstream
traffic (e.g., report the average signal-to-noise ratio on any
transmission direction).

- upstream(1) - Transmission from the xTU-R to the xTU-C
  (refers to the single upstream band for
  ADSL/ADSL2/ADSL2+ or to the whole upstream
  traffic for VDSL2).
- downstream(2) - Transmission from the xTU-C to the xTU-R
  (refers to the single downstream band for
  ADSL/ADSL2/ADSL2+ or to the whole downstream
  traffic for VDSL2).
- us0(3) - Upstream band number 0 (US0) (VDSL2).
- ds1(4) - Downstream band number 1 (DS1) (VDSL2).
- us1(5) - Upstream band number 1 (US1) (VDSL2).
- ds2(6) - Downstream band number 2 (DS2) (VDSL2).
- us2(7) - Upstream band number 2 (US2) (VDSL2).
- ds3(8) - Downstream band number 3 (DS3) (VDSL2).
- us3(9) - Upstream band number 3 (US3) (VDSL2).
- ds4(10) - Downstream band number 4 (DS4) (VDSL2).
- us4(11) - Upstream band number 4 (US4) (VDSL2).
o Xdsl2TransmissionModeType:

Attributes with this syntax reference the list of possible transmission modes for VDSL2/ADSL/ADSL2 or ADSL2+.

Specified as a BITS construct, there are currently a few dozen transmission modes in the list.

o Xdsl2RaMode:

Attributes with this syntax describe how Rate-Adaptive synchronization is being used on the respective VDSL2/ADSL/ADSL2 or ADSL2+ link:

- manual (1) - No Rate-Adaptation. The initialization process attempts to synchronize to a specified rate.
- raInit (2) - Rate-Adaptation during initialization process only, which attempts to synchronize to a rate between minimum and maximum specified values.
- dynamicRa (3) - Dynamic Rate-Adaptation during initialization process as well as during SHOWTIME.

o Xdsl2InitResult:

Attributes with this syntax report the recent result of a full initialization attempt:

- noFail (0) - Successful initialization.
- configError (1) - Configuration failure.
- configNotFeasible (2) - Configuration details not supported.
- commFail (3) - Communication failure.
- noPeerAtu (4) - Peer ATU not detected.
- otherCause (5) - Other initialization failure reason.

o Xdsl2OperationModes:

Attributes with this syntax uniquely identify an xDSL mode, which is a category associated with each transmission mode defined for the VDSL2/ADSL/ADSL2 or ADSL2+ link. Part of the line configuration profile depends on the xDSL Mode:

Specified as an enumeration construct, there are currently a few dozen transmission modes in the list.

o Xdsl2PowerMngState:

Attributes with this syntax uniquely identify each power management state defined for the VDSL2/ADSL/ADSL2 or ADSL2+ link.
For VDSL2 links only L0 and L3 states are supported:

10 (1) – L0: Full power management state.
11 (2) – L1: Low power management state (for G.992.2).
12 (3) – L2: Low power management state (for G.992.3, G.992.4, and G.992.5).
13 (4) – L3: Idle power management state.

Attributes with this syntax are configuration parameters that reference the desired power management state for the VDSL2/ADSL/ADSL2 or ADSL2+ link. For VDSL2, only L0 and L3 states are supported:

13toL0 (0) – Perform a transition from L3 to L0 (Full power management state).
10toL2 (2) – Perform a transition from L0 to L2 (Low power management state).
10orL2toL3 (3) – Perform a transition into L3 (Idle power management state).

Attributes with this syntax are configuration parameters that reference the power modes/states into which the xTU-C or xTU-R may autonomously transit. This is a BITS structure that allows control of the following transit options:

allowTransitionsToIdle (0) – xTU may autonomously transit to idle (L3) state.
allowTransitionsToLowPower (1) – xTU may autonomously transit to low-power (L1/L2) state.

Attributes with this syntax are configuration parameters that control the Loop Diagnostic mode for the VDSL2/ADSL/ADSL2 or ADSL2+ link:

inhibit (0) – Inhibit Loop Diagnostic mode.
force (1) – Force/Initiate Loop Diagnostic mode.

Attributes with this syntax are status parameters that report the
result of the recent Loop Diagnostic mode issued for the VDSL2/ADSL/ADSL2 or ADSL2+ link:

- none (1) - The default value, in case LDSF was never requested for the associated line.
- success (2) - The recent command completed successfully.
- inProgress (3) - The Loop Diagnostics process is in progress.
- unsupported (4) - The NE or the line card doesn’t support LDSF.
- cannotRun (5) - The NE cannot initiate the command, due to a nonspecific reason.
- aborted (6) - The Loop Diagnostics process aborted.
- failed (7) - The Loop Diagnostics process failed.
- illegalMode (8) - The NE cannot initiate the command, due to the specific mode of the relevant line.
- adminUp (9) - The NE cannot initiate the command because the relevant line is administratively ‘Up’.
- tableFull (10) - The NE cannot initiate the command, due to reaching the maximum number of rows in the results table.
- noResources (11) - The NE cannot initiate the command, due to lack of internal memory resources.

- Xdsl2LineBpsc:

Attributes with this syntax are configuration parameters that control the bits per subcarrier measurement for the VDSL2/ADSL/ADSL2 or ADSL2+ link:

- idle (1) - Idle state.
- measure (2) - Measure the bits per subcarrier.

- Xdsl2BpscResult:

Attributes with this syntax are status parameters that report the result of the recent bits per subcarrier measurement issued for the VDSL2/ADSL/ADSL2 or ADSL2+ link:
none (1) - The default value, in case a measurement was never requested for the associated line.
success (2) - The recent measurement request completed successfully.
inProgress (3) - The bits per subcarrier measurement is in progress.
unsupported (4) - The bits per subcarrier request mechanism is not supported.
failed (5) - The measurement request has failed and no results are available.
noResources (6) - The NE cannot initiate the command, due to lack of internal memory resources.

Attributes with this syntax are configuration parameters that control the line reset function.

idle (1) - This state indicates that there is currently no request for a line reset.
reset (2) - This state indicates that a line reset request has been issued.

Attributes with this syntax reference the list of supported, enabled or active ITU-T G.993.2 implementation profiles. This is a BITS structure with the following values:

profile8a (0) - Profile 8a.
profile8b (1) - Profile 8b.
profile8c (2) - Profile 8c.
profile8d (3) - Profile 8d.
profile12a (4) - Profile 12a.
profile12b (5) - Profile 12b.
profile17a (6) - Profile 17a.
profile30a (7) - Profile 30a.

Attributes with this syntax are configuration parameters that specify the VDSL2 PSD Mask Class for a selected VDSL2 transmission mode. The following classes are defined:
none     (1) - VDSL2 PSD Mask Class is unknown/irrelevant.
a998ORb997M1cORc998B (2) -
For ITU-T G.993.2 Annex A this is the only applicable PSD class.
b997M1xOR998co (3) -
ITU-T G.993.2 Annex B: 997-M1x-M-8 or 997-M1x-M.
b998M1x  (5) - ITU-T G.993.2 Annex B: 998-M1x-A, 998-M1x-B, 998-M1x-NUS0.
bHpeM1   (8) - ITU-T G.993.2 Annex B: HPE17-M1-NUS0, HPE30-M1-NUS0.

- Xdsl2LineLimitMask:
  Attributes with this syntax are configuration parameters that specify the VDSL2 PSD Limit Mask for each PSD Mask Class and implementation profile. The VDSL2 implementation profiles are grouped into 4 classes and each is allocated 16 PSD Limit Mask values in this textual convention.

- Xdsl2LineUs0Disable:
  Attributes with this syntax are configuration parameters that indicate if US0 (upstream band number 0) is disabled for each limit PSD mask. The VDSL2 implementation profiles are grouped into 4 classes and each is allocated 16 values in this textual convention.

- Xdsl2LineUs0Mask:
  Attributes with this syntax are configuration parameters for ITU-T G.993.2 Annex A transmission mode that specify the US0 PSD masks to be allowed by the near-end xTU on the line. This syntax is a
bit map that supports 20 possible US0 masks.

- **Xdsl2SymbolProtection:**

  Attributes with this syntax are configuration parameters that reference the minimum length impulse noise protection (INP) in terms of number of symbols (subcarrier spacing of 4.3125 kHz):

  - noProtection (1) - INP not required
  - halfSymbol (2) - INP length = 1/2 symbol.
  - singleSymbol (3) - INP length = 1 symbol.
  - twoSymbols (4) - INP length = 2 symbols.
  - threeSymbols (5) - INP length = 3 symbols.
  - fourSymbols (6) - INP length = 4 symbols.
  - fiveSymbols (7) - INP length = 5 symbols.
  - sixSymbols (8) - INP length = 6 symbols.
  - sevenSymbols (9) - INP length = 7 symbols.
  - eightSymbols (10) - INP length = 8 symbols.
  - nineSymbols (11) - INP length = 9 symbols.
  - tenSymbols (12) - INP length = 10 symbols.
  - elevenSymbols (13) - INP length = 11 symbols.
  - twelveSymbols (14) - INP length = 12 symbols.
  - thirteenSymbols (15) - INP length = 13 symbols.
  - fourteenSymbols (16) - INP length = 14 symbols.
  - fifteenSymbols (17) - INP length = 15 symbols.
  - sixteenSymbols (18) - INP length = 16 symbols.

- **Xdsl2SymbolProtection8:**

  Attributes with this syntax are configuration parameters that reference the minimum length impulse noise protection (INP) in terms of number of symbols (subcarrier spacing of 8.625 kHz):
noProtection (1) - INP not required.
singleSymbol (2) - INP length = 1 symbol.
twoSymbols (3) - INP length = 2 symbols.
threeSymbols (4) - INP length = 3 symbols.
fourSymbols (5) - INP length = 4 symbols.
fiveSymbols (6) - INP length = 5 symbols.
sixSymbols (7) - INP length = 6 symbols.
sevenSymbols (8) - INP length = 7 symbols.
eightSymbols (9) - INP length = 8 symbols.
nineSymbols (10) - INP length = 9 symbols.
tenSymbols (11) - INP length = 10 symbols.
elevenSymbols (12) - INP length = 11 symbols.
twelveSymbols (13) - INP length = 12 symbols.

Attributes with this syntax are configuration parameters that reference the maximum Bit Error Rate (BER):

eminus3 (1) - Maximum BER=E^-3.
eminus5 (2) - Maximum BER=E^-5.
eminus7 (3) - Maximum BER=E^-7.

Xdsl2ChInitPolicy:

This syntax serves for channel configuration parameters that reference the channel initialization policy.

policy0 (1) - Policy 0 according to the applicable standard.
policy1 (2) - Policy 1 according to the applicable standard.

Xdsl2ScMaskDs:

Attributes with this syntax are configuration parameters that reference the downstream subcarrier mask. This syntax is a bitmap of up to 4096 bits.

Xdsl2ScMaskUs:

Attributes with this syntax are configuration parameters that reference the upstream subcarrier mask. This syntax is a bitmap of up to 4096 bits.
- **Xdsl2CarMask:**
  Attributes with this syntax are configuration parameters for VDSL2 transmission modes that define an array of up to 32 bands. Each band is represented by a start subcarrier index followed by a stop subcarrier index.

- **Xdsl2RfiBands:**
  Attributes with this syntax are configuration parameters that define radio frequency interference (RFI) bands. Each RFI band is represented by 4 octets: 16 bit start subcarrier index followed by a 16 bit stop subcarrier index.

- **Xdsl2PsdMaskDs:**
  Attributes with this syntax are configuration parameters that reference the downstream power spectrum density (PSD) mask. This syntax is a structure of up to 32 breakpoints, where each breakpoint occupies 3 octets.

- **Xdsl2PsdMaskUs:**
  Attributes with this syntax are configuration parameters that reference the upstream power spectrum density (PSD) mask. This syntax is a structure of up to 16 breakpoints, where each breakpoint occupies 3 octets.

- **Xdsl2Tssi:**
  Attributes with this syntax are status parameters that reference the transmit spectrum shaping (TSSi). This syntax is a structure of up to 32 breakpoints, where each breakpoint occupies 3 octets.

- **Xdsl2LastTransmittedState:**
  Attributes with this syntax reference the list of initialization states for VDSL2/ADSL/ADSL2 or ADSL2+ modems. The list of states for CO side modems is different from the list of states for the CPE side modems. Also, the states for VDSL2 modems are not the same as those for the ADSL/ADSL2 and ADSL2+ modems.

  Specified as an enumeration type, there are currently a few dozen states in the list per each unit side (i.e., CO and CPE).

- **Xdsl2LineStatus:**
  Attributes with this syntax are status parameters that reflect the
failure status for a given end point of a VDSL2/ADSL/ADSL2 or ADSL2+ link.

This is a BITS structure that can report the following failures:

- noDefect (0) - This bit position positively reports that no defect or failure exist.
- lossOfFraming (1) - Loss of frame synchronization.
- lossOfSignal (2) - Loss of signal.
- lossOfPower (3) - Loss of power. Usually this failure may be reported for CPE units only.
- initFailure (4) - Recent initialization process failed. Never active on xTU-R.

- Xdsl2ChInpReport:

  Attributes with this syntax are status parameters that report the method that ACTINP is computed with.
  
  - inpComputedUsingFormula (1) - ACTINP computed using INP_no_erasure formula.
  - inpEstimatedByXtur (2) - ACTINP estimated by the xTU receiver.

- Xdsl2ChAtmStatus:

  Attributes with this syntax are status parameters that reflect the failure status for Transmission Convergence (TC) layer of a given ATM interface (data path over a VDSL2/ADSL/ADSL2 or ADSL2+ link).

  This is a BITS structure that can report the following failures:

  - noDefect (0) - This bit position positively reports that no defect or failure exists.
  - noCellDelineation (1) - The link was successfully initialized but cell delineation was never acquired on the associated ATM data path.
  - lossOfCellDelineation (2) - Loss of cell delineation on the associated ATM data path.

- Xdsl2ChPtmStatus:

  Attributes with this syntax are status parameters that reflect the failure status for a given PTM interface (i.e., packet data path over a VDSL2/ADSL/ADSL2 or ADSL2+ link).

  This is a BITS structure that can report the following failures:
noDefect (0) - This bit position positively reports that no defect or failure exists.
outOfSync (1) - Out of synchronization.

- **Xdsl2UpboKLF:**

Attributes with this syntax are configuration parameters referring to whether or not upstream power backoff (UPBO) is enabled and how electrical length in the context of UPBO is determined.

This enumeration type can have the following values:

- **auto(1)** - The VTUs autonomously determine the electrical length.
- **override(2)** - Forces the VTU-R to use the electrical length, \( k_{10} \), of the CO-MIB (UPBOKL) to compute the UPBO.
- **disableUpbo(3)** - Disables UPBO. I.e., UPBO is not utilized.

- **Xdsl2BandUs:**

Attributes with this syntax are used as table indexes that refer to upstream bands of VDSL2 lines (excluding US0 band).

This enumeration type can have the following values:

- **us1(5)** - Upstream band number 1 (US1).
- **us2(7)** - Upstream band number 2 (US2).
- **us3(9)** - Upstream band number 3 (US3).
- **us4(11)** - Upstream band number 4 (US4).

- **Xdsl2LinePsdMaskSelectUs:**

Attributes with this syntax are configuration parameters that control the upstream PSD mask selection for Annexes J and M of G.992.3 and G.992.5.

- **adlu32Eu32 (1)** - ADLU-32 / EU-32.
- **adlu36Eu36 (2)** - ADLU-36 / EU-36.
- **adlu40Eu40 (3)** - ADLU-40 / EU-40.
- **adlu44Eu44 (4)** - ADLU-44 / EU-44.
- **adlu52Eu52 (6)** - ADLU-52 / EU-52.
- **adlu56Eu56 (7)** - ADLU-56 / EU-56.
- **adlu60Eu60 (8)** - ADLU-60 / EU-60.
- **adlu64Eu64 (9)** - ADLU-64 / EU-64.
- **Xdsl2LineCeFlag:**
  Attributes with this syntax are configuration parameters that control the optional cyclic extension values.
  - **enableCyclicExtension (0)** - Enable use of optional Cyclic Extension values.

- **Xdsl2LineSnrMode**
  Attributes with this syntax are parameters related to the enabling and disabling of transmitter referred virtual noise.
  - **virtualNoiseDisabled (1)** - Virtual noise is disabled.
  - **virtualNoiseEnabled (2)** - Virtual noise is enabled.

- **Xdsl2LineTxRefVnDs**
  Attributes with this syntax are configuration parameters that define the downstream transmitter referred virtual noise, which is specified through a set of breakpoints. Each breakpoint occupies 3 octets: The first two octets hold the index of the subcarrier associated with the breakpoint. The third octet holds the PSD reduction at the breakpoint from 0 (-140 dBm/Hz) to 200 (-40 dBm/Hz) using units of 0.5 dBm/Hz. A special value of 255 indicates a noise level of 0 W/Hz.

- **Xdsl2LineTxRefVnUs:**
  Attributes with this syntax are configuration parameters that define the upstream transmitter referred virtual noise, which is specified through a set of breakpoints. Each breakpoint occupies 3 octets: The first two octets hold the index of the subcarrier associated with the breakpoint. The third octet holds the PSD reduction at the breakpoint from 0 (-140 dBm/Hz) to 200 (-40 dBm/Hz) using units of 0.5 dBm/Hz. A special value of 255 indicates a noise level of 0 W/Hz.

- **Xdsl2LineForceInp:**
  Attributes with this syntax are configuration parameters that control the framer of a bearer channel.
  - **forceFramerForInp (0)** - Select framer setting to satisfy impulse noise protection requirements.
Attributes with this syntax are status parameters that report the bits allocation for each subcarrier. The bits allocation for a subcarrier is in the range 0 to 15.

Attributes with this syntax are MEDLEY Reference PSD status parameters in the downstream direction. This is expressed as the set of breakpoints exchanged at initialization. The OCTET STRING contains up to 48 pairs of values in the following structure: Octets 0-1 -- Index of 1st subcarrier used in the context of a first breakpoint. Octets 2-3 -- The PSD level for the subcarrier indicated by octets 0-1. Octets 4-7 -- Same, for a 2nd breakpoint. Octets 8-11 -- Same, for a 3rd breakpoint. And so on until Octets 188-191 -- Same, for a 48th breakpoint. Each subcarrier index is an unsigned number in the range 1 to NSds (i.e., highest supported subcarrier index in the downstream direction). The PSD level is an integer value in the 0 to 4095 range. It is represented in units of 0.1 dB offset from -140dBm/Hz.

Attributes with this syntax are MEDLEY Reference PSD status parameters in the upstream direction. This is expressed as the set of breakpoints exchanged at initialization. The OCTET STRING contains up to 32 pairs of values in the following structure: Octets 0-1 -- Index of 1st subcarrier used in the context of a first breakpoint. Octets 2-3 -- The PSD level for the subcarrier indicated by octets 0-1. Octets 4-7 -- Same, for a 2nd breakpoint. Octets 8-11 -- Same, for a 3rd breakpoint. And so on until Octets 124-127 -- Same, for a 32nd breakpoint. Each subcarrier index is an unsigned number in the range 1 to NSus (i.e., highest supported subcarrier index in the upstream direction). The PSD level is an integer value in the 0 to 4095 range. It is represented in units of 0.1 dB offset from -140dBm/Hz.

2.4. Structure

The MIB module is structured into the following MIB groups:

- **Line Configuration, Maintenance, and Status Group:**

  This group supports MIB objects for configuring parameters for the VDSL2/ADSL/ADSL2 or ADSL2+ line and retrieving line status information. It also supports MIB objects for configuring a requested power state or initiating a Dual Ended Loop Test (DELT)
process in the VDSL2/ADSL/ADSL2 or ADSL2+ line. It contains the following tables:

- xdsl2LineTable
- xdsl2LineSegmentTable
- xdsl2LineBandTable

- Channel Status Group:

  This group supports MIB objects for retrieving channel layer status information. It contains the following table:

  - xdsl2ChannelStatusTable

- Subcarrier Status Group:

  This group supports MIB objects for retrieving the subcarrier layer status information, mostly collected by a Dual Ended Loop Test (DELT) process. It contains the following tables:

  - xdsl2SCStatusTable
  - xdsl2SCStatusBandTable
  - xdsl2SCStatusSegmentTable

- Unit Inventory Group:

  This group supports MIB objects for retrieving Unit inventory information about units in VDSL2/ADSL/ADSL2 or ADSL2+ lines via the EOC. It contains the following table:

  - xdsl2LineInventoryTable

- Current Performance Group:

  This group supports MIB objects that provide the current performance information relating to VDSL2/ADSL/ADSL2 and ADSL2+ line, unit and channel levels. It contains the following tables:

  - xdsl2PMLineCurrTable
  - xdsl2PMLineInitCurrTable
  - xdsl2PMChCurrTable

- 15-Minute Interval Performance Group:

  This group supports MIB objects that provide historic performance information relating to VDSL2/ADSL/ADSL2 and ADSL2+ line, unit and channel levels in 15-minute intervals. It contains the following tables:
- xdsl2PMLineHist15MinTable
- xdsl2PMLineInitHist15MinTable
- xdsl2PMChHist15MinTable

1-Day Interval Performance Group:

This group supports MIB objects that provide historic performance information relating to VDSL2/ADSL/ADSL2 and ADSL2+ line, unit and channel levels in 1-day intervals. It contains the following tables:

- xdsl2PMLineHist1DayTable
- xdsl2PMLineInitHist1DayTable
- xdsl2PMChHist1DTable

Configuration Template and Profile Group:

This group supports MIB objects for defining configuration profiles for VDSL2/ADSL/ADSL2 and ADSL2+ lines and channels, as well as configuration templates. Each configuration template is comprised of one line configuration profile and one or more channel configuration profiles. This group contains the following tables:

- xdsl2LineConfTemplateTable
- xdsl2LineConfProfTable
- xdsl2LineConfProfModeSpecTable
- xdsl2LineConfProfModeSpecBandUsTable
- xdsl2ChConfProfileTable

Alarm Configuration Template and Profile Group:

This group supports MIB objects for defining alarm profiles for VDSL2/ADSL/ADSL2 and ADSL2+ lines and channels, as well as alarm templates. Each alarm template is comprised of one line alarm profile and one or more channel alarm profiles. This group contains the following tables:

- xdsl2LineAlarmConfTemplateTable
- xdsl2LineAlarmConfProfileTable
- xdsl2ChAlarmConfProfileTable

Notifications Group:

This group defines the notifications supported for VDSL2/ADSL/ADSL2 and ADSL2+ lines:
2.5. Persistence

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

- `xdsl2LineCnfgTemplate`
- `xdsl2LineAlarmCnfgTemplate`
- `xdsl2LineCmdndConfPmsf`
- `xdsl2LCnfTempTemplateTemplateName`
- `xdsl2LCnfTempLineProfile`
- `xdsl2LCnfTempChan1ConfProfile`
- `xdsl2LCnfTempChan1RaRatioDs`
- `xdsl2LCnfTempChan1RaRatioUs`
- `xdsl2LCnfTempChan2ConfProfile`
- `xdsl2LCnfTempChan2RaRatioDs`
- `xdsl2LCnfTempChan2RaRatioUs`
- `xdsl2LCnfTempChan3ConfProfile`
- `xdsl2LCnfTempChan3RaRatioDs`
- `xdsl2LCnfTempChan3RaRatioUs`
- `xdsl2LCnfTempChan4ConfProfile`
- `xdsl2LCnfTempChan4RaRatioDs`
- `xdsl2LCnfTempChan4RaRatioUs`
- `xdsl2LCnfTempRowStatus`
- `xdsl2LCnfProfProfileName`
- `xdsl2LCnfProfScMaskDs`
- `xdsl2LCnfProfScMaskUs`
- `xdsl2LCnfProfVdsl2CarMask`
- `xdsl2LCnfProfRfiBandsDs`
xdsl2LConfProfRaModeDs
xdsl2LConfProfRaModeUs
xdsl2LConfProfRaUsNrmDs
xdsl2LConfProfRaUsNrmUs
xdsl2LConfProfRaUsTimeDs
xdsl2LConfProfRaUsTimeUs
xdsl2LConfProfRaDsNrmDs
xdsl2LConfProfRaDsNrmUs
xdsl2LConfProfRaDsTimeDs
xdsl2LConfProfRaDsTimeUs
xdsl2LConfProfTargetSnrmDs
xdsl2LConfProfTargetSnrmUs
xdsl2LConfProfMaxSnrmDs
xdsl2LConfProfMaxSnrmUs
xdsl2LConfProfMinSnrmDs
xdsl2LConfProfMinSnrmUs
xdsl2LConfProfMsgMinUs
xdsl2LConfProfMsgMinDs
xdsl2LConfProfXtuTransSysEna
xdsl2LConfProfPmMode
xdsl2LConfProfL0Time
xdsl2LConfProfL2Time
xdsl2LConfProfL2Atpr
xdsl2LConfProfL2Atprt
xdsl2LConfProfProfiles
xdsl2LConfProfDpboEPsd
xdsl2LConfProfDpboEsEL
xdsl2LConfProfDpboEsCableModelA
xdsl2LConfProfDpboEsCableModelB
xdsl2LConfProfDpboEsCableModelC
xdsl2LConfProfDpboMus
xdsl2LConfProfDpboFMin
xdsl2LConfProfDpboFMax
xdsl2LConfProfUpboKL
xdsl2LConfProfUpboKLF
xdsl2LConfProfUs0Mask
xdsl2LConfProfRowStatus
xdsl2LConfProfXds1Mode
xdsl2LConfProfMaxNomPsdDs
xdsl2LConfProfMaxNomPsdUs
xdsl2LConfProfMaxNomAtpDs
xdsl2LConfProfMaxNomAtpUs
xdsl2LConfProfMaxAggRxPwrUs
xdsl2LConfProfPsdMaskDs
xdsl2LConfProfPsdMaskUs
xdsl2LConfProfPsdMaskSelectUs
xdsl2LConfProfClassMask
xdsl2LConfProfLimitMask
xdsl2LConfProfUs0Disabl
xdsl2LConfProfModeSpecRowStatus
xdsl2LConfProfXds1BandUs
xdsl2LConfProfUpboPsdA
xdsl2LConfProfUpboPsdB
xdsl2LConfProfModeSpecBandUsRowStatus
xdsl2ChConfProfProfileName
xdsl2ChConfProfMinDataRateDs
xdsl2ChConfProfMinDataRateUs
xdsl2ChConfProfMinResDataRateDs
xdsl2ChConfProfMinResDataRateUs
xdsl2ChConfProfMaxDataRateDs
xdsl2ChConfProfMaxDataRateUs
xdsl2ChConfProfMinDataRateLowPwrDs
xdsl2ChConfProfMaxDelayDs
xdsl2ChConfProfMaxDelayUs
xdsl2ChConfProfMinProtectionDs
xdsl2ChConfProfMinProtectionUs
xdsl2ChConfProfMaxBerDs
xdsl2ChConfProfMaxBerUs
xdsl2ChConfProfUsDataRateDs
xdsl2ChConfProfDsDataRateDs
xdsl2ChConfProfUsDataRateUs
xdsl2ChConfProfDsDataRateUs
xdsl2ChConfProfilemaEnabled
xdsl2ChConfProfMaxDelayVar
xdsl2ChConfProfInitPolicy
xdsl2ChConfProfRowStatus
xdsl2LAlarmConfTempTemplateName
xdsl2LAlarmConfTempLineProfile
xdsl2LAlarmConfTempChan1ConfProfile
xdsl2LAlarmConfTempChan2ConfProfile
xdsl2LAlarmConfTempChan3ConfProfile
xdsl2LAlarmConfTempChan4ConfProfile
xdsl2LAlarmConfTempRowStatus
xdsl2LAlarmConfProfileName
xdsl2LAlarmConfProfileXtucThresh15MinFecs
xdsl2LAlarmConfProfileXtucThresh15MinEs
xdsl2LAlarmConfProfileXtucThresh15MinSes
xdsl2LAlarmConfProfileXtucThresh15MinLoss
xdsl2LAlarmConfProfileXtucThresh15MinUas
xdsl2LAlarmConfProfileXturThresh15MinFecs
xdsl2LAlarmConfProfileXturThresh15MinEs
xdsl2LAlarmConfProfileXturThresh15MinSes
xdsl2LAlarmConfProfileXturThresh15MinLoss
xdsl2LAlarmConfProfileXturThresh15MinUas
xdsl2LAlarmConfProfileThresh15MinFailedFullInt
xdsl2LAlarmConfProfileThresh15MinFailedShrtInt
Note, also, that the interface indices in this MIB are maintained persistently. View-based Access Control Model (VACM) data relating to these SHOULD be stored persistently as well [RFC3410].

### 2.6. Line Topology

A VDSL2/ADSL/ADSL2 and ADSL2+ Line consists of two units: atuc or vtuc (a central office termination unit) and atur or vtur (a remote termination unit). There are up to 4 channels (maximum number of channels depends on the specific DSL technology), each carrying an independent information flow, as shown in the figure below.

![Diagram of VDSL2/ADSL/ADSL2/ADSL2+ Line](image-url)

**Figure 3:** General topology for a VDSL2/ADSL/ADSL2/ADSL2+ Line

### 2.7. Counters, Interval Buckets, and Thresholds

#### 2.7.1. Counters Managed

There are various types of counters specified in this MIB. Each counter refers either to the whole VDSL2/ADSL/ADSL2/ADSL2+ line, to
one of the xTU entities, or to one of the bearer channels.

o  On the whole line level

   For full initializations, failed full initializations, short
   initializations, and for failed short initializations there are
   event counters, current 15-minute and 0 to 96 15-minute history
   bucket(s) of "interval-counters", as well as current and 0 to 30
   previous 1-day interval-counter(s). Each current 15-minute
   "failed" event bucket has an associated threshold notification.

o  On the xTU level

   For the LOS Seconds, ES, SES, FEC seconds, and UAS, there are
   event counters, current 15-minute and 0 to 96 15-minute history
   bucket(s) of "interval-counters", as well as current and 0 to 30
   previous 1-day interval-counter(s). Each current 15-minute event
   bucket has an associated threshold notification.

o  On the bearer channel level

   For the coding violations (CRC anomalies) and corrected blocks
   (i.e., FEC events) there are event counters, current 15-minute and
   0 to 96 15-minute history bucket(s) of "interval-counters", as
   well as current and 0 to 30 previous 1-day interval-counter(s). Each current 15-minute event
   bucket has an associated threshold notification.

2.7.2. Minimum Number Of Buckets

   Although it is possible to support up to 96 15-minute history buckets
   of "interval-counters", systems implementing this MIB module SHOULD
   practically support at least 16 buckets, as specified in ITU-T
   G.997.1, paragraph #7.2.7.9.

   Similarly, it is possible to support up to 30 previous 1-day
   "interval-counters", but systems implementing this MIB module SHOULD
   support at least 1 previous day bucket.

2.7.3. Interval Buckets Initialization

   There is no requirement for an agent to ensure a fixed relationship
   between the start of a 15-minute interval and any wall clock;
   however, some implementations may align the 15-minute intervals with
   quarter hours. Likewise, an implementation may choose to align one
   day intervals with the start of a day.

   Counters are not reset when an xTU is reinitialized, only when the
agent is reset or reinitialized (or under specific request outside the scope of this MIB module).

2.7.4. Interval Buckets Validity

As in RFC 3593 [RFC3593] and RFC 2662 [RFC2662], in case the data for an interval is suspect or known to be invalid, the agent MUST report the interval as invalid. If the current 15-minute event bucket is determined to be invalid, the element management system SHOULD ignore its content and the agent MUST NOT generate notifications based upon the value of the event bucket.

A valid 15-minute event bucket SHOULD usually count the events for exactly 15 minutes. Similarly, a valid 1-day event bucket SHOULD usually count the events for exactly 24 hours. However, the following scenarios are exceptional:

1) For implementations that align the 15-minute intervals with quarter hours, and the 1-day intervals with start of a day, the management system may still start the PM process not aligned with the wall clock. Such a management system may wish to retrieve even partial information for the first event buckets, rather than declaring them all as invalid.

2) For an event bucket that suffered relatively short outages, the management system may wish to retrieve the available PM outcomes, rather than declaring the whole event bucket as invalid. This is more important for 1-day event buckets.

3) An event bucket may be shorter or longer than the formal duration if a clock adjustment was performed during the interval.

This MIB allows supporting the exceptional scenarios described above by reporting the actual Monitoring Time of a monitoring interval. This parameter is relevant only for Valid intervals, but is useful for these exceptional scenarios:

a) The management system MAY still declare a partial PM interval as Valid and report the actual number of seconds the interval lasted.

b) If the interval was shortened or extended due to clock corrections, the management system SHOULD report the actual number of seconds the interval lasted, beside reporting that the interval is Valid.

2.8. Profiles

As a managed node can handle a large number of xTUs, (e.g., hundreds or perhaps thousands of lines), provisioning every parameter on every xTU may become burdensome. Moreover, most lines are provisioned identically with the same set of parameters. To simplify the provisioning process, this MIB module makes use of profiles and templates.
A configuration profile is a set of parameters that can be shared by multiple entities. There is a configuration profile to address line-level provisioning and another type of profile that addresses channel-level provisioning parameters.

A configuration template is actually a profile-of-profiles. That is, a template is comprised of one line configuration profile and one or more channel configuration profiles. A template provides the complete configuration of a line. The same configuration can be shared by multiple lines.

In a similar manner to the configuration profiles and templates, this MIB module makes use of templates and profiles for specifying the alarm thresholds associated with performance parameters. This allows provisioning multiple lines with the same criteria for generating threshold crossing notifications.

The following paragraphs describe templates and profiles used in this MIB module

2.8.1. Configuration Profiles And Templates

- Line Configuration Profiles - Line configuration profiles contain line-level parameters for configuring VDSL2/ADSL/ADSL2 and ADSL2+ lines. They are defined in the xdsl2LineConfProfTable.

  The line configuration includes settings such as the specific VDSL2/ADSL/ADSL2 or ADSL2+ modes to enable on the respective line, power spectrum parameters, rate adaptation criteria, and SNR margin-related parameters. A subset of the line configuration parameters depends upon the specific xDSL Mode allowed (i.e., Does the profile allow VDSL2, ADSL, ADSL2 and/or ADSL2+?) as well as what annex/annexes of the standard are allowed. This is the reason a line profile MUST include one or more mode-specific extensions.

- Channel Configuration Profiles - Channel configuration profiles contain parameters for configuring bearer channels over the VDSL2/ADSL/ADSL2 and ADSL2+ lines. They are sometimes considered as the service layer configuration of the VDSL2/ADSL/ADSL2 and ADSL2+ lines. They are defined in the xdsl2ChConfProfTable.

  The channel configuration includes issues such as the desired minimum and maximum rate on each traffic flow direction and impulse noise protection parameters.
o Line Configuration Templates - Line configuration templates allow combining line configuration profiles and channel configuration profiles into a comprehensive configuration of the VDSL2/ADSL/ADSL2 and ADSL2+ line. They are defined in the
xdsl2LineConfTemplateTable.

The line configuration template includes one index of a line configuration profile and one to four indexes of channel configuration profiles. The template also addresses the issue of distributing the excess available data rate on each traffic flow direction (i.e., the data rate left after each channel is allocated a data rate to satisfy its minimum requested data rate) among the various channels.

2.8.2. Alarm Configuration Profiles And Templates

o Line Alarm Configuration Profiles - Line-level Alarm configuration profiles contain the threshold values for Performance Monitoring (PM) parameters, counted either on the whole line level or on an xTU level. Thresholds are required only for failures and anomalies. E.g., there are thresholds for failed initializations and LOS seconds, but not for the aggregate number of full initializations. These profiles are defined in the
xdsl2LineAlarmConfProfileTable.

o Channel Alarm Configuration Profiles - Channel-level Alarm configuration profiles contain the threshold values for PM parameters counted on a bearer channel level. Thresholds are defined for two types of anomalies: corrected blocks and coding violations. These profiles are defined in the
xdsl2ChAlarmConfProfileTable.

o Line Alarm Configuration Templates - Line Alarm configuration templates allow combining line-level alarm configuration profiles and channel-level alarm configuration profiles into a comprehensive configuration of the PM thresholds for the VDSL2/ADSL/ADSL2 and ADSL2+ line. They are defined in the
xdsl2LineAlarmConfTemplateTable.

The line alarm configuration template includes one index of a line-level alarm configuration profile and one to four indexes of channel-level alarm configuration profiles.

2.8.3. Managing Profiles And Templates

The index value for each profile and template is a locally-unique, administratively assigned name having the textual convention


'SnmpAdminString' (RFC 3411 [RFC3411]).

One or more lines may be configured to share parameters of a single configuration template (e.g., xdsl2LConfTempTemplateName = 'silver') by setting its xdsl2LineCnfgTemplate object to the value of this template.

One or more lines may be configured to share parameters of a single Alarm configuration template (e.g., xdsl2LAlarmConfTempTemplateName = 'silver') by setting its xdsl2LineAlarmCnfgTemplate object to the value of this template.

Before a template can be deleted or taken out of service, it MUST be first unreferenced from all associated lines. Implementations MAY also reject template modification while it is associated with any line.

Before a profile can be deleted or taken out of service, it MUST be first unreferenced from all associated templates. Implementations MAY also reject profile modification while it is referenced by any template.

Implementations MUST provide a default profile whose name is 'DEFVAL' for each profile and template type. The values of the associated parameters will be vendor-specific unless otherwise indicated in this document. Before a line’s templates have been set, these templates will be automatically used by setting xdsl2LineCnfgTemplate and xdsl2LineAlarmCnfgTemplate to 'DEFVAL' where appropriate. This default profile name, 'DEFVAL', is considered reserved in the context of profiles and templates defined in this MIB module.

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

If the implementation allows modifying a profile or template while it is associated with a line, then such changes MUST take effect immediately. These changes MAY result in a restart (hard reset or soft restart) of the units on the line.

Network Elements may optionally implement a fallback line configuration template (See xdsl2LineCnfgFallbackTemplate). The fallback template will be tried if the xDSL2 line fails to operate using the primary template. If the xDSL2 line fails to operate using the fallback template then the primary template should be retried. The xTU-C should continue to alternate between the primary and fallback templates until one of them succeeds.
2.8.4. Managing Multiple Bearer Channels

The number of bearer channels is configured by setting the template attributes xdsl2LConfTempChan1ConfProfile, xdsl2LConfTempChan2ConfProfile, xdsl2LConfTempChan3ConfProfile, and xdsl2LConfTempChan4ConfProfile and then assigning that template to a DSL line using the xdsl2LineCfgTemplate attribute. When the number of bearer channels for a DSL line changes, the SNMP agent will automatically create or destroy rows in channel-related tables associated with that line. For example, when a DSL line is operating with one bearer channel, there will be zero rows in channel-related tables for channels two, three, and four. The SNMP agent MUST create and destroy channel-related rows as follows:

- When the number of bearer channels for a DSL line changes to a higher number, the SNMP agent will automatically create rows in the xdsl2ChannelStatusTable, and xdsl2PMChCurrTable tables for that line.
- When the number of bearer channels for a DSL line changes to a lower number, the SNMP agent will automatically destroy rows in the xdsl2ChannelStatusTable, xdsl2PMChCurrTable, xdsl2PMChHist15MinTable and xdsl2PMChHist1DTable tables for that line.

2.9. 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., VDSL2/ADSL/ADSL2 or ADSL2+ line) is required.

A linkDown notification MAY be generated whenever any of ES, SES, CRC Anomaly, LOS, LOF, or UAS event occurs. The corresponding linkUp notification MAY be sent when all link failure conditions are cleared.

The notifications defined in this MIB module are for status change (e.g., initialization failure) and for the threshold crossings associated with the following events: Full initialization failures, short initialization failures, ES, SES, LOS Seconds, UAS, FEC Seconds, FEC events, and CRC anomalies. Each threshold has its own enable/threshold value. When that value is 0, the notification is disabled.

The xdsl2LineStatusXtur and xdsl2LineStatusXtuc are bitmasks representing all outstanding error conditions associated with the xTU-R and xTU-C (respectively). Note that since the xTU-R status is
obtained via the EOC, this information may be unavailable in case the xTU-R is unreachable via EOC during a line error condition. Therefore, not all conditions may always be included in its current status. Notifications corresponding to the bit fields in those two status objects are defined.

Note that there are other status parameters that refer to the xTU-R (e.g., downstream line attenuation). Those parameters also depend on the availability of EOC between the central office xTU and the remote xTU.

A threshold notification occurs whenever the corresponding current 15-minute interval error counter becomes equal to, or exceeds the threshold value. Only one notification SHOULD be sent per interval per interface. Since the current 15-minute counter is reset to 0 every 15 minutes, and 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.

Notifications, other than the threshold notifications listed above, SHOULD be rate-limited (throttled) such that there is an implementation-specific gap between the generation of consecutive notifications of the same event. When notifications are rate-limited, they are dropped and not queued for sending at a future time. This is intended to be a general rate-limiting statement for notifications that otherwise have no explicit rate limiting assertions in this document.

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.

3. Definitions

VDSL2-LINE-TC-MIB DEFINITIONS ::= BEGIN

IMPORTS
    MODULE-IDENTITY,
    transmission
    FROM SNMPv2-SMI
TEXTUAL-CONVENTION
FROM SNMPv2-TC;

vdsl2TCMIB MODULE-IDENTITY
LAST-UPDATED "200807010000Z" -- July 1, 2008
ORGANIZATION "ADSLMIB Working Group"
CONTACT-INFO "WG-email: adslmib@ietf.org
Info: https://www1.ietf.org/mailman/listinfo/adslmib

Chair: Mike Sneed
Sand Channel Systems
Postal: P.O. Box 37324
       Raleigh NC 27627-732
Email: sneedmike@hotmail.com
Phone: +1 206 600 7022

Co-Chair: Menachem Dodge
ECI Telecom Ltd.
Postal: 30 Hasivim St.
       Petach Tikva 49517,
       Israel.
Email: mbdodge@ieee.org
Phone: +972 3 926 8421

Co-editor: Moti Morgenstern
ECI Telecom Ltd.
Postal: 30 Hasivim St.
       Petach Tikva 49517,
       Israel.
Email: moti.morgenstern@ecitele.com
Phone: +972 3 926 6258

Co-editor: Scott Baillie
NEC Australia
Postal: 649-655 Springvale Road,
       Mulgrave, Victoria 3170,
       Australia.
Email: scott.baillie@nec.com.au
Phone: +61 3 9264 3986

Co-editor: Umberto Bonollo
NEC Australia
Postal: 649-655 Springvale Road,
       Mulgrave, Victoria 3170,
       Australia.
Email: umberto.bonollo@nec.com.au
This MIB Module provides Textual Conventions to be used by the VDSL2-LINE-MIB module for the purpose of managing VDSL2, ADSL, ADSL2 and ADSL2+ lines.

Copyright (C) The IETF Trust (2008). This version of this MIB module is part of RFC XXXX: see the RFC itself for full legal notices.

--- RFC Ed.: replace XXXX with assigned number & remove this note
REVISION "200807010000Z" -- July 1, 2008
DESCRIPTION "Initial version, published as RFC XXXX."
--- RFC Ed.: replace XX with assigned number & remove this note
::= { transmission xxx 2} -- vdsl2MIB 2
--- IANA, the xxx here must be the same as the one assigned
to the vdsl2MIB below.
--- RFC Ed.: Please fill in xxx once assigned by IANA.

------------------------------------------------
--          Textual Conventions               --
------------------------------------------------

Xdsl2Unit ::= TEXTUAL-CONVENTION
  STATUS current
  DESCRIPTION
    "Identifies a transceiver as being either xTU-C or xTU-R.
A VDSL2/ADSL/ADSL2 or ADSL2+ line consists of two transceivers, an xTU-C and an xTU-R.
In the case of ADSL/ADSL2 and ADSL2+ those two transceivers are also called atuc and atur.
In the case of VDSL2 those two transceivers are also called vtuc and vtur.
Specified as an INTEGER, the two values are:
  xtuc(1) -- central office transceiver
  xtur(2) -- remote site transceiver"
SYNTAX INTEGER {
  xtuc(1),
  xtur(2)
}

Xdsl2Direction ::= TEXTUAL-CONVENTION
  STATUS current
  DESCRIPTION
    "Identifies the direction of a band in a VDSL2/ADSL/ADSL2/
ADSL2+ link.
The upstream direction is a transmission from the remote end
(xTU-R) towards the central office end (xTU-C). The downstream direction is a transmission from the xTU-C towards the xTU-R. Specified as an INTEGER, the values are defined as follows:

SYNTAX INTEGER {
  upstream(1), -- Transmission from the xTU-R to the xTU-C.
  downstream(2) -- Transmission from the xTU-C to the xTU-R.
}

Xdsl2Band ::= TEXTUAL-CONVENTION

STATUS current
DESCRIPTION
"Identifies a band in a VDSL2/ADSL/ADSL2/ADSL2+ link.
For a band in the upstream direction, transmission is from the remote end (xTU-R) towards the central office end (xTU-C).
For a band in the downstream direction, transmission is from the xTU-C towards the xTU-R.
For ADSL, ADSL2 and ADSL2+, which use a single band in the upstream direction and a single band in the downstream direction, the only relevant values are upstream(1) and downstream(2).
For VDSL2, which uses multiple bands in each transmission direction, a band in the upstream direction is indicated by any of us0(3), us1(5), us2(7), us3(9) or us4(11) and a band in the downstream direction is indicated by any of ds1(4), ds2(6), ds3(8) or ds4(10).
For VDSL2, the values upstream(1) and downstream(2) may be used when there is a need to refer to the whole upstream or downstream traffic (e.g., report the average signal-to-noise ratio on any transmission direction).
Specified as an INTEGER, the values are defined as follows:"

SYNTAX INTEGER {
  upstream(1), -- Transmission from the xTU-R to the xTU-C
  downstream(2), -- Transmission from the xTU-C to the xTU-R
  us0(3), -- Upstream band number 0 (US0) (VDSL2).
  ds1(4), -- Downstream band number 1 (DS1) (VDSL2).
  us1(5), -- Upstream band number 1 (US1) (VDSL2).
  ds2(6), -- Downstream band number 2 (DS2) (VDSL2).
  us2(7), -- Upstream band number 2 (US2) (VDSL2).
  ds3(8), -- Downstream band number 3 (DS3) (VDSL2).
  us3(9), -- Upstream band number 3 (US3) (VDSL2).

ds4(10),   -- Downstream band number 4 (DS4) (VDSL2).
us4(11)    -- Upstream band number 4   (US4) (VDSL2).
}

Xdsl2TransmissionModeType ::= TEXTUAL-CONVENTION
STATUS      current
DESCRIPTION
"A set of xDSL line transmission modes, with one bit per mode. The notes (F) and (L) denote Full-Rate and Lite/splitterless respectively:

Bit 00 : Regional Std. (ANSI T1.413) (F)
Bit 01 : Regional Std. (ETSI DTS/TM06006) (F)
Bit 02 : G.992.1 POTS non-overlapped (F)
Bit 03 : G.992.1 POTS overlapped (F)
Bit 04 : G.992.1 ISDN non-overlapped (F)
Bit 05 : G.992.1 ISDN overlapped (F)
Bit 06 : G.992.1 TCM-ISDN non-overlapped (F)
Bit 07 : G.992.1 TCM-ISDN overlapped (F)
Bit 08 : G.992.2 POTS non-overlapped (L)
Bit 09 : G.992.2 POTS overlapped (L)
Bit 10 : G.992.2 with TCM-ISDN non-overlapped (L)
Bit 11 : G.992.2 with TCM-ISDN overlapped (L)
Bit 12 : G.992.1 TCM-ISDN symmetric (F) --- not in G.997.1
Bit 13-17: Reserved
Bit 18 : G.992.3 POTS non-overlapped (F)
Bit 19 : G.992.3 POTS overlapped (F)
Bit 20 : G.992.3 ISDN non-overlapped (F)
Bit 21 : G.992.3 ISDN overlapped (F)
Bit 22-23: Reserved
Bit 24 : G.992.4 POTS non-overlapped (L)
Bit 25 : G.992.4 POTS overlapped (L)
Bit 26-27: Reserved
Bit 28 : G.992.3 Annex I All-Digital non-overlapped (F)
Bit 29 : G.992.3 Annex I All-Digital overlapped (F)
Bit 30 : G.992.3 Annex J All-Digital non-overlapped (F)
Bit 31 : G.992.3 Annex J All-Digital overlapped (F)
Bit 32 : G.992.4 Annex I All-Digital non-overlapped (L)
Bit 33 : G.992.4 Annex I All-Digital overlapped (L)
Bit 34 : G.992.3 Annex L POTS non-overlapped, mode 1, wide U/S (F)
Bit 35 : G.992.3 Annex L POTS non-overlapped, mode 2, narrow U/S (F)
Bit 36 : G.992.3 Annex L POTS overlapped, mode 3, wide U/S (F)
Bit 37 : G.992.3 Annex L POTS overlapped, mode 4, narrow U/S (F)
Bit 38 : G.992.3 Annex M POTS non-overlapped (F)
Bit 39 : G.992.3 Annex M POTS overlapped (F)
Bit 40 : G.992.5 POTS non-overlapped (F)
Bit 41 : G.992.5 POTS overlapped (F)
Bit 42 : G.992.5 ISDN non-overlapped (F)
Bit 43 : G.992.5 ISDN overlapped (F)
Bit 44-45: Reserved
Bit 46 : G.992.5 Annex I All-Digital non-overlapped (F)
Bit 47 : G.992.5 Annex I All-Digital overlapped (F)
Bit 48 : G.992.5 Annex J All-Digital non-overlapped (F)
Bit 49 : G.992.5 Annex J All-Digital overlapped (F)
Bit 50 : G.992.5 Annex M POTS non-overlapped (F)
Bit 51 : G.992.5 Annex M POTS overlapped (F)
Bit 52-55: Reserved
Bit 56 : G.993.2 Annex A
Bit 57 : G.993.2 Annex B
Bit 58 : G.993.2 Annex C
Bit 59-63: Reserved

SYNTAX BITS {
  ansit1413(0),
  etsi(1),
  g9921PotsNonOverlapped(2),
  g9921PotsOverlapped(3),
  g9921isdnNonOverlapped(4),
  g9921isdnOverlapped(5),
  g9921tcmIsdnNonOverlapped(6),
  g9921tcmIsdnOverlapped(7),
  g9922potsNonOverlapped(8),
  g9922potsOverlapped(9),
  g9922tcmIsdnNonOverlapped(10),
  g9922tcmIsdnOverlapped(11),
  g9921tcmIsdnSymmetric(12),
  reserved1(13),
  reserved2(14),
  reserved3(15),
  reserved4(16),
  reserved5(17),
  g9923PotsNonOverlapped(18),
  g9923PotsOverlapped(19),
  g9923isdnNonOverlapped(20),
  g9923isdnOverlapped(21),
  reserved6(22),
  reserved7(23),
  g9924potsNonOverlapped(24),
  g9924potsOverlapped(25),
  reserved8(26),
  reserved9(27),
  g9923AnnexIAllDigNonOverlapped(28),
  g9923AnnexIAllDigOverlapped(29),
  g9923AnnexJAllDigNonOverlapped(30),
g9923AnnexJAllDigOverlapped(31),
g9924AnnexIAllDigNonOverlapped(32),
g9924AnnexIAllDigOverlapped(33),
g9923AnnexLMode1NonOverlapped(34),
g9923AnnexLMode2NonOverlapped(35),
g9923AnnexLMode3Overlapped(36),
g9923AnnexLMode4Overlapped(37),
g9923AnnexMPotsNonOverlapped(38),
g9923AnnexMPotsOverlapped(39),
g9925PotsNonOverlapped(40),
g9925PotsOverlapped(41),
g9925IsdnNonOverlapped(42),
g9925IsdnOverlapped(43),
reserved10(44),
reserved11(45),
g9925AnnexIAllDigNonOverlapped(46),
g9925AnnexIAllDigOverlapped(47),
g9925AnnexJAllDigNonOverlapped(48),
g9925AnnexJAllDigOverlapped(49),
g9925AnnexMPotsNonOverlapped(50),
g9925AnnexMPotsOverlapped(51),
reserved12(52),
reserved13(53),
reserved14(54),
reserved15(55),
g9932AnnexA(56),
g9932AnnexB(57),
g9932AnnexC(58),
reserved16(59),
reserved17(60),
reserved18(61),
reserved19(62),
reserved20(63)
}

Xdsl2RaMode ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION
"Specifies the rate adaptation behavior for the line.
The three possible behaviors are:
manual (1) - No Rate-Adaptation. The initialization
process attempts to synchronize to a
specified rate.
raInit (2) - Rate-Adaptation during initialization process
only, which attempts to synchronize to a rate
between minimum and maximum specified values.
dynamicRa (3) - Dynamic Rate-Adaptation during initialization
process as well as during SHOWTIME"
SYNTAX INTEGER {
    manual(1),
    raInit(2),
    dynamicRa(3)
}

Xdsl2InitResult ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION
"Specifies the result of full initialization attempt; the
six possible result values are:
noFail (0) - Successful initialization
configError (1) - Configuration failure
configNotFeasible (2) - Configuration details not supported
commFail (3) - Communication failure
noPeerAtu (4) - Peer ATU not detected
otherCause (5) - Other initialization failure
reason"

SYNTAX INTEGER {
    noFail(0),
    configError(1),
    configNotFeasible(2),
    commFail(3),
    noPeerAtu(4),
    otherCause(5)
}

Xdsl2OperationModes ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION
"The VDSL2 management model specified includes an xDSL Mode
attribute which identifies an instance of xDSL Mode-Specific
PSD Configuration object in the xDSL Line Profile. The
following classes of xDSL operating mode are defined.
The notes (F) and (L) denote Full-Rate and Lite/splitterless respectively:

<table>
<thead>
<tr>
<th>Value</th>
<th>xDSL operation mode description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>- The default/generic PSD configuration. Default configuration will be used when no other matching mode-specific configuration can be found.</td>
</tr>
<tr>
<td>2</td>
<td>- Regional Std. (ANSI T1.413) (F)</td>
</tr>
<tr>
<td>3</td>
<td>- Regional Std. (ETSI DTS/TM06006) (F)</td>
</tr>
<tr>
<td>4</td>
<td>- G.992.1 POTS non-overlapped (F)</td>
</tr>
<tr>
<td>5</td>
<td>- G.992.1 POTS overlapped (F)</td>
</tr>
<tr>
<td>6</td>
<td>- G.992.1 ISDN non-overlapped (F)</td>
</tr>
<tr>
<td>7</td>
<td>- G.992.1 ISDN overlapped (F)</td>
</tr>
<tr>
<td>Feature</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>8</td>
<td>G.992.1 TCM-ISDN non-overlapped (F)</td>
</tr>
<tr>
<td>9</td>
<td>G.992.1 TCM-ISDN overlapped (F)</td>
</tr>
<tr>
<td>10</td>
<td>G.992.2 POTS non-overlapped (L)</td>
</tr>
<tr>
<td>11</td>
<td>G.992.2 POTS overlapped (L)</td>
</tr>
<tr>
<td>12</td>
<td>G.992.2 with TCM-ISDN non-overlapped (L)</td>
</tr>
<tr>
<td>13</td>
<td>G.992.2 with TCM-ISDN overlapped (L)</td>
</tr>
<tr>
<td>14</td>
<td>G.992.1 TCM-ISDN symmetric (F) --- not in G.997.1</td>
</tr>
<tr>
<td>20</td>
<td>G.992.3 POTS non-overlapped (F)</td>
</tr>
<tr>
<td>21</td>
<td>G.992.3 POTS overlapped (F)</td>
</tr>
<tr>
<td>22</td>
<td>G.992.3 ISDN non-overlapped (F)</td>
</tr>
<tr>
<td>23</td>
<td>G.992.3 ISDN overlapped (F)</td>
</tr>
<tr>
<td>24-25</td>
<td>Unused. Reserved for future ITU-T specification.</td>
</tr>
<tr>
<td>26</td>
<td>G.992.4 POTS non-overlapped (L)</td>
</tr>
<tr>
<td>27</td>
<td>G.992.4 POTS overlapped (L)</td>
</tr>
<tr>
<td>30</td>
<td>G.992.3 Annex I All-Digital non-overlapped (F)</td>
</tr>
<tr>
<td>31</td>
<td>G.992.3 Annex I All-Digital overlapped (F)</td>
</tr>
<tr>
<td>32</td>
<td>G.992.3 Annex J All-Digital non-overlapped (F)</td>
</tr>
<tr>
<td>33</td>
<td>G.992.3 Annex J All-Digital overlapped (F)</td>
</tr>
<tr>
<td>34</td>
<td>G.992.4 Annex I All-Digital non-overlapped (L)</td>
</tr>
<tr>
<td>35</td>
<td>G.992.4 Annex I All-Digital overlapped (L)</td>
</tr>
<tr>
<td>36</td>
<td>G.992.3 Annex L POTS non-overlapped, mode 1, wide U/S (F)</td>
</tr>
<tr>
<td>37</td>
<td>G.992.3 Annex L POTS non-overlapped, mode 2, narrow U/S (F)</td>
</tr>
<tr>
<td>38</td>
<td>G.992.3 Annex L POTS overlapped, mode 3, wide U/S (F)</td>
</tr>
<tr>
<td>39</td>
<td>G.992.3 Annex L POTS overlapped, mode 4, narrow U/S (F)</td>
</tr>
<tr>
<td>40</td>
<td>G.992.3 Annex M POTS non-overlapped (F)</td>
</tr>
<tr>
<td>41</td>
<td>G.992.3 Annex M POTS overlapped (F)</td>
</tr>
<tr>
<td>42</td>
<td>G.992.5 POTS non-overlapped (F)</td>
</tr>
<tr>
<td>43</td>
<td>G.992.5 POTS overlapped (F)</td>
</tr>
<tr>
<td>44</td>
<td>G.992.5 ISDN non-overlapped (F)</td>
</tr>
<tr>
<td>45</td>
<td>G.992.5 ISDN overlapped (F)</td>
</tr>
<tr>
<td>48</td>
<td>G.992.5 Annex I All-Digital non-overlapped (F)</td>
</tr>
<tr>
<td>49</td>
<td>G.992.5 Annex I All-Digital overlapped (F)</td>
</tr>
<tr>
<td>50</td>
<td>G.992.5 Annex J All-Digital non-overlapped (F)</td>
</tr>
<tr>
<td>51</td>
<td>G.992.5 Annex J All-Digital overlapped (F)</td>
</tr>
<tr>
<td>52</td>
<td>G.992.5 Annex M POTS non-overlapped (F)</td>
</tr>
<tr>
<td>53</td>
<td>G.992.5 Annex M POTS overlapped (F)</td>
</tr>
<tr>
<td>54-57</td>
<td>Unused. Reserved for future ITU-T specification.</td>
</tr>
<tr>
<td>58</td>
<td>G.993.2 Annex A</td>
</tr>
<tr>
<td>59</td>
<td>G.993.2 Annex B</td>
</tr>
<tr>
<td>60</td>
<td>G.993.2 Annex C</td>
</tr>
</tbody>
</table>
SYNTAX INTEGER {
    defMode(1),
    ansiti413(2),
    etsi(3),
    g9921PotsNonOverlapped(4),
    g9921PotsOverlapped(5),
    g9921IsdnNonOverlapped(6),
    g9921IsdnOverlapped(7),
    g9921tcmIsdnNonOverlapped(8),
    g9921tcmIsdnOverlapped(9),
    g9922PotsNonOverlapped(10),
    g9922PotsOverlapped(11),
    g9922tcmIsdnNonOverlapped(12),
    g9922tcmIsdnOverlapped(13),
    g9921tcmIsdnSymmetric(14),
    g9923PotsNonOverlapped(20),
    g9923PotsOverlapped(21),
    g9923IsdnNonOverlapped(22),
    g9923IsdnOverlapped(23),
    g9924PotsNonOverlapped(26),
    g9924PotsOverlapped(27),
    g9923AnnexIA11DigNonOverlapped(30),
    g9923AnnexIA11DigOverlapped(31),
    g9923AnnexJAl1DigNonOverlapped(32),
    g9923AnnexJAl1DigOverlapped(33),
    g9924AnnexIA11DigNonOverlapped(34),
    g9924AnnexIA11DigOverlapped(35),
    g9923AnnexLMode1NonOverlapped(36),
    g9923AnnexLMode2NonOverlapped(37),
    g9923AnnexLMode3Overlapped(38),
    g9923AnnexLMode4Overlapped(39),
    g9923AnnexMPotsNonOverlapped(40),
    g9923AnnexMPotsOverlapped(41),
    g9925PotsNonOverlapped(42),
    g9925PotsOverlapped(43),
    g9925IsdnNonOverlapped(44),
    g9925IsdnOverlapped(45),
    g9925AnnexIA11DigNonOverlapped(48),
    g9925AnnexIA11DigOverlapped(49),
    g9925AnnexJAl1DigNonOverlapped(50),
    g9925AnnexJAl1DigOverlapped(51),
    g9925AnnexMPotsNonOverlapped(52),
    g9925AnnexMPotsOverlapped(53),
    g9932AnnexA(58),
    g9932AnnexB(59),
    g9932AnnexC(60)
}
Xdsl2PowerMngState ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION
"Attributes with this syntax uniquely identify each power
management state defined for the VDSL2/ADSL/ADSL2 or ADSL2+
link.
In VDSL2, only L0 and L3 states are defined.
The possible values are:
  10(1)  - (L0): Full power management state
  11(2)  - (L1): Low power management state
    (for G.992.2)
  12(3)  - (L2): Low power management state
    (for G.992.3, G.992.4 and G.992.5)
  13(4)  - (L3): Idle power management state"

SYNTAX      INTEGER {
    10(1),
    11(2),
    12(3),
    13(4)
}

Xdsl2ConfPmsForce ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION
"Attributes with this syntax are configuration parameters
that reference the desired power management state for the
VDSL2/ADSL/ADSL2 or ADSL2+ link
In VDSL2, only L0 and L3 states are defined:
  l3toL0 (0)         - Perform a transition from L3 to L0
                      (Full power management state)
  l0toL2 (2)         - Perform a transition from L0 to L2
                      (Low power management state)
  l0orL2toL3 (3)     - Perform a transition into L3 (Idle
                      power management state)"

SYNTAX      INTEGER {
    l3toL0 (0),
    l0toL2 (2),
    l0orL2toL3 (3)
}

Xdsl2LinePmMode ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION
"Attributes with this syntax are configuration parameters
that reference the power modes/states into which the xTU-C or
xTU-R may autonomously transit.
It is a BITS structure that allows control of the following transit options:

- allowTransitionsToIdle (0) - xTU may autonomously transit to idle (L3) state.
- allowTransitionsToLowPower (1) - xTU may autonomously transit to low-power (L1/L2) state.

SYNTAX BITS {
    allowTransitionsToIdle(0),
    allowTransitionsToLowPower(1)
}

Xdsl2LineLdsf ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION
"Attributes with this syntax are configuration parameters that control the Loop Diagnostic mode for a VDSL2/ADSL/ADSL2 or ADSL2+ link. The possible values are:
- inhibit (0) - Inhibit Loop Diagnostic mode
- force (1) - Force/Initiate Loop Diagnostic mode"

SYNTAX INTEGER {
    inhibit(0),
    force(1)
}

Xdsl2LdsfResult ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION
"Possible failure reasons associated with performing Dual Ended Loop Test (DELT) on a DSL line. Possible values are:
- none (1) - The default value in case LDSF was never requested for the associated line.
- success (2) - The recent command completed successfully.
- inProgress (3) - The Loop Diagnostics process is in progress.
- unsupported (4) - The NE or the line card doesn’t support LDSF.
- cannotRun (5) - The NE cannot initiate the command, due to a nonspecific reason.
- aborted (6) - The Loop Diagnostics process aborted.
- failed (7) - The Loop Diagnostics process failed.
- illegalMode (8) - The NE cannot initiate the command, due to the specific mode of the relevant line."
adminUp     (9) - The NE cannot initiate the command, as the relevant line is administratively 'Up'.

tableFull   (10)- The NE cannot initiate the command, due to reaching the maximum number of rows in the results table.

noResources (11)- The NE cannot initiate the command, due to lack of internal memory resources.

SYNTAX INTEGER {
  none (1),
  success (2),
  inProgress (3),
  unsupported (4),
  cannotRun (5),
  aborted (6),
  failed (7),
  illegalMode (8),
  adminUp (9),
  tableFull (10),
  noResources (11)
}

Xdsl2LineBpsc ::= TEXTUAL-CONVENTION
  STATUS current
  DESCRIPTION
    "Attributes with this syntax are configuration parameters that control the bits per subcarrier measurement for a VDSL2/ADSL/ADSL2 or ADSL2+ link. The possible values are:
    idle    (1)  - Idle state
    measure (2)  - Measure the bits per subcarrier"

SYNTAX INTEGER {
  idle(1),
  measure(2)
}

Xdsl2BpscResult ::= TEXTUAL-CONVENTION
  STATUS current
  DESCRIPTION
    "Possible failure reasons associated with performing a bits per subcarrier measurement on a DSL line. Possible values are:
    none        (1) - The default value, in case a measurement was never requested for the associated line.
    success     (2) - The recent measurement request completed successfully."
inProgress (3) - The bits per subcarrier measurement is in progress.
unsupported (4) - The bits per subcarrier request mechanism is not supported.
failed (5) - The measurement request has failed and no results are available.
noResources (6) - The NE cannot initiate the command, due to lack of internal memory resources.

SYNTAX INTEGER {
    none(1),
    success(2),
    inProgress(3),
    unsupported(4),
    failed(5),
    noResources(6)
}

Xdsl2LineReset ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION  "This type is used to request a line reset to occur.
    idle (1) - This state indicates that there is currently no request for a line reset.
    reset (2) - This state indicates that a line reset request has been issued."

SYNTAX INTEGER {
    idle(1),
    reset(2)
}

Xdsl2LineProfiles ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION  "Attributes with this syntax reference the list of ITU-T G.993.2 implementation profiles supported by an xTU, enabled on the VDSL2 line or active on that line."

SYNTAX BITS {
    profile8a(0),
    profile8b(1),
    profile8c(2),
    profile8d(3),
    profile12a(4),
    profile12b(5),
    profile17a(6),
    profile30a(7)
}
Xdsl2LineClassMask ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION "VDSL2 PSD Mask Class.
The limit Power Spectral Density masks are grouped in the following PSD mask classes:

Class 997-M1x Annex B: 997-M1x-M-8, 997-M1x-M.
Class 998-M1x Annex B: 998-M1x-A, 998-M1x-B, 998-M1x-NUS0.
Class 998-B Annex C: POTS-138b, POTS-276b per C.2.1.1 in G.993.2, TCM-ISDN per C.2.1.2 in G.993.2.
Class 998-CO Annex C: POTS-138co, POTS-276co per C.2.1.1 in G.993.2.
Class HPE-M1 Annex B: HPE17-M1-NUS0, HPE30-M1-NUS0."
SYNTAX INTEGER {
    none(1),
    a998ORb997M1cORc998B2(2),
    b997M1xOR998co3(3),
    b997M2x4(4),
    b998M1x5(5),
    b998M2x6(6),
    b998AdeM2x7(7),
    bHpeM18(8)
}

Xdsl2LineLimitMask ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION "The G.993.2 limit PSD mask for each class of profile. The profiles are grouped in following profile classes:
- Class 8: Profiles 8a, 8b, 8c, 8d
- Class 12: Profiles 12a, 12b"
- Class 17: Profile 17a
- Class 30: Profile 30a.

SYNTAX BITS {
  profile8Limit1(0),
  profile8Limit2(1),
  profile8Limit3(2),
  profile8Limit4(3),
  profile8Limit5(4),
  profile8Limit6(5),
  profile8Limit7(6),
  profile8Limit8(7),
  profile8Limit9(8),
  profile8Limit10(9),
  profile8Limit11(10),
  profile8Limit12(11),
  profile8Limit13(12),
  profile8Limit14(13),
  profile8Limit15(14),
  profile8Limit16(15),
  --
  profile12Limit1(16),
  profile12Limit2(17),
  profile12Limit3(18),
  profile12Limit4(19),
  profile12Limit5(20),
  profile12Limit6(21),
  profile12Limit7(22),
  profile12Limit8(23),
  profile12Limit9(24),
  profile12Limit10(25),
  profile12Limit11(26),
  profile12Limit12(27),
  profile12Limit13(28),
  profile12Limit14(29),
  profile12Limit15(30),
  profile12Limit16(31),
  --
  profile17Limit1(32),
  profile17Limit2(33),
  profile17Limit3(34),
  profile17Limit4(35),
  profile17Limit5(36),
  profile17Limit6(37),
  profile17Limit7(38),
  profile17Limit8(39),
  profile17Limit9(40),
  profile17Limit10(41),
profile17Limit11(42),
profile17Limit12(43),
profile17Limit13(44),
profile17Limit14(45),
profile17Limit15(46),
profile17Limit16(47),

--
profile30Limit1(48),
profile30Limit2(49),
profile30Limit3(50),
profile30Limit4(51),
profile30Limit5(52),
profile30Limit6(53),
profile30Limit7(54),
profile30Limit8(55),
profile30Limit9(56),
profile30Limit10(57),
profile30Limit11(58),
profile30Limit12(59),
profile30Limit13(60),
profile30Limit14(61),
profile30Limit15(62),
profile30Limit16(63)
}

Xdsl2LineUs0Disable ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION
"Indicates if US0 is disabled for each limit PSD mask.
The profiles are grouped in following profile classes:
- Class 8: Profiles 8a, 8b, 8c, 8d
- Class 12: Profiles 12a, 12b
- Class 17: Profile 17a
- Class 30: Profile 30a."

SYNTAX BITS {
  profile8Us0Disable1(0),
  profile8Us0Disable2(1),
  profile8Us0Disable3(2),
  profile8Us0Disable4(3),
  profile8Us0Disable5(4),
  profile8Us0Disable6(5),
  profile8Us0Disable7(6),
  profile8Us0Disable8(7),
  profile8Us0Disable9(8),
  profile8Us0Disable10(9),
  profile8Us0Disable11(10),
  profile8Us0Disable12(11),
}
profile8Us0Disable13(12),
profile8Us0Disable14(13),
profile8Us0Disable15(14),
profile8Us0Disable16(15),

profile12Us0Disable1(16),
profile12Us0Disable2(17),
profile12Us0Disable3(18),
profile12Us0Disable4(19),
profile12Us0Disable5(20),
profile12Us0Disable6(21),
profile12Us0Disable7(22),
profile12Us0Disable8(23),
profile12Us0Disable9(24),
profile12Us0Disable10(25),
profile12Us0Disable11(26),
profile12Us0Disable12(27),
profile12Us0Disable13(28),
profile12Us0Disable14(29),
profile12Us0Disable15(30),
profile12Us0Disable16(31),

profile17Us0Disable1(32),
profile17Us0Disable2(33),
profile17Us0Disable3(34),
profile17Us0Disable4(35),
profile17Us0Disable5(36),
profile17Us0Disable6(37),
profile17Us0Disable7(38),
profile17Us0Disable8(39),
profile17Us0Disable9(40),
profile17Us0Disable10(41),
profile17Us0Disable11(42),
profile17Us0Disable12(43),
profile17Us0Disable13(44),
profile17Us0Disable14(45),
profile17Us0Disable15(46),
profile17Us0Disable16(47),

profile30Us0Disable1(48),
profile30Us0Disable2(49),
profile30Us0Disable3(50),
profile30Us0Disable4(51),
profile30Us0Disable5(52),
profile30Us0Disable6(53),
profile30Us0Disable7(54),
profile30Us0Disable8(55),
profile30Us0Disable9(56),
Xdsl2LineUs0Mask ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION
"The US0 PSD masks to be allowed by the near-end xTU on
the line. This parameter is only defined for G.993.2 Annex A.
It is represented as a bitmap (0 if not allowed and 1 if
allowed) with the following definitions."

SYNTAX BITS {
   eu32(0),
   eu36(1),
   eu40(2),
   eu44(3),
   eu48(4),
   eu52(5),
   eu56(6),
   eu60(7),
   --
   eu64(8),
   eu128(9),
   reserved1(10),
   reserved2(11),
   reserved3(12),
   reserved4(13),
   reserved5(14),
   reserved6(15),
   --
   adlu32(16),
   adlu36(17),
   adlu40(18),
   adlu44(19),
   adlu48(20),
   adlu52(21),
   adlu56(22),
   adlu60(23),
   --
   adlu64(24),
   adlu128(25),
   reserved7(26),
reserved8(27),
reserved9(28),
reserved10(29),
reserved11(30),
reserved12(31)

Xdsl2SymbolProtection ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION
"This type specifies the minimum impulse noise protection
for the bearer channel if it is transported over DMT symbols
with a subcarrier spacing of 4.3125 kHz.
The possible values are:
noProtection (i.e., INP not required), halfSymbol (i.e., INP
length is 1/2 symbol), and 1-16 symbols in steps of 1
symbol"
SYNTAX INTEGER {
  noProtection (1),
  halfSymbol (2),
  singleSymbol (3),
  twoSymbols (4),
  threeSymbols (5),
  fourSymbols (6),
  fiveSymbols (7),
  sixSymbols (8),
  sevenSymbols (9),
  eightSymbols (10),
  nineSymbols (11),
  tenSymbols (12),
  elevenSymbols (13),
  twelveSymbols (14),
  thirteeSymbols (15),
  fourteenSymbols (16),
  fifteenSymbols (17),
  sixteenSymbols (18)
}

Xdsl2SymbolProtection8 ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION
"This type specifies the minimum impulse noise protection
for the bearer channel if it is transported over DMT symbols
with a subcarrier spacing of 8.625 kHz.
The possible values are:
noProtection (i.e., INP not required) and 1-16 symbols in
steps of 1 symbol"
SYNTAX      INTEGER {
  noProtection (1),
  singleSymbol (2),
  twoSymbols (3),
  threeSymbols (4),
  fourSymbols (5),
  fiveSymbols (6),
  sixSymbols (7),
  sevenSymbols (8),
  eightSymbols (9),
  nineSymbols (10),
  tenSymbols (11),
  elevenSymbols (12),
  twelveSymbols (13),
  thirteeSymbols (14),
  fourteenSymbols (15),
  fifteenSymbols (16),
  sixteenSymbols (17)
}

Xdsl2MaxBer ::= TEXTUAL-CONVENTION
STATUS      current
DESCRIPTION  "Attributes with this syntax are configuration parameters
  that reference the maximum Bit Error Rate (BER).
  The possible values are:

  eminus3 (1)   - Maximum BER=E^-3
  eminus5 (2)   - Maximum BER=E^-5
  eminus7 (3)   - Maximum BER=E^-7"

SYNTAX      INTEGER {
  eminus3(1),
  eminus5(2),
  eminus7(3)
}

Xdsl2ChInitPolicy ::= TEXTUAL-CONVENTION
STATUS      current
DESCRIPTION  "This syntax serves for channel configuration parameters
  that reference the channel initialization policy.
  The possible values are:

  policy0 (1)   - Policy 0 according to the applicable standard
  policy1 (2)   - Policy 1 according to the applicable standard"

SYNTAX      INTEGER {
  policy0(1),
  policy1(2)
}
Xdsl2ScMaskDs ::= TEXTUAL-CONVENTION
STATUS    current
DESCRIPTION
"Each one of the 4096 bits in this OCTET STRING array
represents the corresponding bin in the downstream direction.
A value of one indicates that the bin is not in use."
SYNTAX    OCTET STRING (SIZE(0..512))

Xdsl2ScMaskUs ::= TEXTUAL-CONVENTION
STATUS    current
DESCRIPTION
"Each one of the 4096 bits in this OCTET STRING array
represents the corresponding bin in the upstream direction.
A value of one indicates that the bin is not in use."
SYNTAX    OCTET STRING (SIZE(0..512))

Xdsl2CarMask ::= TEXTUAL-CONVENTION
STATUS    current
DESCRIPTION
"This type defines an array of bands. Each band is
represented by 4 octets and there is a maximum of 32 bands
allowed.
Each band consists of a 16 bit start subcarrier index followed by
a 16 bit stop subcarrier index."
SYNTAX    OCTET STRING (SIZE(0..128))

Xdsl2RfiBands ::= TEXTUAL-CONVENTION
STATUS    current
DESCRIPTION
"This type defines a subset of downstream PSD mask
breakpoints used to notch radio frequency interference (RFI)
bands.
Each RFI band is represented by 4 octets: 16 bit start subcarrier
index followed by a 16 bit stop subcarrier index.
There is a maximum of 16 RFI bands allowed."
SYNTAX    OCTET STRING (SIZE(0..64))

Xdsl2PsdMaskDs ::= TEXTUAL-CONVENTION
STATUS    current
DESCRIPTION
"This is a structure that represents up to 32 PSD Mask
breakpoints.
Each breakpoint occupies 3 octets: The first
two octets hold the index of the subcarrier associated with the
breakpoint. The third octet holds the PSD reduction at the
breakpoint from 0 (0dBm/Hz) to 255 (-127.5 dBm/Hz) using units of
SYNTAX OCTET STRING (SIZE(0..96))

Xdsl2PsdMaskUs ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION "This is a structure that represents up to 16 PSD Mask breakpoints.
Each breakpoint occupies 3 octets: The first two octets hold the index of the subcarrier associated with the breakpoint. The third octet holds the PSD reduction at the breakpoint from 0 (0dBm/Hz) to 255 (-127.5 dBm/Hz) using units of 0.5dBm/Hz."
SYNTAX OCTET STRING (SIZE(0..48))

Xdsl2Tssi ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION "This is a structure that represents up to 32 transmit spectrum shaping (TSSi) breakpoints.
Each breakpoint occupies 3 octets: The first two octets hold the index of the subcarrier associated with the breakpoint. The third octet holds the shaping parameter at the breakpoint. It is a value from 0 to 126 (units of -0.5dB). The special value 127 indicates that the subcarrier is not transmitted."
SYNTAX OCTET STRING (SIZE(0..96))

Xdsl2LastTransmittedState ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION "This parameter represents the last successful transmitted initialization state in the last full initialization performed on the line. States are per the specific xDSL technology and are numbered from 0 (if G.994.1 is used) or 1 (if G.994.1 is not used) up to Showtime."
SYNTAX INTEGER {
-- ADSL family ATU-C side --
atucG9941(0),
atucQuiet1(1),
atucCombl(2),
atucQuiet2(3),
atucComb2(4),
atucICombl(5),
atucLineprob(6),
atucQuiet3(7),
atucComb3(8),
atucIComb2(9),
atucMsgfmt(10),
atucMsgpcb(11),
atucQuiet4(12),
atucReverb1(13),
atucTref1(14),
atucReverb2(15),
atucEct(16),
atucReverb3(17),
atucTref2(18),
atucReverb4(19),
atucSegue1(20),
atucMsg1(21),
atucReverb5(22),
atucSegue2(23),
atucMedley(24),
atucExchmarker(25),
atucMsg2(26),
atucReverb6(27),
atucSegue3(28),
atucParams(29),
atucReverb7(30),
atucSegue4(31),
atucShowtime(32),

-- ADSL family ATU-R side --
aturG9941(100),
aturQuiet1(101),
aturCombl1(102),
aturQuiet2(103),
aturCombl2(104),
aturIcombl1(105),
aturLineprob(106),
aturQuiet3(107),
aturCombl3(108),
aturIcombl2(109),
aturMsgfmt(110),
aturMsgpcb(111),
aturReverb1(112),
aturQuiet4(113),
aturReverb2(114),
aturQuiet5(115),
aturReverb3(116),
aturEct(117),
aturReverb4(118),
aturSegue1(119),
aturReverb5(120),
aturSegue2(121),
aturMsg1(122),
aturMedley(123),
aturExchmarker(124),
aturMsg2(125),
aturReverb6(126),
aturSegue3(127),
aturParams(128),
aturReverb7(129),
aturSegue4(130),
aturShowtime(131),
-- VDSL2 VTU-C side --
vtucG9941(200),
vtucQuiet1(201),
vtucChDiscov1(202),
vtucSynchro1(203),
vtucPilot1(204),
vtucQuiet2(205),
vtucPeriodic1(206),
vtucSynchro2(207),
vtucChDiscov2(208),
vtucSynchro3(209),
vtucTraining1(210),
vtucSynchro4(211),
vtucPilot2(212),
vtucTeq(213),
vtucEct(214),
vtucPilot3(215),
vtucPeriodic2(216),
vtucTraining2(217),
vtucSynchro5(218),
vtucMedley(219),
vtucSynchro6(220),
vtucShowtime(221),
-- VDSL2 VTU-R side --
vturG9941(300),
vturQuiet1(301),
vturChDiscov1(302),
vturSynchro1(303),
vturLineprobe(304),
vturPeriodic1(305),
vturSynchro2(306),
vturChDiscov2(307),
vturSynchro3(308),
vturQuiet2(309),
vturTraining1(310),
vturSynchro4(311),
vturTeq(312),
vturQuiet3(313),
vturEct(314),
vturPeriodic2(315),
vturTraining2(316),
vturSynchro5(317),
vturMedley(318),
vturSynchro6(319),
vturShowtime(320)
}

Xdsl2LineStatus ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION
"Attributes with this syntax are status parameters
that reflect the failure status for a given end point of a
VDSL2/ADSL/ADSL2 or ADSL2+ link.

This BITS structure can report the following failures:

noDefect (0) - This bit position positively reports
that no defect or failure exist.
lossOfFraming (1) - Loss of frame synchronization.
lossOfSignal (2) - Loss of signal.
lossOfPower (3) - Loss of power. Usually this failure may
be reported for CPE units only.
initFailure (4) - Recent initialization process failed.

Never active on xTU-R."

SYNTAX BITS {
  noDefect(0),
  lossOfFraming(1),
  lossOfSignal(2),
  lossOfPower(3),
  initFailure(4)
}

Xdsl2ChInpReport ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION
"This type is used to indicate the method used to compute the
ACTINP. If set to inpComputedUsingFormula(1), the ACTINP is
computed according to the INP_no_erasure formula (9.6/G.993.2).
If set to inpEstimatedByXtur(2), the ACTINP is the value
estimated by the xTU receiver.

inpComputedUsingFormula (1) - ACTINP computed using
INP_no_erasure formula.
inpEstimatedByXtur (2) - ACTINP estimated by
the xTU receiver."

SYNTAX INTEGER {
  inpComputedUsingFormula(1),
  inpEstimatedByXtur(2)
}
Xdsl2ChAtmStatus ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION
"Attributes with this syntax are status parameters that
reflect the failure status for Transmission Convergence (TC)
layer of a given ATM interface (data path over a VDSL2/ADSL/
ADSL2 or ADSL2+ link).

This BITS structure can report the following failures:
noDefect (0) - This bit position positively
reports that no defect or failure exist.
noCellDelineation (1) - The link was successfully
initialized but cell delineation
was never acquired on the
associated ATM data path.
lossOfCellDelineation (2) - Loss of cell delineation on the
associated ATM data path."
SYNTAX BITS {
  noDefect(0),
  noCellDelineation(1),
  lossOfCellDelineation(2)
}

Xdsl2ChPtmStatus ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION
"Attributes with this syntax are status parameters that
reflect the failure status for a given PTM interface (packet
data path over a VDSL2/ADSL/ADSL2 or ADSL2+ link).

This BITS structure can report the following failures:
noDefect (0) - This bit position positively
reports that no defect or failure exist.
outOfSync (1) - Out of synchronization."
SYNTAX BITS {
  noDefect(0),
  outOfSync(1)
}

Xdsl2UpboKLF ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION
"Defines the upstream power backoff force mode (UPBOKLF).
The three possible mode values are:
auto(1) - The VTUs will autonomously determine the
electrical length.
override(2) - Forces the VTU-R to use the electrical
length, k10, of the CO-MIB (UPBOKL) to compute the UPBO.

disableUpbo(3)  - Disables UPBO such that UPBO is not utilized.

SYNTAX INTEGER {
  auto(1),
  override(2),
  disableUpbo(3)
}

Xdsl2BandUs ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION
"Each value identifies a specific band in the upstream transmission direction (Excluding US0 band.).
The possible values which identify a band are as follows:
  us1(5)  - Upstream band number 1 (US1).
  us2(7)  - Upstream band number 2 (US2).
  us3(9)  - Upstream band number 3 (US3).
  us4(11) - Upstream band number 4 (US4)."
SYNTAX        INTEGER {
  us1(5),
  us2(7),
  us3(9),
  us4(11)
}

Xdsl2LinePsdMaskSelectUs ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION
"This type is used to define which upstream PSD mask is enabled. This type is used only for Annexes J and M of ITU-T Recs G.992.3 and G.992.5.
  adlu32Eu32 (1),   - ADLU-32 / EU-32
  adlu36Eu36 (2),   - ADLU-36 / EU-36
  adlu40Eu40 (3),   - ADLU-40 / EU-40
  adlu44Eu44 (4),   - ADLU-44 / EU-44
  adlu48Eu48 (5),   - ADLU-48 / EU-48
  adlu52Eu52 (6),   - ADLU-52 / EU-52
  adlu56Eu56 (7),   - ADLU-56 / EU-56
  adlu60Eu60 (8),   - ADLU-60 / EU-60
  adlu64Eu64 (9)    - ADLU-64 / EU-64"
SYNTAX        INTEGER {
  adlu32Eu32(1),
  adlu36Eu36(2),
  adlu40Eu40(3),
  adlu44Eu44(4),
Xdsl2LineCeFlag ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION "This type is used to enable the use of the optional
cyclic extension values. If the bit is set to 1, the optional
cyclic extension values may be used. Otherwise, the cyclic
extension shall be forced to the mandatory length (5N/32)

   enableCyclicExtension (0) - Enable use of optional
       Cyclic Extension values."
SYNTAX     BITS {
  enableCyclicExtension(0)
}

Xdsl2LineSnrMode ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION "This type is used to enable the transmitter referred
virtual noise. The value of 1, indicates that virtual
noise is disabled. The value of 2, indicates that virtual
noise is enabled.

   virtualNoiseDisabled (1) - virtual noise is disabled.
   virtualNoiseEnabled (2)  - virtual noise is enabled."
SYNTAX     INTEGER {
  virtualNoiseDisabled(1),
  virtualNoiseEnabled(2)
}

Xdsl2LineTxRefVnDs ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION "This is a structure that represents up to 32 PSD Mask
breakpoints. Each breakpoint occupies 3 octets: The first two octets hold the
index of the subcarrier associated with the breakpoint. The
third octet holds the PSD reduction at the breakpoint from 0
(-140 dBm/Hz) to 200 (-40 dBm/Hz) using units of 0.5dBm/Hz.
A special value of 255 indicates a noise level of 0 W/Hz."
SYNTAX      OCTET STRING (SIZE(0..96))
Xdsl2LineTxRefVnUs ::= TEXTUAL-CONVENTION
  STATUS current
  DESCRIPTION "This is a structure that represents up to 16 PSD Mask
  breakpoints. Each breakpoint occupies 3 octets: The first two octets hold the
  index of the subcarrier associated with the breakpoint. The
  third octet holds the PSD reduction at the breakpoint from 0
  (-140 dBm/Hz) to 200 (-40 dBm/Hz) using units of 0.5dBm/Hz.
  A special value of 255 indicates a noise level of 0 W/Hz."
  SYNTAX OCTET STRING (SIZE(0..48))

Xdsl2LineForceInp ::= TEXTUAL-CONVENTION
  STATUS current
  DESCRIPTION "This type is being used for specifying that the framer
  settings of all the bearers of a line in any transmission
  direction shall be selected such that the impulse noise
  protection computed according to the formula specified
  in the relevant Recommendation is greater than or equal
  to the minimal impulse noise protection requirement.

  forceFramerForInp(0) - Select framer setting to satisfy
  impulse noise protection
  requirements."
  SYNTAX BITS {
    forceFramerForInp(0)
  }

Xdsl2BitsAlloc ::= TEXTUAL-CONVENTION
  STATUS current
  DESCRIPTION "This type specifies a array of nibbles, where each nibble
  indicates the bits allocation for a subcarrier.
  Each nibble has a value in the range 0 to 15 to indicate
  the bits allocation."
  SYNTAX OCTET STRING (SIZE(0..256))

Xdsl2MrefPsdDs ::= TEXTUAL-CONVENTION
  STATUS current
  DESCRIPTION "Attributes with this syntax are MEDLEY Reference PSD status
  parameters in the downstream direction. This is expressed as
  the set of
  breakpoints exchanged at initialization.
  The OCTET STRING contains up to 48 pairs of values in the
  following structure:
Octets 0-1 -- Index of 1st subcarrier used in the context of a first breakpoint.
Octets 2-3 -- The PSD level for the subcarrier indicated in octets 0-1.
Octets 4-7 -- Same, for a 2nd breakpoint
Octets 8-11 -- Same, for a 3rd breakpoint
And so on until
Octets 188-191 -- Same, for a 48th breakpoint.

Each subcarrier index is an unsigned number in the range 1 to NSds (i.e., highest supported subcarrier index in the downstream direction).
The PSD level is an integer value in the 0 to 4095 range. It is represented in units of 0.1 dB offset from -140dBm/Hz.

SYNTAX OCTET STRING (SIZE(0..192))

Xdsl2MrefPsdUs ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION "Attributes with this syntax are MEDLEY Reference PSD status parameters in the upstream direction. This is expressed as the set of breakpoints exchanged at initialization.
The OCTET STRING contains up to 32 pairs of values in the following structure:
Octets 0-1 -- Index of 1st subcarrier used in the context of a first breakpoint.
Octets 2-3 -- The PSD level for the subcarrier indicated in octets 0-1.
Octets 4-7 -- Same, for a 2nd breakpoint
Octets 8-11 -- Same, for a 3rd breakpoint
And so on until
Octets 124-127 -- Same, for a 32nd breakpoint.
Each subcarrier index is an unsigned number in the range 1 to NSus (i.e., highest supported subcarrier index in the upstream direction).
The PSD level is an integer value in the 0 to 4095 range. It is represented in units of 0.1 dB offset from -140dBm/Hz."
SYNTAX OCTET STRING (SIZE(0..128))

END

VDSL2-LINE-MIB DEFINITIONS ::= BEGIN

IMPORTS
   MODULE-IDENTITY, OBJECT-TYPE,
transmission,
Unsigned32,
NOTIFICATION-TYPE,
Integer32,
Counter32
FROM SNMPv2-SMI

ifIndex
FROM IF-MIB

TruthValue,
RowStatus
FROM SNMPv2-TC

SnmpAdminString
FROM SNMP-FRAMEWORK-MIB

HCPerfIntervalThreshold,
HCPerfTimeElapsed
FROM HC-PerfHist-TC-MIB -- [RFC3705]

Xds12Unit,
Xds12Direction,
Xds12Band,
Xds12TransmissionModeType,
Xds12RaMode,
Xds12InitResult,
Xds12OperationModes,
Xds12PowerMngState,
Xds12ConfPmsForce,
Xds12LinePmMode,
Xds12LineLdsf,
Xds12LdsfResult,
Xds12LineBpsc,
Xds12BpscResult,
Xds12LineReset,
Xds12SymbolProtection,
Xds12SymbolProtection8,
Xds12MaxBer,
Xds12ChInitPolicy,
Xds12ScMaskDs,
Xds12ScMaskUs,
Xds12CarMask,
Xds12RfiBands,
Xds12PsdMaskDs,
Xds12PsdMaskUs,
Xds12Tssi,
Xds12LastTransmittedState,
Xdsl2LineStatus,  
Xdsl2ChInpReport,  
Xdsl2ChAtmStatus,  
Xdsl2ChPtmStatus,  
Xdsl2UpboKLF,  
Xdsl2BandUs,  
Xdsl2LineProfiles,  
Xdsl2LineUs0Mask,  
Xdsl2LineClassMask,  
Xdsl2LineLimitMask,  
Xdsl2LineUs0Disable,  
Xdsl2LinePsdMaskSelectUs,  
Xdsl2LineCeFlag,  
Xdsl2LineSnrMode,  
Xdsl2LineTxRefVnDs,  
Xdsl2LineTxRefVnUs,  
Xdsl2LineForceInp,  
Xdsl2BitsAlloc,  
Xdsl2MrefPsdDs,  
Xdsl2MrefPsdUs

FROM   VDSL2-LINE-TC-MIB       -- [This document]

MODULE-COMPLIANCE,  
OBJECT-GROUP,  
NOTIFICATION-GROUP
FROM SNMPv2-CONF;

vdsl2MIB MODULE-IDENTITY  
LAST-UPDATED "200807010000Z" -- July 1, 2008  
ORGANIZATION "ADSLMIB Working Group"  
CONTACT-INFO "WG-email:  adslmib@ietf.org  
Info:  https://www1.ietf.org/mailman/listinfo/adslmib

Chair:    Mike Sneed  
Sand Channel Systems
Postal:   P.O. Box 37324  
Raleigh NC 27627-732
Email:    sneedmike@hotmail.com
Phone:    +1 206 600 7022

Co-Chair:  Menachem Dodge  
ECI Telecom Ltd.
Postal:   30 Hasivim St.  
Petach Tikva 49517,  
Israel.
Email:    mbdodge@ieee.org

This document defines a Management Information Base (MIB) module for use with network management protocols in the Internet community for the purpose of managing VDSL2, ADSL, ADSL2, and ADSL2+ lines.

The MIB module described in RFC 2662 [RFC2662] defines objects used for managing Asymmetric Bit-Rate DSL (ADSL) interfaces per [T1E1.413], [G.992.1], and [G.992.2]. These object descriptions are based upon the specifications for the ADSL Embedded Operations Channel (EOC) as defined in American National Standards Institute (ANSI) T1E1.413 [T1E1.413] and International Telecommunication Union (ITU-T) G.992.1 [G.992.1] and G.992.2 [G.992.2].

The MIB module described in RFC 4706 [RFC4706] defines objects used for managing ADSL2 interfaces per [G.992.3] and [G.992.4], and ADSL2+ interfaces per [G.992.5]. That MIB is also capable of managing ADSL interfaces per [T1E1.413], [G.992.1], and [G.992.2].
This document does not obsolete RFC 2662 [RFC2662] and RFC 4706 [RFC4706], but rather provides a more comprehensive management model that manages VDSL2 interfaces per G.993.2 [G.993.2] as well as ADSL, ADSL2 and ADSL2+ technologies per T1E1.413, G.992.1, G.992.2, G.992.3, G.992.4, and G.992.5 ([T1E1.413], [G.992.1], [G.992.2], [G.992.3], [G.992.4], and [G.992.5] respectively).

Additionally, the management framework for VDSL2 lines specified by the Digital Subscriber Line Forum (DSLF) has been taken into consideration [TR-129]. That framework is based on ITU-T G.997.1 standard [G.997.1] and its amendment 1 [G.997.1-Am1].

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.

Copyright (C) The IETF Trust (2008). This version of this MIB module is part of RFC XXXX: see the RFC itself for full legal notices.

-- RFC Ed.: replace XXXX with assigned number & remove this note
REVISION "200807010000Z" -- July 1, 2008
DESCRIPTION "Initial version, published as RFC XXXX."
-- RFC Ed.: replace XXXX with assigned number & remove this note
::= { transmission xxx }
-- IANA, please assign a branch number under transmission.
-- RFC Ed.: Please fill in xxx once assigned by IANA.

vds12 OBJECT IDENTIFIER ::= { vds12MIB 1 }

-----------------------------------------------
xsds12Line OBJECT IDENTIFIER ::= { vds12 1 }
xsds12Status OBJECT IDENTIFIER ::= { vds12 2 }
xsds12Inventory OBJECT IDENTIFIER ::= { vds12 3 }
xsds12PM OBJECT IDENTIFIER ::= { vds12 4 }
xsds12Profile OBJECT IDENTIFIER ::= { vds12 5 }
xsds12Scalar OBJECT IDENTIFIER ::= { vds12 6 }
xsds12Notifications OBJECT IDENTIFIER ::= { vds12 0 }
xsds12Conformance OBJECT IDENTIFIER ::= { vds12 7 }

-----------------------------------------------
xsds12PMLine OBJECT IDENTIFIER ::= { xsds12PM 1 }
xsds12PMChannel OBJECT IDENTIFIER ::= { xsds12PM 2 }

-----------------------------------------------
xsds12ProfileLine OBJECT IDENTIFIER ::= { xsds12Profile 1 }
xsds12ProfileChannel OBJECT IDENTIFIER ::= { xsds12Profile 2 }

xdsl2ProfileAlarmConf OBJECT IDENTIFIER ::= { xdsl2Profile 3 }

xdsl2ScalarSC OBJECT IDENTIFIER ::= { xdsl2Scalar 1 }

--
xdsl2LineTable OBJECT-TYPE
SYNTAX Sequence OF Xdsl2LineEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "The table xdsl2LineTable contains configuration, command and status parameters of the VDSL2/ADSL/ADSL2 or ADSL2+ line. The index of this table is an interface index where the interface has an ifType of vdsl2(xxx).

Several objects in this table MUST be maintained in a persistent manner."
 ::= { xdsl2Line 1 }

xdsl2LineEntry OBJECT-TYPE
SYNTAX Xdsl2LineEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "The table xdsl2LineTable contains configuration, command and status parameters of the VDSL2/ADSL/ADSL2 or ADSL2+ line."
INDEX { ifIndex }
 ::= { xdsl2LineTable 1 }

Xdsl2LineEntry ::= SEQUENCE {
  xdsl2LineCnfgTemplate SnmpAdminString,
  xdsl2LineCnfgFallbackTemplate SnmpAdminString,
  xdsl2LineAlarmCnfgTemplate SnmpAdminString,
  xdsl2LineCmndConfPmsf Xdsl2ConfPmsForce,
  xdsl2LineCmndConfLdsf Xdsl2LineLdsf,
  xdsl2LineCmndConfLdsfFailReason Xdsl2LdsfResult,
  xdsl2LineCmndConfBpsc Xdsl2LineBpsc,
  xdsl2LineCmndConfBpscFailReason Xdsl2BpscResult,
  xdsl2LineCmndConfBpscReqCount Unsigned32,
  xdsl2LineCmndAutomodeColdStart TruthValue,
  xdsl2LineCmndConfReset Xdsl2LineReset,
  xdsl2LineStatusActTemplate SnmpAdminString,
  xdsl2LineStatusXtuTransSys Xdsl2TransmissionModeType,
Internet-Draft               VDSL2-LINE MIB                    July 2008

template. The primary template is identified using the
xdsl2LineCnfgTemplate attribute.

For example, a xDSL2 line may fallback to a template with a lower
rate if the rate specified in the primary template cannot be
achieved.

The value of this object identifies a row in the xDSL2 Line
Configuration Template Table, xdsl2LineConfTemplateTable.
Any row in the xdsl2LineConfTemplateTable table may be used as a
fallback template.

If the xDSL2 line fails to operate using the fallback template
then the primary template should be retried.
The xTU-C should continue to alternate between the primary and
fallback templates until one of them succeeds.

If the value of this object is a zero-length string then no
fallback template is defined and only the primary template will
be used.

Note that implementation of this object is not mandatory.
If this object is not supported, any attempt to modify this
object should result in the SET request being rejected.

This object MUST be maintained in a persistent manner.

::= { xds1LineEntry 2 }

xdsl2LineAlarmCnfgTemplate  OBJECT-TYPE
SYNTAX      SnmpAdminString (SIZE(1..32))
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
 "The value of this object identifies the row in the xDSL2
 Line Alarm Configuration Template Table,
 xdsl2LineAlarmConfTemplateTable, which applies to this line.

 This object MUST be maintained in a persistent manner." 
REFERENCE    "DSL Forum TR-129, paragraph #5.1"
DEFVAL       { "DEFVAL" }
::= { xds1LineEntry 3 }

xdsl2LineCmdConfPmsf  OBJECT-TYPE
SYNTAX      Xdsl2ConfPmsForce
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
 "Power management state forced (PMSF). Defines the line
states to be forced by the near-end xTU on this line.
The various possible values are:
   13toL0 (0),
   10toL2 (2),
   10orL2toL3 (3).

This object MUST be maintained in a persistent manner.
REFERENCE    "ITU-T G.997.1, paragraph #7.3.1.1.3 (PMSF)"
DEFVAL       { l3toL0 }
 ::= { xdsl2LineEntry 4 }

xdsl2LineCmndConfLdsf OBJECT-TYPE
SYNTAX      Xdsl2LineLdsf
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
"Loop diagnostics mode forced (LDSF).
Defines whether the line should be forced into the loop
diagnostics mode by the near-end xTU of this line. Note that
a loop diagnostics may be initiated by the far-end xTU at any
time.

Only when the xdsl2LineStatusPwrMngState attribute is in the
13(4) state and the xdsl2LineCmndConfPmsf attribute is in the
10orL2toL3(3) state, can the line be forced into loop diagnostic
mode procedures. Upon successful completion of the loop
diagnostic mode procedures, the Access Node shall set this
attribute to inhibit(0), and xdsl2LineStatusPwrMngState will
remain in the 13(4) state. The loop diagnostic data shall be
available at least until xdsl2LineCmndConfPmsf is set to the
13toL0(0) state.

The results of the loop diagnostic procedure are stored in the
tables xdsl2SCStatusTable, xdsl2SCStatusBandTable and
xdsl2SCStatusSegmentTable. The status of the loop diagnostic
procedue is indicated by xdsl2LineCmndConfLdsfFailReason.

As long as loop diagnostic procedures are not completed
successfully, attempts shall be made to do so, until the loop
diagnostic mode is no longer forced on the line through this
configuration parameter.
REFERENCE    "ITU-T G.997.1, paragraph #7.3.1.1.8 (LDSF)"
DEFVAL       { inhibit }
 ::= { xdsl2LineEntry 5 }

xdsl2LineCmndConfLdsfFailReason OBJECT-TYPE
SYNTAX      Xdsl2LdsfResult
MAX-ACCESS  read-only
STATUS     current
DESCRIPTION
"The status of the most recent occasion when the Loop
diagnostics mode forced (LDSF) command was issued for the
associated line.
Possible values are:

  none        (1) - The default value in case LDSF was never
  requested for the associated line.
  success     (2) - The recent command completed
  successfully.
  inProgress  (3) - The Loop Diagnostics process is in
  progress.
  unsupported (4) - The NE or the line card doesn’t support
  LDSF.
  cannotRun  (5) - The NE cannot initiate the command, due
  to a nonspecific reason.
  aborted     (6) - The Loop Diagnostics process aborted.
  failed      (7) - The Loop Diagnostics process failed.
  illegalMode (8) - The NE cannot initiate the command, due
  to the specific mode of the relevant line.
  adminUp     (9) - The NE cannot initiate the command, as
  the relevant line is administratively
  ‘Up’.
  tableFull   (10)- The NE cannot initiate the command, due
  to reaching the maximum number of rows
  in the results table.
  noResources (11)- The NE cannot initiate the command, due
  to lack of internal memory resources."

DEFVAL     { none }
 ::= { xdsl2LineEntry 6 }

xdsl2LineCmndConfBpsc OBJECT-TYPE
SYNTAX     Xdsl2LineBpsc
MAX-ACCESS read-write
STATUS     current
DESCRIPTION
"Request a bits per subcarrier measurement to be made.

A request for a bits per subcarrier measurement is made by
setting this attribute to the value of measure(2). Upon
completion of the measurement request, the Access Node shall set
this attribute to idle(1).

Note that a bits per subcarrier measurement is also performed
during a line diagnostic procedure. This attribute provides an
additional mechanism to fetch the bits per subcarrier data. This
additional mechanism is provided so that bits per subcarrier
data may be fetched without forcing the line into no power state. This is useful because the bits per subcarrier allocation may be adjusted at show time due to rate adaption and bit swapping.

The implementation of this additional mechanism for measuring bits per subcarrier is not mandatory.

The results of the bits per subcarrier measurement are stored in xdsl2LineSegmentTable. The status of the bits per subcarrier measurement is indicated by xdsl2LineCmndConfBpscFailReason.

```
DEFVAL { idle }
 ::= { xdsl2LineEntry 7 }
```

```
xdsl2LineCmndConfBpscFailReason  OBJECT-TYPE
SYNTAX   Xdsl2BpscResult
MAX-ACCESS read-only
STATUS    current
DESCRIPTION "The status of the most recent bits per subcarrier measurement request issued for the associated line. Possible values are:

none       (1)  - The default value, in case a measurement was never requested for the associated line.
success    (2)  - The recent measurement request completed successfully.
inProgress (3)  - The bits per subcarrier measurement is in progress.
unsupported (4)  - The bits per subcarrier request mechanism is not supported.
failed     (5)  - The measurement request has failed and no results are available.
noResources (6)  - The NE cannot initiate the command, due to lack of internal memory resources."
DEFVAL { none }
 ::= { xdsl2LineEntry 8 }
```

```
xdsl2LineCmndConfBpscReqCount  OBJECT-TYPE
SYNTAX   Unsigned32
MAX-ACCESS read-only
STATUS    current
DESCRIPTION "Measurement request counter. This counter is incremented by one every time a request for a measurement is made. A measurement request is made by setting the xdsl2LineCmndConfBpsc attribute to the value measure(2)."
```
SNMP managers can use this attribute to check that the measurement results retrieved by the manager where not interrupted by another measurement request.

DEFVAL { 0 }
 ::= { xdsl2LineEntry 9 }

\textbf{xdsl2LineCmndAutomodeColdStart}  \textbf{OBJECT-TYPE}

\textbf{SYNTAX}  TruthValue

\textbf{MAX-ACCESS}  read-write

\textbf{STATUS}  current

\textbf{DESCRIPTION}
"Automode cold start forced. This parameter is defined in order to improve testing of the performance of xTUs supporting automode when it is enabled in the MIB. Change the value of this parameter to ‘true’ indicates a change in loop conditions applied to the devices under test. The xTUs shall reset any historical information used for automode and for shortening G.994.1 handshake and initialization.

Automode is the case where multiple operation-modes are enabled through the xdsl2LConfProfXtuTransSysEna object in the line configuration profile being used for the line, and where the selection of the actual operation-mode depends not only on the common capabilities of both xTUs (as exchanged in G.994.1), but also on achievable data rates under given loop conditions."

\textbf{REFERENCE}  "ITU-T G.997.1, paragraph #7.3.1.1.10 (Automode Cold Start Forced)"

DEFVAL { false }
 ::= { xdsl2LineEntry 10 }

\textbf{xdsl2LineCmndConfReset}  \textbf{OBJECT-TYPE}

\textbf{SYNTAX}  Xdsl2LineReset

\textbf{MAX-ACCESS}  read-write

\textbf{STATUS}  current

\textbf{DESCRIPTION}
"Request a line reset to occur. If this attribute is set to the value of reset(2), then force the line to reset (i.e., the modems will retrain). When the line has successfully reset, the SNMP agent will set the value of this attribute to idle(1).

Note that the xdsl2LineCmndConfPmsf attribute will always take precedence over this attribute. If the xdsl2LineCmndConfPmsf attribute is set to the value 10orL2toL3(3), then the line MUST NOT return to the showtime state due to a reset request action performed using this attribute."

DEFVAL { idle }
::= { xds2LineEntry 11 }

xds2LineStatusActTemplate OBJECT-TYPE
SYNTAX      SnmpAdminString (SIZE(0..32))
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"This object is used to identify the template that is
 currently in use for this line.
 This attribute is updated when a successful line initialisation
 occurs.
 This attribute indicates if the primary template
 (xds2LineCnfgTemplate) is in use or the fallback template
 (xds2LineCnfgFallbackTemplate) is in use.
 If the line is not successfully initialised then the value of
 this object will be a zero-length string."
::= { xds2LineEntry 12 }

xds2LineStatusXtuTransSys OBJECT-TYPE
SYNTAX      Xdsl2TransmissionModeType
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"The xTU Transmission System (xTS) in use.
 It is coded in a bit-map representation with one bit set to
 '1' (the selected coding for the DSL line). This
 parameter may be derived from the handshaking procedures defined
 in Recommendation G.994.1. A set of xDSL line transmission
 modes, with one bit per mode."
REFERENCE    "ITU-T G.997.1, paragraph #7.5.1.1
 (xDSL transmission system)"
DEFVAL       { {} } 
::= { xds2LineEntry 13 }

xds2LineStatusPwrMngState OBJECT-TYPE
SYNTAX      Xdsl2PowerMngState
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"The current power management state. One of four possible
 power management states:
 L0 - Synchronized and full transmission (i.e., Showtime).
 L1 - Low Power with reduced net data rate (G.992.2 only).
 L2 - Low Power with reduced net data rate (G.992.3 and
        G.992.4 only).
 L3 - No power.
 The various possible values are: 10(1), 11(2), 12(3), 13(4)."
REFERENCE    "ITU-T G.997.1, paragraph #7.5.1.5"
(Line power management state)

DEFVAL { 13 }
::= { xdsl2LineEntry 14 }

xdsl2LineStatusInitResult OBJECT-TYPE
SYNTAX Xdsl2InitResult
MAX-ACCESS read-only
STATUS current
DESCRIPTION "Indicates the result of the last full initialization performed on the line. It is an enumeration type with the following values: noFail(0), configError(1), configNotFeasible(2), commFail(3), noPeerAtu(4), otherCause(5)."
REFERENCE "ITU-T G.997.1, paragraph #7.5.1.6
(Initialization success/failure cause)"
DEFVAL { noFail }
::= { xdsl2LineEntry 15 }

xdsl2LineStatusLastStateDs OBJECT-TYPE
SYNTAX Xdsl2LastTransmittedState
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The last successful transmitted initialization state in the downstream direction in the last full initialization performed on the line."
REFERENCE "ITU-T G.997.1, paragraph #7.5.1.7
(Downstream last transmitted state)"
DEFVAL { atucG9941 }
::= { xdsl2LineEntry 16 }

xdsl2LineStatusLastStateUs OBJECT-TYPE
SYNTAX Xdsl2LastTransmittedState
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The last successful transmitted initialization state in the upstream direction in the last full initialization performed on the line."
REFERENCE "ITU-T G.997.1, paragraph #7.5.1.8
(Upstream last transmitted state)"
DEFVAL { aturG9941 }
::= { xdsl2LineEntry 17 }

xdsl2LineStatusXtur OBJECT-TYPE
SYNTAX Xdsl2LineStatus
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Indicates current state (existing failures) of the xTU-R. This is a bit-map of possible conditions."
REFERENCE "ITU-T G.997.1, paragraph #7.1.1.2 (Line far-end failures)"
DEFVAL { { noDefect } }
 ::= { xdsl2LineEntry 18 }

xdsl2LineStatusXtuc OBJECT-TYPE
SYNTAX Xdsl2LineStatus
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Indicates current state (existing failures) of the xTU-C. This is a bit-map of possible conditions."
REFERENCE "ITU-T G.997.1, paragraph #7.1.1.1 (Line near-end failures)"
DEFVAL { { noDefect } }
 ::= { xdsl2LineEntry 19 }

xdsl2LineStatusAttainableRateDs OBJECT-TYPE
SYNTAX Unsigned32
UNITS "bits/second"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Maximum Attainable Data Rate Downstream. The maximum downstream net data rate currently attainable by the xTU-C transmitter and the xTU-R receiver, coded in bit/s."
REFERENCE "ITU-T G.997.1, paragraph #7.5.1.19 (ATTNDRds)"
DEFVAL { 0 }
 ::= { xdsl2LineEntry 20 }

xdsl2LineStatusAttainableRateUs OBJECT-TYPE
SYNTAX Unsigned32
UNITS "bits/second"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Maximum Attainable Data Rate Upstream. The maximum upstream net data rate currently attainable by the xTU-R transmitter and the xTU-C receiver, coded in bit/s."
REFERENCE "ITU-T G.997.1, paragraph #7.5.1.20 (ATTNDRus)"
DEFVAL { 0 }
::= { xDSL2LineEntry 21 }

xDSL2LineStatusActPsdDs OBJECT-TYPE
SYNTAX     Integer32 (-900..0 | 2147483647)
UNITS      "0.1 dBm/Hz"
MAX-ACCESS read-only
STATUS     current
DESCRIPTION
"Actual Power Spectrum Density (PSD) Downstream. The average
downstream transmit PSD over the subcarriers used for downstream.
It ranges from -900 to 0 units of 0.1 dBm/Hz (Physical values are
-90 to 0 dBm/Hz).
A value of 0x7FFFFFFF (2147483647) indicates the measurement is
out of range to be represented."
REFERENCE    "ITU-T G.997.1, paragraph #7.5.1.21 (ACTPSDds)"
DEFVAL      { 2147483647 }
::= { xDSL2LineEntry 22 }

xDSL2LineStatusActPsdUs OBJECT-TYPE
SYNTAX     Integer32 (-900..0 | 2147483647)
UNITS      "0.1 dBm/Hz"
MAX-ACCESS read-only
STATUS     current
DESCRIPTION
"Actual Power Spectrum Density (PSD) Upstream. The average
upstream transmit PSD over the subcarriers used for upstream.
It ranges from -900 to 0 units of 0.1 dBm/Hz (Physical values are
-90 to 0 dBm/Hz).
A value of 0x7FFFFFFF (2147483647) indicates the measurement is
out of range to be represented."
REFERENCE    "ITU-T G.997.1, paragraph #7.5.1.22 (ACTPSDus)"
DEFVAL      { 2147483647 }
::= { xDSL2LineEntry 23 }

xDSL2LineStatusActAtpDs OBJECT-TYPE
SYNTAX     Integer32 (-310..310 | 2147483647)
UNITS      "0.1 dBm"
MAX-ACCESS read-only
STATUS     current
DESCRIPTION
"Actual Aggregate Transmit Power Downstream.
The total amount of transmit power delivered by the xTU-C at
the U-C reference point, at the instant of measurement. It
ranges from -310 to 310 units of 0.1 dBm (Physical values are -31
to 31 dBm).
A value of 0x7FFFFFFF (2147483647) indicates the measurement is
out of range to be represented.

REFERENCE "ITU-T G.997.1, paragraph #7.5.1.24 (ACTATPds)"
DEFVAL { 2147483647 }
::= { xdsl2LineEntry 24 }

*xdsl2LineStatusActAtpUs*  OBJECT-TYPE
SYNTAX      Integer32 (-310..310 | 2147483647)
UNITS       "0.1 dBm"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"Actual Aggregate Transmit Power Upstream.  
The total amount of transmit power delivered by the xTU-R at the 
U-R reference point, at the instant of measurement.  It ranges 
from -310 to 310 units of 0.1 dBm (Physical values are -31 
to 31 dBm).  
A value of 0x7FFFFFFF (2147483647) indicates the measurement is 
out of range to be represented."
REFERENCE "ITU-T G.997.1, paragraph #7.5.1.25 (ACTATPus)"
DEFVAL { 2147483647 }
::= { xdsl2LineEntry 25 }

*xdsl2LineStatusActProfile*  OBJECT-TYPE
SYNTAX      Xdsl2LineProfiles
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"The G.993.2 profile in use.  
The configuration parameter xdsl2LConfProfProfiles defines 
the set of allowed G.993.2 profiles.  This parameter indicates 
the profile in use on this line.  
This parameter may be derived from the handshaking procedures 
defined in ITU-T Rec. G.994.1."
REFERENCE "ITU-T G.997.1, paragraph #7.5.1.2 (VDSL2 Profile)"
DEFVAL { {} }
::= { xdsl2LineEntry 26 }

*xdsl2LineStatusActLimitMask*  OBJECT-TYPE
SYNTAX      Xdsl2LineLimitMask
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"The Limit PSD mask and band plan in use.  
The configuration parameter xdsl2LConfProfLimitMask defines 
the set of allowed G.993.2 limit PSD masks."
This parameter indicates the limit PSD mask in use on this line.

REFERENCE    "ITU-T G.997.1, paragraph #7.5.1.3
              (VDSL2 Limit PSD Mask and Band plan)"
DEFVAL       { {} }
 ::= { xdsl2LineEntry 27 }

xdsl2LineStatusActUs0Mask OBJECT-TYPE
SYNTAX      Xdsl2LineUs0Mask
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
 "The US0 PSD mask in use.
 The configuration parameter xdsl2LConfProfUs0Mask defines
 the set of allowed US0 PSD masks.
 This parameter indicates the US0 PSD mask in use on this line.
 This parameter may be derived from the handshaking procedures
defined in ITU-T Rec. G.994.1."
REFERENCE    "ITU-T G.997.1, paragraph #7.5.1.4
              (VDSL2 US0 PSD Mask)"
DEFVAL       { {} }
 ::= { xdsl2LineEntry 28 }

xdsl2LineStatusActSnrModeDs OBJECT-TYPE
SYNTAX      Xdsl2LineSnrMode
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
 "This parameter indicates if the transmitter
 referred virtual noise is active on the line in the downstream
 direction.
 The configuration parameter xdsl2LConfProfSnrModeDs is used to
 configure referred virtual noise."
REFERENCE    "ITU-T G.997.1, paragraph #7.5.1.15 (ACTSNRMODEds)"
DEFVAL       { virtualNoiseDisabled }
 ::= { xdsl2LineEntry 29 }

xdsl2LineStatusActSnrModeUs OBJECT-TYPE
SYNTAX      Xdsl2LineSnrMode
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
 "This parameter indicates if the transmitter referred virtual
 noise is active on the line in the upstream direction.
 The configuration parameter xdsl2LConfProfSnrModeUs is used to
 configure referred virtual noise."
REFERENCE    "ITU-T G.997.1, paragraph #7.5.1.18 (ACTSNRMODEus)"
Internet-Draft               VDSL2-LINE MIB                    July 2008

DEFVAL       { virtualNoiseDisabled }
::= { xdsl2LineEntry 30 }

xdsl2LineStatusElectricalLength  OBJECT-TYPE
SYNTAX      Unsigned32 (0..1280)
UNITS       "0.1 dB"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
  "This parameter contains the estimated electrical length
  expressed in dB at 1 MHz, k10. This is the final electrical
  length that would have been sent from the VTU-O to VTU-R if the
  electrical length was not forced by the CO-MIB.
  The value ranges from 0 to 128 dB in steps of 0.1 dB."
REFERENCE    "ITU-T G.997.1, paragraph #7.5.1.23 (UPBOKLE)"
DEFVAL       { 0 }
::= { xdsl2LineEntry 31 }

xdsl2LineStatusTssiDs  OBJECT-TYPE
SYNTAX      Xdsl2Tssi
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
  "The transmit spectrum shaping (TSSi) breakpoints expressed
  as the set of breakpoints exchanged during G.994.1.
  Each breakpoint is a pair of values occupying 3 octets with the
  following structure:
  First 2 octets - Index of the subcarrier used in the context of
                    the breakpoint.
  Third octet    - The shaping parameter at the breakpoint.
  Subcarrier index is an unsigned number in the range 1 to NSCds.
  The shaping parameter value is in the range 0 to 126 (units of
  -0.5dB). The special value 127 indicates that the subcarrier is
  not transmitted."
REFERENCE  "ITU-T G.997.1, paragraph #7.5.1.29.5 (TSSpsds)"
::= { xdsl2LineEntry 32 }

xdsl2LineStatusTssiUs  OBJECT-TYPE
SYNTAX      Xdsl2Tssi
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
  "The transmit spectrum shaping (TSSi) breakpoints expressed
  as the set of breakpoints exchanged during G.994.1.
  Each breakpoint is a pair of values occupying 3 octets with the
  following structure:
  First 2 octets - Index of the subcarrier used in the context of
the breakpoint.
Third octet - The shaping parameter at the breakpoint.
Subcarrier index is an unsigned number in the range 1 to NSCus.
The shaping parameter value is in the range 0 to 126 (units of
-0.5dB). The special value 127 indicates that the subcarrier is
not transmitted.

REFERENCE "ITU-T G.997.1, paragraph #7.5.1.29.6 (TSSpsus)"
::= { xdsl2LineEntry 33 }

::= { xdsl2LineEntry 34 }

"The MEDLEY Reference PSD status parameters in the
downstream direction expressed as the set of breakpoints exchanged at
initialization.
The OCTET STRING contains up to 48 pairs of values in the
following structure:
Octets 0-1 -- Index of 1st subcarrier used in the context
of a first breakpoint.
Octets 2-3 -- The PSD level for the subcarrier indicated
in octets 0-1.
Octets 4-7 -- Same, for a 2nd breakpoint
Octets 8-11 -- Same, for a 3rd breakpoint
And so on until
Octets 188-191 -- Same, for a 48th breakpoint.
Each subcarrier index is an unsigned number in the range 1 to
NSds (i.e., highest supported subcarrier index in the downstream
direction).
The PSD level is an integer value in the 0 to 4095 range. It is
represented in units of 0.1 dB offset from -140dBm/Hz.

REFERENCE "ITU-T G.997.1, paragraph #7.5.1.29.7 (MREFPSPDUs)"
"
of a first breakpoint.
Octets 2-3 -- The PSD level for the subcarrier indicated
in octets 0-1.
Octets 4-7 -- Same, for a 2nd breakpoint
Octets 8-11 -- Same, for a 3rd breakpoint
And so on until
Octets 124-127 -- Same, for a 32nd breakpoint.
Each subcarrier index is an unsigned number in the range 1 to
NSus (i.e., highest supported subcarrier index in the upstream
direction).
The PSD level is an integer value in the 0 to 4095 range. It is
represented in units of 0.1 dB offset from -140dBm/Hz.
REFERENCE "ITU-T G.997.1, paragraph #7.5.1.29.8 (MREFPSDus)"
::= { xdsl2LineEntry 35 }

xdsl2LineStatusTrellisDs OBJECT-TYPE
SYNTAX      TruthValue
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"This parameter reports whether trellis coding is in use in
the downstream direction."
REFERENCE    "ITU-T G.997.1, paragraph #7.5.1.30 (TRELLISds)"
DEFVAL       { false }::= { xdsl2LineEntry 36 }

xdsl2LineStatusTrellisUs OBJECT-TYPE
SYNTAX      TruthValue
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"This parameter reports whether trellis coding is in use in
the upstream direction."
REFERENCE    "ITU-T G.997.1, paragraph #7.5.1.31 (TRELLISus)"
DEFVAL       { false }::= { xdsl2LineEntry 37 }

xdsl2LineStatusActualCe OBJECT-TYPE
SYNTAX      Unsigned32 (2..16)
UNITS       "N/32 samples"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"(ACTUALCE)
This parameter reports the cyclic extension used on the line. It
is coded as an unsigned integer from 2 to 16 in units of N/32
samples, where 2N is the IDFT size.

REFERENCE  "ITU-T G.997.1, paragraph #7.5.1.32 (ACTUALCE)
"

DEFVAL       { 2 }
::= { xdsl2LineEntry 38 }

------------------------------------------------
--          xdsl2LineSegmentTable             --
------------------------------------------------

xdsl2LineSegmentTable  OBJECT-TYPE
SYNTAX      SEQUENCE  OF  Xdsl2LineSegmentEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
"The table xdsl2LineSegmentTable contains status parameters
of VDSL2/ADSL/ADSL2 and ADSL2+ subcarriers. The parameters in this table
are updated when a measurement request is made using the xdsl2LineCmndConfBpsc attribute.

Note that a bits per subcarrier measurement is also performed
during a line diagnostic procedure. This table provides an
additional mechanism to fetch the bits per subcarrier data. This
additional mechanism is provided so that bits per subcarrier
data may be fetched without forcing the line into no power state.
This is useful because the bits per subcarrier allocation may be
adjusted at show time due to rate adaption and bit swapping.

The implementation of this additional mechanism for measuring
bits per subcarrier is not mandatory."
::= { xdsl2Status 1 }

xdsl2LineSegmentEntry  OBJECT-TYPE
SYNTAX      Xdsl2LineSegmentEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
"The table xdsl2LineSegmentEntry contains status parameters
of VDSL2/ADSL/ADSL2 and ADSL2+ subcarriers.

Objects in the table refer to NSus and NSds. For G.993.2, the
value of NSus and NSds are respectively the indices of the
highest supported upstream and downstream subcarriers according
to the selected implementation profile. For ADSL, NSus is equal
to NSCus-1 and NSds is equal to NSCds-1.

One index of this table is an interface index where the interface
has an ifType of vdsl2(xxx). A second index of this table is the
transmission direction. A third index identifies the specific segment of the subcarriers status addressed.

INDEX  
\{ ifIndex,
    xDSLLineSegmentDirection,
    xDSLLineSegment  
\} 
::=  \{ xDSLLineSegmentTable 1 \}

XDSLLineSegmentEntry  ::=  
SEQUENCE  
\{ 
    xDSLLineSegmentDirection  XDSLDirection,
    xDSLLineSegment          Unsigned32,
    xDSLLineSegmentBitsAlloc  XDSLBitsAlloc,
    xDSLLineSegmentRowStatus  RowStatus
\} 

XDSLLineSegmentDirection  OBJECT-TYPE
SYNTAX  XDSLDirection
MAX-ACCESS  not-accessible
STATUS  current
DESCRIPTION  
"The direction of the subcarrier either upstream or downstream."
 ::=  \{ xDSLLineSegmentEntry 1 \}

XDSLLineSegment  OBJECT-TYPE
SYNTAX  Unsigned32(1..8)
MAX-ACCESS  not-accessible
STATUS  current
DESCRIPTION  
"The segment of the subcarriers status information provided by this row.
Status parameters in this table are retrieved in segments. The first segment of the status information is retrieved with xDSLLineSegment=1, the second segment is retrieved with xDSLLineSegment=2, and so on. When a status parameter is retrieved in n segments where n<8) then, for that parameter, GET operations for the remaining segment numbers (n+1 to 8) will respond with a zero-length OCTET STRING."
 ::=  \{ xDSLLineSegmentEntry 2 \}

XDSLLineSegmentBitsAlloc  OBJECT-TYPE
SYNTAX  XDSLBitsAlloc
UNITS  "bits"
MAX-ACCESS  read-only
STATUS  current
DESCRIPTION  
"The bits allocation per subcarrier. An array of 256 octets (512 nibbles), designed for supporting up to 512 (downstream)
When more than 512 subcarriers are supported, the status information is reported through multiple (up to 8) segments. The first segment is then used for the first 512 subcarriers. The second segment is used for the subcarriers 512 to 1023 and so on.

The aggregate number of utilized nibbles on downstream direction (in all segments) depends on NSds, and on upstream direction it depends on NSus.

This value is referred here as NS. The segment number is in xdsl2SCStatusSegment.

Nibble i (0 <= i < MIN(NS-(segment-1)*512,512)) in each segment is set to a value in the range 0 to 15 to indicate that the respective downstream or upstream subcarrier j (j=(segment-1)*512+i) has the same amount of bits allocation.

REFERENCE
"ITU-T G.997.1, paragraph #7.5.1.29.1 (BITSpds)
and paragraph #7.5.1.29.2 (BITSpsus)"
::= { xdsl2LineSegmentEntry 3 }

xdsl2LineSegmentRowStatus OBJECT-TYPE
SYNTAX RowStatus
MAX-ACCESS read-write
STATUS current
DESCRIPTION "Row Status. The SNMP manager is not permitted to create rows in this table. The SNMP agent will create a row in this table for storing the results of a measurement performed on the associated line, if the row does not already exist.

The SNMP agent may have limited resources; therefore, if multiple rows co-exist in this table, it may fail to add new rows to this table or allocate memory resources.
If that occurs, the SNMP agent responds with the value ‘noResources’ (for the xdsl2LineCmndConfBpscFailReason object in xdsl2LineTable).

The management system (the operator) may delete rows from this table according to any scheme. E.g., after retrieving the results.

When the SNMP manager deletes any row in this table, the SNMP agent MUST delete all rows in this table that have the same ifIndex value."
::= { xdsl2LineSegmentEntry 4 }

-----------------------------------------------
--          xdsl2LineBandTable                --
-----------------------------------------------

xdsl2LineBandTable  OBJECT-TYPE

The table xdsl2LineBandTable contains the, per-band line status parameters of the VDSL2/ADSL/ADSL2 or ADSL2+ line. The indexes of this table consist of an interface index where the interface has an ifType of vdsl2(xxx), together with a per-band index covering both VDSL2 and ADSL/ADSL2/ADSL2+. The parameters in this table are updated at line initialisation time and at showtime.

 ::= { xdsl2Line 2 }

xdsl2LineBandEntry  OBJECT-TYPE
SYNTAX      Xdsl2LineBandEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
"The table xdsl2LineBandTable contains the, per-band line status parameters of the VDSL2/ADSL/ADSL2 or ADSL2+ line."
INDEX  { ifIndex, xdsl2LineBand }
 ::= { xdsl2LineBandTable 1 }

Xdsl2LineBandEntry  ::=  
SEQUENCE  {
  xdsl2LineBand                        Xdsl2Band,
  xdsl2LineBandStatusLnAtten           Unsigned32,
  xdsl2LineBandStatusSigAtten          Unsigned32,
  xdsl2LineBandStatusSnrMargin         Integer32
}

xdsl2LineBand OBJECT-TYPE
SYNTAX      Xdsl2Band
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
"Identifies the band(s) associated with this line. For ADSL/ADSL2/ADSL2+ the values upstream(1) and downstream(2) will always be present. For VDSL2, a subset of {us0(3), ds1(4), us1(5) ... } will always be present (See Xdsl2Band for more details) together with rows for upstream(1) and downstream(2) in which only the xdsl2LineBandStatusSnrMargin attribute is expected to hold a valid (average) measurement."
 ::= { xdsl2LineBandEntry 1 }

xdsl2LineBandStatusLnAtten  OBJECT-TYPE
SYNTAX      Unsigned32 (0..1270 | 2147483646 | 2147483647)
**Internet-Draft**

**VDSL2-LINE MIB**

**July 2008**

---

**UNITS**

"0.1 dB"

**MAX-ACCESS**

read-only

**STATUS**

current

**DESCRIPTION**

"Line Attenuation.

When referring to a band in the downstream direction, it is the measured difference in the total power transmitted by the xTU-C and the total power received by the xTU-R over all subcarriers of that band during initialization.

When referring to a band in the upstream direction, it is the measured difference in the total power transmitted by the xTU-R and the total power received by the xTU-C over all subcarriers of that band during initialization.

Values range from 0 to 1270 in units of 0.1 dB (Physical values are 0 to 127 dB).

A special value of 0x7FFFFFFF (2147483647) indicates the line attenuation is out of range to be represented.

A special value of 0x7FFFFFFE (2147483646) indicates the line attenuation measurement is unavailable."

**REFERENCE**

"ITU-T G.997.1, paragraph #7.5.1.9 (LATNds) and paragraph #7.5.1.10 (LATNus)"

**DEFVAL**

{ 2147483646 }

::= { xdsl2LineBandEntry 2 }

---

**xds12LineBandStatusSigAtten**

**OBJECT-TYPE**

**SYNTAX**

Unsigned32 (0..1270 | 2147483646 | 2147483647)

**UNITS**

"0.1 dB"

**MAX-ACCESS**

read-only

**STATUS**

current

**DESCRIPTION**

"Signal Attenuation.

When referring to a band in the downstream direction, it is the measured difference in the total power transmitted by the xTU-C and the total power received by the xTU-R over all subcarriers of that band during Showtime.

When referring to a band in the upstream direction, it is the measured difference in the total power transmitted by the xTU-R and the total power received by the xTU-C over all subcarriers of that band during Showtime.

Values range from 0 to 1270 in units of 0.1 dB (Physical values are 0 to 127 dB).

A special value of 0x7FFFFFFF (2147483647) indicates the line attenuation is out of range to be represented.

A special value of 0x7FFFFFFE (2147483646) indicates the line attenuation is unavailable."
attenuation measurement is unavailable."
REFERENCE    "ITU-T G.997.1, paragraph #7.5.1.11 (SATNds)
and paragraph #7.5.1.12 (SATNus)"
DEFVAL       { 2147483646 }
 ::= { xdsl2LineBandEntry 3 }

xdsl2LineBandStatusSnrMargin  OBJECT-TYPE
SYNTAX      Integer32 (-640..630 | 2147483646 | 2147483647)
UNITS       "0.1 dB"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"SNR Margin is the maximum increase in dB of the noise power
received at the xTU (xTU-R for a band in the downstream direction
and xTU-C for a band in the upstream direction), such that the
BER requirements are met for all bearer channels received at the
xTU. Values range from -640 to 630 in units of 0.1 dB (Physical
values are -64 to 63 dB).
A special value of 0x7FFFFFFF (2147483647) indicates the SNR
Margin is out of range to be represented.
A special value of 0x7FFFFFFE (2147483646) indicates the SNR
Margin measurement is currently unavailable."
REFERENCE    "ITU-T G.997.1, paragraph #7.5.1.13 (SNRMds)
and paragraph #7.5.1.14 (SNRMpbds)
and paragraph #7.5.1.16 (SNRMus)
and paragraph #7.5.1.17 (SNRMpbus)"
DEFVAL       { 2147483646 }
 ::= { xdsl2LineBandEntry 4 }

------------------------------------------------
--        xdsl2ChannelStatusTable             --
------------------------------------------------

xdsl2ChannelStatusTable  OBJECT-TYPE
SYNTAX      SEQUENCE  OF  Xdsl2ChannelStatusEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
"The table xdsl2ChannelStatusTable contains status
parameters of VDSL2/ADSL/ADSL2 or ADSL2+ channel.
This table contains live data from equipment."
 ::= { xdsl2Status 2 }

xdsl2ChannelStatusEntry  OBJECT-TYPE
SYNTAX      Xdsl2ChannelStatusEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
"The table xdsl2ChannelStatusTable contains status parameters

of VDSL2/ADSL/ADSL2 or ADSL2+ channel.
The index of this table is an interface index where the interface
has an iftype value that is applicable for a DSL channel and the
termination unit."
INDEX  { ifIndex, xDSL2ChStatusUnit }
 ::=  { xDSL2ChannelStatusTable 1 }

XDSL2ChannelStatusEntry  ::=  
SEQUENCE {
  xDSL2ChStatusUnit XDSL2Unit,
  xDSL2ChStatusActDataRate Unsigned32,
  xDSL2ChStatusPrevDataRate Unsigned32,
  xDSL2ChStatusActDelay Unsigned32,
  xDSL2ChStatusActInp Unsigned32,
  xDSL2ChStatusInpReport XDSL2ChInpReport,
  xDSL2ChStatusNFec Unsigned32,
  xDSL2ChStatusRFec Unsigned32,
  xDSL2ChStatusLSymb Unsigned32,
  xDSL2ChStatusIntlvDepth Unsigned32,
  xDSL2ChStatusIntlvBlock Unsigned32,
  xDSL2ChStatusLPath Unsigned32,
  xDSL2ChStatusAtmStatus XDSL2ChAtmStatus,
  xDSL2ChStatusPtmStatus XDSL2ChPtmStatus
}

xDSL2ChStatusUnit OBJECT-TYPE
SYNTAX  XDSL2Unit
MAX-ACCESS not-accessible
STATUS  current
DESCRIPTION 
"The termination unit xtuc(1) or xtur(2)."
 ::=  { xDSL2ChannelStatusEntry 1 }

xDSL2ChStatusActDataRate OBJECT-TYPE
SYNTAX  Unsigned32
UNITS   "bits/second"
MAX-ACCESS read-only
STATUS  current
DESCRIPTION 
"The actual net data rate that the bearer channel is
operating at, if in L0 power management state. In L1 or L2
states, it relates to the previous L0 state. The data rate is
coded in bit/s."
REFERENCE  "ITU-T G.997.1, paragraph #7.5.2.1
(Actual data rate)"
DEFVAL  { 0 }
 ::=  { xDSL2ChannelStatusEntry 2 }
Internet-Draft VDSL2-LINE MIB July 2008

xdsl2ChStatusPrevDataRate OBJECT-TYPE
SYNTAX      Unsigned32
UNITS       "bits/second"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION  "The previous net data rate that the bearer channel was
operating at just before the latest rate change event. This
could be a full or short initialization, fast retrain, DRA or
power management transitions, excluding transitions between L0
state and L1 or L2 states. The data rate is coded in
bit/s."
REFERENCE    "ITU-T G.997.1, paragraph #7.5.2.2
(Previous data rate)"
DEFVAL       { 0 }
::= { xdsl2ChannelStatusEntry 3 }

xdsl2ChStatusActDelay  OBJECT-TYPE
SYNTAX      Unsigned32(0..8176)
UNITS       "milliseconds"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION  "The actual one-way interleaving delay introduced by the
PMS-TC in the direction of the bearer channel, if in L0 power
management state. In L1 or L2 states, it relates to the previous
L0 state. It is coded in ms (rounded to the nearest ms)."
REFERENCE    "ITU-T G.997.1, paragraph #7.5.2.3
(Actual interleaving delay)"
DEFVAL       { 0 }
::= { xdsl2ChannelStatusEntry 4 }

xdsl2ChStatusActInp  OBJECT-TYPE
SYNTAX      Unsigned32(0..255)
UNITS       "0.1 symbols"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION  "Actual impulse noise protection.
This parameter reports the actual impulse noise protection (INP)
on the bearer channel in the L0 state. In the L1 or L2 state, the
parameter contains the INP in the previous L0 state. For ADSL,
this value is computed according to the formula specified in the
relevant Recommendation based on the actual framing parameters.
For ITU-T Rec. G.993.2, the method to report this value is
according to the INPREPORT parameter. The value is coded in
fractions of DMT symbols with a granularity of 0.1 symbols.
The range is from 0 to 25.4. The special value of 255 indicates

an ACTINP higher than 25.4."
REFERENCE "ITU-T G.997.1, paragraph #7.5.2.4 (ACTINP)"
DEFVAL { 0 }
::= { xdsl2ChannelStatusEntry 5 }

xdsl2ChStatusInpReport  OBJECT-TYPE
SYNTAX  Xdsl2ChInpReport
MAX-ACCESS read-only
STATUS current
DESCRIPTION "Impulse noise protection reporting mode. This parameter reports the method used to compute the ACTINP. If set to inpComputedUsingFormula(1), the ACTINP is computed according to the INP_no_erasure formula (9.6/G.993.2). If set to inpEstimatedByXtur(2), the ACTINP is the value estimated by the xTU receiver."
REFERENCE "ITU-T G.997.1 Amendment 1, paragraph #7.5.2.5 (INPREPORT)"
DEFVAL { inpComputedUsingFormula }
::= { xdsl2ChannelStatusEntry 6 }

xdsl2ChStatusNFec  OBJECT-TYPE
SYNTAX  Unsigned32(0..255)
UNITS "bytes"
MAX-ACCESS read-only
STATUS current
DESCRIPTION "Actual size of Reed-Solomon codeword. This parameter reports the actual number of Reed-Solomon redundancy bytes per codeword used in the latency path in which the bearer channel is transported. The value is coded in bytes. It ranges from 0 to 16. The value 0 indicates no Reed-Solomon coding."
REFERENCE "ITU-T G.997.1, paragraph #7.5.2.6.1 (NFEC)"
DEFVAL { 0 }
::= { xdsl2ChannelStatusEntry 7 }

xdsl2ChStatusRFec  OBJECT-TYPE
SYNTAX  Unsigned32(0..16)
UNITS "bits"
MAX-ACCESS read-only
STATUS current
DESCRIPTION "Actual number of Reed-Solomon redundancy bytes. This parameter reports the actual number of Reed-Solomon redundancy bytes per codeword used in the latency path in which the bearer channel is transported. The value is coded in bytes. It ranges from 0 to 16."
The value 0 indicates no Reed-Solomon coding.
REFERENCE "ITU-T G.997.1, paragraph #7.5.2.6.2 (RFEC)"
DEFVAL { 0 }
::= { xdsl2ChannelStatusEntry 8 }

xdsl2ChStatusLSymb OBJECT-TYPE
SYNTAX Unsigned32(0..65535)
UNITS "bits"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Actual number of bits per symbol.
This parameter reports the actual number of bits per symbol
assigned to the latency path in which the bearer channel is
transported. This value does not include trellis overhead. The
value is coded in bits.
It ranges from 0 to 65535."
REFERENCE "ITU-T G.997.1, paragraph #7.5.2.6.3 (LSYMB)"
DEFVAL { 0 }
::= { xdsl2ChannelStatusEntry 9 }

xdsl2ChStatusIntlvDepth OBJECT-TYPE
SYNTAX Unsigned32(1..4096)
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Actual interleaving depth.
This parameter reports the actual depth of the interleaver used
in the latency path in which the bearer channel is transported.
The value ranges from 1 to 4096 in steps of 1.
The value 1 indicates no interleaving."
REFERENCE "ITU-T G.997.1, paragraph #7.5.2.6.4 (INTLVDEPTH)"
DEFVAL { 1 }
::= { xdsl2ChannelStatusEntry 10 }

xdsl2ChStatusIntlvBlock OBJECT-TYPE
SYNTAX Unsigned32(4..255)
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Actual interleaving block length.
This parameter reports the actual block length of the interleaver
used in the latency path in which the bearer channel is
transported.
The value ranges from 4 to 255 in steps of 1."
REFERENCE "ITU-T G.997.1, paragraph #7.5.2.6.5 (INTLVBLOCK)"
DEFVAL { 4 }
::= { xdsl2ChannelStatusEntry 11 }

**xdsl2ChStatusLPath** 
**OBJECT-TYPE**
SYNTAX Unsigned32(0..3)
MAX-ACCESS read-only
STATUS current
DESCRIPTION 
"Actual latency path. This parameter reports the index of the actual latency path in which the bearer is transported. The valid values are 0, 1, 2 and 3. For G.992.1, the FAST path shall be mapped to the latency index 0, and the INTERLEAVED path shall be mapped to the latency index 1."
REFERENCE "ITU-T G.997.1 amendment 1, paragraph #7.5.2.7 (LPATH)"
DEFVAL { 0 }
::= { xdsl2ChannelStatusEntry 12 }

**xdsl2ChStatusAtmStatus** 
**OBJECT-TYPE**
SYNTAX Xdsl2ChAtmStatus
MAX-ACCESS read-only
STATUS current
DESCRIPTION 
"Indicates current state (existing failures) of the DSL channel in case its Data Path is ATM. This is a bit-map of possible conditions. The various bit positions are: noDefect (0), noCellDelineation (1), lossOfCellDelineation (2). In case the channel is not of ATM Data Path the object is set to '0'."
REFERENCE "ITU-T G.997.1, paragraph #7.1.4 (ATM data path failures)"
DEFVAL { { noDefect } }
::= { xdsl2ChannelStatusEntry 13 }

**xdsl2ChStatusPtmStatus** 
**OBJECT-TYPE**
SYNTAX Xdsl2ChPtmStatus
MAX-ACCESS read-only
STATUS current
DESCRIPTION 
"Indicates current state (existing failures) of the DSL channel in case its Data Path is PTM (Packet Transfer Mode). This is a bit-map of possible conditions. The various bit positions are: noDefect (0),"
outOfSync (1).
In case the channel is not of PTM Data Path the object is set
to ‘0’.
REFERENCE
"ITU-T G.997.1, paragraph #7.1.5
(PTM Data Path failures)"
DEFVAL
{ ( noDefect ) }
::= { xdsl2ChannelStatusEntry 14 }

-- Scalars that relate to the SC Status Tables
---------------------------

xdsl2ScalarSCMaxInterfaces  OBJECT-TYPE
SYNTAX      Unsigned32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"This value determines the maximum number of
interfaces supported by xdsl2SCStatusTable,
xdsl2SCStatusBandTable, and xdsl2SCStatusSegmentTable."
::= { xdsl2ScalarSC 1 }

xdsl2ScalarSCAvailInterfaces  OBJECT-TYPE
SYNTAX      Unsigned32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"This value determines the currently available number of
interfaces listed in xdsl2SCStatusTable,
xdsl2SCStatusBandTable, and xdsl2SCStatusSegmentTable."
::= { xdsl2ScalarSC 2 }

-- xdsl2SCStatusTable --
---------------------------

xdsl2SCStatusTable  OBJECT-TYPE
SYNTAX      SEQUENCE  OF  Xdsl2SCStatusEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
"The table xdsl2SCStatusTable contains
subcarrier status parameters for VDSL2/ADSL/ADSL2 and ADSL2+
that DO NOT refer to specific subcarriers.
In addition, the table contains parameters that provide
information about the size of parameters in
xdsl2SCStatusSegmentTable."
The parameters in this table MUST be updated after a loop diagnostic procedure and MAY be updated after a line initialisation and MAY be updated at showtime.

::= { xdsl2Status 3 }

xdsl2SCStatusEntry OBJECT-TYPE
SYNTAX Xdsl2SCStatusEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The table xdsl2SCStatusTable contains subcarrier status parameters for VDSL2/ADSL/ADSL2 and ADSL2+ that DO NOT refer to specific subcarriers. In addition, the table contains parameters that provide information about the size of parameters in xdsl2SCStatusSegmentTable.
One index of this table is an interface index where the interface has an ifType of vdsl2(xxx). A second index of this table is the transmission direction."
INDEX { ifIndex, xdsl2SCStatusDirection }
::= { xdsl2SCStatusTable 1 }

Xdsl2SCStatusEntry ::= SEQUENCE {
    xdsl2SCStatusDirection Xdsl2Direction,
    xdsl2SCStatusLinScale Unsigned32,
    xdsl2SCStatusLinScGroupSize Unsigned32,
    xdsl2SCStatusLogMt Unsigned32,
    xdsl2SCStatusLogScGroupSize Unsigned32,
    xdsl2SCStatusQlnMt Unsigned32,
    xdsl2SCStatusQlnScGroupSize Unsigned32,
    xdsl2SCStatusSnrMtime Unsigned32,
    xdsl2SCStatusSnrScGroupSize Unsigned32,
    xdsl2SCStatusAttainableRate Unsigned32,
    xdsl2SCStatusRowStatus RowStatus
}

xdsl2SCStatusDirection OBJECT-TYPE
SYNTAX Xdsl2Direction
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The direction of the subcarrier either upstream or downstream."
::= { xdsl2SCStatusEntry 1 }

xdsl2SCStatusLinScale OBJECT-TYPE
SYNTAX Unsigned32 (1..65535)
MAX-ACCESS read-only
STATUS      current
DESCRIPTION
"The scale factor to be applied to the H(f) linear
representation values for the respective transmission direction.
This parameter is only available after a loop diagnostic
procedure. It is represented as an unsigned integer in the range
from 1 to 2^16-1."
REFERENCE  "ITU-T G.997.1, paragraph #7.5.1.26.1 (HLINScds)
and paragraph #7.5.1.26.7 (HLINScus)"
 ::= { xdsl2SCStatusEntry 2 }

xdsl2SCStatusLinScGroupSize OBJECT-TYPE
SYNTAX      Unsigned32(1 | 2 | 4 | 8)
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"Number of subcarriers per group used to report the H(f)
linear representation values for the respective transmission
direction. The valid values are 1, 2, 4 and 8. For ADSL, this
parameter is equal to one and, for VDSL2, it is equal to the size
of a subcarrier group used to compute these parameters.
This parameter is only available after a loop diagnostic
procedure."
REFERENCE  "ITU-T G.997.1, paragraph #7.5.1.26.2 (HLINGsds)
and paragraph #7.5.1.26.8 (HLINGsus)"
 ::= { xdsl2SCStatusEntry 3 }

xdsl2SCStatusLogMt  OBJECT-TYPE
SYNTAX      Unsigned32 (1..65535)
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"This parameter contains the number of symbols used to
measure the Hlog(f) values. It is represented as an unsigned
integer in the range from 1 to 2^16-1.
After a loop diagnostic procedure, this parameter shall contain
the number of symbols used to measure the Hlog(f). It should
correspond to the value specified in the Recommendation (e.g., the
number of symbols in 1 s time interval for ITU-T Rec.
G.992.3)."
REFERENCE  "ITU-T G.997.1, paragraph #7.5.1.26.4 (HLOGMtds)
and paragraph #7.5.1.26.10 (HLOGMts)"
 ::= { xdsl2SCStatusEntry 4 }

xdsl2SCStatusLogScGroupSize OBJECT-TYPE
SYNTAX      Unsigned32(1 | 2 | 4 | 8)
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"Number of subcarriers per group used to report the \( H(f) \)
logarithmic representation values for the respective
transmission direction. The valid values are 1, 2, 4 and 8.
For ADSL, this parameter is equal to one and, for VDSL2, it is
equal to the size of a subcarrier group used to compute these
parameters."
REFERENCE "ITU-T G.997.1, paragraph #7.5.1.26.5 (HLOGGds)
and paragraph #7.5.1.26.11 (HLOGGus)"
::= { xdsl2SCStatusEntry 5 }

xdsl2SCStatusQlnMt  OBJECT-TYPE
SYNTAX  Unsigned32 (1..65535)
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"This parameter contains the number of symbols used to
measure the QLN(f) values. It is an unsigned integer in the range
from 1 to 2^16-1. After a loop diagnostic procedure, this
parameter shall contain the number of symbols used to measure the
QLN(f). It should correspond to the value specified in the
Recommendation (e.g., the number of symbols in 1 s time interval
for ITU-T Rec. G.992.3)."
REFERENCE "ITU-T G.997.1, paragraph #7.5.1.27.1 (QLNMTds)
and paragraph #7.5.1.27.4 (QLNMTus)"
::= { xdsl2SCStatusEntry 6 }

xdsl2SCStatusQlnScGroupSize OBJECT-TYPE
SYNTAX  Unsigned32(1 | 2 | 4 | 8)
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"Number of subcarriers per group used to report the Quiet
Line Noise values for the respective transmission direction.
The valid values are 1, 2, 4 and 8.
For ADSL, this parameter is equal to one and, for VDSL2, it is
equal to the size of a subcarrier group used to compute these
parameters."
REFERENCE "ITU-T G.997.1, paragraph #7.5.1.27.2 (QLNGds)
and paragraph #7.5.1.27.5 (QLNGus)"
::= { xdsl2SCStatusEntry 7 }

xdsl2SCStatusSnrMtime  OBJECT-TYPE
SYNTAX  Unsigned32 (1..65535)
UNITS       "symbols"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"This parameter contains the number of symbols used to measure
the SNR(\(f\)) values. It is an unsigned integer in the range from 1
to \(2^{16}-1\). After a loop diagnostic procedure, this parameter shall
contain the number of symbols used to measure the SNR(\(f\)).
It should correspond to the value specified in the Recommendation
(e.g., the number of symbols in 1 s time interval for ITU-T Rec.
G.992.3)."
REFERENCE  "ITU-T G.997.1, paragraph #7.5.1.28.1 (SNRMTds)
and paragraph #7.5.1.28.4 (SNRMTus)"
::= { xdsl2SCStatusEntry 8 }

xdsl2SCStatusSnrScGroupSize OBJECT-TYPE
SYNTAX      Unsigned32(1 | 2 | 4 | 8)
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"Number of subcarriers per group used to report the SNR values
on the respective transmission direction.
The valid values are 1, 2, 4 and 8.
For ADSL, this parameter is equal to one and, for VDSL2, it is
equal to the size of a subcarrier group used to compute these
parameters."
REFERENCE  "ITU-T G.997.1, paragraph #7.5.1.28.2 (SNRGds)
and paragraph #7.5.1.28.5 (SNRGus)"
::= { xdsl2SCStatusEntry 9 }

xdsl2SCStatusAttainableRate  OBJECT-TYPE
SYNTAX      Unsigned32
UNITS       "bits/second"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"Maximum Attainable Data Rate. The maximum net data rate
currently attainable by the xTU-C transmitter and xTU-R receiver
(when referring to downstream direction) or by the xTU-R
transmitter and xTU-C receiver (when referring to upstream
direction). Value is coded in bits/s.
This object reflects the value of the parameter following the
most recent DELT performed on the associated line. Once the DELT
process is over, the parameter no longer changes until the row is
deleted or a new DELT process is initiated."
REFERENCE  "ITU-T G.997.1, paragraph #7.5.1.19 (ATTNDRds)
and paragraph #7.5.1.20 (ATTNDRus)"
::= { xdsl2SCStatusEntry 10 }

xdsl2SCStatusRowStatus  OBJECT-TYPE
SYNTAX      RowStatus
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"Row Status. The SNMP manager is not permitted to create rows in this table. The SNMP agent will create a row in this table for storing the results of a DELT performed on the associated line, if the row does not already exist.

When a row is created in this table, the SNMP agent should also create corresponding rows in the tables xdsl2SCStatusBandTable and xdsl2SCStatusSegmentTable.

When a row is deleted in this table, the SNMP agent should also delete corresponding rows in the tables xdsl2SCStatusBandTable and xdsl2SCStatusSegmentTable.

The SNMP agent may have limited resources; therefore, if multiple rows co-exist in this table, it may fail to add new rows to this table or allocate memory resources for a new DELT process. If that occurs, the SNMP agent responds with either the value 'tableFull' or the value 'noResources' (for the xdsl2LineCmdndConfLdsfFailReason object in xdsl2LineTable).

The management system (the operator) may delete rows from this table according to any scheme. E.g., after retrieving the results."
::= { xdsl2SCStatusEntry 11 }

-----------------------------------------------
-- xdsl2SCStatusBandTable --
-----------------------------------------------

xdsl2SCStatusBandTable OBJECT-TYPE
SYNTAX SEQUENCE OF Xdsl2SCStatusBandEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The table xdsl2SCStatusBandTable contains subcarrier status parameters for VDSL2/ADSL/ADSL2 and ADSL2+ that are grouped per-band.

For ADSL/ADSL2/ADSL2+, there is a single upstream band and a single downstream band. For VDSL2, there are several downstream bands and several upstream bands.

The parameters in this table are only available after a loop diagnostic procedure."
::= { xdsl2Status 4 }

xdsl2SCStatusBandEntry OBJECT-TYPE
SYNTAX Xdsl2SCStatusBandEntry
MAX-ACCESS not-accessible
The table xdsl2SCStatusBandTable contains subcarrier status parameters for VDSL2/ADSL/ADSL2 and ADSL2+ that are grouped per-band.
For ADSL/ADSL2/ADSL2+, there is a single upstream band and a single downstream band.
For VDSL2, there are several downstream bands and several upstream bands.
One index of this table is an interface index where the interface has an ifType of vdsl2(xxx). A second index of this table is transmission band.

INDEX  { ifIndex, xdsl2SCStatusBand }
 ::= { xdsl2SCStatusBandTable 1 }

Xdsl2SCStatusBandEntry ::= SEQUENCE {
  xdsl2SCStatusBand          Xdsl2Band,
  xdsl2SCStatusBandLnAtten   Unsigned32,
  xdsl2SCStatusBandSigAtten  Unsigned32
}

Xdsl2SCStatusBand OBJECT-TYPE
SYNTAX      Xdsl2Band
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
"The transmission band."
 ::= { xdsl2SCStatusBandEntry 1 }

Xdsl2SCStatusBandLnAtten OBJECT-TYPE
SYNTAX      Unsigned32 (0..1270 | 2147483646 | 2147483647)
UNITS       "0.1 dB"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"When referring to a band in the downstream direction, it is the measured difference in the total power transmitted by the xTU-C and the total power received by the xTU-R over all subcarriers during diagnostics mode.
When referring to a band in the upstream direction, it is the measured difference in the total power transmitted by the xTU-R and the total power received by the xTU-C over all subcarriers during diagnostics mode.
It ranges from 0 to 1270 units of 0.1 dB (Physical values are 0 to 127 dB).
A special value of 0x7FFFFFFF (2147483647) indicates the line attenuation is out of range to be represented."
A special value of 0x7FFFFFFE (2147483646) indicates the line attenuation measurement is unavailable. This object reflects the value of the parameter following the most recent DELT performed on the associated line. Once the DELT process is over, the parameter no longer changes until the row is deleted or a new DELT process is initiated.

REFERENCE  
"ITU-T G.997.1, paragraph #7.5.1.9 (LATNds) and paragraph #7.5.1.10 (LATNus)"

DEFVAL       { 2147483646 }
::= { xdsl2SCStatusBandEntry 2 }

---
--        xdsl2SCStatusSegmentEntry           --
---

xdsl2SCStatusSegmentTable  OBJECT-TYPE
SYNTAX      SEQUENCE  OF  Xdsl2SCStatusSegmentEntry
MAX-ACCESS  not-accessible
STATUS      current

The table xdsl2SCStatusSegmentTable contains status parameters of VDSL2/ADSL/ADSL2 and ADSL2+ subcarriers. The parameters in this table MUST be updated after a loop diagnostic procedure and MAY be updated after a line initialisation and MAY be updated at showtime.

::= { xdsl2Status 5 }

xdsl2SCStatusSegmentEntry  OBJECT-TYPE
SYNTAX  Xdsl2SCStatusSegmentEntry
MAX-ACCESS not-accessible
STATUS  current
DESCRIPTION
"The table xdsl2SCStatusSegmentEntry contains status parameters of VDSL2/ADSL/ADSL2 and ADSL2+ subcarriers.

Several objects in the table refer to NSus and NSds. For G.993.2, the value of NSus and NSds are respectively the indices of the highest supported upstream and downstream subcarriers according to the selected implementation profile.

For ADSL, NSus is equal to NSCus-1 and NSds is equal to NSCds-1.

One index of this table is an interface index where the interface has an ifType of vdsl2(xxx). A second index of this table is the transmission direction. A third index identifies the specific segment of the subcarriers status addressed."

INDEX  { ifIndex,
  xdsl2SCStatusDirection,
  xdsl2SCStatusSegment }
::= { xdsl2SCStatusSegmentTable 1 }

Xds12SCStatusSegmentEntry  ::=  SEQUENCE {
  xdsl2SCStatusSegment                  Unsigned32,
  xdsl2SCStatusSegmentLinReal           OCTET STRING,
  xdsl2SCStatusSegmentLinImg            OCTET STRING,
  xdsl2SCStatusSegmentLog               OCTET STRING,
  xdsl2SCStatusSegmentQln               OCTET STRING,
  xdsl2SCStatusSegmentSnr               OCTET STRING,
  xdsl2SCStatusSegmentBitsAlloc         Xdsl2BitsAlloc,
  xdsl2SCStatusSegmentGainAlloc         OCTET STRING
}

xdsl2SCStatusSegment  OBJECT-TYPE
SYNTAX  Unsigned32(1..8)
MAX-ACCESS not-accessible
STATUS  current
DESCRIPTION
"The segment of the subcarriers status information provided by this row.
Several status parameters in this table are retrieved in segments. The first segment of the status information is retrieved with xdsl2SCStatusSegment=1, the second segment is retrieved with xdsl2SCStatusSegment=2, and so on. When any status parameter is retrieved in n segments where n<8) then, for that parameter, GET operations for the remaining segment numbers (n+1 to 8) will respond with a zero-length OCTET STRING."
::= { xdsl2SCStatusSegmentEntry 1 }

xdsl2SCStatusSegmentLinReal OBJECT-TYPE
SYNTAX OCTET STRING (SIZE(0..1024))
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"An array of up to 512 complex H(f) linear representation values in linear scale for the respective transmission direction. It is designed to support up to 512 (downstream) subcarriers groups and can be retrieved in a single segment. The number of utilized values on downstream direction depends on NSds, and on upstream direction it depends on NSus. This value is referred here as NS.
Each array entry represents the real component [referred here as a(i)] of Hlin(f = i*Df) value for a particular subcarrier group index i (0 <= i < NS).
Hlin(f) is represented as ((scale/2^15)*((a(i)+j*b(i))/2^15)), where scale is xdsl2SCStatusLinScale and a(i) and b(i) [provided by the xdsl2SCStatusSegmentLinImg object] are in the range (-2^15+1) to (+2^15-1).
A special value a(i)=b(i)= -2^15 indicates that no measurement could be done for the subcarriers group because it is out of the passband or that the attenuation is out of range to be represented. This parameter is only available after a loop diagnostic procedure.
Each value in this array is 16 bits wide and is stored in big endian format."
REFERENCE "ITU-T G.997.1, paragraph #7.5.1.26.3 (HLINpsds) and paragraph #7.5.1.26.9 (HLINpsus)"
::= { xdsl2SCStatusSegmentEntry 2 }

xdsl2SCStatusSegmentLinImg OBJECT-TYPE
SYNTAX OCTET STRING (SIZE(0..1024))
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"An array of up to 512 complex H(f) linear representation values in linear scale for the respective transmission direction."
It is designed to support up to 512 (downstream) subcarriers groups and can be retrieved in a single segment. The number of utilized values on downstream direction depends on NSds, and on upstream direction it depends on NSus. This value is referred here as NS.

Each array entry represents the imaginary component [referred here as \text{b(i)}] of H\text{lin}(f = i*Df) value for a particular subcarrier group index \(i\) (\(0 \leq i < \text{NS}\)).

H\text{lin}(f) is represented as \(((\text{scale}/2^{15})*((\text{a(i)}+j*\text{b(i)})/2^{15})), where scale is xdsl2SCStatusLinScale and a(i) [provided by the xdsl2SCStatusSegmentLinReal object] and \text{b(i)} are in the range (-2^{15}+1) to (+2^{15}-1).

A special value a(i)=\text{b(i)}= -2^{15} indicates that no measurement could be done for the subcarriers group because it is out of the passband or that the attenuation is out of range to be represented. This parameter is only available after a loop diagnostic procedure.

Each value in this array is 16 bits wide and is stored in big endian format."

REFERENCE  "ITU-T G.997.1, paragraph #7.5.1.26.3 (HLINpsds) and paragraph #7.5.1.26.9 (HLINpsus)"

::= { xdsl2SCStatusSegmentEntry 3 }

**xdsl2SCStatusSegmentLog**  OBJECT-TYPE
SYNTAX      OCTET STRING  (SIZE(0..1024))
UNITS       "dB"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION  "An array of up to 512 real H(f) logarithmic representation values in dB for the respective transmission direction. It is designed to support up to 512 (downstream) subcarriers groups and can be retrieved in a single segment. The number of utilized values on downstream direction depends on NSds, and on upstream direction it depends on NSus. This value is referred here as NS. Each array entry represents the real Hlog(f = i*Df) value for a particular subcarrier group index i, (0 <= i < NS). The real Hlog(f) value is represented as (6-m(i)/10), with m(i) in the range 0 to 1022. A special value m=1023 indicates that no measurement could be done for the subcarrier group because it is out of the passband or that the attenuation is out of range to be represented. This parameter is applicable in loop diagnostic procedure and initialization. Each value in this array is 16 bits wide and is stored in big endian format."

REFERENCE  "ITU-T G.997.1, paragraph #7.5.1.26.6 (HLOGpsds) and paragraph #7.5.1.26.12 (HLOGpsus)"
::= { xdsl2SCStatusSegmentEntry 4 }

xdsl2SCStatusSegmentQln  OBJECT-TYPE
SYNTAX       OCTET STRING  (SIZE(0..512))
UNITS        "dBm/Hz"
MAX-ACCESS   read-only
STATUS       current
DESCRIPTION  
"An array of up to 512 real Quiet Line Noise values in dBm/Hz for the respective transmission direction. It is designed for up to 512 (downstream) subcarriers groups and can be retrieved in a single segment.

The number of utilized values on downstream direction depends on NSds, and on upstream direction it depends on NSus. This value is referred here as NS.

Each array entry represents the QLN(f = i*Df) value for a particular subcarrier index i, (0 <= i < NS).

The QLN(f) is represented as ( -23-n(i)/2), with n(i) in the range 0 to 254. A special value n(i)=255 indicates that no measurement could be done for the subcarrier group because it is out of the passband or that the noise PSD is out of range to be represented. This parameter is applicable in loop diagnostic procedure and initialization. Each value in this array is 8 bits wide."
REFERENCE  "ITU-T G.997.1, paragraph #7.5.1.27.3 (QLNpsds) and paragraph #7.5.1.27.6 (QLNpsus)"
::= { xdsl2SCStatusSegmentEntry 5 }

xdsl2SCStatusSegmentSnr  OBJECT-TYPE
SYNTAX       OCTET STRING  (SIZE(0..512))
UNITS        "0.5 dB"
MAX-ACCESS   read-only
STATUS       current
DESCRIPTION  
"The SNR Margin per subcarrier group, expressing the ratio between the received signal power and received noise power per subscriber group. It is an array of 512 octets, designed for supporting up to 512 (downstream) subcarriers groups and can be retrieved in a single segment.

The number of utilized octets on downstream direction depends on NSds, and on upstream direction it depends on NSus. This value is referred here as NS.

Octet i (0 <= i < NS) is set to a value in the range 0 to 254 to indicate that the respective downstream or upstream subcarrier group i has SNR of:
(-32 + xdsl2SCStatusSegmentSnr(i)/2) in dB (i.e., -32 to 95dB).

The special value 255 means that no measurement could be done for the subcarrier group because it is out of the PSD mask passband or that the noise PSD is out of range to be represented. Each value
in this array is 8 bits wide."
REFERENCE  "ITU-T G.997.1, paragraph #7.5.1.28.3 (SNRpsds) and paragraph #7.5.1.28.6 (SNRpsus)"
::= { xdsl2SCStatusSegmentEntry 6 }
xdsl2SCStatusSegmentBitsAlloc OBJECT-TYPE
SYNTAX      Xdsl2BitsAlloc
UNITS       "bits"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION "The bits allocation per subcarrier. An array of 256 octets (512 nibbles), designed for supporting up to 512 (downstream) subcarriers. When more then 512 subcarriers are supported, the status information is reported through multiple (up to 8) segments. The first segment is then used for the first 512 subcarriers. The second segment is used for the subcarriers 512 to 1023 and so on. The aggregate number of utilized nibbles on downstream direction (in all segments) depends on NSds, and on upstream direction it depends on NSus. This value is referred here as NS. The segment number is in xdsl2SCStatusSegment.Nibble i (0 <= i < MIN(NS-(segment-1)*512,512)) in each segment is set to a value in the range 0 to 15 to indicate that the respective downstream or upstream subcarrier j (j=(segment-1)*512+i) has the same amount of bits allocation."
REFERENCE  "ITU-T G.997.1, paragraph #7.5.1.29.1 (BITSpeds) and paragraph #7.5.1.29.2 (BITSpsus)"
::= { xdsl2SCStatusSegmentEntry 7 }
xdsl2SCStatusSegmentGainAlloc OBJECT-TYPE
SYNTAX      OCTET STRING  (SIZE(0..1024))
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION "The gain allocation per subcarrier. An array of 512 16-bits values, designed for supporting up to 512 (downstream) subcarriers. When more then 512 subcarriers are supported, the status information is reported through multiple (up to 8) segments. The first segment is then used for the first 512 subcarriers. The second segment is used for the subcarriers 512 to 1023 and so on. The aggregate number of utilized octets on downstream direction depends on NSds, and on upstream direction it depends on NSus. This value is referred here as NS. The segment number is in xdsl2SCStatusSegment."
Value i (0 <= i < MIN(NS-(segment-1)*512,512)) in each
segment is set to a value in the range 0 to 4093 to indicate that
the respective downstream or upstream subcarrier j 
(j=(segment-1)*512+i) has the same amount of gain value.
The gain value is represented as a multiple of 1/512 on linear
scale. Each value in this array is 16 bits wide and is stored in
big endian format.
REFERENCE    "ITU-T G.997.1, paragraph #7.5.1.29.3 (GAINSpsds)
and paragraph #7.5.1.29.4 (GAINSpsus)"
::= { xdsl2SCStatusSegmentEntry 8 }

-- xdsl2LineInventoryTable --

xdsl2LineInventoryTable OBJECT-TYPE
  SYNTAX      SEQUENCE  OF  Xdsl2LineInventoryEntry
  MAX-ACCESS  not-accessible
  STATUS      current
  DESCRIPTION
    "The table xdsl2LineInventoryTable contains inventory of the
    DSL termination unit."
 ::= { xdsl2Inventory 1 }

xdsl2LineInventoryEntry OBJECT-TYPE
  SYNTAX      Xdsl2LineInventoryEntry
  MAX-ACCESS  not-accessible
  STATUS      current
  DESCRIPTION
    "The table xdsl2LineInventoryTable contains inventory of DSL
    termination unit.
    The index of this table is an interface index where the interface
    has an ifType of vdsl2(xxx)."
INDEX  { ifIndex, xdsl2LInvUnit }
 ::= { xdsl2LineInventoryTable 1 }

Xdsl2LineInventoryEntry ::= SEQUENCE {
  xdsl2LInvUnit                      Xdsl2Unit,
  xdsl2LInvG994VendorId              OCTET STRING,
  xdsl2LInvSystemVendorId            OCTET STRING,
  xdsl2LInvVersionNumber             OCTET STRING,
  xdsl2LInvSerialNumber              OCTET STRING,
  xdsl2LInvSelfTestResult            Unsigned32,
  xdsl2LInvTransmissionCapabilities  Xdsl2TransmissionModeType
}

xdsl2LInvUnit OBJECT-TYPE
SYNTAX      Xdsl2Unit
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION  "The termination unit xtuc{1} or xtur{2}.''
::= { xdsl2LineInventoryEntry 1 }

xdsl2LInvG994VendorId  OBJECT-TYPE
SYNTAX      OCTET STRING  (SIZE(8))
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION  "The ATU G.994.1 Vendor ID as inserted in the G.994.1 CL/CLR message. It consists of 8 binary octets, including a country code followed by a (regionally allocated) provider code, as defined in Recommendation T.35."
REFERENCE   "ITU-T G.997.1, paragraph #7.4.1-7.4.2"
::= { xdsl2LineInventoryEntry 2 }

xdsl2LInvSystemVendorId  OBJECT-TYPE
SYNTAX      OCTET STRING  (SIZE(8))
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION  "The ATU System Vendor ID (identifies the xTU system integrator) as inserted in the Overhead Messages (both xTUs for G.992.3, G.992.4, G.992.5 and G.993.2) or in the Embedded Operations Channel (xTU-R in G.992.1 and G.992.2). It consists of 8 binary octets, with same format as used for Xdsl2InvG994VendorId."
REFERENCE   "ITU-T G.997.1, paragraph #7.4.3-7.4.4"
::= { xdsl2LineInventoryEntry 3 }

xdsl2LInvVersionNumber  OBJECT-TYPE
SYNTAX      OCTET STRING  (SIZE(0..16))
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION  "The xTU version number (vendor-specific information) as inserted in the Overhead Messages (both xTUs for G.992.3, G.992.4, G.992.5 and G.993.2) or in the Embedded Operations Channel (xTU-R in G.992.1 and G.992.2). It consists of up to 16 binary octets."
REFERENCE   "ITU-T G.997.1, paragraph #7.4.5-7.4.6"
::= { xdsl2LineInventoryEntry 4 }

xdsl2LInvSerialNumber  OBJECT-TYPE
SYNTAX      OCTET STRING  (SIZE(0..32))
Internet-Draft               VDSL2-LINE MIB                    July 2008

MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The xTU serial number (vendor-specific information) as
inserted in the Overhead Messages (both xTUs for G.992.3,
G.992.4, G.992.5 and G.993.2) or in the Embedded Operations
Channel (xTU-R in G.992.1 and G.992.2). It is vendor specific
information consisting of up to 32 ASCII characters."
REFERENCE "ITU-T G.997.1, paragraph #7.4.7-7.4.8"
::= { xdsl2LineInventoryEntry 5 }

dxsl2LInvSelfTestResult OBJECT-TYPE
SYNTAX Unsigned32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The xTU self-test result, coded as a 32-bit value. The
most significant octet of the result is '0' if the
self-test passed, and '1' if the self-test failed. The
interpretation of the other octets is vendor discretionary."
REFERENCE "ITU-T G.997.1, paragraph #7.4.9-7.4.10"
DEFVAL { 0 }
::= { xdsl2LineInventoryEntry 6 }

ndxsl2LInvTransmissionCapabilities OBJECT-TYPE
SYNTAX Xdsl2TransmissionModeType
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The xTU transmission system capability list of the different
coding types. It is coded in a bit-map representation with 1 or
more bits set. A bit set to '1' means that the xTU
supports the respective coding. The value may be derived from
the handshaking procedures defined in G.994.1. A set of xDSL
line transmission modes, with one bit per mode."
REFERENCE "ITU-T G.997.1, paragraph #7.4.11-7.4.12"
::= { xdsl2LineInventoryEntry 7 }

-- xdsl2LineConfTemplateTable --

-----------------------------------------------
xdsl2LineConfTemplateTable OBJECT-TYPE
SYNTAX SEQUENCE OF Xdsl2LineConfTemplateEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The table xdsl2LineConfTemplateTable contains VDSL2/ADSL/
ADSL2 and ADSL2+ line configuration templates.

Note that this table is also used to configure the number of bearer channels.

When the number of bearer channels is increased, the SNMP agent SHOULD create rows in all tables indexed by a channel index. When the number of bearer channels is decreased, the SNMP agent SHOULD delete rows in all tables indexed by a channel index.

For example, if the value of xdsl2LConfTempChan4ConfProfile is set to a non null value then rows SHOULD be created in xdsl2ChannelStatusTable, xdsl2PMChCurrTable, and all other tables indexed by a channel index.

For example, if the value of xdsl2LConfTempChan2ConfProfile is set to a null value then rows SHOULD be deleted in xdsl2ChannelStatusTable, xdsl2PMChCurrTable, and all other tables indexed by a channel index.

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

::= { xdsl2ProfileLine 1 }

xdsl2LineConfTemplateEntry OBJECT-TYPE
SYNTAX      Xdsl2LineConfTemplateEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
"The table xdsl2LineConfTemplateTable contains VDSL2/ADSL/
ADSL2 and ADSL2+ line configuration templates.

A default template 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  { xdsl2LConfTempTemplateName }
::= { xdsl2LineConfTemplateTable 1 }

Xdsl2LineConfTemplateEntry ::= SEQUENCE {
   xdsl2LConfTempTemplateName      SnmpAdminString,
   xdsl2LConfTempLineProfile        SnmpAdminString,
   xdsl2LConfTempChan1ConfProfile   SnmpAdminString,
   xdsl2LConfTempChan1RaRatioDs    Unsigned32,
   xdsl2LConfTempChan1RaRatioUs    Unsigned32,
   xdsl2LConfTempChan2ConfProfile   SnmpAdminString,
   xdsl2LConfTempChan2RaRatioDs    Unsigned32,
   xdsl2LConfTempChan2RaRatioUs    Unsigned32,
   xdsl2LConfTempChan3ConfProfile   SnmpAdminString,
   xdsl2LConfTempChan3RaRatioDs    Unsigned32,
   xdsl2LConfTempChan3RaRatioUs    Unsigned32,
Internet-Draft               VDSL2-LINE MIB                    July 2008

...}

xdsl2LConfTempTemplateName  OBJECT-TYPE
SYNTAX      SnmpAdminString (SIZE(1..32))
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
  "This object identifies a row in this table."
REFERENCE    "DSL Forum TR-129, paragraph #5.4"
::= { xdsl2LineConfTemplateEntry 1 }

xdsl2LConfTempLineProfile  OBJECT-TYPE
SYNTAX      SnmpAdminString (SIZE(1..32))
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
  "The value of this object identifies the row in the
  VDSL2/ADSL/ADSL2 and ADSL2+ line configuration Profile Table,
  (xdsl2LineConfProfTable) that applies for this DSL line."
REFERENCE    "DSL Forum TR-129, paragraph #5.4"
DEFVAL       { "DEFVAL" }
::= { xdsl2LineConfTemplateEntry 2 }

xdsl2LConfTempChan1ConfProfile  OBJECT-TYPE
SYNTAX      SnmpAdminString (SIZE(1..32))
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
  "The value of this object identifies the row in the VDSL2/
  ADSL/ADSL2 and ADSL2+ channel configuration Profile Table,
  (xdsl2ChConfProfileTable) that applies to DSL bearer channel #1.
  The channel profile name specified here MUST match the name of an
  existing row in the xdsl2ChConfProfileTable table."
DEFVAL       { "DEFVAL" }
::= { xdsl2LineConfTemplateEntry 3 }

xdsl2LConfTempChan1RaRatioDs  OBJECT-TYPE
SYNTAX      Unsigned32(0..100)
UNITS       "percent"
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
  "Rate Adaptation Ratio. The ratio (in %) that should be
  taken into account for the bearer channel #1 when performing rate
adaptation on Downstream. The ratio refers to the available data rate in excess of the Minimum Data Rate, summed over all bearer channels. Also, the 100 - xdsl2LConfTempChan1RaRatioDs is the ratio of excess data rate to be assigned to all other bearer channels on Downstream direction. The sum of rate adaptation ratios over all bearers on the same direction shall be equal to 100%.

REFERENCE
"ITU-T G.997.1, paragraph #7.3.2.1.4
(Rate adaptation ratio)"
DEFVAL { 100 }
::= { xdsl2LineConfTemplateEntry 4 }

xdsl2LConfTempChan1RaRatioUs OBJECT-TYPE
SYNTAX Unsigned32(0..100)
UNITS "percent"
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"Rate Adaptation Ratio. The ratio (in %) that should be taken into account for the bearer channel #1 when performing rate adaptation on Upstream. The ratio refers to the available data rate in excess of the Minimum Data Rate, summed over all bearer channels. Also, the 100 - xdsl2LConfTempChan1RaRatioUs is the ratio of excess data rate to be assigned to all other bearer channels on Upstream direction. The sum of rate adaptation ratios over all bearers on the same direction shall be equal to 100 %."

REFERENCE
"ITU-T G.997.1, paragraph #7.3.2.1.4
(Rate adaptation ratio)"
DEFVAL { 100 }
::= { xdsl2LineConfTemplateEntry 5 }

xdsl2LConfTempChan2ConfProfile OBJECT-TYPE
SYNTAX SnmpAdminString (SIZE(0..32))
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"The value of this object identifies the row in the VDSL2/ADSL/ADSL2 and ADSL2+ channel configuration Profile Table, (xdsl2ChConfProfileTable) that applies to DSL bearer channel #2. If the channel is unused, then the object is set to a zero-length string. This object may be set to a zero-length string only if xdsl2LConfTempChan3ConfProfile contains a zero-length string."

DEFVAL { "" }

::= { xdsl2LineConfTemplateEntry 6 }

xdsl2LConfTempChan2RaRatioDs  OBJECT-TYPE
SYNTAX       Unsigned32(0..100)
UNITS        "percent"
MAX-ACCESS   read-create
STATUS       current
DESCRIPTION  
"Rate Adaptation Ratio. The ratio (in %) that should be taken into account for the bearer channel #2 when performing rate adaptation on Downstream. The ratio refers to the available data rate in excess of the Minimum Data Rate, summed over all bearer channels. Also, the 100 - xDSLConfTempChan2RaRatioDs is the ratio of excess data rate to be assigned to all other bearer channels on Downstream direction. The sum of rate adaptation ratios over all bearers on the same direction shall be equal to 100%.
" 
REFERENCE    "ITU-T G.997.1, paragraph #7.3.2.1.4 (Rate adaptation ratio)"
DEFVAL       { 0 }
::= { xdsl2LineConfTemplateEntry 7 }

xdsl2LConfTempChan2RaRatioUs  OBJECT-TYPE
SYNTAX       Unsigned32(0..100)
UNITS        "percent"
MAX-ACCESS   read-create
STATUS       current
DESCRIPTION  
"Rate Adaptation Ratio. The ratio (in %) that should be taken into account for the bearer channel #2 when performing rate adaptation on Upstream. The ratio refers to the available data rate in excess of the Minimum Data Rate, summed over all bearer channels. Also, the 100 - xDSLConfTempChan2RaRatioUs is the ratio of excess data rate to be assigned to all other bearer channels on Upstream direction. The sum of rate adaptation ratios over all bearers on the same direction shall be equal to 100 %.
" 
REFERENCE    "ITU-T G.997.1, paragraph #7.3.2.1.4 (Rate adaptation ratio)"
DEFVAL       { 0 }
::= { xdsl2LineConfTemplateEntry 8 }

xdsl2LConfTempChan3ConfProfile  OBJECT-TYPE
SYNTAX       SnmpAdminString (SIZE(0..32))
MAX-ACCESS   read-create
STATUS       current
DESCRIPTION  

"The value of this object identifies the row in the VDSL2/ADSL/ADSL2 and ADSL2+ channel configuration Profile Table, (xdsl2ChConfProfileTable) that applies to DSL bearer channel #3. If the channel is unused, then the object is set to a zero-length string.
This object may be set to a zero-length string only if xdsl2LConfTempChan4ConfProfile contains a zero-length string. This object may be set to a non-zero-length string only if xdsl2LConfTempChan2ConfProfile contains a non-zero-length string."
DEFVAL       { "" }
::= { xdsl2LineConfTemplateEntry 9 }

xdsl2LConfTempChan3RaRatioDs OBJECT-TYPE
SYNTAX      Unsigned32(0..100)
UNITS       "percent"
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
"Rate Adaptation Ratio. The ratio (in %) that should be taken into account for the bearer channel #3 when performing rate adaptation on Downstream. The ratio refers to the available data rate in excess of the Minimum Data Rate, summed over all bearer channels.
Also, the 100 - xdsl2LConfTempChan3RaRatioDs is the ratio of excess data rate to be assigned to all other bearer channels on Downstream direction. The sum of rate adaptation ratios over all bearers on the same direction shall be equal to 100%.
"
REFERENCE    "ITU-T G.997.1, paragraph #7.3.2.1.4 (Rate adaptation ratio)"
DEFVAL       { 0 }
::= { xdsl2LineConfTemplateEntry 10 }

xdsl2LConfTempChan3RaRatioUs OBJECT-TYPE
SYNTAX      Unsigned32(0..100)
UNITS       "percent"
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
"Rate Adaptation Ratio. The ratio (in %) that should be taken into account for the bearer channel #3 when performing rate adaptation on Upstream. The ratio refers to the available data rate in excess of the Minimum Data Rate, summed over all bearer channels.
Also, the 100 - xdsl2LConfTempChan3RaRatioUs is the ratio of excess data rate to be assigned to all other bearer channels on Upstream direction. The sum of rate adaptation ratios over all
bearers on the same direction shall be equal to 100%.

REFERENCE    "ITU-T G.997.1, paragraph #7.3.2.1.4
(Rate adaptation ratio)"

DEFVAL       { 0 }
::= { xdsl2LineConfTemplateEntry 11 }

"The value of this object identifies the row in the VDSL2/
ADSL/ADSL2 and ADSL2+ channel configuration Profile Table,
(xdsl2ChConfProfileTable) that applies to DSL bearer channel #4.
If the channel is unused, then the object is set to a zero-length
string.
This object may be set to a non-zero-length string only if
xdsl2LConfTempChan3ConfProfile contains a non-zero-length
string."

DEFVAL       { "" }
::= { xdsl2LineConfTemplateEntry 12 }

"Rate Adaptation Ratio.  The ratio (in %) that should be
taken into account for the bearer channel #4 when performing rate
adaptation on Downstream.  The ratio refers to the available data
rate in excess of the Minimum Data Rate, summed over all bearer
channels.
Also, the 100 - xdsl2LConfTempChan4RaRatioDs is the ratio of
excess data rate to be assigned to all other bearer channels.
The sum of rate adaptation ratios over all bearers on the same
direction shall sum to 100%.

REFERENCE    "ITU-T G.997.1, paragraph #7.3.2.1.4
(Rate adaptation ratio)"

DEFVAL       { 0 }
::= { xdsl2LineConfTemplateEntry 13 }
"Rate Adaptation Ratio. The ratio (in %) that should be taken into account for the bearer channel #4 when performing rate adaptation on Upstream. The ratio refers to the available data rate in excess of the Minimum Data Rate, summed over all bearer channels.
Also, the 100 - xdsl2LConfTempChan4RaRatioUs is the ratio of excess data rate to be assigned to all other bearer channels. The sum of rate adaptation ratios over all bearers on the same direction shall sum to 100%.
"REFERENCE "ITU-T G.997.1, paragraph #7.3.2.1.4 (Rate adaptation ratio)"
DEFVAL { 0 }
::= { xdsl2LineConfTemplateEntry 14 }

xdsl2LConfTempRowStatus OBJECT-TYPE
SYNTAX RowStatus
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"This object is used to create a new row or to modify or delete an existing row in this table. A template is activated by setting this object to ‘active’. When ‘active’ is set, the system will validate the template. Before a template can be deleted or taken out of service (by setting this object to ‘destroy’ or ‘notInService’), it MUST be first unreferenced from all associated lines."
::= { xdsl2LineConfTemplateEntry 15 }
DESCRIPTION
"The table xdsl2LineConfProfTable contains VDSL2/ADSL/
ADSL2 and ADSL2+ line configuration profiles.

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 { xdsl2LConfProfProfileName }
 ::= { xdsl2LineConfProfTable 1 }

Xdsl2LineConfProfEntry ::= 
SEQUENCE {
  xdsl2LConfProfProfileName          SnmpAdminString,
  xdsl2LConfProfScMaskDs             Xdsl2ScMaskDs,
  xdsl2LConfProfScMaskUs             Xdsl2ScMaskUs,
  xdsl2LConfProfVdsl2CarMask         Xdsl2CarMask,
  xdsl2LConfProfRfiBands             Xdsl2RfiBands,
  xdsl2LConfProfRaModeDs             Xdsl2RaMode,
  xdsl2LConfProfRaModeUs             Xdsl2RaMode,
  xdsl2LConfProfRaUsNrmDs            Unsigned32,
  xdsl2LConfProfRaUsNrmUs            Unsigned32,
  xdsl2LConfProfRaUsTimeDs           Unsigned32,
  xdsl2LConfProfRaUsTimeUs           Unsigned32,
  xdsl2LConfProfRaDsNrmDs            Unsigned32,
  xdsl2LConfProfRaDsNrmUs            Unsigned32,
  xdsl2LConfProfRaDsTimeDs           Unsigned32,
  xdsl2LConfProfRaDsTimeUs           Unsigned32,
  xdsl2LConfProfTargetSnrmDs         Unsigned32,
  xdsl2LConfProfTargetSnrmUs         Unsigned32,
  xdsl2LConfProfMaxSnrmDs            Unsigned32,
  xdsl2LConfProfMaxSnrmUs            Unsigned32,
  xdsl2LConfProfMinSnrmDs            Unsigned32,
  xdsl2LConfProfMinSnrmUs            Unsigned32,
  xdsl2LConfProfMsgMinUs             Unsigned32,
  xdsl2LConfProfMsgMinDs             Unsigned32,
  xdsl2LConfProfCeFlag               Xdsl2LineCeFlag,
  xdsl2LConfProfSnrModeDs            Xdsl2LineSnrMode,
  xdsl2LConfProfSnrModeUs            Xdsl2LineSnrMode,
  xdsl2LConfProfTxRefVnDs            Xdsl2LineTxRefVnDs,
  xdsl2LConfProfTxRefVnUs            Xdsl2LineTxRefVnUs,
  xdsl2LConfProfXtuTransSysEna       Xdsl2TransmissionModeType,
  xdsl2LConfProfPmMode               Xdsl2LinePmMode,
  xdsl2LConfProfL0Time               Unsigned32,
  xdsl2LConfProfL2Time               Unsigned32,
  xdsl2LConfProfL2Atpr               Unsigned32,
  xdsl2LConfProfPmMode               Xdsl2LinePmMode,
  xdsl2LConfProfL0Time               Unsigned32,
  xdsl2LConfProfL2Time               Unsigned32,
  xdsl2LConfProfL2Atpr               Unsigned32,
Internet-Draft               VDSL2-LINE MIB                    July 2008

respective subcarrier is unmasked. Note that there should always be unmasked subcarriers (i.e., the object cannot be all 1's). Also note that if NSCu < 4096, all bits i (NSCu < i <= 4096) should be set to '1'."

REFERENCE  "ITU-T G.997.1, paragraph #7.3.1.2.7 (CARMASKus)"

 ::= { xdsl2LineConfProfEntry 3 }

xdsl2LConfProfVdsl2CarMask  OBJECT-TYPE
SYNTAX      Xdsl2CarMask
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
"VDSL2 specific subcarriers mask. This configuration parameter defines the restrictions, additional to the band plan, to determine the set of subcarriers allowed for transmission in both upstream and downstream directions. The parameter shall describe the not masked subcarriers as one or more frequency bands. Each band is represented by start and stop subcarrier indices with a subcarrier spacing of 4.3125kHz. The valid range of subcarrier indices runs from 0 to at least the index of the highest allowed subcarrier in both transmission directions among all profiles enabled by the parameter xdsl2LConfProfProfiles. Up to 32 bands may be specified. Other subcarriers shall be masked."

REFERENCE  "ITU-T G.997.1, paragraph #7.3.1.2.8 (VDSL2-CARMASK)"

 ::= { xdsl2LineConfProfEntry 4 }

xdsl2LConfProfRfiBands  OBJECT-TYPE
SYNTAX      Xdsl2RfiBands
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
"For ITU-T Rec. G.992.5, this configuration parameter defines the subset of downstream PSD mask breakpoints, as specified in xdsl2LConfProfPsdMaskDs (PSDMASKds), that shall be used to notch an RFI band. This subset consists of pairs of consecutive subcarrier indices belonging to breakpoints: [ti; ti + 1], corresponding to the low level of the notch. The specific interpolation around these points is defined in the relevant Recommendations (e.g., ITU-T Rec. G.992.5). The CO-MIB shall define the RFI notches using breakpoints in xdsl2LConfProfPsdMaskDs (PSDMASKds) as specified in the relevant Recommendations (e.g., ITU-T Rec. G.992.5)."
For ITU-T Rec. G.993.2, this configuration parameter defines the bands where the PSD shall be reduced as specified in #7.2.1.2/G.993.2. Each band shall be represented by a start and stop subcarrier indices with a subcarrier spacing of 4.3125 kHz. Up to 16 bands may be specified. This parameter defines the RFI bands for both upstream and downstream directions.

REFERENCE  "ITU-T G.997.1, paragraph #7.3.1.2.10 (RFIBANDS)

::= { xdsl2LineConfProfEntry 5 }

xdsl2LConfProfRaModeDs  OBJECT-TYPE
SYNTAX      Xdsl2RaMode
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
 "The mode of operation of a rate-adaptive xTU-C in the transmit direction. The parameter can take three values: manual(1), raInit(2), dynamicRa(3)."
REFERENCE   "ITU-T G.997.1, paragraph #7.3.1.4.1 (RA-MODEds)

DEFVAL      { manual }
::= { xdsl2LineConfProfEntry 6 }

xdsl2LConfProfRaModeUs  OBJECT-TYPE
SYNTAX      Xdsl2RaMode
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
 "The mode of operation of a rate-adaptive xTU-R in the transmit direction. The parameter can take three values: manual(1), raInit(2), dynamicRa(3)."
REFERENCE   "ITU-T G.997.1, paragraph #7.3.1.4.2 (RA-MODEus)

DEFVAL      { manual }
::= { xdsl2LineConfProfEntry 7 }

xdsl2LConfProfRaUsNrmDs  OBJECT-TYPE
SYNTAX      Unsigned32(0..310)
UNITS       "0.1 dB"
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
 "The Downstream Up-Shift Noise Margin value, to be used when xdsl2LConfProfRaModeDs is set to dynamicRa. If the downstream

noise margin is above this value, and stays above it, for more than
the time specified by the xdsl2LConfProfRaUsTimeDs, the xTU-R shall attempt to increase the downstream net data rate. The Downstream Up-Shift Noise Margin ranges from 0 to 310 units of 0.1 dB (Physical values are 0 to 31 dB)."
REFERENCE    "ITU-T G.997.1, paragraph #7.3.1.4.3 (RA-USNRMds)
  "
DEFVAL       { 10 }
::= { xdsl2LineConfProfEntry 8 }

xdsl2LConfProfRaUsNrmUs  OBJECT-TYPE
SYNTAX      Unsigned32(0..310)
UNITS       "0.1 dB"
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
 "The Upstream Up-Shift Noise Margin value, to be used when
xdsl2LConfProfRaModeUs is set to dynamicRa. If the upstream
noise margin is above this value, and stays above it, for more than
the time specified by the xdsl2LConfProfRaUsTimeUs, the xTU-C shall attempt to increase the upstream net data rate.
The Upstream Up-Shift Noise Margin ranges from 0 to 310 units of 0.1 dB (Physical values are 0 to 31 dB)."
REFERENCE    "ITU-T G.997.1, paragraph #7.3.1.4.4 (RA-USNRMUs)
  "
DEFVAL       { 10 }
::= { xdsl2LineConfProfEntry 9 }

xdsl2LConfProfRaUsTimeDs  OBJECT-TYPE
SYNTAX      Unsigned32(0..16383)
UNITS       "seconds"
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
 "The Downstream Up-Shift Time Interval, to be used when
xdsl2LConfProfRaModeDs is set to dynamicRa. The interval of time
that the downstream noise margin should stay above the Downstream
Up-Shift Noise Margin before the xTU-R shall attempt to increase the downstream net data rate. The time interval ranges from 0 to 16383 seconds."
REFERENCE    "ITU-T G.997.1, paragraph #7.3.1.4.5 (RA-UTIMEEds)
  "
DEFVAL       { 3600 }
::= { xdsl2LineConfProfEntry 10 }

xdsl2LConfProfRaUsTimeUs  OBJECT-TYPE
SYNTAX    Unsigned32(0..16383)
UNITS     "seconds"
MAX-ACCESS read-create
STATUS    current
DESCRIPTION
"The Upstream Up-Shift Time Interval, to be used when
xdsl2LConfProfRaModeUs is set to dynamicRa. The interval of time
the upstream noise margin should stay above the Upstream Up-Shift
Noise Margin before the xTU-C shall attempt to increase the
upstream net data rate. The time interval ranges from 0 to 16383
seconds."
REFERENCE  "ITU-T G.997.1, paragraph #7.3.1.4.6 (RA-UTIMEus)
"
DEFVAL     { 3600 }
::= { xdsl2LineConfProfEntry 11 }

xdsl2LConfProfRaDsNrmDs OBJECT-TYPE
SYNTAX    Unsigned32(0..310)
UNITS     "0.1 dB"
MAX-ACCESS read-create
STATUS    current
DESCRIPTION
"The Downstream Down-Shift Noise Margin value, to be used
when xdsl2LConfProfRaModeDs is set to dynamicRa. If the
downstream noise margin is below this value,
and stays below that value,
for more than the time specified by the xdsl2LConfProfRaDsTimeDs,
the xTU-R shall attempt to decrease the downstream net data rate.
The Downstream Down-Shift Noise Margin ranges from 0 to 310 units
of 0.1 dB (Physical values are 0 to 31 dB)."
REFERENCE  "ITU-T G.997.1, paragraph #7.3.1.4.7 (RA-DSNRMds)
"
DEFVAL     { 10 }
::= { xdsl2LineConfProfEntry 12 }

xdsl2LConfProfRaDsNrmUs OBJECT-TYPE
SYNTAX    Unsigned32(0..310)
UNITS     "0.1 dB"
MAX-ACCESS read-create
STATUS    current
DESCRIPTION
"The Upstream Downshift Noise Margin value, to be used when
xdsl2LConfProfRaModeUs is set to dynamicRa. If the upstream
noise margin is below this value,
and stays below that value, for more
than the time specified by the xdsl2LConfProfRaDsTimeUs, the
xTU-C shall attempt to decrease the upstream net data rate.
The Upstream Down-Shift Noise Margin ranges from 0 to 310 units
of 0.1 dB (Physical values are 0 to 31 dB)."
REFERENCE    "ITU-T G.997.1, paragraph #7.3.1.4.8 (RA-DSNRMus)
"
DEFVAL       { 10 }
::= { xdsl2LineConfProfEntry 13 }

xdsl2LConfProfRaDsTimeDs  OBJECT-TYPE
SYNTAX      Unsigned32(0..16383)
UNITS       "seconds"
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION  "The Downstream Downshift Time Interval, to be used when
xdsl2LConfProfRaModeDs is set to dynamicRa. The interval of
time the downstream noise margin should stay below the Downstream
Down-Shift Noise Margin before the xTU-R shall attempt to
decrease the downstream net data rate. The time interval ranges
from 0 to 16383 seconds."
REFERENCE    "ITU-T G.997.1, paragraph #7.3.1.4.9 (RA-DTIMEds)
"
DEFVAL       { 3600 }
::= { xdsl2LineConfProfEntry 14 }

xdsl2LConfProfRaDsTimeUs  OBJECT-TYPE
SYNTAX      Unsigned32(0..16383)
UNITS       "seconds"
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION  "The Upstream Down-Shift Time Interval, to be used when
xdsl2LConfProfRaModeUs is set to dynamicRa. The interval of time
the upstream noise margin should stay below the Upstream Down-
Shift Noise Margin before the xTU-C shall attempt to decrease the
upstream net data rate. The time interval ranges from 0 to 16383
seconds."
REFERENCE    "ITU-T G.997.1, paragraph #7.3.1.4.10 (RA-DTIMEus)
"
DEFVAL       { 3600 }
::= { xdsl2LineConfProfEntry 15 }

xdsl2LConfProfTargetSnrmDs  OBJECT-TYPE
SYNTAX      Unsigned32(0..310)
UNITS       "0.1 dB"
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION  "The minimum Noise Margin the xTU-R receiver shall achieve,
relative to the BER requirement for each of the downstream bearer
channels, to successfully complete initialization.
The target noise margin ranges from 0 to 310 units of 0.1 dB
(Physical values are 0 to 31 dB)."
REFERENCE "ITU-T G.997.1, paragraph #7.3.1.3.1 (TARSNRMds)
"
DEFVAL { 60 }
::= { xDSL2LineConfProfEntry 16 }

xdsl2LConfProfTargetSnrmUs OBJECT-TYPE
SYNTAX Unsigned32(0..310)
UNITS "0.1 dB"
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"The minimum Noise Margin the xTU-C receiver shall achieve,
relative to the BER requirement for each of the upstream bearer
channels, to successfully complete initialization.
The target noise margin ranges from 0 to 310 units of 0.1 dB
(Physical values are 0 to 31 dB)."
REFERENCE "ITU-T G.997.1, paragraph #7.3.1.3.2 (TARSNRMus)
"
DEFVAL { 60 }
::= { xDSL2LineConfProfEntry 17 }

xdsl2LConfProfMaxSnrmDs OBJECT-TYPE
SYNTAX Unsigned32 (0..310 | 2147483647)
UNITS "0.1 dB"
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"The maximum Noise Margin the xTU-R receiver shall try to
sustain. If the Noise Margin is above this level, the xTU-R
shall request that the xTU-C reduce the xTU-C transmit power to
gain a noise margin below this limit (if this functionality is
supported). The maximum noise margin ranges from 0 to 310 units
of 0.1 dB (Physical values are 0 to 31 dB). A value of
0x7FFFFFFF (2147483647) means that there is no maximum."
REFERENCE "ITU-T G.997.1, paragraph #7.3.1.3.3 (MAXSNRMds)
"
DEFVAL { 310 }
::= { xDSL2LineConfProfEntry 18 }

xdsl2LConfProfMaxSnrmUs OBJECT-TYPE
SYNTAX Unsigned32 (0..310 | 2147483647)
UNITS "0.1 dB"
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"The maximum Noise Margin the xTU-C receiver shall try to sustain. If the Noise Margin is above this level, the xTU-C shall request that the xTU-R reduce the xTU-R transmit power to get a noise margin below this limit (if this functionality is supported). The maximum noise margin ranges from 0 to 310 units of 0.1 dB (Physical values are 0 to 31 dB). A value of 0x7FFFFFFF (2147483647) means that there is no maximum."

REFERENCE "ITU-T G.997.1, paragraph #7.3.1.3.4 (MAXSNRMus)"

DEFVAL { 310 }
::= { xdsl2LineConfProfEntry 19 }

xdsl2LConfProfMinSnrmDs OBJECT-TYPE
SYNTAX  Unsigned32(0..310)
UNITS "0.1 dB"
MAX-ACCESS read-create
STATUS current
DESCRIPTION "The minimum Noise Margin the xTU-R receiver shall tolerate. If the noise margin falls below this level, the xTU-R shall request that the xTU-C increase the xTU-C transmit power. If an increase to xTU-C transmit power is not possible, a loss-of-margin (LOM) defect occurs, the xTU-R shall fail and attempt to re-initialize and the NMS shall be notified. The minimum noise margin ranges from 0 to 310 units of 0.1 dB (Physical values are 0 to 31 dB). A value of 0 means that there is no minimum."

REFERENCE "ITU-T G.997.1, paragraph #7.3.1.3.5 (MINSNRMds)"

DEFVAL { 10 }
::= { xdsl2LineConfProfEntry 20 }

xdsl2LConfProfMinSnrmUs OBJECT-TYPE
SYNTAX  Unsigned32(0..310)
UNITS "0.1 dB"
MAX-ACCESS read-create
STATUS current
DESCRIPTION "The minimum Noise Margin the xTU-C receiver shall tolerate. If the noise margin falls below this level, the xTU-C shall request that the xTU-R increase the xTU-R transmit power. If an increase of xTU-R transmit power is not possible, a loss-of-margin (LOM) defect occurs, the xTU-C shall fail and attempt to re-initialize and the NMS shall be notified. The minimum noise margin ranges from 0 to 310 units of 0.1 dB (Physical values are 0 to 31 dB). A value of 0 means that there is no minimum."

REFERENCE "ITU-T G.997.1, paragraph #7.3.1.3.6 (MINSNRMus)"
DEFVAL { 10 }
::= { xDSL2LineConfProfEntry 21 }

xDSL2LineConfProfMsgMinUs OBJECT-TYPE
SYNTAX Unsigned32(4000..248000)
UNITS "bits/second"
MAX-ACCESS read-create
STATUS current
DESCRIPTION "Minimum Overhead Rate Upstream. Defines the minimum rate of the message-based overhead that shall be maintained by the xTU in upstream direction. Expressed in bits per second and ranges from 4000 to 248000 bps."
REFERENCE "ITU-T G.997.1, paragraph #7.3.1.5.1 (MSGMINus)"

DEFVAL { 4000 }
::= { xDSL2LineConfProfEntry 22 }

xDSL2LineConfProfMsgMinDs OBJECT-TYPE
SYNTAX Unsigned32(4000..248000)
UNITS "bits/second"
MAX-ACCESS read-create
STATUS current
DESCRIPTION "Minimum Overhead Rate Downstream. Defines the minimum rate of the message-based overhead that shall be maintained by the xTU in downstream direction. Expressed in bits per second and ranges from 4000 to 248000 bps."
REFERENCE "ITU-T G.997.1, paragraph #7.3.1.5.2 (MSGMINds)"

DEFVAL { 4000 }
::= { xDSL2LineConfProfEntry 23 }

xDSL2LineConfProfCeFlag OBJECT-TYPE
SYNTAX XDSL2LineCeFlag
MAX-ACCESS read-create
STATUS current
DESCRIPTION "This parameter is a bit that enables the use of the optional cyclic extension values. If the bit is set to 1, the optional cyclic extension values may be used. Otherwise, the cyclic extension shall be forced to the mandatory length (5N/32)."
REFERENCE "ITU-T G.997.1, paragraph #7.3.1.6.1 (CEFLAG)"
DEFVAL { { } }
::= { xDSL2LineConfProfEntry 24 }

xDSL2LineConfProfSnrModeDs OBJECT-TYPE
SYNTAX XDSL2LineSnrMode
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"This parameter enables the transmitter referred virtual noise in the downstream direction. If set to 1, the virtual noise is disabled. If set to 2, the virtual noise is enabled."
REFERENCE "ITU-T G.997.1, paragraph #7.3.1.7.1 (SNRMODEds)"
DEFVAL { virtualNoiseDisabled }
::= { xdsl2LineConfProfEntry 25 }

xdsl2LConfProfSnrModeUs OBJECT-TYPE
SYNTAX Xdsl2LineSnrMode
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"This parameter enables the transmitter referred virtual noise in the upstream direction. If set to 1, the virtual noise is disabled. If set to 2, the virtual noise is enabled."
REFERENCE "ITU-T G.997.1, paragraph #7.3.1.7.2 (SNRMODEus)"
DEFVAL { virtualNoiseDisabled }
::= { xdsl2LineConfProfEntry 26 }

xdsl2LConfProfTxRefVnDs OBJECT-TYPE
SYNTAX Xdsl2LineTxRefVnDs
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"This configuration parameter defines the downstream transmitter referred virtual noise. The TXREFVNds shall be specified through a set of breakpoints. Each breakpoint shall consist of a subcarrier index $t$, with a subcarrier spacing of 4.3125 kHz, and a noise PSD level (expressed in dBm/Hz) at that subcarrier. The set of breakpoints can then be represented as:
\[(t_1, PSD_1), (t_2, PSD_2), \ldots, (t_N, PSD_N)\].
The subcarrier index shall be coded as an unsigned integer. The noise level ranges from -40 dBm/Hz to -140 dBm/Hz in steps of 0.5 dBm/Hz.
A special value indicates a noise level of 0 W/Hz. The maximum number of breakpoints is 32."
REFERENCE "ITU-T G.997.1, paragraph #7.3.1.7.3 (TXREFVNds)"
::= { xdsl2LineConfProfEntry 27 }

xdsl2LConfProfTxRefVnUs OBJECT-TYPE
SYNTAX Xdsl2LineTxRefVnUs
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"This configuration parameter defines the upstream transmitter referred virtual noise. 
The TXREFVNus shall be specified through a set of breakpoints. Each breakpoint shall consist of a subcarrier index t, with a subcarrier spacing of 4.3125 kHz, and a noise PSD level (expressed in dBm/Hz) at that subcarrier. The set of breakpoints can then be represented as:
\[(t1, PSD1), (t2, PSD2), \ldots, (tN, PSDN)\].
The subcarrier index shall be coded as an unsigned integer. The noise level ranges from -40 dBm/Hz to -140 dBm/Hz in steps of 0.5 dBm/Hz.
A special value indicates a noise level of 0 W/Hz.
The maximum number of breakpoints is 16."
REFERENCE "ITU-T G.997.1, paragraph #7.3.1.7.4 (TXREFVNus)"
::= { xdsl2LineConfProfEntry 28 }

xdsl2LConfProfXtuTransSysEna OBJECT-TYPE
SYNTAX Xdsl2TransmissionModeType
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"xTU Transmission System Enabling (XTSE). A list of the different coding types enabled in this profile. It is coded in a bit-map representation with 1 or more bits set. A bit set to ‘1’ means that the xTUs may apply the respective coding for the DSL line. A bit set to ‘0’ means that the xTUs cannot apply the respective coding for the ADSL line. All ‘reserved’ bits should be set to ‘0’.
REFERENCE "ITU-T G.997.1, paragraph #7.3.1.1.1 (XTSE)"
::= { xdsl2LineConfProfEntry 29 }

xdsl2LConfProfPmMode OBJECT-TYPE
SYNTAX Xdsl2LinePmMode
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"Power management state Enabling (PMMode). Defines the power states the xTU-C or xTU-R may autonomously transition to on this line. The various bit positions are: allowTransitionsToIdle (0) and allowTransitionsToLowPower (1). A bit with a ‘1’ value means that the xTU is allowed to transit into the respective state and a ‘0’ value means that the xTU is not allowed..."
to transit into the respective state."
REFERENCE "ITU-T G.997.1, paragraph #7.3.1.1.4 (PMMode)"
DEFVAL { { allowTransitionsToIdle, allowTransitionsToLowPower } }
::= { xdsl2LineConfProfEntry 30 }

xdsl2LConfProfL0Time OBJECT-TYPE
SYNTAX Unsigned32 (0..255)
UNITS "seconds"
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"The minimum time (in seconds) between an Exit from the L2
state and the next Entry into the L2 state.
It ranges from 0 to 255 seconds."
REFERENCE "ITU-T G.997.1, paragraph #7.3.1.1.5 (L0-TIME)"
DEFVAL { 255 }
::= { xdsl2LineConfProfEntry 31 }

xdsl2LConfProfL2Time OBJECT-TYPE
SYNTAX Unsigned32 (0..255)
UNITS "seconds"
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"The minimum time (in seconds) between an Entry into the
L2 state and the first Power Trim in the L2 state and between two
consecutive Power Trims in the L2 State.
It ranges from 0 to 255 seconds."
REFERENCE "ITU-T G.997.1, paragraph #7.3.1.1.6 (L2-TIME)"
DEFVAL { 255 }
::= { xdsl2LineConfProfEntry 32 }

xdsl2LConfProfL2Atpr OBJECT-TYPE
SYNTAX Unsigned32 (0..31)
UNITS "dB"
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"The maximum aggregate transmit power reduction (in dB) that
can be performed at transition of L0 to L2 state or through a
single Power Trim in the L2 state.
It ranges from 0 dB to 31 dB."
REFERENCE "ITU-T G.997.1, paragraph #7.3.1.1.7 (L2-ATPR)"
DEFVAL { 10 }
::= { xdsl2LineConfProfEntry 33 }
Internet-Draft               VDSL2-LINE MIB                    July 2008

xdsl2LConfProfL2Atprt  OBJECT-TYPE
SYNTAX      Unsigned32 (0..31)
UNITS       "dB"
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
  "The total maximum aggregate transmit power reduction (in dB)
  that can be performed in an L2 state. This is the sum of all
  reductions of L2 Request (i.e., at transition of L0 to L2 state)
  and Power Trims."
REFERENCE    "ITU-T G.997.1, paragraph #7.3.1.1.9 (L2-ATPRT)
  "
DEFVAL       { 31 }
::= { xdsl2LineConfProfEntry 34 }

xdsl2LConfProfProfiles  OBJECT-TYPE
SYNTAX      Xdsl2LineProfiles
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
  "The configuration parameter contains the G.993.2 profiles
  to be allowed by the near-end xTU on this line.
  It is coded in a bitmap representation (0 if not allowed, 1 if
  allowed)"
REFERENCE    "ITU-T G.997.1, paragraph #7.3.1.1.11 (PROFILES)
  "
DEFVAL       { { profile8a,   profile8b,   profile8c,
        profile8d,   profile12a, profile12b,
        profile17a, profile30a } }
::= { xdsl2LineConfProfEntry 35 }

xdsl2LConfProfDpboEpPs  OBJECT-TYPE
SYNTAX      Xdsl2PsdMaskDs
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
  "This configuration parameter defines the PSD mask that is
  assumed to be permitted at the exchange. This parameter shall use
  the same format as xdsl2LConfProfPsdMaskDs (PSDMASKds). The
  maximum number of breakpoints for xdsl2LConfProfDpboEpPs is
  16."
REFERENCE    "ITU-T G.997.1, paragraph #7.3.1.2.13 (DPBOEPSD)
  "
::= { xdsl2LineConfProfEntry 36 }

MAX-ACCESS read-create
STATUS current
DESCRIPTION
"This configuration parameter defines the assumed electrical
length of cables (E-side cables) connecting exchange based DSL
services to a remote flexibility point (cabinet), that hosts the
xTU-C that is subject to spectrally shaped downstream power back-
off (DPBO) depending on this length. The electrical length is
defined as the loss (in dB) of an equivalent length of
hypothetical cable at a reference frequency defined by the
network operator or in spectrum management regulations.
This parameter shall be coded as an unsigned integer representing
an electrical length from 0 dB (coded as 0) to 255.5 dB (coded as
511) in steps of 0.5 dB. All values in the range are valid. If
this parameter is set to zero, the DPBO shall be disabled."
REFERENCE "ITU-T G.997.1, paragraph #7.3.1.2.13 (DPBOESEL)
"
DEFVAL { 0 }
::= { xdsl2LineConfProfEntry 37 }

xdsl2LConfProfDpboEsCableModelA OBJECT-TYPE
SYNTAX Unsigned32 (0..640)
UNITS "2^-8"
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"The E-side Cable Model parameter A (DPBOESCMA) of the cable
model (DPBOESC) for cables connecting exchange based DSL
services to a remote flexibility point (cabinet), that hosts the
xTU-C that is subject to spectrally shaped downstream power back-
off (DPBO) depending on this value.
The cable model is in terms of three scalars
xdsl2LConfProfDpboEsCableModelA (DPBOESCMA),
xdsl2LConfProfDpboEsCableModelB (DPBOESCMB), and
xdsl2LConfProfDpboEsCableModelC (DPBOESCMC), that are used to
estimate the frequency dependent loss of E-side cables calculated
from the xdsl2LConfProfDpboEsEL (DPBOESEL) parameter. Possible
values shall be coded as unsigned integers representing a scalar
value from -1 (coded as 0) to 1.5 (coded as 640) in steps of
2^-8. All values in the range are valid. This parameter is used
only for G.993.2."
REFERENCE "ITU-T G.997.1, paragraph #7.3.1.2.13 (DPBOESCMA)
"
DEFVAL { 0 }
::= { xdsl2LineConfProfEntry 38 }

xdsl2LConfProfDpboEsCableModelB OBJECT-TYPE
SYNTAX Unsigned32 (0..640)
UNITS "2^-8"
MAX-ACCESS read-create
STATUS current
DESCRIPTION "The E-side Cable Model parameter B (DPBOESCMB) of the cable model (DPBOESCM) for cables connecting exchange based DSL services to a remote flexibility point (cabinet), that hosts the xTU-C that is subject to spectrally shaped downstream power back-off (DPBO) depending on this value. The cable model is in terms of three scalars xdsl2LConfProfDpboEsCableModelA (DPBOESCMA), xdsl2LConfProfDpboEsCableModelB (DPBOESCMB), and xdsl2LConfProfDpboEsCableModelC (DPBOESCMC), that are used to estimate the frequency dependent loss of E-side cables calculated from the xdsl2LConfProfDpboEsEL (DPBOESEL) parameter. Possible values shall be coded as unsigned integers representing a scalar value from -1 (coded as 0) to 1.5 (coded as 640) in steps of 2^-8. All values in the range are valid. This parameter is used only for G.993.2."
REFERENCE "ITU-T G.997.1, paragraph #7.3.1.2.13 (DPBOESCMB)"
DEFVAL { 0 }
::= { xdsl2LineConfProfEntry 39 }

xdsl2LConfProfDpboEsCableModelC OBJECT-TYPE
SYNTAX Unsigned32 (0..640)
UNITS "2^-8"
MAX-ACCESS read-create
STATUS current
DESCRIPTION "The E-side Cable Model parameter C (DPBOESCMC) of the cable model (DPBOESCM) for cables connecting exchange based DSL services to a remote flexibility point (cabinet), that hosts the xTU-C that is subject to spectrally shaped downstream power back-off (DPBO) depending on this value. The cable model is in terms of three scalars xdsl2LConfProfDpboEsCableModelA (DPBOESCMA), xdsl2LConfProfDpboEsCableModelB (DPBOESCMB), and xdsl2LConfProfDpboEsCableModelC (DPBOESCMC), that are used to estimate the frequency dependent loss of E-side cables calculated from the xdsl2LConfProfDpboEsEL (DPBOESEL) parameter. Possible values shall be coded as unsigned integers representing a scalar value from -1 (coded as 0) to 1.5 (coded as 640) in steps of 2^-8. All values in the range are valid. This parameter is used only for G.993.2."
REFERENCE "ITU-T G.997.1, paragraph #7.3.1.2.13 (DPBOESCMC)"
DEFVAL { 0 }
::= { xdsl2LineConfProfEntry 40 }

xdsl2LConfProfDpboMus OBJECT-TYPE
SYNTAX     Unsigned32 (0..255)
UNITS      "0.5 dBm/Hz"
MAX-ACCESS read-create
STATUS     current
DESCRIPTION
  "This configuration parameter defines the assumed Minimum
  Usable receive PSD mask (in dBm/Hz) for exchange based services,
  used to modify parameter xDSL2ConfProfDpboFMax (DPBOFMAX)
  defined below [to determine the DPBO]. It shall be coded as an
  unsigned integer representing a PSD mask level from 0 dBm/Hz
  (coded as 0) to -127.5 dBm/Hz (coded as 255) in steps of 0.5
  dBm/Hz. All values in the range are valid.
  NOTE - The PSD mask level is 3.5 dB above the signal PSD level.
  This parameter is used only for G.993.2."
REFERENCE   "ITU-T G.997.1, paragraph #7.3.1.2.13 (DPBOMUS)
  "
DEFVAL      { 0 }
::= { xdsl2LineConfProfEntry 41 }

xdsl2LConfProfDpboFMin OBJECT-TYPE
SYNTAX     Unsigned32 (0..2048)
UNITS      "4.3125 kHz"
MAX-ACCESS read-create
STATUS     current
DESCRIPTION
  "This configuration parameter defines the minimum frequency
  from which the DPBO shall be applied. It ranges from 0 kHz (coded
  as 0) to 8832 kHz (coded as 2048) in steps of 4.3125 kHz. This
  parameter is used only for G.993.2."
REFERENCE   "ITU-T G.997.1, paragraph #7.3.1.2.13 (DPBOFMIN)
  "
DEFVAL      { 32 }
::= { xdsl2LineConfProfEntry 42 }

xdsl2LConfProfDpboFMax OBJECT-TYPE
SYNTAX     Unsigned32 (32..6956)
UNITS      "4.3125 kHz"
MAX-ACCESS read-create
STATUS     current
DESCRIPTION
  "This configuration parameter defines the maximum frequency
  at which DPBO may be applied. It ranges from 138 kHz (coded as
  32) to 29997.75 kHz (coded as 6956) in steps of 4.3125 kHz.
  This parameter is used only for G.993.2."
REFERENCE   "ITU-T G.997.1, paragraph #7.3.1.2.13 (DPBOFMAX)
DEFVAL     { 512 }
::= { xdsl2LineConfProfEntry 43 }

xdsl2LConfProfUpboKL  OBJECT-TYPE
SYNTAX      Unsigned32 (0..1280)
UNITS       "0.1 dB"
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
 "This configuration parameter defines the electrical length
expressed in dB at 1MHz, k10, configured by the CO-MIB.
The value ranges from 0 (coded as 0) to 128 dB (coded as 1280) in
steps of 0.1 dB. This parameter is relevant only if
xdsl2LConfProfUpboKLF is set to override(2), which indicates that
this parameter’s value will override the VTUs’ determination of
the electrical length.
If xdsl2LConfProfUpboKLF is set either to auto(1) or
disableUpbo(3), then this parameter will be ignored."
REFERENCE   "ITU-T G.997.1, paragraph #7.3.1.2.14 (UPBOKL)"
DEFVAL     { 0 }
::= { xdsl2LineConfProfEntry 44 }

xdsl2LConfProfUpboKLF OBJECT-TYPE
SYNTAX      Xdsl2UpboKLF
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
 "Defines the upstream power backoff force mode.
The three possible mode values are:
auto(1),
override(2),
disableUpbo(3)."
REFERENCE   "ITU-T G.997.1, paragraph #7.3.1.2.14 (UPBOKLF)"

DEFVAL     { disableUpbo }
::= { xdsl2LineConfProfEntry 45 }

xdsl2LConfProfUs0Mask  OBJECT-TYPE
SYNTAX      Xdsl2LineUs0Mask
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
 "The configuration parameter contains the US0 PSD masks to be
allowed by the near-end xTU on the line. This parameter is only
defined for G.993.2 Annex A. It is represented as a bitmap (0 if
not allowed and 1 if allowed)."
REFERENCE   "ITU-T G.997.1 Amendment 1, paragraph #7.3.1.2.18"
This parameter indicates that the framer settings of the bearer shall be selected such that the impulse noise protection computed according to the formula specified in the relevant Recommendation is greater than or equal to the minimal impulse noise protection requirement. This flag shall have the same value for all the bearers of one line in the same direction.

REFERENCE  "ITU-T G.997.1, paragraph #7.3.2.5 (FORCEINP)"

This object is used to create a new row or to modify or delete an existing row in this table.

A profile is 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 'notInService'), it MUST be first unreferenced from all associated templates.

When a row is created in this table, the SNMP agent should also create corresponding rows in the tables xDSL2LineConfProfModeSpecTable and xDSL2LineConfProfModeSpecBandUsTable.

When a row is deleted in this table, the SNMP agent should also delete corresponding rows in the tables xDSL2LineConfProfModeSpecTable and xDSL2LineConfProfModeSpecBandUsTable.
The table `xdsl2LineConfProfModeSpecTable` extends the DSL line configuration profile by xDSL Mode Specific parameters. A row in this table that has an index of `xdsl2LConfProfXdslMode == defMode(1)`, is called a ‘mandatory’ row. A row in this table that has an index such that `xdsl2LConfProfXdslMode` is not equal to `defMode(1)`, is called an ‘optional’ row. When a row in the `xdsl2LineConfProfTable` table (the parent row) is created, the SNMP agent will automatically create a ‘mandatory’ row in this table. When the parent row is deleted, the SNMP agent will automatically delete all associated rows in this table. Any attempt to delete the ‘mandatory’ row using the `xdsl2LConfProfModeSpecRowStatus` attribute will be rejected by the SNMP agent. The manager MAY create an ‘optional’ row in this table using the `xdsl2LConfProfModeSpecRowStatus` attribute if the parent row exists. The manager MAY delete an ‘optional’ row in this table using the `xdsl2LConfProfModeSpecRowStatus` attribute at any time. If the actual transmission mode of a DSL line does not match one of the ‘optional’ rows in this table, then the line will use the PSD configuration from the ‘mandatory’ row.

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

```
xdsl2LineConfProfModeSpecTable OBJECT-TYPE
SYNTAX SEQUENCE OF Xdsl2LineConfProfModeSpecEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "The table `xdsl2LineConfProfModeSpecTable` extends the DSL line configuration profile by xDSL Mode Specific parameters."
INDEX { xdsl2LConfProfProfileName, xdsl2LConfProfXdslMode }
 ::= { xdsl2LineConfProfModeSpecTable 1 }
```

```
xdsl2LineConfProfModeSpecEntry OBJECT-TYPE
SYNTAX Xdsl2LineConfProfModeSpecEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "The table `xdsl2LineConfProfModeSpecTable` extends the DSL line configuration profile by DSL Mode Specific parameters."
INDEX { xdsl2LConfProfProfileName, xdsl2LConfProfXdslMode }
 ::= { xdsl2LineConfProfModeSpecTable 1 }
```

```
Xdsl2LineConfProfModeSpecEntry ::= SEQUENCE {
   xdsl2LConfProfXdslMode Xdsl2OperationModes,
   xdsl2LConfProfMaxNomPsdDs Integer32,
}
```
Internet-Draft               VDSL2-LINE MIB                    July 2008

xdsl2LConfProfMaxNomPsdUs  OBJECT-TYPE
SYNTAX      Integer32,
xdsl2LConfProfMaxNomAtpDs  Unsigned32,
xdsl2LConfProfMaxNomAtpUs  Unsigned32,
xdsl2LConfProfMaxAggRxPwrUs Integer32,
xdsl2LConfProfPsdMaskDs    Xdsl2PsdMaskDs,
xdsl2LConfProfPsdMaskUs    Xdsl2PsdMaskUs,
xdsl2LConfProfPsdMaskSelectUs Xdsl2LinePsdMaskSelectUs,
xdsl2LConfProfClassMask    Xdsl2LineClassMask,
xdsl2LConfProfLimitMask    Xdsl2LineLimitMask,
xdsl2LConfProfUs0Disable   Xdsl2LineUs0Disable,
xdsl2LConfProfModeSpecRowStatus RowStatus

xdsl2LConfProfXdslMode    OBJECT-TYPE
SYNTAX      Xdsl2OperationModes
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
"The DSL Mode is a way of categorizing the various xDSL
transmission modes into groups, each group (xDSL Mode) shares
the same PSD configuration. There should be multiple entries in this table for a given line
profile in case multiple bits are set in
xdsl2LConfProfXtuTransSysEna for that profile."
REFERENCE    "DSL Forum TR-129, paragraph #5.5"
::= { xdsl2LineConfProfModeSpecEntry 1 }

xdsl2LConfProfMaxNomPsdDs  OBJECT-TYPE
SYNTAX      Integer32(-600..-300)
UNITS       "0.1 dBm/Hz"
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
"The maximum nominal transmit PSD in the downstream direction
during initialization and Showtime. It ranges from -600 to -300
units of 0.1 dBm/Hz. (physical values are -60 to -30
dBm/Hz)."
REFERENCE    "ITU-T G.997.1, paragraph #7.3.1.2.1 (MAXNOMPSDDs)"
"DEFVAL       { -300 }
::= { xdsl2LineConfProfModeSpecEntry 2 }

xdsl2LConfProfMaxNomPsdUs  OBJECT-TYPE
SYNTAX      Integer32(-600..-300)
UNITS       "0.1 dBm/Hz"
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
"The maximum nominal transmit PSD in the upstream direction during initialization and Showtime. It ranges from -600 to -300 units of 0.1 dBm/Hz. (physical values are -60 to -30 dBm/Hz)."

REFERENCE "ITU-T G.997.1, paragraph #7.3.1.2.2 (MAXNOMPSDus)"

DEFVAL { -300 }
::= { xdsl2LineConfProfModeSpecEntry 3 }

xdsl2LConfProfMaxNomAtpDs OBJECT-TYPE
SYNTAX Unsigned32 (0..255)
UNITS "0.1 dBm"
MAX-ACCESS read-create
STATUS current
DESCRIPTION "The maximum nominal aggregate transmit power in the downstream direction during initialization and Showtime. It ranges from 0 to 255 units of 0.1 dBm (physical values are 0 to 25.5 dBm)."

REFERENCE "ITU-T G.997.1, paragraph #7.3.1.2.3 (MAXNOMATPds)"

DEFVAL { 255 }
::= { xdsl2LineConfProfModeSpecEntry 4 }

xdsl2LConfProfMaxNomAtpUs OBJECT-TYPE
SYNTAX Unsigned32 (0..255)
UNITS "0.1 dBm"
MAX-ACCESS read-create
STATUS current
DESCRIPTION "The maximum nominal aggregate transmit power in the upstream direction during initialization and Showtime. It ranges from 0 to 255 units of 0.1 dBm (physical values are 0 to 25.5 dBm)."

REFERENCE "ITU-T G.997.1, paragraph #7.3.1.2.4 (MAXNOMATPus)"

DEFVAL { 255 }
::= { xdsl2LineConfProfModeSpecEntry 5 }

xdsl2LConfProfMaxAggRxPwrUs OBJECT-TYPE
SYNTAX Integer32(-255..255 | 2147483647)
UNITS "0.1 dBm"
MAX-ACCESS read-create
STATUS current
DESCRIPTION "The maximum upstream aggregate receive power over the relevant set of subcarriers. The xTU-C should verify that the upstream power cutback is such that this maximum aggregate
receive power value is honored. It ranges from -255 to 255 units of 0.1 dBm (physical values are -25.5 to 25.5 dBm). A value of 0x7FFFFFFF (2147483647) means that there is no limit."

REFERENCE    "ITU-T G.997.1, paragraph #7.3.1.2.5 (MAXRXPWRus)"

DEFVAL       { 255 }
::= { xdsl2LineConfProfModeSpecEntry 6 }

xdsl2LConfProfPsdMaskDs  OBJECT-TYPE
SYNTAX      Xdsl2PsdMaskDs
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
"The downstream PSD mask applicable at the U-C2 reference point.
This parameter is used only for G.992.5 and it may impose PSD restrictions (breakpoints) in addition to the Limit PSD mask defined in G.992.5.
This is a string of 32 pairs of values in the following structure:
Octets 0-1 - Index of 1st subcarrier used in the context of a first breakpoint.
Octet 2    - The PSD reduction for the subcarrier indicated in octets 0 and 1.
Octets 3-5 - Same, for a 2nd breakpoint.
Octets 6-8 - Same, for a 3rd breakpoint.
This architecture continues until octets 94-95, which are associated with a 32nd breakpoint.
Each subcarrier index is an unsigned number in the range 1 and NSCds. Each PSD reduction value is in the range 0 (0dBm/Hz) to 255 (-127.5dBm/Hz) with steps of 0.5dBm/Hz. Valid values are in the range 0 to 190 (0 to -95dBm/Hz).
When the number of breakpoints is less than 32, all remaining octets are set to the value 0. Note that the content of this object should be correlated with the subcarriers mask and with the RFI setup."

REFERENCE    "ITU-T G.997.1, paragraph #7.3.1.2.9 (PSDMASKds)"
::= { xdsl2LineConfProfModeSpecEntry 7 }

xdsl2LConfProfPsdMaskUs  OBJECT-TYPE
SYNTAX      Xdsl2PsdMaskUs
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
"The upstream PSD mask applicable at the U-R2 reference point.
This parameter is used only for G.992.5 and it may impose PSD restrictions (breakpoints) in addition to the Limit PSD mask defined in G.992.5. This is a string of 16 pairs of values in the following structure:

Octets 0-1 - Index of 1st subcarrier used in the context of a first breakpoint.
Octet 2 - The PSD reduction for the subcarrier indicated in octets 0 and 1.
Octets 3-5 - Same, for a 2nd breakpoint.
Octets 6-8 - Same, for a 3rd breakpoint.
This architecture continues until octets 9-47, which are associated with a 16th breakpoint.
Each subcarrier index is an unsigned number in the range 1 and NSCus. Each PSD reduction value is in the range 0 (0dBm/Hz) to 255 (-127.5dBm/Hz) with steps of 0.5dBm/Hz. Valid values are in the range 0 to 190 (0 to -95dBm/Hz).
When the number of breakpoints is less than 16, all remaining octets are set to the value 0. Note that the content of this object should be correlated with the subcarriers mask and with the RFI setup.

REFERENCE: "ITU-T G.997.1, paragraph #7.3.1.2.12 (PSDMASKus)"

::= { xDSL2LineConfProfModeSpecEntry 8 }

xDSL2ConfProfPsdMaskSelectUs OBJECT-TYPE
SYNTAX XDSL2LinePsdMaskSelectUs
MAX-ACCESS read-create
STATUS current
DESCRIPTION "The selected upstream PSD mask. This parameter is used only for Annexes J and M of G.992.3 and G.992.5, and the same selection is used for all relevant enabled bits in xDSL2ConfProfXtuTransSysEna."
REFERENCE "ITU-T G.997.1, paragraph #7.3.1.2.11 (Upstream PSD mask selection)"
DEFVAL { adlu32Eu32 }
::= { xDSL2LineConfProfModeSpecEntry 9 }

xDSL2ConfProfClassMask OBJECT-TYPE
SYNTAX XDSL2LineClassMask
MAX-ACCESS read-create
STATUS current
DESCRIPTION "In order to reduce the number of configuration possibilities, the limit Power Spectral Density masks (see LIMITMASK) are grouped in PSD mask classes. Each class is designed such that the PSD levels of each limit PSD
mask of a specific class are equal in their respective passband above 552 kHz.
This parameter is defined per VDSL2 Annex enabled in the xdsl2LConfProfXtuTransSysEna object. It selects a single PSD mask class per Annex that is activated at the VTU-O."

REFERENCE "ITU-T G.997.1 Amendment 1, paragraph #7.3.1.2.15 (CLASSMASK)"
DEFVAL { a998Orb997M1cOrC998B }
::= { xdsl2LineConfProfModeSpecEntry 10 }

xdsl2LConfProfLimitMask OBJECT-TYPE
SYNTAX Xdsl2LineLimitMask
MAX-ACCESS read-create
STATUS current
DESCRIPTION "This configuration parameter contains the G.993.2 limit PSD masks of the selected PSD mask class, enabled by the near-end xTU on this line for each class of profiles.
This parameter is defined per VDSL2 Annex enabled in the xdsl2LConfProfXtuTransSysEna object.
Through this parameter several limit PSD masks of the selected PSD mask class (xdsl2LConfProfClassMask) may be enabled. The enabling parameter is coded in a bitmap representation (0 if the associated mask is not allowed, 1 if it is allowed)."

REFERENCE "ITU-T G.997.1 Amendment 1, paragraph #7.3.1.2.16 (LIMITMASK)"
DEFVAL { {} }
::= { xdsl2LineConfProfModeSpecEntry 11 }

xdsl2LConfProfUs0Disable OBJECT-TYPE
SYNTAX Xdsl2LineUs0Disable
MAX-ACCESS read-create
STATUS current
DESCRIPTION "This configuration parameter indicates if the use of US0 is disabled for each limit PSD mask enabled in the xdsl2LConfProfLimitMask parameter.
This parameter is defined per VDSL2 Annex enabled in the xdsl2LConfProfXtuTransSysEna object.
For each limit PSD mask enabled in xdsl2LConfProfLimitMask parameter, a bit shall indicate if US0 is disabled. The disabling parameter is coded as a bitmap. The bit is set to 1 if US0 is disabled for the associated limit mask.
This parameter and the xdsl2LConfProfLimitMask parameter use the same structure."

REFERENCE "ITU-T G.997.1, paragraph #7.3.1.2.17 (US0DISABLE)"
DEFVAL { {} }
Internet-Draft               VDSL2-LINE MIB                    July 2008

 ::= { xdsl2LineConfProfModeSpecEntry 12 }

xdsl2LConfProfModeSpecRowStatus  OBJECT-TYPE
SYNTAX      RowStatus
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
 "This object is used to create a new row or to modify or
delete an existing row in this table. A profile is 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 'notInService'), it MUST be
first unreferenced from all associated templates."

 ::= { xdsl2LineConfProfModeSpecEntry 13 }

----------------------------------------------
--   xdsl2LineConfProfModeSpecBandUsTable   --
----------------------------------------------

xdsl2LineConfProfModeSpecBandUsTable  OBJECT-TYPE
SYNTAX      SEQUENCE  OF  Xdsl2LineConfProfModeSpecBandUsEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
 "The table xdsl2LineConfProfModeSpecBandUsTable extends
xdsl2LineConfProfModeSpecTable with upstream-band-specific
parameters for VDSL2, such as upstream power back-off
parameters, xdsl2LConfProfUpboPsdA and xdsl2LConfProfUpboPsdB
(UPBOPSD-pb).
When a parent 'mandatory row' is created in
xdsl2LineConfProfModeSpecTable, the SNMP agent will automatically
create several 'mandatory' rows in this table-- one for each
upstream band:
Note: A mandatory row is one where xdsl2LConfProfXdslMode =
defMode(1). When the parent row is deleted, the SNMP agent will
automatically delete all associated rows in this table. Any
attempt to delete a 'mandatory' row using the
xdsl2LConfProfModeSpecBandUsRowStatus attribute will be rejected
by the SNMP agent. The manager only MAY create a new 'optional'
row in this table using the xdsl2LConfProfModeSpecBandUsRowStatus
attribute if the associated parent optional row exists, and the
value of xdsl2LConfProfXdslMode is a G.993.2 value. The manager
MAY delete an 'optional' row in this table using the
xdsl2LConfProfModeSpecBandUsRowStatus attribute at any time.
With respect to xdsl2LConfProfUpboPsdA and xdsl2LConfProfUpboPsdB parameters, for a given upstream band, if an optional row is missing from this table, then that means upstream power back-off is disabled for that upstream band.

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

::= { xdsl2ProfileLine 4 }

xdsl2LineConfProfModeSpecBandUsEntry OBJECT-TYPE
SYNTAX Xdsl2LineConfProfModeSpecBandUsEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "The table xdsl2LineConfProfModeSpecBandUsTable extends xdsl2LineConfProfModeSpecTable with upstream-band-specific parameters for VDSL2, such as upstream power back-off parameters, xdsl2LConfProfUpboPsdA and xdsl2LConfProfUpboPsdB (UPBOPSD-pb)."
INDEX { xdsl2LConfProfProfileName, xdsl2LConfProfXdslMode, xdsl2LConfProfXdslBandUs }
::= { xdsl2LineConfProfModeSpecBandUsTable 1 }

Xdsl2LineConfProfModeSpecBandUsEntry ::= SEQUENCE {
  xdsl2LConfProfXdslBandUs Xdsl2BandUs,
  xdsl2LConfProfUpboPsdA Integer32,
  xdsl2LConfProfUpboPsdB Integer32,
  xdsl2LConfProfModeSpecBandUsRowStatus RowStatus
}

xdsl2LConfProfXdslBandUs OBJECT-TYPE
SYNTAX Xdsl2BandUs
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "Each value identifies a specific band in the upstream transmission direction (excluding US0 band)."
REFERENCE "ITU-T G.997.1, paragraph #7.3.1.2.14"
::= { xdsl2LineConfProfModeSpecBandUsEntry 1 }

xdsl2LConfProfUpboPsdA OBJECT-TYPE
SYNTAX Integer32(4000..8095)
UNITS "0.01 dBm/Hz"
MAX-ACCESS read-create
STATUS current
DESCRIPTION "This configuration parameter defines the 'a' reference
parameter of the UPBO reference PSD used to compute the upstream power back-off for the upstream band. A UPBOPSD defined for each band shall consist of two parameters \([a, b]\). Parameter \(a\) (\text{xdsl2LConfProfUpboPsdA}) ranges from 40 \(\text{dBm/Hz}\) (coded as 4000) to 80.95 \(\text{dBm/Hz}\) (coded as 8095) in steps of 0.01 \(\text{dBm/Hz}\); and parameter \(b\) (\text{xdsl2LConfProfUpboPsdB}) ranges from 0 \(\text{dBm/Hz}\) (coded as 0) to 40.95 \(\text{dBm/Hz}\) (coded as 4095) in steps of 0.01 \(\text{dBm/Hz}\). The UPBO reference PSD at the frequency \(f\) expressed in MHz shall be equal to \(-a-b(\text{SQRT}(f))\). Setting \text{xdsl2LConfProfUpboPsdA} to 4000 and \text{xdsl2LConfProfUpboPsdB} to 0 is a special configuration to disable UPBO in the respective upstream band.

REFERENCE "ITU-T G.997.1, paragraph #7.3.1.2.14 (UPBOPSD-pb)"

DEFVAL { 4000 }
::= { xdsl2LineConfProfModeSpecBandUsEntry 2 }

\text{xdsl2LConfProfUpboPsdB} OBJECT-TYPE
SYNTAX Integer32(0..4095)
UNITS "0.01 \text{dBm/Hz}"
MAX-ACCESS read-create
STATUS current
DESCRIPTION "This configuration parameter defines the ‘b’ reference parameter of the UPBO reference PSD used to compute the upstream power back-off for the upstream band. A UPBOPSD defined for each band shall consist of two parameters \([a, b]\). Parameter \(a\) (\text{xdsl2LConfProfUpboPsdA}) ranges from 40 \(\text{dBm/Hz}\) (coded as 4000) to 80.95 \(\text{dBm/Hz}\) (coded as 8095) in steps of 0.01 \(\text{dBm/Hz}\); and parameter \(b\) (\text{xdsl2LConfProfUpboPsdB}) ranges from 0 \(\text{dBm/Hz}\) (coded as 0) to 40.95 \(\text{dBm/Hz}\) (coded as 4095) in steps of 0.01 \(\text{dBm/Hz}\). The UPBO reference PSD at the frequency \(f\) expressed in MHz shall be equal to \(-a-b(\text{SQRT}(f))\). Setting \text{xdsl2LConfProfUpboPsdA} to 4000 and \text{xdsl2LConfProfUpboPsdB} to 0 is a special configuration to disable UPBO in the respective upstream band."

REFERENCE "ITU-T G.997.1, paragraph #7.3.1.2.14 (UPBOPSD-pb)"

DEFVAL { 0 }
::= { xdsl2LineConfProfModeSpecBandUsEntry 3 }

\text{xdsl2LConfProfModeSpecBandUsRowStatus} OBJECT-TYPE
SYNTAX RowStatus
MAX-ACCESS read-create
STATUS current
DESCRIPTION "This object is used to create a new row or to modify or delete an existing row in this table."
A profile is 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 ‘notInService’), it MUST be first unreferenced from all associated templates.

 ::= { xdsl2LineConfProfModeSpecBandUsEntry 4 }

-- xxxxxx --

-- xDSLChConfProfileTable --

xDSLChConfProfileTable OBJECT-TYPE
SYNTAX SEQUENCE OF XDSLChConfProfileEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The table xDSLChConfProfileTable contains DSL channel profile configuration.

Entries in this table MUST be maintained in a persistent manner."
 ::= { xDSL2ProfileChannel 1 }

xDSLChConfProfileEntry OBJECT-TYPE
SYNTAX XDSLChConfProfileEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The table xDSLChConfProfileTable contains DSL channel profile configuration.
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 { xDSLChConfProfProfileName }
 ::= { xDSL2ChConfProfileTable 1 }

XDSLChConfProfileEntry ::= SEQUENCE {
   xDSLChConfProfProfileName SnmpAdminString,
   xDSLChConfProfMinDataRateDs Unsigned32,
   xDSLChConfProfMinDataRateUs Unsigned32,
   xDSLChConfProfMinResDataRateDs Unsigned32,
   xDSLChConfProfMinResDataRateUs Unsigned32,
   xDSLChConfProfMaxDataRateDs Unsigned32,
   xDSLChConfProfMaxDataRateUs Unsigned32,
   xDSLChConfProfMaxDataRateLowPwrDs Unsigned32,
   xDSLChConfProfMaxDataRateLowPwrUs Unsigned32,
   xDSLChConfProfMaxDelayDs Unsigned32,
}
<table>
<thead>
<tr>
<th>xDSL2ChConfProfMaxDelayUs</th>
<th>Unsigned32,</th>
</tr>
</thead>
<tbody>
<tr>
<td>xDSL2ChConfProfMinProtectionDs</td>
<td>XDSL2SymbolProtection,</td>
</tr>
<tr>
<td>xDSL2ChConfProfMinProtectionUs</td>
<td>XDSL2SymbolProtection,</td>
</tr>
<tr>
<td>xDSL2ChConfProfMinProtection8Ds</td>
<td>XDSL2SymbolProtection8,</td>
</tr>
<tr>
<td>xDSL2ChConfProfMinProtection8Us</td>
<td>XDSL2SymbolProtection8,</td>
</tr>
<tr>
<td>xDSL2ChConfProfMaxBerDs</td>
<td>XDSL2MaxBer,</td>
</tr>
<tr>
<td>xDSL2ChConfProfMaxBerUs</td>
<td>XDSL2MaxBer,</td>
</tr>
<tr>
<td>xDSL2ChConfProfMinDataRateDs</td>
<td>Unsigned32,</td>
</tr>
<tr>
<td>xDSL2ChConfProfMinDataRateUs</td>
<td>Unsigned32,</td>
</tr>
<tr>
<td>xDSL2ChConfProfUsDataRateDs</td>
<td>Unsigned32,</td>
</tr>
<tr>
<td>xDSL2ChConfProfUsDataRateUs</td>
<td>Unsigned32,</td>
</tr>
<tr>
<td>xDSL2ChConfProfUsDataRateUsDataRateDs</td>
<td>Unsigned32,</td>
</tr>
<tr>
<td>xDSL2ChConfProfUsDataRateUsDataRateUs</td>
<td>Unsigned32,</td>
</tr>
<tr>
<td>xDSL2ChConfProfUsDataRateUsDataRateUsDataRateUs</td>
<td>TruthValue,</td>
</tr>
<tr>
<td>xDSL2ChConfProfMaxDelayVar</td>
<td>Unsigned32,</td>
</tr>
<tr>
<td>xDSL2ChConfProfInitPolicy</td>
<td>XDSL2ChInitPolicy,</td>
</tr>
<tr>
<td>xDSL2ChConfProfRowStatus</td>
<td>RowStatus</td>
</tr>
</tbody>
</table>

```plaintext
xdsl2ChConfProfProfileName OBJECT-TYPE
SYNTAX     SnmpAdminString (SIZE(1..32))
MAX-ACCESS not-accessible
STATUS      current
DESCRIPTION
    "This object identifies a row in this table."
::= { xDSL2ChConfProfileEntry 1 }
```

```plaintext
xdsl2ChConfProfMinDataRateDs OBJECT-TYPE
SYNTAX     Unsigned32
UNITS       "bits/second"
MAX-ACCESS read-create
STATUS      current
DESCRIPTION
    "Minimum Data Rate on Downstream direction. The minimum net
data rate for the bearer channel, coded in bit/s."
REFERENCE    "ITU-T G.997.1, paragraph #7.3.2.1.1
    (Minimum data rate)"
::= { xDSL2ChConfProfileEntry 2 }
```

```plaintext
xdsl2ChConfProfMinDataRateUs OBJECT-TYPE
SYNTAX     Unsigned32
UNITS       "bits/second"
MAX-ACCESS read-create
STATUS      current
DESCRIPTION
    "Minimum Data Rate on Upstream direction. The minimum net
data rate for the bearer channel, coded in bit/s."
REFERENCE    "ITU-T G.997.1, paragraph #7.3.2.1.1
    (Minimum data rate)"
::= { xDSL2ChConfProfileEntry 3 }
```
Internet-Draft               VDSL2-LINE MIB                    July 2008

xdsl2ChConfProfMinResDataRateDs  OBJECT-TYPE
SYNTAX     Unsigned32
UNITS      "bits/second"
MAX-ACCESS read-create
STATUS     current
DESCRIPTION
   "Minimum Reserved Data Rate on Downstream direction. The
    minimum reserved net data rate for the bearer channel, coded
    in bit/s. This parameter is used only if the Rate Adaptation
    Mode in the direction of the bearer channel (i.e.,
    xdsl2LConfProfRaModeDs) is set to dynamicRa."
REFERENCE  "ITU-T G.997.1, paragraph #7.3.2.1.2
           (Minimum reserved data rate)"
 ::= { xdsl2ChConfProfileEntry 4 }

xdsl2ChConfProfMinResDataRateUs  OBJECT-TYPE
SYNTAX     Unsigned32
UNITS      "bits/second"
MAX-ACCESS read-create
STATUS     current
DESCRIPTION
   "Minimum Reserved Data Rate on Upstream direction. The
    minimum reserved net data rate for the bearer channel, coded in
    bit/s. This parameter is used only if the Rate Adaptation Mode
    in the direction of the bearer channel (i.e.,
    xdsl2LConfProfRaModeUs) is set to dynamicRa."
REFERENCE  "ITU-T G.997.1, paragraph #7.3.2.1.2
           (Minimum reserved data rate)"
 ::= { xdsl2ChConfProfileEntry 5 }

xdsl2ChConfProfMaxDataRateDs  OBJECT-TYPE
SYNTAX     Unsigned32
UNITS      "bits/second"
MAX-ACCESS read-create
STATUS     current
DESCRIPTION
   "Maximum Data Rate on Downstream direction. The maximum net
    data rate for the bearer channel, coded in bit/s."
REFERENCE  "ITU-T G.997.1, paragraph #7.3.2.1.3
           (Maximum data rate)"
 ::= { xdsl2ChConfProfileEntry 6 }

xdsl2ChConfProfMaxDataRateUs  OBJECT-TYPE
SYNTAX     Unsigned32
UNITS      "bits/second"
MAX-ACCESS read-create
STATUS     current
DESCRIPTION
"Maximum Data Rate on Upstream direction. The maximum net data rate for the bearer channel, coded in bit/s."
REFERENCE  "ITU-T G.997.1, paragraph #7.3.2.1.3 (Maximum data rate)"
::= { xdsl2ChConfProfileEntry 7 }

xdsl2ChConfProfMinDataRateLowPwrDs OBJECT-TYPE
SYNTAX      Unsigned32
UNITS       "bits/second"
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION  "This parameter specifies the minimum net data rate for the bearer channel as desired by the operator of the system during the low power state (L1/L2). The power management low power states L1 and L2 are defined in ITU-T Recs G.992.2 and G.992.3 respectively. The data rate is coded in steps of bit/s."
REFERENCE    "ITU-T G.997.1, paragraph #7.3.2.1.5 (Minimum Data Rate in low power state)"
::= { xdsl2ChConfProfileEntry 8 }

xdsl2ChConfProfMinDataRateLowPwrUs OBJECT-TYPE
SYNTAX      Unsigned32
UNITS       "bits/second"
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION  "This parameter specifies the minimum net data rate for the bearer channel as desired by the operator of the system during the low power state (L1/L2). The power management low power states L1 and L2 are defined in ITU-T Recs G.992.2 and G.992.3 respectively. The data rate is coded in steps of bit/s."
REFERENCE    "ITU-T G.997.1, paragraph #7.3.2.1.5 (Minimum Data Rate in low power state)"
::= { xdsl2ChConfProfileEntry 9 }

xdsl2ChConfProfMaxDelayDs OBJECT-TYPE
SYNTAX      Unsigned32(0..63)
UNITS       "milliseconds"
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION  "Maximum Interleave Delay on Downstream direction. The maximum one-way interleaving delay introduced by the PMS-TC on Downstream direction. The xTUs shall choose the S (factor) and D (depth) values such that the actual one-way interleaving delay
(Xdsl2ChStatusActDelay) is as close as possible to, but less than or equal to xDSL2ChConfProfMaxDelayDs. The delay is coded in ms, with the value 0 indicating no delay bound is being imposed.

REFERENCE "ITU-T G.997.1, paragraph #7.3.2.2 (Maximum interleaving delay)"

::= { xDSL2ChConfProfileEntry 10 }

xdsl2ChConfProfMaxDelayUs OBJECT-TYPE
SYNTAX  Unsigned32(0..63)
UNITS    "milliseconds"
MAX-ACCESS read-create
STATUS   current
DESCRIPTION "Maximum Interleave Delay on Upstream direction. The maximum one-way interleaving delay introduced by the PMS-TC on Upstream direction. The xTUs shall choose the S (factor) and D (depth) values such that the actual one-way interleaving delay (Xdsl2ChStatusActDelay) is as close as possible to, but less than or equal to xDSL2ChConfProfMaxDelayUs. The delay is coded in ms, with the value 0 indicating no delay bound is being imposed."

REFERENCE "ITU-T G.997.1, paragraph #7.3.2.2 (Maximum interleaving delay)"

::= { xDSL2ChConfProfileEntry 11 }

xdSL2ChConfProfMinProtectionDs OBJECT-TYPE
SYNTAX  Xdsl2SymbolProtection
UNITS    "symbols"
MAX-ACCESS read-create
STATUS   current
DESCRIPTION "This parameter specifies the minimum impulse noise protection for the bearer channel if it is transported over DMT symbols with a subcarrier spacing of 4.3125 kHz. The impulse noise protection is expressed in DMT symbols with a subcarrier spacing of 4.3125 kHz and can take the values 1/2 and any integer from 0 to 16, inclusive. If the xTU does not support the configured INPMIN value, it shall use the nearest supported impulse noise protection greater than INPMIN."

REFERENCE "ITU-T G.997.1, paragraph #7.3.2.3 (INPMINds)"
DEFVAL  { noProtection }

::= { xDSL2ChConfProfileEntry 12 }

xdSL2ChConfProfMinProtectionUs OBJECT-TYPE
SYNTAX  Xdsl2SymbolProtection
UNITS    "symbols"
MAX-ACCESS read-create
This parameter specifies the minimum impulse noise protection for the bearer channel if it is transported over DMT symbols with a subcarrier spacing of 4.3125 kHz. The impulse noise protection is expressed in DMT symbols with a subcarrier spacing of 4.3125 kHz and can take the values 1/2 and any integer from 0 to 16, inclusive. If the xTU does not support the configured INPMIN value, it shall use the nearest supported impulse noise protection greater than INPMIN.

REFERENCE  "ITU-T G.997.1, paragraph #7.3.2.3 (INPMINus)"
DEFVAL       { noProtection }
::= { xdsl2ChConfProfileEntry 13 }

This parameter specifies the minimum impulse noise protection for the bearer channel if it is transported over DMT symbols with a subcarrier spacing of 8.625 kHz. The impulse noise protection is expressed in DMT symbols with a subcarrier spacing of 8.625 kHz and can take any integer value from 0 to 16, inclusive.

REFERENCE  "ITU-T G.997.1, paragraph #7.3.2.4 (INPMIN8ds)"
DEFVAL       { noProtection }
::= { xdsl2ChConfProfileEntry 14 }

This parameter specifies the minimum impulse noise protection for the bearer channel if it is transported over DMT symbols with a subcarrier spacing of 8.625 kHz. The impulse noise protection is expressed in DMT symbols with a subcarrier spacing of 8.625 kHz and can take any integer value from 0 to 16, inclusive.

REFERENCE  "ITU-T G.997.1, paragraph #7.3.2.4 (INPMIN8us)"
DEFVAL       { noProtection }
::= { xdsl2ChConfProfileEntry 15 }
xdsl2ChConfProfMaxBerDs OBJECT-TYPE
SYNTAX     Xdsl2MaxBer
MAX-ACCESS read-create
STATUS     current
DESCRIPTION
"Maximum Bit Error Ratio on Downstream direction. The maximum bit error ratio for the bearer channel. The parameter can take the following values (for 1E-3, 1E-5 or 1E-7):
eminus3 (1),
eminus5 (2),
eminus7 (3)"
REFERENCE  "ITU-T G.997.1, paragraph #7.3.2.6
(Maximum bit error ratio)"
DEFVAL      { eminus5 }
::= { xdsl2ChConfProfileEntry 16 }

xdsl2ChConfProfMaxBerUs OBJECT-TYPE
SYNTAX     Xdsl2MaxBer
MAX-ACCESS read-create
STATUS     current
DESCRIPTION
"Maximum Bit Error Ratio on Upstream direction. The maximum bit error ratio for the bearer channel. The parameter can take the following values (for 1E-3, 1E-5 or 1E-7):
eminus3 (1),
eminus5 (2),
eminus7 (3)"
REFERENCE  "ITU-T G.997.1, paragraph #7.3.2.6
(Maximum bit error ratio)"
DEFVAL      { eminus5 }
::= { xdsl2ChConfProfileEntry 17 }

xdsl2ChConfProfUsDataRateDs OBJECT-TYPE
SYNTAX     Unsigned32
UNITS      "bits/second"
MAX-ACCESS read-create
STATUS     current
DESCRIPTION
"Data Rate Threshold Upshift for downstream direction. An 'Up-Shift rate change' event is triggered when the actual downstream data rate exceeds, by more than the threshold, the data rate at the last entry into Showtime. The parameter is coded in bit/s."
REFERENCE  "ITU-T G.997.1, paragraph #7.3.2.8.1
(Data rate threshold upshift)"
::= { xdsl2ChConfProfileEntry 18 }

xdsl2ChConfProfDsDataRateDs OBJECT-TYPE
SYNTAX      Unsigned32
UNITS       "bits/second"
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
"Data Rate Threshold Downshift for downstream direction. A
'Down-Shift rate change' event is triggered when the
actual downstream data rate is below the data rate at the last
entry into Showtime, by more than the threshold. The parameter
is coded in bit/s."
REFERENCE    "ITU-T G.997.1, paragraph #7.3.2.8.2
(Data rate threshold downshift)"
::= { xdsl2ChConfProfileEntry 19 }

xdsl2ChConfProfUsDataRateUs  OBJECT-TYPE
SYNTAX      Unsigned32
UNITS       "bits/second"
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
"Data Rate Threshold Upshift for upstream direction. An
'Up-Shift rate change' event is triggered when the
actual upstream data rate exceeds, by more than the threshold,
the data rate at the last entry into Showtime. The parameter is
coded in bit/s."
REFERENCE    "ITU-T G.997.1, paragraph #7.3.2.8.1
(Data rate threshold upshift)"
::= { xdsl2ChConfProfileEntry 20 }

xdsl2ChConfProfDsDataRateUs  OBJECT-TYPE
SYNTAX      Unsigned32
UNITS       "bits/second"
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
"Data Rate Threshold Downshift for upstream direction. A
'Down-Shift rate change' event is triggered when the
actual upstream data rate is below the data rate at the last
entry into Showtime, by more than the threshold. The parameter
is coded in bit/s."
REFERENCE    "ITU-T G.997.1, paragraph #7.3.2.8.2
(Data rate threshold downshift)"
::= { xdsl2ChConfProfileEntry 21 }

xdsl2ChConfProfImaEnabled  OBJECT-TYPE
SYNTAX      TruthValue
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
"IMA Mode Enable. The parameter enables the IMA operation
mode in the ATM Data Path. Relevant only if the channel is of
ATM Data Path. When in 'enable' state, the ATM data
path should comply with the requirements for IMA
transmission."
REFERENCE   "ITU-T G.997.1, paragraph #7.3.4.1
(IMA operation mode enable parameter)"
DEFVAL       { false }
 ::= { xdsl2ChConfProfileEntry 22 }

xdsl2ChConfProfMaxDelayVar  OBJECT-TYPE
SYNTAX      Unsigned32(1..255)
UNITS       "0.1 milliseconds"
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION  "Maximum delay variation (DVMAX).
This optional VDSL2 specific parameter specifies the maximum
value for the delay variation allowed in an OLR procedure.
It is ranges from 1 to 254 units of 0.1 milliseconds (i.e., 0.1
to 25.4 milliseconds) with the special value 255 which indicates
that no delay variation bound is imposed."
REFERENCE   "ITU-T G.997.1 Amendment 1, paragraph #7.3.2.9
(DVMAX)"
DEFVAL       { 255 }
 ::= { xdsl2ChConfProfileEntry 23 }

xdsl2ChConfProfInitPolicy  OBJECT-TYPE
SYNTAX      Xdsl2ChInitPolicy
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION  "Channel Initialization Policy Selection (CIPOLICY).
This optional parameter indicates which policy shall be applied
to determine the transceiver configuration parameters at
initialization. The valid values for CIPOLICY are policy0 and
policy1. Those policies are defined in the respective
Recommendations."
REFERENCE   "ITU-T G.997.1 Amendment 1, paragraph #7.3.2.10
(CIPOLICY)"
DEFVAL       { policy0 }
 ::= { xdsl2ChConfProfileEntry 24 }

xdsl2ChConfProfRowStatus  OBJECT-TYPE
SYNTAX      RowStatus
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION

"This object is used to create a new row or to modify or delete an existing row in this table.

A profile is 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 ‘notInService’), it MUST be first unreferenced from all associated templates."

```::= { xdsl2ChConfProfileEntry 25 }
```

```
-- xdsl2LineAlarmConfTemplateTable --
```

```
xdsl2LineAlarmConfTemplateTable  OBJECT-TYPE
SYNTAX      SEQUENCE  OF  Xdsl2LineAlarmConfTemplateEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
 "The table xdsl2LineAlarConfTemplateTable contains DSL line alarm configuration templates.

Entries in this table MUST be maintained in a persistent manner."
::= { xdsl2ProfileAlarmConf 1 }
```

```
Xdsl2LineAlarmConfTemplateEntry  OBJECT-TYPE
SYNTAX      Xdsl2LineAlarmConfTemplateEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
 "The table xdsl2LineAlarmConfTemplateTable contains DSL line PM thresholds templates.
A default template 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  { xdsl2LAlarmConfTempTemplateName }
::= { xdsl2LineAlarmConfTemplateTable 1 }
```

```
Xdsl2LineAlarmConfTemplateEntry ::= 
SEQUENCE {
    xdsl2LAlarmConfTempTemplateName    SnmpAdminString,
    xdsl2LAlarmConfTempLineProfile      SnmpAdminString,
    xdsl2LAlarmConfTempChan1ConfProfile SnmpAdminString,
    xdsl2LAlarmConfTempChan2ConfProfile SnmpAdminString,
    xdsl2LAlarmConfTempChan3ConfProfile SnmpAdminString,
    xdsl2LAlarmConfTempChan4ConfProfile SnmpAdminString,
  }
```

xdsl2LAlarmConfTempRowStatus

}  

xdsl2LAlarmConfTempTemplateName  OBJECT-TYPE
SYNTAX     SnmpAdminString (SIZE(1..32))
MAX-ACCESS not-accessible
STATUS     current
DESCRIPTION
   "This object identifies a row in this table."
::= { xdsl2LineAlarmConfTemplateEntry 1 }  

xdsl2LAlarmConfTempLineProfile  OBJECT-TYPE
SYNTAX     SnmpAdminString (SIZE(1..32))
MAX-ACCESS read-create
STATUS     current
DESCRIPTION
   "The value of this object identifies the row in the DSL Line
Threshlds Configuration Profile Table
(xdsl2LineAlarmConfProfileTable) that applies to this line."
REFERENCE    "DSL Forum TR-129, paragraph #8.2"
DEFVAL       { "DEFVAL" }
::= { xdsl2LineAlarmConfTemplateEntry 2 }  

xdsl2LAlarmConfTempChan1ConfProfile  OBJECT-TYPE
SYNTAX     SnmpAdminString (SIZE(1..32))
MAX-ACCESS read-create
STATUS     current
DESCRIPTION
   "The value of this object identifies the row in the DSL
Channel Thresholds Configuration Profile Table
(xdsl2ChAlarmConfProfileTable) that applies for DSL bearer
channel #1.  The channel profile name specified here MUST match
the name of an existing row in the xdsl2ChAlarmConfProfileTable
table. If the channel is unused, then the object is set to a zero-length string.
REFERENCE    "DSL Forum TR-129, paragraph #8.4"
DEFVAL       { "" }
::= { xdsl2LineAlarmConfTemplateEntry 4 }

xdsl2LAlarmConfTempChan3ConfProfile  OBJECT-TYPE
SYNTAX      SnmpAdminString (SIZE(0..32))
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
 "The value of this object identifies the row in the DSL Channel Thresholds Configuration Profile Table (xdsl2ChAlarmConfProfileTable) that applies for DSL bearer channel #3. The channel profile name specified here MUST match the name of an existing row in the xdsl2ChAlarmConfProfileTable table.
This object may be set to a non-zero-length string only if xdsl2LAlarmConfTempChan2ConfProfile contains a non-zero-length string."
REFERENCE    "DSL Forum TR-129, paragraph #8.4"
DEFVAL       { "" }
::= { xdsl2LineAlarmConfTemplateEntry 5 }

xdsl2LAlarmConfTempChan4ConfProfile  OBJECT-TYPE
SYNTAX      SnmpAdminString (SIZE(0..32))
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
 "The value of this object identifies the row in the DSL Channel Thresholds Configuration Profile Table (xdsl2ChAlarmConfProfileTable) that applies for DSL bearer channel #4. The channel profile name specified here MUST match the name of an existing row in the xdsl2ChAlarmConfProfileTable table.
This object may be set to a non-zero-length string only if xdsl2LAlarmConfTempChan3ConfProfile contains a non-zero-length string."
REFERENCE    "DSL Forum TR-129, paragraph #8.4"
DEFVAL       { "" }
::= { xdsl2LineAlarmConfTemplateEntry 6 }

xdsl2LAlarmConfTempRowStatus  OBJECT-TYPE
SYNTAX      RowStatus
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
 "This object is used to create a new row or to modify or
delete an existing row in this table.

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

Before a template can be deleted or taken out of service (by setting this object to 'destroy' or 'notInService'), it MUST be first unreferenced from all associated lines.

::= { xdsl2LineAlarmConfTemplateEntry 7 }

-- xDSLLineAlarmConfProfileTable --

xDSLLineAlarmConfProfileTable OBJECT-TYPE
SYNTAX SEQUENCE OF XDSLLineAlarmConfProfileEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The table xDSLLineAlarmConfProfileTable contains DSL line PM thresholds profiles.

Entries in this table MUST be maintained in a persistent manner."
::= { xDSLProfileAlarmConf 2 }

XDSLLineAlarmConfProfileEntry OBJECT-TYPE
SYNTAX XDSLLineAlarmConfProfileEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The table xDSLLineAlarmConfProfileTable contains DSL line PM thresholds profiles.

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 { xDSLLineAlarmConfProfileName }
::= { xDSLLineAlarmConfProfileTable 1 }

XDSLLineAlarmConfProfileEntry ::= SEQUENCE {
 xDSLLineAlarmConfProfileName SnmpAdminString,
 xDSLLineAlarmConfProfileXtucThresh15MinFecs HCPerfIntervalThreshold,
 xDSLLineAlarmConfProfileXtucThresh15MinEs HCPerfIntervalThreshold,
 xDSLLineAlarmConfProfileXtucThresh15MinSes HCPerfIntervalThreshold,

xdsl2LineAlarmConfProfileXtucThresh15MinLoss
  HCPERfIntervalThreshold,
xdsl2LineAlarmConfProfileXtucThresh15MinUas
  HCPERfIntervalThreshold,
xdsl2LineAlarmConfProfileXturThresh15MinFecs
  HCPERfIntervalThreshold,
xdsl2LineAlarmConfProfileXturThresh15MinEs
  HCPERfIntervalThreshold,
xdsl2LineAlarmConfProfileXturThresh15MinSes
  HCPERfIntervalThreshold,
xdsl2LineAlarmConfProfileXturThresh15MinLoss
  HCPERfIntervalThreshold,
xdsl2LineAlarmConfProfileXturThresh15MinUas
  HCPERfIntervalThreshold,

xdsl2LineAlarmConfProfileThreshold15MinFailedFullInt
  Unsigned32,
xdsl2LineAlarmConfProfileThreshold15MinFailedShrtInt
  Unsigned32,

xdsl2LineAlarmConfProfileRowStatus
  RowStatus
}

xdsl2LineAlarmConfProfileName  OBJECT-TYPE
SYNTAX     SnmpAdminString (SIZE(1..32))
MAX-ACCESS not-accessible
STATUS     current
DESCRIPTION
  "This object identifies a row in this table."
::= { xdsl2LineAlarmConfProfileEntry 1 }

xdsl2LineAlarmConfProfileXtucThresh15MinFecs  OBJECT-TYPE
SYNTAX     HCPERfIntervalThreshold
UNITS      "seconds"
MAX-ACCESS read-create
STATUS     current
DESCRIPTION
  "A threshold for the xdsl2PMLCurr15MFecs counter, when
  xdsl2PMLCurrUnit is xtuc (1).
  The value 0 means that no threshold is specified for the
  associated counter."
REFERENCE    "ITU-T G.997.1, paragraph #7.2.7.2"
DEFVAL      { 0 }
::= { xdsl2LineAlarmConfProfileEntry 2 }

xdsl2LineAlarmConfProfileXtucThresh15MinEs  OBJECT-TYPE
SYNTAX     HCPERfIntervalThreshold
UNITS      "seconds"
MAX-ACCESS read-create
STATUS     current
DESCRIPTION
"A threshold for the xdsl2PMLCurr15MEs counter, when xdsl2PMLCurrUnit is xtuc {1}.
The value 0 means that no threshold is specified for the associated counter."
REFERENCE "ITU-T G.997.1, paragraph #7.2.7.2"
DEFVAL { 0 }
::= { xdsl2LineAlarmConfProfileEntry 3 }

xdsl2LineAlarmConfProfileXtucThresh15MinSes OBJECT-TYPE
SYNTAX HCPerfIntervalThreshold
UNITS "seconds"
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"A threshold for the xdsl2PMLCurr15MSes counter, when xdsl2PMLCurrUnit is xtuc {1}.
The value 0 means that no threshold is specified for the associated counter."
REFERENCE "ITU-T G.997.1, paragraph #7.2.7.2"
DEFVAL { 0 }
::= { xdsl2LineAlarmConfProfileEntry 4 }

xdsl2LineAlarmConfProfileXtucThresh15MinLoss OBJECT-TYPE
SYNTAX HCPerfIntervalThreshold
UNITS "seconds"
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"A threshold for the xdsl2PMLCurr15MLoss counter, when xdsl2PMLCurrUnit is xtuc {1}.
The value 0 means that no threshold is specified for the associated counter."
REFERENCE "ITU-T G.997.1, paragraph #7.2.7.2"
DEFVAL { 0 }
::= { xdsl2LineAlarmConfProfileEntry 5 }

xdsl2LineAlarmConfProfileXtucThresh15MinUas OBJECT-TYPE
SYNTAX HCPerfIntervalThreshold
UNITS "seconds"
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"A threshold for the xdsl2PMLCurr15MUas counter, when xdsl2PMLCurrUnit is xtuc {1}.
The value 0 means that no threshold is specified for the associated counter."
REFERENCE "ITU-T G.997.1, paragraph #7.2.7.2"
DEFVAL  { 0 } ::= { xdsl2LineAlarmConfProfileEntry 6 }

xdsl2LineAlarmConfProfileXturThresh15MinFecs  OBJECT-TYPE
SYNTAX   HCPerfIntervalThreshold
UNITS     "seconds"
MAX-ACCESS read-create
STATUS    current
DESCRIPTION
"A threshold for the xdsl2PMLCurr15MFecs counter, when
xdsl2PMLCurrUnit is xtur {2}. The value 0 means that no threshold is specified for
the associated counter."
REFERENCE  "ITU-T G.997.1, paragraph #7.2.7.2"
DEFVAL    { 0 } ::= { xdsl2LineAlarmConfProfileEntry 7 }

xdsl2LineAlarmConfProfileXturThresh15MinEs  OBJECT-TYPE
SYNTAX   HCPerfIntervalThreshold
UNITS     "seconds"
MAX-ACCESS read-create
STATUS    current
DESCRIPTION
"A threshold for the xdsl2PMLCurr15MEs counter, when
xdsl2PMLCurrUnit is xtur {2}. The value 0 means that no threshold is specified for
the associated counter."
REFERENCE  "ITU-T G.997.1, paragraph #7.2.7.2"
DEFVAL    { 0 } ::= { xdsl2LineAlarmConfProfileEntry 8 }

xdsl2LineAlarmConfProfileXturThresh15MinSes  OBJECT-TYPE
SYNTAX   HCPerfIntervalThreshold
UNITS     "seconds"
MAX-ACCESS read-create
STATUS    current
DESCRIPTION
"A threshold for the xdsl2PMLCurr15MSes counter, when
xdsl2PMLCurrUnit is xtur {2}. The value 0 means that no threshold is specified for
the associated counter."
REFERENCE  "ITU-T G.997.1, paragraph #7.2.7.2"
DEFVAL    { 0 } ::= { xdsl2LineAlarmConfProfileEntry 9 }

xdsl2LineAlarmConfProfileXturThresh15MinLoss  OBJECT-TYPE
SYNTAX   HCPerfIntervalThreshold
UNITS     "seconds"
A threshold for the xdsl2PMLCurr15MLoss counter, when xdsl2PMLCurrUnit is xtur (2).

The value 0 means that no threshold is specified for the associated counter.

REFERENCE  "ITU-T G.997.1, paragraph #7.2.7.2"
DEFVAL       { 0 }
::= { xdsl2LineAlarmConfProfileEntry 10 }

A threshold for the xdsl2PMLCurr15MUas counter, when xdsl2PMLCurrUnit is xtur (2).

The value 0 means that no threshold is specified for the associated counter.

REFERENCE  "ITU-T G.997.1, paragraph #7.2.7.2"
DEFVAL       { 0 }
::= { xdsl2LineAlarmConfProfileEntry 11 }

A threshold for the xdsl2PMLInitCurr15MfailedFullInits counter.

The value 0 means that no threshold is specified for the associated counter.

REFERENCE  "ITU-T G.997.1, paragraph #7.2.7.2"
DEFVAL       { 0 }
::= { xdsl2LineAlarmConfProfileEntry 12 }

A threshold for the xdsl2PMLInitCurr15MFailedShortInits counter.

The value 0 means that no threshold is specified for the associated counter.

REFERENCE  "ITU-T G.997.1, paragraph #7.2.7.2"
DEFVAL   { 0 }
::= { xdsl2LineAlarmConfProfileEntry 13 }

xdsl2LineAlarmConfProfileRowStatus  OBJECT-TYPE
SYNTAX     RowStatus
MAX-ACCESS read-create
STATUS      current
DESCRIPTION
 "This object is used to create a new row or to modify or delete an existing row in this table.

A profile is 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 ‘notInService’), it MUST be first unreferenced from all associated templates."
::= { xdsl2LineAlarmConfProfileEntry 14 }

-- xdsl2ChAlarmConfProfileTable --

xdsl2ChAlarmConfProfileTable  OBJECT-TYPE
SYNTAX     SEQUENCE  OF  Xdsl2ChAlarmConfProfileEntry
MAX-ACCESS not-accessible
STATUS      current
DESCRIPTION
 "The table xdsl2ChAlarmConfProfileTable contains DSL channel PM thresholds profiles.

Entries in this table MUST be maintained in a persistent manner."
::= { xdsl2ProfileAlarmConf 3 }

xdsl2ChAlarmConfProfileEntry  OBJECT-TYPE
SYNTAX     Xdsl2ChAlarmConfProfileEntry
MAX-ACCESS not-accessible
STATUS      current
DESCRIPTION
 "The table xdsl2ChAlarmConfProfileTable contains DSL channel PM thresholds profiles.
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     { xdsl2ChAlarmConfProfileName }
::= { xdsl2ChAlarmConfProfileTable 1 }
Xdsl2ChAlarmConfProfileEntry ::= 
  SEQUENCE {
    xdsl2ChAlarmConfProfileName SnmpAdminString,
    xdsl2ChAlarmConfProfileXtucThresh15MinCodingViolations Unsigned32,
    xdsl2ChAlarmConfProfileXtucThresh15MinCorrected Unsigned32,
    xdsl2ChAlarmConfProfileXturThresh15MinCodingViolations Unsigned32,
    xdsl2ChAlarmConfProfileXturThresh15MinCorrected Unsigned32,
    xdsl2ChAlarmConfProfileRowStatus RowStatus
  }

Xdsl2ChAlarmConfProfileName OBJECT-TYPE
SYNTAX SnmpAdminString (SIZE(1..32))
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "This object identifies a row in this table."
::= { xdsl2ChAlarmConfProfileEntry 1 }

Xdsl2ChAlarmConfProfileXtucThresh15MinCodingViolations OBJECT-TYPE
SYNTAX Unsigned32
MAX-ACCESS read-create
STATUS current
DESCRIPTION "A threshold for the xds12PMChCurr15M CodingViolations counter, when xds12PMChCurrUnit is xtuc {1}. The value 0 means that no threshold is specified for the associated counter."
REFERENCE "ITU-T G.997.1, paragraph #7.2.7.2"
DEFVAL { 0 }
::= { xdsl2ChAlarmConfProfileEntry 2 }

Xdsl2ChAlarmConfProfileXtucThresh15MinCorrected OBJECT-TYPE
SYNTAX Unsigned32
MAX-ACCESS read-create
STATUS current
DESCRIPTION "A threshold for the xds12PMChCurr15M CorrectedBlocks counter, when xds12PMChCurrUnit is xtuc {1}. The value 0 means that no threshold is specified for the associated counter."
REFERENCE "ITU-T G.997.1, paragraph #7.2.7.2"
DEFVAL { 0 }
::= { xdsl2ChAlarmConfProfileEntry 3 }

Xdsl2ChAlarmConfProfileXturThresh15MinCodingViolations OBJECT-TYPE
SYNTAX   Unsigned32
MAX-ACCESS read-create
STATUS      current
DESCRIPTION
"A threshold for the xdsl2PMChCurr15MCodingViolations
counter, when xdsl2PMChCurrUnit is xtur {2}.
The value 0 means that no threshold is specified for the
associated counter."
REFERENCE   "ITU-T G.997.1, paragraph #7.2.7.2"
DEFVAL       { 0 }
 ::= { xdsl2ChAlarmConfProfileEntry 4 }

xdsl2ChAlarmConfProfileXturThresh15MinCorrected  OBJECT-TYPE
SYNTAX   Unsigned32
MAX-ACCESS read-create
STATUS      current
DESCRIPTION
"A threshold for the xdsl2PMChCurr15MCorrectedBlocks
counter, when xdsl2PMChCurrUnit is xtur {2}.
The value 0 means that no threshold is specified for the
associated counter."
REFERENCE   "ITU-T G.997.1, paragraph #7.2.7.2"
DEFVAL       { 0 }
 ::= { xdsl2ChAlarmConfProfileEntry 5 }

xdsl2ChAlarmConfProfileRowStatus  OBJECT-TYPE
SYNTAX      RowStatus
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
"This object is used to create a new row or to modify or
delete an existing row in this table.
A profile is 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 ‘notInService’), it MUST be
first unreferenced from all associated templates."
 ::= { xdsl2ChAlarmConfProfileEntry 6 }

--          PM line current counters          --
--          ---------------------------------  --

xdsl2PMLineCurrTable  OBJECT-TYPE
SYNTAX      SEQUENCE  OF  Xdsl2PMLineCurrEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
"The table xdsl2PMLLineCurrTable contains current Performance
Monitoring results for DSL lines."
 ::= { xdsl2PMLLine 1 }

xdsl2PMLLineCurrEntry OBJECT-TYPE
SYNTAX Xdsl2PMLLineCurrEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The table xdsl2PMLLineCurrTable contains current Performance
Monitoring results for DSL lines. The index of this table is an
interface index, where the interface has an ifType of vds12(xxx),
together with a termination unit."
INDEX { ifIndex, xdsl2PMLCurrUnit }
 ::= { xdsl2PMLLineCurrTable 1 }

Xdsl2PMLLineCurrEntry ::= SEQUENCE {
 xdsl2PMLCurrUnit Xdsl2Unit,
 xdsl2PMLCurr15MValidIntervals Unsigned32,
 xdsl2PMLCurr15MInvalidIntervals Unsigned32,
 xdsl2PMLCurr15MTimeElapsed HCPerfTimeElapsed,
 xdsl2PMLCurr15MFecs Counter32,
 xdsl2PMLCurr15MEs Counter32,
 xdsl2PMLCurr15MSes Counter32,
 xdsl2PMLCurr15MLoss Counter32,
 xdsl2PMLCurr15MUas Counter32,
 xdsl2PMLCurr1DayValidIntervals Unsigned32,
 xdsl2PMLCurr1DayInvalidIntervals Unsigned32,
 xdsl2PMLCurr1DayTimeElapsed HCPerfTimeElapsed,
 xdsl2PMLCurr1DayFecs Counter32,
 xdsl2PMLCurr1DayEs Counter32,
 xdsl2PMLCurr1DaySes Counter32,
 xdsl2PMLCurr1DayLoss Counter32,
 xdsl2PMLCurr1DayUas Counter32
}

xdsl2PMLCurrUnit OBJECT-TYPE
SYNTAX Xdsl2Unit
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The termination unit xtuc{1} or xtur{2}.
 ::= { xdsl2PMLLineCurrEntry 1 }

xdsl2PMLCurr15MValidIntervals  OBJECT-TYPE
SYNTAX       Unsigned32
MAX-ACCESS   read-only
STATUS       current
DESCRIPTION  "Valid intervals."
::= { xdsl2PMLineCurrEntry 2 }

xdsl2PMLCurr15MInvalidIntervals  OBJECT-TYPE
SYNTAX       Unsigned32
MAX-ACCESS   read-only
STATUS       current
DESCRIPTION  "Invalid intervals."
::= { xdsl2PMLineCurrEntry 3 }

xdsl2PMLCurr15MTimeElapsed  OBJECT-TYPE
SYNTAX       HCPerfTimeElapsed
UNITS        "seconds"
MAX-ACCESS   read-only
STATUS       current
DESCRIPTION  "Total elapsed seconds in this interval."
::= { xdsl2PMLineCurrEntry 4 }

xdsl2PMLCurr15MFecs  OBJECT-TYPE
SYNTAX       Counter32
UNITS        "seconds"
MAX-ACCESS   read-only
STATUS       current
DESCRIPTION  "Count of seconds during this interval that there was at
             least one FEC correction event for one or more bearer channels in
             this line. This parameter is inhibited during UAS or SES."
REFERENCE    "ITU-T G.997.1, paragraph #7.2.1.1.1 (FECS-L)
             and paragraph #7.2.1.2.1 (FECS-LFE)"
::= { xdsl2PMLineCurrEntry 5 }

xdsl2PMLCurr15MEs  OBJECT-TYPE
SYNTAX       Counter32
UNITS        "seconds"
MAX-ACCESS   read-only
STATUS       current
DESCRIPTION  "Count of seconds during this interval that there was:
             xTU-C: CRC-8 >= 1 for one or more bearer channels OR
             LOS >= 1 OR SEF >=1 OR LPR >= 1
             xTU-R: FEBE >= 1 for one or more bearer channels OR
LOS-FE >=1 OR RDI >=1 OR LPR-FE >=1.

This parameter is inhibited during UAS.

REFERENCE "ITU-T G.997.1, paragraph #7.2.1.1.2 (ES-L)
and paragraph #7.2.1.2.2 (ES-LFE)"

::= { xdsl2PMLLineCurrEntry 6 }

xdsl2PMLCurr15MSes OBJECT-TYPE
SYNTAX Counter32
UNITS "seconds"
MAX-ACCESS read-only
STATUS current
DESCRIPTION "Count of seconds during this interval that there was:
xTU-C: (CRC-8 anomalies in one or more of the
received bearer channels) >= 18 OR LOS >= 1
OR SEF >= 1 OR LPR >= 1
xTU-R: (FEBE anomalies in one or more of the
received bearer channels) >= 18 OR LOS-FE >= 1
OR RDI >= 1 OR LPR-FE >= 1.

This parameter is inhibited during UAS."
REFERENCE "ITU-T G.997.1, paragraph #7.2.1.1.3 (SES-L)
and paragraph #7.2.1.2.3 (SES-LFE)"

::= { xdsl2PMLLineCurrEntry 7 }

xdsl2PMLCurr15MLoss OBJECT-TYPE
SYNTAX Counter32
UNITS "seconds"
MAX-ACCESS read-only
STATUS current
DESCRIPTION "Count of seconds during this interval that there was LOS (or
LOS-FE for xTU-R)."
REFERENCE "ITU-T G.997.1, paragraph #7.2.1.1.4 (LOSS-L)
and paragraph #7.2.1.2.4 (LOSS-LFE)"

::= { xdsl2PMLLineCurrEntry 8 }

xdsl2PMLCurr15MUas OBJECT-TYPE
SYNTAX Counter32
UNITS "seconds"
MAX-ACCESS read-only
STATUS current
DESCRIPTION "Count of seconds in Unavailability State during this
interval. Unavailability begins at the onset of 10 contiguous
severely-errored seconds, and ends at the onset of 10 contiguous
seconds with no severely-errored seconds."
REFERENCE "ITU-T G.997.1, paragraph #7.2.1.1.5 (UAS-L)
and paragraph #7.2.1.2.5 (UAS-LFE)"
::= { xdsl2PMLineCurrEntry 9 }

xdsl2PMLCurr1DayValidIntervals OBJECT-TYPE
SYNTAX     Unsigned32
MAX-ACCESS read-only
STATUS     current
DESCRIPTION "Valid intervals."
::= { xdsl2PMLineCurrEntry 10 }

xdsl2PMLCurr1DayInvalidIntervals OBJECT-TYPE
SYNTAX     Unsigned32
MAX-ACCESS read-only
STATUS     current
DESCRIPTION "Invalid intervals."
::= { xdsl2PMLineCurrEntry 11 }

xdsl2PMLCurr1DayTimeElapsed OBJECT-TYPE
SYNTAX     HCPerfTimeElapsed
UNITS      "seconds"
MAX-ACCESS read-only
STATUS     current
DESCRIPTION "Total elapsed seconds in this interval."
::= { xdsl2PMLineCurrEntry 12 }

xdsl2PMLCurr1DayFecs OBJECT-TYPE
SYNTAX     Counter32
UNITS      "seconds"
MAX-ACCESS read-only
STATUS     current
DESCRIPTION "Count of seconds during this interval that there was at least one FEC correction event for one or more bearer channels in this line. This parameter is inhibited during UAS or SES."
REFERENCE  "ITU-T G.997.1, paragraph #7.2.1.1.1 (FECS-L) and paragraph #7.2.1.2.1 (FECS-LFE)"
::= { xdsl2PMLineCurrEntry 13 }

xdsl2PMLCurr1DayEs OBJECT-TYPE
SYNTAX     Counter32
UNITS      "seconds"
MAX-ACCESS read-only
STATUS     current
DESCRIPTION "Count of seconds during this interval that there was:
             xTU-C: CRC-8 >= 1 for one or more bearer channels OR
LOS >= 1 OR SEF >= 1 OR LPR >= 1

\texttt{xTU-R: FEBE} >= 1 for one or more bearer channels OR
\texttt{LOS-FE} >= 1 OR RDI >= 1 OR LPR-FE >= 1.

This parameter is inhibited during UAS.

REFERENCE "ITU-T G.997.1, paragraph #7.2.1.1.2 (ES-L)
and paragraph #7.2.1.2.2 (ES-LFE)"

::= { xdsl2PMLineCurrEntry 14 }

\texttt{xdsl2PMLCurr1DaySes} OBJECT-TYPE
SYNTAX Counter32
UNITS "seconds"
MAX-ACCESS read-only
STATUS current
DESCRIPTION "Count of seconds during this interval that there was:
\texttt{xTU-C:} \texttt{(CRC-8 anomalies in one or more of the}
received bearer channels) >= 18 OR LOS >= 1
OR SEF >= 1 OR LPR >= 1
\texttt{xTU-R:} \texttt{(FEBE anomalies in one or more of the}
received bearer channels) >= 18 OR LOS-FE >= 1
OR RDI >= 1 OR LPR-FE >= 1.

This parameter is inhibited during UAS.

REFERENCE "ITU-T G.997.1, paragraph #7.2.1.1.3 (SES-L)
and paragraph #7.2.1.2.3 (SES-LFE)"

::= { xdsl2PMLLineCurrEntry 15 }

\texttt{xdsl2PMLCurr1DayLoss} OBJECT-TYPE
SYNTAX Counter32
UNITS "seconds"
MAX-ACCESS read-only
STATUS current
DESCRIPTION "Count of seconds during this interval that there was LOS (or
LOS-FE for xTU-R)."

REFERENCE "ITU-T G.997.1, paragraph #7.2.1.1.4 (LOSS-L)
and paragraph #7.2.1.2.4 (LOSS-LFE)"

::= { xdsl2PMLLineCurrEntry 16 }

\texttt{xdsl2PMLCurr1DayUas} OBJECT-TYPE
SYNTAX Counter32
UNITS "seconds"
MAX-ACCESS read-only
STATUS current
DESCRIPTION "Count of seconds in Unavailability State during this
interval.
Unavailability begins at the onset of 10 contiguous severely-
errored seconds, and ends at the onset of 10 contiguous seconds
REFERENCE    "ITU-T G.997.1, paragraph #7.2.1.1.5 (UAS-L) and paragraph #7.2.1.2.5 (UAS-LFE)"
::= { xdsl2PMLineCurrEntry 17 }

--          PM line init current counters     --
-- --------------------------------------------------

xdsl2PMLineInitCurrTable  OBJECT-TYPE
   SYNTAX  SEQUENCE  OF  Xdsl2PMLineInitCurrEntry
   MAX-ACCESS  not-accessible
   STATUS      current
   DESCRIPTION   "The table xdsl2PMLineInitCurrTable contains current initialization counters for DSL lines."
::= { xdsl2PMLine 2 }

xdsl2PMLineInitCurrEntry  OBJECT-TYPE
   SYNTAX  Xdsl2PMLineInitCurrEntry
   MAX-ACCESS  not-accessible
   STATUS      current
   DESCRIPTION   "The table xdsl2PMLineInitCurrTable contains current initialization counters for DSL lines. The index of this table is an interface index, where the interface has an ifType of vdsl2(xxx), and a termination unit."
   INDEX  { ifIndex }
::= { xdsl2PMLineInitCurrTable 1 }

Xdsl2PMLineInitCurrEntry  ::=  SEQUENCE {
   xdsl2PMLInitCurr15MValidIntervals       Unsigned32,
   xdsl2PMLInitCurr15MInvalidIntervals     Unsigned32,
   xdsl2PMLInitCurr15MTimeElapsed          Unsigned32,
   xdsl2PMLInitCurr15MFullInits            Unsigned32,
   xdsl2PMLInitCurr15MFailedFullInits      Unsigned32,
   xdsl2PMLInitCurr15MShortInits           Unsigned32,
   xdsl2PMLInitCurr15MFailedShortInits     Unsigned32,
   xdsl2PMLInitCurr1DayValidIntervals      Unsigned32,
   xdsl2PMLInitCurr1DayInvalidIntervals    Unsigned32,
   xdsl2PMLInitCurr1DayTimeElapsed         Unsigned32,
   xdsl2PMLInitCurr1DayFullInits           Unsigned32,
   xdsl2PMLInitCurr1DayFailedFullInits     Unsigned32,
   xdsl2PMLInitCurr1DayFailedShortInits    Unsigned32,
   xdsl2PMLInitCurr1DayTimeElapsed         Unsigned32,
xdsl2PMLInitCurr15MValidIntervals  OBJECT-TYPE
SYNTAX    Unsigned32
MAX-ACCESS read-only
STATUS    current
DESCRIPTION
"Valid intervals."
 ::=  { xdsl2PMLineInitCurrEntry 1 }

xdsl2PMLInitCurr15MInvalidIntervals  OBJECT-TYPE
SYNTAX    Unsigned32
MAX-ACCESS read-only
STATUS    current
DESCRIPTION
"Invalid intervals."
 ::=  { xdsl2PMLineInitCurrEntry 2 }

xdsl2PMLInitCurr15MTimeElapsed  OBJECT-TYPE
SYNTAX    Unsigned32
UNITS     "seconds"
MAX-ACCESS read-only
STATUS    current
DESCRIPTION
"Total elapsed seconds in this interval."
 ::=  { xdsl2PMLineInitCurrEntry 3 }

xdsl2PMLInitCurr15MFullInits  OBJECT-TYPE
SYNTAX    Unsigned32
MAX-ACCESS read-only
STATUS    current
DESCRIPTION
"Count of full initializations attempted on the line
(successful and failed) during this interval."
REFERENCE  "ITU-T G.997.1, paragraph #7.2.1.3.1"
 ::=  { xdsl2PMLineInitCurrEntry 4 }

xdsl2PMLInitCurr15MFailedFullInits  OBJECT-TYPE
SYNTAX    Unsigned32
MAX-ACCESS read-only
STATUS    current
DESCRIPTION
"Count of failed full initializations on the line during this
interval."
REFERENCE  "ITU-T G.997.1, paragraph #7.2.1.3.2"
 ::=  { xdsl2PMLineInitCurrEntry 5 }

xdsl2PMLInitCurr15MShortInits  OBJECT-TYPE
SYNTAX     Unsigned32
MAX-ACCESS read-only
STATUS     current
DESCRIPTION
"Count of short initializations attempted on the line
(successful and failed) during this interval."
REFERENCE  "ITU-T G.997.1, paragraph #7.2.1.3.3"
::= { xdsl2PMLLineInitCurrEntry 6 }

xdsl2PMLInitCurr15MFailedShortInits OBJECT-TYPE
SYNTAX     Unsigned32
MAX-ACCESS read-only
STATUS     current
DESCRIPTION
"Count of failed short initializations on the line during
this interval."
REFERENCE  "ITU-T G.997.1, paragraph #7.2.1.3.4"
::= { xdsl2PMLLineInitCurrEntry 7 }

xdsl2PMLInitCurr1DayValidIntervals OBJECT-TYPE
SYNTAX     Unsigned32
MAX-ACCESS read-only
STATUS     current
DESCRIPTION
"Valid intervals."
::= { xdsl2PMLLineInitCurrEntry 8 }

xdsl2PMLInitCurr1DayInvalidIntervals OBJECT-TYPE
SYNTAX     Unsigned32
MAX-ACCESS read-only
STATUS     current
DESCRIPTION
"Invalid intervals."
::= { xdsl2PMLLineInitCurrEntry 9 }

xdsl2PMLInitCurr1DayTimeElapsed OBJECT-TYPE
SYNTAX     Unsigned32
UNITS      "seconds"
MAX-ACCESS read-only
STATUS     current
DESCRIPTION
"Total elapsed seconds in this interval."
::= { xdsl2PMLLineInitCurrEntry 10 }

xdsl2PMLInitCurr1DayFullInits OBJECT-TYPE
SYNTAX     Unsigned32
MAX-ACCESS read-only
STATUS     current
DESCRIPTION
"Count of full initializations attempted on the line (successful and failed) during this interval."
REFERENCE  "ITU-T G.997.1, paragraph #7.2.1.3.1"
::= { xdsl2PMLineInitCurrEntry 11 }

xdsl2PMLInitCurr1DayFailedFullInits  OBJECT-TYPE
SYNTAX      Unsigned32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"Count of failed full initializations on the line during this interval."
REFERENCE    "ITU-T G.997.1, paragraph #7.2.1.3.2"
::= { xdsl2PMLineInitCurrEntry 12 }

xdsl2PMLInitCurr1DayShortInits  OBJECT-TYPE
SYNTAX      Unsigned32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"Count of short initializations attempted on the line (successful and failed) during this interval."
REFERENCE    "ITU-T G.997.1, paragraph #7.2.1.3.3"
::= { xdsl2PMLineInitCurrEntry 13 }

xdsl2PMLInitCurr1DayFailedShortInits  OBJECT-TYPE
SYNTAX      Unsigned32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"Count of failed short initializations on the line during this interval."
REFERENCE    "ITU-T G.997.1, paragraph #7.2.1.3.4"
::= { xdsl2PMLineInitCurrEntry 14 }

-------------------------------------------
--       PM line history 15 Minutes      --
-------------------------------------------

xdsl2PMLineHist15MinTable    OBJECT-TYPE
SYNTAX      SEQUENCE  OF  Xdsl2PMLineHist15MinEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
"The table xdsl2PMLineHist15MinTable contains PM line history for 15min intervals of DSL line."
::= { xdsl2PMLine 3 }

xdsl2PMLineHist15MinEntry  OBJECT-TYPE
   SYNTAX  Xdsl2PMLineHist15MinEntry
   MAX-ACCESS not-accessible
   STATUS  current
   DESCRIPTION
   "The table xdsl2PMLineHist15MinTable contains PM line history
   for 15min intervals of DSL line. The index of this table is an interface index, where the
   interface has an ifType of vdsl2(xxx), together with a termination unit and an
   interval number."
   INDEX  { ifIndex,
       xdsl2PMLHist15MUnit,
       xdsl2PMLHist15MInterval }
   ::= { xdsl2PLineHist15MinTable 1 }

Xdsl2PMLineHist15MinEntry  ::=  
   SEQUENCE  {
      xdsl2PMLHist15MUnit                 Xdsl2Unit,
      xdsl2PMLHist15MInterval             Unsigned32,
      xdsl2PMLHist15MMonitoredTime        Unsigned32,
      xdsl2PMLHist15MFecs                 Counter32,
      xdsl2PMLHist15MEs                   Counter32,
      xdsl2PMLHist15Mses                  Counter32,
      xdsl2PMLHist15MLoss                 Counter32,
      xdsl2PMLHist15MUas                  Counter32,
      xdsl2PMLHist15MValidInterval        TruthValue
   }

xdsl2PMLHist15MUnit  OBJECT-TYPE
   SYNTAX  Xdsl2Unit
   MAX-ACCESS not-accessible
   STATUS  current
   DESCRIPTION
   "The termination unit xtuc{1} or xtur{2}.
   ::= { xdsl2PLineHist15MinEntry 1 }

xdsl2PMLHist15MInterval  OBJECT-TYPE
   SYNTAX  Unsigned32 (1..96)
   MAX-ACCESS not-accessible
   STATUS  current
   DESCRIPTION
   "The interval number."
   ::= { xdsl2PLineHist15MinEntry 2 }

Internet-Draft               VDSL2-LINE MIB                    July 2008

xdsl2PMLHist15MMonitoredTime  OBJECT-TYPE
SYNTAX        Unsigned32
UNITS         "seconds"
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION
"Total seconds monitored in this interval."
::= { xdsl2PMLLineHist15MinEntry 3 }

xdsl2PMLHist15MFecs  OBJECT-TYPE
SYNTAX        Counter32
UNITS         "seconds"
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION
"Count of seconds during this interval that there was at
least one FEC correction event for one or more bearer channels in
this line. This parameter is inhibited during UAS or SES."
REFERENCE    "ITU-T G.997.1, paragraph #7.2.1.1.1 (FECS-L)
and paragraph #7.2.1.2.1 (FECS-LFE)"
::= { xdsl2PMLLineHist15MinEntry 4 }

xdsl2PMLHist15MEs  OBJECT-TYPE
SYNTAX        Counter32
UNITS         "seconds"
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION
"Count of seconds during this interval that there was:
 xTU-C: CRC-8 >= 1 for one or more bearer channels OR
LOS >= 1 OR SEF >= 1 OR LPR >= 1
 xTU-R: FEBE >= 1 for one or more bearer channels OR
LOS-FE >= 1 OR RDI >= 1 OR LPR-FE >= 1.
This parameter is inhibited during UAS."
REFERENCE    "ITU-T G.997.1, paragraph #7.2.1.1.2 (ES-L)
and paragraph #7.2.1.2.2 (ES-LFE)"
::= { xdsl2PMLLineHist15MinEntry 5 }

xdsl2PMLHist15MSes  OBJECT-TYPE
SYNTAX        Counter32
UNITS         "seconds"
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION
"Count of seconds during this interval that there was:
 xTU-C: (CRC-8 anomalies in one or more of the
received bearer channels) >= 18 OR LOS >= 1
 OR SEF >= 1 OR LPR >= 1
xtU-R: (FEBE anomalies in one or more of the received bearer channels) >= 18 OR LOS-FE >= 1 OR RDI >= 1 OR LPR-FE >= 1.

This parameter is inhibited during UAS.

REFERENCE  "ITU-T G.997.1, paragraph #7.2.1.1.3 (SES-L) and paragraph #7.2.1.2.3 (SES-LFE)"
::= { xdsl2PMLineHist15MinEntry 6 }

xdsl2PMLHist15MLoss  OBJECT-TYPE
SYNTAX      Counter32
UNITS       "seconds"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION  "Count of seconds during this interval that there was LOS (or LOS-FE for xTU-R)."
REFERENCE   "ITU-T G.997.1, paragraph #7.2.1.1.4 (LOSS-L) and paragraph #7.2.1.2.4 (LOSS-LFE)"
::= { xdsl2PMLineHist15MinEntry 7 }

xdsl2PMLHist15MUas  OBJECT-TYPE
SYNTAX      Counter32
UNITS       "seconds"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION  "Count of seconds in Unavailability State during this interval. Unavailability begins at the onset of 10 contiguous severely-errored seconds, and ends at the onset of 10 contiguous seconds with no severely-errored seconds."
REFERENCE   "ITU-T G.997.1, paragraph #7.2.1.1.5 (UAS-L) and paragraph #7.2.1.2.5 (UAS-LFE)"
::= { xdsl2PMLineHist15MinEntry 8 }

xdsl2PMLHist15MValidInterval  OBJECT-TYPE
SYNTAX      TruthValue
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION  "This variable indicates if the data for this interval is valid."
::= { xdsl2PMLineHist15MinEntry 9 }

-- PM line history 1 Day --
Internet-Draft               VDSL2-LINE MIB                    July 2008

---

```
xdsl2PMLineHist1DayTable OBJECT-TYPE
SYNTAX       SEQUENCE OF Xdsl2PMLineHist1DayEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
 "The table xdsl2PMLineHist1DayTable contains PM line history for 24-hour intervals of DSL line."
::= { xds12PMLine 4 }

xdsl2PMLineHist1DayEntry OBJECT-TYPE
SYNTAX       Xdsl2PMLineHist1DayEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
 "The table xdsl2PMLineHist1DayTable contains PM line history for 24-hour intervals of DSL line. The index of this table is an interface index, where the interface has an ifType of vdsl2(xxx), together with a termination unit and an interval number."
INDEX  { ifIndex, xds12PMLHist1DUnit, xds12PMLHist1DInterval }
::= { xds12PMLineHist1DayTable 1 }

Xdsl2PMLineHist1DayEntry ::= SEQUENCE {
   xds12PMLHist1DUnit              Xdsl2Unit,
   xds12PMLHist1DInterval          Unsigned32,
   xds12PMLHist1DMonitoredTime     Unsigned32,
   xds12PMLHist1DFecs              Counter32,
   xds12PMLHist1DEs                Counter32,
   xds12PMLHist1DSes               Counter32,
   xds12PMLHist1DLoss              Counter32,
   xds12PMLHist1DUas               Counter32,
   xds12PMLHist1DValidInterval     TruthValue
}

xdsl2PMLHist1DUnit  OBJECT-TYPE
SYNTAX       Xdsl2Unit
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
 "The termination unit."
::= { xds12PMLineHist1DayEntry 1 }

xdsl2PMLHist1DInterval  OBJECT-TYPE
```
SYNTAX      Unsigned32 (1..30)
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION  "The interval number."
::=  { xdsl2PMLineHist1DayEntry 2 }

xdsl2PMLHist1DMonitoredTime  OBJECT-TYPE
SYNTAX      Unsigned32
UNITS       "seconds"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION  "Total seconds monitored in this interval."
::=  { xdsl2PMLineHist1DayEntry 3 }

xdsl2PMLHist1DFecs  OBJECT-TYPE
SYNTAX      Counter32
UNITS       "seconds"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION  "Count of seconds during this interval that there was at least one FEC correction event for one or more bearer channels in this line. This parameter is inhibited during UAS or SES."
REFERENCE    "ITU-T G.997.1, paragraph #7.2.1.1.1 (FECS-L) and paragraph #7.2.1.2.1 (FECS-LFE)"
::=  { xdsl2PMLineHist1DayEntry 4 }

xdsl2PMLHist1DEs  OBJECT-TYPE
SYNTAX      Counter32
UNITS       "seconds"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION  "Count of seconds during this interval that there was: xTU-C: CRC-8 >= 1 for one or more bearer channels OR LOS >= 1 OR SEF >= 1 OR LPR >= 1 xTU-R: FEBE >= 1 for one or more bearer channels OR LOS-FE >= 1 OR RDI >= 1 OR LPR-FE >= 1.
This parameter is inhibited during UAS."
REFERENCE    "ITU-T G.997.1, paragraph #7.2.1.1.2 (ES-L) and paragraph #7.2.1.2.2 (ES-LFE)"
::=  { xdsl2PMLineHist1DayEntry 5 }

xdsl2PMLHist1DSes  OBJECT-TYPE
SYNTAX      Counter32
UNITS       "seconds"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"Count of seconds during this interval that there was:
  xTU-C: (CRC-8 anomalies in one or more of the
    received bearer channels) >= 18 OR LOS >= 1
    OR SEF >= 1 OR LPR >= 1
  xTU-R: (FEBE anomalies in one or more of the
    received bearer channels) >= 18 OR LOS-FE >= 1
    OR RDI >= 1 OR LPR-FE >= 1.
This parameter is inhibited during UAS."
REFERENCE    "ITU-T G.997.1, paragraph #7.2.1.1.3 (SES-L)
              and paragraph #7.2.1.2.3 (SES-LFE)"
::= { xdsl2PMLineHist1DayEntry 6 }

xds12PMLHist1DLoss  OBJECT-TYPE
SYNTAX      Counter32
UNITS       "seconds"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"Count of seconds during this interval that there was LOS (or
LOS-FE for xTU-R)."
REFERENCE    "ITU-T G.997.1, paragraph #7.2.1.1.4 (LOSS-L)
              and paragraph #7.2.1.2.4 (LOSS-LFE)"
::= { xdsl2PMLineHist1DayEntry 7 }

xds12PMLHist1DUas  OBJECT-TYPE
SYNTAX      Counter32
UNITS       "seconds"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"Count of seconds in Unavailability State during this
interval.
Unavailability begins at the onset of 10 contiguous severely-
errored seconds, and ends at the onset of 10 contiguous seconds
with no severely-errored seconds."
REFERENCE    "ITU-T G.997.1, paragraph #7.2.1.1.5 (UAS-L)
              and paragraph #7.2.1.2.5 (UAS-LFE)"
::= { xdsl2PMLineHist1DayEntry 8 }

xds12PMLHist1DValidInterval  OBJECT-TYPE
SYNTAX      TruthValue
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"This variable indicates if the data for this interval is
valid.
::= { xdsl2PMLineHist1DayEntry 9 }

-------------------------------------------
--     PM line init history 15 Minutes   --
-------------------------------------------

xdsl2PMLineInitHist15MinTable OBJECT-TYPE
SYNTAX  SEQUENCE  OF  Xdsl2PMLineInitHist15MinEntry
MAX-ACCESS not-accessible
STATUS   current
DESCRIPTION
"The table xdsl2PMLineInitHist15MinTable contains PM line
initialization history for 15-minutes intervals of DSL
line."
::= { xdsl2PMLine 5 }

xdsl2PMLineInitHist15MinEntry  OBJECT-TYPE
SYNTAX  Xdsl2PMLineInitHist15MinEntry
MAX-ACCESS not-accessible
STATUS   current
DESCRIPTION
"The table xdsl2PMLineInitHist15MinTable contains PM line
initialization history for 15-minute intervals for DSL
lines.
The index of this table is an interface index, where the
interface
has an ifType of vdsl2(xxx), and an interval number."

INDEX  { ifIndex,
        xdsl2PMLInitHist15MInterval }
::= { xdsl2PMLineInitHist15MinTable 1 }

Xdsl2PMLineInitHist15MinEntry  ::==
SEQUENCE {
        xdsl2PMLInitHist15MInterval              Unsigned32,
        xdsl2PMLInitHist15MMonitoredTime         Unsigned32,
        xdsl2PMLInitHist15MFullInits             Unsigned32,
        xdsl2PMLInitHist15MFailedFullInits       Unsigned32,
        xdsl2PMLInitHist15MShortInits            Unsigned32,
        xdsl2PMLInitHist15MFailedShortInits      Unsigned32,
        xdsl2PMLInitHist15MValidInterval         TruthValue
}

xdsl2PMLInitHist15MInterval  OBJECT-TYPE
SYNTAX      Unsigned32 (1..96)
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
   "The interval number."
::= { xdsl2PMLLineInitHist15MinEntry 1 }

xdsl2PMLInitHist15MMonitoredTime OBJECT-TYPE
SYNTAX      Unsigned32
UNITS       "seconds"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
   "Total seconds monitored in this interval."
::= { xdsl2PMLLineInitHist15MinEntry 2 }

xdsl2PMLInitHist15MFullInits OBJECT-TYPE
SYNTAX      Unsigned32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
   "Count of full initializations attempted on the line
   (successful and failed) during this interval."
REFERENCE    "ITU-T G.997.1, paragraph #7.2.1.3.1"
::= { xdsl2PMLLineInitHist15MinEntry 3 }

xdsl2PMLInitHist15MFailedFullInits OBJECT-TYPE
SYNTAX      Unsigned32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
   "Count of failed full initializations on the line during this
   interval."
REFERENCE    "ITU-T G.997.1, paragraph #7.2.1.3.2"
::= { xdsl2PMLLineInitHist15MinEntry 4 }

xdsl2PMLInitHist15MShortInits OBJECT-TYPE
SYNTAX      Unsigned32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
   "Count of short initializations attempted on the line
   (successful and failed) during this interval."
REFERENCE    "ITU-T G.997.1, paragraph #7.2.1.3.3"
::= { xdsl2PMLLineInitHist15MinEntry 5 }

xdsl2PMLInitHist15MFailedShortInits OBJECT-TYPE
SYNTAX      Unsigned32

Internet-Draft               VDSL2-LINE MIB                    July 2008

MAX-ACCESS  read-only
STATUS      current
DESCRIPTION  
"Count of failed short initializations on the line during this interval."
REFERENCE    "ITU-T G.997.1, paragraph #7.2.1.3.4"
::= { xdsl2PMLineInitHist15MinEntry 6 }

xdsl2PMLInitHist15MValidInterval  OBJECT-TYPE
SYNTAX      TruthValue
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION  
"This variable indicates if the data for this interval is valid."
::= { xdsl2PMLineInitHist15MinEntry 7 }

-- PM line init history 1 Day --

xds12PMLLineInitHist1DayTable       OBJECT-TYPE
SYNTAX      SEQUENCE  OF  Xdsl2PMLineInitHist1DayEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION  
"The table xds12PMLLineInitHist1DayTable contains PM line initialization history for 24-hour intervals for DSL lines."
::= { xds12PMLLine 6 }

Xdsl2PMLineInitHist1DayEntry  OBJECT-TYPE
SYNTAX      Xdsl2PMLineInitHist1DayEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION  
"The table xds12PMLLineInitHist1DayTable contains PM line initialization history for 24-hour intervals for DSL lines. The index of this table is an interface index, where the interface has an ifType of vdsl2(xxx), together with an interval number."
INDEX  { ifIndex, xds12PMLInitHist1DInterval }
::= { xds12PMLLineInitHist1DayTable 1 }

Xds12PMLLineInitHist1DayEntry ::=
SEQUENCE {
    xdsl2PMLInitHist1DInterval Unsigned32,
    xdsl2PMLInitHist1DMonitoredTime Unsigned32,
    xdsl2PMLInitHist1DFullInits Unsigned32,
    xdsl2PMLInitHist1DFailedFullInits Unsigned32,
    xdsl2PMLInitHist1DShortInits Unsigned32,
    xdsl2PMLInitHist1DFailedShortInits Unsigned32,
    xdsl2PMLInitHist1DValidInterval TruthValue
}

xdsl2PMLInitHist1DInterval OBJECT-TYPE
SYNTAX        Unsigned32 (1..30)
MAX-ACCESS    not-accessible
STATUS        current
DESCRIPTION   "The interval number."
::= { xdsl2PMLineInitHist1DayEntry 1 }

xdsl2PMLInitHist1DMonitoredTime OBJECT-TYPE
SYNTAX        Unsigned32
UNITS         "seconds"
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION   "Total seconds monitored in this interval."
::= { xdsl2PMLineInitHist1DayEntry 2 }

xdsl2PMLInitHist1DFullInits OBJECT-TYPE
SYNTAX        Unsigned32
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION   "Count of full initializations attempted on the line
               (successful and failed) during this interval."
REFERENCE     "ITU-T G.997.1, paragraph #7.2.1.3.1"
::= { xdsl2PMLineInitHist1DayEntry 3 }

xdsl2PMLInitHist1DFailedFullInits OBJECT-TYPE
SYNTAX        Unsigned32
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION   "Count of failed full initializations on the line during this
               interval."
REFERENCE     "ITU-T G.997.1, paragraph #7.2.1.3.2"
::= { xdsl2PMLineInitHist1DayEntry 4 }

xdsl2PMLInitHist1DShortInits OBJECT-TYPE
SYNTAX      Unsigned32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"Count of short initializations attempted on the line
(succesful and failed) during this interval."
REFERENCE    "ITU-T G.997.1, paragraph #7.2.1.3.3"
::= { xdsl2PMLineInitHist1DayEntry 5 }

xdsl2PMLInitHist1DFailedShortInits  OBJECT-TYPE
SYNTAX      Unsigned32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"Count of failed short initializations on the line during
this interval."
REFERENCE    "ITU-T G.997.1, paragraph #7.2.1.3.4"
::= { xdsl2PMLineInitHist1DayEntry 6 }

xdsl2PMLInitHist1DValidInterval  OBJECT-TYPE
SYNTAX      TruthValue
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"This variable indicates if the data for this interval is
valid."
::= { xdsl2PMLineInitHist1DayEntry 7 }

PM channel current counters

xdsl2PMChCurrTable        OBJECT-TYPE
SYNTAX      SEQUENCE  OF  Xdsl2PMChCurrEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
"The table xdsl2PMChCurrTable contains current Performance
Monitoring results for DSL channels."
::= { xdsl2PMChannel 1 }

xdsl2PMChCurrEntry  OBJECT-TYPE
SYNTAX      Xdsl2PMChCurrEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
"The table xdsl2PMChCurrTable contains current Performance
Monitoring results for DSL channels.
The index of this table is an interface index, where the
interface has an ifType value which is applicable for a DSL
channel, together with a termination unit."
INDEX  { ifIndex, xdsl2PMChCurrUnit }
::= { xdsl2PMChCurrTable 1 }

Xdsl2PMChCurrEntry  ::=  
SEQUENCE { 
  xdsl2PMChCurrUnit                     Xdsl2Unit, 
  xdsl2PMChCurr15MValidIntervals        Unsigned32, 
  xdsl2PMChCurr15MInvalidIntervals      Unsigned32, 
  xdsl2PMChCurr15MTimeElapsed           HCPefTimeElapsed, 
  xdsl2PMChCurr15MCodingViolations      Unsigned32, 
  xdsl2PMChCurr15MCorrectedBlocks       Unsigned32, 
  xdsl2PMChCurr1DayValidIntervals       Unsigned32, 
  xdsl2PMChCurr1DayInvalidIntervals     Unsigned32, 
  xdsl2PMChCurr1DayTimeElapsed          HCPefTimeElapsed, 
  xdsl2PMChCurr1DayCodingViolations     Unsigned32, 
  xdsl2PMChCurr1DayCorrectedBlocks      Unsigned32 
}

Xdsl2PMChCurrUnit  OBJECT-TYPE
  SYNTAX      Xdsl2Unit
  MAX-ACCESS  not-accessible
  STATUS      current
  DESCRIPTION  "The termination unit."
::= { xdsl2PMChCurrEntry 1 }

Xdsl2PMChCurr15MValidIntervals  OBJECT-TYPE
  SYNTAX      Unsigned32
  MAX-ACCESS  read-only
  STATUS      current
  DESCRIPTION  "Valid intervals."
::= { xdsl2PMChCurrEntry 2 }

Xdsl2PMChCurr15MInvalidIntervals  OBJECT-TYPE
  SYNTAX      Unsigned32
  MAX-ACCESS  read-only
  STATUS      current
  DESCRIPTION  "Invalid intervals."
::= { xdsl2PMChCurrEntry 3 }

Xdsl2PMChCurr15MTimeElapsed  OBJECT-TYPE
  SYNTAX      HCPefTimeElapsed
  MAX-ACCESS  read-only
  STATUS      current
  DESCRIPTION  "Time elapsed."
::= { xdsl2PMChCurrEntry 4 }

Xdsl2PMChCurr1DayValidIntervals  OBJECT-TYPE
  SYNTAX      Unsigned32
  MAX-ACCESS  read-only
  STATUS      current
  DESCRIPTION  "Valid intervals.
...
UNITS  "seconds"
MAX-ACCESS  read-only
STATUS  current
DESCRIPTION  "Total elapsed seconds in this interval."
::= { xdsl2PMChCurrEntry 4 }

xdsl2PMChCurr15MCodingViolations  OBJECT-TYPE
SYNTAX  Unsigned32
MAX-ACCESS  read-only
STATUS  current
DESCRIPTION  "Count of CRC-8 (FEBE for xTU-R) anomalies occurring in the
channel during the interval. This parameter is inhibited during
UAS or SES. If the CRC is applied over multiple channels, then
each related CRC-8 (or FEBE) anomaly SHOULD increment each of the
counters related to the individual channels."
REFERENCE  "ITU-T G.997.1, paragraph #7.2.2.1.1 (CV-C)
and paragraph #7.2.2.2.1 (CV-CFE)"
::= { xdsl2PMChCurrEntry 5 }

xdsl2PMChCurr15MCorrectedBlocks  OBJECT-TYPE
SYNTAX  Unsigned32
MAX-ACCESS  read-only
STATUS  current
DESCRIPTION  "Count of FEC (FFEC for xTU-R) anomalies (corrected code
words) occurring in the channel during the interval. This
parameter is inhibited during UAS or SES. If the FEC is applied
over multiple channels, then each related FEC (or FFEC) anomaly
SHOULD increment each of the counters related to the individual
channels."
REFERENCE  "ITU-T G.997.1, paragraph #7.2.2.1.2 (FEC-C)
and paragraph #7.2.2.2.2 (FEC-CFE)"
::= { xdsl2PMChCurrEntry 6 }

xdsl2PMChCurr1DayValidIntervals  OBJECT-TYPE
SYNTAX  Unsigned32
MAX-ACCESS  read-only
STATUS  current
DESCRIPTION  "Valid intervals."
::= { xdsl2PMChCurrEntry 7 }

xdsl2PMChCurr1DayInvalidIntervals  OBJECT-TYPE
SYNTAX  Unsigned32
MAX-ACCESS  read-only
STATUS  current
DESCRIPTION

"Invalid intervals."
::= { xdsl2PMChCurrEntry 8 }

xdsl2PMChCurr1DayTimeElapsed  OBJECT-TYPE
SYNTAX      HCPerfTimeElapsed
UNITS       "seconds"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
  "Total elapsed seconds in this interval."
::= { xdsl2PMChCurrEntry 9 }

xdsl2PMChCurr1DayCodingViolations  OBJECT-TYPE
SYNTAX      Unsigned32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
  "Count of CRC-8 (FEBE for xTU-R) anomalies occurring in the
  channel during the interval. This parameter is inhibited during
  UAS or SES. If the CRC is applied over multiple channels, then
  each related CRC-8 (or FEBE) anomaly SHOULD increment each of the
  counters related to the individual channels."
REFERENCE    "ITU-T G.997.1, paragraph #7.2.2.1.1 (CV-C)
  and paragraph #7.2.2.2.1 (CV-CFE)"
::= { xdsl2PMChCurrEntry 10 }

xdsl2PMChCurr1DayCorrectedBlocks  OBJECT-TYPE
SYNTAX      Unsigned32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
  "Count of FEC (FFEC for xTU-R) anomalies (corrected code
  words) occurring in the channel during the interval. This
  parameter is inhibited during UAS or SES. If the FEC is applied
  over multiple channels, then each related FEC (or FFEC) anomaly
  SHOULD increment each of the counters related to the individual
  channels."
REFERENCE    "ITU-T G.997.1, paragraph #7.2.2.1.2 (FEC-C)
  and paragraph #7.2.2.2.2 (FEC-CFE)"
::= { xdsl2PMChCurrEntry 11 }

-------------------------------------------
--    PM channel history 15 Minutes      --
-------------------------------------------
SYNTAX SEQUENCE OF Xdsl2PMChHist15MinEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "The table xdsl2PMChHist15MinTable contains Performance Monitoring (PM) history for 15-minute intervals for DSL channels PM." ::= { xdsl2PMChannel 2 }

Xdsl2PMChHist15MinEntry OBJECT-TYPE
SYNTAX Xdsl2PMChHist15MinEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "The table xdsl2PMChHist15MinTable contains Performance Monitoring (PM) history for 15-minute intervals for DSL channels PM.
The index of this table is an interface index, where the interface has an ifType value which is applicable for a DSL channel, together with a termination unit and an interval number." INDEX { ifIndex, xdsl2PMChHist15MUnit, xdsl2PMChHist15MInterval } ::= { xdsl2PMChHist15MinTable 1 }

Xdsl2PMChHist15MinEntry ::= SEQUENCE {
  xdsl2PMChHist15MUnit Xdsl2Unit,
  xdsl2PMChHist15MInterval Unsigned32,
  xdsl2PMChHist15MMonitoredTime Unsigned32,
  xdsl2PMChHist15MCodingViolations Unsigned32,
  xdsl2PMChHist15MCorrectedBlocks Unsigned32,
  xdsl2PMChHist15MValidInterval TruthValue
}

Xdsl2PMChHist15MUnit OBJECT-TYPE
SYNTAX Xdsl2Unit
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "The termination unit." ::= { xdsl2PMChHist15MinEntry 1 }

Xdsl2PMChHist15MInterval OBJECT-TYPE
SYNTAX Unsigned32 (1..96)
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The interval number."
::= { xdsl2PMChHist15MinEntry 2 }

xdsl2PMChHist15MMonitoredTime OBJECT-TYPE
SYNTAX     Unsigned32
UNITS       "seconds"
MAX-ACCESS read-only
STATUS      current
DESCRIPTION
"Total seconds monitored in this interval."
::= { xdsl2PMChHist15MinEntry 3 }

xdsl2PMChHist15MCodingViolations OBJECT-TYPE
SYNTAX     Unsigned32
MAX-ACCESS read-only
STATUS      current
DESCRIPTION
"Count of CRC-8 (FEBE for xTU-R) anomalies occurring in the channel during the interval. This parameter is inhibited during UAS or SES. If the CRC is applied over multiple channels, then each related CRC-8 (or FEBE) anomaly SHOULD increment each of the counters related to the individual channels."
REFERENCE   "ITU-T G.997.1, paragraph #7.2.2.1.1 (CV-C) and paragraph #7.2.2.2.1 (CV-CFE)"
::= { xdsl2PMChHist15MinEntry 4 }

xdsl2PMChHist15MCorrectedBlocks OBJECT-TYPE
SYNTAX     Unsigned32
MAX-ACCESS read-only
STATUS      current
DESCRIPTION
"Count of FEC (FFEC for xTU-R) anomalies (corrected code words) occurring in the channel during the interval. This parameter is inhibited during UAS or SES. If the FEC is applied over multiple channels, then each related FEC (or FFEC) anomaly SHOULD increment each of the counters related to the individual channels."
REFERENCE   "ITU-T G.997.1, paragraph #7.2.2.1.2 (FEC-C) and paragraph #7.2.2.2.2 (FEC-CFE)"
::= { xdsl2PMChHist15MinEntry 5 }

xdsl2PMChHist15MValidInterval OBJECT-TYPE
SYNTAX     TruthValue
MAX-ACCESS read-only
STATUS      current
DESCRIPTION
"This variable indicates if the data for this interval is
valid.
::= \{ xds12PMChHist15MinEntry 6 \}

---
--  PM channel history 1 Day  --
---

xds12PMChHist1DTable  OBJECT-TYPE
SYNTAX SEQUENCE  OF  Xdsl2PMChHist1DEntry
MAX-ACCESS not-accessible
STATUS  current
DESCRIPTION
"The table xds12PMChHist1DTable contains Performance Monitoring (PM) history for 1-day intervals for DSL channels PM."
::= \{ xds12PMChannel 3 \}

Xdsl2PMChHist1DEntry  OBJECT-TYPE
SYNTAX Xds12PMChHist1DEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The table xds12PMChHist1DTable contains Performance Monitoring (PM) history for 1-day intervals for DSL channels PM. The index of this table is an interface index, where the interface has an ifType value which is applicable for a DSL channel, together with a termination unit and the interval number."
INDEX \{ ifIndex,
   xds12PMChHist1DUnit,
   xds12PMChHist1DInterval \}
::= \{ xds12PMChHist1DTable 1 \}

Xds12PMChHist1DEntry  ::=  
SEQUENCE \{
   xds12PMChHist1DUnit               Xdsl2Unit,
   xds12PMChHist1DInterval           Unsigned32,
   xds12PMChHist1DMonitoredTime      Unsigned32,
   xds12PMChHist1DCodingViolations   Unsigned32,
   xds12PMChHist1DCorrectedBlocks    Unsigned32,
   xds12PMChHist1DValidInterval      TruthValue
\}

xds12PMChHist1DUnit  OBJECT-TYPE
SYNTAX Xdsl2Unit
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION

"The termination unit."
::= { xdsl2PmChHist1DEntry 1 }

xdsl2PmChHist1DInterval  OBJECT-TYPE
SYNTAX   Unsigned32 (1..30)
MAX-ACCESS not-accessible
STATUS   current
DESCRIPTION
"The interval number."
::= { xdsl2PmChHist1DEntry 2 }

xdsl2PmChHist1DMonitoredTime  OBJECT-TYPE
SYNTAX   Unsigned32
UNITS    "seconds"
MAX-ACCESS read-only
STATUS   current
DESCRIPTION
"Total seconds monitored in this interval."
::= { xdsl2PmChHist1DEntry 3 }

xdsl2PmChHist1DCodingViolations  OBJECT-TYPE
SYNTAX   Unsigned32
MAX-ACCESS read-only
STATUS   current
DESCRIPTION
"Count of CRC-8 (FEBE for xTU-R) anomalies occurring in the channel during the interval. This parameter is inhibited during UAS or SES. If the CRC is applied over multiple channels, then each related CRC-8 (or FEBE) anomaly SHOULD increment each of the counters related to the individual channels."
REFERENCE   "ITU-T G.997.1, paragraph #7.2.2.1.1 (CV-C) and paragraph #7.2.2.2.1 (CV-CFE)"
::= { xdsl2PmChHist1DEntry 4 }

xdsl2PmChHist1DCorrectedBlocks  OBJECT-TYPE
SYNTAX   Unsigned32
MAX-ACCESS read-only
STATUS   current
DESCRIPTION
"Count of FEC (FFEC for xTU-R) anomalies (corrected code words) occurring in the channel during the interval. This parameter is inhibited during UAS or SES. If the FEC is applied over multiple channels, then each related FEC (or FFEC) anomaly SHOULD increment each of the counters related to the individual channels."
REFERENCE   "ITU-T G.997.1, paragraph #7.2.2.1.2 (FEC-C) and paragraph #7.2.2.2.2 (FEC-CFE)"
::= { xdsl2PMChHist1DEntry 5 }

xdsl2PMChHist1DValidInterval  OBJECT-TYPE
SYNTAX      TruthValue
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
  "This variable indicates if the data for this interval is
  valid."
::= { xdsl2PMChHist1DEntry 6 }

-------------------------------------------
--          Notifications Group          --
-------------------------------------------

xdsl2LinePerfFECSThreshXtuc NOTIFICATION-TYPE
OBJECTS
{ xdsl2PMLCurr15MFecs,
  xdsl2LineAlarmConfProfileXtucThresh15MinFecs
}
STATUS      current
DESCRIPTION
  "This notification indicates that the FEC seconds threshold
  has been reached/exceeded for the referred xTU-C."
::= { xdsl2Notifications 1 }

xdsl2LinePerfFECSThreshXtur NOTIFICATION-TYPE
OBJECTS
{ xdsl2PMLCurr15MFecs,
  xdsl2LineAlarmConfProfileXturThresh15MinFecs
}
STATUS      current
DESCRIPTION
  "This notification indicates that the FEC seconds threshold
  has been reached/exceeded for the referred xTU-R."
::= { xdsl2Notifications 2 }

xdsl2LinePerfESThreshXtuc NOTIFICATION-TYPE
OBJECTS
{ xdsl2PMLCurr15MEs,
  xdsl2LineAlarmConfProfileXtucThresh15MinEs
}
STATUS      current
DESCRIPTION
  "This notification indicates that the errored seconds
threshold has been reached/exceeded for the referred xTU-C." 
::= { xdsl2Notifications 3 }

xdsl2LinePerfESThreshXtur NOTIFICATION-TYPE
OBJECTS
{ xdsl2PMLCurr15MEs, 
  xdsl2LineAlarmConfProfileXturThresh15MinEs 
} 
STATUS current
DESCRIPTION
"This notification indicates that the errored seconds 
threshold has been reached/exceeded for the referred xTU-R." 
::= { xdsl2Notifications 4 }

xdsl2LinePerfSESThreshXtuc NOTIFICATION-TYPE
OBJECTS
{ xdsl2PMLCurr15M Ses, 
  xdsl2LineAlarmConfProfileXtucThresh15MinSes 
} 
STATUS current
DESCRIPTION
"This notification indicates that the severely-errored seconds 
threshold has been reached/exceeded for the referred xTU-C." 
::= { xdsl2Notifications 5 }

xdsl2LinePerfSESThreshXtur NOTIFICATION-TYPE
OBJECTS
{ xdsl2PMLCurr15MSes, 
  xdsl2LineAlarmConfProfileXturThresh15MinSes 
} 
STATUS current
DESCRIPTION
"This notification indicates that the severely-errored seconds 
threshold has been reached/exceeded for the referred xTU-R." 
::= { xdsl2Notifications 6 }

xdsl2LinePerfLOSSThreshXtuc NOTIFICATION-TYPE
OBJECTS
{ xdsl2PMLCurr15MLoss, 
  xdsl2LineAlarmConfProfileXtucThresh15MinLoss 
} 
STATUS current
DESCRIPTION
"This notification indicates that the LOS seconds
threshold has been reached/exceeded for the referred xTU-C.

::= { xdsl2Notifications 7 }

xdsl2LinePerfLOSSThreshXtur NOTIFICATION-TYPE
OBJECTS
{
  xdsl2PMLCurr15MLoss,
  xdsl2LineAlarmConfProfileXturThresh15MinLoss
}
STATUS current
DESCRIPTION
"This notification indicates that the LOS seconds
threshold has been reached/exceeded for the referred xTU-R."
::= { xdsl2Notifications 8 }

xdsl2LinePerfUASThreshXtuc NOTIFICATION-TYPE
OBJECTS
{
  xdsl2PMLCurr15MUas,
  xdsl2LineAlarmConfProfileXtucThresh15MinUas
}
STATUS current
DESCRIPTION
"This notification indicates that the unavailable seconds
threshold has been reached/exceeded for the referred xTU-C."
::= { xdsl2Notifications 9 }

xdsl2LinePerfUASThreshXtur NOTIFICATION-TYPE
OBJECTS
{
  xdsl2PMLCurr15MUas,
  xdsl2LineAlarmConfProfileXturThresh15MinUas
}
STATUS current
DESCRIPTION
"This notification indicates that the unavailable seconds
threshold has been reached/exceeded for the referred xTU-R."
::= { xdsl2Notifications 10 }

xdsl2LinePerfCodingViolationsThreshXtuc NOTIFICATION-TYPE
OBJECTS
{
  xdsl2PMChCurr15MCodingViolations,
  xdsl2ChAlarmConfProfileXtucThresh15MinCodingViolations
}
STATUS current
DESCRIPTION
"This notification indicates that the coding violations
threshold has been reached/exceeded for the referred xTU-C."
::= { xdsl2Notifications 11 }

xdsl2LinePerfCodingViolationsThreshXtur NOTIFICATION-TYPE
OBJECTS
{
  xdsl2PMChCurr15MCodingViolations,
  xdsl2ChAlarmConfProfileXturThresh15MinCodingViolations
} STATUS    current
DESCRIPTION
"This notification indicates that the coding violations
threshold has been reached/exceeded for the referred xTU-R."
::= { xdsl2Notifications 12 }

xdsl2LinePerfCorrectedThreshXtuc NOTIFICATION-TYPE
OBJECTS
{
  xdsl2PMChCurr15MCorrectedBlocks,
  xdsl2ChAlarmConfProfileXtucThresh15MinCorrected
} STATUS    current
DESCRIPTION
"This notification indicates that the corrected blocks
(FEC events) threshold has been reached/exceeded for the
referred xTU-C."
::= { xdsl2Notifications 13 }

xdsl2LinePerfCorrectedThreshXtur NOTIFICATION-TYPE
OBJECTS
{
  xdsl2PMChCurr15MCorrectedBlocks,
  xdsl2ChAlarmConfProfileXturThresh15MinCorrected
} STATUS    current
DESCRIPTION
"This notification indicates that the corrected blocks
(FEC events) threshold has been reached/exceeded for the
referred xTU-R."
::= { xdsl2Notifications 14 }

xdsl2LinePerfFailedFullInitThresh NOTIFICATION-TYPE
OBJECTS
{
  xdsl2PMLInitCurr15MFailedFullInits,
  xdsl2LineAlarmConfProfileThresh15MinFailedFullInt
} STATUS    current
DESCRIPTION

"This notification indicates that the failed full initializations threshold has been reached/exceeded for the referred ADSL/ADSL2 or ADSL2 line."
::= { xdsl2Notifications 15 }

xdsl2LinePerfFailedShortInitThresh NOTIFICATION-TYPE
OBJECTS
{ xdsl2PMLInitCurr15MFailedShortInits,
  xdsl2LineAlarmConfProfileThresh15MinFailedShrtInt
}
STATUS    current
DESCRIPTION
"This notification indicates that the failed short initializations threshold has been reached/exceeded for the referred VDSL2/ADSL/ADSL2 or ADSL2+ line."
::= { xdsl2Notifications 16 }

xdsl2LineStatusChangeXtuc NOTIFICATION-TYPE
OBJECTS
{ xdsl2LineStatusXtuc
}
STATUS    current
DESCRIPTION
"This notification indicates that a status change is detected for the referred xTU-C."
::= { xdsl2Notifications 17 }

xdsl2LineStatusChangeXtur NOTIFICATION-TYPE
OBJECTS
{ xdsl2LineStatusXtur
}
STATUS    current
DESCRIPTION
"This notification indicates that a status change is detected for the referred xTU-R."
::= { xdsl2Notifications 18 }

-- conformance information

xdsl2Groups OBJECT IDENTIFIER ::= { xdsl2Conformance 1 }
xdsl2Compliances OBJECT IDENTIFIER ::= { xdsl2Conformance 2 }

xdsl2LineMibCompliance MODULE-COMPLIANCE
STATUS  current
DESCRIPTION
"The compliance statement for SNMP entities which
manage VDSL2/ADSL/ADSL2 and ADSL2+ interfaces."

GROUP  xdsl2LineGroup
MANDATORY-GROUPS
    { xdsl2LineGroup, xdsl2ChannelStatusGroup, xdsl2SCStatusGroup, xdsl2LineInventoryGroup, xdsl2LineConfTemplateGroup, xdsl2LineConfProfGroup, xdsl2LineConfProfModeSpecGroup, xdsl2LineConfProfModeSpecBandUsGroup, xdsl2ChConfProfileGroup, xdsl2LineAlarmConfTemplateGroup, xdsl2PMLineCurrGroup, xdsl2PMLineInitCurrGroup, xdsl2PMLineHist15MinGroup, xdsl2PMLineHist1DayGroup, xdsl2PMLineInitHist15MinGroup, xdsl2PMLineInitHist1DayGroup, xdsl2PMChCurrGroup, xdsl2PMChHist15MinGroup, xdsl2PMChHist1DGroup }

GROUP  xdsl2LineFallbackGroup
DESCRIPTION
"The group of configuration, status, and commands
objects on the line level that are associated with the fallback
feature."

GROUP  xdsl2LineBpscGroup
DESCRIPTION
"The group of configuration, status, and commands objects
on the line level that are associated with requesting a bits
per subcarrier measurement."

GROUP  xdsl2LineSegmentGroup
DESCRIPTION
"The group of status, and commands objects on the line
level that are used to hold the results of the bits per
subcarrier measurement."

GROUP  xdsl2ChannelStatusAtmGroup
DESCRIPTION
"The group of status objects required when the data path is ATM."

GROUP  xds12ChannelStatusPtmGroup
DESCRIPTION
"The group of status objects required when the data path is PTM."

GROUP  xds12LineConfProfRaGroup
DESCRIPTION
"The group of objects required for controlling the rate-adaptive behavior of the line."

GROUP  xds12LineConfProfMsgMinGroup
DESCRIPTION
"The group of objects required for controlling the rate reserved for Overhead traffic."

GROUP  xds12LineAlarmConfProfileGroup
DESCRIPTION
"The group of objects that define the alarm thresholds on line level PM counters."

GROUP  xds12ChAlarmConfProfileGroup
DESCRIPTION
"The group of objects that define the alarm thresholds on channel-level PM counters."

GROUP  xds12ChConfProfileAtmGroup
DESCRIPTION
"The group of configuration objects required when the data path is ATM."

GROUP  xds12ChConfProfileMinResGroup
DESCRIPTION
"The group of configuration objects required for the reserved data rate."

GROUP  xds12ChConfProfileOptAttrGroup
DESCRIPTION
"The group of various optional channel configuration objects."

GROUP  xds12PMLineInitCurrShortGroup
DESCRIPTION
"The group of PM counters for the current intervals short initializations."
GROUP   xdsl2PMLineInitHist15MinShortGroup
  DESCRIPTION
    "The group of PM counters for the previous 15-minutes
    intervals short initializations."

GROUP   xdsl2PMLineInitHist1DayShortGroup
  DESCRIPTION
    "The group of PM counters for the previous 24-hour
    intervals short initializations."

GROUP   xdsl2ScalarSCGroup
  DESCRIPTION
    "The group of objects that report the available memory
    resources for DELT processes."

GROUP   xdsl2ThreshNotificationGroup
  DESCRIPTION
    "The group of thresholds crossing notifications."

GROUP   xdsl2StatusChangeNotificationGroup
  DESCRIPTION
    "The group of status change notifications."

::= { xdsl2Compliances 1 }

-- units of conformance

xdsl2LineGroup OBJECT-GROUP
  OBJECTS
  {
    xdsl2LineCnfgTemplate,
    xdsl2LineAlarmCnfgTemplate,
    xdsl2LineCmdndConfPmsf,
    xdsl2LineCmdndConfLdsf,
    xdsl2LineCmdndConfLdsfFailReason,
    xdsl2LineCmdndAutomodeColdStart,
    xdsl2LineCmdndConfReset,
    xdsl2LineStatusXtuTransSys,
    xdsl2LineStatusPwrMngState,
    xdsl2LineStatusInitResult,
    xdsl2LineStatusLastStateDs,
    xdsl2LineStatusLastStateUs,
    xdsl2LineStatusXtur,
    xdsl2LineStatusXtuc,
    xdsl2LineStatusAttainableRateDs,
    xdsl2LineStatusAttainableRateUs,
    xdsl2LineStatusActPsdDs,
    xdsl2LineStatusActPsdUs,
Internet-Draft               VDSL2-LINE MIB                    July 2008

xdsl2LineStatusActAtpDs,
xdsl2LineStatusActAtpUs,
xdsl2LineStatusActProfile,
xdsl2LineStatusActLimitMask,
xdsl2LineStatusActUsOMask,
xdsl2LineStatusActSnrModeDs,
xdsl2LineStatusActSnrModeUs,
xdsl2LineStatusElectricalLength,
xdsl2LineStatusTssiDs,
xdsl2LineStatusTssiUs,
xdsl2LineStatusMrefPsdDs,
xdsl2LineStatusMrefPsdUs,
xdsl2LineStatusTrellisDs,
xdsl2LineStatusTrellisUs,
xdsl2LineStatusActualCe,
xdsl2LineBandStatusLnAtten,
xdsl2LineBandStatusSigAtten,
xdsl2LineBandStatusSnrMargin
}

STATUS     current
DESCRIPTION
"The group of configuration, status, and commands objects
on the line level."
 ::= { xdsl2Groups 1 }

xdsl2LineFallbackGroup OBJECT-GROUP
OBJECTS
{
  xdsl2LineCnfgFallbackTemplate,
  xdsl2LineStatusActTemplate
}

STATUS     current
DESCRIPTION
"The group of configuration, status, and commands
objects on the line level that are associated with the
fallback feature."
 ::= { xdsl2Groups 2 }

xdsl2LineBpscGroup OBJECT-GROUP
OBJECTS
{
  xdsl2LineCmndConfBpsc,
  xdsl2LineCmndConfBpscFailReason,
  xdsl2LineCmndConfBpscReqCount
}

STATUS     current
DESCRIPTION
"The group of configuration, status, and commands
objects on the line level that are associated with requesting a bits per subcarrier measurement.
::= { xdsl2Groups 3 }

xdsl2LineSegmentGroup OBJECT-GROUP
OBJECTS
{
  xdsl2LineSegmentBitsAlloc,
  xdsl2LineSegmentRowStatus
}
STATUS current
DESCRIPTION "The group of status, and commands objects on the line level that are used to hold the results of the bits per subcarrier measurement."
::= { xdsl2Groups 4 }

xdsl2ChannelStatusGroup OBJECT-GROUP
OBJECTS
{
  xdsl2ChStatusActDataRate,
  xdsl2ChStatusPrevDataRate,
  xdsl2ChStatusActDelay,
  xdsl2ChStatusActInp,
  xdsl2ChStatusInpReport,
  xdsl2ChStatusNFec,
  xdsl2ChStatusRFec,
  xdsl2ChStatusLSymb,
  xdsl2ChStatusIntlvDepth,
  xdsl2ChStatusIntlvBlock,
  xdsl2ChStatusLPath
}
STATUS current
DESCRIPTION "The group of status objects on the channel level."
::= { xdsl2Groups 5 }

xdsl2ChannelStatusAtmGroup OBJECT-GROUP
OBJECTS
{
  xdsl2ChStatusAtmStatus
}
STATUS current
DESCRIPTION "The group of status objects on the data path level when it is ATM."
::= { xdsl2Groups 6 }
xdsl2ChannelStatusPtmGroup OBJECT-GROUP
OBJECTS
{
  xds12ChStatusPtmStatus
}
STATUS  current
DESCRIPTION
"The group of status objects on the data path level when it is PTM."
 ::= { xds12Groups 7 }

xdsl2SCStatusGroup OBJECT-GROUP
OBJECTS
{
  xds12SCStatusLinScale,
  xds12SCStatusLinScGroupSize,
  xds12SCStatusLogMt,
  xds12SCStatusLogScGroupSize,
  xds12SCStatusQlnMt,
  xds12SCStatusQlnScGroupSize,
  xds12SCStatusSnrMtime,
  xds12SCStatusSnrScGroupSize,
  xds12SCStatusBandLnAtten,
  xds12SCStatusBandSigAtten,
  xds12SCStatusAttainableRate,
  xds12SCStatusRowStatus,
  xds12SCStatusSegmentLinReal,
  xds12SCStatusSegmentLinImg,
  xds12SCStatusSegmentLog,
  xds12SCStatusSegmentQln,
  xds12SCStatusSegmentSnr,
  xds12SCStatusSegmentBitsAlloc,
  xds12SCStatusSegmentGainAlloc,
}
STATUS  current
DESCRIPTION
"The group of status objects on the subcarrier level. They are updated as a result of a DELT process."
 ::= { xds12Groups 8 }

xdsl2LineInventoryGroup OBJECT-GROUP
OBJECTS
{
  xds12LInvG994VendorId,
  xds12LInvSystemVendorId,
  xds12LInvVersionNumber,
  xds12LInvSerialNumber,
  xds12LInvSelfTestResult,
xds12LInvTransmissionCapabilities
}

DESCRIPTION
"The group of inventory objects per xTU."
::= { xds12Groups 9 }

xds12LineConfTemplateGroup OBJECT-GROUP
OBJECTS
{
  xds12LConfTempLineProfile,
  xds12LConfTempChan1ConfProfile,
  xds12LConfTempChan1RaRatioDs,
  xds12LConfTempChan1RaRatioUs,
  xds12LConfTempChan2ConfProfile,
  xds12LConfTempChan2RaRatioDs,
  xds12LConfTempChan2RaRatioUs,
  xds12LConfTempChan3ConfProfile,
  xds12LConfTempChan3RaRatioDs,
  xds12LConfTempChan3RaRatioUs,
  xds12LConfTempChan4ConfProfile,
  xds12LConfTempChan4RaRatioDs,
  xds12LConfTempChan4RaRatioUs,
  xds12LConfTempRowStatus
}

DESCRIPTION
"The group of objects in a line configuration template."
::= { xds12Groups 10 }

xds12LineConfProfGroup OBJECT-GROUP
OBJECTS
{
  xds12LConfProfScMaskDs,
  xds12LConfProfScMaskUs,
  xds12LConfProfVdsl2CarMask,
  xds12LConfProfRfiBands,
  xds12LConfProfRaModeDs,
  xds12LConfProfRaModeUs,
  xds12LConfProfTargetSnrmDs,
  xds12LConfProfTargetSnrmUs,
  xds12LConfProfMaxSnrmDs,
  xds12LConfProfMaxSnrmUs,
  xds12LConfProfMinSnrmDs,
  xds12LConfProfMinSnrmUs,
  xds12LConfProfCeFlag,
  xds12LConfProfSnrModeDs,
Internet-Draft               VDSL2-LINE MIB                    July 2008

xdsl2LineConfProfMsgMinGroup OBJECT-GROUP

OBJECTS
{
    xds12LConfProfMsgMinUs,
    xds12LConfProfMsgMinDs
}

STATUS current

DESCRIPTION
"The group of objects required for controlling the rate reserved for Overhead traffic."

::= { xdsl2Groups 13 }

xdsl2LineConfProfModeSpecGroup OBJECT-GROUP

OBJECTS
{
    xds12LConfProfMaxNomPsdDs,
    xds12LConfProfMaxNomPsdUs,
    xds12LConfProfMaxNomAtpDs,
    xds12LConfProfMaxNomAtpUs,
    xds12LConfProfMaxAggRxFwrUs,
    xds12LConfProfPsdMaskDs,
    xds12LConfProfPsdMaskUs,
    xds12LConfProfPsdMaskSelectUs,
    xds12LConfProfClassMask,
    xds12LConfProfLimitMask,
    xds12LConfProfUs0Disable,
    xds12LConfProfModeSpecRowStatus
}

STATUS current

DESCRIPTION
"The group of objects in a line configuration profile that have an instance for each operation mode allowed."

::= { xdsl2Groups 14 }

xdsl2LineConfProfModeSpecBandUsGroup OBJECT-GROUP

OBJECTS
{
    xds12LConfProfUpboPsdA,
    xds12LConfProfUpboPsdB,
    xds12LConfProfModeSpecBandUsRowStatus
}

STATUS current

DESCRIPTION
"The group of objects in a line configuration profile that have several per-upstream-band instances for each operation mode allowed."

::= { xdsl2Groups 15 }
xdsl2ChConfProfileGroup OBJECT-GROUP
OBJECTS
{
  xdsl2ChConfProfMinDataRateDs,
  xdsl2ChConfProfMinDataRateUs,
  xdsl2ChConfProfMaxDataRateDs,
  xdsl2ChConfProfMaxDataRateUs,
  xdsl2ChConfProfMinDataRateLowPwrDs,
  xdsl2ChConfProfMinDataRateLowPwrUs,
  xdsl2ChConfProfMaxDelayDs,
  xdsl2ChConfProfMaxDelayUs,
  xdsl2ChConfProfMinProtectionDs,
  xdsl2ChConfProfMinProtectionUs,
  xdsl2ChConfProfMinProtection8Ds,
  xdsl2ChConfProfMinProtection8Us,
  xdsl2ChConfProfMaxBerDs,
  xdsl2ChConfProfMaxBerUs,
  xdsl2ChConfProfUsDataRateDs,
  xdsl2ChConfProfUsDataRateUs,
  xdsl2ChConfProfDsDataRateDs,
  xdsl2ChConfProfDsDataRateUs,
  xdsl2ChConfProfRowStatus
}
STATUS  current
DESCRIPTION
"The group of objects in a channel configuration
profile."
::= { xds12Groups 16 }

xdsl2ChConfProfileAtmGroup OBJECT-GROUP
OBJECTS
{
  xdsl2ChConfProfImaEnabled,
  xdsl2ChStatusAtmStatus
}
STATUS  current
DESCRIPTION
"The group of configuration objects required when the data
path is ATM."
::= { xds12Groups 17 }

xdsl2ChConfProfileMinResGroup OBJECT-GROUP
OBJECTS
{
  xdsl2ChConfProfMinResDataRateDs,
  xdsl2ChConfProfMinResDataRateUs
}
STATUS  current
DESCRIPTION
"The group of configuration objects required for the reserved data rate."
::= { xds12Groups 18 }

xdsl2ChConfProfileOptAttrGroup OBJECT-GROUP
OBJECTS
{
  xdsl2ChConfProfMaxDelayVar,
  xdsl2ChConfProfInitPolicy
}
STATUS current
DESCRIPTION
"The group of various optional channel configuration parameters."
::= { xds12Groups 19 }

xdsl2LineAlarmConfTemplateGroup OBJECT-GROUP
OBJECTS
{
  xdsl2LAlarmConfTempLineProfile,
  xdsl2LAlarmConfTempChan1ConfProfile,
  xdsl2LAlarmConfTempChan2ConfProfile,
  xdsl2LAlarmConfTempChan3ConfProfile,
  xdsl2LAlarmConfTempChan4ConfProfile,
  xdsl2LAlarmConfTempRowStatus
}
STATUS current
DESCRIPTION
"The group of objects in a line alarm template."
::= { xds12Groups 20 }

xdsl2LineAlarmConfProfileGroup OBJECT-GROUP
OBJECTS
{
  xdsl2LineAlarmConfProfileXtucThresh15MinFecs,
  xdsl2LineAlarmConfProfileXtucThresh15MinEs,
  xdsl2LineAlarmConfProfileXtucThresh15MinSes,
  xdsl2LineAlarmConfProfileXtucThresh15MinLoss,
  xdsl2LineAlarmConfProfileXtucThresh15MinUas,
  xdsl2LineAlarmConfProfileXturThresh15MinFecs,
  xdsl2LineAlarmConfProfileXturThresh15MinEs,
  xdsl2LineAlarmConfProfileXturThresh15MinSes,
  xdsl2LineAlarmConfProfileXturThresh15MinLoss,
  xdsl2LineAlarmConfProfileXturThresh15MinUas,
  xdsl2LineAlarmConfProfileThresh15MinFailedFullInt,
  xdsl2LineAlarmConfProfileThresh15MinFailedShrtInt,
  xdsl2LineAlarmConfProfileRowStatus
}
::= { xdsl2Groups 21 }

xdsl2ChAlarmConfProfileGroup OBJECT-GROUP
OBJECTS
{
    xdsl2ChAlarmConfProfileXtucThresh15MinCodingViolations,
    xdsl2ChAlarmConfProfileXtucThresh15MinCorrected,
    xdsl2ChAlarmConfProfileXturThresh15MinCodingViolations,
    xdsl2ChAlarmConfProfileXturThresh15MinCorrected,
    xdsl2ChAlarmConfProfileRowStatus
}

::= { xdsl2Groups 22 }

xdsl2PMLineCurrGroup OBJECT-GROUP
OBJECTS
{
    xdsl2PMLCurr15MValidIntervals,
    xdsl2PMLCurr15MInvalidIntervals,
    xdsl2PMLCurr15MTimeElapsed,
    xdsl2PMLCurr15MFecs,
    xdsl2PMLCurr15MEs,
    xdsl2PMLCurr15MSes,
    xdsl2PMLCurr15MLoss,
    xdsl2PMLCurr15MUas,
    xdsl2PMLCurr1DayValidIntervals,
    xdsl2PMLCurr1DayInvalidIntervals,
    xdsl2PMLCurr1DayTimeElapsed,
    xdsl2PMLCurr1DayFecs,
    xdsl2PMLCurr1DayEs,
    xdsl2PMLCurr1DaySes,
    xdsl2PMLCurr1DayLoss,
    xdsl2PMLCurr1DayUas
}

::= { xdsl2Groups 23 }

xdsl2PMLLineInitCurrGroup OBJECT-GROUP
OBJECTS
\{ \\
xdsl2PMLInitCurr15MValidIntervals, \\
xdsl2PMLInitCurr15MInvalidIntervals, \\
xdsl2PMLInitCurr15MTimeElapsed, \\
xdsl2PMLInitCurr15MFullInits, \\
xdsl2PMLInitCurr15MFailedFullInits, \\
xdsl2PMLInitCurr1DayValidIntervals, \\
xdsl2PMLInitCurr1DayInvalidIntervals, \\
xdsl2PMLInitCurr1DayTimeElapsed, \\
xdsl2PMLInitCurr1DayFullInits, \\
xdsl2PMLInitCurr1DayFailedFullInits \\
\} \\
\textbf{STATUS} \quad \textit{current} \\
\textbf{DESCRIPTION} \\
"The group of objects that report the full initializations counters for current PM intervals." \\
::= \{ xdsl2Groups 24 \} \\

\textbf{xdsl2PMLineInitCurrShortGroup OBJECT-GROUP} \\
\textbf{OBJECTS} \\
\{ \\
xdsl2PMLInitCurr15MShortInits, \\
xdsl2PMLInitCurr15MFailedShortInits, \\
xdsl2PMLInitCurr1DayShortInits, \\
xdsl2PMLInitCurr1DayFailedShortInits \\
\} \\
\textbf{STATUS} \quad \textit{current} \\
\textbf{DESCRIPTION} \\
"The group of objects that report the short initializations counters for current PM intervals." \\
::= \{ \text{xdsl2Groups 25} \} \\

\textbf{xdsl2PMLineHist15MinGroup OBJECT-GROUP} \\
\textbf{OBJECTS} \\
\{ \\
xdsl2PMLHist15MMonitoredTime, \\
xdsl2PMLHist15MFecs, \\
xdsl2PMLHist15MEs, \\
xdsl2PMLHist15MSes, \\
xdsl2PMLHist15MLoss, \\
xdsl2PMLHist15MUas, \\
xdsl2PMLHist15MValidInterval \\
\} \\
\textbf{STATUS} \quad \textit{current} \\
\textbf{DESCRIPTION} \\
"The group of line-level PM counters for the previous 15 minutes intervals." \\
::= \{ \text{xdsl2Groups 26} \}
Internet-Draft               VDSL2-LINE MIB                    July 2008


xdsl2PMLineHist1DayGroup OBJECT-GROUP
OBJECTS
{
  xdsl2PMLHist1DMonitoredTime,
  xdsl2PMLHist1DFecs,
  xdsl2PMLHist1DEs,
  xdsl2PMLHist1DSes,
  xdsl2PMLHist1DLoss,
  xdsl2PMLHist1DUas,
  xdsl2PMLHist1DValidInterval
}
STATUS     current
DESCRIPTION
  "The group of line-level PM counters for the previous
  24-hour intervals."
 ::= { xdsl2Groups 27 }

xdsl2PMLineInitHist15MinGroup OBJECT-GROUP
OBJECTS
{
  xdsl2PMLInitHist15MMonitoredTime,
  xdsl2PMLInitHist15MFullInits,
  xdsl2PMLInitHist15MFailedFullInits,
  xdsl2PMLInitHist15MValidInterval
}
STATUS     current
DESCRIPTION
  "The group of PM counters for the previous 15-minutes
  intervals full initializations."
 ::= { xdsl2Groups 28 }

xdsl2PMLineInitHist15MinShortGroup OBJECT-GROUP
OBJECTS
{
  xdsl2PMLInitHist15MShortInits,
  xdsl2PMLInitHist15MFailedShortInits
}
STATUS     current
DESCRIPTION
  "The group of PM counters for the previous 15-minutes
  intervals short initializations."
 ::= { xdsl2Groups 29 }

xdsl2PMLineInitHist1DayGroup OBJECT-GROUP
OBJECTS
{
  xdsl2PMLInitHist1DMonitoredTime,
  xdsl2PMLInitHist1DFullInits,
xdsl2PMLInitHist1DFailedFullInits,
xdsl2PMLInitHist1DValidInterval
)
STATUS     current
DESCRIPTION
"The group of PM counters for the previous 24-hour
intervals full initializations."
::= { xdsl2Groups 30 }

xdsl2PMLLineInitHist1DayShortGroup OBJECT-GROUP
OBJECTS
{
  xdsl2PMLInitHist1DShortInits,
  xdsl2PMLInitHist1DFailedShortInits
}
STATUS     current
DESCRIPTION
"The group of PM counters for the previous 24-hour
intervals short initializations."
::= { xdsl2Groups 31 }

xdsl2PMChCurrGroup OBJECT-GROUP
OBJECTS
{
  xdsl2PMChCurr15MValidIntervals,
  xdsl2PMChCurr15MInvalidIntervals,
  xdsl2PMChCurr15MTimeElapsed,
  xdsl2PMChCurr15MCodingViolations,
  xdsl2PMChCurr15MCorrectedBlocks,
  xdsl2PMChCurr1DayValidIntervals,
  xdsl2PMChCurr1DayInvalidIntervals,
  xdsl2PMChCurr1DayTimeElapsed,
  xdsl2PMChCurr1DayCodingViolations,
  xdsl2PMChCurr1DayCorrectedBlocks
}
STATUS     current
DESCRIPTION
"The group of objects that report the channel-level
counters for current PM intervals."
::= { xdsl2Groups 32 }

xdsl2PMChHist15MinGroup OBJECT-GROUP
OBJECTS
{
  xdsl2PMChHist15MMonitoredTime,
  xdsl2PMChHist15MCodingViolations,
  xdsl2PMChHist15MCorrectedBlocks,
  xdsl2PMChHist15MValidInterval
}
Internet-Draft               VDSL2-LINE MIB                    July 2008

{ xdsl2Groups 33 }

::= { xdsl2Groups 33 }

xds12PMChHist1DGroup OBJECT-GROUP
OBJECTS
{
  xds12PMChHist1DMonitoredTime,
  xds12PMChHist1DCodingViolations,
  xds12PMChHist1DCorrectedBlocks,
  xds12PMChHist1DValidInterval
}

::= { xdsl2Groups 34 }

xds12ScalarSCGroup OBJECT-GROUP
OBJECTS
{
  xds12ScalarSCMaxInterfaces,
  xds12ScalarSCAvailableInterfaces
}

::= { xdsl2Groups 35 }

xds12ThreshNotificationGroup NOTIFICATION-GROUP
NOTIFICATIONS
{
  xds12LinePerfFECSThreshXtuc,
  xds12LinePerfFECSThreshXtur,
  xds12LinePerfFESSThreshXtuc,
  xds12LinePerfFESSThreshXtur,
  xds12LinePerfFESSThreshXtuc,
  xds12LinePerfFESSThreshXtur,
  xds12LinePerfFESSThreshXtuc,
  xds12LinePerfFESSThreshXtur,
  xds12LinePerfUASThreshXtuc,
  xds12LinePerfUASThreshXtur,
  xds12LinePerfCodingViolationsThresholdXtuc,
  xds12LinePerfCodingViolationsThresholdXtur,
4. Implementation Analysis

A management application intended to manage ADSL links (e.g., G.992.1) with this MIB module MUST be modified to adapt itself to certain differences between RFC 2662 [RFC2662] and this MIB module, including the following aspects:

- Though the configuration templates/profiles allow referring to 1-4 bearer channels, ADSL links are limited to 2 channels at most.
- Though the channel configuration profile allows higher data rates, ADSL links are limited to downstream/upstream data rate as assumed in RFC 2662 [RFC2662].
- The Impulse Noise Protection (INP) configuration parameters are given by minimum protection and maximum delay parameters.
- The line configuration profile includes a sub-table that addresses mode-specific parameters. For ADSL links, the management application SHOULD create a row in that table for the ADSL modes only.
The line configuration profile includes parameters that are irrelevant for ADSL links. Similarly, many status parameters in the MIB are irrelevant for certain ADSL modes. Therefore, it is advised to consult with ITU G.997.1 standard [G.997.1] regarding the scope and relevance of each parameter in this MIB.

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. These are the tables and objects and their sensitivity/vulnerability:

- **xdsl2LineTable**

  The table consists of the following objects that support SET operations:

  * xdsl2LineCnfgTemplate
  * xdsl2LineCnfgFallbackTemplate
  * xdsl2LineAlarmCnfgTemplate
  * xdsl2LineCmndConfPmsf
  * xdsl2LineCmndConfLdsf
  * xdsl2LineCmndConfBpsc
  * xdsl2LineCmndAutomodeColdStart
  * xdsl2LineCmndConfReset

  Unauthorized changes to xdsl2LineCnfgTemplate could have a major adverse operational effect on many lines simultaneously.

  Unauthorized changes to xdsl2LineCnfgFallbackTemplate could have a major adverse operational effect on many lines simultaneously.

  Unauthorized changes to xdsl2LineAlarmCnfgTemplate could have a contrary effect on notifications.

  Unauthorized changes to xdsl2LineCmndConfPmsf could have an adverse effect on the power consumption of a line and may disrupt an operational service.

  Unauthorized changes to xdsl2LineCmndConfLdsf could cause an unscheduled line test to be carried out on the line.
Unauthorized changes to xdsl2LineCmndConfBpsc could cause an unscheduled bits per subcarrier measurement to be carried out on the line.

Unauthorized changes to xdsl2LineCmndAutomodeColdStart could cause an unscheduled cold reset to the line.

Unauthorized changes to xdsl2LineCmndConfReset could cause an unscheduled retrain of a line.

- xdsl2LineSegmentTable
  
  This table contains one object, xdsl2LineSegmentRowStatus, that supports SET operations. Unauthorized changes could result in measurement results being deleted prematurely.

- xdsl2SCStatusTable
  
  This table contains one object, xdsl2SCStatusRowStatus, that supports SET operations. Unauthorized changes could result in line test results being deleted prematurely.

- xdsl2LineConfTemplateTable
  
  The table consists of the following objects that support SET operations:
  
  * xdsl2LConfTempLineProfile
  * xdsl2LConfTempChan1ConfProfile
  * xdsl2LConfTempChan1RaRatioDs
  * xdsl2LConfTempChan1RaRatioUs
  * xdsl2LConfTempChan2ConfProfile
  * xdsl2LConfTempChan2RaRatioDs
  * xdsl2LConfTempChan2RaRatioUs
  * xdsl2LConfTempChan3ConfProfile
  * xdsl2LConfTempChan3RaRatioDs
  * xdsl2LConfTempChan3RaRatioUs
  * xdsl2LConfTempChan4ConfProfile
  * xdsl2LConfTempChan4RaRatioDs
  * xdsl2LConfTempChan4RaRatioUs
  * xdsl2LConfTempRowStatus

  Unauthorized changes to xdsl2LConfTempLineProfile, xdsl2LConfTempChan1ConfProfile, xdsl2LConfTempChan2ConfProfile, xdsl2LConfTempChan3ConfProfile, or xdsl2LConfTempChan4ConfProfile could have an adverse operational effect on several lines; could change several lines over to running in unwanted levels of operation; or could result in several services undergoing changes
in the number of channels that carry the service.

Unauthorized changes to xdsl2LConfTempChan1RaRatioDs, xdsl2LConfTempChan2RaRatioDs, xdsl2LConfTempChan3RaRatioDs, or xdsl2LConfTempChan4RaRatioDs, would alter the relative rate allocations among all channels belonging to a line. This could have an adverse operational effect on several lines.

Unauthorized changes to xdsl2LConfTempRowStatus could result in templates being created or brought into service prematurely; or could result in templates being inadvertently deleted or taken out of service.

o  xdsl2LineConfProfTable

The table consists of the following objects that support SET operations:

*  xdsl2LConfProfScMaskDs
*  xdsl2LConfProfScMaskUs
*  xdsl2LConfProfRfiBandsDs
*  xdsl2LConfProfRaModeDs
*  xdsl2LConfProfRaModeUs
*  xdsl2LConfProfRaUsNrmDs
*  xdsl2LConfProfRaUsNrmUs
*  xdsl2LConfProfRaUsTimeDs
*  xdsl2LConfProfRaUsTimeUs
*  xdsl2LConfProfRaDsNrmDs
*  xdsl2LConfProfRaDsTimeDs
*  xdsl2LConfProfRaDsNrmUs
*  xdsl2LConfProfRaDsTimeUs
*  xdsl2LConfProfTargetSnrmDs
*  xdsl2LConfProfTargetSnrmUs
*  xdsl2LConfProfMaxSnrmDs
*  xdsl2LConfProfMaxSnrmUs
*  xdsl2LConfProfMinSnrmDs
*  xdsl2LConfProfMinSnrmUs
*  xdsl2LConfProfMsgMinUs
*  xdsl2LConfProfMsgMinDs
*  xdsl2LConfProfCeFlag
*  xdsl2LConfProfSnrModeDs
*  xdsl2LConfProfSnrModeUs
*  xdsl2LConfProfTxRefVnDs
*  xdsl2LConfProfTxRefVnUs
*  xdsl2LConfProfXtuTransSysEna
*  xdsl2LConfProfPmMode
Unauthorized changes resulting in the setting of any of the above objects to an incorrect value could have an adverse operational effect on several lines.

Also, unauthorized changes to xdsl2LConfProfRowStatus could result in unwanted line profiles being created or brought into service prematurely; or could result in line profiles being inadvertently deleted or taken out of service.

o xdsl2LineConfProfModeSpecTable

The table consists of the following objects that support SET operations:

* xdsl2LConfProfMaxNomPsdDs
* xdsl2LConfProfMaxNomPsdUs
* xdsl2LConfProfMaxNomAtpDs
* xdsl2LConfProfMaxNomAtpUs
* xdsl2LConfProfMaxAggRxPwrUs
* xdsl2LConfProfPsdMaskDs
* xdsl2LConfProfPsdMaskUs
* xdsl2LConfProfPsdMaskSelectUs
* xdsl2LConfProfClassMask
* xdsl2LConfProfLimitMask
* xdsl2LConfProfUs0Disable
* xdsl2LConfProfModeSpecRowStatus

Unauthorized changes resulting in the setting of any of the above objects to an incorrect value could have an adverse operational
Effect on several lines.

Also, unauthorized changes to xdsl2LCnfProfModeSpecRowStatus could result in unwanted PSD configurations being created or brought into service prematurely; or could result in PSD configurations being inadvertently deleted or taken out of service.

- xdsl2LineConfProfModeSpecBandUsTable

  The table consists of the following objects that support SET operations:
  
  * xdsl2LCnfUpboPsdA
  * xdsl2LCnfUpboPsdB
  * xdsl2LCnfModeSpecRowStatus

  Unauthorized changes resulting in the setting of any of the above objects to an incorrect value could have an adverse operational effect on several lines.

Also, unauthorized changes to xdsl2LCnfProfModeSpecBandUsRowStatus could result in unwanted PSD configurations being created or brought into service prematurely; or could result in PSD configurations being inadvertently deleted or taken out of service.

- xdsl2ChConfProfileTable

  The table consists of the following objects that support SET operations:
  
  * xdsl2ChConfProfMinDataRateDs
  * xdsl2ChConfProfMinDataRateUs
  * xdsl2ChConfProfMinResDataRateDs
  * xdsl2ChConfProfMinResDataRateUs
  * xdsl2ChConfProfMaxDataRateDs
  * xdsl2ChConfProfMaxDataRateUs
  * xdsl2ChConfProfMinDataRateLowPwrDs
  * xdsl2ChConfProfMinDataRateLowPwrUs
  * xdsl2ChConfProfMaxDelayDs
  * xdsl2ChConfProfMaxDelayUs
  * xdsl2ChConfProfMinProtectionDs
  * xdsl2ChConfProfMinProtectionUs
  * xdsl2ChConfProfMinProtection8Ds
  * xdsl2ChConfProfMinProtection8Us
* xdsl2ChConfProfMaxBerDs
* xdsl2ChConfProfMaxBerUs
* xdsl2ChConfProfUsDataRateDs
* xdsl2ChConfProfDsDataRateDs
* xdsl2ChConfProfUsDataRateUs
* xdsl2ChConfProfDsDataRateUs
* xdsl2ChConfProfImaEnabled
* xdsl2ChConfProfMaxDelayVar
* xdsl2ChConfProfInitPolicy
* xdsl2ChConfProfRowStatus

Unauthorized changes resulting in the setting of any of the above objects to an incorrect value could have an adverse operational effect on several lines.

Also, unauthorized changes to xdsl2ChConfProfRowStatus could result in unwanted channel profiles being created or brought into service prematurely; or could result in channel profiles being inadvertently deleted or taken out of service.

- o xdsl2LineAlarmConfTemplateTable

The table consists of the following objects that support SET operations:

* xdsl2LAlarmConfTempLineProfile
* xdsl2LAlarmConfTempChan1ConfProfile
* xdsl2LalarmConfTempChan2ConfProfile
* xdsl2LalarmConfTempChan3ConfProfile
* xdsl2LalarmConfTempChan4ConfProfile
* xdsl2LAlarmConfTempRowStatus

Unauthorized changes to xdsl2LAlarmConfTempLineProfile, xdsl2LAlarmConfTempChan1ConfProfile, xdsl2LAlarmConfTempChan2ConfProfile, xdsl2LAlarmConfTempChan3ConfProfile, or xdsl2LAlarmConfTempChan4ConfProfile could have an adverse effect on the management of notifications generated at the scope of several to many lines; or could change several to many lines over to running with unwanted management rates for generated notifications.

Unauthorized changes to xdsl2LAlarmConfTempRowStatus could result in alarm templates being created or brought into service prematurely; or could result in alarm templates being inadvertently deleted or taken out of service.
The table consists of the following objects that support SET operations:

- xdsl2LineAlarmConfProfileXtucThresh15MinFecs
- xdsl2LineAlarmConfProfileXtucThresh15MinEs
- xdsl2LineAlarmConfProfileXtucThresh15MinSes
- xdsl2LineAlarmConfProfileXtucThresh15MinLoss
- xdsl2LineAlarmConfProfileXtucThresh15MinUas
- xdsl2LineAlarmConfProfileXturThresh15MinFecs
- xdsl2LineAlarmConfProfileXturThresh15MinEs
- xdsl2LineAlarmConfProfileXturThresh15MinSes
- xdsl2LineAlarmConfProfileXturThresh15MinLoss
- xdsl2LineAlarmConfProfileXturThresh15MinUas
- xdsl2LineAlarmConfProfileThresh15MinFailedFullInt
- xdsl2LineAlarmConfProfileThresh15MinFailedShrtInt
- xdsl2LineAlarmConfProfileRowStatus

Increasing any of the threshold values could result in a notification being suppressed or deferred. Setting a threshold to 0 could result in a notification being suppressed. Suppressing or deferring a notification could prevent the timely delivery of important diagnostic information. Decreasing any of the threshold values could result in a notification being sent from the network falsely reporting a threshold crossing.

Changing a threshold value could also have an impact on the amount of notifications the agent sends. The Notifications Section of this document has a paragraph which provides general guidance on the rate-limiting of notifications. Agent implementations not providing rate-limiting could result in notifications being generated at an uncontrolled rate. Unauthorized changes to a threshold value could result in an undesired notification rate.

Unauthorized changes to row status could result in unwanted line alarm profiles being created or brought into service. Also, changes to the row status could result in line alarm profiles being inadvertently deleted or taken out of service.

The table consists of the following objects that support SET operations:

- xdsl2ChAlarmConfProfileXtucThresh15MinCodingViolations
Increasing any of the threshold values could result in a notification being suppressed or deferred. Setting a threshold to 0 could result in a notification being suppressed. Suppressing or deferring a notification could prevent the timely delivery of important diagnostic information. Decreasing any of the threshold values could result in a notification being sent from the network falsely reporting a threshold crossing.

Changing a threshold value could also have an impact on the amount of notifications the agent sends. The Notifications Section of this document has a paragraph which provides general guidance on the rate-limiting of notifications. Agent implementations not providing rate-limiting could result in notifications being generated at an uncontrolled rate. Unauthorized changes to a threshold value could result in an undesired notification rate.

Unauthorized changes to row status could result in unwanted channel alarm profiles being created or brought into service. Also, changes to the row status could result in channel alarm profiles being inadvertently deleted or taken out of service.

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. These are the tables and objects and their sensitivity/vulnerability:

- xDSL2LineInventoryTable

Access to these objects would allow an intruder to obtain information about which vendor’s equipment is in use on the network. Further, such information is considered sensitive in many environments for competitive reasons.
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).

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 only to those objects whose principals (users) have legitimate rights to indeed GET or SET (change/create/delete) them.

6. Acknowledgments

The authors are deeply grateful to the authors of the HDSL2 LINE MIB (RFC 4319), Clay Sikes and Bob Ray, for contributing to accelerating the work on this document. The structure of this document as well as several paragraphs originate in their document.

Other contributions and advice were received from the following:

Randy Presuhn (Mindspring)
Chen Jian  (Huawei)
Bert Wijnen  (Lucent)
Brian Johnson  (NEC Australia)
Andrew Cheers  (NEC Australia)
Sedat Akca  (NEC Australia)
Victor Sperry  (Calix Networks)
Narendranath Nair  (Wipro)
Uwe Pauluhn  (Infineon)
John d. Boyle  (Alcatel)
Edward Beili  (Actelis)
Dan Romascanu  (Avaya)
7. References

7.1. Normative References


7.2. Informative References


Authors' Addresses

Moti Morgenstern
ECI Telecom Ltd.
30 Hasivim St.
Petach Tikva 49517
Israel

Phone: +972 3 926 6258
Fax: +972 3 928 7342
Email: moti.Morgenstern@ecitele.com

Scott Baillie
NEC Australia
649-655 Springvale Road
Mulgrave, Victoria 3170
Australia

Phone: +61 3 9264 3986
Fax: +61 3 9264 3892
Email: scott.baillie@nec.com.au

Umberto Bonollo
NEC Australia
649-655 Springvale Road
Mulgrave, Victoria 3170
Australia

Phone: +61 3 9264 3385
Fax: +61 3 9264 3892
Email: umberto.bonollo@nec.com.au