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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.

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1. The Internet-Standard Management Framework

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

Managed objects are accessed via a virtual information store, termed the Management Information Base or MIB. MIB objects are generally accessed through the Simple Network Management Protocol (SNMP). Objects in the MIB are defined using the mechanisms defined in the Structure of Management Information (SMI). This memo specifies a MIB module that is compliant to the SMIv2, which is described in STD 58, RFC 2578 [RFC2578], STD 58, RFC 2579 [RFC2579], and STD 58, RFC 2580 [RFC2580].

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC 2119 [RFC2119].

2. Overview

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

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

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

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

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

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

Note that the management model, according to this document, does not allow managing VDSL technology per G.993.1 [G.993.1]. VDSL lines MUST be managed by RFC 3728 [RFC3728].

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

2.1. Relationship to Other MIBs

This section outlines the relationship of this MIB module with other MIB modules described in RFCs. Specifically, IF-MIB as defined in RFC 2863 [RFC2863] and ENTITY-MIB as defined in RFC 4133 [RFC4133] are discussed.

2.1.1. Relationship with IF-MIB (RFC 2863)

2.1.1.1. General IF-MIB Integration

The VDSL2 Line MIB specifies the detailed objects of a data interface. As such, it needs to integrate with RFC 2863 [RFC2863]. The IANA has assigned the following ifTypes, which may be applicable for VDSL2 lines as well as for ADSL, ADSL2, and ADSL2+ lines:

```
IANAifType ::= TEXTUAL-CONVENTION
    ...
SYNTAX INTEGER {
    ...
    channel(70),     -- Channel
    adsl(94),        -- Asymmetric Digital Subscriber Loop
    ...
    interleave(124), -- Interleaved Channel
    fast(125),       -- Fast Channel
    ...
    adsl2plus(238),  -- Asymmetric Digital Subscriber Loop Version 2,
                        Version 2 Plus, and all variants
    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
DPBO	Downstream PBO
DRA	Dynamic Rate Adaptation
DSL	Digital Subscriber Line/Loop
DSLF	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
UPBO	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-O	VDSL2 Transceiver Unit - central office or Network Element End
VTU-R	VTU at the remote site (i.e., subscriber end of the loop)
vtuc	VDSL2 line termination unit - central office
vtur	VDSL2 line termination unit - Remote site
xDSL	Either VDSL2, ADSL, ADSL2 or ADSL2+
xTU-C	ADSL/ADSL2/ADSL2+ or VDSL2 line termination unit - central office
xTU-R	ADSL/ADSL2/ADSL2+ or VDSL2 line termination unit - Remote site
xTU	A line termination unit; either an xTU-C or xTU-R

2.3.2. Textual Conventions

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

- Xdsl2Unit
- Xdsl2Direction
- Xdsl2Band
- Xdsl2TransmissionModeType
- Xdsl2RaMode
- Xdsl2InitResult
- Xdsl2OperationModes
- Xdsl2PowerMngState
- Xdsl2ConfPmsForce
- Xdsl2LinePmMode
- Xdsl2LineLdsf
- Xdsl2LdsfResult
- Xdsl2LineBpsc
- Xdsl2BpscResult
- Xdsl2LineReset
- Xdsl2LineProfiles
- Xdsl2LineClassMask
- Xdsl2LineLimitMask
- Xdsl2LineUs0Disable
- Xdsl2LineUs0Mask
- Xdsl2SymbolProtection
- Xdsl2SymbolProtection8

- Xdsl2MaxBer
- Xdsl2ChInitPolicy
- Xdsl2ScMaskDs
- Xdsl2ScMaskUs
- Xdsl2CarMask
- Xdsl2RfiBands
- Xdsl2PsdMaskDs
- Xdsl2PsdMaskUs
- Xdsl2Tssi
- Xdsl2LastTransmittedState
- Xdsl2LineStatus
- Xdsl2ChInpReport
- Xdsl2ChAtmStatus
- Xdsl2ChPtmStatus
- Xdsl2UpboKLF
- Xdsl2BandUs
- Xdsl2LinePsdMaskSelectUs
- Xdsl2LineCeFlag
- Xdsl2LineSnrMode
- Xdsl2LineTxRefVnDs
- Xdsl2LineTxRefVnUs
- Xdsl2BitsAlloc
- Xdsl2MrefPsdDs
- Xdsl2MrefPsdUs

2.4. Structure

The MIB module is structured into the following MIB groups:

- Line Configuration, Maintenance, and Status Group:

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

  - xdsl2LineTable
  - xdsl2LineSegmentTable
  - xdsl2LineBandTable

- Channel Status Group:

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

  - xdsl2ChannelStatusTable

- Subcarrier Status Group:

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

  - xdsl2SCStatusTable
  - xdsl2SCStatusBandTable
  - xdsl2SCStatusSegmentTable

- Unit Inventory Group:

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

  - xdsl2LineInventoryTable

- Current Performance Group:

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

- xdsl2PMLineCurrTable
- xdsl2PMLineInitCurrTable
- xdsl2PMChCurrTable

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.

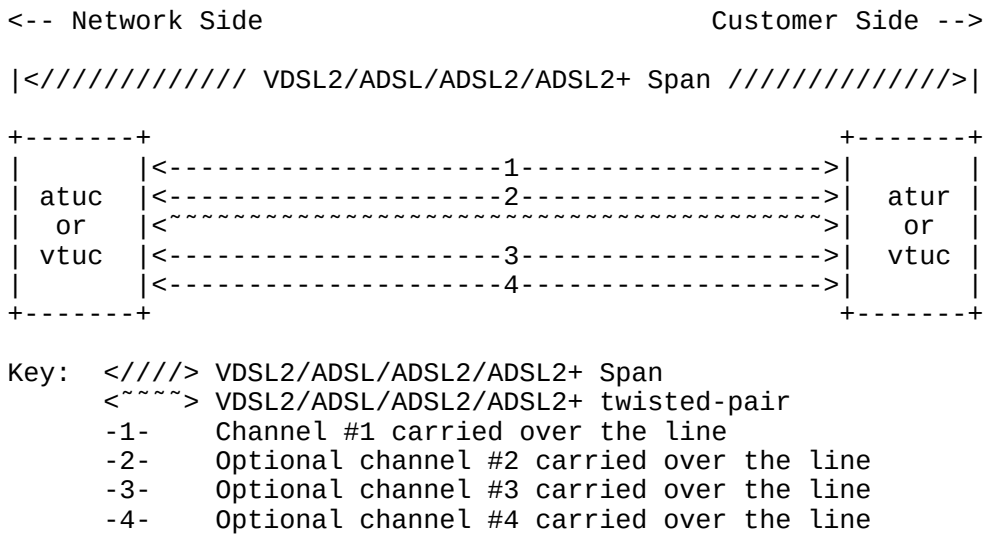

Figure 3: General Topology for a VDSL2/ADSL/ADSL2/ADSL2+ Line

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.

- On the whole line level

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

- On the xTU level

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

- On the bearer channel level

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

2.7.2. Minimum Number of Buckets

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

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

2.7.3. Interval Buckets Initialization

There is no requirement for an agent to ensure a fixed relationship between the start of a 15-minute interval and any wall clock; however, some implementations may align the 15-minute intervals with quarter hours. Likewise, an implementation may choose to align 1-day intervals with the start of a day.

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

2.7.4. Interval Buckets Validity

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

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

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

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

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

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

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

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

2.8. Profiles

As a managed node can handle a large number of xTUs, (e.g., hundreds or perhaps thousands of lines), provisioning every parameter on every xTU may become burdensome. Moreover, most lines are provisioned identically with the same set of parameters. To simplify the provisioning process, this MIB module makes use of profiles and templates.

A configuration profile is a set of parameters that can be shared by multiple entities. There is a configuration profile to address line-level provisioning and another type of profile that addresses channel-level provisioning parameters.

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

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

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

2.8.1. Configuration Profiles and Templates

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

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

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

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

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

  The line configuration template includes one index of a line configuration profile and one to four indices of channel configuration profiles. The template also addresses the issue of distributing the excess available data rate on each traffic flow

direction (i.e., the data rate left after each channel is allocated a data rate to satisfy its minimum requested data rate) among the various channels.

2.8.2. Alarm Configuration Profiles and Templates

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

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

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

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

2.8.3. Managing Profiles and Templates

The index value for each profile and template is a locally unique, administratively assigned name having the textual convention 'SnmpAdminString' (RFC 3411 [RFC3411]).

One or more lines may be configured to share parameters of a single configuration template (e.g., xdsl2LConfTempTemplateName = 'silver') by setting its xdsl2LineConfTemplate object to the value of this template.

One or more lines may be configured to share parameters of a single Alarm configuration template (e.g., xdsl2LAlarmConfTempTemplateName = 'silver') by setting its xdsl2LineAlarmConfTemplate object to the value of this template.

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

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

Implementations MUST provide a default profile whose name is 'DEFVAL' for each profile and template type. The values of the associated parameters will be vendor-specific unless otherwise indicated in this document. Before a line's templates have been set, these templates will be automatically used by setting xdsl2LineConfTemplate and xdsl2LineAlarmConfTemplate to 'DEFVAL' where appropriate. This default profile name, 'DEFVAL', is considered reserved in the context of profiles and templates defined in this MIB module.

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

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

Network Elements MAY optionally implement a fallback line configuration template (see xdsl2LineConfFallbackTemplate). The fallback template will be tried if the xDSL2 line fails to operate using the primary template. If the xDSL2 line fails to operate using the fallback template, then the primary template should be retried. The xTU-C SHOULD continue to alternate between the primary and fallback templates until one of them succeeds.

2.8.4. Managing Multiple Bearer Channels

The number of bearer channels is configured by setting the template objects xdsl2LConfTempChan1ConfProfile, xdsl2LConfTempChan2ConfProfile, xdsl2LConfTempChan3ConfProfile, and xdsl2LConfTempChan4ConfProfile and then assigning that template to a DSL line using the xdsl2LineConfTemplate object. When the number of bearer channels for a DSL line changes, the SNMP agent will automatically create or destroy rows in channel-related tables associated with that line. For example, when a DSL line is operating

with one bearer channel, there will be zero rows in channel-related tables for channels two, three, and four. The SNMP agent MUST create and destroy channel-related rows as follows:

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

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

2.9. Notifications

The ability to generate the SNMP notifications coldStart/WarmStart (per [RFC3418]), which are per agent (e.g., per Digital Subscriber Line Access Multiplexer, or DSLAM, in such a device), and linkUp/linkDown (per [RFC2863]), which are per interface (i.e., VDSL2/ADSL/ADSL2 or ADSL2+ line) is required.

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

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

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

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

A threshold notification occurs whenever the corresponding current 15-minute interval error counter becomes equal to, or exceeds the threshold value. Only one notification SHOULD be sent per interval per interface. Since the current 15-minute counter is reset to 0 every 15 minutes, and if the condition persists, the notification may recur as often as every 15 minutes. For example, to get a notification whenever a "loss of" event occurs (but at most once every 15 minutes), set the corresponding threshold to 1. The agent will generate a notification when the event originally occurs.

Note that the Network Management System, or NMS, may receive a linkDown notification, as well, if enabled (via ifLinkUpDownTrapEnable [RFC2863]). At the beginning of the next 15-minute interval, the counter is reset. When the first second goes by and the event occurs, the current interval bucket will be 1, which equals the threshold, and the notification will be sent again.

3. Definitions

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

IMPORTS
   MODULE-IDENTITY,
   transmission
      FROM SNMPv2-SMI

   TEXTUAL-CONVENTION
      FROM SNMPv2-TC;

vdsl2TCMIB MODULE-IDENTITY
   LAST-UPDATED "200909300000Z" -- September 30, 2009
   ORGANIZATION "ADSLMIB Working Group"
   CONTACT-INFO "WG-email:  adslmib@ietf.org
   Info:      https://www1.ietf.org/mailman/listinfo/adslmib

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               "
   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
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         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.
```

```
   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),
                g9923AnnexIAllDigNonOverlapped(28),
                g9923AnnexIAllDigOverlapped(29),
                g9923AnnexJAllDigNonOverlapped(30),
                g9923AnnexJAllDigOverlapped(31),
                g9924AnnexIAllDigNonOverlapped(32),
                g9924AnnexIAllDigOverlapped(33),
                g9923AnnexLMode1NonOverlapped(34),
                g9923AnnexLMode2NonOverlapped(35),
                g9923AnnexLMode3Overlapped(36),
                g9923AnnexLMode4Overlapped(37),
                g9923AnnexMPotsNonOverlapped(38),
                g9923AnnexMPotsOverlapped(39),
                g9925PotsNonOverlapped(40),
                g9925PotsOverlapped(41),
                g9925IsdnNonOverlapped(42),
                g9925isdnOverlapped(43),
                reserved10(44),
                reserved11(45),
                g9925AnnexIAllDigNonOverlapped(46),
                g9925AnnexIAllDigOverlapped(47),
                g9925AnnexJAllDigNonOverlapped(48),
                g9925AnnexJAllDigOverlapped(49),
                g9925AnnexMPotsNonOverlapped(50),
                g9925AnnexMPotsOverlapped(51),
                reserved12(52),
                reserved13(53),
                reserved14(54),
                reserved15(55),
                g9932AnnexA(56),
                g9932AnnexB(57),
                g9932AnnexC(58),
                reserved16(59),
                reserved17(60),
                reserved18(61),
                reserved19(62),
                reserved20(63)
```

```
               }

Xdsl2RaMode ::= TEXTUAL-CONVENTION
   STATUS      current
   DESCRIPTION
      "Specifies the rate adaptation behavior for the line.
       The three possible behaviors are:
        manual (1)    - No Rate-Adaptation.  The initialization
                        process attempts to synchronize to a
                        specified rate.
        raInit (2)    - Rate-Adaptation during initialization process
                        only, which attempts to synchronize to a rate
                        between minimum and maximum specified values.
        dynamicRa (3)- Dynamic Rate-Adaptation during initialization
                        process as well as during Showtime."
   SYNTAX      INTEGER {
                  manual(1),
                  raInit(2),
                  dynamicRa(3)
               }

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

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

Xdsl2OperationModes ::= TEXTUAL-CONVENTION
   STATUS      current
   DESCRIPTION
      "The VDSL2 management model specified includes an xDSL Mode
       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),
                  g9923AnnexIAllDigNonOverlapped(30),
                  g9923AnnexIAllDigOverlapped(31),
                  g9923AnnexJAllDigNonOverlapped(32),
                  g9923AnnexJAllDigOverlapped(33),
                  g9924AnnexIAllDigNonOverlapped(34),
                  g9924AnnexIAllDigOverlapped(35),
                  g9923AnnexLMode1NonOverlapped(36),
                  g9923AnnexLMode2NonOverlapped(37),
                  g9923AnnexLMode3Overlapped(38),
                  g9923AnnexLMode4Overlapped(39),
                  g9923AnnexMPotsNonOverlapped(40),
                  g9923AnnexMPotsOverlapped(41),
```

```
                  g9925PotsNonOverlapped(42),
                  g9925PotsOverlapped(43),
                  g9925IsdnNonOverlapped(44),
                  g9925isdnOverlapped(45),
                  g9925AnnexIAllDigNonOverlapped(48),
                  g9925AnnexIAllDigOverlapped(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-CO  Annex C: POTS-138co, POTS-276co per C.2.1.1
                              in G.993.2.
       Class HPE-M1  Annex B: HPE17-M1-NUS0, HPE30-M1-NUS0."

   SYNTAX      INTEGER {
```

```
                  none(1),
                  a998ORb997M1cORc998B(2),
                  b997M1xOR998co(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),
               thirteeSymbols (15),
               fourteenSymbols (16),
               fifteenSymbols (17),
               sixteenSymbols (18)
             }

Xdsl2SymbolProtection8 ::= TEXTUAL-CONVENTION
   STATUS      current
   DESCRIPTION
      "This type specifies the minimum impulse noise protection
       for the bearer channel if it is transported over DMT symbols
       with a subcarrier spacing of 8.625 kHz.
       The possible values are:
       'noProtection' (i.e., INP not required) and 1-16 symbols in
       steps of 1 symbol."

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

Xdsl2MaxBer ::= TEXTUAL-CONVENTION
   STATUS      current
   DESCRIPTION
      "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
```

```
                                    associated ATM data path.
       lossOfCellDelineation (2)- Loss of cell delineation on the
                                    associated ATM data path."
   SYNTAX BITS {
       noDefect(0),
       noCellDelineation(1),
       lossOfCellDelineation(2)
     }

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

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

Xdsl2UpboKLF ::= TEXTUAL-CONVENTION
   STATUS      current
   DESCRIPTION
      "Defines the upstream power backoff force mode (UPBOKLF).
       The three possible mode values are:
          auto(1)         - The VDSL Transceiver Unit (VTUs) will
                            autonomously determine the
                            electrical length.
          override(2)     - Forces the VTU-R to use the electrical
                            length, kl0, of the CO-MIB (UPBOKL) to
                            compute the UPBO.
          disableUpbo(3)  - Disables UPBO such that UPBO is not
                            utilized."
   SYNTAX INTEGER {
     auto(1),
     override(2),
     disableUpbo(3)
     }

Xdsl2BandUs ::= TEXTUAL-CONVENTION
   STATUS      current
   DESCRIPTION
      "Each value identifies a specific band in the upstream
```

```
       transmission direction (excluding 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))

Xdsl2MrefPsdDs ::= TEXTUAL-CONVENTION
   STATUS      current
   DESCRIPTION
      "Objects with this syntax are MEDLEY Reference PSD status
       parameters in the downstream direction.  This is expressed as
       the set of
       breakpoints exchanged at initialization.
       The OCTET STRING contains up to 48 pairs of values in the
       following structure:
       Octets 0-1 -- Index of the first subcarrier used in the
                     context of a first breakpoint.
       Octets 2-3 -- The PSD level for the subcarrier indicated
                     in octets 0-1.
       Octets 4-7 -- Same, for a second breakpoint
       Octets 8-11 -- Same, for a third breakpoint
       And so on until
       Octets 188-191 -- Same, for a 48th breakpoint.
       The subcarrier index is an unsigned number in the range 0
       to NSCds-1.
       The PSD level is an integer value in the 0 to 4095 range.  It is
       represented in units of 0.1 dB offset from -140 dBm/Hz."
   SYNTAX      OCTET STRING (SIZE(0..192))

Xdsl2MrefPsdUs ::= TEXTUAL-CONVENTION
   STATUS      current
   DESCRIPTION
      "Objects with this syntax are MEDLEY Reference PSD status
       parameters in the upstream direction.  This is expressed
       as the set of
       breakpoints exchanged at initialization.
       The OCTET STRING contains up to 32 pairs of values in the
       following structure:
       Octets 0-1 -- Index of the first subcarrier used in the
                     context of a first breakpoint.
       Octets 2-3 -- The PSD level for the subcarrier indicated
                     in octets 0-1.
       Octets 4-7 -- Same, for a second breakpoint
       Octets 8-11 -- Same, for a third breakpoint
       And so on until
```

```
       Octets 124-127 -- Same, for a 32nd breakpoint.
       The subcarrier index is an unsigned number in the range 0
       to NSCus-1.
       The PSD level is an integer value in the 0 to 4095 range.  It is
       represented in units of 0.1 dB offset from -140 dBm/Hz."
   SYNTAX      OCTET STRING (SIZE(0..128))

END


VDSL2-LINE-MIB DEFINITIONS ::= BEGIN

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

   ifIndex
      FROM IF-MIB

   TruthValue,
   RowStatus
       FROM SNMPv2-TC
   SnmpAdminString
      FROM SNMP-FRAMEWORK-MIB

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

   Xdsl2Unit,
   Xdsl2Direction,
   Xdsl2Band,
   Xdsl2TransmissionModeType,
   Xdsl2RaMode,
   Xdsl2InitResult,
   Xdsl2OperationModes,
   Xdsl2PowerMngState,
   Xdsl2ConfPmsForce,
   Xdsl2LinePmMode,
   Xdsl2LineLdsf,
   Xdsl2LdsfResult,
   Xdsl2LineBpsc,
```

```
   Xdsl2BpscResult,
   Xdsl2LineReset,
   Xdsl2SymbolProtection,
   Xdsl2SymbolProtection8,
   Xdsl2MaxBer,
   Xdsl2ChInitPolicy,
   Xdsl2ScMaskDs,
   Xdsl2ScMaskUs,
   Xdsl2CarMask,
   Xdsl2RfiBands,
   Xdsl2PsdMaskDs,
   Xdsl2PsdMaskUs,
   Xdsl2Tssi,
   Xdsl2LastTransmittedState,
   Xdsl2LineStatus,
   Xdsl2ChInpReport,
   Xdsl2ChAtmStatus,
   Xdsl2ChPtmStatus,
   Xdsl2UpboKLF,
   Xdsl2BandUs,
   Xdsl2LineProfiles,
   Xdsl2LineUs0Mask,
   Xdsl2LineClassMask,
   Xdsl2LineLimitMask,
   Xdsl2LineUs0Disable,
   Xdsl2LinePsdMaskSelectUs,
   Xdsl2LineCeFlag,
   Xdsl2LineSnrMode,
   Xdsl2LineTxRefVnDs,
   Xdsl2LineTxRefVnUs,
   Xdsl2BitsAlloc,
   Xdsl2MrefPsdDs,
   Xdsl2MrefPsdUs

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

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

vdsl2MIB 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
```

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          "
   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 (DSLF) has been taken into consideration [TR-129]. That framework is based on the ITU-T G.997.1 standard [G.997.1] and its amendment 1 [G.997.1-Am1].

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

```
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        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."
   ::= { xdsl2LineEntry 2 }

xdsl2LineAlarmConfTemplate  OBJECT-TYPE
   SYNTAX      SnmpAdminString (SIZE(1..32))
   MAX-ACCESS  read-write
   STATUS      current
   DESCRIPTION
      "The value of this object identifies the row in the xDSL2
       Line Alarm Configuration Template Table,
       xdsl2LineAlarmConfTemplateTable, which applies to this line.

       This object MUST be maintained in a persistent manner."
   REFERENCE    "DSL Forum TR-129, paragraph #5.1"
   DEFVAL       { "DEFVAL" }
   ::= { xdsl2LineEntry 3 }

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 }
   ::= { xdsl2LineEntry 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 }

xdsl2LineCmndConfReset   OBJECT-TYPE
      SYNTAX      Xdsl2LineReset
      MAX-ACCESS  read-write
      STATUS      current
      DESCRIPTION
         "Request a line reset to occur.
          If this object is set to the value of 'reset', then force
          the line to reset (i.e., the modems will retrain).
          When the line has successfully reset, the SNMP agent will
          set the value of this object to 'idle'.

          Note that the xdsl2LineCmndConfPmsf object will always take
          precedence over this object.
          If the xdsl2LineCmndConfPmsf object is set to the value
          '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       { l3 }
       ::= { xdsl2LineEntry 14 }

xdsl2LineStatusInitResult  OBJECT-TYPE
    SYNTAX      Xdsl2InitResult
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
       "Indicates the result of the last full initialization
        performed on the line."
    REFERENCE    "ITU-T G.997.1, paragraph #7.5.1.6
                  (Initialization success/failure cause)"
    DEFVAL       { noFail }
    ::= { xdsl2LineEntry 15 }

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

xdsl2LineStatusLastStateUs  OBJECT-TYPE
    SYNTAX      Xdsl2LastTransmittedState
```

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

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

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

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

```
xdsl2LineStatusAttainableRateUs  OBJECT-TYPE
   SYNTAX      Unsigned32
   UNITS       "bits/second"
   MAX-ACCESS  read-only
   STATUS      current
   DESCRIPTION
      "Maximum Attainable Data Rate Upstream.
       The maximum upstream net data rate currently attainable by the
       xTU-R transmitter and the xTU-C receiver, coded in bit/s."
   REFERENCE    "ITU-T G.997.1, paragraph #7.5.1.20 (ATTNDRus)"
   DEFVAL       { 0 }
   ::= { xdsl2LineEntry 21 }

xdsl2LineStatusActPsdDs OBJECT-TYPE
   SYNTAX      Integer32 (-900..0 | 2147483647)
   UNITS       "0.1 dBm/Hz"
   MAX-ACCESS  read-only
   STATUS      current
   DESCRIPTION
      "Actual Power Spectral Density (PSD) Downstream.  The average
       downstream transmit PSD over the subcarriers used for downstream.
       It ranges from -900 to 0 units of 0.1 dBm/Hz (physical values are
       -90 to 0 dBm/Hz).
       A value of 0x7FFFFFFF (2147483647) indicates the measurement is
       out of range to be represented."
   REFERENCE    "ITU-T G.997.1, paragraph #7.5.1.21 (ACTPSDds)"
   DEFVAL       { 2147483647 }
   ::= { xdsl2LineEntry 22 }

xdsl2LineStatusActPsdUs OBJECT-TYPE
   SYNTAX      Integer32 (-900..0 | 2147483647)
   UNITS       "0.1 dBm/Hz"
   MAX-ACCESS  read-only
   STATUS      current
   DESCRIPTION
      "Actual Power Spectral Density (PSD) Upstream.  The average
       upstream transmit PSD over the subcarriers used for upstream.
       It ranges from -900 to 0 units of 0.1 dBm/Hz (physical values are
       -90 to 0 dBm/Hz).
       A value of 0x7FFFFFFF (2147483647) indicates the measurement is
       out of range to be represented."
   REFERENCE    "ITU-T G.997.1, paragraph #7.5.1.22 (ACTPSDus)"
   DEFVAL       { 2147483647 }
   ::= { xdsl2LineEntry 23 }

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

```
   MAX-ACCESS  read-only
   STATUS      current
   DESCRIPTION
      "Actual 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, kl0.  This is the final electrical
       length that would have been sent from the VTU-O to VTU-R if the
       electrical length was not forced by the CO-MIB.
       The value ranges from 0 to 128 dB in steps of 0.1 dB."
   REFERENCE    "ITU-T G.997.1, paragraph #7.5.1.23 (UPBOKLE)"
   DEFVAL       { 0 }
   ::= { xdsl2LineEntry 31 }

xdsl2LineStatusTssiDs  OBJECT-TYPE
     SYNTAX      Xdsl2Tssi
     MAX-ACCESS  read-only
     STATUS      current
     DESCRIPTION
     "The transmit spectrum shaping (TSSi) breakpoints expressed
      as the set of breakpoints exchanged
      during G.994.1 (Downstream)."
   REFERENCE  "ITU-T G.997.1, paragraph #7.5.1.29.5 (TSSpsds)"
     ::= { xdsl2LineEntry 32 }

xdsl2LineStatusTssiUs  OBJECT-TYPE
     SYNTAX      Xdsl2Tssi
     MAX-ACCESS  read-only
     STATUS      current
     DESCRIPTION
     "The transmit spectrum shaping (TSSi) breakpoints expressed
      as the set of breakpoints exchanged
      during G.994.1 (Upstream)."
   REFERENCE  "ITU-T G.997.1, paragraph #7.5.1.29.6 (TSSpsus)"
     ::= { xdsl2LineEntry 33 }

xdsl2LineStatusMrefPsdDs  OBJECT-TYPE
     SYNTAX      Xdsl2MrefPsdDs
     MAX-ACCESS  read-only
```

```
     STATUS      current
     DESCRIPTION
     "The MEDLEY Reference PSD status parameters
      in the downstream
      direction expressed as the set of breakpoints exchanged at
      initialization."
   REFERENCE  "ITU-T G.997.1, paragraph #7.5.1.29.7 (MREFPSDds)"
     ::= { 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 xdsl2LineCmndConfBpsc object.

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

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

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 <= i < MIN((NS+1)-(segment-1)*512,512)) in each
       segment is set to a value in the range 0 to 15 to indicate that
       the respective downstream or upstream subcarrier j
       (j=(segement-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 xdsl2LineCmndConfBpscFailReason
       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                        Xdsl2Band,
      xdsl2LineBandStatusLnAtten           Unsigned32,
      xdsl2LineBandStatusSigAtten          Unsigned32,
      xdsl2LineBandStatusSnrMargin         Integer32
   }

xdsl2LineBand OBJECT-TYPE
     SYNTAX      Xdsl2Band
     MAX-ACCESS  not-accessible
     STATUS      current
     DESCRIPTION
     "Identifies the band(s) associated with this line.
      For ADSL/ADSL2/ADSL2+, the values 'upstream' and 'downstream'
      will always be present.
```

```
      For VDSL2, a subset of {'us0', 'ds1', 'us1' ... 'ds4', 'us4' }
      will always be present, together with rows for
      'upstream' and 'downstream', in which only the
      xdsl2LineBandStatusSnrMargin object is expected to hold a valid
      (average) measurement."
     ::= { xdsl2LineBandEntry 1 }

xdsl2LineBandStatusLnAtten  OBJECT-TYPE
   SYNTAX      Unsigned32 (0..1270 | 2147483646 | 2147483647)
   UNITS       "0.1 dB"
   MAX-ACCESS  read-only
   STATUS      current
   DESCRIPTION
      "Line Attenuation.
       When referring to a band in the downstream direction, it is
       the measured difference in the total power transmitted by the
       xTU-C and the total power received by the xTU-R over all
       subcarriers of that band during initialization.

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

       Values range from 0 to 1270 in units of 0.1 dB (physical values
       are 0 to 127 dB).
       A special value of 0x7FFFFFFF (2147483647) indicates the line
       attenuation is out of range to be represented.
       A special value of 0x7FFFFFFE (2147483646) indicates the line
       attenuation measurement is unavailable."
   REFERENCE    "ITU-T G.997.1, paragraph #7.5.1.9 (LATNds)
                and paragraph #7.5.1.10 (LATNus)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 2^16-1."
   REFERENCE  "ITU-T G.997.1, paragraph #7.5.1.26.1 (HLINSCds)
               and paragraph #7.5.1.26.7 (HLINSCus)"
     ::= { xdsl2SCStatusEntry 2 }

xdsl2SCStatusLinScGroupSize OBJECT-TYPE
```

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

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

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

xdsl2SCStatusQlnMt  OBJECT-TYPE
```

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

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

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

xdsl2SCStatusSnrScGroupSize OBJECT-TYPE
```

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

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

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

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

      The SNMP manager is not permitted to create rows in this table or
      set the row status to 'notInService'.  In the first case,
```

```
      if the SNMP manager tries to create a new row, the SNMP agent
      responds with the value 'noCreation' in the error status
      field of the response-PDU.  In the latter case the SNMP agent
      responds with the value 'wrongValue' in the error status
      field of the response-PDU.

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

      The SNMP agent may have limited resources; therefore, if multiple
      rows coexist in this table, it may fail to add new rows to this
      table or allocate memory resources for a new DELT process.  If
      that occurs, the SNMP agent responds with either the value
      'tableFull' or the value 'noResources' (for
      the xdsl2LineCmndConfLdsfFailReason object in xdsl2LineTable).

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

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

xdsl2SCStatusBandTable  OBJECT-TYPE
   SYNTAX      SEQUENCE  OF  Xdsl2SCStatusBandEntry
   MAX-ACCESS  not-accessible
   STATUS      current
   DESCRIPTION
      "The table xdsl2SCStatusBandTable contains subcarrier status
       parameters for VDSL2/ADSL/ADSL2 and ADSL2+ that are grouped per-
       band.
       For ADSL/ADSL2/ADSL2+, there is a single upstream band and a
       single downstream band.  For VDSL2, there are several downstream
       bands and several upstream bands.
       The parameters in this table are only available after a loop
       diagnostic procedure."
   ::= { xdsl2Status 4 }

xdsl2SCStatusBandEntry  OBJECT-TYPE
   SYNTAX      Xdsl2SCStatusBandEntry
   MAX-ACCESS  not-accessible
   STATUS      current
   DESCRIPTION
       "One index of this table is an interface index where the
       interface
```

```
       has an ifType of vdsl2(251).  A second index of this table is the
       transmission band."
   INDEX  { ifIndex, xdsl2SCStatusBand }
   ::= { xdsl2SCStatusBandTable 1 }

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

xdsl2SCStatusBand OBJECT-TYPE
     SYNTAX      Xdsl2Band
     MAX-ACCESS  not-accessible
     STATUS      current
     DESCRIPTION
     "The transmission band."
     ::= { xdsl2SCStatusBandEntry 1 }

xdsl2SCStatusBandLnAtten  OBJECT-TYPE
   SYNTAX      Unsigned32 (0..1270 | 2147483646 | 2147483647)
   UNITS       "0.1 dB"
   MAX-ACCESS  read-only
   STATUS      current
   DESCRIPTION
      "When referring to a band in the downstream direction, it is
       the measured difference in the total power transmitted by the
       xTU-C and the total power received by the xTU-R over all
       subcarriers during diagnostics mode.
       When referring to a band in the upstream direction, it is the
       measured difference in the total power transmitted by the xTU-R
       and the total power received by the xTU-C over all subcarriers
       during diagnostics mode.
       It ranges from 0 to 1270 units of 0.1 dB (physical values are 0
       to 127 dB).
       A special value of 0x7FFFFFFF (2147483647) indicates the line
       attenuation is out of range to be represented.
       A special value of 0x7FFFFFFE (2147483646) indicates the line
       attenuation measurement is unavailable.
       This object reflects the value of the parameter following the
       most recent DELT performed on the associated line.  Once the DELT
       process is over, the parameter no longer changes until the row is
       deleted or a new DELT process is initiated."
   REFERENCE  "ITU-T G.997.1, paragraph #7.5.1.9 (LATNds)
               and paragraph #7.5.1.10 (LATNus)"
   DEFVAL       { 2147483646 }
   ::= { xdsl2SCStatusBandEntry 2 }
```

```
xdsl2SCStatusBandSigAtten  OBJECT-TYPE
   SYNTAX      Unsigned32 (0..1270 | 2147483646 | 2147483647)
   UNITS       "0.1 dB"
   MAX-ACCESS  read-only
   STATUS      current
   DESCRIPTION
      "When referring to a band in the downstream direction, it is the
       measured difference in the total power transmitted by the xTU-C
       and the total power received by the xTU-R over all subcarriers
       during Showtime after the diagnostics mode.
       When referring to the upstream direction, it is the measured
       difference in the total power transmitted by the xTU-R and the
       total power received by the xTU-C over all subcarriers during
       Showtime after the diagnostics mode.
       It ranges from 0 to 1270 units of 0.1 dB (physical values are 0
       to 127 dB).
       A special value of 0x7FFFFFFF (2147483647) indicates the line
       attenuation is out of range to be represented.
       A special value of 0x7FFFFFFE (2147483646) indicates the line
       attenuation measurement is unavailable.
       This object reflects the value of the parameter following the
       most recent DELT performed on the associated line.  Once the DELT
       process is over, the parameter no longer changes until the row is
       deleted or a new DELT process is initiated."
   REFERENCE  "ITU-T G.997.1, paragraph #7.5.1.11 (SATNds)
               and paragraph #7.5.1.12 (SATNus)"
   DEFVAL       { 2147483646 }
   ::= { xdsl2SCStatusBandEntry 3 }

-------------------------------------------------
--        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*Df) value for a particular subcarrier
       group index i (0 <= i <= NS).
       Hlin(f) is represented as ((scale/2^15)*((a(i)+j*b(i))/2^15)),
       where scale is xdsl2SCStatusLinScale and a(i) and b(i)
       (provided by the xdsl2SCStatusSegmentLinImg object) are in the
       range (-2^15+1) to (+2^15-1).
       A special value a(i)=b(i)= -2^15 indicates that no measurement
       could be done for the subcarrier group because it is out of the
       passband or that the attenuation is out of range to be
       represented.  This parameter is only available after a loop
       diagnostic procedure.
       Each value in this array is 16 bits wide and is stored in big
       endian format."
    REFERENCE  "ITU-T G.997.1, paragraph #7.5.1.26.3 (HLINpsds)
                and paragraph #7.5.1.26.9 (HLINpsus)"
      ::= { xdsl2SCStatusSegmentEntry 2 }

xdsl2SCStatusSegmentLinImg  OBJECT-TYPE
      SYNTAX      OCTET STRING  (SIZE(0..1024))
      MAX-ACCESS  read-only
      STATUS      current
      DESCRIPTION
      "An array of up to 512 complex H(f) linear representation
       values in linear scale for the respective transmission direction.
       It is designed to support up to 512 (downstream) subcarrier
       groups and can be retrieved in a single segment.
       The number of utilized values in the downstream direction depends
       on NSds; in the upstream direction, it depends on NSus.  This
       value is referred to here as NS.
       Each array entry represents the imaginary component (referred to
       here as b(i)) of Hlin(f = i*Df) value for a particular
       subcarrier group index i (0 <= i <= NS).
       Hlin(f) is represented as ((scale/2^15)*((a(i)+j*b(i))/2^15)),
       where scale is xdsl2SCStatusLinScale and a(i) (provided by the
       xdsl2SCStatusSegmentLinReal object) and b(i) are in the range
       (-2^15+1) to (+2^15-1).
       A special value a(i)=b(i)= -2^15 indicates that no measurement
```

```
      could be done for the subcarrier group because it is out of the
      passband or that the attenuation is out of range to be
      represented.  This parameter is only available after a loop
      diagnostic procedure.
      Each value in this array is 16 bits wide and is stored in big
      endian format."
   REFERENCE  "ITU-T G.997.1, paragraph #7.5.1.26.3 (HLINpsds)
               and paragraph #7.5.1.26.9 (HLINpsus)"
     ::= { xdsl2SCStatusSegmentEntry 3 }

xdsl2SCStatusSegmentLog  OBJECT-TYPE
     SYNTAX      OCTET STRING  (SIZE(0..1024))
     UNITS       "dB"
     MAX-ACCESS  read-only
     STATUS      current
     DESCRIPTION
     "An array of up to 512 real H(f) logarithmic representation
      values in dB for the respective transmission direction.  It is
      designed to support up to 512 (downstream) subcarrier groups
      and can be retrieved in a single segment.
      The number of utilized values in the downstream direction depends
      on NSds; in the upstream direction, it depends on NSus.  This
      value is referred to here as NS.
      Each array entry represents the real Hlog(f = i*Df) value for a
      particular subcarrier group index i, (0 <= i <= NS).
      The real Hlog(f) value is represented as (6-m(i)/10), with m(i)
      in the range 0 to 1022.  A special value m=1023 indicates that
      no measurement could be done for the subcarrier group because
      it is out of the passband or that the attenuation is out of
      range to be represented.  This parameter is applicable in loop
      diagnostic procedure and initialization.
      Each value in this array is 16 bits wide and is stored in big
      endian format."
   REFERENCE  "ITU-T G.997.1, paragraph #7.5.1.26.6 (HLOGpsds)
               and paragraph #7.5.1.26.12 (HLOGpsus)"
     ::= { xdsl2SCStatusSegmentEntry 4 }

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

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

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 <= i <= NS) is set to a value in the range 0 to
      254 to indicate that the respective downstream or upstream
      subcarrier group i has an SNR of:
      (-32 + 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 <= i < MIN((NS+1)-(segment-1)*512,512)) in each
      segment is set to a value in the range 0 to 15 to indicate that
      the respective downstream or upstream subcarrier j
      (j=(segement-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 <= i < MIN((NS+1)-(segment-1)*512,512)) in each
      segment is set to a value in the range 0 to 4093 to indicate that
      the respective downstream or upstream subcarrier j
      (j=(segement-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."
    ::= { xdsl2ProfileLine 1 }

xdsl2LineConfTemplateEntry  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  { xdsl2LConfTempTemplateName }
    ::= { xdsl2LineConfTemplateTable 1 }

Xdsl2LineConfTemplateEntry  ::=
    SEQUENCE {
        xdsl2LConfTempTemplateName      SnmpAdminString,
        xdsl2LConfTempLineProfile       SnmpAdminString,
        xdsl2LConfTempChan1ConfProfile  SnmpAdminString,
        xdsl2LConfTempChan1RaRatioDs    Unsigned32,
        xdsl2LConfTempChan1RaRatioUs    Unsigned32,
        xdsl2LConfTempChan2ConfProfile  SnmpAdminString,
        xdsl2LConfTempChan2RaRatioDs    Unsigned32,
        xdsl2LConfTempChan2RaRatioUs    Unsigned32,
        xdsl2LConfTempChan3ConfProfile  SnmpAdminString,
        xdsl2LConfTempChan3RaRatioDs    Unsigned32,
        xdsl2LConfTempChan3RaRatioUs    Unsigned32,
        xdsl2LConfTempChan4ConfProfile  SnmpAdminString,
        xdsl2LConfTempChan4RaRatioDs    Unsigned32,
        xdsl2LConfTempChan4RaRatioUs    Unsigned32,
        xdsl2LConfTempRowStatus         RowStatus
    }

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

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

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

xdsl2LConfTempChan1RaRatioDs  OBJECT-TYPE
   SYNTAX      Unsigned32(0..100)
   UNITS       "percent"
   MAX-ACCESS  read-create
   STATUS      current
   DESCRIPTION
      "Rate Adaptation Ratio.  The ratio (in percent) that should be
       taken into account for the bearer channel #1 when performing rate
       adaptation on Downstream.  The ratio refers to the available data
       rate in excess of the Minimum Data Rate, summed over all bearer
       channels.
       Also, the 100 - xdsl2LConfTempChan1RaRatioDs is the ratio of
       excess data rate to be assigned to all other bearer channels on
       Downstream direction.  The sum of rate adaptation ratios over all
       bearers on the same direction shall be equal to 100%."
   REFERENCE    "ITU-T G.997.1, paragraph #7.3.2.1.4
                 (Rate adaptation ratio)"
   DEFVAL       { 100 }
   ::= { xdsl2LineConfTemplateEntry 4 }

xdsl2LConfTempChan1RaRatioUs  OBJECT-TYPE
   SYNTAX      Unsigned32(0..100)
   UNITS       "percent"
```

```
   MAX-ACCESS  read-create
   STATUS      current
   DESCRIPTION
      "Rate Adaptation Ratio.  The ratio (in percent) that should be
       taken into account for the bearer channel #1 when performing
       rate adaptation on Upstream.  The ratio refers to the available
       data rate in excess of the Minimum Data Rate, summed over all
       bearer channels.
       Also, the 100 - xdsl2LConfTempChan1RaRatioUs is the ratio of
       excess data rate to be assigned to all other bearer channels on
       Upstream direction.  The sum of rate adaptation ratios over all
       bearers on the same direction shall be equal to 100%."
   REFERENCE    "ITU-T G.997.1, paragraph #7.3.2.1.4
                 (Rate adaptation ratio)"
   DEFVAL       { 100 }
   ::= { xdsl2LineConfTemplateEntry 5 }

xdsl2LConfTempChan2ConfProfile  OBJECT-TYPE
   SYNTAX      SnmpAdminString (SIZE(0..32))
   MAX-ACCESS  read-create
   STATUS      current
   DESCRIPTION
      "The value of this object identifies the row in the VDSL2/
       ADSL/ADSL2 and ADSL2+ channel configuration Profile Table
       (xdsl2ChConfProfileTable) that applies to DSL bearer channel #2.
       If the channel is unused, then the object is set to a zero-length
       string.
       This object may be set to a zero-length string only if
       xdsl2LConfTempChan3ConfProfile contains a zero-length
       string."
   DEFVAL       { "" }
   ::= { xdsl2LineConfTemplateEntry 6 }

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

```
       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."
   ::= { xdsl2LineConfTemplateEntry 15 }

-----------------------------------------
--        xdsl2LineConfProfTable        --
-----------------------------------------

xdsl2LineConfProfTable  OBJECT-TYPE
   SYNTAX      SEQUENCE  OF  Xdsl2LineConfProfEntry
   MAX-ACCESS  not-accessible
   STATUS      current
   DESCRIPTION
      "The table xdsl2LineConfProfTable contains VDSL2/ADSL/
       ADSL2 and ADSL2+ line configuration profiles.

       Entries in this table MUST be maintained in a persistent
       manner."
   ::= { xdsl2ProfileLine 2 }

xdsl2LineConfProfEntry  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  { xdsl2LConfProfProfileName }
   ::= { xdsl2LineConfProfTable 1 }

Xdsl2LineConfProfEntry  ::=
   SEQUENCE {
      xdsl2LConfProfProfileName          SnmpAdminString,
      xdsl2LConfProfScMaskDs             Xdsl2ScMaskDs,
      xdsl2LConfProfScMaskUs             Xdsl2ScMaskUs,
      xdsl2LConfProfVdsl2CarMask         Xdsl2CarMask,
      xdsl2LConfProfRfiBands             Xdsl2RfiBands,
      xdsl2LConfProfRaModeDs             Xdsl2RaMode,
      xdsl2LConfProfRaModeUs             Xdsl2RaMode,
```

```
      xdsl2LConfProfRaUsNrmDs            Unsigned32,
      xdsl2LConfProfRaUsNrmUs            Unsigned32,
      xdsl2LConfProfRaUsTimeDs           Unsigned32,
      xdsl2LConfProfRaUsTimeUs           Unsigned32,
      xdsl2LConfProfRaDsNrmDs            Unsigned32,
      xdsl2LConfProfRaDsNrmUs            Unsigned32,
      xdsl2LConfProfRaDsTimeDs           Unsigned32,
      xdsl2LConfProfRaDsTimeUs           Unsigned32,
      xdsl2LConfProfTargetSnrmDs         Unsigned32,
      xdsl2LConfProfTargetSnrmUs         Unsigned32,
      xdsl2LConfProfMaxSnrmDs            Unsigned32,
      xdsl2LConfProfMaxSnrmUs            Unsigned32,
      xdsl2LConfProfMinSnrmDs            Unsigned32,
      xdsl2LConfProfMinSnrmUs            Unsigned32,
      xdsl2LConfProfMsgMinUs             Unsigned32,
      xdsl2LConfProfMsgMinDs             Unsigned32,
      xdsl2LConfProfCeFlag               Xdsl2LineCeFlag,
      xdsl2LConfProfSnrModeDs            Xdsl2LineSnrMode,
      xdsl2LConfProfSnrModeUs            Xdsl2LineSnrMode,
      xdsl2LConfProfTxRefVnDs            Xdsl2LineTxRefVnDs,
      xdsl2LConfProfTxRefVnUs            Xdsl2LineTxRefVnUs,
      xdsl2LConfProfXtuTransSysEna       Xdsl2TransmissionModeType,
      xdsl2LConfProfPmMode               Xdsl2LinePmMode,
      xdsl2LConfProfL0Time               Unsigned32,
      xdsl2LConfProfL2Time               Unsigned32,
      xdsl2LConfProfL2Atpr               Unsigned32,
      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 <= i <
       NSCds) is set to '1', the respective downstream
       subcarrier is masked, and if set to '0', the respective
       subcarrier is unmasked.
       Note that there should always be unmasked subcarriers (i.e.,
       this object cannot be all 1's).
       Also note that if NSCds < 4096, all bits i
       (NSCds < i <= 4096) should be set to '1'."
   REFERENCE    "ITU-T G.997.1, paragraph #7.3.1.2.6 (CARMASKds)"
   ::= { xdsl2LineConfProfEntry 2 }

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

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
       xdsl2LConfProfRaModeDs is set to 'dynamicRa'.  The interval of
       time that the downstream noise margin should stay above the
       Downstream Up-Shift Noise Margin before the xTU-R shall attempt
       to increase the downstream net data rate.  The time interval
       ranges from 0 to 16383 seconds."
   REFERENCE    "ITU-T G.997.1, paragraph #7.3.1.4.5 (RA-UTIMEds)"
   DEFVAL       { 3600 }
   ::= { xdsl2LineConfProfEntry 10 }

xdsl2LConfProfRaUsTimeUs  OBJECT-TYPE
   SYNTAX      Unsigned32(0..16383)
   UNITS       "seconds"
   MAX-ACCESS  read-create
   STATUS      current
   DESCRIPTION
      "The Upstream Up-Shift Time Interval, to be used when
       xdsl2LConfProfRaModeUs is set to 'dynamicRa'.  The interval of
       time the upstream noise margin should stay above the Upstream
       Up-Shift Noise Margin before the xTU-C shall attempt to increase
       the upstream net data rate.  The time interval ranges from 0 to
       16383 seconds."
   REFERENCE    "ITU-T G.997.1, paragraph #7.3.1.4.6 (RA-UTIMEus)"
   DEFVAL       { 3600 }
   ::= { xdsl2LineConfProfEntry 11 }

xdsl2LConfProfRaDsNrmDs  OBJECT-TYPE
   SYNTAX      Unsigned32(0..310)
   UNITS       "0.1 dB"
   MAX-ACCESS  read-create
   STATUS      current
   DESCRIPTION
      "The Downstream Down-Shift Noise Margin value, to be used
       when xdsl2LConfProfRaModeDs is set to 'dynamicRa'.  If the
       downstream noise margin is below this value and stays
       below that value, for more than the time specified by the
       xdsl2LConfProfRaDsTimeDs, the xTU-R shall attempt to decrease
       the downstream net data rate.  The Downstream Down-Shift Noise
       Margin ranges from 0 to 310 units of 0.1 dB (physical values
       are 0 to 31 dB)."
   REFERENCE    "ITU-T G.997.1, paragraph #7.3.1.4.7 (RA-DSNRMds)"
   DEFVAL       { 10 }
```

```
   ::= { xdsl2LineConfProfEntry 12 }

xdsl2LConfProfRaDsNrmUs  OBJECT-TYPE
   SYNTAX      Unsigned32(0..310)
   UNITS       "0.1 dB"
   MAX-ACCESS  read-create
   STATUS      current
   DESCRIPTION
      "The Upstream Downshift Noise Margin value, to be used when
       xdsl2LConfProfRaModeUs is set to 'dynamicRa'.  If the upstream
       noise margin is below this value and stays below that value,
       for more than the time specified by the xdsl2LConfProfRaDsTimeUs,
       the xTU-C shall attempt to decrease the upstream net data rate.
       The Upstream Down-Shift Noise Margin ranges from 0 to 310 units
       of 0.1 dB (physical values are 0 to 31 dB)."
   REFERENCE    "ITU-T G.997.1, paragraph #7.3.1.4.8 (RA-DSNRMus)"
   DEFVAL       { 10 }
   ::= { xdsl2LineConfProfEntry 13 }

xdsl2LConfProfRaDsTimeDs  OBJECT-TYPE
   SYNTAX      Unsigned32(0..16383)
   UNITS       "seconds"
   MAX-ACCESS  read-create
   STATUS      current
   DESCRIPTION
      "The Downstream Downshift Time Interval, to be used when
       xdsl2LConfProfRaModeDs is set to 'dynamicRa'.  The interval of
       time the downstream noise margin should stay below the Downstream
       Down-Shift Noise Margin before the xTU-R shall attempt to
       decrease the downstream net data rate.  The time interval ranges
       from 0 to 16383 seconds."
   REFERENCE    "ITU-T G.997.1, paragraph #7.3.1.4.9 (RA-DTIMEds)"
   DEFVAL       { 3600 }
   ::= { xdsl2LineConfProfEntry 14 }

xdsl2LConfProfRaDsTimeUs  OBJECT-TYPE
   SYNTAX      Unsigned32(0..16383)
   UNITS       "seconds"
   MAX-ACCESS  read-create
   STATUS      current
   DESCRIPTION
      "The Upstream Down-Shift Time Interval, to be used when
       xdsl2LConfProfRaModeUs is set to 'dynamicRa'.  The interval of
       time the upstream noise margin should stay below the Upstream
       Down-Shift Noise Margin before the xTU-C shall attempt to
       decrease the upstream net data rate.  The time interval ranges
       from 0 to 16383 seconds."
   REFERENCE    "ITU-T G.997.1, paragraph #7.3.1.4.10 (RA-DTIMEus)"
```

```
   DEFVAL       { 3600 }
   ::= { xdsl2LineConfProfEntry 15 }

xdsl2LConfProfTargetSnrmDs  OBJECT-TYPE
   SYNTAX      Unsigned32(0..310)
   UNITS       "0.1 dB"
   MAX-ACCESS  read-create
   STATUS      current
   DESCRIPTION
      "The minimum Noise Margin the xTU-R receiver shall achieve,
       relative to the BER requirement for each of the downstream bearer
       channels, to successfully complete initialization.
       The target noise margin ranges from 0 to 310 units of 0.1 dB
       (physical values are 0 to 31 dB)."
   REFERENCE    "ITU-T G.997.1, paragraph #7.3.1.3.1 (TARSNRMds)"
   DEFVAL       { 60 }
   ::= { xdsl2LineConfProfEntry 16 }

xdsl2LConfProfTargetSnrmUs  OBJECT-TYPE
   SYNTAX      Unsigned32(0..310)
   UNITS       "0.1 dB"
   MAX-ACCESS  read-create
   STATUS      current
   DESCRIPTION
      "The minimum Noise Margin the xTU-C receiver shall achieve,
       relative to the BER requirement for each of the upstream bearer
       channels, to successfully complete initialization.
       The target noise margin ranges from 0 to 310 units of 0.1 dB
       (physical values are 0 to 31 dB)."
   REFERENCE    "ITU-T G.997.1, paragraph #7.3.1.3.2 (TARSNRMus)"
   DEFVAL       { 60 }
   ::= { xdsl2LineConfProfEntry 17 }

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

```
   ::= { xdsl2LineConfProfEntry 18 }

xdsl2LConfProfMaxSnrmUs  OBJECT-TYPE
   SYNTAX      Unsigned32 (0..310 | 2147483647)
   UNITS       "0.1 dB"
   MAX-ACCESS  read-create
   STATUS      current
   DESCRIPTION
      "The maximum Noise Margin the xTU-C receiver shall try to
       sustain.  If the Noise Margin is above this level, the xTU-C
       shall request that the xTU-R reduce the xTU-R transmit power to
       get a noise margin below this limit (if this functionality is
       supported).  The maximum noise margin ranges from 0 to 310 units
       of 0.1 dB (physical values are 0 to 31 dB).  A value of
       0x7FFFFFFF (2147483647) means that there is no maximum."
   REFERENCE    "ITU-T G.997.1, paragraph #7.3.1.3.4 (MAXSNRMus)"
   DEFVAL       { 310 }
   ::= { xdsl2LineConfProfEntry 19 }

xdsl2LConfProfMinSnrmDs  OBJECT-TYPE
   SYNTAX      Unsigned32(0..310)
   UNITS       "0.1 dB"
   MAX-ACCESS  read-create
   STATUS      current
   DESCRIPTION
      "The minimum Noise Margin the xTU-R receiver shall tolerate.
       If the noise margin falls below this level, the xTU-R shall
       request that the xTU-C increase the xTU-C transmit power.
       If an increase to xTU-C transmit power is not possible, a loss-
       of-margin (LOM) defect occurs, the xTU-R shall fail and attempt
       to reinitialize and the NMS shall be notified.  The minimum noise
       margin ranges from 0 to 310 units of 0.1 dB (physical values are
       0 to 31 dB).  A value of 0 means that there is no minimum."
   REFERENCE    "ITU-T G.997.1, paragraph #7.3.1.3.5 (MINSNRMds)"
   DEFVAL       { 10 }
   ::= { xdsl2LineConfProfEntry 20 }

xdsl2LConfProfMinSnrmUs  OBJECT-TYPE
   SYNTAX      Unsigned32(0..310)
   UNITS       "0.1 dB"
   MAX-ACCESS  read-create
   STATUS      current
   DESCRIPTION
      "The minimum Noise Margin the xTU-C receiver shall tolerate.
       If the noise margin falls below this level, the xTU-C shall
       request that the xTU-R increase the xTU-R transmit power.
       If an increase of xTU-R transmit power is not possible, a loss-
       of-margin (LOM) defect occurs, the xTU-C shall fail and attempt
```

```
        to re-initialize and the NMS shall be notified.  The minimum
        noise margin ranges from 0 to 310 units of 0.1 dB (physical
        values are 0 to 31 dB).  A value of 0 means that there is no
        minimum."
    REFERENCE    "ITU-T G.997.1, paragraph #7.3.1.3.6 (MINSNRMus)"
    DEFVAL       { 10 }
    ::= { xdsl2LineConfProfEntry 21 }

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 }
   ::= { xdsl2LineConfProfEntry 25 }

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

xdsl2LConfProfTxRefVnDs  OBJECT-TYPE
   SYNTAX      Xdsl2LineTxRefVnDs
   MAX-ACCESS  read-create
   STATUS      current
   DESCRIPTION
      "This configuration parameter defines the downstream
       transmitter-referred virtual noise.
       The 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)"
   ::= { xdsl2LineConfProfEntry 27 }

xdsl2LConfProfTxRefVnUs  OBJECT-TYPE
   SYNTAX      Xdsl2LineTxRefVnUs
   MAX-ACCESS  read-create
   STATUS      current
   DESCRIPTION
      "This configuration parameter defines the upstream
       transmitter-referred virtual noise.
       The TXREFVNus shall be specified through a set of breakpoints.
       Each breakpoint shall consist of a subcarrier index t, with a
       subcarrier spacing of 4.3125 kHz, and a noise PSD level
       (expressed in dBm/Hz) at that subcarrier.  The set of breakpoints
```

```
        can then be represented as:
        [(t1, PSD1), (t2, PSD2), ... , (tN, PSDN)]."
    REFERENCE    "ITU-T G.997.1, paragraph #7.3.1.7.4 (TXREFVNus)"
    ::= { 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 }
   ::= { xdsl2LineConfProfEntry 32 }

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

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

xdsl2LConfProfProfiles  OBJECT-TYPE
   SYNTAX      Xdsl2LineProfiles
   MAX-ACCESS  read-create
   STATUS      current
   DESCRIPTION
      "The configuration parameter contains the G.993.2 profiles
```

```
        to be allowed by the near-end xTU on this line.
        It is coded in a bitmap representation (0 if not allowed, 1 if
        allowed)."
    REFERENCE    "ITU-T G.997.1, paragraph #7.3.1.1.11 (PROFILES)"
    DEFVAL       { { profile8a,  profile8b,  profile8c,
                     profile8d,  profile12a, profile12b,
                     profile17a, profile30a } }
    ::= { xdsl2LineConfProfEntry 35 }

xdsl2LConfProfDpboEPsd  OBJECT-TYPE
    SYNTAX      Xdsl2PsdMaskDs
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
       "This configuration parameter defines the PSD mask that is
        assumed to be permitted at the exchange.  This parameter shall
        use the same format as xdsl2LConfProfPsdMaskDs (PSDMASKds).
        The maximum number of breakpoints for xdsl2LConfProfDpboEPsd
        is 16."
    REFERENCE   "ITU-T G.997.1, paragraph #7.3.1.2.13 (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 xdsl2LConfProfDpboEsEL (DPBOESEL) parameter.  Possible
       values shall be coded as unsigned integers representing a scalar
       value from -1 (coded as 0) to 1.5 (coded as 640) in steps of
       2^-8.  All values in the range are valid.  This parameter is used
       only for G.993.2."
   REFERENCE   "ITU-T G.997.1, paragraph #7.3.1.2.13 (DPBOESCMA)"
   DEFVAL      { 0 }
   ::= { xdsl2LineConfProfEntry 38 }

xdsl2LConfProfDpboEsCableModelB  OBJECT-TYPE
   SYNTAX      Unsigned32 (0..640)
   UNITS       "2^-8"
   MAX-ACCESS  read-create
   STATUS      current
   DESCRIPTION
      "The E-side Cable Model parameter B (DPBOESCMB) of the cable
       model (DPBOESCM) for cables connecting exchange-based DSL
       services to a remote flexibility point (cabinet), that hosts the
       xTU-C that is subject to spectrally shaped downstream power back-
       off (DPBO) depending on this value.
       The cable model is in terms of three scalars
       dsl2LConfProfDpboEsCableModelA (DPBOESCMA),
       xdsl2LConfProfDpboEsCableModelB(DPBOESCMB), and
       xdsl2LConfProfDpboEsCableModelC (DPBOESCMC), that are used to
       estimate the frequency dependent loss of E-side cables calculated
       from the xdsl2LConfProfDpboEsEL (DPBOESEL) parameter.  Possible
       values shall be coded as unsigned integers representing a scalar
       value from -1 (coded as 0) to 1.5 (coded as 640) in steps of
       2^-8.  All values in the range are valid.  This parameter is used
       only for G.993.2."
   REFERENCE   "ITU-T G.997.1, paragraph #7.3.1.2.13 (DPBOESCMB)"
   DEFVAL      { 0 }
   ::= { xdsl2LineConfProfEntry 39 }

xdsl2LConfProfDpboEsCableModelC  OBJECT-TYPE
   SYNTAX      Unsigned32 (0..640)
```

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

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

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

```
      "This configuration parameter defines the minimum frequency
       from which the DPBO shall be applied.  It ranges from 0 kHz
       (coded as 0) to 8832 kHz (coded as 2048) in steps of
       4.3125 kHz.  This parameter is used only for G.993.2."
   REFERENCE   "ITU-T G.997.1, paragraph #7.3.1.2.13 (DPBOFMIN)"
   DEFVAL      { 32 }
   ::= { xdsl2LineConfProfEntry 42 }

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

xdsl2LConfProfUpboKL  OBJECT-TYPE
   SYNTAX      Unsigned32 (0..1280)
   UNITS       "0.1 dB"
   MAX-ACCESS  read-create
   STATUS      current
   DESCRIPTION
      "This configuration parameter defines the electrical length
       expressed in dB at 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 (MAXRXPWRus)"
   DEFVAL       { 255 }
   ::= { xdsl2LineConfProfModeSpecEntry 6 }

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

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

xdsl2LConfProfPsdMaskUs   OBJECT-TYPE
   SYNTAX      Xdsl2PsdMaskUs
   MAX-ACCESS  read-create
   STATUS      current
   DESCRIPTION
     "The upstream PSD mask applicable at the U-R2 reference
      point.
      This parameter is used only for G.992.5, and it may impose PSD
      restrictions (breakpoints) in addition to the Limit PSD mask
      defined in G.992.5.
      This is a string of 16 pairs of values in the following
      structure:
      Octets 0-1 - Index of the first subcarrier used in the context of
                   a first breakpoint.
      Octet 2    - The PSD reduction for the subcarrier indicated in
                   octets 0 and 1.
      Octets 3-5 - Same, for a second breakpoint.
      Octets 6-8 - Same, for a third breakpoint.
      This architecture continues until octets 9-47, which are
      associated with a 16th breakpoint.
      Each subcarrier index is an unsigned number in the range 0 and
      NSCus-1.  Each PSD reduction value is in the range 0 (0 dBm/Hz) to
      255 (-127.5 dBm/Hz) with steps of 0.5 dBm/Hz.  Valid values are in
      the range 0 to 190 (0 to -95 dBm/Hz).
      When the number of breakpoints is less than 16, all remaining
      octets are set to the value '0'.  Note that the content of this
      object should be correlated with the subcarrier mask and with
      the RFI setup."
   REFERENCE    "ITU-T G.997.1, paragraph #7.3.1.2.12 (PSDMASKus)"
     ::= { xdsl2LineConfProfModeSpecEntry 8 }

xdsl2LConfProfPsdMaskSelectUs  OBJECT-TYPE
   SYNTAX      Xdsl2LinePsdMaskSelectUs
   MAX-ACCESS  read-create
   STATUS      current
   DESCRIPTION
     "The selected upstream PSD mask.  This parameter is used only
      for Annexes J and M of G.992.3 and G.992.5, and the same
      selection is used for all relevant enabled bits in
      xdsl2LConfProfXtuTransSysEna."
   REFERENCE    "ITU-T G.997.1, paragraph #7.3.1.2.11
                 (Upstream PSD mask selection)"
   DEFVAL       { adlu32Eu32 }
    ::= { xdsl2LineConfProfModeSpecEntry 9 }
```

```
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
       xdsl2LConfProfXtuTransSysEna object.  It selects a single PSD
       mask class per Annex that is activated at the VTU-O."
   REFERENCE    "ITU-T G.997.1 Amendment 1, paragraph #7.3.1.2.15
                 (CLASSMASK)"
   DEFVAL       { a998ORb997M1cORc998B }
   ::= { xdsl2LineConfProfModeSpecEntry 10 }

xdsl2LConfProfLimitMask  OBJECT-TYPE
   SYNTAX      Xdsl2LineLimitMask
   MAX-ACCESS  read-create
   STATUS      current
   DESCRIPTION
      "This configuration parameter contains the G.993.2 limit
       PSD masks of the selected PSD mask class, enabled by the near-end
       xTU on this line for each class of profiles.
       This parameter is defined per VDSL2 Annex enabled in the
       xdsl2LConfProfXtuTransSysEna object.
       Through this parameter, several limit PSD masks of the selected
       PSD mask class (xdsl2LConfProfClassMask) may be enabled.  The
       enabling parameter is coded in a bitmap representation (0 if the
       associated mask is not allowed, 1 if it is allowed)."
   REFERENCE    "ITU-T G.997.1 Amendment 1, paragraph #7.3.1.2.16
                  (LIMITMASK)"
   DEFVAL       { {} }
   ::= { xdsl2LineConfProfModeSpecEntry 11 }

xdsl2LConfProfUs0Disable  OBJECT-TYPE
   SYNTAX      Xdsl2LineUs0Disable
   MAX-ACCESS  read-create
   STATUS      current
   DESCRIPTION
      "This configuration parameter indicates if the use of the US0 is
       disabled for each limit PSD mask enabled in the
       xdsl2LConfProfLimitMask parameter.
       This parameter is defined per VDSL2 Annex enabled in the
       xdsl2LConfProfXtuTransSysEna object.
```

```
       For each limit PSD mask enabled in the xdsl2LConfProfLimitMask
       parameter, a bit shall indicate if the US0 is disabled.  The
       disabling parameter is coded as a bitmap.  The bit is set to '1'
       if the US0 is disabled for the associated limit mask.
       This parameter and the xdsl2LConfProfLimitMask parameter use the
       same structure."
   REFERENCE    "ITU-T G.997.1, paragraph #7.3.1.2.17 (US0DISABLE)"
   DEFVAL       { {} }
   ::= { xdsl2LineConfProfModeSpecEntry 12 }

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 (UPBOPSD-
       pb)."
   INDEX       { xdsl2LConfProfProfileName, xdsl2LConfProfXdslMode,
                 xdsl2LConfProfXdslBandUs}
   ::= { xdsl2LineConfProfModeSpecBandUsTable 1 }

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

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

xdsl2LConfProfUpboPsdA  OBJECT-TYPE
   SYNTAX      Integer32(4000..8095)
   UNITS       "0.01 dBm/Hz"
   MAX-ACCESS  read-create
   STATUS      current
   DESCRIPTION
      "This configuration parameter defines the 'a' reference
       parameter of the UPBO reference PSD used to compute the
       upstream power back-off for the upstream band.  A UPBO PSD
       defined for each band shall consist of two parameters [a, b].
       Parameter 'a' (xdsl2LConfProfUpboPsdA) ranges from 40 dBm/Hz
       (coded as 4000) to 80.95 dBm/Hz (coded as 8095) in steps of 0.01
       dBm/Hz; and parameter 'b' (xdsl2LConfProfUpboPsdB) ranges from 0
       dBm/Hz (coded as 0) to 40.95 dBm/Hz (coded as 4095) in steps of
       0.01 dBm/Hz.  The UPBO reference PSD at the frequency 'f'
       expressed in MHz shall be equal to '-a-b(SQRT(f))'.  Setting
       xdsl2LConfProfUpboPsdA to 4000 and xdsl2LConfProfUpboPsdB to 0 is
       a special configuration to disable UPBO in the respective
       upstream band."
   REFERENCE   "ITU-T G.997.1, paragraph #7.3.1.2.14 (UPBOPSD-pb)"
   DEFVAL      { 4000 }
  ::= { xdsl2LineConfProfModeSpecBandUsEntry 2 }

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

```
       expressed in MHz shall be equal to '-a-b(SQRT(f))'.  Setting
       xdsl2LConfProfUpboPsdA to 4000 and xdsl2LConfProfUpboPsdB to 0 is
       a special configuration to disable UPBO in the respective
       upstream band."
   REFERENCE   "ITU-T G.997.1, paragraph #7.3.1.2.14 (UPBOPSD-pb)"
   DEFVAL      { 0 }
  ::= { xdsl2LineConfProfModeSpecBandUsEntry 3 }

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  { xdsl2ChConfProfProfileName }
   ::= { xdsl2ChConfProfileTable 1 }

Xdsl2ChConfProfileEntry  ::=
   SEQUENCE {
      xdsl2ChConfProfProfileName          SnmpAdminString,
      xdsl2ChConfProfMinDataRateDs        Unsigned32,
      xdsl2ChConfProfMinDataRateUs        Unsigned32,
      xdsl2ChConfProfMinResDataRateDs     Unsigned32,
      xdsl2ChConfProfMinResDataRateUs     Unsigned32,
      xdsl2ChConfProfMaxDataRateDs        Unsigned32,
      xdsl2ChConfProfMaxDataRateUs        Unsigned32,
      xdsl2ChConfProfMinDataRateLowPwrDs  Unsigned32,
      xdsl2ChConfProfMinDataRateLowPwrUs  Unsigned32,
      xdsl2ChConfProfMaxDelayDs           Unsigned32,
      xdsl2ChConfProfMaxDelayUs           Unsigned32,
      xdsl2ChConfProfMinProtectionDs      Xdsl2SymbolProtection,
      xdsl2ChConfProfMinProtectionUs      Xdsl2SymbolProtection,
      xdsl2ChConfProfMinProtection8Ds     Xdsl2SymbolProtection8,
      xdsl2ChConfProfMinProtection8Us     Xdsl2SymbolProtection8,
      xdsl2ChConfProfMaxBerDs             Xdsl2MaxBer,
      xdsl2ChConfProfMaxBerUs             Xdsl2MaxBer,
      xdsl2ChConfProfUsDataRateDs         Unsigned32,
      xdsl2ChConfProfDsDataRateDs         Unsigned32,
      xdsl2ChConfProfUsDataRateUs         Unsigned32,
      xdsl2ChConfProfDsDataRateUs         Unsigned32,
      xdsl2ChConfProfImaEnabled           TruthValue,
      xdsl2ChConfProfMaxDelayVar          Unsigned32,
      xdsl2ChConfProfInitPolicy           Xdsl2ChInitPolicy,
      xdsl2ChConfProfRowStatus            RowStatus
   }

xdsl2ChConfProfProfileName  OBJECT-TYPE
   SYNTAX      SnmpAdminString (SIZE(1..32))
   MAX-ACCESS  not-accessible
   STATUS      current
   DESCRIPTION
      "This object identifies a row in this table."
   ::= { xdsl2ChConfProfileEntry 1 }

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)"
   ::= { xdsl2ChConfProfileEntry 5 }

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

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

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

xdsl2ChConfProfMinDataRateLowPwrUs  OBJECT-TYPE
   SYNTAX      Unsigned32
   UNITS       "bits/second"
```

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

xdsl2ChConfProfMaxDelayDs  OBJECT-TYPE
   SYNTAX      Unsigned32(0..63)
   UNITS       "milliseconds"
   MAX-ACCESS  read-create
   STATUS      current
   DESCRIPTION
      "Maximum Interleave Delay on Downstream direction.  The
       maximum one-way interleaving delay introduced by the PMS-TC on
       Downstream direction.  The xTUs shall choose the S (factor) and D
       (depth) values such that the actual one-way interleaving delay
       (Xdsl2ChStatusActDelay) is as close as possible to, but less than
       or equal to, xdsl2ChConfProfMaxDelayDs.  The delay is coded in
       ms, with the value 0 indicating no delay bound is being
       imposed."
   REFERENCE    "ITU-T G.997.1, paragraph #7.3.2.2
                 (Maximum interleaving delay)"
   ::= { xdsl2ChConfProfileEntry 10 }

xdsl2ChConfProfMaxDelayUs  OBJECT-TYPE
   SYNTAX      Unsigned32(0..63)
   UNITS       "milliseconds"
   MAX-ACCESS  read-create
   STATUS      current
   DESCRIPTION
      "Maximum Interleave Delay on Upstream direction.  The maximum
       one-way interleaving delay introduced by the PMS-TC on Upstream
       direction.  The xTUs shall choose the S (factor) and D (depth)
       values such that the actual one-way interleaving delay
       (Xdsl2ChStatusActDelay) is as close as possible to, but less than
       or equal to, xdsl2ChConfProfMaxDelayUs.  The delay is coded in
       ms, with the value 0 indicating no delay bound is being
       imposed."
   REFERENCE    "ITU-T G.997.1, paragraph #7.3.2.2
                 (Maximum interleaving delay)"
   ::= { xdsl2ChConfProfileEntry 11 }
```

```
xdsl2ChConfProfMinProtectionDs  OBJECT-TYPE
   SYNTAX      Xdsl2SymbolProtection
   UNITS       "symbols"
   MAX-ACCESS  read-create
   STATUS      current
   DESCRIPTION
      "This parameter specifies the minimum impulse noise
       protection for the bearer channel if it is transported over DMT
       symbols with a subcarrier spacing of 4.3125 kHz.  The impulse
       noise protection is expressed in DMT symbols with a subcarrier
       spacing of 4.3125 kHz and can take the values 1/2 and any integer
       from 0 to 16, inclusive.  If the xTU does not support the
       configured INPMIN value, it shall use the nearest supported
       impulse noise protection greater than INPMIN."
   REFERENCE    "ITU-T G.997.1, paragraph #7.3.2.3 (INPMINds)"
   DEFVAL       { noProtection }
   ::= { xdsl2ChConfProfileEntry 12 }

xdsl2ChConfProfMinProtectionUs  OBJECT-TYPE
   SYNTAX      Xdsl2SymbolProtection
   UNITS       "symbols"
   MAX-ACCESS  read-create
   STATUS      current
   DESCRIPTION
      "This parameter specifies the minimum impulse noise
       protection for the bearer channel if it is transported over DMT
       symbols with a subcarrier spacing of 4.3125 kHz.  The impulse
       noise protection is expressed in DMT symbols with a subcarrier
       spacing of 4.3125 kHz and can take the values 1/2 and any integer
       from 0 to 16, inclusive.  If the xTU does not support the
       configured INPMIN value, it shall use the nearest supported
       impulse noise protection greater than INPMIN."
   REFERENCE    "ITU-T G.997.1, paragraph #7.3.2.3 (INPMINus)"
   DEFVAL       { noProtection }
   ::= { xdsl2ChConfProfileEntry 13 }

xdsl2ChConfProfMinProtection8Ds  OBJECT-TYPE
   SYNTAX      Xdsl2SymbolProtection8
   UNITS       "symbols"
   MAX-ACCESS  read-create
   STATUS      current
   DESCRIPTION
      "This parameter specifies the minimum impulse noise
       protection for the bearer channel if it is transported over DMT
       symbols with a subcarrier spacing of 8.625 kHz.  The impulse
       noise protection is expressed in DMT symbols with a subcarrier
       spacing of 8.625 kHz."
   REFERENCE    "ITU-T G.997.1, paragraph #7.3.2.4 (INPMIN8ds)"
```

```
   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
       xdsl2LAlarmConfTempChan3ConfProfile contains a non-zero-length
       string."
   REFERENCE    "DSL Forum TR-129, paragraph #8.4"
   DEFVAL       { "" }
   ::= { xdsl2LineAlarmConfTemplateEntry 6 }

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

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

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

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

-------------------------------------------------
--      xdsl2LineAlarmConfProfileTable        --
-------------------------------------------------

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

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

       Entries in this table MUST be maintained in a persistent
       manner."
     ::= { xdsl2ProfileAlarmConf 2 }
```

```
xdsl2LineAlarmConfProfileEntry  OBJECT-TYPE
     SYNTAX      Xdsl2LineAlarmConfProfileEntry
     MAX-ACCESS  not-accessible
     STATUS      current
     DESCRIPTION
      "A default profile with an index of 'DEFVAL' will always
       exist, and its parameters will be set to vendor-specific values,
       unless otherwise specified in this document."
     INDEX  { xdsl2LineAlarmConfProfileName }
     ::= { xdsl2LineAlarmConfProfileTable 1 }

Xdsl2LineAlarmConfProfileEntry ::=
     SEQUENCE {
     xdsl2LineAlarmConfProfileName                SnmpAdminString,
     xdsl2LineAlarmConfProfileXtucThresh15MinFecs
                                            HCPerfIntervalThreshold,
     xdsl2LineAlarmConfProfileXtucThresh15MinEs
                                            HCPerfIntervalThreshold,
     xdsl2LineAlarmConfProfileXtucThresh15MinSes
                                             HCPerfIntervalThreshold,
     xdsl2LineAlarmConfProfileXtucThresh15MinLoss
                                             HCPerfIntervalThreshold,
     xdsl2LineAlarmConfProfileXtucThresh15MinUas
                                             HCPerfIntervalThreshold,
     xdsl2LineAlarmConfProfileXturThresh15MinFecs
                                             HCPerfIntervalThreshold,
     xdsl2LineAlarmConfProfileXturThresh15MinEs
                                             HCPerfIntervalThreshold,
     xdsl2LineAlarmConfProfileXturThresh15MinSes
                                             HCPerfIntervalThreshold,
     xdsl2LineAlarmConfProfileXturThresh15MinLoss
                                             HCPerfIntervalThreshold,
     xdsl2LineAlarmConfProfileXturThresh15MinUas
                                             HCPerfIntervalThreshold,

     xdsl2LineAlarmConfProfileThresh15MinFailedFullInt   Unsigned32,
     xdsl2LineAlarmConfProfileThresh15MinFailedShrtInt   Unsigned32,

     xdsl2LineAlarmConfProfileRowStatus                   RowStatus
     }

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

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

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

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

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

```
     "A threshold for the xdsl2PMLCurr15MLoss counter, when
      xdsl2PMLCurrUnit is xtuc {1}.
      The value 0 means that no threshold is specified for the
      associated counter."
   REFERENCE    "ITU-T G.997.1, paragraph #7.2.7.2"
   DEFVAL       { 0 }
     ::= { xdsl2LineAlarmConfProfileEntry 5 }

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
                                                    SnmpAdminString,
     xdsl2ChAlarmConfProfileXtucThresh15MinCodingViolations
                                                    Unsigned32,
     xdsl2ChAlarmConfProfileXtucThresh15MinCorrected Unsigned32,
     xdsl2ChAlarmConfProfileXturThresh15MinCodingViolations
                                                    Unsigned32,
     xdsl2ChAlarmConfProfileXturThresh15MinCorrected Unsigned32,
     xdsl2ChAlarmConfProfileRowStatus               RowStatus
     }

xdsl2ChAlarmConfProfileName  OBJECT-TYPE
     SYNTAX      SnmpAdminString (SIZE(1..32))
     MAX-ACCESS  not-accessible
     STATUS      current
     DESCRIPTION
     "This object identifies a row in this table."
     ::= { xdsl2ChAlarmConfProfileEntry 1 }
```

```
xdsl2ChAlarmConfProfileXtucThresh15MinCodingViolations OBJECT-TYPE
     SYNTAX      Unsigned32
     MAX-ACCESS  read-create
     STATUS      current
     DESCRIPTION
     "A threshold for the xdsl2PMChCurr15MCodingViolations
      counter, when xdsl2PMChCurrUnit is xtuc {1}.
      The value 0 means that no threshold is specified for the
      associated counter."
   REFERENCE    "ITU-T G.997.1, paragraph #7.2.7.2"
   DEFVAL       { 0 }
     ::= { xdsl2ChAlarmConfProfileEntry 2 }

xdsl2ChAlarmConfProfileXtucThresh15MinCorrected  OBJECT-TYPE
     SYNTAX      Unsigned32
     MAX-ACCESS  read-create
     STATUS      current
     DESCRIPTION
     "A threshold for the xdsl2PMChCurr15MCorrectedBlocks
      counter, when xdsl2PMChCurrUnit is xtuc {1}.
      The value 0 means that no threshold is specified for the
      associated counter."
   REFERENCE    "ITU-T G.997.1, paragraph #7.2.7.2"
   DEFVAL       { 0 }
     ::= { xdsl2ChAlarmConfProfileEntry 3 }

xdsl2ChAlarmConfProfileXturThresh15MinCodingViolations  OBJECT-TYPE
     SYNTAX      Unsigned32
     MAX-ACCESS  read-create
     STATUS      current
     DESCRIPTION
     "A threshold for the xdsl2PMChCurr15MCodingViolations
      counter, when xdsl2PMChCurrUnit is xtur {2}.
      The value 0 means that no threshold is specified for the
      associated counter."
   REFERENCE    "ITU-T G.997.1, paragraph #7.2.7.2"
   DEFVAL       { 0 }
     ::= { xdsl2ChAlarmConfProfileEntry 4 }

xdsl2ChAlarmConfProfileXturThresh15MinCorrected  OBJECT-TYPE
     SYNTAX      Unsigned32
     MAX-ACCESS  read-create
     STATUS      current
     DESCRIPTION
     "A threshold for the xdsl2PMChCurr15MCorrectedBlocks
      counter, when xdsl2PMChCurrUnit is xtur {2}.
      The value 0 means that no threshold is specified for the
      associated counter."
```

```
   REFERENCE    "ITU-T G.997.1, paragraph #7.2.7.2"
   DEFVAL       { 0 }
     ::= { xdsl2ChAlarmConfProfileEntry 5 }

xdsl2ChAlarmConfProfileRowStatus  OBJECT-TYPE
     SYNTAX      RowStatus
     MAX-ACCESS  read-create
     STATUS      current
     DESCRIPTION
      "This object is used to create a new row or to modify or
       delete an existing row in this table.

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

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

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

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

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

xdsl2PMLineCurrEntry  OBJECT-TYPE
   SYNTAX      Xdsl2PMLineCurrEntry
   MAX-ACCESS  not-accessible
   STATUS      current
   DESCRIPTION
       "One index of this table is an interface index where the
        interface has an ifType of 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)."
   ::= { xdsl2PMLineCurrEntry 3 }

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

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

xdsl2PMLCurr15MEs  OBJECT-TYPE
   SYNTAX      Counter32
   UNITS       "seconds"
   MAX-ACCESS  read-only
   STATUS      current
   DESCRIPTION
      "Count of seconds during this interval that there was:
          xTU-C: CRC-8 >= 1 for one or more bearer channels OR
                 LOS >= 1 OR SEF >=1 OR LPR >= 1.
          xTU-R: FEBE >= 1 for one or more bearer channels OR
                 LOS-FE >=1 OR RDI >=1 OR LPR-FE >=1.
       This parameter is inhibited during UAS."
   REFERENCE    "ITU-T G.997.1, paragraph #7.2.1.1.2 (ES-L)
                 and paragraph #7.2.1.2.2 (ES-LFE)"
   ::= { xdsl2PMLineCurrEntry 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)"
   ::= { xdsl2PMLineCurrEntry 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)"
   ::= { xdsl2PMLineCurrEntry 8 }

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

xdsl2PMLCurr1DayValidIntervals  OBJECT-TYPE
   SYNTAX      Unsigned32 (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)"
   ::= { xdsl2PMLineCurrEntry 15 }

xdsl2PMLCurr1DayLoss  OBJECT-TYPE
   SYNTAX      Counter32
   UNITS       "seconds"
   MAX-ACCESS  read-only
   STATUS      current
   DESCRIPTION
      "Count of seconds during this interval that there was LOS (or
       LOS-FE for xTU-R)."
   REFERENCE    "ITU-T G.997.1, paragraph #7.2.1.1.4 (LOSS-L)
                 and paragraph #7.2.1.2.4 (LOSS-LFE)"
   ::= { xdsl2PMLineCurrEntry 16 }

xdsl2PMLCurr1DayUas  OBJECT-TYPE
   SYNTAX      Counter32
   UNITS       "seconds"
   MAX-ACCESS  read-only
```

```
   STATUS      current
   DESCRIPTION
      "Count of seconds in Unavailability State during this
       interval.
       Unavailability begins at the onset of 10 contiguous severely
       errored seconds, and ends at the onset of 10 contiguous seconds
       with no severely errored seconds."
   REFERENCE    "ITU-T G.997.1, paragraph #7.2.1.1.5 (UAS-L)
                 and paragraph #7.2.1.2.5 (UAS-LFE)"
   ::= { xdsl2PMLineCurrEntry 17 }

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

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

xdsl2PMLineInitCurrEntry  OBJECT-TYPE
   SYNTAX      Xdsl2PMLineInitCurrEntry
   MAX-ACCESS  not-accessible
   STATUS      current
   DESCRIPTION
      "The index of this table is an interface index where the
       interface has an ifType of vdsl2(251)."
   INDEX  { ifIndex }
   ::= { xdsl2PMLineInitCurrTable 1 }

Xdsl2PMLineInitCurrEntry  ::=
   SEQUENCE {
      xdsl2PMLInitCurr15MValidIntervals       Unsigned32,
      xdsl2PMLInitCurr15MInvalidIntervals     Unsigned32,
      xdsl2PMLInitCurr15MTimeElapsed          Unsigned32,
      xdsl2PMLInitCurr15MFullInits            Unsigned32,
      xdsl2PMLInitCurr15MFailedFullInits      Unsigned32,
      xdsl2PMLInitCurr15MShortInits           Unsigned32,
      xdsl2PMLInitCurr15MFailedShortInits     Unsigned32,
      xdsl2PMLInitCurr1DayValidIntervals      Unsigned32,
      xdsl2PMLInitCurr1DayInvalidIntervals    Unsigned32,
      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."
   ::= { xdsl2PMLineInitCurrEntry 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)."
   ::= { xdsl2PMLineInitCurrEntry 2 }

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

xdsl2PMLInitCurr15MFullInits  OBJECT-TYPE
   SYNTAX      Unsigned32
   MAX-ACCESS  read-only
   STATUS      current
   DESCRIPTION
      "Count of full initializations attempted on the line
       (successful and failed) during this interval."
```

```
   REFERENCE    "ITU-T G.997.1, paragraph #7.2.1.3.1"
   ::= { xdsl2PMLineInitCurrEntry 4 }

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

xdsl2PMLInitCurr15MShortInits  OBJECT-TYPE
   SYNTAX      Unsigned32
   MAX-ACCESS  read-only
   STATUS      current
   DESCRIPTION
      "Count of short initializations attempted on the line
       (successful and failed) during this interval."
   REFERENCE    "ITU-T G.997.1, paragraph #7.2.1.3.3"
   ::= { 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."
   ::= { xdsl2PMLineHist15MinEntry 1 }

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

xdsl2PMLHist15MMonitoredTime  OBJECT-TYPE
   SYNTAX      Unsigned32
   UNITS       "seconds"
   MAX-ACCESS  read-only
   STATUS      current
   DESCRIPTION
      "Total seconds monitored in this interval."
   ::= { xdsl2PMLineHist15MinEntry 3 }

xdsl2PMLHist15MFecs  OBJECT-TYPE
   SYNTAX      Counter32
   UNITS       "seconds"
   MAX-ACCESS  read-only
   STATUS      current
   DESCRIPTION
      "Count of seconds during this interval that there was at
       least one FEC correction event for one or more bearer channels in
       this line.  This parameter is inhibited during UAS or SES."
   REFERENCE    "ITU-T G.997.1, paragraph #7.2.1.1.1 (FECS-L)
                 and paragraph #7.2.1.2.1 (FECS-LFE)"
   ::= { xdsl2PMLineHist15MinEntry 4 }

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

```
   STATUS      current
   DESCRIPTION
      "Count of seconds during this interval that there was:
          xTU-C: CRC-8 >= 1 for one or more bearer channels OR
                 LOS >= 1 OR SEF >= 1 OR LPR >= 1.
          xTU-R: FEBE >= 1 for one or more bearer channels OR
                 LOS-FE >= 1 OR RDI >= 1 OR LPR-FE >= 1.
       This parameter is inhibited during UAS."
   REFERENCE    "ITU-T G.997.1, paragraph #7.2.1.1.2 (ES-L)
                 and paragraph #7.2.1.2.2 (ES-LFE)"
   ::= { xdsl2PMLineHist15MinEntry 5 }

xdsl2PMLHist15MSes  OBJECT-TYPE
   SYNTAX      Counter32
   UNITS       "seconds"
   MAX-ACCESS  read-only
   STATUS      current
   DESCRIPTION
      "Count of seconds during this interval that there was:
          xTU-C: (CRC-8 anomalies in one or more of the
                 received bearer channels) >= 18 OR LOS >= 1
                 OR SEF >= 1 OR LPR >= 1.
          xTU-R: (FEBE anomalies in one or more of the
                 received bearer channels) >= 18 OR LOS-FE >= 1
                 OR RDI >= 1 OR LPR-FE >= 1.
       This parameter is inhibited during UAS."
   REFERENCE    "ITU-T G.997.1, paragraph #7.2.1.1.3 (SES-L)
                 and paragraph #7.2.1.2.3 (SES-LFE)"
   ::= { xdsl2PMLineHist15MinEntry 6 }

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

xdsl2PMLHist15MUas  OBJECT-TYPE
   SYNTAX      Counter32
   UNITS       "seconds"
   MAX-ACCESS  read-only
   STATUS      current
   DESCRIPTION
```

```
      "Count of seconds in Unavailability State during this
       interval.
       Unavailability begins at the onset of 10 contiguous severely
       errored seconds, and ends at the onset of 10 contiguous seconds
       with no severely errored seconds."
   REFERENCE    "ITU-T G.997.1, paragraph #7.2.1.1.5 (UAS-L)
                 and paragraph #7.2.1.2.5 (UAS-LFE)"
   ::= { 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."
   ::= { xdsl2PMLineHist1DayEntry 1 }

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

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

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

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

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

xdsl2PMLHist1DLoss  OBJECT-TYPE
   SYNTAX      Counter32
   UNITS       "seconds"
   MAX-ACCESS  read-only
   STATUS      current
   DESCRIPTION
      "Count of seconds during this interval that there was LOS (or
       LOS-FE for xTU-R)."
   REFERENCE    "ITU-T G.997.1, paragraph #7.2.1.1.4 (LOSS-L)
                 and paragraph #7.2.1.2.4 (LOSS-LFE)"
   ::= { xdsl2PMLineHist1DayEntry 7 }

xdsl2PMLHist1DUas  OBJECT-TYPE
   SYNTAX      Counter32
```

```
   UNITS       "seconds"
   MAX-ACCESS  read-only
   STATUS      current
   DESCRIPTION
      "Count of seconds in Unavailability State during this
       interval.
       Unavailability begins at the onset of 10 contiguous severely
       errored seconds, and ends at the onset of 10 contiguous seconds
       with no severely errored seconds."
   REFERENCE    "ITU-T G.997.1, paragraph #7.2.1.1.5 (UAS-L)
                 and paragraph #7.2.1.2.5 (UAS-LFE)"
   ::= { 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 {
      xdsl2PMLInitHist15MInterval             Unsigned32,
      xdsl2PMLInitHist15MMonitoredTime        Unsigned32,
      xdsl2PMLInitHist15MFullInits            Unsigned32,
      xdsl2PMLInitHist15MFailedFullInits      Unsigned32,
      xdsl2PMLInitHist15MShortInits           Unsigned32,
      xdsl2PMLInitHist15MFailedShortInits     Unsigned32,
      xdsl2PMLInitHist15MValidInterval        TruthValue
   }

xdsl2PMLInitHist15MInterval  OBJECT-TYPE
   SYNTAX      Unsigned32 (1..96)
   MAX-ACCESS  not-accessible
   STATUS      current
   DESCRIPTION
      "The interval number."
   ::= { xdsl2PMLineInitHist15MinEntry 1 }

xdsl2PMLInitHist15MMonitoredTime  OBJECT-TYPE
   SYNTAX      Unsigned32
   UNITS       "seconds"
   MAX-ACCESS  read-only
   STATUS      current
   DESCRIPTION
      "Total seconds monitored in this interval."
   ::= { xdsl2PMLineInitHist15MinEntry 2 }

xdsl2PMLInitHist15MFullInits  OBJECT-TYPE
   SYNTAX      Unsigned32
   MAX-ACCESS  read-only
   STATUS      current
   DESCRIPTION
      "Count of full initializations attempted on the line
       (successful and failed) during this interval."
   REFERENCE    "ITU-T G.997.1, paragraph #7.2.1.3.1"
   ::= { xdsl2PMLineInitHist15MinEntry 3 }

xdsl2PMLInitHist15MFailedFullInits  OBJECT-TYPE
   SYNTAX      Unsigned32
   MAX-ACCESS  read-only
   STATUS      current
   DESCRIPTION
      "Count of failed full initializations on the line during this
       interval."
   REFERENCE    "ITU-T G.997.1, paragraph #7.2.1.3.2"
   ::= { xdsl2PMLineInitHist15MinEntry 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"
   ::= { xdsl2PMLineInitHist15MinEntry 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"
   ::= { xdsl2PMLineInitHist15MinEntry 6 }

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

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

xdsl2PMLineInitHist1DayTable       OBJECT-TYPE
   SYNTAX      SEQUENCE  OF  Xdsl2PMLineInitHist1DayEntry
   MAX-ACCESS  not-accessible
   STATUS      current
   DESCRIPTION
      "The table xdsl2PMLineInitHist1DayTable contains PM line
       initialization history for 24-hour intervals for DSL
       lines."
   ::= { xdsl2PMLine 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 }
   ::= { xdsl2PMLineInitHist1DayTable 1 }

Xdsl2PMLineInitHist1DayEntry  ::=
   SEQUENCE {
      xdsl2PMLInitHist1DInterval             Unsigned32,
      xdsl2PMLInitHist1DMonitoredTime        Unsigned32,
      xdsl2PMLInitHist1DFullInits            Unsigned32,
      xdsl2PMLInitHist1DFailedFullInits      Unsigned32,
      xdsl2PMLInitHist1DShortInits           Unsigned32,
      xdsl2PMLInitHist1DFailedShortInits     Unsigned32,
      xdsl2PMLInitHist1DValidInterval        TruthValue
   }

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

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

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

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

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

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

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

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

-- ------------------------------------------------
--          PM channel current counters          --
-- ------------------------------------------------

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

```
xdsl2PMChCurrEntry  OBJECT-TYPE
   SYNTAX      Xdsl2PMChCurrEntry
   MAX-ACCESS  not-accessible
   STATUS      current
   DESCRIPTION
       "One index of this table is an interface index where the
       interface has an ifType of a DSL channel.  A second index of
       this table is the termination unit."
   INDEX  { ifIndex, xdsl2PMChCurrUnit }
   ::= { xdsl2PMChCurrTable 1 }

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

xdsl2PMChCurrUnit  OBJECT-TYPE
   SYNTAX      Xdsl2Unit
   MAX-ACCESS  not-accessible
   STATUS      current
   DESCRIPTION
   "The termination unit."
   ::= { xdsl2PMChCurrEntry 1 }

xdsl2PMChCurr15MValidIntervals  OBJECT-TYPE
   SYNTAX      Unsigned32 (0..96)
   MAX-ACCESS  read-only
   STATUS      current
   DESCRIPTION
      "The number of 15-minute PM intervals for which data
       was collected.  The value will typically be equal to the maximum
       number of 15-minute intervals the implementation is planned to
       store (i.e., beyond the scope of this MIB module) unless the
       measurement was (re-)started recently, in which case the value
       will be the number of complete 15-minute intervals for which
       the agent has at least some data.  In certain cases (e.g., in
       the case where the agent is a proxy), it is possible that some
       intervals are unavailable.  In this case, this interval is the
```

```
       maximum interval number for which data is available."
   ::= { xdsl2PMChCurrEntry 2 }

xdsl2PMChCurr15MInvalidIntervals  OBJECT-TYPE
   SYNTAX      Unsigned32 (0..96)
   MAX-ACCESS  read-only
   STATUS      current
   DESCRIPTION
      "The number of 15-minute PM intervals for which no data is
       available.  The value will typically be zero except in cases
       where the data for some intervals are not available (e.g.,
       in proxy situations)."
    ::= { xdsl2PMChCurrEntry 3 }

xdsl2PMChCurr15MTimeElapsed  OBJECT-TYPE
   SYNTAX      HCPerfTimeElapsed
   UNITS       "seconds"
   MAX-ACCESS  read-only
   STATUS      current
   DESCRIPTION
      "Total elapsed seconds in this interval."
   ::= { xdsl2PMChCurrEntry 4 }

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

xdsl2PMChCurr15MCorrectedBlocks  OBJECT-TYPE
   SYNTAX      Unsigned32
   MAX-ACCESS  read-only
   STATUS      current
   DESCRIPTION
      "Count of FEC (FFEC for xTU-R) anomalies (corrected code
       words) occurring in the channel during the interval.  This
       parameter is inhibited during UAS or SES.  If the FEC is applied
       over multiple channels, then each related FEC (or FFEC) anomaly
       SHOULD increment each of the counters related to the individual
       channels."
```

```
   REFERENCE    "ITU-T G.997.1, paragraph #7.2.2.1.2 (FEC-C)
                 and paragraph #7.2.2.2.2 (FEC-CFE)"
   ::= { xdsl2PMChCurrEntry 6 }

xdsl2PMChCurr1DayValidIntervals  OBJECT-TYPE
   SYNTAX      Unsigned32 (0..30)
   MAX-ACCESS  read-only
   STATUS      current
   DESCRIPTION
      "The number of 24-hour PM intervals for which data was
       collected.  The value will typically be equal to the maximum
       number of 24-hour intervals the implementation is planned to
       store (i.e., beyond the scope of this MIB module) unless the
       measurement was (re-)started recently, in which case the value
       will be the number of complete 24-hour intervals for which
       the agent has at least some data.  In certain cases (e.g., in
       the case where the agent is a proxy), it is possible that some
       intervals are unavailable.  In this case, this interval is the
       maximum interval number for which data is available."
   ::= { xdsl2PMChCurrEntry 7 }

xdsl2PMChCurr1DayInvalidIntervals  OBJECT-TYPE
   SYNTAX      Unsigned32 (0..30)
   MAX-ACCESS  read-only
   STATUS      current
   DESCRIPTION
      "The number of 24-hour PM intervals for which no data is
       available.  The value will typically be zero except in cases
       where the data for some intervals are not available (e.g.,
       in proxy situations)."
   ::= { xdsl2PMChCurrEntry 8 }

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

xdsl2PMChCurr1DayCodingViolations  OBJECT-TYPE
   SYNTAX      Unsigned32
   MAX-ACCESS  read-only
   STATUS      current
   DESCRIPTION
      "Count of CRC-8 (FEBE for xTU-R) anomalies occurring in the
       channel during the interval.  This parameter is inhibited during
```

```
        UAS or SES.  If the CRC is applied over multiple channels, then
        each related CRC-8 (or FEBE) anomaly SHOULD increment each of the
        counters related to the individual channels."
    REFERENCE    "ITU-T G.997.1, paragraph #7.2.2.1.1 (CV-C)
                  and paragraph #7.2.2.2.1 (CV-CFE)"
    ::= { xdsl2PMChCurrEntry 10 }

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

-----------------------------------------
--    PM channel history 15 Minutes      --
-----------------------------------------

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

xdsl2PMChHist15MinEntry  OBJECT-TYPE
    SYNTAX      Xdsl2PMChHist15MinEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
       "One index of this table is an interface index where the
        interface has an ifType of a DSL channel.  A second index of
        this table is the transmission unit.  The third index is the
        interval number."
    INDEX  { ifIndex,
             xdsl2PMChHist15MUnit,
             xdsl2PMChHist15MInterval }
```

```
   ::= { xdsl2PMChHist15MinTable 1 }

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

xdsl2PMChHist15MUnit  OBJECT-TYPE
   SYNTAX      Xdsl2Unit
   MAX-ACCESS  not-accessible
   STATUS      current
   DESCRIPTION
      "The termination unit."
   ::= { xdsl2PMChHist15MinEntry 1 }

xdsl2PMChHist15MInterval  OBJECT-TYPE
   SYNTAX      Unsigned32 (1..96)
   MAX-ACCESS  not-accessible
   STATUS      current
   DESCRIPTION
      "The interval number."
   ::= { xdsl2PMChHist15MinEntry 2 }

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

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

```
                and paragraph #7.2.2.2.1 (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
   {
   xdsl2PMLCurr15MFecs,
   xdsl2LineAlarmConfProfileXturThresh15MinFecs
   }
   STATUS     current
   DESCRIPTION
     "This notification indicates that the FEC seconds threshold
      has been reached/exceeded for the referred xTU-R."
   ::= { xdsl2Notifications 2 }

xdsl2LinePerfESThreshXtuc NOTIFICATION-TYPE
   OBJECTS
   {
   xdsl2PMLCurr15MEs,
   xdsl2LineAlarmConfProfileXtucThresh15MinEs
   }
   STATUS     current
   DESCRIPTION
     "This notification indicates that the errored seconds
      threshold has been reached/exceeded for the referred xTU-C."
   ::= { xdsl2Notifications 3 }

xdsl2LinePerfESThreshXtur NOTIFICATION-TYPE
   OBJECTS
   {
   xdsl2PMLCurr15MEs,
   xdsl2LineAlarmConfProfileXturThresh15MinEs
   }
   STATUS     current
   DESCRIPTION
     "This notification indicates that the errored seconds
      threshold has been reached/exceeded for the referred xTU-R."
   ::= { xdsl2Notifications 4 }

xdsl2LinePerfSESThreshXtuc NOTIFICATION-TYPE
   OBJECTS
   {
   xdsl2PMLCurr15MSes,
   xdsl2LineAlarmConfProfileXtucThresh15MinSes
   }
   STATUS     current
   DESCRIPTION
     "This notification indicates that the severely errored seconds
      threshold has been reached/exceeded for the referred xTU-C."
   ::= { xdsl2Notifications 5 }
```

```
xdsl2LinePerfSESThreshXtur NOTIFICATION-TYPE
   OBJECTS
   {
   xdsl2PMLCurr15MSes,
   xdsl2LineAlarmConfProfileXturThresh15MinSes
   }
   STATUS     current
   DESCRIPTION
     "This notification indicates that the severely errored seconds
      threshold has been reached/exceeded for the referred xTU-R."
   ::= { xdsl2Notifications 6 }

xdsl2LinePerfLOSSThreshXtuc NOTIFICATION-TYPE
   OBJECTS
   {
   xdsl2PMLCurr15MLoss,
   xdsl2LineAlarmConfProfileXtucThresh15MinLoss
   }
   STATUS     current
   DESCRIPTION
     "This notification indicates that the LOS seconds
      threshold has been reached/exceeded for the referred xTU-C."
   ::= { xdsl2Notifications 7 }

xdsl2LinePerfLOSSThreshXtur NOTIFICATION-TYPE
   OBJECTS
   {
   xdsl2PMLCurr15MLoss,
   xdsl2LineAlarmConfProfileXturThresh15MinLoss
   }
   STATUS     current
   DESCRIPTION
     "This notification indicates that the LOS seconds
      threshold has been reached/exceeded for the referred xTU-R."
   ::= { xdsl2Notifications 8 }

xdsl2LinePerfUASThreshXtuc NOTIFICATION-TYPE
   OBJECTS
   {
   xdsl2PMLCurr15MUas,
   xdsl2LineAlarmConfProfileXtucThresh15MinUas
   }
   STATUS     current
   DESCRIPTION
     "This notification indicates that the unavailable seconds
      threshold has been reached/exceeded for the referred xTU-C."
   ::= { xdsl2Notifications 9 }
```

```
xdsl2LinePerfUASThreshXtur NOTIFICATION-TYPE
   OBJECTS
   {
   xdsl2PMLCurr15MUas,
   xdsl2LineAlarmConfProfileXturThresh15MinUas
   }
   STATUS     current
   DESCRIPTION
     "This notification indicates that the unavailable seconds
      threshold has been reached/exceeded for the referred xTU-R."
   ::= { xdsl2Notifications 10 }

xdsl2LinePerfCodingViolationsThreshXtuc NOTIFICATION-TYPE
   OBJECTS
   {
   xdsl2PMChCurr15MCodingViolations,
   xdsl2ChAlarmConfProfileXtucThresh15MinCodingViolations
   }
   STATUS     current
   DESCRIPTION
     "This notification indicates that the coding violations
      threshold has been reached/exceeded for the referred xTU-C."
   ::= { xdsl2Notifications 11 }

xdsl2LinePerfCodingViolationsThreshXtur NOTIFICATION-TYPE
   OBJECTS
   {
   xdsl2PMChCurr15MCodingViolations,
   xdsl2ChAlarmConfProfileXturThresh15MinCodingViolations
   }
   STATUS     current
   DESCRIPTION
     "This notification indicates that the coding violations
      threshold has been reached/exceeded for the referred xTU-R."
   ::= { xdsl2Notifications 12 }

xdsl2LinePerfCorrectedThreshXtuc NOTIFICATION-TYPE
   OBJECTS
   {
   xdsl2PMChCurr15MCorrectedBlocks,
   xdsl2ChAlarmConfProfileXtucThresh15MinCorrected
   }
   STATUS     current
   DESCRIPTION
     "This notification indicates that the corrected blocks
      (FEC events) threshold has been reached/exceeded for the
      referred xTU-C."
   ::= { xdsl2Notifications 13 }
```

```
xdsl2LinePerfCorrectedThreshXtur NOTIFICATION-TYPE
   OBJECTS
   {
   xdsl2PMChCurr15MCorrectedBlocks,
   xdsl2ChAlarmConfProfileXturThresh15MinCorrected
   }
   STATUS     current
   DESCRIPTION
     "This notification indicates that the corrected blocks
      (FEC events) threshold has been reached/exceeded for the
      referred xTU-R."
   ::= { xdsl2Notifications 14 }

xdsl2LinePerfFailedFullInitThresh NOTIFICATION-TYPE
   OBJECTS
   {
   xdsl2PMLInitCurr15MFailedFullInits,
   xdsl2LineAlarmConfProfileThresh15MinFailedFullInt
   }
   STATUS     current
   DESCRIPTION
     "This notification indicates that the failed full
      initializations threshold has been reached/exceeded for the
      referred ADSL/ADSL2 or ADSL2 line."
   ::= { xdsl2Notifications 15 }

xdsl2LinePerfFailedShortInitThresh NOTIFICATION-TYPE
   OBJECTS
   {
   xdsl2PMLInitCurr15MFailedShortInits,
   xdsl2LineAlarmConfProfileThresh15MinFailedShrtInt
   }
   STATUS     current
   DESCRIPTION
     "This notification indicates that the failed short
      initializations threshold has been reached/exceeded for the
      referred VDSL2/ADSL/ADSL2 or ADSL2+ line."
   ::= { xdsl2Notifications 16 }

xdsl2LineStatusChangeXtuc NOTIFICATION-TYPE
   OBJECTS
   {
   xdsl2LineStatusXtuc
   }
   STATUS     current
   DESCRIPTION
     "This notification indicates that a status change is
      detected for the referred xTU-C."
```

```
   ::= { xdsl2Notifications 17 }

xdsl2LineStatusChangeXtur NOTIFICATION-TYPE
   OBJECTS
   {
   xdsl2LineStatusXtur
   }
   STATUS     current
   DESCRIPTION
     "This notification indicates that a status change is
      detected for the referred xTU-R."
   ::= { xdsl2Notifications 18 }


   -- conformance information

   xdsl2Groups OBJECT IDENTIFIER ::= { xdsl2Conformance 1 }
   xdsl2Compliances OBJECT IDENTIFIER ::= { xdsl2Conformance 2 }

   xdsl2LineMibCompliance MODULE-COMPLIANCE
      STATUS  current
      DESCRIPTION
         "The compliance statement for SNMP entities which
          manage VDSL2/ADSL/ADSL2 and ADSL2+ interfaces."
      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
          {
          xdsl2ChConfProfImaEnabled,
          xdsl2ChStatusAtmStatus
          }
      STATUS     current
      DESCRIPTION
         "The group of configuration objects required when the data
          path is ATM."
      ::= { xdsl2Groups 17 }

   xdsl2ChConfProfileMinResGroup OBJECT-GROUP
      OBJECTS
          {
          xdsl2ChConfProfMinResDataRateDs,
          xdsl2ChConfProfMinResDataRateUs
          }
      STATUS     current
      DESCRIPTION
         "The group of configuration objects required for the
          reserved data rate."
      ::= { xdsl2Groups 18 }
   xdsl2ChConfProfileOptAttrGroup OBJECT-GROUP
      OBJECTS
          {
          xdsl2ChConfProfMaxDelayVar,
          xdsl2ChConfProfInitPolicy
          }
      STATUS     current
      DESCRIPTION
         "The group of various optional channel configuration
          parameters."
      ::= { xdsl2Groups 19 }

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

```
      ::= { 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,
```

```
          xdsl2PMLCurr15MUas,
          xdsl2PMLCurr1DayValidIntervals,
          xdsl2PMLCurr1DayInvalidIntervals,
          xdsl2PMLCurr1DayTimeElapsed,
          xdsl2PMLCurr1DayFecs,
          xdsl2PMLCurr1DayEs,
          xdsl2PMLCurr1DaySes,
          xdsl2PMLCurr1DayLoss,
          xdsl2PMLCurr1DayUas
          }
      STATUS     current
      DESCRIPTION
         "The group of objects that report the line-level
          counters for current PM intervals."
      ::= { xdsl2Groups 23 }

   xdsl2PMLineInitCurrGroup OBJECT-GROUP
      OBJECTS
          {
          xdsl2PMLInitCurr15MValidIntervals,
          xdsl2PMLInitCurr15MInvalidIntervals,
          xdsl2PMLInitCurr15MTimeElapsed,
          xdsl2PMLInitCurr15MFullInits,
          xdsl2PMLInitCurr15MFailedFullInits,
          xdsl2PMLInitCurr1DayValidIntervals,
          xdsl2PMLInitCurr1DayInvalidIntervals,
          xdsl2PMLInitCurr1DayTimeElapsed,
          xdsl2PMLInitCurr1DayFullInits,
          xdsl2PMLInitCurr1DayFailedFullInits
          }
      STATUS     current
      DESCRIPTION
         "The group of objects that report the full
          initialization counters for current PM intervals."
      ::= { xdsl2Groups 24 }

   xdsl2PMLineInitCurrShortGroup OBJECT-GROUP
      OBJECTS
          {
          xdsl2PMLInitCurr15MShortInits,
          xdsl2PMLInitCurr15MFailedShortInits,
          xdsl2PMLInitCurr1DayShortInits,
          xdsl2PMLInitCurr1DayFailedShortInits
          }
      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:

- Though the configuration templates/profiles allow referring to 1-4 bearer channels, ADSL links are limited to two channels at most.

- Though the channel configuration profile allows higher data rates, ADSL links are limited to downstream/upstream data rate as assumed in RFC 2662 [RFC2662].

- The Impulse Noise Protection (INP) configuration parameters are given by minimum protection and maximum delay parameters.

- The line configuration profile includes a sub-table that addresses mode-specific parameters. For ADSL links, the management application SHOULD create a row in that table for the ADSL modes only.

- The line configuration profile includes parameters that are irrelevant for ADSL links. Similarly, many status parameters in the MIB are irrelevant for certain ADSL modes. Therefore, it is advised to consult with ITU G.997.1 standard [G.997.1] regarding the scope and relevance of each parameter in this MIB.

5. Security Considerations

There are a number of management objects defined in this MIB module with a MAX-ACCESS clause of read-write and/or read-create. Such objects may be considered sensitive or vulnerable in some network environments. The support for SET operations in a non-secure

environment without proper protection can have a negative effect on network operations. These are the tables and objects and their sensitivity/vulnerability:

- 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.

- xdsl2LineSegmentTable

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

- xdsl2SCStatusTable

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

- xdsl2LineConfTemplateTable

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

  * xdsl2LConfTempLineProfile
  * xdsl2LConfTempChan1ConfProfile
  * xdsl2LConfTempChan1RaRatioDs
  * xdsl2LConfTempChan1RaRatioUs
  * xdsl2LConfTempChan2ConfProfile
  * xdsl2LConfTempChan2RaRatioDs
  * xdsl2LConfTempChan2RaRatioUs
  * xdsl2LConfTempChan3ConfProfile
  * xdsl2LConfTempChan3RaRatioDs
  * xdsl2LConfTempChan3RaRatioUs
  * xdsl2LConfTempChan4ConfProfile
  * xdsl2LConfTempChan4RaRatioDs
  * xdsl2LConfTempChan4RaRatioUs
  * xdsl2LConfTempRowStatus

Unauthorized changes to xdsl2LConfTempLineProfile, xdsl2LConfTempChan1ConfProfile, xdsl2LConfTempChan2ConfProfile, xdsl2LConfTempChan3ConfProfile, or xdsl2LConfTempChan4ConfProfile could have an adverse operational effect on several lines; could change several lines over to running in unwanted levels of operation; or could result in several services undergoing changes in the number of channels that carry the service.

Unauthorized changes to xdsl2LConfTempChan1RaRatioDs, xdsl2LConfTempChan2RaRatioDs, xdsl2LConfTempChan3RaRatioDs, or xdsl2LConfTempChan4RaRatioDs would alter the relative rate allocations among all channels belonging to a line. This could have an adverse operational effect on several lines.

Unauthorized changes to xdsl2LConfTempRowStatus could result in templates being created or brought into service prematurely, or they could result in templates being inadvertently deleted or taken out of service.

- o xdsl2LineConfProfTable

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

  * xdsl2LConfProfScMaskDs
  * xdsl2LConfProfScMaskUs
  * xdsl2LConfProfRfiBandsDs
  * xdsl2LConfProfRaModeDs
  * xdsl2LConfProfRaModeUs
  * xdsl2LConfProfRaUsNrmDs
  * xdsl2LConfProfRaUsNrmUs
  * xdsl2LConfProfRaUsTimeDs
  * xdsl2LConfProfRaUsTimeUs
  * xdsl2LConfProfRaDsNrmDs
  * xdsl2LConfProfRaDsNrmUs
  * xdsl2LConfProfRaDsTimeDs

* xdsl2LConfProfRaDsTimeUs
* xdsl2LConfProfTargetSnrmDs
* xdsl2LConfProfTargetSnrmUs
* xdsl2LConfProfMaxSnrmDs
* xdsl2LConfProfMaxSnrmUs
* xdsl2LConfProfMinSnrmDs
* xdsl2LConfProfMinSnrmUs
* xdsl2LConfProfMsgMinUs
* xdsl2LConfProfMsgMinDs
* 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

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.

- xdsl2LineAlarmConfTemplateTable

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

  * xdsl2LAlarmConfTempLineProfile

  * xdsl2LAlarmConfTempChan1ConfProfile

  * xdsl2LalarmConfTempChan2ConfProfile

  * xdsl2LalarmConfTempChan3ConfProfile

  * xdsl2LalarmConfTempChan4ConfProfile

  * xdsl2LAlarmConfTempRowStatus

  Unauthorized changes to xdsl2LAlarmConfTempLineProfile, xdsl2LAlarmConfTempChan1ConfProfile, xdsl2LAlarmConfTempChan2ConfProfile, xdsl2LAlarmConfTempChan3ConfProfile, or xdsl2LAlarmConfTempChan4ConfProfile could have an adverse effect on the management of notifications generated at the scope of several to many lines, or they could change several to many lines over to running with unwanted management rates for generated notifications.

  Unauthorized changes to xdsl2LAlarmConfTempRowStatus could result in alarm templates being created or brought into service prematurely, or they could result in alarm templates being inadvertently deleted or taken out of service.

- xdsl2LineAlarmConfProfileTable

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

  * xdsl2LineAlarmConfProfileXtucThresh15MinFecs

* 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.

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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.

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