

Network Working Group  
Request for Comments: 5650  
Category: Standards Track

M. Morgenstern  
ECI Telecom Ltd.  
S. Baillie  
U. Bonollo  
NEC Australia  
September 2009

## 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.

## Table of Contents

1. The Internet-Standard Management Framework .....	2
2. Overview .....	2
2.1. Relationship to Other MIBs .....	4
2.2. IANA Considerations .....	7
2.3. Conventions Used in the MIB Module .....	7
2.4. Structure .....	11
2.5. Persistence .....	13
2.6. Line Topology .....	16
2.7. Counters, Interval Buckets, and Thresholds .....	17
2.8. Profiles .....	19
2.9. Notifications .....	23
3. Definitions .....	24
4. Implementation Analysis .....	204
5. Security Considerations .....	204
6. Acknowledgments .....	215
7. References .....	216
7.1. Normative References .....	216
7.2. Informative References .....	217

### 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 (DSL Forum) 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  
    vdsl2(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=vdsl2(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	vdsl2(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' ifEntrys 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.

HigherLayer	LowerLayer
-----	-----
0	ATM
ATM	XdslChannel
XdslChannel	XdslPhysical
XdslPhysical	0

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

ADSL	Asymmetric (bit rate) DSL
ATM	Asynchronous Transfer Mode
atuc	ADSL/ADSL2 or ADSL2+ line termination unit - central office
atur	ADSL/ADSL2 or ADSL2+ line termination unit - Remote site
BER	Bit Error Rate
CO	Central Office
CPE	Customer Premise Equipment
CRC	Cyclic Redundancy Check
DELT	Dual Ended Loop Test
DMT	Discrete Multitone
DPB0	Downstream PBO
DRA	Dynamic Rate Adaptation
DSL	Digital Subscriber Line/Loop
DSLFF	DSL Forum
EOC	Embedded Operations Channel
ES	Errored Second
FE	Far-End (unit)
FEBE	Far-End Block Error
FEC	Forward Error Correction
FFEC	Far-End FEC
IMA	Inverse Multiplexing over ATM
INP	Impulse Noise Protection
ISDN	Integrated Services Digital Network
LDSF	Loop Diagnostic State Forced

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
NSCds	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
UPB0	Upstream PBO
U-R	Loop interface-remote side (i.e., subscriber end of the loop)
US0	Upstream band number 0
VDSL	Very high speed DSL
VTU-0	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:

- o Xdsl2Unit
- o Xdsl2Direction
- o Xdsl2Band
- o Xdsl2TransmissionModeType
- o Xdsl2RaMode
- o Xdsl2InitResult
- o Xdsl2OperationModes
- o Xdsl2PowerMngState
- o Xdsl2ConfPmsForce
- o Xdsl2LinePmMode
- o Xdsl2LineLdsf
- o Xdsl2LdsfResult
- o Xdsl2LineBpsc
- o Xdsl2BpscResult
- o Xdsl2LineReset
- o Xdsl2LineProfiles
- o Xdsl2LineClassMask
- o Xdsl2LineLimitMask
- o Xdsl2LineUs0Disable
- o Xdsl2LineUs0Mask
- o Xdsl2SymbolProtection
- o 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:

- o 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

- o Channel Status Group:

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

- xdsl2ChannelStatusTable

- o 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

- o 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

- o 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

**o 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

**o 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

**o 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

**o 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

o Notifications Group:

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  
xdsl2LConfProfVdsl2CarMask  
xdsl2LConfProfRfiBandsDs  
xdsl2LConfProfRaModeDs  
xdsl2LConfProfRaModeUs  
xdsl2LConfProfRaUsNrmDs  
xdsl2LConfProfRaUsNrmUs  
xdsl2LConfProfRaUsTimeDs  
xdsl2LConfProfRaUsTimeUs  
xdsl2LConfProfRaDsNrmDs  
xdsl2LConfProfRaDsNrmUs  
xdsl2LConfProfRaDsTimeDs  
xdsl2LConfProfRaDsTimeUs  
xdsl2LConfProfTargetSnrmDs  
xdsl2LConfProfTargetSnrmUs  
xdsl2LConfProfMaxSnrmDs  
xdsl2LConfProfMaxSnrmUs  
xdsl2LConfProfMinSnrmDs  
xdsl2LConfProfMinSnrmUs  
xdsl2LConfProfMsgMinUs  
xdsl2LConfProfMsgMinDs  
xdsl2LConfProfXtuTransSysEna  
xdsl2LConfProfPmMode  
xdsl2LConfProfL0Time  
xdsl2LConfProfL2Time  
xdsl2LConfProfL2Atpr  
xdsl2LConfProfL2Atprt  
xdsl2LConfProfProfiles  
xdsl2LConfProfDpboEPsd  
xdsl2LConfProfDpboEsEL  
xdsl2LConfProfDpboEsCableModelA  
xdsl2LConfProfDpboEsCableModelB  
xdsl2LConfProfDpboEsCableModelC  
xdsl2LConfProfDpboMus  
xdsl2LConfProfDpboFMin  
xdsl2LConfProfDpboFMax  
xdsl2LConfProfUpboKL  
xdsl2LConfProfUpboKLF  
xdsl2LConfProfUs0Mask  
xdsl2LConfProfRowStatus  
xdsl2LConfProfXdslMode  
xdsl2LConfProfMaxNomPsdDs

xdsl2LConfProfMaxNomPsdUs  
xdsl2LConfProfMaxNomAtpDs  
xdsl2LConfProfMaxNomAtpUs  
xdsl2LConfProfMaxAggRxPwrUs  
xdsl2LConfProfPsdMaskDs  
xdsl2LConfProfPsdMaskUs  
xdsl2LConfProfPsdMaskSelectUs  
xdsl2LConfProfClassMask  
xdsl2LConfProfLimitMask  
xdsl2LConfProfUs0Disabl  
xdsl2LConfProfModeSpecRowStatus  
xdsl2LConfProfXdslBandUs  
xdsl2LConfProfUpboPsdA  
xdsl2LConfProfUpboPsdB  
xdsl2LConfProfModeSpecBandUsRowStatus  
xdsl2ChConfProfProfileName  
xdsl2ChConfProfMinDataRateDs  
xdsl2ChConfProfMinDataRateUs  
xdsl2ChConfProfMinResDataRateDs  
xdsl2ChConfProfMinResDataRateUs  
xdsl2ChConfProfMaxDataRateDs  
xdsl2ChConfProfMaxDataRateUs  
xdsl2ChConfProfMinDataRateLowPwrDs  
xdsl2ChConfProfMaxDelayDs  
xdsl2ChConfProfMaxDelayUs  
xdsl2ChConfProfMinProtectionDs  
xdsl2ChConfProfMinProtectionUs  
xdsl2ChConfProfMaxBerDs  
xdsl2ChConfProfMaxBerUs  
xdsl2ChConfProfUsDataRateDs  
xdsl2ChConfProfDsDataRateDs  
xdsl2ChConfProfUsDataRateUs  
xdsl2ChConfProfDsDataRateUs  
xdsl2ChConfProfImaEnabled  
xdsl2ChConfProfMaxDelayVar  
xdsl2ChConfProfInitPolicy  
xdsl2ChConfProfRowStatus  
xdsl2LAlarmConfTempTemplateName  
xdsl2LAlarmConfTempLineProfile  
xdsl2LAlarmConfTempChan1ConfProfile  
xdsl2LAlarmConfTempChan2ConfProfile  
xdsl2LAlarmConfTempChan3ConfProfile  
xdsl2LAlarmConfTempChan4ConfProfile  
xdsl2LAlarmConfTempRowStatus  
xdsl2LineAlarmConfProfileName  
xdsl2LineAlarmConfProfileXtucThresh15MinFecs  
xdsl2LineAlarmConfProfileXtucThresh15MinEs  
xdsl2LineAlarmConfProfileXtucThresh15MinSes

```
xdsl2LineAlarmConfProfileXtucThresh15MinLoss
xdsl2LineAlarmConfProfileXtucThresh15MinUas
xdsl2LineAlarmConfProfileXturThresh15MinFecs
xdsl2LineAlarmConfProfileXturThresh15MinEs
xdsl2LineAlarmConfProfileXturThresh15MinSes
xdsl2LineAlarmConfProfileXturThresh15MinLoss
xdsl2LineAlarmConfProfileXturThresh15MinUas
xdsl2LineAlarmConfProfileThresh15MinFailedFullInt
xdsl2LineAlarmConfProfileThresh15MinFailedShrtInt
xdsl2LineAlarmConfProfileRowStatus
xdsl2ChAlarmConfProfileName
xdsl2ChAlarmConfProfileXtucThresh15MinCodingViolations
xdsl2ChAlarmConfProfileXtucThresh15MinCorrected
xdsl2ChAlarmConfProfileXturThresh15MinCodingViolations
xdsl2ChAlarmConfProfileXturThresh15MinCorrected
xdsl2ChAlarmConfProfileRowStatus
```

Note, also, that the interface indices in this MIB are maintained persistently. View-based Access Control Model (VACM) data relating to these SHOULD be stored persistently as well [RFC3410].

## 2.6. Line Topology

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



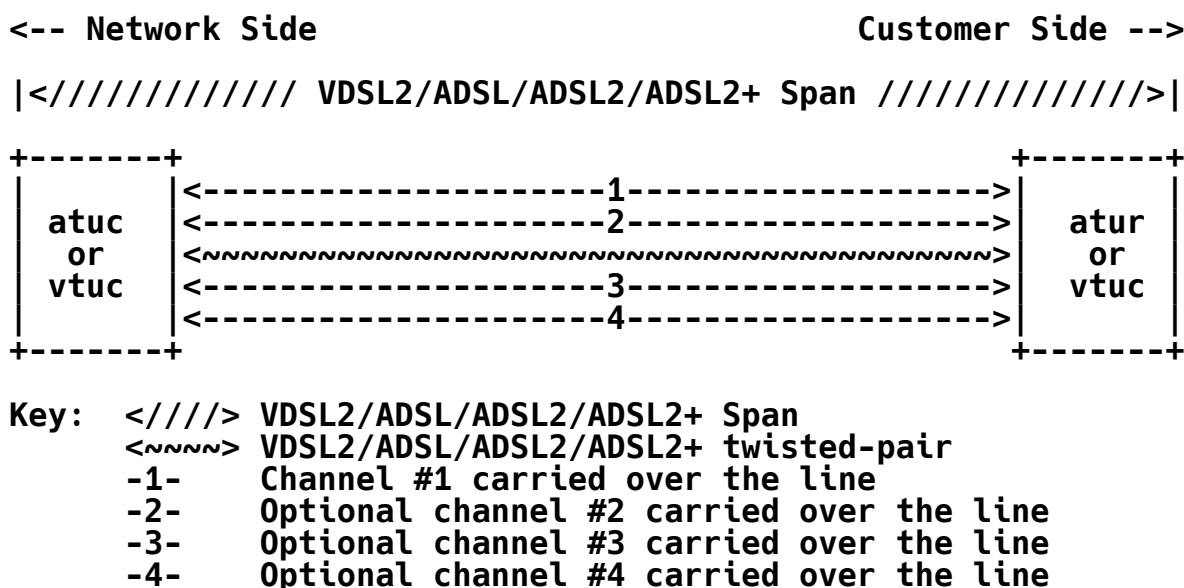


Figure 3: General Topology for a VDSL2/ADSL/ADSL2/ADSL2+ Line

## 2.7. Counters, Interval Buckets, and Thresholds

### 2.7.1. Counters Managed

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

#### o On the whole line level

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

#### o On the xTU level

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

- o On the bearer channel level

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

#### 2.7.2. Minimum Number of Buckets

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

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

#### 2.7.3. Interval Buckets Initialization

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

- o **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.

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

The channel configuration includes issues such as the desired minimum and maximum rate on each traffic flow direction and impulse noise protection parameters.

- o **Line Configuration Templates** - Line configuration templates allow combining line configuration profiles and channel configuration profiles into a comprehensive configuration of the VDSL2/ADSL/ADSL2 and ADSL2+ line. They are defined in the `xdsl2LineConfTemplateTable`.

The line configuration template includes one index of a line configuration profile and one to four 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

- o **Line Alarm Configuration Profiles** - Line-level Alarm configuration profiles contain the threshold values for Performance Monitoring (PM) parameters, counted either on the whole line level or on an xTU level. Thresholds are required only for failures and anomalies. 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`.
- o **Channel Alarm Configuration Profiles** - Channel-level Alarm configuration profiles contain the threshold values for PM parameters counted on a bearer channel level. Thresholds are defined for two types of anomalies: corrected blocks and coding violations. These profiles are defined in the `xdsl2ChAlarmConfProfileTable`.
- o **Line Alarm Configuration Templates** - Line Alarm configuration templates allow combining line-level alarm configuration profiles and channel-level alarm configuration profiles into a comprehensive configuration of the PM thresholds for the VDSL2/ADSL/ADSL2 and ADSL2+ line. They are defined in the `xdsl2LineAlarmConfTemplateTable`.

The line alarm configuration template includes one index of a line-level alarm configuration profile and one to four 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:

- o 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.
- o 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



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

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

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

Co-editor: Umberto Bonollo  
NEC Australia  
Postal: 649-655 Springvale Road,  
Mulgrave, Victoria 3170,  
Australia.  
Email: umberto.bonollo@nec.com.au  
Phone: +61 3 9264 3385

#### 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} -- vdsl2MIB 3

```
-----
--          Textual Conventions          --
-----
```

Xdsl2Unit ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"Identifies a transceiver as being either xTU-C or xTU-R.

A VDSL2/ADSL/ADSL2 or ADSL2+ line consists of two transceivers: an xTU-C and an xTU-R.

In the case of ADSL/ADSL2 and ADSL2+, those two transceivers are also called atuc and atur.

In the case of VDSL2, those two transceivers are also called vtuc and vtur.

Specified as an INTEGER, the two values are:

xtuc(1) -- central office transceiver

xtur(2) -- remote site transceiver"

```
SYNTAX      INTEGER {  
                xtuc(1),  
                xtur(2)  
            }
```

Xdsl2Direction ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"Identifies the direction of a band in a VDSL2/ADSL/ADSL2/ADSL2+ link.

The upstream direction is a transmission from the remote end (xTU-R) towards the central office end (xTU-C). The downstream direction is a transmission from the xTU-C towards the xTU-R.

Specified as an INTEGER, the values are defined as follows:"

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

Xdsl2Band ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"Identifies a band in a VDSL2/ADSL/ADSL2/ADSL2+ link.

For a band in the upstream direction, transmission is from the remote end (xTU-R) towards the central office end (xTU-C).

For a band in the downstream direction, transmission is from the xTU-C towards the xTU-R.

For ADSL, ADSL2 and ADSL2+, which use a single band in the upstream direction and a single band

in the downstream direction,

the only relevant values are upstream(1) and downstream(2).

For VDSL2, which uses multiple bands in each transmission direction, a band in the upstream direction is indicated by any of us0(3), us1(5), us2(7), us3(9), or us4(11), and a band in the downstream direction is indicated by any of ds1(4), ds2(6), ds3(8), or ds4(10).

For VDSL2, the values upstream(1) and downstream(2) may be used when there is a need to refer to the whole upstream or downstream traffic (e.g., report the average signal-to-noise ratio on any transmission direction).

Specified as an INTEGER, the values are defined as follows:"

```
SYNTAX INTEGER {  
    upstream(1),    -- Transmission from the xTU-R to the xTU-C
```

```

-- (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 {
                ansit1413(0),
                etsi(1),
                g9921PotsNonOverlapped(2),
                g9921PotsOverlapped(3),
                g9921IsdnNonOverlapped(4),
                g9921isdnOverlapped(5),
                g9921tcmIsdnNonOverlapped(6),
                g9921tcmIsdnOverlapped(7),
                g9922potsNonOverlapped(8),
                g9922potsOverlapped(9),
                g9922tcmIsdnNonOverlapped(10),
                g9922tcmIsdnOverlapped(11),
                g9921tcmIsdnSymmetric(12),
                reserved1(13),
                reserved2(14),
                reserved3(15),
            }

```

```
reserved4(16),
reserved5(17),
g9923PotsNonOverlapped(18),
g9923PotsOverlapped(19),
g9923IsdnNonOverlapped(20),
g9923IsdnOverlapped(21),
reserved6(22),
reserved7(23),
g9924potsNonOverlapped(24),
g9924potsOverlapped(25),
reserved8(26),
reserved9(27),
g9923AnnexIAAllDigNonOverlapped(28),
g9923AnnexIAAllDigOverlapped(29),
g9923AnnexJAllDigNonOverlapped(30),
g9923AnnexJAllDigOverlapped(31),
g9924AnnexIAAllDigNonOverlapped(32),
g9924AnnexIAAllDigOverlapped(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),
g9925AnnexIAAllDigNonOverlapped(46),
g9925AnnexIAAllDigOverlapped(47),
g9925AnnexJAllDigNonOverlapped(48),
g9925AnnexJAllDigOverlapped(49),
g9925AnnexMPotsNonOverlapped(50),
g9925AnnexMPotsOverlapped(51),
reserved12(52),
reserved13(53),
reserved14(54),
reserved15(55),
g9932AnnexA(56),
g9932AnnexB(57),
g9932AnnexC(58),
reserved16(59),
reserved17(60),
reserved18(61),
reserved19(62),
reserved20(63)
```

}

**Xdsl2RaMode ::= TEXTUAL-CONVENTION**

**STATUS** current

**DESCRIPTION**

"Specifies the rate adaptation behavior for the line.

The three possible behaviors are:

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

**SYNTAX** INTEGER {  
manual(1),  
raInit(2),  
dynamicRa(3)  
}

**Xdsl2InitResult ::= TEXTUAL-CONVENTION**

**STATUS** current

**DESCRIPTION**

"Specifies the result of full initialization attempt; the six possible result values are:

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

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

**Xdsl2OperationModes ::= TEXTUAL-CONVENTION**

**STATUS** current

**DESCRIPTION**

"The VDSL2 management model specified includes an xDSL Mode object that identifies an instance of xDSL Mode-Specific PSD Configuration object in the xDSL Line Profile. The

following classes of xDSL operating mode are defined. The notes (F) and (L) denote Full-Rate and Lite/splitterless, respectively:

+-----+   Value	+-----+ xDSL operation mode description +-----+
1	- The default/generic PSD configuration. Default configuration will be used when no other matching mode-specific configuration can be found.
2	- Regional Std. (ANSI T1.413) (F)
3	- Regional Std. (ETSI DTS/TM06006) (F)
4	- G.992.1 POTS non-overlapped (F)
5	- G.992.1 POTS overlapped (F)
6	- G.992.1 ISDN non-overlapped (F)
7	- G.992.1 ISDN overlapped (F)
8	- G.992.1 TCM-ISDN non-overlapped (F)
9	- G.992.1 TCM-ISDN overlapped (F)
10	- G.992.2 POTS non-overlapped (L)
11	- G.992.2 POTS overlapped (L)
12	- G.992.2 with TCM-ISDN non-overlapped (L)
13	- G.992.2 with TCM-ISDN overlapped (L)
14	- G.992.1 TCM-ISDN symmetric (F) --- not in G.997.1
15-19	- Unused. Reserved for future ITU-T specification.
20	- G.992.3 POTS non-overlapped (F)
21	- G.992.3 POTS overlapped (F)
22	- G.992.3 ISDN non-overlapped (F)
23	- G.992.3 ISDN overlapped (F)
24-25	- Unused. Reserved for future ITU-T specification.
26	- G.992.4 POTS non-overlapped (L)
27	- G.992.4 POTS overlapped (L)
28-29	- Unused. Reserved for future ITU-T specification.
30	- G.992.3 Annex I All-Digital non-overlapped (F)
31	- G.992.3 Annex I All-Digital overlapped (F)
32	- G.992.3 Annex J All-Digital non-overlapped (F)
33	- G.992.3 Annex J All-Digital overlapped (F)
34	- G.992.4 Annex I All-Digital non-overlapped (L)
35	- G.992.4 Annex I All-Digital overlapped (L)
36	- G.992.3 Annex L POTS non-overlapped, mode 1, wide U/S (F)
37	- G.992.3 Annex L POTS non-overlapped, mode 2, narrow U/S(F)
38	- G.992.3 Annex L POTS overlapped, mode 3, wide U/S (F)
39	- G.992.3 Annex L POTS overlapped, mode 4, narrow U/S (F)
40	- G.992.3 Annex M POTS non-overlapped (F)
41	- G.992.3 Annex M POTS overlapped (F)
42	- G.992.5 POTS non-overlapped (F)



- 43 - G.992.5 POTS overlapped (F)
- 44 - G.992.5 ISDN non-overlapped (F)
- 45 - G.992.5 ISDN overlapped (F)
- 46-47 - Unused. Reserved for future ITU-T specification.
- 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),
    g9923AnnexIAAllDigNonOverlapped(30),
    g9923AnnexIAAllDigOverlapped(31),
    g9923AnnexJAllDigNonOverlapped(32),
    g9923AnnexJAllDigOverlapped(33),
    g9924AnnexIAAllDigNonOverlapped(34),
    g9924AnnexIAAllDigOverlapped(35),
    g9923AnnexLMode1NonOverlapped(36),
    g9923AnnexLMode2NonOverlapped(37),
    g9923AnnexLMode3Overlapped(38),
    g9923AnnexLMode4Overlapped(39),
    g9923AnnexMPotsNonOverlapped(40),
    g9923AnnexMPotsOverlapped(41),

```

```

    g9925PotsNonOverlapped(42),
    g9925PotsOverlapped(43),
    g9925IsdnNonOverlapped(44),
    g9925IsdnOverlapped(45),
    g9925AnnexIAAllDigNonOverlapped(48),
    g9925AnnexIAAllDigOverlapped(49),
    g9925AnnexJAllDigNonOverlapped(50),
    g9925AnnexJAllDigOverlapped(51),
    g9925AnnexMPotsNonOverlapped(52),
    g9925AnnexMPotsOverlapped(53),
    g9932AnnexA(58),
    g9932AnnexB(59),
    g9932AnnexC(60)
}

```

**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:

- |       |  |
|-------|--|
| l0(1) | - L0: Full power. Synchronized and full transmission (i.e., Showtime).         |
| l1(2) | - L1: Low power with reduced net data rate (for G.992.2 only).                 |
| l2(3) | - L2: Low power with reduced net data rate (for G.992.3, G.992.4 and G.992.5). |
| l3(4) | - L3: Idle power management state / No power."                                 |

**SYNTAX** INTEGER {  
     l0(1),  
     l1(2),  
     l2(3),  
     l3(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:

- |            |   |
|------------|---|
| l3toL0 (0) | - Perform a transition from L3 to L0 (Full power management state). |
|------------|---|

- l0toL2 (2) - Perform a transition from L0 to L2 (Low power management state).
- l0orL2toL3 (3) - Perform a transition into L3 (Idle power management state)."

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

**Xdsl2LinePmMode ::= TEXTUAL-CONVENTION**

**STATUS** current

**DESCRIPTION**

"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 998      Annex A: D-32, D-48, D-64, D-128.
Class 997-M1c  Annex B: 997-M1c-A-7.
Class 997-M1x  Annex B: 997-M1x-M-8, 997-M1x-M.
Class 997-M2x  Annex B: 997-M2x-M-8, 997-M2x-A, 997-M2x-M,
                      997E17-M2x-NUS0, 997E30-M2x-NUS0.
Class 998-M1x  Annex B: 998-M1x-A, 998-M1x-B, 998-M1x-NUS0.
Class 998-M2x  Annex B: 998-M2x-A, 998-M2x-M, 998-M2x-B,
                      998-M2x-NUS0, 998E17-M2x-NUS0,
                      998E17-M2x-NUS0-M, 998E30-M2x-NUS0,
                      998E30-M2x-NUS0-M.
Class 998ADE-M2x Annex B: Annex B: 998-M2x-A, 998-M2x-M,
                      998-M2x-B, 998-M2x-NUS0,
                      998ADE17-M2x-A, 998ADE17-M2x-B,
                      998ADE17-M2x-NUS0-M,
                      998ADE30-M2x-NUS0-A,
                      998ADE30-M2x-NUS0-M.
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-C0   Annex C: POTS-138co, POTS-276co per C.2.1.1
                      in G.993.2.
Class HPE-M1   Annex B: HPE17-M1-NUS0, HPE30-M1-NUS0."
```

SYNTAX INTEGER {

```

        none(1),
        a9980Rb997M1c0Rc998B(2),
        b997M1x0R998co(3),
        b997M2x(4),
        b998M1x(5),
        b998M2x(6),
        b998AdeM2x(7),
        bHpeM1(8)
    }

```

**Xdsl2LineLimitMask ::= TEXTUAL-CONVENTION**

**STATUS** current

**DESCRIPTION**

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

**SYNTAX BITS {**

```

    profile8Limit1(0),
    profile8Limit2(1),
    profile8Limit3(2),
    profile8Limit4(3),
    profile8Limit5(4),
    profile8Limit6(5),
    profile8Limit7(6),
    profile8Limit8(7),
    profile8Limit9(8),
    profile8Limit10(9),
    profile8Limit11(10),
    profile8Limit12(11),
    profile8Limit13(12),
    profile8Limit14(13),
    profile8Limit15(14),
    profile8Limit16(15),
    --
    profile12Limit1(16),
    profile12Limit2(17),
    profile12Limit3(18),
    profile12Limit4(19),
    profile12Limit5(20),
    profile12Limit6(21),
    profile12Limit7(22),
    profile12Limit8(23),
    profile12Limit9(24),
    profile12Limit10(25),

```

```
profile12Limit11(26),
profile12Limit12(27),
profile12Limit13(28),
profile12Limit14(29),
profile12Limit15(30),
profile12Limit16(31),
--
profile17Limit1(32),
profile17Limit2(33),
profile17Limit3(34),
profile17Limit4(35),
profile17Limit5(36),
profile17Limit6(37),
profile17Limit7(38),
profile17Limit8(39),
profile17Limit9(40),
profile17Limit10(41),
profile17Limit11(42),
profile17Limit12(43),
profile17Limit13(44),
profile17Limit14(45),
profile17Limit15(46),
profile17Limit16(47),
--
profile30Limit1(48),
profile30Limit2(49),
profile30Limit3(50),
profile30Limit4(51),
profile30Limit5(52),
profile30Limit6(53),
profile30Limit7(54),
profile30Limit8(55),
profile30Limit9(56),
profile30Limit10(57),
profile30Limit11(58),
profile30Limit12(59),
profile30Limit13(60),
profile30Limit14(61),
profile30Limit15(62),
profile30Limit16(63)
}
```

**Xdsl2LineUs0Disable ::= TEXTUAL-CONVENTION**

**STATUS** current

**DESCRIPTION**

"Indicates if US0 is disabled for each limit PSD mask.  
The profiles are grouped in following profile classes:  
- Class 8: Profiles 8a, 8b, 8c, 8d.



- Class 12: Profiles 12a, 12b.
- Class 17: Profile 17a.
- Class 30: Profile 30a."

```
SYNTAX BITS {
    profile8Us0Disable1(0),
    profile8Us0Disable2(1),
    profile8Us0Disable3(2),
    profile8Us0Disable4(3),
    profile8Us0Disable5(4),
    profile8Us0Disable6(5),
    profile8Us0Disable7(6),
    profile8Us0Disable8(7),
    profile8Us0Disable9(8),
    profile8Us0Disable10(9),
    profile8Us0Disable11(10),
    profile8Us0Disable12(11),
    profile8Us0Disable13(12),
    profile8Us0Disable14(13),
    profile8Us0Disable15(14),
    profile8Us0Disable16(15),
    --
    profile12Us0Disable1(16),
    profile12Us0Disable2(17),
    profile12Us0Disable3(18),
    profile12Us0Disable4(19),
    profile12Us0Disable5(20),
    profile12Us0Disable6(21),
    profile12Us0Disable7(22),
    profile12Us0Disable8(23),
    profile12Us0Disable9(24),
    profile12Us0Disable10(25),
    profile12Us0Disable11(26),
    profile12Us0Disable12(27),
    profile12Us0Disable13(28),
    profile12Us0Disable14(29),
    profile12Us0Disable15(30),
    profile12Us0Disable16(31),
    --
    profile17Us0Disable1(32),
    profile17Us0Disable2(33),
    profile17Us0Disable3(34),
    profile17Us0Disable4(35),
    profile17Us0Disable5(36),
    profile17Us0Disable6(37),
    profile17Us0Disable7(38),
    profile17Us0Disable8(39),
    profile17Us0Disable9(40),
```

```

    profile17Us0Disable10(41),
    profile17Us0Disable11(42),
    profile17Us0Disable12(43),
    profile17Us0Disable13(44),
    profile17Us0Disable14(45),
    profile17Us0Disable15(46),
    profile17Us0Disable16(47),
    --
    profile30Us0Disable1(48),
    profile30Us0Disable2(49),
    profile30Us0Disable3(50),
    profile30Us0Disable4(51),
    profile30Us0Disable5(52),
    profile30Us0Disable6(53),
    profile30Us0Disable7(54),
    profile30Us0Disable8(55),
    profile30Us0Disable9(56),
    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 {

```

    eu32(0),
    eu36(1),
    eu40(2),
    eu44(3),
    eu48(4),
    eu52(5),
    eu56(6),
    eu60(7),
    --
    eu64(8),
    eu128(9),
    reserved1(10),
    reserved2(11),

```

```
        reserved3(12),
        reserved4(13),
        reserved5(14),
        reserved6(15),
        --
        adlu32(16),
        adlu36(17),
        adlu40(18),
        adlu44(19),
        adlu48(20),
        adlu52(21),
        adlu56(22),
        adlu60(23),
        --
        adlu64(24),
        adlu128(25),
        reserved7(26),
        reserved8(27),
        reserved9(28),
        reserved10(29),
        reserved11(30),
        reserved12(31)
    }
```

Xdsl2SymbolProtection ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"This type specifies the minimum impulse noise protection for the bearer channel if it is transported over DMT symbols with a subcarrier spacing of 4.3125 kHz.

The possible values are:

'noProtection' (i.e., INP not required), 'halfSymbol' (i.e., INP length is 1/2 symbol), and 1-16 symbols in steps of 1 symbol."

SYNTAX        INTEGER {  
                noProtection (1),  
                halfSymbol (2),  
                singleSymbol (3),  
                twoSymbols (4),  
                threeSymbols (5),  
                fourSymbols (6),  
                fiveSymbols (7),  
                sixSymbols (8),  
                sevenSymbols (9),  
                eightSymbols (10),  
                nineSymbols (11),  
                tenSymbols (12),

```
        elevenSymbols (13),
        twelveSymbols (14),
        thirteenSymbols (15),
        fourteenSymbols (16),
        fifteenSymbols (17),
        sixteenSymbols (18)
    }
```

**Xdsl2SymbolProtection8 ::= TEXTUAL-CONVENTION**

**STATUS** current

**DESCRIPTION**

"This type specifies the minimum impulse noise protection for the bearer channel if it is transported over DMT symbols with a subcarrier spacing of 8.625 kHz.  
The possible values are:  
'noProtection' (i.e., INP not required) and 1-16 symbols in steps of 1 symbol."

**SYNTAX**

```
    INTEGER {
        noProtection (1),
        singleSymbol (2),
        twoSymbols (3),
        threeSymbols (4),
        fourSymbols (5),
        fiveSymbols (6),
        sixSymbols (7),
        sevenSymbols (8),
        eightSymbols (9),
        nineSymbols (10),
        tenSymbols (11),
        elevenSymbols (12),
        twelveSymbols (13),
        thirteenSymbols (14),
        fourteenSymbols (15),
        fifteenSymbols (16),
        sixteenSymbols (17)
    }
```

**Xdsl2MaxBer ::= TEXTUAL-CONVENTION**

**STATUS** current

**DESCRIPTION**

"Objects with this syntax are configuration parameters that reference the maximum Bit Error Rate (BER).  
The possible values are:  
 eminus3 (1) - Maximum BER=E^-3  
 eminus5 (2) - Maximum BER=E^-5  
 eminus7 (3) - Maximum BER=E^-7"

**SYNTAX**

```
    INTEGER {
```

```
        eminus3(1),  
        eminus5(2),  
        eminus7(3)  
    }
```

**Xdsl2ChInitPolicy ::= TEXTUAL-CONVENTION**

**STATUS** current

**DESCRIPTION**

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

The possible values are:

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

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

```
SYNTAX    INTEGER {  
            policy0(1),  
            policy1(2)  
        }
```

**Xdsl2ScMaskDs ::= TEXTUAL-CONVENTION**

**STATUS** current

**DESCRIPTION**

"Each one of the 4096 bits in this OCTET STRING array represents the corresponding 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 NSCds-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 NSCus-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))

Xdsl2LastTransmittedState ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"This parameter represents the last successful transmitted initialization state in the last full initialization performed on the line. States are per the specific xDSL technology and are numbered from 0 (if G.994.1 is used) or 1 (if G.994.1 is not used) up to Showtime."

SYNTAX INTEGER {  
-- ADSL family ATU-C side --  
atucG9941(0),  
atucQuiet1(1),  
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),
vtucQuiet1(201),
vtucChDiscov1(202),
vtucSynchro1(203),
vtucPilot1(204),
vtucQuiet2(205),
vtucPeriodic1(206),
vtucSynchro2(207),
```



```

vtucChDiscov2(208),
vtucSynchro3(209),
vtucTraining1(210),
vtucSynchro4(211),
vtucPilot2(212),
vtucTeq(213),
vtucEct(214),
vtucPilot3(215),
vtucPeriodic2(216),
vtucTraining2(217),
vtucSynchro5(218),
vtucMedley(219),
vtucSynchro6(220),
vtucShowtime(221),
-- VDSL2 VTU-R side --
vturG9941(300),
vturQuiet1(301),
vturChDiscov1(302),
vturSynchro1(303),
vturLineprobe(304),
vturPeriodic1(305),
vturSynchro2(306),
vturChDiscov2(307),
vturSynchro3(308),
vturQuiet2(309),
vturTraining1(310),
vturSynchro4(311),
vturTeq(312),
vturQuiet3(313),
vturEct(314),
vturPeriodic2(315),
vturTraining2(316),
vturSynchro5(317),
vturMedley(318),
vturSynchro6(319),
vturShowtime(320)
}

```

**Xdsl2LineStatus ::= TEXTUAL-CONVENTION**

**STATUS** current

**DESCRIPTION**

"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)
}
```

Xdsl2ChInpReport ::= 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)
}
```

Xdsl2ChAtmStatus ::= 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

lossOfCellDelineation (2)- associated ATM data path.  
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 (UPBOKL) to compute the UPB0.

disableUpbo(3) - Disables UPB0 such that UPB0 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  
NSCds-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  
NSCUs-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))

Xdsl2MrefPsds ::= 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 NSCs-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..192))

Xdsl2MrefPsdsUs ::= 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

HCPperfIntervalThreshold,  
HCPperfTimeElapsed  
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;

**vdsl2MIB MODULE-IDENTITY**

LAST-UPDATED "200909300000Z" -- September 30, 2009  
ORGANIZATION "ADSLMIB Working Group"  
CONTACT-INFO "WG-email: [adslmib@ietf.org](mailto:adslmib@ietf.org)  
Info: <https://www1.ietf.org/mailman/listinfo/adslmib>



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

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

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

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

Co-editor: Umberto Bonollo  
NEC Australia  
Postal: 649-655 Springvale Road,  
Mulgrave, Victoria 3170,  
Australia.  
Email: umberto.bonollo@nec.com.au  
Phone: +61 3 9264 3385

## DESCRIPTION

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

The MIB module described in RFC 2662 [RFC2662] defines objects used for managing Asymmetric Bit-Rate DSL (ADSL)

interfaces per [T1E1.413], [G.992.1], and [G.992.2]. These object descriptions are based upon the specifications for the ADSL Embedded Operations Channel (EOC) as defined in American National Standards Institute (ANSI) T1E1.413 [T1E1.413] and International Telecommunication Union (ITU-T) G.992.1 [G.992.1] and G.992.2 [G.992.2].

The MIB module described in RFC 4706 [RFC4706] defines objects used for managing ADSL2 interfaces per [G.992.3] and [G.992.4], and ADSL2+ interfaces per [G.992.5]. That MIB is also capable of managing ADSL interfaces per [T1E1.413], [G.992.1], and [G.992.2].

This document does not obsolete RFC 2662 [RFC2662] 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 (DSL Forum) 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 }

```

xDSL2Notifications OBJECT IDENTIFIER ::= { vDSL2MIB 0 }
xDSL2Objects        OBJECT IDENTIFIER ::= { vDSL2MIB 1 }
xDSL2Conformance    OBJECT IDENTIFIER ::= { vDSL2MIB 2 }
-----
xDSL2Line            OBJECT IDENTIFIER ::= { xDSL2Objects 1 }
xDSL2Status          OBJECT IDENTIFIER ::= { xDSL2Objects 2 }
xDSL2Inventory       OBJECT IDENTIFIER ::= { xDSL2Objects 3 }
xDSL2PM              OBJECT IDENTIFIER ::= { xDSL2Objects 4 }
xDSL2Profile         OBJECT IDENTIFIER ::= { xDSL2Objects 5 }
xDSL2Scalar          OBJECT IDENTIFIER ::= { xDSL2Objects 6 }
-----
xDSL2PMLine          OBJECT IDENTIFIER ::= { xDSL2PM 1 }
xDSL2PMChannel        OBJECT IDENTIFIER ::= { xDSL2PM 2 }
-----
xDSL2ProfileLine     OBJECT IDENTIFIER ::= { xDSL2Profile 1 }
xDSL2ProfileChannel  OBJECT IDENTIFIER ::= { xDSL2Profile 2 }
xDSL2ProfileAlarmConf OBJECT IDENTIFIER ::= { xDSL2Profile 3 }
-----
xDSL2ScalarSC        OBJECT IDENTIFIER ::= { xDSL2Scalar 1 }
-----

```

```

--          xdsl2LineTable          --
-----

xdsl2LineTable  OBJECT-TYPE
    SYNTAX      SEQUENCE OF Xdsl2LineEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The table xdsl2LineTable contains configuration, command and
        status parameters of the VDSL2/ADSL/ADSL2 or ADSL2+ line.

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

xdsl2LineEntry  OBJECT-TYPE
    SYNTAX      Xdsl2LineEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The index of this table is an interface index where the
        interface has an ifType of vdsl2(251)."
```

INDEX { ifIndex }

```

    ::= { xdsl2LineTable 1 }

Xdsl2LineEntry ::=
    SEQUENCE {
        xdsl2LineConfTemplate          SnmpAdminString,
        xdsl2LineConfFallbackTemplate  SnmpAdminString,
        xdsl2LineAlarmConfTemplate     SnmpAdminString,
        xdsl2LineCmndConfPmsf          Xdsl2ConfPmsForce,
        xdsl2LineCmndConfLdsf          Xdsl2LineLdsf,
        xdsl2LineCmndConfLdsfFailReason Xdsl2LdsfResult,
        xdsl2LineCmndConfBpsc          Xdsl2LineBpsc,
        xdsl2LineCmndConfBpscFailReason Xdsl2BpscResult,
        xdsl2LineCmndConfBpscRequests  Counter32,
        xdsl2LineCmndAutomodeColdStart TruthValue,
        xdsl2LineCmndConfReset          Xdsl2LineReset,
        xdsl2LineStatusActTemplate      SnmpAdminString,
        xdsl2LineStatusXtuTransSys      Xdsl2TransmissionModeType,
        xdsl2LineStatusPwrMngState      Xdsl2PowerMngState,
        xdsl2LineStatusInitResult       Xdsl2InitResult,
        xdsl2LineStatusLastStateDs      Xdsl2LastTransmittedState,
        xdsl2LineStatusLastStateUs      Xdsl2LastTransmittedState,
        xdsl2LineStatusXtur             Xdsl2LineStatus,
        xdsl2LineStatusXtuc             Xdsl2LineStatus,
        xdsl2LineStatusAttainableRateDs Unsigned32,
        xdsl2LineStatusAttainableRateUs Unsigned32,
```

xdsl2LineStatusActPsdDs	Integer32,
xdsl2LineStatusActPsdUs	Integer32,
xdsl2LineStatusActAtpDs	Integer32,
xdsl2LineStatusActAtpUs	Integer32,
xdsl2LineStatusActProfile	Xdsl2LineProfiles,
xdsl2LineStatusActLimitMask	Xdsl2LineLimitMask,
xdsl2LineStatusActUs0Mask	Xdsl2LineUs0Mask,
xdsl2LineStatusActSnrModeDs	Xdsl2LineSnrMode,
xdsl2LineStatusActSnrModeUs	Xdsl2LineSnrMode,
xdsl2LineStatusElectricalLength	Unsigned32,
xdsl2LineStatusTssiDs	Xdsl2Tssi,
xdsl2LineStatusTssiUs	Xdsl2Tssi,
xdsl2LineStatusMrefPsdDs	Xdsl2MrefPsdDs,
xdsl2LineStatusMrefPsdUs	Xdsl2MrefPsdUs,
xdsl2LineStatusTrellisDs	TruthValue,
xdsl2LineStatusTrellisUs	TruthValue,
xdsl2LineStatusActualCe	Unsigned32

}

**xdsl2LineConfTemplate 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, xdsl2LineConfTemplateTable, that applies for this line.

This object MUST be maintained in a persistent manner."

REFERENCE "DSL Forum TR-129, paragraph #5.1"

DEFVAL { "DEFVAL" }

::= { xdsl2LineEntry 1 }

**xdsl2LineConfFallbackTemplate 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 xdsl2LineConfTemplate 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."

::= { xsdl2LineEntry 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" }

::= { xsdl2LineEntry 3 }

`xdsl2LineCmndConfPmsf` 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 }

::= { xsdl2LineEntry 4 }

`xdsl2LineCmndConfLdsf` OBJECT-TYPE

SYNTAX Xdsl2LineLdsf

MAX-ACCESS read-write  
 STATUS current  
 DESCRIPTION

"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  
 'l3' state and the xdsl2LineCmndConfPmsf object is in the  
 'l0orL2toL3' 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 'l3' state. The loop diagnostic data shall be  
 available at least until xdsl2LineCmndConfPmsf is set to the  
 'l3toL0' 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 xdsl2LineCmndConfBpscFailReason."

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

xdsl2LineCmndConfBpscFailReason OBJECT-TYPE

```
SYNTAX      Xdsl2BpscResult
```

```
MAX-ACCESS  read-only
```

```
STATUS      current
```

```
DESCRIPTION
```

"The status of the most recent bits-per-subcarrier measurement request issued for the associated line."

```
DEFVAL      { none }
```

```
::= { xdsl2LineEntry 8 }
```

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

::= { `xdsl2LineEntry 9` }

`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 `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 }

xdsl2LineCmdnConfReset 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 xdsl2LineCmdnConfPmsf object will always take precedence over this object.

If the xdsl2LineCmdnConfPmsf object is set to the value 'l0orL2toL3', 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 }

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 { 13 }

::= { xdsl2LineEntry 14 }

xdsl2LineStatusInitResult OBJECT-TYPE

SYNTAX Xdsl2InitResult

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates the result of the last full initialization performed on the line."

REFERENCE "ITU-T G.997.1, paragraph #7.5.1.6  
(Initialization success/failure cause)"

DEFVAL { noFail }

::= { xdsl2LineEntry 15 }

xdsl2LineStatusLastStateDs OBJECT-TYPE

SYNTAX Xdsl2LastTransmittedState

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The last successful transmitted initialization state in the downstream direction in the last full initialization performed on the line."

REFERENCE "ITU-T G.997.1, paragraph #7.5.1.7  
(Downstream last transmitted state)"

DEFVAL { atucG9941 }

::= { xdsl2LineEntry 16 }

xdsl2LineStatusLastStateUs OBJECT-TYPE

SYNTAX Xdsl2LastTransmittedState

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

xdsl2LineStatusXtur OBJECT-TYPE  
SYNTAX Xdsl2LineStatus  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
    "Indicates 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 }

::= { xsdsl2LineEntry 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 (ACTPSDs)"**DEFVAL** { 2147483647 }

::= { xsdsl2LineEntry 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 }

::= { xsdsl2LineEntry 23 }

**xdsl2LineStatusActAtpDs OBJECT-TYPE****SYNTAX** Integer32 (-310..310 | 2147483647)**UNITS** "0.1 dBm"

```

MAX-ACCESS    read-only
STATUS        current
DESCRIPTION
    "Actual Aggregate Transmit Power Downstream.
    The total amount of transmit power delivered by the xTU-C at
    the U-C reference point, at the instant of measurement. It
    ranges from -310 to 310 units of 0.1 dBm (physical values are -31
    to 31 dBm).
    A value of 0x7FFFFFFF (2147483647) indicates the measurement is
    out of range to be represented."
REFERENCE      "ITU-T G.997.1, paragraph #7.5.1.24 (ACTATPDs)"
DEFVAL         { 2147483647 }
 ::= { xdsl2LineEntry 24 }

```

```

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

```

```

xdsl2LineStatusActProfile OBJECT-TYPE
SYNTAX          Xdsl2LineProfiles
MAX-ACCESS      read-only
STATUS          current
DESCRIPTION
    "The G.993.2 profile in use.
    The configuration parameter xdsl2LConfProfProfiles defines
    the set of allowed G.993.2 profiles. This parameter indicates
    the profile in use on this line.
    This parameter may be derived from the handshaking procedures
    defined in ITU-T 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

```

MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
    "The Limit PSD mask and band plan in use.  
    The configuration parameter xdsl2LConfProfLimitMask defines  
    the set of allowed G.993.2 limit PSD masks.  
    This parameter indicates the limit PSD mask in use on this  
    line."  
REFERENCE     "ITU-T G.997.1, paragraph #7.5.1.3  
              (VDSL2 Limit PSD Mask and Band plan)"  
DEFVAL       { {} }  
::= { xdsl2LineEntry 27 }

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

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

xdsl2LineStatusActSnrModeUs OBJECT-TYPE  
SYNTAX       Xdsl2LineSnrMode  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION

"This parameter indicates if the transmitter-referred virtual noise is active on the line in the upstream direction. The configuration parameter xdsl2LConfProfSnrModeUs is used to configure referred virtual noise."

REFERENCE "ITU-T G.997.1, paragraph #7.5.1.18 (ACTSNRMODEus)"

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-0 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 (UPB0KLE)"

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 (MREFPSDs)"  
::= { 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 (MREFPSDus)"  
::= { xdsl2LineEntry 35 }

xdsl2LineStatusTrellisDs OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This parameter reports whether trellis coding is in use in the downstream direction."

REFERENCE "ITU-T G.997.1, paragraph #7.5.1.30 (TRELLISDs)"

DEFVAL { false }

::= { xdsl2LineEntry 36 }

xdsl2LineStatusTrellisUs OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This parameter reports whether trellis coding is in use in the upstream direction."

REFERENCE "ITU-T G.997.1, paragraph #7.5.1.31 (TRELLISUs)"

DEFVAL { false }

::= { xdsl2LineEntry 37 }

xdsl2LineStatusActualCe OBJECT-TYPE

SYNTAX Unsigned32 (2..16)

UNITS "N/32 samples"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

“(ACTUALCE)

This parameter reports the cyclic extension used on the line. It is coded as an unsigned integer from 2 to 16 in units of N/32 samples, where 2N is the Inverse Discrete Fourier Transform (IDFT) size.”

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

DEFVAL        { 2 }

::= { xdsl2LineEntry 38 }

```
-----
--          xdsl2LineSegmentTable          --
-----
```

xdsl2LineSegmentTable OBJECT-TYPE

SYNTAX        SEQUENCE OF Xdsl2LineSegmentEntry

MAX-ACCESS    not-accessible

STATUS        current

DESCRIPTION

"The table xdsl2LineSegmentTable contains status parameters of VDSL2/ADSL/ADSL2 and ADSL2+ subcarriers. The parameters in this table are updated when a measurement request is made using the xdsl2LineCmdnConfBpsc 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 }

xdsl2LineSegmentEntry OBJECT-TYPE

SYNTAX        Xdsl2LineSegmentEntry

MAX-ACCESS    not-accessible

STATUS        current

DESCRIPTION

"The table xdsl2LineSegmentEntry contains status parameters of VDSL2/ADSL/ADSL2 and ADSL2+ subcarriers.

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

One index of this table is an interface index where the interface has an ifType of vdsl2(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  $i$  ( $0 \leq i < \text{MIN}((\text{NS}+1) - (\text{segment}-1)*512, 512)$ ) in each segment is set to a value in the range 0 to 15 to indicate that the respective downstream or upstream subcarrier  $j$  ( $j = (\text{segment}-1)*512 + i$ ) has the same amount of bits allocation."

REFERENCE "ITU-T G.997.1, paragraph #7.5.1.29.1 (BITSpsds)  
and paragraph #7.5.1.29.2 (BITSpsus)"

::= { xdsl2LineSegmentEntry 3 }

xdsl2LineSegmentRowStatus OBJECT-TYPE

SYNTAX RowStatus

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Row Status. The SNMP 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 table or allocate memory resources.

If that occurs, the SNMP agent responds with the value 'noResources' (for the xdsl2LineCmdnConfBpscFailReason object in xdsl2LineTable).

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

When the SNMP manager deletes any row in this table, the SNMP agent MUST delete all rows in this table that have the same ifIndex value."

::= { xdsl2LineSegmentEntry 4 }

```
-----
--          xdsl2LineBandTable          --
-----
```

xdsl2LineBandTable OBJECT-TYPE

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

xdsl2LineBandStatusLnAtten

xdsl2LineBandStatusSigAtten

xdsl2LineBandStatusSnrMargin

Xdsl2Band,

Unsigned32,

Unsigned32,

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)6"

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 (SATNds)  
and paragraph #7.5.1.12 (SATNus)"

DEFVAL { 2147483646 }  
::= { xdsl2LineBandEntry 3 }

xdsl2LineBandStatusSnrMargin OBJECT-TYPE

SYNTAX Integer32 (-640..630 | 2147483646 | 2147483647)

UNITS "0.1 dB"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"SNR Margin is the maximum increase in dB of the noise power received at the xTU (xTU-R for a band in the downstream direction and xTU-C for a band in the upstream direction), such that the BER requirements are met for all bearer channels received at the xTU. Values range from -640 to 630 in units of 0.1 dB (physical values are -64 to 63 dB).

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

A special value of 0x7FFFFFFE (2147483646) indicates the SNR Margin measurement is currently unavailable."

REFERENCE "ITU-T G.997.1, paragraph #7.5.1.13 (SNRMds)  
and paragraph #7.5.1.14 (SNRMpbds)  
and paragraph #7.5.1.16 (SNRMus)  
and paragraph #7.5.1.17 (SNRMpbus)"

DEFVAL { 2147483646 }  
::= { xdsl2LineBandEntry 4 }

```
-----
--          xdsl2ChannelStatusTable          --
-----
```

xdsl2ChannelStatusTable OBJECT-TYPE

SYNTAX SEQUENCE OF Xdsl2ChannelStatusEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The table xdsl2ChannelStatusTable contains status

parameters of VDSL2/ADSL/ADSL2 or ADSL2+ channel.  
 This table contains live data from equipment."  
 ::= { xdsl2Status 2 }

**xdsl2ChannelStatusEntry** OBJECT-TYPE  
 SYNTAX Xdsl2ChannelStatusEntry  
 MAX-ACCESS not-accessible  
 STATUS current  
 DESCRIPTION  
 "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,
xdsl2ChStatusInpReport	Xdsl2ChInpReport,
xdsl2ChStatusNFec	Unsigned32,
xdsl2ChStatusRFec	Unsigned32,
xdsl2ChStatusLSymb	Unsigned32,
xdsl2ChStatusIntlvDepth	Unsigned32,
xdsl2ChStatusIntlvBlock	Unsigned32,
xdsl2ChStatusLPath	Unsigned32,
xdsl2ChStatusAtmStatus	Xdsl2ChAtmStatus,
xdsl2ChStatusPtmStatus	Xdsl2ChPtmStatus
}	

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

```

```

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<sup>16</sup>-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<sup>16</sup>-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 `xdsl2LineCmdnConfLdsfFailReason` 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 }

```

```

-----
--          xDSL2SCStatusSegmentTable          --
-----

```

```

xDSL2SCStatusSegmentTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF XDSL2SCStatusSegmentEntry
    MAX-ACCESS   not-accessible
    STATUS      current
    DESCRIPTION
        "The table xDSL2SCStatusSegmentTable 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  $Hlin(f = i \cdot Df)$  value for a particular subcarrier group index  $i$  ( $0 \leq i \leq NS$ ).  $Hlin(f)$  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  $Hlin(f = i \cdot Df)$  value for a particular subcarrier group index  $i$  ( $0 \leq i \leq NS$ ).  $Hlin(f)$  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  $H\log(f = i \cdot Df)$  value for a particular subcarrier group index  $i$ , ( $0 \leq i \leq NS$ ).

The real  $H\log(f)$  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  $QLN(f = i \cdot Df)$  value for a particular subcarrier index  $i$ , ( $0 \leq i \leq NS$ ).

The  $QLN(f)$  is represented as  $(-23 - n(i)/2)$ , with  $n(i)$  in the range 0 to 254. A special value  $n(i)=255$  indicates that no measurement could be done for the subcarrier group because it is out of the passband or that the noise PSD is out of range to be represented. This parameter is applicable in loop diagnostic procedure and initialization. Each value in this array is 8 bits wide."

REFERENCE "ITU-T G.997.1, paragraph #7.5.1.27.3 (QLNpsds)  
and paragraph #7.5.1.27.6 (QLNpsus)"

::= { xdsl2SCStatusSegmentEntry 5 }

xdsl2SCStatusSegmentSnr OBJECT-TYPE

SYNTAX OCTET STRING (SIZE(0..512))

UNITS "0.5 dB"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The SNR Margin per subcarrier group, expressing the ratio between the received signal power and received noise power per subscriber group. It is an array of 512 octets, designed for supporting up to 512 (downstream) 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  $i$  ( $0 \leq i \leq NS$ ) 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:

$(-32 + \text{xdsl2SCStatusSegmentSnr}(i)/2)$  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 }

xdsl2SCStatusSegmentBitsAlloc OBJECT-TYPE

SYNTAX Xdsl2BitsAlloc

UNITS "bits"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The bits allocation per subcarrier. An array of 256 octets (512 nibbles) designed for supporting up to 512 (downstream)



subcarriers. When more 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  $i$  ( $0 \leq i < \text{MIN}((\text{NS}+1) - (\text{segment}-1)*512, 512)$ ) in each segment is set to a value in the range 0 to 15 to indicate that the respective downstream or upstream subcarrier  $j$  ( $j = (\text{segment}-1)*512 + i$ ) has the same amount of bits allocation."

REFERENCE "ITU-T G.997.1, paragraph #7.5.1.29.1 (BITSpsds) and paragraph #7.5.1.29.2 (BITSpsus)"

::= { `xdsl2SCStatusSegmentEntry` 7 }

`xdsl2SCStatusSegmentGainAlloc` OBJECT-TYPE  
SYNTAX OCTET STRING (SIZE(0..1024))  
MAX-ACCESS read-only  
STATUS current

#### DESCRIPTION

"The gain allocation per subcarrier. An array of 512 16-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  $i$  ( $0 \leq i < \text{MIN}((\text{NS}+1) - (\text{segment}-1)*512, 512)$ ) in each segment is set to a value in the range 0 to 4093 to indicate that the respective downstream or upstream subcarrier  $j$  ( $j = (\text{segment}-1)*512 + i$ ) 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 (GAINSpsds) and paragraph #7.5.1.29.4 (GAINSpsus)"

::= { `xdsl2SCStatusSegmentEntry` 8 }

-----  
-- `xdsl2LineInventoryTable` --

-----

```

xDSL2LineInventoryTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF XDSL2LineInventoryEntry
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
        "The table xDSL2LineInventoryTable contains an inventory of the
        DSL termination unit."
    ::= { xDSL2Inventory 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, xDSL2LInvUnit }
    ::= { xDSL2LineInventoryTable 1 }

XDSL2LineInventoryEntry ::=
    SEQUENCE {
        xDSL2LInvUnit                XDSL2Unit,
        xDSL2LInvG994VendorId        OCTET STRING,
        xDSL2LInvSystemVendorId      OCTET STRING,
        xDSL2LInvVersionNumber        OCTET STRING,
        xDSL2LInvSerialNumber         OCTET STRING,
        xDSL2LInvSelfTestResult       Unsigned32,
        xDSL2LInvTransmissionCapabilities XDSL2TransmissionModeType
    }

xDSL2LInvUnit OBJECT-TYPE
    SYNTAX      XDSL2Unit
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
        "The termination unit."
    ::= { xDSL2LineInventoryEntry 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 }

```

```

xdsl2LInvTransmissionCapabilities 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."

```
::= { xsdl2ProfileLine 1 }
```

`xsdl2LineConfTemplateEntry` OBJECT-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 { `xsdl2LConfTempTemplateName` }

```
::= { xsdl2LineConfTemplateTable 1 }
```

`Xdsl2LineConfTemplateEntry` ::=

SEQUENCE {

<code>xsdl2LConfTempTemplateName</code>	<code>SnmpAdminString</code> ,
<code>xsdl2LConfTempLineProfile</code>	<code>SnmpAdminString</code> ,
<code>xsdl2LConfTempChan1ConfProfile</code>	<code>SnmpAdminString</code> ,
<code>xsdl2LConfTempChan1RaRatioDs</code>	<code>Unsigned32</code> ,
<code>xsdl2LConfTempChan1RaRatioUs</code>	<code>Unsigned32</code> ,
<code>xsdl2LConfTempChan2ConfProfile</code>	<code>SnmpAdminString</code> ,
<code>xsdl2LConfTempChan2RaRatioDs</code>	<code>Unsigned32</code> ,
<code>xsdl2LConfTempChan2RaRatioUs</code>	<code>Unsigned32</code> ,
<code>xsdl2LConfTempChan3ConfProfile</code>	<code>SnmpAdminString</code> ,
<code>xsdl2LConfTempChan3RaRatioDs</code>	<code>Unsigned32</code> ,
<code>xsdl2LConfTempChan3RaRatioUs</code>	<code>Unsigned32</code> ,
<code>xsdl2LConfTempChan4ConfProfile</code>	<code>SnmpAdminString</code> ,
<code>xsdl2LConfTempChan4RaRatioDs</code>	<code>Unsigned32</code> ,
<code>xsdl2LConfTempChan4RaRatioUs</code>	<code>Unsigned32</code> ,
<code>xsdl2LConfTempRowStatus</code>	<code>RowStatus</code>

}

`xsdl2LConfTempTemplateName` 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"

```
::= { xsdl2LineConfTemplateEntry 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" }  
 ::= { xsdl2LineConfTemplateEntry 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 xsdl2ChConfProfileTable table."  
DEFVAL { "DEFVAL" }  
 ::= { xsdl2LineConfTemplateEntry 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 - xsdl2LConfTempChan1RaRatioDs 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 }  
 ::= { xsdl2LineConfTemplateEntry 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

```

    100%."
REFERENCE      "ITU-T G.997.1, paragraph #7.3.2.1.4
                (Rate adaptation ratio)"
DEFVAL         { 0 }
 ::= { xdsl2LineConfTemplateEntry 7 }

xdsl2LConfTempChan2RaRatioUs  OBJECT-TYPE
SYNTAX         Unsigned32(0..100)
UNITS          "percent"
MAX-ACCESS     read-create
STATUS         current
DESCRIPTION    "Rate Adaptation Ratio.  The ratio (in 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 `xdsl2LineConfTemplate` or `xdsl2LineConfFallbackTemplate` that refers to the row."

::= { xsdl2LineConfTemplateEntry 15 }

```
-----
--          xsdl2LineConfProfTable          --
-----
```

`xsdl2LineConfProfTable` OBJECT-TYPE

SYNTAX SEQUENCE OF `Xdsl2LineConfProfEntry`

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The table `xsdl2LineConfProfTable` contains VDSL2/ADSL/ADSL2 and ADSL2+ line configuration profiles.

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

::= { xsdl2ProfileLine 2 }

`xsdl2LineConfProfEntry` 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 { `xsdl2LConfProfProfileName` }

::= { `xsdl2LineConfProfTable` 1 }

`Xdsl2LineConfProfEntry` ::=

SEQUENCE {

<code>xsdl2LConfProfProfileName</code>	<code>SnmpAdminString</code> ,
<code>xsdl2LConfProfScMaskDs</code>	<code>Xdsl2ScMaskDs</code> ,
<code>xsdl2LConfProfScMaskUs</code>	<code>Xdsl2ScMaskUs</code> ,
<code>xsdl2LConfProfVdsl2CarMask</code>	<code>Xdsl2CarMask</code> ,
<code>xsdl2LConfProfRfiBands</code>	<code>Xdsl2RfiBands</code> ,
<code>xsdl2LConfProfRaModeDs</code>	<code>Xdsl2RaMode</code> ,
<code>xsdl2LConfProfRaModeUs</code>	<code>Xdsl2RaMode</code> ,

xdsl2LConfProfRaUsNrmDs	Unsigned32,
xdsl2LConfProfRaUsNrmUs	Unsigned32,
xdsl2LConfProfRaUsTimeDs	Unsigned32,
xdsl2LConfProfRaUsTimeUs	Unsigned32,
xdsl2LConfProfRaDsNrmDs	Unsigned32,
xdsl2LConfProfRaDsNrmUs	Unsigned32,
xdsl2LConfProfRaDsTimeDs	Unsigned32,
xdsl2LConfProfRaDsTimeUs	Unsigned32,
xdsl2LConfProfTargetSnrmDs	Unsigned32,
xdsl2LConfProfTargetSnrmUs	Unsigned32,
xdsl2LConfProfMaxSnrmDs	Unsigned32,
xdsl2LConfProfMaxSnrmUs	Unsigned32,
xdsl2LConfProfMinSnrmDs	Unsigned32,
xdsl2LConfProfMinSnrmUs	Unsigned32,
xdsl2LConfProfMsgMinUs	Unsigned32,
xdsl2LConfProfMsgMinDs	Unsigned32,
xdsl2LConfProfCeFlag	Xdsl2LineCeFlag,
xdsl2LConfProfSnrModeDs	Xdsl2LineSnrMode,
xdsl2LConfProfSnrModeUs	Xdsl2LineSnrMode,
xdsl2LConfProfTxRefVnDs	Xdsl2LineTxRefVnDs,
xdsl2LConfProfTxRefVnUs	Xdsl2LineTxRefVnUs,
xdsl2LConfProfXtuTransSysEna	Xdsl2TransmissionModeType,
xdsl2LConfProfPmMode	Xdsl2LinePmMode,
xdsl2LConfProfL0Time	Unsigned32,
xdsl2LConfProfL2Time	Unsigned32,
xdsl2LConfProfL2Atpr	Unsigned32,
xdsl2LConfProfL2Atprt	Unsigned32,
xdsl2LConfProfProfiles	Xdsl2LineProfiles,
xdsl2LConfProfDpboEPsd	Xdsl2PsdMaskDs,
xdsl2LConfProfDpboEsEL	Unsigned32,
xdsl2LConfProfDpboEsCableModelA	Unsigned32,
xdsl2LConfProfDpboEsCableModelB	Unsigned32,
xdsl2LConfProfDpboEsCableModelC	Unsigned32,
xdsl2LConfProfDpboMus	Unsigned32,
xdsl2LConfProfDpboFMin	Unsigned32,
xdsl2LConfProfDpboFMax	Unsigned32,
xdsl2LConfProfUpboKL	Unsigned32,
xdsl2LConfProfUpboKLF	Xdsl2UpboKLF,
xdsl2LConfProfUs0Mask	Xdsl2LineUs0Mask,
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  $i$  ( $0 \leq i < \text{NSCds}$ ) 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  $\text{NSCds} < 4096$ , all bits  $i$  ( $\text{NSCds} < i \leq 4096$ ) 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  $i$  ( $0 \leq i < \text{NSCus}$ ) 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  $\text{NSCus} < 4096$ , all bits  $i$  ( $\text{NSCus} < i \leq 4096$ ) should be set to '1'."

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

::= { xdsl2LineConfProfEntry 3 }

**xdsl2LConfProfVdsl2CarMask OBJECT-TYPE**

SYNTAX Xdsl2CarMask

MAX-ACCESS read-create

STATUS current

**DESCRIPTION**

"VDSL2-specific 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-USNRMus)"

DEFVAL { 10 }

```
::= { xdsl2LineConfProfEntry 9 }
```

**xdsl2LConfProfRaUsTimeDs OBJECT-TYPE****SYNTAX** Unsigned32(0..16383)**UNITS** "seconds"**MAX-ACCESS** read-create**STATUS** current**DESCRIPTION**

"The Downstream Up-Shift Time Interval, to be used when xsdl2LConfProfRaModeDs 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 }

::= { xsdl2LineConfProfEntry 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 xsdl2LConfProfRaModeUs 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 }

::= { xsdl2LineConfProfEntry 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 xsdl2LConfProfRaModeDs 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 xsdl2LConfProfRaDsTimeDs, 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 }

**xdsl2LConfProfMsgMinUs 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 }

**xdsl2LConfProfMsgMinDs 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 }

**xdsl2LConfProfCeFlag 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 }

**xdsl2LConfProfSnrModeDs 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 }  
::= { xsdsl2LineConfProfEntry 25 }

xsdsl2LConfProfSnrModeUs   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 }  
::= { xsdsl2LineConfProfEntry 26 }

xsdsl2LConfProfTxRefVnDs   OBJECT-TYPE  
SYNTAX           Xdsl2LineTxRefVnDs  
MAX-ACCESS      read-create  
STATUS           current  
DESCRIPTION  
    "This configuration parameter defines the downstream  
    transmitter-referred virtual noise.  
    The TXREFVnDs shall be specified through a set of breakpoints.  
    Each breakpoint shall consist of a subcarrier index t, with a  
    subcarrier spacing of 4.3125 kHz, and a noise PSD level  
    (expressed in dBm/Hz) at that subcarrier. The set of breakpoints  
    can then be represented as:  
    [(t1, PSD1), (t2, PSD2), ... , (tN, PSDN)]."  
REFERENCE        "ITU-T G.997.1, paragraph #7.3.1.7.3 (TXREFVnDs)"  
::= { xsdsl2LineConfProfEntry 27 }

xsdsl2LConfProfTxRefVnUs   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)"

`::= { xdsl2LineConfProfEntry 28 }`

**xdsl2LConfProfXtuTransSysEna OBJECT-TYPE**

SYNTAX Xdsl2TransmissionModeType

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"xTU Transmission System Enabling (XTSE). A list of the different coding types enabled in this profile. It is coded in a 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)"

`::= { xdsl2LineConfProfEntry 29 }`

**xdsl2LConfProfPmMode OBJECT-TYPE**

SYNTAX Xdsl2LinePmMode

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"Power management state Enabling (PMMode). Defines the power states the xTU-C or xTU-R may autonomously transition to on this line.

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 } }  
`::= { xdsl2LineConfProfEntry 30 }`

**xdsl2LConfProfL0Time OBJECT-TYPE**

SYNTAX Unsigned32 (0..255)

UNITS "seconds"

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The minimum time (in seconds) between an Exit from the L2 state and the next Entry into the L2 state.

It ranges from 0 to 255 seconds."

REFERENCE "ITU-T G.997.1, paragraph #7.3.1.1.5 (L0-TIME)"

DEFVAL { 255 }

`::= { xdsl2LineConfProfEntry 31 }`

**xdsl2LConfProfL2Time OBJECT-TYPE**  
SYNTAX Unsigned32 (0..255)  
UNITS "seconds"  
MAX-ACCESS read-create  
STATUS current  
DESCRIPTION  
    "The minimum time (in seconds) between an Entry into the  
    L2 state and the first Power Trim in the L2 state and between two  
    consecutive Power Trims in the L2 state.  
    It ranges from 0 to 255 seconds."  
REFERENCE "ITU-T G.997.1, paragraph #7.3.1.1.6 (L2-TIME)"  
DEFVAL { 255 }  
 ::= { xsdl2LineConfProfEntry 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 }  
 ::= { xsdl2LineConfProfEntry 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 }  
 ::= { xsdl2LineConfProfEntry 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 (DPBOEPSD)"

::= { 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



STATUS current

DESCRIPTION

"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 xsdl2LConfProfDpboEsEL (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 }

::= { xsdl2LineConfProfEntry 38 }

xsdl2LConfProfDpboEsCableModelB OBJECT-TYPE

SYNTAX Unsigned32 (0..640)

UNITS " $2^{-8}$ "

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The E-side Cable Model parameter B (DPBOESCMB) of the cable model (DPBOESCM) for cables connecting exchange-based DSL services to a remote flexibility point (cabinet), that hosts the xTU-C that is subject to spectrally shaped downstream power back-off (DPBO) depending on this value.

The cable model is in terms of three scalars

xsdl2LConfProfDpboEsCableModelA (DPBOESCMA),

xsdl2LConfProfDpboEsCableModelB (DPBOESCMB), and

xsdl2LConfProfDpboEsCableModelC (DPBOESCMC), that are used to estimate the frequency dependent loss of E-side cables calculated from the xsdl2LConfProfDpboEsEL (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 }

::= { xsdl2LineConfProfEntry 39 }

xsdl2LConfProfDpboEsCableModelC OBJECT-TYPE

SYNTAX Unsigned32 (0..640)

UNITS "2<sup>-8</sup>"  
 MAX-ACCESS read-create  
 STATUS current  
 DESCRIPTION  
 "The E-side Cable Model parameter C (DPBOESCMC) of the cable model (DPBOESCM) for cables connecting exchange-based DSL services to a remote flexibility point (cabinet), that hosts the xTU-C that is subject to spectrally shaped downstream power back-off (DPB0) 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<sup>-8</sup>. All values in the range are valid. This parameter is used only for G.993.2."  
 REFERENCE "ITU-T G.997.1, paragraph #7.3.1.2.13 (DPBOESCMC)"  
 DEFVAL { 0 }  
 ::= { xdsl2LineConfProfEntry 40 }

xdsl2LConfProfDpboMus OBJECT-TYPE  
 SYNTAX Unsigned32 (0..255)  
 UNITS "0.5 dBm/Hz"  
 MAX-ACCESS read-create  
 STATUS current  
 DESCRIPTION  
 "This configuration parameter defines the assumed Minimum Usable receive PSD mask (in dBm/Hz) for exchange-based services, used to modify parameter xdsl2LConfProfDpboFMax (DPBOFMAX) defined below (to determine the DPB0). It shall be coded as an unsigned integer representing a PSD mask level from 0 dBm/Hz (coded as 0) to -127.5 dBm/Hz (coded as 255) in steps of 0.5 dBm/Hz. All values in the range are valid.  
 NOTE - The PSD mask level is 3.5 dB above the signal PSD level. This parameter is used only for G.993.2."  
 REFERENCE "ITU-T G.997.1, paragraph #7.3.1.2.13 (DPBOMUS)"  
 DEFVAL { 0 }  
 ::= { xdsl2LineConfProfEntry 41 }

xdsl2LConfProfDpboFMin OBJECT-TYPE  
 SYNTAX Unsigned32 (0..2048)  
 UNITS "4.3125 kHz"  
 MAX-ACCESS read-create  
 STATUS current  
 DESCRIPTION

"This configuration parameter defines the minimum frequency from which the DPBO shall be applied. It ranges from 0 kHz (coded as 0) to 8832 kHz (coded as 2048) in steps of 4.3125 kHz. This parameter is used only for G.993.2."

REFERENCE "ITU-T G.997.1, paragraph #7.3.1.2.13 (DPBOFMIN)"

DEFVAL { 32 }

::= { xdsl2LineConfProfEntry 42 }

xdsl2LConfProfDpboFMax OBJECT-TYPE

SYNTAX Unsigned32 (32..6956)

UNITS "4.3125 kHz"

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"This configuration parameter defines the maximum frequency at which DPBO may be applied. It ranges from 138 kHz (coded as 32) to 29997.75 kHz (coded as 6956) in steps of 4.3125 kHz. This parameter is used only for G.993.2."

REFERENCE "ITU-T G.997.1, paragraph #7.3.1.2.13 (DPBOFMAX)"

DEFVAL { 512 }

::= { xdsl2LineConfProfEntry 43 }

xdsl2LConfProfUpboKL OBJECT-TYPE

SYNTAX Unsigned32 (0..1280)

UNITS "0.1 dB"

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"This configuration parameter defines the electrical length expressed in dB at 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."

```
 ::= { xdsl2ProfileLine 3 }
```

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

```
Xdsl2LineConfProfModeSpecEntry ::=
    SEQUENCE {
        xdsl2LConfProfXdslMode          Xdsl2OperationModes,
        xdsl2LConfProfMaxNomPsdDs       Integer32,
        xdsl2LConfProfMaxNomPsdUs       Integer32,
        xdsl2LConfProfMaxNomAtpDs       Unsigned32,
        xdsl2LConfProfMaxNomAtpUs       Unsigned32,
        xdsl2LConfProfMaxAggRxPwrUs     Integer32,
        xdsl2LConfProfPsdMaskDs         Xdsl2PsdMaskDs,
        xdsl2LConfProfPsdMaskUs         Xdsl2PsdMaskUs,
        xdsl2LConfProfPsdMaskSelectUs   Xdsl2LinePsdMaskSelectUs,
        xdsl2LConfProfClassMask         Xdsl2LineClassMask,
        xdsl2LConfProfLimitMask         Xdsl2LineLimitMask,
        xdsl2LConfProfUs0Disable        Xdsl2LineUs0Disable,
        xdsl2LConfProfModeSpecRowStatus RowStatus
    }
```

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

```
xdsl2LConfProfMaxNomPsdDs OBJECT-TYPE
    SYNTAX      Integer32(-600..-300)
    UNITS       "0.1 dBm/Hz"
    MAX-ACCESS   read-create
```

STATUS current

DESCRIPTION

"The maximum nominal transmit PSD in the downstream direction during initialization and Showtime. It ranges from -600 to -300 units of 0.1 dBm/Hz (physical values are -60 to -30 dBm/Hz)."

REFERENCE "ITU-T G.997.1, paragraph #7.3.1.2.1 (MAXNOMPSDds)"

DEFVAL { -300 }

::= { xdsl2LineConfProfModeSpecEntry 2 }

xdsl2LConfProfMaxNomPsdUs OBJECT-TYPE

SYNTAX Integer32(-600..-300)

UNITS "0.1 dBm/Hz"

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The maximum nominal transmit PSD in the upstream direction during initialization and Showtime. It ranges from -600 to -300 units of 0.1 dBm/Hz (physical values are -60 to -30 dBm/Hz)."

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

DEFVAL { -300 }

::= { xdsl2LineConfProfModeSpecEntry 3 }

xdsl2LConfProfMaxNomAtpDs OBJECT-TYPE

SYNTAX Unsigned32 (0..255)

UNITS "0.1 dBm"

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The maximum nominal aggregate 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 }

xdsl2LConfProfMaxNomAtpUs OBJECT-TYPE

SYNTAX Unsigned32 (0..255)

UNITS "0.1 dBm"

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The maximum nominal aggregate transmit power in the upstream direction during initialization and Showtime. It ranges from 0 to 255 units of 0.1 dBm (physical values are 0 to 25.5 dBm)."

REFERENCE "ITU-T G.997.1, paragraph #7.3.1.2.4 (MAXNOMATPus)"  
 DEFVAL { 255 }  
 ::= { xdsl2LineConfProfModeSpecEntry 5 }

xdsl2LConfProfMaxAggRxPwrUs OBJECT-TYPE

SYNTAX Integer32(-255..255 | 2147483647)

UNITS "0.1 dBm"

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The maximum upstream aggregate receive power over the relevant set of subcarriers. The xTU-C should verify that the upstream power cutback is such that this maximum aggregate receive power value is honored. It ranges from -255 to 255 units of 0.1 dBm (physical values are -25.5 to 25.5 dBm). A value of 0x7FFFFFFF (2147483647) means that there is no limit."

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

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 }

**xdsl2LConfProfClassMask OBJECT-TYPE****SYNTAX** Xdsl2LineClassMask**MAX-ACCESS** read-create**STATUS** current**DESCRIPTION**

"In order to reduce the number of configuration possibilities, the limit Power Spectral Density masks (see LIMITMASK) are grouped in PSD mask classes. Each class is designed such that the PSD levels of each limit PSD mask of a specific class are equal in their respective passband above 552 kHz.

This parameter is defined per VDSL2 Annex enabled in the xsdl2LConfProfXtuTransSysEna object. It selects a single PSD mask class per Annex that is activated at the VTU-0."

**REFERENCE** "ITU-T G.997.1 Amendment 1, paragraph #7.3.1.2.15 (CLASSMASK)"**DEFVAL** { a9980Rb997M1c0Rc998B }

::= { xsdl2LineConfProfModeSpecEntry 10 }

**xdsl2LConfProfLimitMask OBJECT-TYPE****SYNTAX** Xdsl2LineLimitMask**MAX-ACCESS** read-create**STATUS** current**DESCRIPTION**

"This configuration parameter contains the G.993.2 limit PSD masks of the selected PSD mask class, enabled by the near-end xTU on this line for each class of profiles.

This parameter is defined per VDSL2 Annex enabled in the xsdl2LConfProfXtuTransSysEna 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** { {} }

::= { xsdl2LineConfProfModeSpecEntry 11 }

**xdsl2LConfProfUs0Disable OBJECT-TYPE****SYNTAX** Xdsl2LineUs0Disable**MAX-ACCESS** read-create**STATUS** current**DESCRIPTION**

"This configuration parameter indicates if the use of the US0 is disabled for each limit PSD mask enabled in the xsdl2LConfProfLimitMask parameter.

This parameter is defined per VDSL2 Annex enabled in the xsdl2LConfProfXtuTransSysEna 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 }

`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 }

-----  
 -- `xdsl2LineConfProfModeSpecBandUsTable` --  
 -----

`xdsl2LineConfProfModeSpecBandUsTable` OBJECT-TYPE

SYNTAX SEQUENCE OF `Xdsl2LineConfProfModeSpecBandUsEntry`

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The table `xdsl2LineConfProfModeSpecBandUsTable` extends `xdsl2LineConfProfModeSpecTable` with upstream-band-specific parameters for VDSL2, such as upstream power back-off parameters `xdsl2LConfProfUpboPsdA` and `xdsl2LConfProfUpboPsdB` (UPBOPSD-pb).

When a parent 'mandatory row' is created in `xdsl2LineConfProfModeSpecTable`, the SNMP agent will automatically create several 'mandatory' rows in this table -- one for each upstream band:

Note: A mandatory row is one where `xdsl2LConfProfXdslMode = defMode(1)`. When the parent row is deleted, the SNMP agent will automatically delete all associated rows in this table. Any attempt to delete a 'mandatory' row using the `xdsl2LConfProfModeSpecBandUsRowStatus` object will be rejected by the SNMP agent. The manager MAY create a new 'optional' row in this table using the `xdsl2LConfProfModeSpecBandUsRowStatus` object if the associated parent row exists, and the value of `xdsl2LConfProfXdslMode` is a G.993.2 value. The manager MAY delete an 'optional' row in this table using the `xdsl2LConfProfModeSpecBandUsRowStatus` object at any time.

With respect to the `xdsl2LConfProfUpboPsdA` and `xdsl2LConfProfUpboPsdB` parameters, for a given upstream band, if an optional row is missing from this table, then that means upstream power back-off is disabled for that upstream band.

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

```
::= { xdsl2ProfileLine 4 }
```

```
xdsl2LineConfProfModeSpecBandUsEntry OBJECT-TYPE
```

```
SYNTAX      Xdsl2LineConfProfModeSpecBandUsEntry
```

```
MAX-ACCESS  not-accessible
```

```
STATUS      current
```

```
DESCRIPTION
```

```
"The table xdsl2LineConfProfModeSpecBandUsTable extends
xdsl2LineConfProfModeSpecTable with upstream-band-specific
parameters for VDSL2, such as upstream power back-off parameters
xdsl2LConfProfUpboPsdA and xdsl2LConfProfUpboPsdB (UPB0PSD-
pb)."
```

```
INDEX       { xdsl2LConfProfProfileName, xdsl2LConfProfXdslMode,
              xdsl2LConfProfXdslBandUs }
```

```
::= { xdsl2LineConfProfModeSpecBandUsTable 1 }
```

```
Xdsl2LineConfProfModeSpecBandUsEntry ::=
```

```
SEQUENCE {
```

```
    xdsl2LConfProfXdslBandUs
```

```
    Xdsl2BandUs,
```

```
    xdsl2LConfProfUpboPsdA
```

```
    Integer32,
```

```
    xdsl2LConfProfUpboPsdB
```

```
    Integer32,
```

```
    xdsl2LConfProfModeSpecBandUsRowStatus
```

```
    RowStatus
```

```
}
```

**xdsl2LConfProfXdslBandUs OBJECT-TYPE**

SYNTAX Xdsl2BandUs  
 MAX-ACCESS not-accessible  
 STATUS current

**DESCRIPTION**

"Each value identifies a specific band in the upstream transmission direction (excluding the US0 band)."

REFERENCE "ITU-T G.997.1, paragraph #7.3.1.2.14"

::= { xsdl2LineConfProfModeSpecBandUsEntry 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 UPB0 reference PSD used to compute the upstream power back-off for the upstream band. A UPB0 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 UPB0 reference PSD at the frequency 'f' expressed in MHz shall be equal to '-a-b(SQRT(f))'. Setting xsdl2LConfProfUpboPsdA to 4000 and xsdl2LConfProfUpboPsdB to 0 is a special configuration to disable UPB0 in the respective upstream band."

REFERENCE "ITU-T G.997.1, paragraph #7.3.1.2.14 (UPB0PSD-pb)"

DEFVAL { 4000 }

::= { xsdl2LineConfProfModeSpecBandUsEntry 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 UPB0 reference PSD used to compute the upstream power back-off for the upstream band. A UPB0 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 UPB0 reference PSD at the frequency 'f'

expressed in MHz shall be equal to  $-\alpha - b(\sqrt{f})$ '. 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 }

xdsl2LConfProfModeSpecBandUsRowStatus OBJECT-TYPE

SYNTAX RowStatus

MAX-ACCESS read-create

STATUS current

DESCRIPTION

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

This row is activated by setting this object to 'active'.

A 'mandatory' row, as defined in the DESCRIPTION clause of xdsl2LineConfProfModeSpecBandUsTable, 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 xdsl2LineConfProfModeSpecTable 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."

::= { xdsl2LineConfProfModeSpecBandUsEntry 4 }

```
-----
--                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 }

xdsl2ChConfProfileEntry OBJECT-TYPE

```

SYNTAX      Xdsl2ChConfProfileEntry
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 { xsdl2ChConfProfProfileName }
 ::= { xsdl2ChConfProfileTable 1 }

```

```

Xdsl2ChConfProfileEntry ::=
SEQUENCE {
    xsdl2ChConfProfProfileName      SnmpAdminString,
    xsdl2ChConfProfMinDataRateDs    Unsigned32,
    xsdl2ChConfProfMinDataRateUs    Unsigned32,
    xsdl2ChConfProfMinResDataRateDs Unsigned32,
    xsdl2ChConfProfMinResDataRateUs Unsigned32,
    xsdl2ChConfProfMaxDataRateDs    Unsigned32,
    xsdl2ChConfProfMaxDataRateUs    Unsigned32,
    xsdl2ChConfProfMinDataRateLowPwrDs Unsigned32,
    xsdl2ChConfProfMinDataRateLowPwrUs Unsigned32,
    xsdl2ChConfProfMaxDelayDs       Unsigned32,
    xsdl2ChConfProfMaxDelayUs       Unsigned32,
    xsdl2ChConfProfMinProtectionDs  Xdsl2SymbolProtection,
    xsdl2ChConfProfMinProtectionUs  Xdsl2SymbolProtection,
    xsdl2ChConfProfMinProtection8Ds Xdsl2SymbolProtection8,
    xsdl2ChConfProfMinProtection8Us Xdsl2SymbolProtection8,
    xsdl2ChConfProfMaxBerDs          Xdsl2MaxBer,
    xsdl2ChConfProfMaxBerUs          Xdsl2MaxBer,
    xsdl2ChConfProfUsDataRateDs      Unsigned32,
    xsdl2ChConfProfDsDataRateDs      Unsigned32,
    xsdl2ChConfProfUsDataRateUs      Unsigned32,
    xsdl2ChConfProfDsDataRateUs      Unsigned32,
    xsdl2ChConfProfImaEnabled         TruthValue,
    xsdl2ChConfProfMaxDelayVar        Unsigned32,
    xsdl2ChConfProfInitPolicy         Xdsl2ChInitPolicy,
    xsdl2ChConfProfRowStatus          RowStatus
}

```

```

xdsl2ChConfProfProfileName OBJECT-TYPE
SYNTAX      SnmpAdminString (SIZE(1..32))
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "This object identifies a row in this table."
 ::= { xsdl2ChConfProfileEntry 1 }

```

```

xdsl2ChConfProfMinDataRateDs OBJECT-TYPE

```

```

SYNTAX      Unsigned32
UNITS       "bits/second"
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "Minimum Data Rate on Downstream direction. The minimum net
    data rate for the bearer channel, coded in bit/s."
REFERENCE   "ITU-T G.997.1, paragraph #7.3.2.1.1
    (Minimum data rate)"
 ::= { xdsl2ChConfProfileEntry 2 }

```

```

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)"  
::= { xsdl2ChConfProfileEntry 5 }

xsdl2ChConfProfMaxDataRateDs 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)"  
::= { xsdl2ChConfProfileEntry 6 }

xsdl2ChConfProfMaxDataRateUs 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)"  
::= { xsdl2ChConfProfileEntry 7 }

xsdl2ChConfProfMinDataRateLowPwrDs 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)"  
::= { xsdl2ChConfProfileEntry 8 }

xsdl2ChConfProfMinDataRateLowPwrUs 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 (Xdsl2ChStatusActDelay) is as close as possible to, but less than or equal to, xdsl2ChConfProfMaxDelayDs. The delay is coded in ms, with the value 0 indicating no delay bound is being imposed."

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

::= { xdsl2ChConfProfileEntry 10 }

xdsl2ChConfProfMaxDelayUs OBJECT-TYPE

SYNTAX Unsigned32(0..63)

UNITS "milliseconds"

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"Maximum Interleave Delay on Upstream direction. The maximum one-way interleaving delay introduced by the PMS-TC on Upstream direction. The xTUs shall choose the S (factor) and D (depth) values such that the actual one-way interleaving delay (Xdsl2ChStatusActDelay) is as close as possible to, but less than or equal to, xdsl2ChConfProfMaxDelayUs. The delay is coded in ms, with the value 0 indicating no delay bound is being imposed."

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

::= { xdsl2ChConfProfileEntry 11 }

**xdsl2ChConfProfMinProtectionDs OBJECT-TYPE****SYNTAX** Xdsl2SymbolProtection**UNITS** "symbols"**MAX-ACCESS** read-create**STATUS** current**DESCRIPTION**

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

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

::= { xsdl2ChConfProfileEntry 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 }

::= { xsdl2ChConfProfileEntry 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)"

```
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, 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 }

xdsl2ChConfProfRowStatus OBJECT-TYPE

SYNTAX RowStatus

MAX-ACCESS read-create

STATUS current

DESCRIPTION

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

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

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 }

```
-----
--          xdsl2LineAlarmConfTemplateTable          --
-----
```

xdsl2LineAlarmConfTemplateTable OBJECT-TYPE

SYNTAX SEQUENCE OF Xdsl2LineAlarmConfTemplateEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The table xdsl2LineAlarConfTemplateTable contains DSL line alarm configuration templates.

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

::= { xdsl2ProfileAlarmConf 1 }

xdsl2LineAlarmConfTemplateEntry OBJECT-TYPE

SYNTAX Xdsl2LineAlarmConfTemplateEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"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 }
```

xdsl2LAlarmConfTempChan2ConfProfile 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 }
```

xdsl2LAlarmConfTempChan3ConfProfile OBJECT-TYPE

SYNTAX SnmpAdminString (SIZE(0..32))

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The value of this object identifies the row in the DSL Channel Thresholds Configuration Profile Table (xdsl2ChAlarmConfProfileTable) that applies for DSL bearer channel #3. The channel profile name specified here MUST match the name of an existing row in the xdsl2ChAlarmConfProfileTable table.

This object may be set to a non-zero-length string only if xdsl2LAlarmConfTempChan2ConfProfile contains a non-zero-length string."

REFERENCE "DSL Forum TR-129, paragraph #8.4"

DEFVAL { "" }

```
::= { xdsl2LineAlarmConfTemplateEntry 5 }
```

xdsl2LAlarmConfTempChan4ConfProfile OBJECT-TYPE

SYNTAX SnmpAdminString (SIZE(0..32))

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The value of this object identifies the row in the DSL Channel Thresholds Configuration Profile Table (xdsl2ChAlarmConfProfileTable) that applies for DSL bearer channel #4. The channel profile name specified here MUST match the name of an existing row in the xdsl2ChAlarmConfProfileTable table."

This object may be set to a non-zero-length string only if xdsl2LineAlarmConfTempChan3ConfProfile contains a non-zero-length string."

REFERENCE "DSL Forum TR-129, paragraph #8.4"

DEFVAL { "" }

::= { xdsl2LineAlarmConfTemplateEntry 6 }

xdsl2LineAlarmConfTempRowStatus 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      --
-----
```

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 { xsdl2LineAlarmConfProfileName }
    ::= { xsdl2LineAlarmConfProfileTable 1 }

```

```

Xdsl2LineAlarmConfProfileEntry ::=
    SEQUENCE {
        xsdl2LineAlarmConfProfileName          SnmpAdminString,
        xsdl2LineAlarmConfProfileXtucThresh15MinFecs
                                                    HCPperfIntervalThreshold,
        xsdl2LineAlarmConfProfileXtucThresh15MinEs
                                                    HCPperfIntervalThreshold,
        xsdl2LineAlarmConfProfileXtucThresh15MinSes
                                                    HCPperfIntervalThreshold,
        xsdl2LineAlarmConfProfileXtucThresh15MinLoss
                                                    HCPperfIntervalThreshold,
        xsdl2LineAlarmConfProfileXtucThresh15MinUas
                                                    HCPperfIntervalThreshold,
        xsdl2LineAlarmConfProfileXtucThresh15MinFecs
                                                    HCPperfIntervalThreshold,
        xsdl2LineAlarmConfProfileXtucThresh15MinEs
                                                    HCPperfIntervalThreshold,
        xsdl2LineAlarmConfProfileXtucThresh15MinSes
                                                    HCPperfIntervalThreshold,
        xsdl2LineAlarmConfProfileXtucThresh15MinLoss
                                                    HCPperfIntervalThreshold,
        xsdl2LineAlarmConfProfileXtucThresh15MinUas
                                                    HCPperfIntervalThreshold,

        xsdl2LineAlarmConfProfileThresh15MinFailedFullInt  Unsigned32,
        xsdl2LineAlarmConfProfileThresh15MinFailedShrtInt  Unsigned32,

        xsdl2LineAlarmConfProfileRowStatus                  RowStatus
    }

```

```

xdsl2LineAlarmConfProfileName OBJECT-TYPE
    SYNTAX      SnmpAdminString (SIZE(1..32))
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This object identifies a row in this table."
    ::= { xsdl2LineAlarmConfProfileEntry 1 }

```

**xdsl2LineAlarmConfProfileXtucThresh15MinFecs** OBJECT-TYPE  
SYNTAX HCPerfIntervalThreshold  
UNITS "seconds"  
MAX-ACCESS read-create  
STATUS current  
DESCRIPTION  
"A threshold for the xsdl2PMLCurr15MFecs counter, when  
xsdl2PMLCurrUnit 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 }  
::= { xsdl2LineAlarmConfProfileEntry 2 }

**xdsl2LineAlarmConfProfileXtucThresh15MinEs** OBJECT-TYPE  
SYNTAX HCPerfIntervalThreshold  
UNITS "seconds"  
MAX-ACCESS read-create  
STATUS current  
DESCRIPTION  
"A threshold for the xsdl2PMLCurr15MEs counter, when  
xsdl2PMLCurrUnit 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 }  
::= { xsdl2LineAlarmConfProfileEntry 3 }

**xdsl2LineAlarmConfProfileXtucThresh15MinSes** OBJECT-TYPE  
SYNTAX HCPerfIntervalThreshold  
UNITS "seconds"  
MAX-ACCESS read-create  
STATUS current  
DESCRIPTION  
"A threshold for the xsdl2PMLCurr15MSes counter, when  
xsdl2PMLCurrUnit 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 }  
::= { xsdl2LineAlarmConfProfileEntry 4 }

**xdsl2LineAlarmConfProfileXtucThresh15MinLoss** OBJECT-TYPE  
SYNTAX HCPerfIntervalThreshold  
UNITS "seconds"  
MAX-ACCESS read-create  
STATUS current  
DESCRIPTION

"A threshold for the xdsl2PMLCurr15MLoss counter, when xdsl2PMLCurrUnit is xtuc {1}. The value 0 means that no threshold is specified for the associated counter."

REFERENCE "ITU-T G.997.1, paragraph #7.2.7.2"

DEFVAL { 0 }

::= { xdsl2LineAlarmConfProfileEntry 5 }

xdsl2LineAlarmConfProfileXtucThresh15MinUas OBJECT-TYPE

SYNTAX HCPerfIntervalThreshold

UNITS "seconds"

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"A threshold for the xdsl2PMLCurr15MUas counter, when xdsl2PMLCurrUnit is xtuc {1}. The value 0 means that no threshold is specified for the associated counter."

REFERENCE "ITU-T G.997.1, paragraph #7.2.7.2"

DEFVAL { 0 }

::= { xdsl2LineAlarmConfProfileEntry 6 }

xdsl2LineAlarmConfProfileXturThresh15MinFecs OBJECT-TYPE

SYNTAX HCPerfIntervalThreshold

UNITS "seconds"

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"A threshold for the xdsl2PMLCurr15MFecs counter, when xdsl2PMLCurrUnit is xtur {2}. The value 0 means that no threshold is specified for the associated counter."

REFERENCE "ITU-T G.997.1, paragraph #7.2.7.2"

DEFVAL { 0 }

::= { xdsl2LineAlarmConfProfileEntry 7 }

xdsl2LineAlarmConfProfileXturThresh15MinEs OBJECT-TYPE

SYNTAX HCPerfIntervalThreshold

UNITS "seconds"

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"A threshold for the xdsl2PMLCurr15MEs counter, when xdsl2PMLCurrUnit is xtur {2}. The value 0 means that no threshold is specified for the associated counter."

REFERENCE "ITU-T G.997.1, paragraph #7.2.7.2"

DEFVAL { 0 }

```
::= { xdsl2LineAlarmConfProfileEntry 8 }
```

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

```
xdsl2LineAlarmConfProfileXturThresh15MinLoss OBJECT-TYPE
    SYNTAX      HCPerfIntervalThreshold
    UNITS       "seconds"
    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 }

```
-----
--          xdsl2ChAlarmConfProfileTable          --
-----
```

xdsl2ChAlarmConfProfileTable OBJECT-TYPE

SYNTAX SEQUENCE OF Xdsl2ChAlarmConfProfileEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"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."

::= { xdsl2ProfileAlarmConf 3 }

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 }

Xdsl2ChAlarmConfProfileEntry ::=

SEQUENCE {

xdsl2ChAlarmConfProfileName

xdsl2ChAlarmConfProfileXtucThresh15MinCodingViolations SnmpAdminString,

Unsigned32,

xdsl2ChAlarmConfProfileXtucThresh15MinCorrected Unsigned32,

xdsl2ChAlarmConfProfileXturThresh15MinCodingViolations

Unsigned32,

xdsl2ChAlarmConfProfileXturThresh15MinCorrected Unsigned32,

xdsl2ChAlarmConfProfileRowStatus RowStatus

}

xdsl2ChAlarmConfProfileName OBJECT-TYPE

SYNTAX SnmpAdminString (SIZE(1..32))

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This object identifies a row in this table."

::= { xdsl2ChAlarmConfProfileEntry 1 }



**xdsl2ChAlarmConfProfileXtucThresh15MinCodingViolations OBJECT-TYPE****SYNTAX** Unsigned32**MAX-ACCESS** read-create**STATUS** current**DESCRIPTION**

"A threshold for the xsdl2PMChCurr15MCodingViolations counter, when xsdl2PMChCurrUnit 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 }

::= { xsdl2ChAlarmConfProfileEntry 2 }

**xdsl2ChAlarmConfProfileXtucThresh15MinCorrected OBJECT-TYPE****SYNTAX** Unsigned32**MAX-ACCESS** read-create**STATUS** current**DESCRIPTION**

"A threshold for the xsdl2PMChCurr15MCorrectedBlocks counter, when xsdl2PMChCurrUnit 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 }

::= { xsdl2ChAlarmConfProfileEntry 3 }

**xdsl2ChAlarmConfProfileXturThresh15MinCodingViolations OBJECT-TYPE****SYNTAX** Unsigned32**MAX-ACCESS** read-create**STATUS** current**DESCRIPTION**

"A threshold for the xsdl2PMChCurr15MCodingViolations counter, when xsdl2PMChCurrUnit 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 }

::= { xsdl2ChAlarmConfProfileEntry 4 }

**xdsl2ChAlarmConfProfileXturThresh15MinCorrected OBJECT-TYPE****SYNTAX** Unsigned32**MAX-ACCESS** read-create**STATUS** current**DESCRIPTION**

"A threshold for the xsdl2PMChCurr15MCorrectedBlocks counter, when xsdl2PMChCurrUnit 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 vdsl2(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 }
```

**xdsl2PMLCurr15MInvalidIntervals 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)."

::= { xsdl2PMLineCurrEntry 3 }

**xdsl2PMLCurr15MTimeElapsed OBJECT-TYPE**

SYNTAX HCPerfTimeElapsed

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"Total elapsed seconds in this interval."

::= { xsdl2PMLineCurrEntry 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)"

::= { xsdl2PMLineCurrEntry 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)"

::= { xsdl2PMLineCurrEntry 6 }

**xdsl2PMLCurr15MSes OBJECT-TYPE**

SYNTAX Counter32

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

**DESCRIPTION**

"Count of seconds during this interval that there was:

xTU-C: (CRC-8 anomalies in one or more of the  
received bearer channels) >= 18 OR LOS >= 1  
OR SEF >= 1 OR LPR >= 1.

xTU-R: (FEBE anomalies in one or more of the  
received bearer channels) >= 18 OR LOS-FE >= 1  
OR RDI >= 1 OR LPR-FE >= 1.

This parameter is inhibited during UAS."

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

::= { xsdl2PMLLineCurrEntry 7 }

**xdsl2PMLCurr15MLoss OBJECT-TYPE**

SYNTAX Counter32

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

**DESCRIPTION**

"Count of seconds during this interval that there was LOS (or  
LOS-FE for xTU-R)."

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

::= { xsdl2PMLLineCurrEntry 8 }

**xdsl2PMLCurr15MUas OBJECT-TYPE**

SYNTAX Counter32

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

**DESCRIPTION**

"Count of seconds in Unavailability State during this  
interval. Unavailability begins at the onset of 10 contiguous  
severely errored seconds, and ends at the onset of 10 contiguous  
seconds with no severely errored seconds."

REFERENCE "ITU-T G.997.1, paragraph #7.2.1.1.5 (UAS-L)  
and paragraph #7.2.1.2.5 (UAS-LFE)"

::= { xsdl2PMLLineCurrEntry 9 }

**xdsl2PMLCurr1DayValidIntervals 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."

::= { 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)"  
 ::= { xdsl2PMLLineCurrEntry 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)"  
 ::= { xdsl2PMLLineCurrEntry 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,
        xdsl2PMLInitCurr1DayTimeElapsed         Unsigned32,
        xdsl2PMLInitCurr1DayFullInits           Unsigned32,
        xdsl2PMLInitCurr1DayFailedFullInits     Unsigned32,

```



```
        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."

```
 ::= { xdsl2PMLineInitCurrEntry 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)."
    ::= { xdsl2PMLineInitCurrEntry 9 }

xdsl2PMLInitCurr1DayTimeElapsed OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS        "seconds"
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "Total elapsed seconds in this interval."
    ::= { xdsl2PMLineInitCurrEntry 10 }

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

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

xdsl2PMLInitCurr1DayShortInits OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "Count of short initializations attempted on the line
```

(successful and failed) during this interval."  
 REFERENCE "ITU-T G.997.1, paragraph #7.2.1.3.3"  
 ::= { xdsl2PMLineInitCurrEntry 13 }

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

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

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

xdsl2PMLineHist15MinEntry 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 }  
 ::= { xdsl2PMLineHist15MinTable 1 }

Xdsl2PMLineHist15MinEntry ::=

SEQUENCE {	
xdsl2PMLHist15MUnit	Xdsl2Unit,
xdsl2PMLHist15MInterval	Unsigned32,
xdsl2PMLHist15MMonitoredTime	Unsigned32,
xdsl2PMLHist15MFecs	Counter32,
xdsl2PMLHist15MEs	Counter32,

```

        xdsl2PMLHist15MSes          Counter32,
        xdsl2PMLHist15MLoss        Counter32,
        xdsl2PMLHist15MUas         Counter32,
        xdsl2PMLHist15MValidInterval TruthValue
    }

xdsl2PMLHist15MUnit OBJECT-TYPE
    SYNTAX      Xdsl2Unit
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The termination unit."
    ::= { xdsl2PMLLineHist15MinEntry 1 }

xdsl2PMLHist15MInterval OBJECT-TYPE
    SYNTAX      Unsigned32 (1..96)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The interval number."
    ::= { xdsl2PMLLineHist15MinEntry 2 }

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

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

xdsl2PMLHist15MEs OBJECT-TYPE
    SYNTAX      Counter32
    UNITS       "seconds"
    MAX-ACCESS  read-only

```

STATUS current

DESCRIPTION

"Count of seconds during this interval that there was:

xTU-C: CRC-8 >= 1 for one or more bearer channels OR  
LOS >= 1 OR SEF >= 1 OR LPR >= 1.

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

This parameter is inhibited during UAS."

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

::= { 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)"

::= { xdsl2PMLineHist15MinEntry 8 }

xdsl2PMLHist15MValidInterval OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This variable indicates if the data for this interval is valid."

::= { xdsl2PMLineHist15MinEntry 9 }

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

xdsl2PMLineHist1DayTable OBJECT-TYPE

SYNTAX SEQUENCE OF Xdsl2PMLineHist1DayEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The table xdsl2PMLineHist1DayTable contains PM line history for 24-hour intervals of DSL line."

::= { xdsl2PMLine 4 }

xdsl2PMLineHist1DayEntry 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      Unsigned32,
        xdsl2PMLHist1DMonitoredTime Unsigned32,
        xdsl2PMLHist1DFecs          Counter32,
        xdsl2PMLHist1DEs            Counter32,
        xdsl2PMLHist1DSes           Counter32,
        xdsl2PMLHist1DLoss          Counter32,
        xdsl2PMLHist1DUas           Counter32,
        xdsl2PMLHist1DValidInterval TruthValue
    }

xdsl2PMLHist1DUnit OBJECT-TYPE
    SYNTAX      Xdsl2Unit
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
        "The termination unit."
    ::= { xdsl2PMLLineHist1DayEntry 1 }

xdsl2PMLHist1DInterval OBJECT-TYPE
    SYNTAX      Unsigned32 (1..30)
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
        "The interval number."
    ::= { xdsl2PMLLineHist1DayEntry 2 }

xdsl2PMLHist1DMonitoredTime OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS        "seconds"
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "Total seconds monitored in this interval."
    ::= { xdsl2PMLLineHist1DayEntry 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)"
    ::= { xdsl2PMLLineHist1DayEntry 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)"

::= { xsdl2PMLLineHist1DayEntry 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)"

::= { xsdl2PMLLineHist1DayEntry 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)"

::= { xsdl2PMLLineHist1DayEntry 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)"
 ::= { xdsl2PMLineHist1DayEntry 8 }

```

```

xdsl2PMLHist1DValidInterval OBJECT-TYPE
    SYNTAX      TruthValue
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION  "This variable indicates if the data for this interval is
                valid."
 ::= { xdsl2PMLineHist1DayEntry 9 }

```

```

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

```

```

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

```

```

xdsl2PMLineInitHist15MinEntry 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 vdsl2(251). A second index is the
                interval number."
    INDEX       { ifIndex,
                xdsl2PMLInitHist15MInterval }
 ::= { xdsl2PMLineInitHist15MinTable 1 }

```

Xdsl2PMLineInitHist15MinEntry ::=

```
SEQUENCE {
    xsdl2PMLInitHist15MInterval          Unsigned32,
    xsdl2PMLInitHist15MMonitoredTime    Unsigned32,
    xsdl2PMLInitHist15MFullInits        Unsigned32,
    xsdl2PMLInitHist15MFailedFullInits  Unsigned32,
    xsdl2PMLInitHist15MShortInits       Unsigned32,
    xsdl2PMLInitHist15MFailedShortInits Unsigned32,
    xsdl2PMLInitHist15MValidInterval    TruthValue
}
```

xsdl2PMLInitHist15MInterval OBJECT-TYPE

SYNTAX Unsigned32 (1..96)

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The interval number."

::= { xsdl2PMLineInitHist15MinEntry 1 }

xsdl2PMLInitHist15MMonitoredTime OBJECT-TYPE

SYNTAX Unsigned32

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Total seconds monitored in this interval."

::= { xsdl2PMLineInitHist15MinEntry 2 }

xsdl2PMLInitHist15MFullInits 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"

::= { xsdl2PMLineInitHist15MinEntry 3 }

xsdl2PMLInitHist15MFailedFullInits 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"

::= { xsdl2PMLineInitHist15MinEntry 4 }

**xdsl2PMLInitHist15MShortInits OBJECT-TYPE**

SYNTAX Unsigned32

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"Count of short initializations attempted on the line (successful and failed) during this interval."

REFERENCE "ITU-T G.997.1, paragraph #7.2.1.3.3"

::= { xsdl2PMLineInitHist15MinEntry 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"

::= { xsdl2PMLineInitHist15MinEntry 6 }

**xdsl2PMLInitHist15MValidInterval OBJECT-TYPE**

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"This variable indicates if the data for this interval is valid."

::= { xsdl2PMLineInitHist15MinEntry 7 }

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

**xdsl2PMLineInitHist1DayTable OBJECT-TYPE**

SYNTAX SEQUENCE OF Xdsl2PMLineInitHist1DayEntry

MAX-ACCESS not-accessible

STATUS current

## DESCRIPTION

"The table xsdl2PMLineInitHist1DayTable contains PM line initialization history for 24-hour intervals for DSL lines."

::= { xsdl2PMLine 6 }

**xdsl2PMLineInitHist1DayEntry 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 }
 ::= { xdsl2PMLLineInitHist1DayTable 1 }
```

```
Xdsl2PMLLineInitHist1DayEntry ::=
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."
 ::= { xdsl2PMLLineInitHist1DayEntry 1 }
```

```
xdsl2PMLInitHist1DMonitoredTime OBJECT-TYPE
SYNTAX      Unsigned32
UNITS       "seconds"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "Total seconds monitored in this interval."
 ::= { xdsl2PMLLineInitHist1DayEntry 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"
 ::= { xdsl2PMLLineInitHist1DayEntry 3 }
```

```
xdsl2PMLInitHist1DFailedFullInits OBJECT-TYPE
SYNTAX      Unsigned32
MAX-ACCESS  read-only
```

```

STATUS      current
DESCRIPTION
    "Count of failed full initializations on the line during this
    interval."
REFERENCE    "ITU-T G.997.1, paragraph #7.2.1.3.2"
 ::= { xdsl2PMLineInitHist1DayEntry 4 }

```

```

xdsl2PMLInitHist1DShortInits  OBJECT-TYPE
SYNTAX      Unsigned32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "Count of short initializations attempted on the line
    (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, xsdl2PMChCurrUnit }

::= { xsdl2PMChCurrTable 1 }

**Xdsl2PMChCurrEntry ::=**

## SEQUENCE {

xsdl2PMChCurrUnit

xsdl2PMChCurr15MValidIntervals

xsdl2PMChCurr15MInvalidIntervals

xsdl2PMChCurr15MTimeElapsed

xsdl2PMChCurr15MCodingViolations

xsdl2PMChCurr15MCorrectedBlocks

xsdl2PMChCurr1DayValidIntervals

xsdl2PMChCurr1DayInvalidIntervals

xsdl2PMChCurr1DayTimeElapsed

xsdl2PMChCurr1DayCodingViolations

xsdl2PMChCurr1DayCorrectedBlocks

Xdsl2Unit,

Unsigned32,

Unsigned32,

HCPerfTimeElapsed,

Unsigned32,

Unsigned32,

Unsigned32,

Unsigned32,

HCPerfTimeElapsed,

Unsigned32,

Unsigned32

}

**xsdl2PMChCurrUnit OBJECT-TYPE**

SYNTAX Xdsl2Unit

MAX-ACCESS not-accessible

STATUS current

## DESCRIPTION

"The termination unit."

::= { xsdl2PMChCurrEntry 1 }

**xsdl2PMChCurr15MValidIntervals 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 (FEBC 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 FEBC) 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 (FEFE 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 #7.2.2.2.1 (CV-CFE)"  
 ::= { xdsl2PMChHist15MinEntry 4 }

xdsl2PMChHist15MCorrectedBlocks OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Count of FEC (FFEC for xTU-R) anomalies (corrected code words) occurring in the channel during the interval. This parameter is inhibited during UAS or SES. If the FEC is applied over multiple channels, then each related FEC (or FFEC) anomaly SHOULD increment each of the counters related to the individual channels."

REFERENCE "ITU-T G.997.1, paragraph #7.2.2.1.2 (FEC-C)  
 and paragraph #7.2.2.2.2 (FEC-CFE)"

::= { xdsl2PMChHist15MinEntry 5 }

xdsl2PMChHist15MValidInterval OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This variable indicates if the data for this interval is valid."

::= { xdsl2PMChHist15MinEntry 6 }

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

xdsl2PMChHist1DTable OBJECT-TYPE

SYNTAX SEQUENCE OF Xdsl2PMChHist1DEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The table xdsl2PMChHist1DTable contains Performance Monitoring (PM) history for 1-day intervals for DSL channels PM."

::= { xdsl2PMChannel 3 }

xdsl2PMChHist1DEntry OBJECT-TYPE

SYNTAX Xdsl2PMChHist1DEntry

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,
        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**

```
{
  xsdl2PMLCurr15MFecs,
  xsdl2LineAlarmConfProfileXturThresh15MinFecs
}
```

**STATUS** current**DESCRIPTION**

"This notification indicates that the FEC seconds threshold has been reached/exceeded for the referred xTU-R."

::= { xsdl2Notifications 2 }

**xdsl2LinePerfESThreshXtuc NOTIFICATION-TYPE****OBJECTS**

```
{
  xsdl2PMLCurr15MEs,
  xsdl2LineAlarmConfProfileXtucThresh15MinEs
}
```

**STATUS** current**DESCRIPTION**

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

::= { xsdl2Notifications 3 }

**xdsl2LinePerfESThreshXtur NOTIFICATION-TYPE****OBJECTS**

```
{
  xsdl2PMLCurr15MEs,
  xsdl2LineAlarmConfProfileXturThresh15MinEs
}
```

**STATUS** current**DESCRIPTION**

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

::= { xsdl2Notifications 4 }

**xdsl2LinePerfSESThreshXtuc NOTIFICATION-TYPE****OBJECTS**

```
{
  xsdl2PMLCurr15MSes,
  xsdl2LineAlarmConfProfileXtucThresh15MinSes
}
```

**STATUS** current**DESCRIPTION**

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

::= { xsdl2Notifications 5 }

```
xdsl2LinePerfSESThreshXtur NOTIFICATION-TYPE
OBJECTS
{
    xsdl2PMLCurr15MSes,
    xsdl2LineAlarmConfProfileXturThresh15MinSes
}
STATUS      current
DESCRIPTION
    "This notification indicates that the severely errored seconds
    threshold has been reached/exceeded for the referred xTU-R."
 ::= { xsdl2Notifications 6 }
```

```
xdsl2LinePerfLOSSThreshXtuc NOTIFICATION-TYPE
OBJECTS
{
    xsdl2PMLCurr15MLoss,
    xsdl2LineAlarmConfProfileXtucThresh15MinLoss
}
STATUS      current
DESCRIPTION
    "This notification indicates that the LOS seconds
    threshold has been reached/exceeded for the referred xTU-C."
 ::= { xsdl2Notifications 7 }
```

```
xdsl2LinePerfLOSSThreshXtur NOTIFICATION-TYPE
OBJECTS
{
    xsdl2PMLCurr15MLoss,
    xsdl2LineAlarmConfProfileXturThresh15MinLoss
}
STATUS      current
DESCRIPTION
    "This notification indicates that the LOS seconds
    threshold has been reached/exceeded for the referred xTU-R."
 ::= { xsdl2Notifications 8 }
```

```
xdsl2LinePerfUASThreshXtuc NOTIFICATION-TYPE
OBJECTS
{
    xsdl2PMLCurr15MUas,
    xsdl2LineAlarmConfProfileXtucThresh15MinUas
}
STATUS      current
DESCRIPTION
    "This notification indicates that the unavailable seconds
    threshold has been reached/exceeded for the referred xTU-C."
 ::= { xsdl2Notifications 9 }
```



```
xdsl2LinePerfUASThreshXtur NOTIFICATION-TYPE
OBJECTS
{
    xsdl2PMLCurr15MUas,
    xsdl2LineAlarmConfProfileXturThresh15MinUas
}
STATUS      current
DESCRIPTION
    "This notification indicates that the unavailable seconds
    threshold has been reached/exceeded for the referred xTU-R."
 ::= { xsdl2Notifications 10 }
```

```
xdsl2LinePerfCodingViolationsThreshXtuc NOTIFICATION-TYPE
OBJECTS
{
    xsdl2PMChCurr15MCodingViolations,
    xsdl2ChAlarmConfProfileXtucThresh15MinCodingViolations
}
STATUS      current
DESCRIPTION
    "This notification indicates that the coding violations
    threshold has been reached/exceeded for the referred xTU-C."
 ::= { xsdl2Notifications 11 }
```

```
xdsl2LinePerfCodingViolationsThreshXtur NOTIFICATION-TYPE
OBJECTS
{
    xsdl2PMChCurr15MCodingViolations,
    xsdl2ChAlarmConfProfileXturThresh15MinCodingViolations
}
STATUS      current
DESCRIPTION
    "This notification indicates that the coding violations
    threshold has been reached/exceeded for the referred xTU-R."
 ::= { xsdl2Notifications 12 }
```

```
xdsl2LinePerfCorrectedThreshXtuc NOTIFICATION-TYPE
OBJECTS
{
    xsdl2PMChCurr15MCorrectedBlocks,
    xsdl2ChAlarmConfProfileXtucThresh15MinCorrected
}
STATUS      current
DESCRIPTION
    "This notification indicates that the corrected blocks
    (FEC events) threshold has been reached/exceeded for the
    referred xTU-C."
 ::= { xsdl2Notifications 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,
  xdsl2LineCmndConfPmsf,
  xdsl2LineCmndConfLdsf,
  xdsl2LineCmndConfLdsfFailReason,
  xdsl2LineCmndAutomodeColdStart,
  xdsl2LineCmndConfReset,
  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,
    xdsl2LConfProfDpboEPsd,
    xdsl2LConfProfDpboEsEL,
    xdsl2LConfProfDpboEsCableModelA,
    xdsl2LConfProfDpboEsCableModelB,
    xdsl2LConfProfDpboEsCableModelC,
    xdsl2LConfProfDpboMus,
    xdsl2LConfProfDpboFMin,
    xdsl2LConfProfDpboFMax,
    xdsl2LConfProfUpboKL,
    xdsl2LConfProfUpboKLF,
    xdsl2LConfProfUs0Mask,
    xdsl2LConfProfForceInp,
    xdsl2LConfProfRowStatus
}

```

STATUS current

## DESCRIPTION

"The group of objects in a line configuration profile."

```
::= { xdsl2Groups 11 }
```

```
xdsl2LineConfProfRaGroup OBJECT-GROUP  
OBJECTS
```

```
{  
    xdsl2LConfProfRaUsNrmDs,  
    xdsl2LConfProfRaUsNrmUs,  
    xdsl2LConfProfRaUsTimeDs,  
    xdsl2LConfProfRaUsTimeUs,  
    xdsl2LConfProfRaDsNrmDs,  
    xdsl2LConfProfRaDsNrmUs,  
    xdsl2LConfProfRaDsTimeDs,  
    xdsl2LConfProfRaDsTimeUs  
}
```

```
STATUS      current
```

```
DESCRIPTION
```

```
"The group of objects required for controlling the  
rate-adaptive behavior of the line."
```

```
::= { xdsl2Groups 12 }
```

```
xdsl2LineConfProfMsgMinGroup OBJECT-GROUP  
OBJECTS
```

```
{  
    xdsl2LConfProfMsgMinUs,  
    xdsl2LConfProfMsgMinDs  
}
```

```
STATUS      current
```

```
DESCRIPTION
```

```
"The group of objects required for controlling the rate  
reserved for Overhead traffic."
```

```
::= { xdsl2Groups 13 }
```

```
xdsl2LineConfProfModeSpecGroup OBJECT-GROUP  
OBJECTS
```

```
{  
    xdsl2LConfProfMaxNomPsdDs,  
    xdsl2LConfProfMaxNomPsdUs,  
    xdsl2LConfProfMaxNomAtpDs,  
    xdsl2LConfProfMaxNomAtpUs,  
    xdsl2LConfProfMaxAggRxPwrUs,  
    xdsl2LConfProfPsdMaskDs,  
    xdsl2LConfProfPsdMaskUs,  
    xdsl2LConfProfPsdMaskSelectUs,  
    xdsl2LConfProfClassMask,  
    xdsl2LConfProfLimitMask,  
    xdsl2LConfProfUs0Disable,  
    xdsl2LConfProfModeSpecRowStatus  
}
```

```

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
    {
        xsdl2ChConfProfImaEnabled,
        xsdl2ChStatusAtmStatus
    }
STATUS      current
DESCRIPTION
    "The group of configuration objects required when the data
    path is ATM."
 ::= { xsdl2Groups 17 }
```

```
xdsl2ChConfProfileMinResGroup OBJECT-GROUP
OBJECTS
    {
        xsdl2ChConfProfMinResDataRateDs,
        xsdl2ChConfProfMinResDataRateUs
    }
STATUS      current
DESCRIPTION
    "The group of configuration objects required for the
    reserved data rate."
 ::= { xsdl2Groups 18 }
```

```
xdsl2ChConfProfileOptAttrGroup OBJECT-GROUP
OBJECTS
    {
        xsdl2ChConfProfMaxDelayVar,
        xsdl2ChConfProfInitPolicy
    }
STATUS      current
DESCRIPTION
    "The group of various optional channel configuration
    parameters."
 ::= { xsdl2Groups 19 }
```

```
xdsl2LineAlarmConfTemplateGroup OBJECT-GROUP
OBJECTS
    {
        xsdl2LAlarmConfTempLineProfile,
        xsdl2LAlarmConfTempChan1ConfProfile,
        xsdl2LAlarmConfTempChan2ConfProfile,
        xsdl2LAlarmConfTempChan3ConfProfile,
        xsdl2LAlarmConfTempChan4ConfProfile,
        xsdl2LAlarmConfTempRowStatus
    }
STATUS      current
DESCRIPTION
    "The group of objects in a line alarm template."
```

```
::= { xdsl2Groups 20 }
```

```
xdsl2LineAlarmConfProfileGroup OBJECT-GROUP
```

```
OBJECTS
```

```
{
    xdsl2LineAlarmConfProfileXtucThresh15MinFecs,
    xdsl2LineAlarmConfProfileXtucThresh15MinEs,
    xdsl2LineAlarmConfProfileXtucThresh15MinSes,
    xdsl2LineAlarmConfProfileXtucThresh15MinLoss,
    xdsl2LineAlarmConfProfileXtucThresh15MinUas,
    xdsl2LineAlarmConfProfileXturThresh15MinFecs,
    xdsl2LineAlarmConfProfileXturThresh15MinEs,
    xdsl2LineAlarmConfProfileXturThresh15MinSes,
    xdsl2LineAlarmConfProfileXturThresh15MinLoss,
    xdsl2LineAlarmConfProfileXturThresh15MinUas,
    xdsl2LineAlarmConfProfileThresh15MinFailedFullInt,
    xdsl2LineAlarmConfProfileThresh15MinFailedShrtInt,
    xdsl2LineAlarmConfProfileRowStatus
}
```

```
STATUS      current
```

```
DESCRIPTION
```

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

```
::= { xdsl2Groups 21 }
```

```
xdsl2ChAlarmConfProfileGroup OBJECT-GROUP
```

```
OBJECTS
```

```
{
    xdsl2ChAlarmConfProfileXtucThresh15MinCodingViolations,
    xdsl2ChAlarmConfProfileXtucThresh15MinCorrected,
    xdsl2ChAlarmConfProfileXturThresh15MinCodingViolations,
    xdsl2ChAlarmConfProfileXturThresh15MinCorrected,
    xdsl2ChAlarmConfProfileRowStatus
}
```

```
STATUS      current
```

```
DESCRIPTION
```

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

```
::= { xdsl2Groups 22 }
```

```
xdsl2PMLineCurrGroup OBJECT-GROUP
```

```
OBJECTS
```

```
{
    xdsl2PMLCurr15MValidIntervals,
    xdsl2PMLCurr15MInvalidIntervals,
    xdsl2PMLCurr15MTimeElapsed,
    xdsl2PMLCurr15MFecs,
    xdsl2PMLCurr15MEs,
    xdsl2PMLCurr15MSes,
    xdsl2PMLCurr15MLoss,
}
```

```

xds12PMLCurr15MUas,
xds12PMLCurr1DayValidIntervals,
xds12PMLCurr1DayInvalidIntervals,
xds12PMLCurr1DayTimeElapsed,
xds12PMLCurr1DayFecs,
xds12PMLCurr1DayEs,
xds12PMLCurr1DaySes,
xds12PMLCurr1DayLoss,
xds12PMLCurr1DayUas
}

```

STATUS current

DESCRIPTION

"The group of objects that report the line-level counters for current PM intervals."

::= { xds12Groups 23 }

xds12PMLineInitCurrGroup OBJECT-GROUP

OBJECTS

```

{
  xds12PMLInitCurr15MValidIntervals,
  xds12PMLInitCurr15MInvalidIntervals,
  xds12PMLInitCurr15MTimeElapsed,
  xds12PMLInitCurr15MFullInits,
  xds12PMLInitCurr15MFailedFullInits,
  xds12PMLInitCurr1DayValidIntervals,
  xds12PMLInitCurr1DayInvalidIntervals,
  xds12PMLInitCurr1DayTimeElapsed,
  xds12PMLInitCurr1DayFullInits,
  xds12PMLInitCurr1DayFailedFullInits
}

```

STATUS current

DESCRIPTION

"The group of objects that report the full initialization counters for current PM intervals."

::= { xds12Groups 24 }

xds12PMLineInitCurrShortGroup OBJECT-GROUP

OBJECTS

```

{
  xds12PMLInitCurr15MShortInits,
  xds12PMLInitCurr15MFailedShortInits,
  xds12PMLInitCurr1DayShortInits,
  xds12PMLInitCurr1DayFailedShortInits
}

```

STATUS current

DESCRIPTION

"The group of objects that report the short initialization counters for current PM intervals."

```
::= { xdsl2Groups 25 }
```

```
xdsl2PMLineHist15MinGroup OBJECT-GROUP
```

```
OBJECTS
```

```
{  
    xdsl2PMLHist15MMonitoredTime,  
    xdsl2PMLHist15MFecs,  
    xdsl2PMLHist15MEs,  
    xdsl2PMLHist15MSes,  
    xdsl2PMLHist15MLoss,  
    xdsl2PMLHist15MUas,  
    xdsl2PMLHist15MValidInterval  
}
```

```
STATUS      current
```

```
DESCRIPTION
```

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

```
::= { xdsl2Groups 26 }
```

```
xdsl2PMLineHist1DayGroup OBJECT-GROUP
```

```
OBJECTS
```

```
{  
    xdsl2PMLHist1DMonitoredTime,  
    xdsl2PMLHist1DFecs,  
    xdsl2PMLHist1DEs,  
    xdsl2PMLHist1DSes,  
    xdsl2PMLHist1DLoss,  
    xdsl2PMLHist1DUas,  
    xdsl2PMLHist1DValidInterval  
}
```

```
STATUS      current
```

```
DESCRIPTION
```

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

```
::= { xdsl2Groups 27 }
```

```
xdsl2PMLineInitHist15MinGroup OBJECT-GROUP
```

```
OBJECTS
```

```
{  
    xdsl2PMLInitHist15MMonitoredTime,  
    xdsl2PMLInitHist15MFullInits,  
    xdsl2PMLInitHist15MFailedFullInits,  
    xdsl2PMLInitHist15MValidInterval  
}
```

```
STATUS      current
```

```
DESCRIPTION
```

```
"The group of PM counters for the previous 15-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,
    xdsl2PMChCurr15MTimeElapsed,
    xdsl2PMChCurr15MCodingViolations,
    xdsl2PMChCurr15MCorrectedBlocks,
```

```
        xdsl2PMChCurr1DayValidIntervals,
        xdsl2PMChCurr1DayInvalidIntervals,
        xdsl2PMChCurr1DayTimeElapsed,
        xdsl2PMChCurr1DayCodingViolations,
        xdsl2PMChCurr1DayCorrectedBlocks
    }
    STATUS          current
    DESCRIPTION
        "The group of objects that report the channel-level
        counters for current PM intervals."
    ::= { xdsl2Groups 32 }

xdsl2PMChHist15MinGroup OBJECT-GROUP
    OBJECTS
        {
            xdsl2PMChHist15MMonitoredTime,
            xdsl2PMChHist15MCodingViolations,
            xdsl2PMChHist15MCorrectedBlocks,
            xdsl2PMChHist15MValidInterval
        }
    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

```
{
  xdsl2LinePerfFECSThreshXtuc,
  xdsl2LinePerfFECSThreshXtur,
  xdsl2LinePerfESThreshXtuc,
  xdsl2LinePerfESThreshXtur,
  xdsl2LinePerfSESThreshXtuc,
  xdsl2LinePerfSESThreshXtur,
  xdsl2LinePerfLOSSThreshXtuc,
  xdsl2LinePerfLOSSThreshXtur,
  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:

- o Though the configuration templates/profiles allow referring to 1-4 bearer channels, ADSL links are limited to two channels at most.
- o Though the channel configuration profile allows higher data rates, ADSL links are limited to downstream/upstream data rate as assumed in RFC 2662 [RFC2662].
- o The Impulse Noise Protection (INP) configuration parameters are given by minimum protection and maximum delay parameters.
- o 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.
- o 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:

o **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 `xdsl2LineCmndConfReset` could cause a unscheduled retrain of a line.

- o `xdsl2LineSegmentTable`

This table contains one object, `xdsl2LineSegmentRowStatus`, that supports SET operations. Unauthorized changes could result in measurement results being deleted prematurely.

- o `xdsl2SCStatusTable`

This table contains one object, `xdsl2SCStatusRowStatus`, that supports SET operations. Unauthorized changes could result in line test results being deleted prematurely.

- o `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.

o xdsl2LineConfProfModeSpecTable

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

- \* xdsl2LConfProfMaxNomPsdDs
- \* xdsl2LConfProfMaxNomPsdUs
- \* xdsl2LConfProfMaxNomAtpDs
- \* xdsl2LConfProfMaxNomAtpUs
- \* xdsl2LConfProfMaxAggRxPwrUs
- \* xdsl2LConfProfPsdMaskDs
- \* xdsl2LConfProfPsdMaskUs

- \* xdsl2LConfProfPsdMaskSelectUs
- \* xdsl2LConfProfClassMask
- \* xdsl2LConfProfLimitMask
- \* xdsl2LConfProfUs0Disable
- \* xdsl2LConfProfModeSpecRowStatus

Unauthorized changes resulting in the setting of any of the above objects to an incorrect value could have an adverse operational effect on several lines.

Also, unauthorized changes to 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.

o 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.

o 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.

o `xdsl2LineAlarmConfTemplateTable`

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

- \* `xdsl2LAlarmConfTempLineProfile`
- \* `xdsl2LAlarmConfTempChan1ConfProfile`
- \* `xdsl2LAlarmConfTempChan2ConfProfile`
- \* `xdsl2LAlarmConfTempChan3ConfProfile`
- \* `xdsl2LAlarmConfTempChan4ConfProfile`
- \* `xdsl2LAlarmConfTempRowStatus`

Unauthorized changes to `xdsl2LAlarmConfTempLineProfile`, `xdsl2LAlarmConfTempChan1ConfProfile`, `xdsl2LAlarmConfTempChan2ConfProfile`, `xdsl2LAlarmConfTempChan3ConfProfile`, or `xdsl2LAlarmConfTempChan4ConfProfile` could have an adverse effect on the management of notifications generated at the scope of several to many lines, or 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.

o `xdsl2LineAlarmConfProfileTable`

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

- \* `xdsl2LineAlarmConfProfileXtucThresh15MinFecs`

- \* xdsl2LineAlarmConfProfileXtucThresh15MinEs
- \* xdsl2LineAlarmConfProfileXtucThresh15MinSes
- \* xdsl2LineAlarmConfProfileXtucThresh15MinLoss
- \* xdsl2LineAlarmConfProfileXtucThresh15MinUas
- \* xdsl2LineAlarmConfProfileXturThresh15MinFecs
- \* xdsl2LineAlarmConfProfileXturThresh15MinEs
- \* xdsl2LineAlarmConfProfileXturThresh15MinSes
- \* xdsl2LineAlarmConfProfileXturThresh15MinLoss
- \* xdsl2LineAlarmConfProfileXturThresh15MinUas
- \* xdsl2LineAlarmConfProfileThresh15MinFailedFullInt
- \* xdsl2LineAlarmConfProfileThresh15MinFailedShrtInt
- \* xdsl2LineAlarmConfProfileRowStatus

Increasing any of the threshold values could result in a notification being suppressed or deferred. Setting a threshold to '0' could result in a notification being suppressed. Suppressing or deferring a notification could prevent the timely delivery of important diagnostic information. Decreasing any of the threshold values could result in a notification being sent from the network falsely reporting a threshold crossing.

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.

o xdsl2ChAlarmConfProfileTable

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.

- \* xdsl2LInvG994VendorId
- \* xdsl2LInvSystemVendorId
- \* xdsl2LInvVersionNumber
- \* xdsl2LInvSerialNumber
- \* xdsl2LInvSelfTestResult
- \* xdsl2LInvTransmissionCapabilities

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

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

It is RECOMMENDED to deploy SNMPv3 and to enable cryptographic security. It is then a customer/operator responsibility to ensure that the SNMP entity giving access to an instance of this MIB module is properly configured to give access only to those objects whose principals (users) have legitimate rights to indeed GET or SET (change/create/delete) them.

## 6. Acknowledgments

The authors are deeply grateful to the authors of the HDSL2 LINE MIB (RFC 4319), Clay Sikes and Bob Ray, for contributing to accelerating the work on this document. The structure of this document as well as several paragraphs originate in their document.

Other contributions and advice were received from the following:

Randy Presuhn (Mindspring)  
Chen Jian (Huawei)  
Bert Wijnen (Lucent)  
Brian Johnson (NEC Australia)  
Andrew Cheers (NEC Australia)  
Sedat Akca (NEC Australia)  
Victor Sperry (Calix Networks)  
Narendranath Nair (Wipro)  
Uwe Pauluhn (Infineon)

John D. Boyle (Alcatel)  
Edward Beili (Actelis)  
Dan Romascanu (Avaya)  
David Harrington (Comcast)  
Smadar Tauber (RAD Data Communications)  
Richard Barnes (BBN Technologies)

## 7. References

### 7.1. Normative References

- [G.992.1] "Asymmetric digital subscriber line (ADSL) transceivers", ITU-T G.992.1, 1999.
- [G.992.2] "Splitterless asymmetric digital subscriber line (ADSL) transceivers", ITU-T G.992.2, 1999.
- [G.992.3] "Asymmetric digital subscriber line transceivers 2 (ADSL2)", ITU-T G.992.3, 2002.
- [G.992.4] "Splitterless asymmetric digital subscriber line transceivers 2 (Splitterless ADSL2)", ITU-T G.992.4, 2002.
- [G.992.5] "Asymmetric digital subscriber line (ADSL) transceivers - Extended bandwidth ADSL2 (ADSL2+)", ITU-T G.992.5, 2005.
- [G.993.1] "Very-high speed Digital Subscriber Line Transceivers", ITU-T G.993.1, June 2004.
- [G.993.2] "Very-high speed Digital Subscriber Line Transceivers 2 (VDSL2 draft)", ITU-T G.993.2, February 2006.
- [G.997.1] "Physical layer management for digital subscriber line (DSL) transceivers", ITU-T G.997.1, June 2006.
- [G.997.1-Am1] "Physical layer management for digital subscriber line (DSL) transceivers - Amendment 1", ITU-T G.997.1-Amendment 1, December 2006.
- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.
- [RFC2578] McCloghrie, K., Ed., Perkins, D., Ed., and J. Schoenwaelder, Ed., "Structure of Management Information Version 2 (SMIv2)", STD 58, RFC 2578, April 1999.



- [RFC2579] McCloghrie, K., Ed., Perkins, D., Ed., and J. Schoenwaelder, Ed., "Textual Conventions for SMIV2", STD 58, RFC 2579, April 1999.
- [RFC2580] McCloghrie, K., Perkins, D., and J. Schoenwaelder, "Conformance Statements for SMIV2", STD 58, RFC 2580, April 1999.
- [RFC2863] McCloghrie, K. and F. Kastenholz, "The Interfaces Group MIB", RFC 2863, June 2000.
- [RFC3411] Harrington, D., Presuhn, R., and B. Wijnen, "An Architecture for Describing Simple Network Management Protocol (SNMP) Management Frameworks", STD 62, RFC 3411, December 2002.
- [RFC3593] Tesink, K., "Textual Conventions for MIB Modules Using Performance History Based on 15 Minute Intervals", RFC 3593, September 2003.
- [RFC3705] Ray, B. and R. Abbi, "High Capacity Textual Conventions for MIB Modules Using Performance History Based on 15 Minute Intervals", RFC 3705, February 2004.
- [T1E1.413] J. Bingham & F. Van der Putten, "Network and Customer Installation Interfaces - Asymmetric Digital Subscriber Line (ADSL) Metallic Interface (T1.413 Issue 2)", ANSI T1E1.413-1998, June 1998.

## 7.2. Informative References

- [RFC2662] Bathrick, G. and F. Ly, "Definitions of Managed Objects for the ADSL Lines", RFC 2662, August 1999.
- [RFC3410] Case, J., Mundy, R., Partain, D., and B. Stewart, "Introduction and Applicability Statements for Internet-Standard Management Framework", RFC 3410, December 2002.
- [RFC3418] Presuhn, R., "Management Information Base (MIB) for the Simple Network Management Protocol (SNMP)", STD 62, RFC 3418, December 2002.
- [RFC3728] Ray, B. and R. Abbi, "Definitions of Managed Objects for Very High Speed Digital Subscriber Lines (VDSL)", RFC 3728, February 2004.

- [RFC4133] Bierman, A. and K. McCloghrie, "Entity MIB (Version 3)", RFC 4133, August 2005.
- [RFC4706] Morgenstern, M., Dodge, M., Baillie, S., and U. Bonollo, "Definitions of Managed Objects for Asymmetric Digital Subscriber Line 2 (ADSL2)", RFC 4706, November 2006.
- [TR-129] Adams, P., "Protocol Independent Management Model for Next Generation DSL Technologies", DSL Forum TR-129, December 2006.

#### 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](mailto: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](mailto: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](mailto:umberto.bonollo@nec.com.au)