Definitions of Managed Objects for Very High Speed Digital Subscriber Line 2 (VDSL2)

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 Asymmetric Digital Subscriber Line (ADSL), ADSL2, and ADSL2+ interfaces.

Status of This Memo

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

Copyright and License Notice

Copyright (c) 2009 IETF Trust and the persons identified as the document authors. All rights reserved.

This document is subject to BCP 78 and the IETF Trust’s Legal Provisions Relating to IETF Documents (http://trustee.ietf.org/license-info) in effect on the date of publication of this document. Please review these documents carefully, as they describe your rights and restrictions with respect to this document. Code Components extracted from this document must include Simplified BSD License text as described in Section 4.e of the Trust Legal Provisions and are provided without warranty as described in the BSD License.
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.

This document does not obsolete RFC 2662 [RFC2662] or RFC 4706 [RFC4706]. RFC 2662 is relevant only for managing modems that do not support any DSL technology other than ADSL (e.g., G.992.1 [G.992.1] and G.992.2 [G.992.2]) especially if the modems were produced prior to approval of ITU-T G.997.1 standard revision 3 [G.997.1]. RFC 4706 is more appropriate for managing modems that support ADSL2 technology variants (with or without being able to support the legacy ADSL). This document supports all ADSL, ADSL2, and VDSL2 standards, but it assumes a more sophisticated management model, which older modems (even ADSL2 ones) may not be able to support. The selection of the appropriate MIB module for any DSL modem is based on the ifType value it reports, as explained in the next section.

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 the 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 defined in RFC 2863 [RFC2863] and ENTITY-MIB as defined in RFC 4133 [RFC4133] are discussed.

2.1.1. Relationship with IF-MIB (RFC 2863)

2.1.1.1. General IF-MIB Integration

The VDSL2 Line MIB specifies the detailed objects 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:

IANAifType ::= TEXTUAL-CONVENTION

... SYNTAX INTEGER {

... channel(70), -- Channel
adsl(94), -- Asymmetric Digital Subscriber Loop
...
interleave(124), -- Interleaved Channel
fast(125), -- Fast Channel
...
adsl2plus(238), -- Asymmetric Digital Subscriber Loop Version 2, Version 2 Plus, and all variants
vds12(251), -- Very High Speed Digital Subscriber Loop 2
...
}

ADSL lines that are identified with ifType=adsl(94) MUST be managed with the MIB specified by RFC 2662. 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=vds12(251) 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.
2.1.1.2. 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 objects 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**: vds12(251), 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

2.1.1.3. 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 the 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

2.1.2. Relationship with the ENTITY-MIB (RFC 4133)

Implementation of the Entity MIB [RFC4133] is optional. It in no way alters the information required in the VDSL2 Line MIB, nor does it alter the relationship with IF-MIB.

The Entity MIB introduces a standardized way of presenting the components of complex systems, such as a Digital Subscriber Line Access Multiplexer (DSLAM), that may contain multiple racks, shelves, line cards, and/or ports. The Entity MIB’s main goal is to present these system components, their containment relationship, and mapping information with other MIBs such as the Interface MIB and the VDSL2 Line MIB.

The Entity MIB is capable of supporting the local DSL termination unit. Thus, assuming the SNMP agent is in the DSLAM, the Entity MIB should include entities for the xTU-C in the entPhysicalTable. The MIB’s entAliasMappingTable would contain mapping information identifying the ‘ifIndex’ object associated with each xTU-C. In case the SNMP agent is actually in the Customer Premise Equipment (CPE), the Entity MIB should include entities for the xTU-R in the entPhysicalTable. In this case, the MIB’s entAliasMappingTable would contain mapping information identifying the ‘ifIndex’ object associated with each xTU-R.

Also associating the relationship between the ifTable and Entity MIB, the entPhysicalTable contains an ‘entPhysicalName’ object, which approximates the semantics of the ‘ifName’ object from the Interface MIB.
2.2. IANA Considerations

A new ifType value (251) for Very High Speed Digital Subscriber Loop Version 2 has been allocated for the VDSL2-LINE-MIB module, to distinguish between ADSL lines that are managed with the RFC 2662 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 has been assigned a single object identifier (251) for its MODULE-IDENTITY. The IANA has allocated this object identifier in the transmission subtree.

As performed in the past for the ADSL2-LINE-MIB module, the IANA has ensured 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

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADSL</td>
<td>Asymmetric (bit rate) DSL</td>
</tr>
<tr>
<td>ATM</td>
<td>Asynchronous Transfer Mode</td>
</tr>
<tr>
<td>atuc</td>
<td>ADSL/ADSL2 or ADSL2+ line termination unit - central office</td>
</tr>
<tr>
<td>atur</td>
<td>ADSL/ADSL2 or ADSL2+ line termination unit - Remote site</td>
</tr>
<tr>
<td>BER</td>
<td>Bit Error Rate</td>
</tr>
<tr>
<td>CO</td>
<td>Central Office</td>
</tr>
<tr>
<td>CPE</td>
<td>Customer Premise Equipment</td>
</tr>
<tr>
<td>CRC</td>
<td>Cyclic Redundancy Check</td>
</tr>
<tr>
<td>DELT</td>
<td>Dual Ended Loop Test</td>
</tr>
<tr>
<td>DMT</td>
<td>Discrete Multitone</td>
</tr>
<tr>
<td>DPBO</td>
<td>Downstream PBO</td>
</tr>
<tr>
<td>DRA</td>
<td>Dynamic Rate Adaptation</td>
</tr>
<tr>
<td>DSL</td>
<td>Digital Subscriber Line/Loop</td>
</tr>
<tr>
<td>DSLF</td>
<td>DSL Forum</td>
</tr>
<tr>
<td>EOC</td>
<td>Embedded Operations Channel</td>
</tr>
<tr>
<td>ES</td>
<td>Errored Second</td>
</tr>
<tr>
<td>FE</td>
<td>Far-End (unit)</td>
</tr>
<tr>
<td>FEBE</td>
<td>Far-End Block Error</td>
</tr>
<tr>
<td>FEC</td>
<td>Forward Error Correction</td>
</tr>
<tr>
<td>FFEC</td>
<td>Far-End FEC</td>
</tr>
<tr>
<td>IMA</td>
<td>Inverse Multiplexing over ATM</td>
</tr>
<tr>
<td>INP</td>
<td>Impulse Noise Protection</td>
</tr>
<tr>
<td>ISDN</td>
<td>Integrated Services Digital Network</td>
</tr>
<tr>
<td>LDSF</td>
<td>Loop Diagnostic State Forced</td>
</tr>
</tbody>
</table>
LOF    Loss Of Frame
LOS    Loss Of Signal
LOSS   LOS Seconds
LPR    Loss of Power
NE     Network Element or Near-End (unit)
NSC    Highest transmittable subcarriers index
NSCd    NSC for downstream transmission direction
NSCus   NSC for upstream transmission direction
OLR    Online Reconfiguration
PBO    Power Backoff
PM     Performance Monitoring
PMS-TC Physical Media Specific-Transmission Convergence
POTS   Plain Old Telephone Service
PSD    Power Spectral Density
PTM    Packet Transfer Mode
QLN    Quiet Line
RDI    Remote Defect Indication
RFI    Radio Frequency Interference
SEF    Severely Errored Frame
SES    Severely Errored Second
SNR    Signal-to-Noise Ratio
TC     Transmission Convergence (e.g., ATM sub layer)
TCM    (TCM-ISDN) Time Compression Multiplexed ISDN
UAS    Unavailable Seconds
U-C    Loop interface-central office end
UPBO   Upstream PBO
U-R    Loop interface-remote side (i.e., subscriber end of the loop)
UBO    Upstream band number 0
VDSL   Very high speed DSL
VTU-O   VDSL2 Transceiver Unit - central office or
        Network Element End
VTU-R   VTU at the remote site (i.e., subscriber end of the loop)
vtuc    VDSL2 line termination unit - central office
vtur    VDSL2 line termination unit - Remote site
xDSL   Either VDSL2, ADSL, ADSL2 or ADSL2+
xTU-C   ADSL/ADSL2/ADSL2+ or VDSL2 line termination unit -
        central office
xTU-R   ADSL/ADSL2/ADSL2+ or VDSL2 line termination unit -
        Remote site
XTU     A line termination unit; either an xTU-C or xTU-R
2.3.2. Textual Conventions

The following lists the textual conventions defined by VDSL2-LINE-TC-MIB in this document:

- Xdsl2Unit
- Xdsl2Direction
- Xdsl2Band
- Xdsl2TransmissionModeType
- Xdsl2RaMode
- Xdsl2InitResult
- Xdsl2OperationModes
- Xdsl2PowerMngState
- Xdsl2ConfPmsForce
- Xdsl2LinePmMode
- Xdsl2LineLdsf
- Xdsl2LdsfResult
- Xdsl2LineBpsc
- Xdsl2BpscResult
- Xdsl2LineReset
- Xdsl2LineProfiles
- Xdsl2LineClassMask
- Xdsl2LineLimitMask
- Xdsl2LineUs0Disable
- Xdsl2LineUs0Mask
- Xdsl2SymbolProtection
- Xdsl2SymbolProtection8
o Xdsl2MaxBer
o Xdsl2ChInitPolicy
o Xdsl2ScMaskDs
o Xdsl2ScMaskUs
o Xdsl2CarMask
o Xdsl2RfiBands
o Xdsl2PsdMaskDs
o Xdsl2PsdMaskUs
o Xdsl2Tssi
o Xdsl2LastTransmittedState
o Xdsl2LineStatus
o Xdsl2ChInpReport
o Xdsl2ChAtmStatus
o Xdsl2ChPtmStatus
o Xdsl2UpboKLF
o Xdsl2BandUs
o Xdsl2LinePsdMaskSelectUs
o Xdsl2LineCeFlag
o Xdsl2LineSnrMode
o Xdsl2LineTxRefVnDs
o Xdsl2LineTxRefVnUs
o Xdsl2BitsAlloc
o Xdsl2MrefPsdDs
o Xdsl2MrefPsdUs
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 a 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

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

- xdsl2LinePerfFECSThreshXtuc
- xdsl2LinePerfFECSThreshXtur
- xdsl2LinePerfESThreshXtuc
- xdsl2LinePerfESThreshXtur
- xdsl2LinePerfSESThreshXtuc
- xdsl2LinePerfSESThreshXtur
- xdsl2LinePerfLOSSThreshXtuc
- xdsl2LinePerfLOSSThreshXtur
- xdsl2LinePerfUASThreshXtuc
- xdsl2LinePerfUASThreshXtur
- xdsl2LinePerfCodingViolationsThreshXtuc
- xdsl2LinePerfCodingViolationsThreshXtur
- xdsl2LinePerfCorrectedThreshXtuc
- xdsl2LinePerfCorrectedThreshXtur
- xdsl2LinePerfFailedFullInitThresh
- xdsl2LinePerfFailedShortInitThresh
- xdsl2LineStatusChangeXtuc
- xdsl2LineStatusChangeXtur

2.5. Persistence

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

- xdsl2LineConfTemplate
- xdsl2LineAlarmConfTemplate
- xdsl2LineCmndConfPmsf
- xdsl2LConfTempTemplateName
- xdsl2LConfTempLineProfile
- xdsl2LConfTempChan1ConfProfile
- xdsl2LConfTempChan1RaRatioDs
- xdsl2LConfTempChan1RaRatioUs
- xdsl2LConfTempChan2ConfProfile
- xdsl2LConfTempChan2RaRatioDs
- xdsl2LConfTempChan2RaRatioUs
- xdsl2LConfTempChan3ConfProfile
- xdsl2LConfTempChan3RaRatioDs
- xdsl2LConfTempChan3RaRatioUs
xdsl2LConfTempChan4ConfProfile
xdsl2LConfTempChan4RaRatioDs
xdsl2LConfTempChan4RaRatioUs
xdsl2LConfTempRowStatus
xdsl2LConfProfProfileName
xdsl2LConfProfScMaskDs
xdsl2LConfProfScMaskUs
xdsl2LConfProfVds1L2CarMask
xdsl2LConfProfRfiBandsDs
xdsl2LConfProfRaModeDs
xdsl2LConfProfRaModeUs
xdsl2LConfProfRaUsNrmDs
xdsl2LConfProfRaUsNrmUs
xdsl2LConfProfRaUsTimeDs
xdsl2LConfProfRaUsTimeUs
xdsl2LConfProfRaDsNrmDs
xdsl2LConfProfRaDsNrmUs
xdsl2LConfProfRaDsTimeDs
xdsl2LConfProfRaDsTimeUs
xdsl2LConfProfTargetSnrmDs
xdsl2LConfProfTargetSnrmUs
xdsl2LConfProfMaxSnrmDs
xdsl2LConfProfMaxSnrmUs
xdsl2LConfProfMinSnrmDs
xdsl2LConfProfMinSnrmUs
xdsl2LConfProfMsgMinUs
xdsl2LConfProfMsgMinDs
xdsl2LConfProfMsgMinUs
xdsl2LConfProfMsgMinDs
xdsl2LConfProfMsgMinUs
xdsl2LConfProfMsgMinDs
xdsl2LConfProfXtuTransSysEna
xdsl2LConfProfFmMode
xdsl2LConfProfL0Time
xdsl2LConfProfL2Time
xdsl2LConfProfL2Atpr
xdsl2LConfProfL2Atprt
xdsl2LConfProfProfiles
xdsl2LConfProfDpboPEsd
xdsl2LConfProfDpboEsEL
xdsl2LConfProfDpboEsCableModelA
xdsl2LConfProfDpboEsCableModelB
xdsl2LConfProfDpboEsCableModelC
xdsl2LConfProfDpboMus
xdsl2LConfProfDpboFMin
xdsl2LConfProfDpboFMax
xdsl2LConfProfUpboKL
xdsl2LConfProfUpboKLF
xdsl2LConfProfUs0Mask
xdsl2LConfProfRowStatus
xdsl2LConfProfXdslMode
xdsl2LConfProfMaxNomPsdDs
xds1LConfProfMaxNomPsdUs
xds1LConfProfMaxNomAtpDs
xds1LConfProfMaxNomAtpUs
xds1LConfProfMaxAggRxPwrUs
xds1LConfProfPsdMaskDs
xds1LConfProfPsdMaskUs
xds1LConfProfPsdMaskSelectUs
xds1LConfProfClassMask
xds1LConfProfLimitMask
xds1LConfProfUs0Disabl
xds1LConfProfModeSpecRowStatus
xds1LConfProfXdslBandUs
xds1LConfProfUpboPsdA
xds1LConfProfUpboPsdB
xds1LConfProfModeSpecBandUsRowStatus
xds1ChConfProfProfileName
xds1ChConfProfMinDataRateDs
xds1ChConfProfMinDataRateUs
xds1ChConfProfMinResDataRateDs
xds1ChConfProfMinResDataRateUs
xds1ChConfProfMaxDataRateDs
xds1ChConfProfMaxDataRateUs
xds1ChConfProfMinDataRateLowPwrDs
xds1ChConfProfMaxDelayDs
xds1ChConfProfMaxDelayUs
xds1ChConfProfMinProtectionDs
xds1ChConfProfMinProtectionUs
xds1ChConfProfMaxBerDs
xds1ChConfProfMaxBerUs
xds1ChConfProfUsDataRateDs
xds1ChConfProfDsDataRateDs
xds1ChConfProfUsDataRateUs
xds1ChConfProfDsDataRateUs
xds1ChConfProfImaEnabled
xds1ChConfProfMaxDelayVar
xds1ChConfProfInitPolicy
xds1ChConfProfRowStatus
xds1LAlarmConfTempTemplateName
xds1LAlarmConfTempLineProfile
xds1LAlarmConfTempChan1ConfProfile
xds1LAlarmConfTempChan2ConfProfile
xds1LAlarmConfTempChan3ConfProfile
xds1LAlarmConfTempChan4ConfProfile
xds1LAlarmConfTempRowStatus
xds1LineAlarmConfProfileName
xds1LineAlarmConfProfileXtucThresh15MinFecs
xds1LineAlarmConfProfileXtucThresh15MinEs
xds1LineAlarmConfProfileXtucThresh15MinSes
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.

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].
Key:  

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.

- 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.

- 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 1-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 module 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, in addition to 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.

- 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 indices 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

- **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. For example, 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.

- **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.

- **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 indices 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 xdsl2LineConfTemplate 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 xdsl2LineAlarmConfTemplate 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 xdsl2LineConfTemplate and xdsl2LineAlarmConfTemplate 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 xdsl2LineConfFallbackTemplate). 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 objects xdsl2LConfTempChan1ConfProfile, xdsl2LConfTempChan2ConfProfile, xdsl2LConfTempChan3ConfProfile, and xdsl2LConfTempChan4ConfProfile and then assigning that template to a DSL line using the xdsl2LineConfTemplate object. 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 events occur. 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.

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 "200909300000Z" -- September 30, 2009
  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

Morgenstern, et al. Standards Track [Page 24]
DESCRIPTION

"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) 2009 IETF Trust and the persons identified as authors of the code. All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

- Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
- Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

- Neither the name of Internet Society, IETF or IETF Trust, nor the names of specific contributors, may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

This version of this MIB module is part of RFC 5650; see the RFC itself for full legal notices.

REVISION "200909300000Z" -- September 30, 2009
DESCRIPTION "Initial version, published as RFC 5650."
::= { transmission 251 3} -- vds12MIB 3

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

Xds12Unit ::= 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
-- (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).
}

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 {
    ansi1413(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),
g9923AnnexIA11DigNonOverlapped(28),
g9923AnnexIA11DigOverlapped(29),
g9923AnnexJA11DigNonOverlapped(30),
g9923AnnexJA11DigOverlapped(31),
g9924AnnexIA11DigNonOverlapped(32),
g9924AnnexIA11DigOverlapped(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),
g9925AnnexIA11DigNonOverlapped(46),
g9925AnnexIA11DigOverlapped(47),
g9925AnnexJA11DigNonOverlapped(48),
g9925AnnexJA11DigOverlapped(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 object that identifies an instance of xDSL Mode-Specific PSD Configuration object in the xDSL Line Profile. The
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>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>
</tbody>
</table>
43 - G.992.5 POTS overlapped (F)
44 - G.992.5 ISDN non-overlapped (F)
45 - G.992.5 ISDN overlapped (F)
48 - G.992.5 Annex I All-Digital non-overlapped (F)
49 - G.992.5 Annex I All-Digital overlapped (F)
50 - G.992.5 Annex J All-Digital non-overlapped (F)
51 - G.992.5 Annex J All-Digital overlapped (F)
52 - G.992.5 Annex M POTS non-overlapped (F)
53 - G.992.5 Annex M POTS overlapped (F)
54-57 - Unused. Reserved for future ITU-T specification.
58 - G.993.2 Annex A
59 - G.993.2 Annex B
60 - G.993.2 Annex C

```
SYNTAX INTEGER {
  defMode(1),
  ansit1413(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),
  g9923AnnexIAllDigNonOverlapped(30),
  g9923AnnexIAllDigOverlapped(31),
  g9923AnnexJAllDigNonOverlapped(32),
  g9923AnnexJAllDigOverlapped(33),
  g9924AnnexIAllDigNonOverlapped(34),
  g9924AnnexIAllDigOverlapped(35),
  g9923AnnexLMode1NonOverlapped(36),
  g9923AnnexLMode2NonOverlapped(37),
  g9923AnnexLMode3Overlapped(38),
  g9923AnnexLMode4Overlapped(39),
  g9923AnnexMPotsNonOverlapped(40),
  g9923AnnexMPotsOverlapped(41),
...
Xdsl2PowerMngState ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION "Objects 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. Synchronized and
full transmission (i.e., Showtime).
11(2) - L1: Low power with reduced net data rate
(for G.992.2 only).
12(3) - L2: Low power with reduced net data rate
(for G.992.3, G.992.4 and G.992.5).
13(4) - L3: Idle power management state / No
power."
SYNTAX INTEGER {
    10(1),
    11(2),
    12(3),
    13(4)
}

Xdsl2ConfPmsForce ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION "Objects with this syntax are configuration parameters
that specify the desired power management state transition
for the VDSL2/ADSL/ADSL2 or ADSL2+ link. In VDSL2, only L0 and L3 states are defined:
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).

SYNTAX INTEGER {
    13toL0 (0),
    10toL2 (2),
    10orL2toL3 (3)
}

Xdsl2LinePmMode ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION
"Objects 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
"Objects 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
"Objects 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
"Objects 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 {

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),
profile30Us0Disable10(57),
profile30Us0Disable11(58),
profile30Us0Disable12(59),
profile30Us0Disable13(60),
profile30Us0Disable14(61),
profile30Us0Disable15(62),
profile30Us0Disable16(63)
}

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 {
edu32(0),
edu36(1),
edu40(2),
edu44(3),
edu48(4),
edu52(5),
edu56(6),
edu60(7),
--
edu64(8),
edu128(9),
reserved1(10),
reserved2(11),
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),
  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)
}
null
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 subcarrier in the downstream
direction. A bit value of one indicates that a subcarrier is masked."
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 subcarrier in the upstream
direction. A bit value of one indicates that a subcarrier is masked."
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. The subcarrier index is an unsigned number in the range 0 to
NSC-1."
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: a 16-bit start subcarrier index followed by a 16-bit stop subcarrier index.  
There is a maximum of 16 RFI bands allowed.  
The subcarrier index is an unsigned number in the range 0 to NSC-1."
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 (0 dBm/Hz) to 255 (-127.5 dBm/Hz) using units of 0.5 dBm/Hz.  
The subcarrier index is an unsigned number in the range 0 to NSCd-1."
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 (0 dBm/Hz) to 255 (-127.5 dBm/Hz) using units of 0.5 dBm/Hz.  
The subcarrier index is an unsigned number in the range 0 to NSCu-1."
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 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.
The shaping parameter value is in the range 0 to 126 (units of -0.5 dB). The special value 127 indicates that the subcarrier is not transmitted.
The subcarrier index is an unsigned number in the range 0 to NSC-1.

SYNTAX OCTET STRING (SIZE(0..96))

Xds12LastTransmittedState ::= 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),
atucComb1(2),
atucQuiet2(3),
atucComb2(4),
atucIcomb1(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),
aturComb1(102),
aturQuiet2(103),
aturComb2(104),
aturIcomb1(105),
aturLineprob(106),
aturQuiet3(107),
aturComb3(108),
aturIcomb2(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),
vttucQuiet1(201),
vttucChDiscov1(202),
vttucSynchro1(203),
vttucPilot1(204),
vttucQuiet2(205),
vttucPeriodic1(206),
vttucSynchro2(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
"Objects with this syntax are status parameters that reflect the failure status for a given endpoint 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)
}

Xds12ChInpReport ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION "This type is used to indicate the method used to compute the Actual Impulse Noise Protection (ACTINP). If set to ‘inpComputedUsingFormula’, the ACTINP is computed according to the INP_no_erasure formula (9.6/G.993.2). If set to ‘inpEstimatedByXtur’, 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)
}

Xds12ChAtmStatus ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION "Objects with this syntax are status parameters that reflect the failure status for the 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 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.

SYNTAX BITS {
    noDefect (0),
    noCellDelineation (1),
    lossOfCellDelineation (2)
}

Xdsl2ChPtmStatus ::= TEXTUAL-CONVENTION
STATUS      current
DESCRIPTION
"Objects 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 exists.
    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 VDSL Transceiver Unit (VTUs) will
        autonomously determine the
        electrical length.
    override (2) - Forces the VTU-R to use the electrical
        length, kl0, of the CO-MIB (UPBK0L) 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 the US0 band.).
The possible values that 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 Recommendations 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),
  adlu48Eu48(5),
  adlu52Eu52(6),
  adlu56Eu56(7),
  adlu60Eu60(8),
  adlu64Eu64(9)
}

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 0.5 dBm/Hz.
A special value of 255 indicates a noise level of 0 W/Hz.
The subcarrier index is an unsigned number in the range 0 to NSCd-1."

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 0.5 dBm/Hz.
A special value of 255 indicates a noise level of 0 W/Hz.
The subcarrier index is an unsigned number in the range 0 to NSCu-1."

SYNTAX      OCTET STRING (SIZE(0..48))
Xdsl2BitsAlloc ::= TEXTUAL-CONVENTION
  STATUS          current
  DESCRIPTION    "This type specifies an 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    "Objects 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 the first 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 second breakpoint
                  Octets 8-11 -- Same, for a third breakpoint
                  And so on until
                  Octets 188-191 -- Same, for a 48th breakpoint.
                  The subcarrier index is an unsigned number in the range 0
                  to NSCds-1.
                  The PSD level is an integer value in the range 0 to 4095.
                  It is represented in units of 0.1 dB offset from -140 dBm/Hz."
  SYNTAX         OCTET STRING (SIZE(0..192))

Xdsl2MrefPsdUs ::= TEXTUAL-CONVENTION
  STATUS          current
  DESCRIPTION    "Objects 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 the first 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 second breakpoint
                  Octets 8-11 -- Same, for a third breakpoint
                  And so on until
Octets 124-127 -- Same, for a 32nd breakpoint.
   The subcarrier index is an unsigned number in the range 0 to NSCus-1.
   The PSD level is an integer value in the 0 to 4095 range. It is represented in units of 0.1 dB offset from -140 dBm/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]

   Xdsl2Unit,
   Xdsl2Direction,
   Xdsl2Band,
   Xdsl2TransmissionModeType,
   Xdsl2RaMode,
   Xdsl2InitResult,
   Xdsl2OperationModes,
   Xdsl2PowerMngState,
   Xdsl2ConfPmsForce,
   Xdsl2LinePmMode,
   Xdsl2LineLdsf,
   Xdsl2LdsfResult,
   Xdsl2LineBpsc,
Xdsl2BpscResult,        
Xdsl2LineReset,         
Xdsl2SymbolProtection,  
Xdsl2SymbolProtection8, 
Xdsl2MaxBer,           
Xdsl2ChInitPolicy,      
Xdsl2ScMaskDs,          
Xdsl2ScMaskUs,          
Xdsl2CarMask,           
Xdsl2RfiBands,          
Xdsl2PsdMaskDs,         
Xdsl2PsdMaskUs,         
Xdsl2Tssi,              
Xdsl2LastTransmittedState, 
Xdsl2LineStatus,       
Xdsl2ChInpReport,       
Xdsl2ChAtmStatus,       
Xdsl2ChPtmStatus,       
Xdsl2UpboKLF,           
Xdsl2BandUs,            
Xdsl2LineProfiles,      
Xdsl2LineUs0Mask,       
Xdsl2LineClassMask,     
Xdsl2LineLimitMask,     
Xdsl2LineUs0Disable,    
Xdsl2LinePsdMaskSelectUs, 
Xdsl2LineCeFlag,        
Xdsl2LineSnrMode,       
Xdsl2LineTxRefVnDs,     
Xdsl2LineTxRefVnUs,     
Xdsl2BitsAlloc,         
Xdsl2MrefPsdDs,         
Xdsl2MrefPsdUs

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

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

vds12MIB MODULE-IDENTITY
LAST-UPDATED "200909300000Z" -- September 30, 2009
ORGANIZATION "ADSLMIB Working Group"
CONTACT-INFO "WG-email: adslmib@ietf.org
Info: https://www1.ietf.org/mailman/listinfo/adslmib
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 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] or
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 the 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) 2009 IETF Trust and the persons identified
as authors of the code. All rights reserved.

Redistribution and use in source and binary forms, with
or without modification, are permitted provided that the
following conditions are met:

- Redistributions of source code must retain the above
copyright notice, this list of conditions and the
following disclaimer.

- Redistributions in binary form must reproduce the above
copyright notice, this list of conditions and the
following disclaimer in the documentation and/or other
materials provided with the distribution.
- Neither the name of Internet Society, IETF or IETF Trust, nor the names of specific contributors, may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS ‘AS IS’ AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

This version of this MIB module is part of RFC 5650; see the RFC itself for full legal notices.

REVISION "200909300000Z" -- September 30, 2009
DESCRIPTION "Initial version, published as RFC 5650."
 ::= { transmission 251 }

xds12Notifications OBJECT IDENTIFIER ::= { vds12MIB 0 }
xds12Objects OBJECT IDENTIFIER ::= { vds12MIB 1 }
xds12Conformance OBJECT IDENTIFIER ::= { vds12MIB 2 }

xds12Line OBJECT IDENTIFIER ::= { xds12objects 1 }
xds12Status OBJECT IDENTIFIER ::= { xds12objects 2 }
xds12Inventory OBJECT IDENTIFIER ::= { xds12objects 3 }
xds12PM OBJECT IDENTIFIER ::= { xds12objects 4 }
xds12Profile OBJECT IDENTIFIER ::= { xds12objects 5 }
xds12Scalar OBJECT IDENTIFIER ::= { xds12objects 6 }

xds12PMLine OBJECT IDENTIFIER ::= { xds12PM 1 }
xds12PMChannel OBJECT IDENTIFIER ::= { xds12PM 2 }

xds12ProfileLine OBJECT IDENTIFIER ::= { xds12Profile 1 }
xds12ProfileChannel OBJECT IDENTIFIER ::= { xds12Profile 2 }
xds12ProfileAlarmConf OBJECT IDENTIFIER ::= { xds12Profile 3 }

xds12ScalarSC OBJECT IDENTIFIER ::= { xds12Scalar 1 }
-- xds12LineTable --
------------------------------------------------

xds12LineTable OBJECT-TYPE
SYNTAX SEQUENCE OF Xdsl2LineEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The table xds12LineTable contains configuration, command and
status parameters of the VDSL2/ADSL/ADSL2 or ADSL2+ line.

Several objects in this table MUST be maintained in a persistent
manner."
 ::= { xds12Line 1 }

xds12LineEntry OBJECT-TYPE
SYNTAX Xds12LineEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The index of this table is an interface index where the
interface has an ifType of vdsl2(251)."
INDEX { ifIndex }
 ::= { xds12LineTable 1 }

Xds12LineEntry ::= SEQUENCE {
    xds12LineConfTemplate SnmpAdminString,
    xds12LineConfFallbackTemplate SnmpAdminString,
    xds12LineConfAlarmConfTemplate SnmpAdminString,
    xds12LineCmdConfPmsf Xdsl2ConfPmsForce,
    xds12LineCmdConfLdsf Xdsl2LineLdsf,
    xds12LineCmdConfLdsfFailReason Xdsl2LdsfResult,
    xds12LineCmdConfBpsc Xdsl2LineBpsc,
    xds12LineCmdConfBpscFailReason Xdsl2BpscResult,
    xds12LineCmdConfBpscRequests Counter32,
    xds12LineCmdConfAutomodeColdStart TruthValue,
    xds12LineCmdConfReset Xdsl2LineReset,
    xds12LineStatusActTemplate SnmpAdminString,
    xds12LineStatusXtuTransSys Xdsl2TransmissionModeType,
    xds12LineStatusPwrMngState Xdsl2PowerMngState,
    xds12LineStatusInitResult Xdsl2InitResult,
    xds12LineStatusLastStateDs Xdsl2LastTransmittedState,
    xds12LineStatusLastStateUs Xdsl2LastTransmittedState,
    xds12LineStatusXtur Xdsl2LineStatus,
    xds12LineStatusXtuc Xdsl2LineStatus,
    xds12LineStatusAttainableRateDs Unsigned32,
    xds12LineStatusAttainableRateUs Unsigned32,
}
xds12LineStatusActPsdDs  Integer32,
xds12LineStatusActPsdUs  Integer32,
xds12LineStatusActAtpDs  Integer32,
xds12LineStatusActAtpUs  Integer32,
xds12LineStatusActProfile  Xdsl2LineProfiles,
xds12LineStatusActLimitMask  Xdsl2LineLimitMask,
xds12LineStatusActUs0Mask  Xdsl2LineUs0Mask,
xds12LineStatusActSnrModeDs  Xdsl2LineSnrMode,
xds12LineStatusActSnrModeUs  Xdsl2LineSnrMode,
xds12LineStatusElectricalLength  Unsigned32,
xds12LineStatusTssiDs  Xdsl2Tssi,
xds12LineStatusTssiUs  Xdsl2Tssi,
xds12LineStatusMrefPsdDs  Xdsl2MrefPsdDs,
xds12LineStatusMrefPsdUs  Xdsl2MrefPsdUs,
xds12LineStatusTrellisDs  TruthValue,
xds12LineStatusTrellisUs  TruthValue,
xds12LineStatusActualCe  Unsigned32

}

xds12LineConfTemplate  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 Configuration Template Table, xds12LineConfTemplateTable, that applies for this line.

This object MUST be maintained in a persistent manner."
REFERENCE  "DSL Forum TR-129, paragraph #5.1"
DEFVAL  { "DEFVAL" }
::= { xds12LineEntry 1 }

xds12LineConfFallbackTemplate  OBJECT-TYPE
SYNTAX  SnmpAdminString (SIZE(0..32))
MAX-ACCESS  read-write
STATUS  current
DESCRIPTION
"This object is used to identify the template that will be used if the xDSL2 line fails to operate using the primary template. The primary template is identified using the xds12LineConfTemplate object.

For example, a xDSL2 line may fall back 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 fall-back template.

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

If the value of this object is a zero-length string, then no fall-back 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.

::= { xdsl2LineEntry 2 }

xdsl2LineAlarmConfTemplate 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" }
::= { xdsl2LineEntry 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.
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 }

xdsl2LineCmdConfLdsf OBJECT-TYPE
SYNTAX       Xdsl2LineLdsf
"Loop diagnostic state 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 diagnostic may be initiated by the far-end xTU at any
time.

Only when the xdsl2LineStatusPwrMngState object is in the
‘13’ state and the xdsl2LineCmndConfPmsf object is in the
‘10orL2toL3’ 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
object to ‘inhibit’, and xdsl2LineStatusPwrMngState will
remain in the ‘13’ state. The loop diagnostic data shall be
available at least until xdsl2LineCmndConfPmsf is set to the
‘13toL0’ state.

The results of the loop diagnostic procedure are stored in the
tables xdsl2SCStatusTable, xdsl2SCStatusBandTable, and
xdsl2SCStatusSegmentTable. The status of the loop diagnostic
procedure 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 state forced (LDSF) command was issued for the
associated line."
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 object to the value of 'measure'. Upon completion of the measurement request, the Access Node shall set this object to 'idle'.

The SNMP agent should allow initiating a bits-per-subcarrier measurement process only if there is no other bits-per-subcarrier measurement already running, and respond with an SNMP error (e.g., wrongValue) otherwise.

Note that a bits-per-subcarrier measurement is also performed during a line diagnostic procedure. This object 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 xDSL2LineCmdConfBpscFailReason."

DEFVAL { idle }
 ::= { xDSL2LineEntry 7 }

xDSL2LineCmdConfBpscFailReason 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."
DEFVAL  { none }
 ::= { xDSL2LineEntry 8 }

xDSL2LineCmdConfBpscRequests OBJECT-TYPE
SYNTAX  Counter32
MAX-ACCESS  read-only
STATUS  current
DESCRIPTION  "Measurement request counter. This counter is incremented by one every time a request for a bits-per-subcarrier measurement is made. A measurement request
is made by modifying the \texttt{xdsl2LineCmndConfBpsc} object from \texttt{idle(1)} to the value \texttt{measure(2)}.

The measurement results may be very large and will not fit into a single PDU; hence, multiple SNMP GET requests may be required to fetch the measurement results. Because the measurement results cannot be fetched atomically, it is possible for a second manager to start a new measurement before a first manager has fetched all of its results. An SNMP manager can use this object to ensure that the measurement results retrieved using one or more GET requests all belong to the measurement initiated by that manager.

The following steps are suggested in order for the SNMP manager to initiate the bits-per-subcarrier measurement:

1. Wait for \texttt{xdsl2LineCmndConfBpsc} value to be \texttt{idle(1)}.
2. Perform an SNMP GET for \texttt{xdsl2LineCmndConfBpscRequests}.
3. Wait a short delay (4 -> 8 seconds).
4. Perform an SNMP SET on \texttt{xdsl2LineCmndConfBpsc} with the value \texttt{measure(2)}.
5. If step 4 returns an error, then go to step 1.
6. Wait for \texttt{xdsl2LineCmndConfBpsc} value to be \texttt{idle(1)}.
7. Fetch measurement results using one or more GET PDUs.
8. Perform an SNMP GET for \texttt{xdsl2LineCmndConfBpscRequests}.
9. Compute the difference between the two values of \texttt{xdsl2LineCmndConfBpscRequests}. If the value is one, then the results are valid, else go to step 1.

\[
::= \{ \texttt{xdsl2LineEntry 9} \}
\]

\texttt{xdsl2LineCmndAutomodeColdStart} OBJECT-TYPE
SYNTAX TruthValue
MAX-ACCESS read-write
STATUS current
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' to indicate a change in loop conditions applied to the devices under the 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 \texttt{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."
REFERENCE "ITU-T G.997.1, paragraph #7.3.1.1.10
(Automode Cold Start Forced)"
DEFVAL { false }
::= { xdsl2LineEntry 10 }

xdsl2LineCmndConfReset OBJECT-TYPE
SYNTAX Xdsl2LineReset
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"Request a line reset to occur.
If this object is set to the value of ‘reset’, 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 object to ‘idle’.

Note that the xdsl2LineCmndConfPmsf object will always take
precedence over this object.
If the xdsl2LineCmndConfPmsf object is set to the value
‘100rI2toL3’, then the line MUST NOT return to the Showtime
state due to a reset request action performed using this
object."
DEFVAL { idle }
::= { xdsl2LineEntry 11 }

xdsl2LineStatusActTemplate 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 object is updated when a successful line initialization
occurs.
This object indicates if the primary template
(xdsl2LineConfTemplate) is in use or the fall-back template
(xdsl2LineConfFallbackTemplate) is in use.
If the line is not successfully initialized, then the value of
this object will be a zero-length string."
::= { xdsl2LineEntry 12 }

xdsl2LineStatusXtuTransSys OBJECT-TYPE
SYNTAX Xdsl2TransmissionModeType
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The xTU Transmission System (xTS) in use."
It is coded in a bitmap 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       { {} }
 ::= { xdsl2LineEntry 13 }

```markdown
xdsl2LineStatusPwrMngState  OBJECT-TYPE
  SYNTAX      Xdsl2PowerMngState
  MAX-ACCESS  read-only
  STATUS      current
  DESCRIPTION
    "The current power management state."
REFERENCE    "ITU-T G.997.1, paragraph #7.5.1.5
(line power management state)"
DEFVAL       { l3 }
 ::= { 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."
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 }
```

```markdown
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 the current state (existing failures) of the xTU-R.
This is a bitmap 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 the current state (existing failures) of the xTU-C.
This is a bitmap 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 Spectral 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 Spectral 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 Power (AP) Downstream.  The average
upstream transmit PSD over the subcarriers used for upstream.
It ranges from -310 to 310 units of 0.1 dBm (physical values are
-310 to 310 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 Power (AP) Upstream.  The average
upstream transmit PSD over the subcarriers used for upstream.
It ranges from -310 to 310 units of 0.1 dBm (physical values are
-310 to 310 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 }

xdsl2LineStatusActPsdAtpUs  OBJECT-TYPE
SYNTAX      Integer32 (-900..0 | 2147483647)
UNITS       "0.1 dBm/Hz"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION  "Actual Power Spectral 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 #7.5.1.26 (ACTPSDAtpUs)"
DEFVAL       { 2147483647 }
::= { xdsl2LineEntry 26 }

xdsl2LineStatusActPsdAtpDs  OBJECT-TYPE
SYNTAX      Integer32 (-900..0 | 2147483647)
UNITS       "0.1 dBm/Hz"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION  "Actual Power Spectral 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 #7.5.1.27 (ACTPSDAtpDs)"
DEFVAL       { 2147483647 }
::= { xdsl2LineEntry 27 }

xdsl2LineStatusAttainableAtpUs OBJECT-TYPE
SYNTAX      Integer32 (-310..310 | 2147483647)
UNITS       "0.1 dBm"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION  "Maximum Attainable Power (AP) Upstream.  The maximum
upstream net power currently attainable by the
xTU-R transmitter and the xTU-C receiver, coded in dBm."
REFERENCE    "ITU-T G.997.1, paragraph #7.5.1.28 (ATTNAPUs)"
DEFVAL       { 0 }
::= { xdsl2LineEntry 28 }
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 Recommendation G.994.1."
REFERENCE: "ITU-T G.997.1, paragraph #7.5.1.2 (VDSL2 Profile)"
DEFVAL: { {} } ::= { xdsl2LineEntry 26 }

xdsl2LineStatusActLimitMask OBJECT-TYPE
SYNTAX: Xdsl2LineLimitMask
"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 }

xDSLLineStatusActUs0Mask 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 Recommendation G.994.1."

REFERENCE "ITU-T G.997.1, paragraph #7.5.1.4 (VDSL2 US0 PSD Mask)"

DEFVAL { {} } ::= { xdsl2LineEntry 28 }

xDSLLineStatusActSnrModeDs 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 }

xDSLLineStatusActSnrModeUs 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)

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 (Downstream)."

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 (Upstream)."

REFERENCE ITU-T G.997.1, paragraph #7.5.1.29.6 (TSSpsus)

::= { xdsl2LineEntry 33 }

---

**xdsl2LineStatusMrefPsdDs** OBJECT-TYPE
SYNTAX Xdsl2MrefPsdDs
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The MEDLEY Reference PSD status parameters in the downstream direction expressed as the set of breakpoints exchanged at initialization."
REFERENCE "ITU-T G.997.1, paragraph #7.5.1.29.7 (MREFPSSDds)"
::= { xdsl2LineEntry 34 }

xdsl2LineStatusMrefPsdUs OBJECT-TYPE
SYNTAX Xdsl2MrefPsdUs
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The MEDLEY Reference PSD status parameters in the upstream direction expressed as the set of breakpoints exchanged at initialization."
REFERENCE "ITU-T G.997.1, paragraph #7.5.1.29.8 (MREFPSSDus)"
::= { 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
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 Inverse Discrete Fourier Transform (IDFT) size.

REFERENCE    "ITU-T G.997.1, paragraph #7.5.1.32 (ACTUALCE)"
DEFVAL       { 2 }
 ::= { xdsl2LineEntry 38 }

The table \texttt{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 \texttt{xdsl2LineCmndConfBpsc} object.

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 Showtime due to rate adaption and bit swapping.

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

 ::= { xdsl2Status 1 }

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(251). A second index of this table is the transmission direction. A third index identifies the specific segment of the subcarriers status addressed.

INDEX { ifIndex, xdsl2LineSegmentDirection, xdsl2LineSegment } ::= { xDSL2LineSegmentTable 1 }

Xdsl2LineSegmentEntry ::= SEQUENCE {
  xdsl2LineSegmentDirection Xdsl2Direction,
  xdsl2LineSegment Unsigned32,
  xdsl2LineSegmentBitsAlloc Xdsl2BitsAlloc,
  xdsl2LineSegmentRowStatus RowStatus
}

Xdsl2LineSegmentDirection OBJECT-TYPE
SYNTAX Xdsl2Direction
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "The direction of the subcarrier either upstream or downstream."
 ::= { xDSL2LineSegmentEntry 1 }

Xdsl2LineSegment 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 xDSL2LineSegment=1, the second segment is retrieved with xDSL2LineSegment=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."
 ::= { xDSL2LineSegmentEntry 2 }

Xdsl2LineSegmentBitsAlloc 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 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 in the downstream direction (in all segments) depends on NSds; in the upstream direction, it depends on NSus. This value is referred to here as NS. The segment number is in xdsl2SCStatusSegment.

Nibble i (0 <= i < MIN((NS+1)-(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 (BITSpus)"
 ::= { xdsl2LineSegmentEntry 3 }

xDSLLineSegmentRowStatus  OBJECT-TYPE
   SYNTAX    RowStatus
   MAX-ACCESS read-write
   STATUS    current
   DESCRIPTION
      "Row Status. 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 manager is not permitted to create rows in this table or
set the row status to 'notInService'. In the first case,
if the SNMP manager tries to create a new row, the SNMP agent
responds with the value 'noCreation' in the error status
field of the response-PDU. In the latter case, the SNMP agent
responds with the value 'wrongValue' in the error status
field of the response-PDU.

      The SNMP agent may have limited resources; therefore, if multiple
rows coexist in this table, it may fail to add new rows to this
or allocate memory resources.
If that occurs, the SNMP agent responds with the value
'noResources' (for the xdsl2LineCmdConfBpscFailReason
object in xdsl2LineTable).

      The management system (the operator) may delete rows from this
and allocate memory resources.

The management system (the operator) may delete rows from this
and allocate memory resources.

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

Morgenstern, et al. Standards Track [Page 76]
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
SYNTAX      SEQUENCE  OF  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.
The parameters in this table are updated at line initialization
time and at Showtime."
::= { xdsl2Line 2 }

xdsl2LineBandEntry  OBJECT-TYPE
SYNTAX      Xdsl2LineBandEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
"One index of this table is an interface index where the
interface
has an ifType of vdsl2(251). A second index of this table is a
per-band index covering both VDSL2 and ADSL/ADSL2/ADSL2+.
"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' and 'downstream'
will always be present."
For VDSL2, a subset of {'us0', 'ds1', 'us1' ... 'ds4', 'us4'} will always be present, together with rows for 'upstream' and 'downstream', in which only the xDSL2LineBandStatusSnrMargin object is expected to hold a valid (average) measurement.

::= { xDSL2LineBandEntry 1 }

xDSL2LineBandStatusLnAtten  OBJECT-TYPE
SYNTAX      Unsigned32 (0..1270 | 2147483646 | 2147483647)
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 }

xDSL2LineBandStatusSigAtten  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 measurement is unavailable.

REFERENCE  "ITU-T G.997.1, paragraph #7.5.1.11 (SATNd) and paragraph #7.5.1.12 (SATNu)"
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 (SNRMd) and paragraph #7.5.1.14 (SNRmbd) and paragraph #7.5.1.16 (SNRMu) and paragraph #7.5.1.17 (SNRmbu)"
DEFVAL    { 2147483646 }
::= { xdsl2LineBandEntry 4 }
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
"One index of this table is an interface index where the
interface has an ifType of a DSL channel. A second index of
this table is the termination unit."
INDEX { ifIndex, xdsl2ChStatusUnit }
::= { xdsl2ChannelStatusTable 1 }

Xdsl2ChannelStatusEntry ::= SEQUENCE {
    xdsl2ChStatusUnit                Xdsl2Unit,
    xdsl2ChStatusActDataRate         Unsigned32,
    xdsl2ChStatusPrevDataRate        Unsigned32,
    xdsl2ChStatusActDelay            Unsigned32,
    xdsl2ChStatusActInp              Unsigned32,
    xdsl2ChStatusActInput            Xdsl2ChInput,
    xdsl2ChStatusNWay                Unsigned32,
    xdsl2ChStatusRFec                Unsigned32,
    xdsl2ChStatusLSymb               Unsigned32,
    xdsl2ChStatusIntlvBlock          Unsigned32,
    xdsl2ChStatusLPath               Unsigned32,
    xdsl2ChStatusAtmStatus           Xdsl2ChAtmStatus,
    xdsl2ChStatusPtmStatus           Xdsl2ChPtmStatus
}

xdsl2ChStatusUnit OBJECT-TYPE
SYNTAX Xdsl2Unit
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The termination unit."
::= { xdsl2ChannelStatusEntry 1 }

xdsl2ChStatusActDataRate OBJECT-TYPE
SYNTAX  Unsigned32
UNITS "bits/second"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The actual net data rate at which the bearer channel is
operating, 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 }

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 Recommendation 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."
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 bitmap of
possible conditions.
  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 bitmap of possible conditions.
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 OBJECT-TYPE
SYNTAX    SEQUENCE  OF  Xdsl2SCStatusEntry
MAX-ACCESS not-accessible
STATUS    current
DESCRIPTION
   "The table xdsl2SCStatusTable contains status parameters for VDSL2/ADSL/ADSL2 and ADSL2+ that provide information about the size of parameters in xdsl2SCStatusSegmentTable. The parameters in this table MUST be updated after a loop diagnostic procedure, MAY be updated after a line initialization, and MAY be updated at Showtime."
::= { xdsl2Status 3 }

xdsl2SCStatusEntry OBJECT-TYPE
SYNTAX    Xdsl2SCStatusEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"One index of this table is an interface index where the
interface has an ifType of vdsl2(251). 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 (HLINGds) 
and paragraph #7.5.1.26.8 (HLINGus)"
::= { 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 Recommendation. 
G.992.3)."
REFERENCE  "ITU-T G.997.1, paragraph #7.5.1.26.4 (HLOGMTds) 
and paragraph #7.5.1.26.10 (HLOGMTus)"
::= { 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 1, 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 Recommendation 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 1, 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
Recommendation 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 1, 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 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.

The SNMP manager is not permitted to create rows in this table or set the row status to ‘notInService’. In the first case,
if the SNMP manager tries to create a new row, the SNMP agent responds with the value 'noCreation' in the error status field of the response-PDU. In the latter case the SNMP agent responds with the value 'wrongValue' in the error status field of the response-PDU.

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 coexist 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 xdsl2LineCmndConfLdsfFailReason object in xdsl2LineTable).

The management system (the operator) may delete rows from this table according to any scheme. For example, 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
STATUS      current
DESCRIPTION
"One index of this table is an interface index where the interface
has an ifType of vdsl2(251). A second index of this table is the 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 }
xdsl2SCStatusBandSigAtten  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 Showtime after the diagnostics mode. When referring to 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 Showtime after the 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 #7.5.1.11 (SATNds) and paragraph #7.5.1.12 (SATNus)"
DEFVAL       { 2147483646 }
::= { xdsl2SCStatusBandEntry 3 }

-- xds12SCStatusSegmentTable ---------------------------------

xdsl2SCStatusSegmentTable  OBJECT-TYPE
SYNTAX      SEQUENCE  OF  Xdsl2SCStatusSegmentEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
 "The table xds12SCStatusSegmentTable 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. The parameters in this table MUST be updated after a loop..."
diagnostic procedure and MAY be updated after a line
initialization and MAY be updated at Showtime.''
::= { xdsl2Status 5 }

xdsl2SCStatusSegmentEntry OBJECT-TYPE
SYNTAX Xdsl2SCStatusSegmentEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"One index of this table is an interface index where the
interface has an ifType of vdsl2(251). 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 }

Xdsl2SCStatusSegmentEntry ::= 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) subcarrier
groups and can be retrieved in a single segment.
The number of utilized values in the downstream direction depends
on NSds; in the upstream direction, it depends on NSus. This
value is referred to here as NS.
Each array entry represents the real component (referred to 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 subcarrier 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) subcarrier
groups and can be retrieved in a single segment.
The number of utilized values in the downstream direction depends
on NSds; in the upstream direction, it depends on NSus. This
value is referred to here as NS.
Each array entry represents the imaginary component (referred to here
as b(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) (provided by the
xdsl2SCStatusSegmentLinReal object) and b(i) 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 subcarrier 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) subcarrier groups and can be retrieved in a single segment. The number of utilized values in the downstream direction depends on NSds; in the upstream direction, it depends on NSus. This value is referred to 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) subcarrier groups and can be retrieved in a single segment. The number of utilized values in the downstream direction depends
on NSds; in the upstream direction, it depends on NSus. This value is referred to 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 }

xds12SCStatusSegmentSnr  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) subcarrier groups and can be retrieved in a single segment.

The number of utilized octets in the downstream direction depends on NSds; in the upstream direction, it depends on NSus. This value is referred to 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 an SNR of:

(-32 + xds12SCStatusSegmentSnr(i)/2) in dB (i.e., -32 to 95 dB).

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 }

xds12SCStatusSegmentBitsAlloc  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 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 in the downstream direction (in all segments) depends on NSds; in the upstream direction, it depends on NSus.

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

Nibble i (0 <= i < MIN((NS+1)-(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 (BITSpus)"

::= { 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-bit 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 in the downstream direction depends on NSds; in the upstream direction, it depends on NSus. This value is referred to here as NS. The segment number is in xdsl2SCStatusSegment.

Value i (0 <= i < MIN((NS+1)-(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 a 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 (GAINSpds) and paragraph #7.5.1.29.4 (GAINSpus)"

::= { xdsl2SCStatusSegmentEntry 8 }

------------------------------------------------
--        xdsl2LineInventoryTable             --
------------------------------------------------

Morgenstern, et al. Standards Track [Page 97]
xdsl2LineInventoryTable OBJECT-TYPE
SYNTAX   SEQUENCE OF Xdsl2LineInventoryEntry
MAX-ACCESS not-accessible
STATUS   current
DESCRIPTION  
"The table xds12LineInventoryTable contains an inventory of the
DSL termination unit."
 ::= { xds12Inventory 1 }

xdsl2LineInventoryEntry OBJECT-TYPE
SYNTAX   Xdsl2LineInventoryEntry
MAX-ACCESS not-accessible
STATUS   current
DESCRIPTION  
"One index of this table is an interface index where the
interface
has an ifType of vdsl2(251). A second index of this table is the
termination unit."
INDEX   { ifIndex, xds12LInvUnit }
 ::= { xds12LineInventoryTable 1 }

Xdsl2LineInventoryEntry ::= SEQUENCE {
  xds12LInvUnit                      Xdsl2Unit,
  xds12LInvG994VendorId              OCTET STRING,
  xds12LInvSystemVendorId            OCTET STRING,
  xds12LInvVersionNumber             OCTET STRING,
  xds12LInvSerialNumber              OCTET STRING,
  xds12LInvSelfTestResult            Unsigned32,
  xds12LInvTransmissionCapabilities  Xdsl2TransmissionModeType
}

xdsl2LInvUnit OBJECT-TYPE
SYNTAX   Xdsl2Unit
MAX-ACCESS not-accessible
STATUS   current
DESCRIPTION  
"The termination unit."
 ::= { xds12LineInventoryEntry 1 }

xdsl2LInvG994VendorId OBJECT-TYPE
SYNTAX   OCTET STRING  (SIZE(8))
MAX-ACCESS read-only
STATUS   current
DESCRIPTION  
"The ADSL Transceiver Unit (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))
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 }

xdsl2LInvSelfTestResult 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 }

dsl2LInvTransmissionCapabilities  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 bitmap 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 }
```

```EXTERNAL-TYPE
SYNTAX Xdsl2LineConfTemplateEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "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 }
```

```Xds12LineConfTemplateEntry ::=
  SEQUENCE {
    xdsl2LConfTempTemplateName SnmpAdminString,
    xdsl2LConfTempLineProfile SnmpAdminString,
    xdsl2LConfTempChan1ConfProfile SnmpAdminString,
    xdsl2LConfTempChan1RaRatioDs Unsigned32,
    xdsl2LConfTempChan1RaRatioUs Unsigned32,
    xdsl2LConfTempChan2ConfProfile SnmpAdminString,
    xdsl2LConfTempChan2RaRatioDs Unsigned32,
    xdsl2LConfTempChan2RaRatioUs Unsigned32,
    xdsl2LConfTempChan3ConfProfile SnmpAdminString,
    xdsl2LConfTempChan3RaRatioDs Unsigned32,
    xdsl2LConfTempChan3RaRatioUs Unsigned32,
    xdsl2LConfTempChan4ConfProfile SnmpAdminString,
    xdsl2LConfTempChan4RaRatioDs Unsigned32,
    xdsl2LConfTempChan4RaRatioUs Unsigned32,
    xdsl2LConfTempRowStatus RowStatus
  }
```

```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 percent) 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 percent) 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 percent) 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 - xdsl2LConfTempChan2RaRatioDs 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
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 percent) 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 - xdsl2LConfTempChan2RaRatioUs 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 percent) 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 percent) 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 }

xdsl2LConfTempChan4ConfProfile  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 #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 }

xdsl2LConfTempChan4RaRatioDs OBJECT-TYPE
SYNTAX Unsigned32(0..100)
UNITS "percent"
MAX-ACCESS read-create
STATUS current
DESCRIPTION "Rate Adaptation Ratio. The ratio (in percent) 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 }

xdsl2LConfTempChan4RaRatioUs OBJECT-TYPE
SYNTAX Unsigned32(0..100)
UNITS "percent"
MAX-ACCESS read-create
STATUS current
DESCRIPTION "Rate Adaptation Ratio. The ratio (in percent) 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'. 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 lines. A row in this table is said to be unreferenced when there is no instance of xds12LineConfTemplate or xds12LineConfFallbackTemplate that refers to the row."

 ::= { xds12LineConfTemplateEntry 15 }

------------------------------------------
--        xds12LineConfProfTable        --
------------------------------------------

xds12LineConfProfTable  OBJECT-TYPE
SYNTAX      SEQUENCE  OF  Xdsl2LineConfProfEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION

"The table xds12LineConfProfTable contains VDSL2/ADSL/ADSL2 and ADSL2+ line configuration profiles.

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

 ::= { xds12ProfileLine 2 }

xds12LineConfProfEntry  OBJECT-TYPE
SYNTAX      Xdsl2LineConfProfEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION

"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  { xds12LConfProfProfileName }

 ::= { xds12LineConfProfTable 1 }

Xds12LineConfProfEntry  ::=  

SEQUENCE  

  xds12LConfProfProfileName          SnmpAdminString,
  xds12LConfProfScMaskDs             Xdsl2ScMaskDs,
  xds12LConfProfScMaskUs             Xdsl2ScMaskUs,
  xds12LConfProfVdsl2CarMask         Xdsl2CarMask,
  xds12LConfProfRfiBands             Xdsl2RfiBands,
  xds12LConfProfRaModeDs             Xdsl2RaMode,
  xds12LConfProfRaModeUs             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              Xds12LineSnrMode,
xdsl2LConfProfSnrModeUs              Xds12LineSnrMode,
xdsl2LConfProfTxRefVnDs              Xds12LineTxRefVnDs,
xdsl2LConfProfTxRefVnUs              Xds12LineTxRefVnUs,
xdsl2LConfProfXtuTransSysEna         Xds12TransmissionModeType,
xdsl2LConfProfPmMode                 Xds12LinePmMode,
xdsl2LConfProfL0Time                  Unsigned32,
xdsl2LConfProfL2Time                  Unsigned32,
xdsl2LConfProfL2Atpr                  Unsigned32,
xdsl2LConfProfL2Atprt                  Unsigned32,
xdsl2LConfProfProfiles              Xds12LineProfiles,
xdsl2LConfProfDpboEPsd                Xds12PsdMaskDs,
xdsl2LConfProfDpboEsEL                Unsigned32,
xdsl2LConfProfDpboEsCableModelA       Unsigned32,
xdsl2LConfProfDpboEsCableModelB       Unsigned32,
xdsl2LConfProfDpboEsCableModelC       Unsigned32,
xdsl2LConfProfDpboMus                 Unsigned32,
xdsl2LConfProfDpboFMin                 Unsigned32,
xdsl2LConfProfDpboFMax                 Unsigned32,
xdsl2LConfProfUboKL                   Unsigned32,
xdsl2LConfProfUboKLF                   Xds12UpboKLF,
xdsl2LConfProfUs0Mask                 Xds12LineUs0Mask,
xdsl2LConfProfForceInp               TruthValue,
xdsl2LConfProfRowStatus               RowStatus

xdsl2LConfProfProfileName  OBJECT-TYPE
   SYNTAX     SnmpAdminString (SIZE(1..32))
   MAX-ACCESS not-accessible
   STATUS     current
   DESCRIPTION
"This object identifies a row in this table."
 ::= { xdsl2LineConfProfEntry 1 }

xdsl2LConfProfScMaskDs OBJECT-TYPE
SYNTAX      Xdsl2ScMaskDs
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
 "Subcarrier mask.  A bitmap of 4096 bits that allows masking up to 4096 downstream subcarriers.  If bit i (0 <= i < NSCds) is set to ‘1’, the respective downstream subcarrier is masked, and if set to ‘0’, the respective subcarrier is unmasked.  Note that there should always be unmasked subcarriers (i.e., this object cannot be all 1’s).  Also note that if NSCds < 4096, all bits i (NSCds < i <= 4096) should be set to ‘1’."
REFERENCE    "ITU-T G.997.1, paragraph #7.3.1.2.6 (CARMASKds)"
 ::= { xdsl2LineConfProfEntry 2 }

xdsl2LConfProfScMaskUs OBJECT-TYPE
SYNTAX      Xdsl2ScMaskUs
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
 "Subcarrier mask.  A bitmap of 4096 bits that allows masking up to 4096 upstream subcarriers.  If bit i (0 <= i < NSCus) is set to ‘1’, the respective upstream subcarrier is masked, and if set to ‘0’, the respective subcarrier is unmasked.  Note that there should always be unmasked subcarriers (i.e., this object cannot be all 1’s).  Also note that if NSCus < 4096, all bits i (NSCus < i <= 4096) should be set to ‘1’."
REFERENCE    "ITU-T G.997.1, paragraph #7.3.1.2.7 (CARMASKus)"
 ::= { xdsl2LineConfProfEntry 3 }

xdsl2LConfProfVds12CarMask OBJECT-TYPE
SYNTAX      Xdsl2CarMask
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
 "VDSL2-specific subcarrier mask.  This configuration parameter defines the restrictions, additional to the band plan, to determine the set of subcarriers allowed for transmission in both the 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 4.3125 kHz. 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 Recommendation 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 Recommendation 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 Recommendation G.992.5). For ITU-T Recommendation 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 the 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."
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."
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-USNRMU)"
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-UTIMEds)"
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 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 #7.3.1.3.3 (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 reinitialize 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 }

xDSL2ConfProfMsgMinUs  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 bits/s."
REFERENCE    "ITU-T G.997.1, paragraph #7.3.1.5.1 (MSGMINus)"
DEFVAL       { 4000 }
::= { xdsl2LineConfProfEntry 22 }

xDSL2ConfProfMsgMinDs  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 the downstream direction. Expressed in bits per second and ranges from 4000 to 248000 bits/s."
REFERENCE    "ITU-T G.997.1, paragraph #7.3.1.5.2 (MSGMINds)"
DEFVAL       { 4000 }
::= { xdsl2LineConfProfEntry 23 }

xDSL2ConfProfCeFlag  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."
REFERENCE    "ITU-T G.997.1, paragraph #7.3.1.6.1 (CEFLAG)"
DEFVAL       { { } }
::= { xdsl2LineConfProfEntry 24 }

xDSL2ConfProfSnrModeDs  OBJECT-TYPE
SYNTAX      Xdsl2LineSnrMode
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION  "This parameter enables the transmitter-referred virtual
noise in the downstream direction."
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."
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 TXREFVNd 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), ... , (tN, PSDN)]."
REFERENCE    "ITU-T G.997.1, paragraph #7.3.1.7.3 (TXREFVNd)"
 ::=  { 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), ..., (tN, PSDN)]."
REFERENCE    "ITU-T G.997.1, paragraph #7.3.1.7.4 (TXREFVNus)"
::= { xds12LineConfProfEntry 28 }

xds12LConfProfXtuTransSysEna  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
bitmap 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)"
::= { xds12LineConfProfEntry 29 }

xds12LConfProfPmMode  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.
This is a set of bits, where any bit with a ‘1’ value
means that the xTU is allowed to transit into the respective
state and any bit with 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 } }  
::= { xds12LineConfProfEntry 30 }

xds12LConfProfL0Time  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 }  
::= { xds12LineConfProfEntry 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 }

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 Requests (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 }

xdsl2LConfProfDpboEPsd 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 xdsl2LConfProfDpboEPsd
is 16."
REFERENCE "ITU-T G.997.1, paragraph #7.3.1.2.13 (DPBOESELD)"
::= { xdsl2LineConfProfEntry 36 }

xdsl2LConfProfDpboEsEL OBJECT-TYPE
SYNTAX Unsigned32 (0..511)
UNITS "0.5 dB"
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 '0', 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
The E-side Cable Model parameter A (DPBOESCMA) 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 (DPBOESCMA)"
DEFVAL { 0 }
 ::= { xdsl2LineConfProfEntry 38 }

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 }

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 }

::= { xdsl2LineConfProfEntry 38 }

::= { xdsl2LineConfProfEntry 39 }

::= { xdsl2LineConfProfEntry 40 }
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 backoff (DPBO) depending on this value.

The cable model is in terms of three scalars

- xDSL2ConfProfDpboEsCableModelA (DPBOESCMA),
- xDSL2ConfProfDpboEsCableModelB (DPBOESCMB),
- xDSL2ConfProfDpboEsCableModelC (DPBOESCMC),

that are used to estimate the frequency dependent loss of E-side cables calculated from the xDSL2ConfProfDpboEsEL (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 }

xDSL2ConfProfDpboMus 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 }

xDSL2ConfProfDpboFMin 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 1 MHz, kl0, 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."
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
(US0MASK)"
DEFVAL { {} }
::= { xdsl2LineConfProfEntry 46 }

xdsl2LConfProfForceInp OBJECT-TYPE
SYNTAX  TruthValue
MAX-ACCESS read-create
STATUS  current
DESCRIPTION "This parameter, when set to ‘true’ 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)"
DEFVAL { false }
::= { xdsl2LineConfProfEntry 47 }

xdsl2LConfProfRowStatus 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’.
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 templates."
A row in this table is said to be unreferenced when there is no instance of xdsl2LConfTempLineProfile that refers to the row.

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.

::= { xdsl2LineConfProfEntry 48 }

------------------------------
--    xdsl2LineConfProfModeSpecTable    --
------------------------------

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. A row in this table that has an index of xdsl2LConfProfXdslMode == defMode(1), is called a ‘mandatory’ row or ‘default’ row. A row in this table that has an index such that xdsl2LConfProfXdslMode is not equal to defMode(1), is called an ‘optional’ row or ‘mode-specific’ 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 object will be rejected by the SNMP agent. The manager MAY create an ‘optional’ row in this table using the xdsl2LConfProfModeSpecRowStatus object if the parent row exists. The manager MAY delete an ‘optional’ row in this table using the xdsl2LConfProfModeSpecRowStatus object 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."
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,
    xdsl2LConfProfMaxNomPsdUs          Integer32,
    xdsl2LConfProfMaxNomAtpDs          Unsigned32,
    xdsl2LConfProfMaxNomAtpUs          Unsigned32,
    xdsl2LConfProfMaxAggRxPwrUs        Integer32,
    xdsl2LConfProfPsdMaskDs            Xdsl2PsdMaskDs,
    xdsl2LConfProfPsdMaskUs            Xdsl2PsdMaskUs,
    xdsl2LConfProfPsdMaskSelectUs      Xdsl2LinePsdMaskSelectUs,
    xdsl2LConfProfClassMask            Xdsl2LineClassMask,
    xdsl2LConfProfLimitMask            Xdsl2LineLimitMask,
    xdsl2LConfProfUs0Disable           Xdsl2LineUs0Disable,
    xdsl2LConfProfModeSpecRowStatus    RowStatus
}

Xdsl2LineConfProfXdslMode 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 }

Xdsl2LineConfProfMaxNomPsdDs OBJECT-TYPE
SYNTAX     Integer32(-600..-300)
UNITS       "0.1 dBm/Hz"
MAX-ACCESS read-create
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 }

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 }

The maximum nominal aggregate to 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 }

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 (MAXOMATPus)"
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 the first 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 second breakpoint.
Octets 6-8 - Same, for a third 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 0 and NSCDs-1. Each PSD reduction value is in the range 0 (0 dBm/Hz) to 255 (-127.5 dBm/Hz) with steps of 0.5 dBm/Hz. Valid values are in the range 0 to 190 (0 to -95 dBm/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 subcarrier 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 the first 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 second breakpoint.
Octets 6-8 - Same, for a third 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 0 and NSCus-1. Each PSD reduction value is in the range 0 (0 dBm/Hz) to 255 (-127.5 dBm/Hz) with steps of 0.5 dBm/Hz. Valid values are in the range 0 to 190 (0 to -95 dBm/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 subcarrier mask and with the RFI setup."
REFERENCE "ITU-T G.997.1, paragraph #7.3.1.2.12 (PSDMASKus)"
::= { xdsl2LineConfProfModeSpecEntry 8 }

xdsl2LConfProfPsdMaskSelectUs 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 xdsl2LConfProfXtuTransSysEna."
REFERENCE "ITU-T G.997.1, paragraph #7.3.1.2.11 (Upstream PSD mask selection)"
DEFVAL { adlu32Eu32 }
::= { xdsl2LineConfProfModeSpecEntry 9 }
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 }

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 }

This configuration parameter indicates if the use of the 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 the xdsl2LConfProfLimitMask parameter, a bit shall indicate if the US0 is disabled. The disabling parameter is coded as a bitmap. The bit is set to ‘1’ if the 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       { {} }
::= { xdsl2LineConfProfModeSpecEntry 12 }

---
--   xdsl2LineConfProfModeSpecRowStatus --
---

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.

This row is activated by setting this object to ‘active’.

A ‘mandatory’ row, as defined in the DESCRIPTION clause of xdsl2LineConfProfModeSpecTable, cannot be deleted at all.

A ‘mandatory’ row can be taken out of service (by setting this object to ‘notInService’) if the parent row in the xdsl2LineConfProfTable table is not in the ‘active’ state.

An ‘optional’ row (or ‘mode-specific’ row) can be deleted or taken out of service (by setting this object to ‘destroy’ or ‘notInService’) at any time."
::= { xdsl2LineConfProfModeSpecEntry 13 }
When a parent 'mandatory row' is created in xDSLLineConfProfModeSpecTable, the SNMP agent will automatically create several 'mandatory' rows in this table -- one for each upstream band:

Note: A mandatory row is one where xDSLLineConfProfXds1Mode = 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 xDSLLineConfProfModeSpecBandUsRowStatus object will be rejected by the SNMP agent. The manager MAY create a new 'optional' row in this table using the xDSLLineConfProfModeSpecBandUsRowStatus object if the associated parent row exists, and the value of xDSLLineConfProfXds1Mode is a G.993.2 value. The manager MAY delete an 'optional' row in this table using the xDSLLineConfProfModeSpecBandUsRowStatus object at any time.

With respect to the xDSLLineConfProfUpboPsdA and xDSLLineConfProfUpboPsdB 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."

::= { xDSLProfileLine 4 }

xDSLLineConfProfModeSpecBandUsEntry OBJECT-TYPE
SYNTAX     XDSLLineConfProfModeSpecBandUsEntry
MAX-ACCESS not-accessible
STATUS     current
DESCRIPTION "The table xDSLLineConfProfModeSpecBandUsTable extends xDSLLineConfProfModeSpecTable with upstream-band-specific parameters for VDSL2, such as upstream power back-off parameters xDSLLineConfProfUpboPsdA and xDSLLineConfProfUpboPsdB (UPBOPSD-pb)."
INDEX       { xDSLLineConfProfProfileName, xDSLLineConfProfXds1Mode, xDSLLineConfProfXds1BandUs }
::= { xDSLLineConfProfModeSpecBandUsTable 1 }

XDSLLineConfProfModeSpecBandUsEntry ::= SEQUENCE {
    xDSLLineConfProfXds1BandUs       XDSLBandUs,
    xDSLLineConfProfUpboPsdA         Integer32,
    xDSLLineConfProfUpboPsdB         Integer32,
    xDSLLineConfProfModeSpecBandUsRowStatus 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 the 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 UPBO PSD
defined for each band shall consist of two parameters [a, b].
Parameter ‘a’ (xdsl2LConfProfUpboPsdA) ranges from 40 dBm/Hz
(coded as 4000) to 80.95 dBm/Hz (coded as 8095) in steps of 0.01
dBm/Hz; and parameter ‘b’ (xdsl2LConfProfUpboPsdB) ranges from 0
dBm/Hz (coded as 0) to 40.95 dBm/Hz (coded as 4095) in steps of
0.01 dBm/Hz. The UPBO reference PSD at the frequency ‘f’
expressed in MHz shall be equal to ‘-a-b(SQRT(f))’. Setting
xdsl2LConfProfUpboPsdA to 4000 and 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 }

xdsl2LConfProfUpboPsdB OBJECT-TYPE
SYNTAX       Integer32(0..4095)
UNITS        "0.01 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 UPBO PSD
defined for each band shall consist of two parameters [a, b].
Parameter ‘a’ (xdsl2LConfProfUpboPsdA) ranges from 40 dBm/Hz
(coded as 4000) to 80.95 dBm/Hz (coded as 8095) in steps of 0.01
dBm/Hz; and parameter ‘b’ (xdsl2LConfProfUpboPsdB) ranges from 0
dBm/Hz (coded as 0) to 40.95 dBm/Hz (coded as 4095) in steps of
0.01 dBm/Hz. The UPBO reference PSD at the frequency ‘f’
expressed in MHz shall be equal to ‘-a-b(SQRT(f))’. Setting xdsl2LConfProfUpboPsdA to 4000 and 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 }

------------------------------------------------
--          xdsl2ChConfProfileTable           --
------------------------------------------------

xdsl2ChConfProfileTable  OBJECT-TYPE
SYNTAX      SEQUENCE  OF  Xdsl2ChConfProfileEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
   "The table xdsl2ChConfProfileTable contains DSL channel profile configuration.

   Entries in this table MUST be maintained in a persistent manner."
::= { xdsl2ProfileChannel 1 }
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 { xds12ChConfProfProfileName }
::= { xds12ChConfProfileTable 1 }

Xds12ChConfProfileEntry ::=
  SEQUENCE {
    xds12ChConfProfProfileName          SnmpAdminString,
    xds12ChConfProfMinDataRateDs        Unsigned32,
    xds12ChConfProfMinDataRateUs        Unsigned32,
    xds12ChConfProfMinResDataRateDs     Unsigned32,
    xds12ChConfProfMinResDataRateUs     Unsigned32,
    xds12ChConfProfMaxDataRateDs        Unsigned32,
    xds12ChConfProfMaxDataRateUs        Unsigned32,
    xds12ChConfProfMinDataRateLowPwrDs  Unsigned32,
    xds12ChConfProfMinDataRateLowPwrUs  Unsigned32,
    xds12ChConfProfMaxDelayDs           Unsigned32,
    xds12ChConfProfMaxDelayUs           Unsigned32,
    xds12ChConfProfMinProtectionDs      Xdsl2SymbolProtection,
    xds12ChConfProfMinProtectionUs      Xdsl2SymbolProtection,
    xds12ChConfProfMinProtection8Ds     Xdsl2SymbolProtection8,
    xds12ChConfProfMinProtection8Us     Xdsl2SymbolProtection8,
    xds12ChConfProfMaxBerDs             Xdsl2MaxBer,
    xds12ChConfProfMaxBerUs             Xds12MaxBer,
    xds12ChConfProfUsDataRateDs         Unsigned32,
    xds12ChConfProfDsDataRateDs         Unsigned32,
    xds12ChConfProfUsDataRateUs         Unsigned32,
    xds12ChConfProfDsDataRateUs         Unsigned32,
    xds12ChConfProfImaEnabled           TruthValue,
    xds12ChConfProfMaxDelayVar          Unsigned32,
    xds12ChConfProfInitPolicy           Xds12ChInitPolicy,
    xds12ChConfProfRowStatus            RowStatus
  }

xds12ChConfProfProfileName  OBJECT-TYPE
SYNTAX      SnmpAdminString (SIZE(1..32))
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
  "This object identifies a row in this table."
::= { xds12ChConfProfileEntry 1 }

xds12ChConfProfMinDataRateDs  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 }

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 }

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 Recommendations
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 Recommendations
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
(Xds12ChStatusActDelay) 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
(Xds12ChStatusActDelay) 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
   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 (INPMINus)"
   DEFVAL       { noProtection }
   ::= { xdsl2ChConfProfileEntry 13 }

xdsl2ChConfProfMinProtection8Ds OBJECT-TYPE
   SYNTAX       Xdsl2SymbolProtection8
   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 8.625 kHz. The impulse noise protection is expressed in DMT symbols with a subcarrier spacing of 8.625 kHz."
   REFERENCE    "ITU-T G.997.1, paragraph #7.3.2.4 (INPMIN8ds)"

Morgenstern, et al. Standards Track [Page 139]
DEFVAL       { noProtection }  
::= { xdsl2ChConfProfileEntry 14 }  

xdsl2ChConfProfMinProtection8Us  OBJECT-TYPE 
SYNTAX      Xdsl2SymbolProtection8  
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 8.625 kHz. The impulse  
noise protection is expressed in DMT symbols with a subcarrier  
spacing of 8.625 kHz."  
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."  
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."  
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. 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 }
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. 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 }

---

>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’.

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.

A row in xdsl2ChConfProfTable is said to be unreferenced when there is no instance of xdsl2LConfTempChan1ConfProfile, xdsl2LConfTempChan2ConfProfile, xdsl2LConfTempChan3ConfProfile, or xdsl2LConfTempChan4ConfProfile that refers to the row.

::= { xdsl2ChConfProfileEntry 25 }

---

>This table contains DSL line alarm configuration templates.

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

::= { xdsl2ProfileAlarmConf 1 }

>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 RowStatus
}

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 Thresholds 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."
REFERENCE "DSL Forum TR-129, paragraph #8.4"
DEFVAL { "DEFVAL" } ::= { xdsl2LineAlarmConfTemplateEntry 3 }

xdsl2LAAlarmConfTempChan2ConfProfile 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 #2. 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 }

xdsl2LAAlarmConfTempChan3ConfProfile 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 xdsl2LAAlarmConfTempChan2ConfProfile contains a non-zero-length string."
REFERENCE "DSL Forum TR-129, paragraph #8.4"
DEFVAL { "" }
 ::= { xdsl2LineAlarmConfTemplateEntry 5 }

xdsl2LAAlarmConfTempChan4ConfProfile 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’.

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.

A row in this table is said to be unreferenced when there is no instance of xdsl2LineAlarmConfTemplate that refers to the row."
::= { xdsl2LineAlarmConfTemplateEntry 7 }

--      xdsl2LineAlarmConfProfileTable        --
--  xdsl2ProfileAlarmConf 2  --

xdsl2LineAlarmConfProfileTable  OBJECT-TYPE
SYNTAX      SEQUENCE  OF  Xdsl2LineAlarmConfProfileEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
"The table xdsl2LineAlarmConfProfileTable contains DSL line performance threshold values.

If a performance counter exceeds the threshold value specified in this table, then the SNMP agent will issue a threshold trap. Each performance counter has a unique trap type (see NOTIFICATION-TYPE definitions below). One trap will be sent per interval, per interface, per trap type. A value of 0 will disable the trap.

Entries in this table MUST be maintained in a persistent manner."
::= { xdsl2ProfileAlarmConf 2 }
xdsl2LineAlarmConfProfileEntry  OBJECT-TYPE
SYNTAX     Xdsl2LineAlarmConfProfileEntry
MAX-ACCESS not-accessible
STATUS      current
DESCRIPTION "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  { xdsl2LineAlarmConfProfileName }
::= { xdsl2LineAlarmConfProfileTable 1 }

Xdsl2LineAlarmConfProfileEntry ::= SEQUENCE {
  xdsl2LineAlarmConfProfileName                SnmpAdminString,
  xdsl2LineAlarmConfProfileXtucThresh15MinFecs  HCPerfIntervalThreshold,
  xdsl2LineAlarmConfProfileXtucThresh15MinEs    HCPerfIntervalThreshold,
  xdsl2LineAlarmConfProfileXtucThresh15MinSes   HCPerfIntervalThreshold,
  xdsl2LineAlarmConfProfileXtucThresh15MinLoss HCPerfIntervalThreshold,
  xdsl2LineAlarmConfProfileXturThresh15MinFecs  HCPerfIntervalThreshold,
  xdsl2LineAlarmConfProfileXturThresh15MinEs    HCPerfIntervalThreshold,
  xdsl2LineAlarmConfProfileXturThresh15MinSes   HCPerfIntervalThreshold,
  xdsl2LineAlarmConfProfileXturThresh15MinLoss HCPerfIntervalThreshold,
  xdsl2LineAlarmConfProfileXturThresh15MinUas   HCPerfIntervalThreshold,
  xdsl2LineAlarmConfProfileThresh15MinFailedFullInt   Unsigned32,
  xdsl2LineAlarmConfProfileThresh15MinFailedShrtInt   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 }

::= { xdsl2LineAlarmConfProfileEntry 6 }

::= { xdsl2LineAlarmConfProfileEntry 7 }

::= { 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"
MAX-ACCESS read-create
STATUS     current
DESCRIPTION
 "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 }

xdsl2LineAlarmConfProfileXturThresh15MinUas  OBJECT-TYPE
SYNTAX    HCPerfIntervalThreshold
UNITS      "seconds"
MAX-ACCESS read-create
STATUS     current
DESCRIPTION
 "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 }

xdsl2LineAlarmConfProfileThresh15MinFailedFullInt  OBJECT-TYPE
SYNTAX    Unsigned32
MAX-ACCESS read-create
STATUS     current
DESCRIPTION
"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 }

xdsl2LineAlarmConfProfileThresh15MinFailedShrtInt OBJECT-TYPE
SYNTAX Unsigned32
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"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’.
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.
A row in this table is said to be unreferenced when there is no instance of xdsl2LAlarmConfTempLineProfile that refers to the row."
::= { xdsl2LineAlarmConfProfileEntry 14 }

-- xds12ChAlarmConfProfileTable --

xdsl2ChAlarmConfProfileTable OBJECT-TYPE
SYNTAX SEQUENCE OF Xdsl2ChAlarmConfProfileEntry
MAX-ACCESS not-accessible
The table `xdsl2ChAlarmConfProfileTable` contains DSL channel performance threshold values.

If a performance counter exceeds the threshold value specified in this table, then the SNMP agent will issue a threshold trap. Each performance counter has a unique trap type (see NOTIFICATION-TYPE definitions below). One trap will be sent per interval per interface per trap type. A value of 0 will disable the trap.

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

```plaintext
::= { xdsl2ProfileAlarmConf 3 }
```

```plaintext
xdsl2ChAlarmConfProfileEntry  OBJECT-TYPE
SYNTAX  Xdsl2ChAlarmConfProfileEntry
MAX-ACCESS not-accessible
STATUS  current
DESCRIPTION
"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 }
```

```plaintext
Xdsl2ChAlarmConfProfileEntry ::= SEQUENCE {
    xdsl2ChAlarmConfProfileName  SnmpAdminString,
    xdsl2ChAlarmConfProfileXtucThresh15MinCodingViolations  Unsigned32,
    xdsl2ChAlarmConfProfileXtucThresh15MinCorrected  Unsigned32,
    xdsl2ChAlarmConfProfileXturThresh15MinCodingViolations  Unsigned32,
    xdsl2ChAlarmConfProfileXturThresh15MinCorrected  Unsigned32,
    xdsl2ChAlarmConfProfileRowStatus                RowStatus
}
```

```plaintext
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 xdsl2PMChCurr15MCodingViolations counter, when xdsl2PMChCurrUnit 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 xdsl2PMChCurr15MCorrectedBlocks counter, when xdsl2PMChCurrUnit 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’. 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.
A row in xdsl2ChConfProfTable is said to be unreferenced when
there is no instance of xdsl2LAlarmConfTempChan1ConfProfile,
xdsl2LAlarmConfTempChan2ConfProfile,
xdsl2LAlarmConfTempChan3ConfProfile, or
xdsl2LAlarmConfTempChan4ConfProfile that refers to
the row."
 ::= { xdsl2ChAlarmConfProfileEntry 6 }

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

xdsl2PMLineCurrTable  OBJECT-TYPE
SYNTAX      SEQUENCE  OF  Xdsl2PMLineCurrEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
 "The table xdsl2PMLineCurrTable contains current Performance
Monitoring results for DSL lines."
 ::= { xdsl2PMLine 1 }

xdsl2PMLineCurrEntry  OBJECT-TYPE
SYNTAX      Xdsl2PMLineCurrEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
 "One index of this table is an interface index where the
interface has an ifType of vds12(251). A second index of this
table is the termination unit."
INDEX  { ifIndex, xdsl2PMLCurrUnit }
::= { xdsl2PMLineCurrTable 1 }

Xdsl2PMLineCurrEntry  ::=  
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."
 ::= { xdsl2PMLineCurrEntry 1 }

xdsl2PMLCurr15MValidIntervals  OBJECT-TYPE
SYNTAX      Unsigned32 (0..96)
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION   "The number of 15-minute PM intervals for which data was collected. The value will typically be equal to the maximum number of 15-minute intervals the implementation is planned to store (i.e., beyond the scope of this MIB module) unless the measurement was (re-)started recently, in which case the value will be the number of complete 15-minute intervals for which the agent has at least some data. In certain cases (e.g., in the case where the agent is a proxy), it is possible that some intervals are unavailable. In this case, this interval is the maximum interval number for which data is available."
 ::= { xdsl2PMLineCurrEntry 2 }
xdsl2PMLCurr15MIvalidIntervals  OBJECT-TYPE
SYNTAX      Unsigned32 (0..96)
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
  "The number of 15-minute PM intervals for which no data is
available. The value will typically be zero except in cases
where the data for some intervals are not available (e.g.,
in proxy situations)."
 ::= { xdsl2PMLLineCurrEntry 3 }

xdsl2PMLCurr15MTimeElapsed  OBJECT-TYPE
SYNTAX      HCPerfTimeElapsed
UNITS       "seconds"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
  "Total elapsed seconds in this interval."
 ::= { xdsl2PMLLineCurrEntry 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)"
 ::= { xdsl2PMLLineCurrEntry 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 }
xds12PMLCurr15MSes  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)"
 ::= { xds12PLineCurrEntry 7 }

xds12PMLCurr15MLoss  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)"
 ::= { xds12PLineCurrEntry 8 }

xds12PMLCurr15MUas  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)"
 ::= { xds12PLineCurrEntry 9 }

xds12PMLCurr1DayValidIntervals  OBJECT-TYPE
SYNTAX     Unsigned32 (0..30)
MAX-ACCESS read-only
STATUS     current

Morgenstern, et al. Standards Track [Page 157]
DESCRIPTION
"The number of 24-hour PM intervals for which data was collected. The value will typically be equal to the maximum number of 24-hour intervals the implementation is planned to store (i.e., beyond the scope of this MIB module) unless the measurement was (re-)started recently, in which case the value will be the number of complete 24-hour intervals for which the agent has at least some data. In certain cases (e.g., in the case where the agent is a proxy), it is possible that some intervals are unavailable. In this case, this interval is the maximum interval number for which data is available."
::= { xdsl2PMLineCurrEntry 10 }

xdsl2PMLCurr1DayInvalidIntervals OBJECT-TYPE
SYNTAX          Unsigned32 (0..30)
MAX-ACCESS      read-only
STATUS          current
DESCRIPTION
"The number of 24-hour PM intervals for which no data is available. The value will typically be zero except in cases where the data for some intervals are not available (e.g., in proxy situations)."
::= { 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.
    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)"
::= { xdsl2PMLineCurrEntry 14 }

xdsl2PMLCurr1DaySes 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)"
::= { xdsl2PMLineCurrEntry 15 }

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)"
::= { xdsl2PMLineCurrEntry 16 }

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
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 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 index of this table is an interface index where the
interface has an ifType of vdsl2(251)."
INDEX  { ifIndex }
::= { xdsl2PMLineInitCurrTable 1 }

Xdsl2PMLineInitCurrEntry  ::=  
SEQUENCE  {
    xdsl2PMLInitCurr15MValidIntervals  Unsigned32,
    xdsl2PMLInitCurr15MInvalidIntervals Unsigned32,
    xdsl2PMLInitCurr15MTimeElapsed      Unsigned32,
    xdsl2PMLInitCurr15MFullInits        Unsigned32,
    xdsl2PMLInitCurr15MFailedFullInits  Unsigned32,
    xdsl2PMLInitCurr15MShortInits       Unsigned32,
    xdsl2PMLInitCurr15MFailedShortInits Unsigned32,
    xdsl2PMLInitCurr1DayValidIntervals  Unsigned32,
    xdsl2PMLInitCurr1DayInvalidIntervals Unsigned32,
    xdsl2PMLInitCurr1DayElapsedTime     Unsigned32,
    xdsl2PMLInitCurr1DayFullInits       Unsigned32,
    xdsl2PMLInitCurr1DayFailedFullInits Unsigned32,
    xdsl2PMLInitCurr1DayFailedShortInits Unsigned32,

Morgenstern, et al. Standards Track [Page 160]
xdsl2PMLInitCurr1DayShortInits
    Unsigned32,
xdsl2PMLInitCurr1DayFailedShortInits
    Unsigned32
}

xdsl2PMLInitCurr15MValidIntervals
    OBJECT-TYPE
    SYNTAX
      Unsigned32 (0..96)
    MAX-ACCESS
      read-only
    STATUS
      current
    DESCRIPTION
      "The number of 15-minute PM intervals for which data
was collected. The value will typically be equal to the maximum
number of 15-minute intervals the implementation is planned to
store (i.e., beyond the scope of this MIB module) unless the
measurement was (re-)started recently, in which case the value
will be the number of complete 15-minute intervals for which
the agent has at least some data. In certain cases (e.g., in
the case where the agent is a proxy), it is possible that some
intervals are unavailable. In this case, this interval is the
maximum interval number for which data is available."
::= { xdsl2PMLLineInitCurrEntry 1 }

xdsl2PMLInitCurr15MInvalidIntervals
    OBJECT-TYPE
    SYNTAX
      Unsigned32 (0..96)
    MAX-ACCESS
      read-only
    STATUS
      current
    DESCRIPTION
      "The number of 15-minute PM intervals for which no data is
available. The value will typically be zero except in cases
where the data for some intervals are not available (e.g.,
in proxy situations)."
::= { xdsl2PMLLineInitCurrEntry 2 }

xdsl2PMLInitCurr15MTimeElapsed
    OBJECT-TYPE
    SYNTAX
      Unsigned32
    UNITS
      "seconds"
    MAX-ACCESS
      read-only
    STATUS
      current
    DESCRIPTION
      "Total elapsed seconds in this interval."
    ::= { xdsl2PMLLineInitCurrEntry 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"
::= { xdsl2PMLineInitCurrEntry 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"
::= { xdsl2PMLineInitCurrEntry 7 }

xdsl2PMLInitCurr1DayValidIntervals OBJECT-TYPE
SYNTAX Unsigned32 (0..30)
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The number of 24-hour PM intervals for which data was collected. The value will typically be equal to the maximum number of 24-hour intervals the implementation is planned to store (i.e., beyond the scope of this MIB module) unless the measurement was (re-)started recently, in which case the value will be the number of complete 24-hour intervals for which the agent has at least some data. In certain cases (e.g., in the case where the agent is a proxy), it is possible that some intervals are unavailable. In this case, this interval is the maximum interval number for which data is available."
::= { xdsl2PMLLineInitCurrEntry 8 }

xdsl2PMLInitCurr1DayInvalidIntervals OBJECT-TYPE
SYNTAX     Unsigned32 (0..30)
MAX-ACCESS read-only
STATUS     current
DESCRIPTION
"The number of 24-hour PM intervals for which no data is available. The value will typically be zero except in cases where the data for some intervals are not available (e.g., in proxy situations)."
::= { 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"
::= { xdsl2PMLLineInitCurrEntry 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"
::= { xdsl2PMLLineInitCurrEntry 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"
::= { xdsl2PMLLineInitCurrEntry 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"
::= { xdsl2PMLLineInitCurrEntry 14 }

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

xdsl2PMLLineHist15MinTable    OBJECT-TYPE
SYNTAX      SEQUENCE  OF  Xdsl2PMLineHist15MinEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
"The table xdsl2PMLLineHist15MinTable contains PM line history
for 15-minute intervals of DSL line."
::= { xdsl2PMLine 3 }

xdsl2PMLLineHist15MinEntry  OBJECT-TYPE
SYNTAX      Xdsl2PMLineHist15MinEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
"One index of this table is an interface index where the
interface has an ifType of vdsl2(251). A second index of this
table is the transmission unit. The third index is the interval
number."
INDEX  { ifIndex,
        xdsl2PMLHist15MUnit,
        xdsl2PMLHist15MInterval }
::= { xdsl2PMLLineHist15MinTable 1 }

Xdsl2PMLLineHist15MinEntry  ::=  
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."
::= { xdsl2PMLineHist15MinEntry 1 }

xdsl2PMLHist15MInterval  OBJECT-TYPE
SYNTAX      Unsigned32 (1..96)
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
  "The interval number."
::= { xdsl2PMLineHist15MinEntry 2 }

xdsl2PMLHist15MMonitoredTime  OBJECT-TYPE
SYNTAX      Unsigned32
UNITs       "seconds"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
  "Total seconds monitored in this interval."
::= { xdsl2PMLineHist15MinEntry 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)"
::= { xdsl2PMLineHist15MinEntry 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)"
::= { xdsl2PMLineHist15MinEntry 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)"

::= { xdsl2PMLLineHist15MinEntry 8 }

xdsl2PMLHist15MValidInterval  OBJECT-TYPE
SYNTAX      TruthValue
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION  "This variable indicates if the data for this interval is valid."
::= { xdsl2PMLLineHist15MinEntry 9 }

-- PM line history 1 Day --

-- ---------------------------------------
--       PM line history 1 Day       --
-- ---------------------------------------

xdsl2PMLLineHist1DayTable  OBJECT-TYPE
SYNTAX      SEQUENCE  OF  Xdsl2PMLineHist1DayEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION  "The table xdsl2PMLLineHist1DayTable contains PM line history for 24-hour intervals of DSL line."
::= { xdsl2PMLine 4 }

xdsl2PMLLineHist1DayEntry  OBJECT-TYPE
SYNTAX      Xdsl2PMLineHist1DayEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION  "One index of this table is an interface index where the interface has an ifType of vdsl2(251). A second index of this table is the transmission unit. The third index is the interval number."
INDEX  { ifIndex,
         xdsl2PMLHist1DUnit,
         xdsl2PMLHist1DInterval }
::= { xdsl2PMLineHist1DayTable 1 }

Xdsl2PMLineHist1DayEntry  ::=  
SEQUENCE  {
   xdsl2PMLHist1DUnit    Xdsl2Unit,
...
xdsl2PMLHist1DInterval OBJECT-TYPE
SYNTAX      Unsigned32
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION  "The interval number."
::= { xdsl2PMLineHist1DayEntry 1 }

xdsl2PMLHist1DMonitoredTime OBJECT-TYPE
SYNTAX      Unsigned32 (1..30)
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION  "The interval number."
::= { xdsl2PMLineHist1DayEntry 2 }

xdsl2PMLHist1DInterval 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 }

xdsl2PMLHist1DLoss  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 }

xdsl2PMLHist1DUas  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)"
 ::= { xds1PMLLineHist1DayEntry 8 }

xds1PMLHist1DValidInterval OBJECT-TYPE
SYNTAX TruthValue
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"This variable indicates if the data for this interval is
valid."
 ::= { xds1PMLLineHist1DayEntry 9 }

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

xds1PMLineInitHist15MinTable OBJECT-TYPE
SYNTAX SEQUENCE OF Xdsl2PMLineInitHist15MinEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The table xds1PMLineInitHist15MinTable contains PM line
initialization history for 15-minute intervals of DSL
line."
 ::= { xds1PMLine 5 }

xds1PMLineInitHist15MinEntry OBJECT-TYPE
SYNTAX Xdsl2PMLineInitHist15MinEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"One index of this table is an interface index where the
interface has an ifType of vds12(251). A second index is the
interval number."
INDEX { ifIndex,
    xds1PMLInitHist15MInterval }
 ::= { xds1PMLineInitHist15MinTable 1 }
Xdsl2PMLInitHist15MinEntry ::= 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 }

Morgenstern, et al.         Standards Track                   [Page 171]
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
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"
::= { xdsl2PMLLineInitHist15MinEntry 6 }

xdsl2PMLInitHist15MValidInterval OBJECT-TYPE
SYNTAX TruthValue
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"This variable indicates if the data for this interval is valid."
::= { xdsl2PMLLineInitHist15MinEntry 7 }

-------------------------------------------
--       PM line init history 1 Day      --
-------------------------------------------

xdsl2PMLLineInitHist1DayTable OBJECT-TYPE
SYNTAX SEQUENCE  OF  Xdsl2PMLineInitHist1DayEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The table xdsl2PMLLineInitHist1DayTable contains PM line initialization history for 24-hour intervals for DSL lines."
::= { xdsl2PMLine 6 }

xdsl2PMLLineInitHist1DayEntry OBJECT-TYPE
SYNTAX  Xdsl2PMLineInitHist1DayEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"One index of this table is an interface index where the interface has an ifType of vdsl2(251). A second index is the interval number."

INDEX { ifIndex, xdsl2PMLInitHist1DInterval }
::= { xdsl2PMLineInitHist1DayTable 1 }

Xdsl2PMLineInitHist1DayEntry ::= 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

Morgenstern, et al. Standards Track [Page 173]
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
(successful 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
"One index of this table is an interface index where the
interface has an ifType of a DSL channel. A second index of
this table is the termination unit."
INDEX  { ifIndex, xdsl2PMChCurrUnit }
::= { xdsl2PMChCurrTable 1 }

Xdsl2PMChCurrEntry  ::=  
SEQUENCE  {
  xdsl2PMChCurrUnit                     Xdsl2Unit,
  xdsl2PMChCurr15MValidIntervals        Unsigned32,
  xdsl2PMChCurr15MInvalidIntervals      Unsigned32,
  xdsl2PMChCurr15MTimeElapsed           HCPerfTimeElapsed,
  xdsl2PMChCurr15MCodingViolations      Unsigned32,
  xdsl2PMChCurr15MCorrectedBlocks       Unsigned32,
  xdsl2PMChCurr1DayValidIntervals       Unsigned32,
  xdsl2PMChCurr1DayInvalidIntervals     Unsigned32,
  xdsl2PMChCurr1DayTimeElapsed          HCPerfTimeElapsed,
  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 (0..96)
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"The number of 15-minute PM intervals for which data
was collected. The value will typically be equal to the maximum
number of 15-minute intervals the implementation is planned to
store (i.e., beyond the scope of this MIB module) unless the
measurement was (re-)started recently, in which case the value
will be the number of complete 15-minute intervals for which
the agent has at least some data. In certain cases (e.g., in
the case where the agent is a proxy), it is possible that some
intervals are unavailable. In this case, this interval is the
maximum interval number for which data is available.

::= { xdsl2PMChCurrEntry 2 }

xdsl2PMChCurr15MInvalidIntervals  OBJECT-TYPE
SYNTAX       Unsigned32 (0..96)
MAX-ACCESS   read-only
STATUS       current
DESCRIPTION
"The number of 15-minute PM intervals for which no data is available. The value will typically be zero except in cases where the data for some intervals are not available (e.g., in proxy situations)."

::= { xdsl2PMChCurrEntry 3 }

xdsl2PMChCurr15MTimeElapsed  OBJECT-TYPE
SYNTAX       HCPerfTimeElapsed
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 (0..30)
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
 "The number of 24-hour PM intervals for which data was collected. The value will typically be equal to the maximum number of 24-hour intervals the implementation is planned to store (i.e., beyond the scope of this MIB module) unless the measurement was (re-)started recently, in which case the value will be the number of complete 24-hour intervals for which the agent has at least some data. In certain cases (e.g., in the case where the agent is a proxy), it is possible that some intervals are unavailable. In this case, this interval is the maximum interval number for which data is available."
::= { xdsl2PMChCurrEntry 7 }

xdsl2PMChCurr1DayInvalidIntervals  OBJECT-TYPE
SYNTAX      Unsigned32 (0..30)
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
 "The number of 24-hour PM intervals for which no data is available. The value will typically be zero except in cases where the data for some intervals are not available (e.g., in proxy situations)."
::= { 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 --
---------------------------------------------

xdsl2PMChHist15MinTable     OBJECT-TYPE
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
"One index of this table is an interface index where the interface has an ifType of a DSL channel. A second index of this table is the transmission unit. The third index is the 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 #7.2.2.1 (CV-CFE)"
::= { xdsl2PMChHist15MinEntry 4 }

\textit{xdsl2PMChHist15MCorrectedBlocks \hspace{1em} OBJECT-TYPE}
\texttt{SYNTAX \hspace{1em} Unsigned32}
\texttt{MAX-ACCESS \hspace{1em} read-only}
\texttt{STATUS \hspace{1em} current}
\texttt{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."
\texttt{REFERENCE \hspace{1em} "ITU-T G.997.1, paragraph #7.2.2.1.2 (FEC-C) and paragraph #7.2.2.2.2 (FEC-CFE)"}
::= { xdsl2PMChHist15MinEntry 5 }

\textit{xdsl2PMChHist15MValidInterval \hspace{1em} OBJECT-TYPE}
\texttt{SYNTAX \hspace{1em} TruthValue}
\texttt{MAX-ACCESS \hspace{1em} read-only}
\texttt{STATUS \hspace{1em} current}
\texttt{DESCRIPTION}
"This variable indicates if the data for this interval is valid."
::= { xdsl2PMChHist15MinEntry 6 }

-- PM channel history 1 Day --

\textit{xdsl2PMChHist1DTable \hspace{1em} OBJECT-TYPE}
\texttt{SYNTAX \hspace{1em} SEQUENCE OF Xdsl2PMChHist1DEntry}
\texttt{MAX-ACCESS \hspace{1em} not-accessible}
\texttt{STATUS \hspace{1em} current}
\texttt{DESCRIPTION}
"The table xdsl2PMChHist1DTable contains Performance Monitoring (PM) history for 1-day intervals for DSL channels PM."
::= { xdsl2PMChannel 3 }

\textit{xdsl2PMChHist1DEntry \hspace{1em} OBJECT-TYPE}
\texttt{SYNTAX \hspace{1em} Xdsl2PMChHist1DEntry}
\texttt{MAX-ACCESS \hspace{1em} not-accessible}
\texttt{STATUS \hspace{1em} current}
\texttt{DESCRIPTION}
"One index of this table is an interface index where the interface has an ifType of a DSL channel. A second index of
this table is the transmission unit. The third index is the
interval number."
INDEX { ifIndex,
  xDSL2PMChHist1DUnit,
  xDSL2PMChHist1DInterval }
::= { xDSL2PMChHist1DTable 1 }

XDSL2PMChHist1DEntry ::= 
SEQUENCE {
  xDSL2PMChHist1DUnit                      XDSL2Unit,
  xDSL2PMChHist1DInterval                  Unsigned32,
  xDSL2PMChHist1DMonitoredTime             Unsigned32,
  xDSL2PMChHist1DCodingViolations          Unsigned32,
  xDSL2PMChHist1DCorrectedBlocks           Unsigned32,
  xDSL2PMChHist1DValidInterval             TruthValue
}

xDSL2PMChHist1DUnit  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
{
  xdsl2PMLCurr15MSes,
  xdsl2LineAlarmConfProfileXtucThresh15MinSes
}  
STATUS current
DESCRIPTION
"This notification indicates that the severely errored seconds
threshold has been reached/exceeded for the referred xTU-C."
::= { xdsl2Notifications 5 }

Morgenstern, et al. Standards Track [Page 183]
xdsl2LinePerfSESThreshXtuc NOTIFICATION-TYPE
  OBJECTS
  
  xdsl2PMLCurr15MSes,
  xdsl2LineAlarmConfProfileXtucThresh15MinSes

  STATUS current

  DESCRIPTION
  "This notification indicates that the severely errored seconds
   threshold has been reached/exceeded for the referred xTU-C."

  ::= { 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 }

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-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 }
xdsl2LinePerfUAStreshXtur 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."
MODULE  -- this module
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  xdsl2ChannelStatusPtmGroup
   DESCRIPTION
   "The group of status objects required when the data path is PTM."

GROUP  xdsl2LineConfProfRaGroup
   DESCRIPTION
   "The group of objects required for controlling the rate-adaptive behavior of the line."

GROUP  xdsl2LineConfProfMsgMinGroup
   DESCRIPTION
   "The group of objects required for controlling the rate reserved for Overhead traffic."

GROUP  xdsl2LineAlarmConfProfileGroup
   DESCRIPTION
   "The group of objects that define the alarm thresholds on line-level PM counters."

GROUP  xdsl2ChAlarmConfProfileGroup
   DESCRIPTION
   "The group of objects that define the alarm thresholds on channel-level PM counters."
GROUP  xDSL2ChConfProfileAtmGroup
  DESCRIPTION
   "The group of configuration objects required when the data
    path is ATM."

GROUP  xDSL2ChConfProfileMinResGroup
  DESCRIPTION
   "The group of configuration objects required for the
    reserved data rate."

GROUP  xDSL2ChConfProfileOptAttrGroup
  DESCRIPTION
   "The group of various optional channel configuration
    objects."

GROUP  xDSL2PMLineInitCurrShortGroup
  DESCRIPTION
   "The group of PM counters for the current intervals short
    initializations."

GROUP  xDSL2PMLineInitHist15MinShortGroup
  DESCRIPTION
   "The group of PM counters for the previous 15-minute
    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 the 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
{
  xdsl2LineConfTemplate,
  xdsl2LineAlarmConfTemplate,
  xdsl2LineCmdConfPmsf,
  xdsl2LineCmdConfLdsf,
  xdsl2LineCmdConfLdsfFailReason,
  xdsl2LineCmdConfAutomodeColdStart,
  xdsl2LineCmdConfReset,
  xdsl2LineStatusXtuTransSys,
  xdsl2LineStatusPwrMngState,
  xdsl2LineStatusInitResult,
  xdsl2LineStatusLastStateDs,
  xdsl2LineStatusLastStateUs,
  xdsl2LineStatusXtur,
  xdsl2LineStatusXtuc,
  xdsl2LineStatusAttainableRateDs,
  xdsl2LineStatusAttainableRateUs,
  xdsl2LineStatusActPsdDs,
  xdsl2LineStatusActPsdUs,
  xdsl2LineStatusActAtpDs,
  xdsl2LineStatusActAtpUs,
  xdsl2LineStatusActProfile,
  xdsl2LineStatusActLimitMask,
  xdsl2LineStatusActUs0Mask,
  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
{

xdsl2LineConfFallbackTemplate,
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,
  xdsl2LineCmndConfBpscRequests
}

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
{
    xdsl2ChStatusPtmStatus
}
STATUS     current  
DESCRIPTION  "The group of status objects on the data path level  
when it is PTM."  
::= { xdsl2Groups 7 }

xdsl2SCStatusGroup OBJECT-GROUP
OBJECTS
{
    xdsl2SCStatusLinScale,  
    xdsl2SCStatusLinScGroupSize,  
    xdsl2SCStatusLogMt,  
    xdsl2SCStatusLogScGroupSize,  
    xdsl2SCStatusQlnMt,  
    xdsl2SCStatusQlnScGroupSize,  
    xdsl2SCStatusSnrMtime,  
    xdsl2SCStatusSnrScGroupSize,  
    xdsl2SCStatusBandLnAtten,  
    xdsl2SCStatusBandSigAtten,  
    xdsl2SCStatusAttainableRate,  
    xdsl2SCStatusRowStatus,  
    xdsl2SCStatusSegmentLinReal,  
    xdsl2SCStatusSegmentLinImg,  

xdsl2SCStatusSegmentLog,
xdsl2SCStatusSegmentQln,
xdsl2SCStatusSegmentSnr,
xdsl2SCStatusSegmentBitsAlloc,
xdsl2SCStatusSegmentGainAlloc
}

STATUS     current
DESCRIPTION
 "The group of status objects on the subcarrier level. They are updated as a result of a DELT process."
 ::= { xdsl2Groups 8 }

xdsl2LineInventoryGroup OBJECT-GROUP
OBJECTS
{
  xdsl2LInvG994VendorId,
  xdsl2LInvSystemVendorId,
  xdsl2LInvVersionNumber,
  xdsl2LInvSerialNumber,
  xdsl2LInvSelfTestResult,
  xdsl2LInvTransmissionCapabilities
}

STATUS     current
DESCRIPTION
 "The group of inventory objects per xTU."
 ::= { xdsl2Groups 9 }

xdsl2LineConfTemplateGroup OBJECT-GROUP
OBJECTS
{
  xdsl2LConfTempLineProfile,
  xdsl2LConfTempChan1ConfProfile,
  xdsl2LConfTempChan1RaRatioDs,
  xdsl2LConfTempChan1RaRatioUs,
  xdsl2LConfTempChan2ConfProfile,
  xdsl2LConfTempChan2RaRatioDs,
  xdsl2LConfTempChan2RaRatioUs,
  xdsl2LConfTempChan3ConfProfile,
  xdsl2LConfTempChan3RaRatioDs,
  xdsl2LConfTempChan3RaRatioUs,
  xdsl2LConfTempChan4ConfProfile,
  xdsl2LConfTempChan4RaRatioDs,
  xdsl2LConfTempChan4RaRatioUs,
  xdsl2LConfTempRowStatus
}

STATUS     current
DESCRIPTION
 "The group of objects in a line configuration
template.

::= { xdsl2Groups 10 }

xdsl2LineConfProfGroup OBJECT-GROUP

OBJECTS

{ xdsl2LConfProfScMaskDs,
  xdsl2LConfProfScMaskUs,
  xdsl2LConfProfVdsl2CarMask,
  xdsl2LConfProfRfiBands,
  xdsl2LConfProfRaModeDs,
  xdsl2LConfProfRaModeUs,
  xdsl2LConfProfTargetSnrmDs,
  xdsl2LConfProfTargetSnrmUs,
  xdsl2LConfProfMaxSnrmDs,
  xdsl2LConfProfMaxSnrmUs,
  xdsl2LConfProfMinSnrmDs,
  xdsl2LConfProfMinSnrmUs,
  xdsl2LConfProfCeFlag,
  xdsl2LConfProfSnrModeDs,
  xdsl2LConfProfSnrModeUs,
  xdsl2LConfProfTxRefVnDs,
  xdsl2LConfProfTxRefVnUs,
  xdsl2LConfProfXtuTransSysEna,
  xdsl2LConfProfPmMode,
  xdsl2LConfProfL0Time,
  xdsl2LConfProfL2Time,
  xdsl2LConfProfL2Atpr,
  xdsl2LConfProfL2Atprt,
  xdsl2LConfProfProfiles,
  xdsl2LConfProfDdboEPsd,
  xdsl2LConfProfDdboEsEL,
  xdsl2LConfProfDdboEsCableModelA,
  xdsl2LConfProfDdboEsCableModelB,
  xdsl2LConfProfDdboEsCableModelC,
  xdsl2LConfProfDdboMus,
  xdsl2LConfProfDdboFMin,
  xdsl2LConfProfDdboFMax,
  xdsl2LConfProfUpboKL,
  xdsl2LConfProfUpboKLF,
  xdsl2LConfProfUs0Mask,
  xdsl2LConfProfForceInp,
  xdsl2LConfProfRowStatus
}

STATUS current

DESCRIPTION

"The group of objects in a line configuration profile."
::= { xds2Groups 11 }

xds2LineConfProfRaGroup OBJECT-GROUP
OBJECTS

{ xds2LConfProfRaUsNrmDs, xds2LConfProfRaUsNrmUs, xds2LConfProfRaUsTimeDs, xds2LConfProfRaUsTimeUs, xds2LConfProfRaDsNrmDs, xds2LConfProfRaDsNrmUs, xds2LConfProfRaDsTimeDs, xds2LConfProfRaDsTimeUs }

STATUS current
DESCRIPTION
"The group of objects required for controlling the rate-adaptive behavior of the line."

::= { xds2Groups 12 }

xds2LineConfProfMsgMinGroup OBJECT-GROUP
OBJECTS

{ xds2LConfProfMsgMinUs, xds2LConfProfMsgMinDs }

STATUS current
DESCRIPTION
"The group of objects required for controlling the rate reserved for Overhead traffic."

::= { xds2Groups 13 }

xds2LineConfProfModeSpecGroup OBJECT-GROUP
OBJECTS

{ xds2LConfProfMaxNomPsdDs, xds2LConfProfMaxNomPsdUs, xds2LConfProfMaxNomAtpDs, xds2LConfProfMaxNomAtpUs, xds2LConfProfMaxAggRxPwrUs, xds2LConfProfPsdMaskDs, xds2LConfProfPsdMaskUs, xds2LConfProfPsdMaskSelectUs, xds2LConfProfClassMask, xds2LConfProfLimitMask, xds2LConfProfUs0Disable, xds2LConfProfModeSpecRowStatus }
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
{
  xdsl2LConfProfUpboPsdA,
  xdsl2LConfProfUpboPsdB,
  xdsl2LConfProfModeSpecBandUsRowStatus
}
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,
  xdsl2ChConfProfDsDataRateDs,
  xdsl2ChConfProfUsDataRateUs,
  xdsl2ChConfProfDsDataRateUs,
  xdsl2ChConfProfRowStatus
}
STATUS    current
DESCRIPTION
"The group of objects in a channel configuration profile."
 ::= { xdsl2Groups 16 }
xdsl2ChConfProfileAtmGroup OBJECT-GROUP
OBJECTS
{  
  xdsl2ChConfProfImaEnabled,  
  xdsl2ChStatusAtmStatus  
}
STATUS current
DESCRIPTION
"The group of configuration objects required when the data path is ATM."
::= { xdsl2Groups 17 }

xdsl2ChConfProfileMinResGroup OBJECT-GROUP
OBJECTS
{  
  xdsl2ChConfProfMinResDataRateDs,  
  xdsl2ChConfProfMinResDataRateUs  
}
STATUS current
DESCRIPTION
"The group of configuration objects required for the reserved data rate."
::= { xdsl2Groups 18 }

xdsl2ChConfProfileOptAttrGroup OBJECT-GROUP
OBJECTS
{  
  xdsl2ChConfProfMaxDelayVar,  
  xdsl2ChConfProfInitPolicy  
}
STATUS current
DESCRIPTION
"The group of various optional channel configuration parameters."
::= { xdsl2Groups 19 }

xdsl2LineAlarmConfTemplateGroup OBJECT-GROUP
OBJECTS
{  
  xdsl2LAlarmConfTempLineProfile,  
  xdsl2LAlarmConfTempChan1ConfProfile,  
  xdsl2LAlarmConfTempChan2ConfProfile,  
  xdsl2LAlarmConfTempChan3ConfProfile,  
  xdsl2LAlarmConfTempChan4ConfProfile,  
  xdsl2LAlarmConfTempRowStatus  
}
STATUS current
DESCRIPTION
"The group of objects in a line alarm template."
::= { xds2Groups 20 }

xds2LineAlarmConfProfileGroup OBJECT-GROUP

OBJECTS

{  
  xds2LineAlarmConfProfileXtucThresh15MinFecs,
  xds2LineAlarmConfProfileXtucThresh15MinEs,
  xds2LineAlarmConfProfileXtucThresh15MinSes,
  xds2LineAlarmConfProfileXtucThresh15MinLoss,
  xds2LineAlarmConfProfileXtucThresh15MinUas,
  xds2LineAlarmConfProfileXturThresh15MinFecs,
  xds2LineAlarmConfProfileXturThresh15MinEs,
  xds2LineAlarmConfProfileXturThresh15MinSes,
  xds2LineAlarmConfProfileXturThresh15MinLoss,
  xds2LineAlarmConfProfileXturThresh15MinUas,
  xds2LineAlarmConfProfileThresh15MinFailedFullInt,
  xds2LineAlarmConfProfileThresh15MinFailedShrtInt,
  xds2LineAlarmConfProfileRowStatus
}

STATUS current

DESCRIPTION
"The group of objects in a line alarm profile."

::= { xds2Groups 21 }

xds2ChAlarmConfProfileGroup OBJECT-GROUP

OBJECTS

{  
  xds2ChAlarmConfProfileXtucThresh15MinCodingViolations,
  xds2ChAlarmConfProfileXtucThresh15MinCorrected,
  xds2ChAlarmConfProfileXturThresh15MinCodingViolations,
  xds2ChAlarmConfProfileXturThresh15MinCorrected,
  xds2ChAlarmConfProfileRowStatus
}

STATUS current

DESCRIPTION
"The group of objects in a channel alarm profile."

::= { xds2Groups 22 }

xds2PMLLineCurrGroup OBJECT-GROUP

OBJECTS

{  
  xds2PMLCurr15MValidIntervals,
  xds2PMLCurr15MInvalidIntervals,
  xds2PMLCurr15MTimeElapsed,
  xds2PMLCurr15MFecs,
  xds2PMLCurr15MEs,
  xds2PMLCurr15MSes,
  xds2PMLCurr15MLoss,
Morgenstern, et al. Standards Track [Page 199]
::= { xds2Groups 25 }

xds2PMLLineHist15MinGroup OBJECT-GROUP

OBJECTS
{
  xds2PMLHist15MMonitoredTime,
  xds2PMLHist15MFecs,
  xds2PMLHist15MEs,
  xds2PMLHist15MSes,
  xds2PMLHist15MLoss,
  xds2PMLHist15MUas,
  xds2PMLHist15MValidInterval
}

STATUS current

DESCRIPTION
"The group of line-level PM counters for the previous 15-minute intervals."

::= { xds2Groups 26 }

xds2PMLLineHist1DayGroup OBJECT-GROUP

OBJECTS
{
  xds2PMLHist1DMonitoredTime,
  xds2PMLHist1DFecs,
  xds2PMLHist1DEs,
  xds2PMLHist1DSes,
  xds2PMLHist1DLoss,
  xds2PMLHist1DUas,
  xds2PMLHist1DValidInterval
}

STATUS current

DESCRIPTION
"The group of line-level PM counters for the previous 24-hour intervals."

::= { xds2Groups 27 }

xds2PMLInitHist15MinGroup OBJECT-GROUP

OBJECTS
{
  xds2PMLInitHist15MMonitoredTime,
  xds2PMLInitHist15MFullInits,
  xds2PMLInitHist15MFailedFullInits,
  xds2PMLInitHist15MValidInterval
}

STATUS current

DESCRIPTION
"The group of PM counters for the previous 15-minute interval full initializations."
::= { xdsl2Groups 28 }

xdsl2PMLineInitHist15MinShortGroup OBJECT-GROUP
OBJECTS
{
  xdsl2PMLInitHist15MShortInits,
  xdsl2PMLInitHist15MFailedShortInits
}
STATUS    current
DESCRIPTION
"The group of PM counters for the previous 15-minute interval 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 interval full initializations."
::= { xdsl2Groups 30 }

xdsl2PMLineInitHist1DayShortGroup OBJECT-GROUP
OBJECTS
{
  xdsl2PMLInitHist1DShortInits,
  xdsl2PMLInitHist1DFailedShortInits
}
STATUS    current
DESCRIPTION
"The group of PM counters for the previous 24-hour interval short initializations."
::= { xdsl2Groups 31 }

xdsl2PMChCurrGroup OBJECT-GROUP
OBJECTS
{
  xdsl2PMChCurr15MValidIntervals,
  xdsl2PMChCurr15MInvalidIntervals,
  xdsl2PMChCurr15MElapsedTime,
  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
}
STATUS     current
DESCRIPTION
"The group of objects that report the channel-level
counters for previous 15-minute PM intervals."
 ::= { xdsl2Groups 33 }

xdsl2PMChHist1DGroup OBJECT-GROUP
OBJECTS
{
  xdsl2PMChHist1DMonitoredTime,
  xdsl2PMChHist1DCodingViolations,
  xdsl2PMChHist1DCorrectedBlocks,
  xdsl2PMChHist1DValidInterval
}
STATUS     current
DESCRIPTION
"The group of objects that report the channel-level
counters for previous 24-hour PM intervals."
 ::= { xdsl2Groups 34 }

xdsl2ScalarSCGroup OBJECT-GROUP
OBJECTS
{
  xdsl2ScalarSCMaxInterfaces,
  xdsl2ScalarSCAvailInterfaces
}
STATUS     current
DESCRIPTION
"The group of objects that report the available memory resources for DELT processes."
 ::= { xdsl2Groups 35 }

xdsl2ThreshNotificationGroup NOTIFICATION-GROUP
 NOTIFICATIONS
  { 
    xdsl2LinePerfFFECSThreshXtuc,
    xdsl2LinePerfFFECSThreshXtur,
    xdsl2LinePerfFESThreshXtuc,
    xdsl2LinePerfFESThreshXtur,
    xdsl2LinePerfESThreshXtuc,
    xdsl2LinePerfESThreshXtur,
    xdsl2LinePerfFLOSSThreshXtuc,
    xdsl2LinePerfFLOSSThreshXtur,
    xdsl2LinePerfUASThreshXtuc,
    xdsl2LinePerfUASThreshXtur,
    xdsl2LinePerfCodingViolationsThreshXtuc,
    xdsl2LinePerfCodingViolationsThreshXtur,
    xdsl2LinePerfCorrectedThreshXtuc,
    xdsl2LinePerfCorrectedThreshXtur,
    xdsl2LinePerfFailedFullInitThresh,
    xdsl2LinePerfFailedShortInitThresh
  }
 STATUS current
DESCRIPTION
  "This group supports notifications of significant conditions associated with DSL lines."
 ::= { xdsl2Groups 36 }

xdsl2StatusChangeNotificationGroup NOTIFICATION-GROUP
 NOTIFICATIONS
  { 
    xdsl2LineStatusChangeXtuc,
    xdsl2LineStatusChangeXtur
  }
 STATUS current
DESCRIPTION
  "This group supports notifications of thresholds crossing associated with DSL lines."
 ::= { xdsl2Groups 37 }
END

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 two 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:

  - `xdsl2LineConfTemplate`
  - `xdsl2LineConfFallbackTemplate`
  - `xdsl2LineAlarmConfTemplate`
  - `xdsl2LineCmndConfPmsf`
  - `xdsl2LineCmndConfLdsf`
  - `xdsl2LineCmndConfBpsc`
  - `xdsl2LineCmndAutomodeColdStart`
  - `xdsl2LineCmndConfReset`

  Unauthorized changes to `xdsl2LineConfTemplate` could have a major
  adverse operational effect on many lines simultaneously.

  Unauthorized changes to `xdsl2LineConfFallbackTemplate` could have a
  major adverse operational effect on many lines simultaneously.

  Unauthorized changes to `xdsl2LineAlarmConfTemplate` could have a
  contrary effect on notifications.

  Unauthorized changes to `xdsl2LineCmndConfPmsf` could have an
  adverse affect 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 xdsl2LineCmdConfReset 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 they 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
* xdsl2LConfProfRaDsNrmUs
* xdsl2LConfProfRaDsTimeDs
* xds12LConfProfRaDsTimeUs
* xds12LConfProfTargetSnrmDs
* xds12LConfProfTargetSnrmUs
* xds12LConfProfMaxSnrmDs
* xds12LConfProfMaxSnrmUs
* xds12LConfProfMinSnrmDs
* xds12LConfProfMinSnrmUs
* xds12LConfProfMsgMinUs
* xds12LConfProfMsgMinDs
* xds12LConfProfCeFlag
* xds12LConfProfSnrModeDs
* xds12LConfProfSnrModeUs
* xds12LConfProfTxRefVnDs
* xds12LConfProfTxRefVnUs
* xds12LConfProfXtuTransSysEna
* xds12LConfProfPmMode
* xds12LConfProfL0Time
* xds12LConfProfL2Time
* xds12LConfProfL2Atpr
* xds12LConfProfL2Atprt
* xds12LConfProfProfiles
* xds12LConfProfDpboEPsd
* xds12LConfProfDpboEsEL
* xds12LConfProfDpboEsCableModelA
*  xdsl2LConfProfDpboEsCableModelB
*  xdsl2LConfProfDpboEsCableModelC
*  xdsl2LConfProfDpboMus
*  xdsl2LConfProfDpboFMin
*  xdsl2LConfProfDpboFMax
*  xdsl2LConfProfUpboKL
*  xdsl2LConfProfUpboKLF
*  xdsl2LConfProfUs0Mask
*  xdsl2LConfProfForceInp
*  xdsl2LConfProfRowStatus

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 they could result in line profiles being inadvertently deleted or taken out of service.

- xdsl2LineConfProfModeSpecTable

The table consists of the following objects that support SET operations:

*  xdsl2LConfProfMaxNomPsdDs
*  xdsl2LConfProfMaxNomPsdUs
*  xdsl2LConfProfMaxNomAtpDs
*  xdsl2LConfProfMaxNomAtpUs
*  xdsl2LConfProfMaxAggRxPwrUs
*  xdsl2LConfProfPsdMaskDs
*  xdsl2LConfProfPsdMaskUs
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 `xdsl2LConfProfModeSpecRowStatus` could result in unwanted PSD configurations being created or brought into service prematurely, or they 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:

  * `xdsl2LConfProfUpboPsdA`
  * `xdsl2LConfProfUpboPsdB`
  * `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 `xdsl2LConfProfModeSpecBandUsRowStatus` could result in unwanted PSD configurations being created or brought into service prematurely, or they 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 they could result in channel profiles being inadvertently deleted or taken out of service.

- **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 they 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 they could result in alarm templates being inadvertently deleted or taken out of service.

- **xdsl2LineAlarmConfProfileTable**

  The table consists of the following objects that support SET operations:

  * xdsl2LineAlarmConfProfileXtucThresh15MinFecs
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.

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`
* `xdsl2ChAlarmConfProfileXtucThresh15MinCorrected`
* `xdsl2ChAlarmConfProfileXturThresh15MinCodingViolations`
*  xdsl2ChAlarmConfProfileXturThresh15MinCorrected
*  xdsl2ChAlarmConfProfileRowStatus
*  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.

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:

o  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)
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