INTERNET-DRAFT

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Definitions of Managed Objects for HDSL2 and SHDSL Lines
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1. Abstract

This document defines an experimental portion of the Management Information Base (MIB) MIB module for use with network management protocols in the Internet community. In particular, it describes objects used for managing HDSL2 and SHDSL interfaces.

This document specifies a MIB module in a manner that is both compliant to the SNMPv2 SMI, and semantically identical to the peer SNMPv1 definitions.

2. The SNMP Management Framework

The SNMP Management Framework presently consists of five major components:

o An overall architecture, described in RFC 2571 [1].

o Mechanisms for describing and naming objects and events for the purpose of management. The first version of this Structure of Management Information (SMI) is called SMIv1 and described in

STD 16, RFC 1155 [2], STD 16, RFC 1212 [3] and RFC 1215 [4]. The second version, called SMIv2, is described in STD 58, RFC 2578 [5], STD 58, RFC 2579 [6] and STD 58, RFC 2580 [7].

o Message protocols for transferring management information. The first version of the SNMP message protocol is called SNMPv1 and described in STD 15, RFC 1157 [8]. A second version of the SNMP message protocol, which is not an Internet standards track protocol, is called SNMPv2c and described in RFC 1901 [9] and

RFC 1906 [10]. The third version of the message protocol is called SNMPv3 and described in RFC 1906 [10], RFC 2572 [11] and RFC 2574 [12].

o Protocol operations for accessing management information. The first set of protocol operations and associated PDU formats is described in STD 15, RFC 1157 [8]. A second set of protocol operations and associated PDU formats is described in RFC 1905 [13].

o A set of fundamental applications described in RFC 2573 [14] and the view-based access control mechanism described in RFC 2575 [15].

A more detailed introduction to the current SNMP Management Framework can be found in RFC 2570 [16].

Managed objects are accessed via a virtual information store, termed the Management Information Base or MIB. Objects in the MIB are defined using the mechanisms defined in the SMI.

This memo specifies a MIB module that is compliant to the SMIv2. A MIB conforming to the SMIv1 can be produced through the appropriate translations. The resulting translated MIB must be semantically equivalent, except where objects or events are omitted because no translation is possible (use of Counter64). Some machine readable information in SMIv2 will be converted into textual descriptions in SMIv1 during the translation process. However, this loss of machine readable information is not considered to change the semantics of the MIB.

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 [17].

2.1. Object Definitions

Managed objects are accessed via a virtual information store, termed

the Management Information Base or MIB. Objects in the MIB are defined using the subset of Abstract Syntax Notation One (ASN.1) defined in the SMI. In particular, each object type is named by an OBJECT IDENTIFIER, an administratively assigned name. The object type together with an object instance serves to uniquely identify a specific instantiation of the object. For human convenience, we often use a textual string, termed the descriptor, to also refer to the object type.

3. Introduction

This document describes an SNMP MIB for managing HDSL2/SHDSL Lines. The MIB is intended to be compatible with both the SNMPv1 and SNMPv2. These definitions are based upon the specifications for the HDSL2 and

SHDSL Embedded Operations Channel (EOC) as defined in ANSI T1E1.4/2000-006 [18] and ITU G.991.2 (ex G.SHDSL) [19].

The MIB will eventually be located in the MIB tree under MIB 2 transmission, as discussed in the MIB-2 Integration (RFC 1213 [20] and RFC 2863 [21]) section of this document. Until approved by the IETF, vendors may also choose to support it under the experimental tree.

NOTE TO RFC EDITOR: please replace the above paragraph with the following paragraph when appropriate:

The MIB is located in the MIB tree under MIB-2 transmission, as discussing in the MIB-2 Integration (RFC 1213 [20] and RFC 2863 [21]) section of this document.

3.1. Relationship of the HDSL2/SHDSL Line MIB with Standard MIBs

This section outlines the relationship of this MIB with other MIBs described in RFCs and in various degrees of "standardization". Specifically, MIB-2 as presented in RFC 1213 [20] and RFC 2863 [21] is discussed.

3.1.1 General MIB-2 Integration (RFCs 1213 and 2863)

The HDSL2/SHDSL Line MIB specifies the detailed attributes of a data interface. As such, it needs to integrate with RFC 2863 [21]. The IANA has assigned the following ifTypes to HDSL2 and SHDSL:

```
IANAifType ::= TEXTUAL-CONVENTION
    ...
SYNTAX INTEGER {
    ...
```

```
    hdsl2 (168), -- High Bit-Rate DSL, 2nd generation
    shdsl (169), -- Multirate HDSL2
    ...
    }
```

This MIB will be accessed through the transmission subtree as shown:

```
hdsl2ShdslInterface  ::= { transmission xxx }
NOTE TO RFC EDITOR: please replace the xxx with an assigned number
```

3.1.2 Usage of ifTable

The MIB branch identified by this ifType contains tables appropriate for this interface type. Most such tables extend the ifEntry table, and are indexed by ifIndex.

The following attributes are part of the mandatory ifGeneral group in RFC 2863 [21], and are not duplicated in the HDSL2/SHDSL Line MIB.

ifIndex	Interface index.
ifDescr	See interfaces MIB [21].
ifType	hdsl2(168) or shdsl(169).
ifSpeed	Set as appropriate. (This is fixed at 1552000 for HDSL2 lines)
ifPhysAddress	This object should have an octet string with zero length.
ifAdminStatus	See interfaces MIB [21].
ifOperStatus	See interfaces MIB [21].
ifLastChange	See interfaces MIB [21].
ifName	See interfaces MIB [21].
ifLinkUpDownTrapEnable	Default to enabled(1).
ifHighSpeed	Set as appropriate. (For HDSL2 lines, this is fixed at 2)

ifConnectorPresent	Set as appropriate.

Figure 1: Use of ifTable Objects

4. Conventions used in the MIB

4.1. Naming Conventions

A. **xtuC refers to a central site terminal unit;**
H2TU-C for HDSL2, or STU-C for SHDSL.
B. **xtuR refers to a remote site terminal unit;**
H2TU-R for HDSL2, or STU-R for SHDSL.
C. **xtu refers to a terminal unit; either an xtuC or xtuR.**
D. **xru refer to a regenerator unit;**
H2RU for HDSL2, or SRU for SHDSL.
E. **xU refers to any HDSL2/SHDSL unit; either an xtu or xru.**
F. **CRC is cyclic redundancy check.**
G. **ES means errored second.**
H. **LOS means loss of signal.**
I. **LOSS means loss of signal second.**
J. **LOSW means loss of sync word, distinct from LOS.**
K. **LOSWS means LOSW second.**
L. **SES means severely errored second.**
M. **SNR means signal-to-noise ratio.**
N. **UAS means unavailable second.**

4.2. Textual Conventions

The following textual conventions are defined to reflect the line topology in the MIB (further discussed is the following section) and to define the behaviour of the statistics to be maintained by an agent.

o Hdsl2ShdslUnitId :
This attribute uniquely identifies each unit in a HDSL2/SHDSL span. It mirrors the EOC addressing mechanism:

xtuC(1)	- CO terminal unit
xtuR(2)	- CPE terminal unit
xru1(3) .. xru8(10)	- regenerators, numbered from central office side

o Hdsl2ShdslUnitSide:
This attribute references the two sides of a unit:

networkSide(1)	- N in figure 2, below
customerSide(2)	- C in figure 2, below

o Hdsl2ShdslWirePair:
This attribute references the wire-pairs connecting the units:

wirePair1(1) - First pair for HDSL2/SHDSL.
wirePair2(2) - Optional second pair for SHDSL only.

o Hdsl2ShdslTransmissionModeType:
This attribute specifies the regional setting for a SHDSL line. Specified as a bit-map, the three mode type are:

region1 - ITU-T G.991.2 Annex A
region2 - ITU-T G.991.2 Annex B
region3 - ITU-T G.991.2 Annex C

o Hdsl2ShdslPerfCurrDayCount:

This attribute defines the behaviour of the 1-day (24 hour) gauges found in the MIB.

o Hdsl2Shdsl1DayIntervalCount:

This attribute defines the behaviour of the 1-day (24 hour) interval counters found in the MIB.

o Hdsl2ShdslPerfTimeElapsed:

This attribute defines the behaviour of the elapsed time counters found in the MIB.

o Hdsl2ShdslPerfIntervalThreshold:

This attribute defines the behaviour of the alarm thresholds found in the MIB.

4.3. Structure

The MIB is structured into following MIB groups:

o Span Configuration Group:

This group supports MIB objects for configuring parameters for the HDSL2/SHDSL span. It contains the following table(s):

- hdsl2ShdslSpanConfTable

o Span Status Group:

This group supports MIB objects for retrieving span status information. It contains the following table(s):

- hdsl2ShdslSpanStatusTable

o Unit Inventory Group:

This group supports MIB objects for retrieving unit inventory information about units in HDSL2/SHDSL lines via the EOC. It contains the following table(s):

- hdsl2ShdslInventoryTable

o Segment Endpoint Configuration Group:

This group supports MIB objects for configuring parameters for the HDSL2/SHDSL segment endpoints. It contains the following table(s):

- hdsl2ShdslEndpointConfTable

o Segment Endpoint Current Status/Performance Group:

This group supports MIB objects that provide the current status/performance information relating to segment endpoints. It contains the following table(s):

- hdsl2ShdslEndpointCurrTable

o Segment Endpoint 15-Minute Interval Status/Performance Group:

This group supports MIB objects that provide historic status/performance information relating to segment endpoints in 15-minute intervals. It contains the following table(s):

- hdsl2Shdsl15MinIntervalTable

o Segment Endpoint 1-Day Interval Status/Performance Group:

This group supports MIB objects that provide historic status/performance information relating to segment endpoints in 1-day intervals. It contains the following table(s):

- hdsl2Shdsl1DayIntervalTable

o Maintenance Group:

This group supports MIB objects for performing maintenance

operations such as loopbacks for HDSL2/SHDSL lines. It contains the following table(s):

- hdsl2ShdslEndpointMaintTable
- hdsl2ShdslUnitMaintTable

o Span Configuration Profile Group:

This group supports MIB objects for defining configuration profiles for HDSL2/SHDSL Spans. It contains the following table(s):

- hdsl2ShdslSpanConfProfileTable

o Segment Endpoint Alarm Configuration Profile Group:

This group supports MIB objects for defining alarm configuration profiles for HDSL2/SHDSL Segment Endpoints. It contains the following table(s):

- hdsl2ShdslEndpointAlarmConfProfileTable

o Notifications Group:

This group defines Notiofication messages supported for HDSL2/SHDSL lines. It defines the following notifications:

- hdsl2ShdslLoopAttenCrossingTrap
- hdsl2ShdslSNRMarginCrossingTrap
- hdsl2ShdslPerfESThreshTrap
- hdsl2ShdslPerfSESThreshTrap
- hdsl2ShdslPerfCRCanomaliesThreshTrap
- hdsl2ShdslPerfLOSWSThreshTrap
- hdsl2ShdslPerfUASThreshTrap
- hdsl2ShdslSpanInvalidNumRepeaters
- hdsl2ShdslLoopbackFailure

4.3.1 Line Topology

An HDSL2/SHDSL Line consists of a minimum of two units - xtuC (the central termination unit) and an xtuR (the remote termination unit). The line may optionally support up to 8 repeater/regenerator units (xru) as shown in the figure below.

<-- Network Side Customer Side -->

|</////////////////// HDSL2/SHDSL Span //////////////////>|

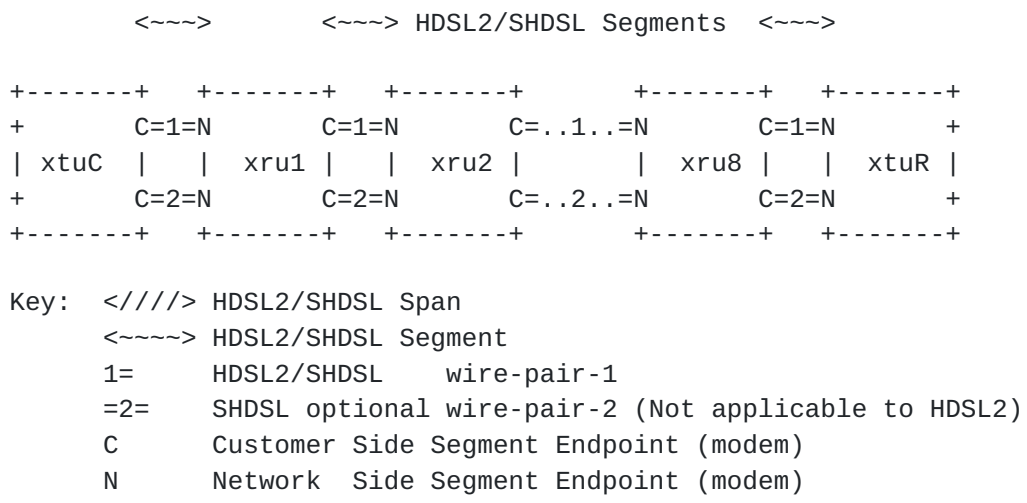

Figure 2: General topology for an HDSL2/SHDSL Line

4.4. Counters, Interval Buckets and Thresholds

For SNR Margin, Loop Attenuation, ES, SES, CRC anomalies, LOSWS, and UAS, there are event counters, current 15-minute and one (up to 96) 15-minute history bucket(s) of "interval-counters", as well as current and one (up to 30) previous 1-day interval-counter(s). Each current 15-minute event bucket has an associated threshold trap.

Unlike RFC 2493 [22] and RFC 2662 [23], there is no representation in the MIB for invalid buckets. In those cases where the data for an interval is suspect or known to be invalid, the agent should not report the interval.

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

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

4.5. Profiles

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

set of parameters that can be shared by multiple lines using the same configuration.

The following profiles are used in this MIB:

- Span Configuration Profiles - Span configuration profiles contain parameters for configuring HDSL2/SHDSL spans. They are defined in the hdsl2ShdslSpanConfProfileTable. Since span configuration parameters are only applicable for SHDSL, the support for span configuration profiles is optional for HDSL2 interfaces.

  Note that the configuration of the span dictates the behavior for each individual segment end point in the span. If a different configuration is provisioned for any given segment end point within the span, however, the new configuraiton for this segment end point will override the span configuration for this segment end point only.

- Segment Endpoint Alarm Configuration Profiles - These profiles contain parameters for configuring alarm thresholds for HDSL2/SHDSL segment endpoints. These profiles are defined in the hdsl2ShdslEndpointAlarmConfProfileTable.

Implementations will enable the manager to dynamically create and delete profiles as needed. The index of each profile is a locally-unique administratively assigned name for the profile having the textual convention `SnmpAdminString' (RFC 2571 [1]).

One or more lines may be configured to share parameters of a single profile (e.g., hdsl2ShdslEndpointAlarmConfProfile = `silver') by setting its hdsl2ShdslEndpointAlarmConfProfile objects to the value of this profile. If a change is made to the profile, all lines that refer to it will be reconfigured to the changed parameters. Before a profile can be deleted or taken out of service it must be first unreferenced from all associated lines.

Implementations must provide a default profile whose name is `DEFVAL' for each profile type. The values of the associated parameters will be vendor specific unless otherwise indicated in this document. Before a line's profiles have been set, these profiles will be automatically used by setting hdsl2ShdslEndpointAlarmConfProfile and hdsl2ShdslSpanConfProfile to `DEFVAL' where appropriate.

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

Profile changes MUST take effect immediately. These changes MAY result in a restart (hard reset or soft restart) of the units on the line.

4.6. Traps

The ability to generate the SNMP traps coldStart/WarmStart (per [21])

which are per agent (e.g., per DSLAM in such a device), and linkUp /

linkDown (per [21]) -- which are per interface (i.e., HDSL2/SHDSL line) is required.

A linkDown trap may be generated whenever any of ES, SES, CRC Anomaly, LOSWS, or UAS event occurs. At this operational point, a manager can use hdsl2ShdslEndpointCurrStatus for additional detailed information. The corresponding linkUp trap MAY be sent when all link failure conditions are cleared.

The traps defined in this MIB are for initialization failure and for the threshold crossings associated with the following events: ES, SES, CRC Anomaly, LOSWS, and UAS. Each threshold has its own enable/threshold value. When that value is 0, the trap is disabled.

The hdsl2ShdslEndpointCurrStatus is a bitmask representing all outstanding error conditions associated with a particular Segment Endpoint. Note that since status of remote endpoints is obtained via the EOC, this information may be unavailable for units that are unreachable via EOC during a line error condition. Therefore, not all conditions may always be included in its current status.

Two alarm conditions, SNR Margin Alarm and Loop Attenuation Alarm, are organized in a manner slightly different from that implied in the EOC specifications. In the MIB, these alarm conditions are tied to the two thresholds hdsl2ShdslEndpointThreshSNRMargin and hdsl2ShdslEndpointThreshLoopAttenuation found in the hdsl2ShdslEndpointAlarmConfProfileTable. In the EOC, the alarm conditions associated with these thresholds are per-unit. In the MIB, these alarm conditions are per-endpoint. For terminal units, this has no impact. For repeaters, this implies an implementation variance where the agent in the terminal unit is responsible for detecting a threshold crossing. As the reporting of a repeater detected alarm condition to the polling terminal unit occurs in the same EOC message as the reporting of the current SNR Margin and Loop Attenuation values, it is anticipated that this will have very little impact on agent implementation.

A threshold trap occurs whenever the corresponding current 15-minute interval error counter becomes equal to, or exceeds the threshold value. One trap may be sent per interval per interface. Since the current 15-minute counter are reset to 0 every 15 minutes, if the condition persists, the trap may recur as often as every 15 minutes. For example, to get a trap whenever a "loss of" event occurs (but at most once every 15 minutes), set the corresponding threshold to 1. The

agent will generate a trap when the event originally occurs.

Note that the NMS may receive a linkDown trap, as well, if enabled. 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 trap will be sent again.

A hdsl2ShdslSpanInvalidNumRepeaters trap may be generated following completion of the discovery phase if the number of repeaters discovered on the line differs from the number of repeaters specified in hdsl2ShdslConfNumRepeaters. For those conditions where the number of provisioned repeaters is greater than those encountered during span discovery, all table entries associated with the nonexistant repeaters are to be discarded. For those conditions where the number of provisioned repeaters is less than those encountered during span discovery, additional table entries are to be created using the default span configuration profile.

5. Conformance and Compliance

For both HDSL2 and SHDSL lines, the following group(s) are mandatory:

- hdsl2ShdslSpanConfGroup
- hdsl2ShdslSpanStatusGroup
- hdsl2ShdslInventoryGroup
- hdsl2ShdslEndpointConfGroup
- hdsl2Shdsl15MinIntervalGroup
- hdsl2Shdsl1DayIntervalGroup
- hdsl2ShdslMaintenanceGroup
- hdsl2ShdslEndpointAlarmConfGroup
- hdsl2ShdslNotificationGroup

For HDSL2 lines, the following group(s) are optional:

- hdsl2ShdslSpanConfProfileGroup
- hdsl2ShdslSpanShdslStatusGroup

6. Definitions

```
HDSL2-SHDSL-LINE-MIB DEFINITIONS ::= BEGIN

IMPORTS
MODULE-IDENTITY,
OBJECT-TYPE,
```

```
Counter32,
Gauge32,
NOTIFICATION-TYPE,
Integer32,
experimental                    FROM SNMPv2-SMI
DisplayString,
RowStatus,
TEXTUAL-CONVENTION              FROM SNMPv2-TC
ifIndex                         FROM IF-MIB
PerfCurrentCount,
PerfIntervalCount               FROM PerfHist-TC-MIB
SnmpAdminString                 FROM SNMP-FRAMEWORK-MIB
MODULE-COMPLIANCE,
OBJECT-GROUP,
NOTIFICATION-GROUP              FROM SNMPv2-CONF;
```



```
hdsl2ShdslMIB MODULE-IDENTITY

LAST-UPDATED "000011210000Z"    -- November 21, 2000

ORGANIZATION "ADSLMIB Working Group"

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"

DESCRIPTION
    "This MIB module defines a collection of objects for
    managing HDSL2/SHDSL lines.  An agent may reside at
    either end of the line, however the MIB is designed
    to require no management communication between the
```

```
    modems beyond that inherent in the low-level EOC line
    protocol as defined in ANSI T1E1.4/2000-006 (for HDSL2
    lines), or in ITU G.991.2 (for SHDSL lines)."

-- NOTE TO RFC EDITOR: Please replace the following with the
-- appropriate assigned 'transmission xxx' number
::= { experimental 999999 }

hdsl2ShdslLineMib    OBJECT IDENTIFIER ::= { hdsl2ShdslMIB 1 }
hdsl2ShdslMibObjects OBJECT IDENTIFIER ::= { hdsl2ShdslLineMib 1 }

-- Textual Conventions used in this MIB
--

Hdsl2ShdslPerfCurrDayCount ::= TEXTUAL-CONVENTION
    STATUS    current
    DESCRIPTION
        "A counter associated with interface performance
        measurements in a current 1-day (24 hour) measurement
        interval.
```



```
        The value of this counter starts at zero at the
        beginning of an interval and is increased when
        associated events occur, until the end of the
        1-day interval.  At that time the value of the
        counter is stored in the previous 1-day history
        interval, if available, and the current interval
        counter is restarted at zero.

        In the case where the agent has no valid data available
        for this interval the corresponding object
        instance is not available and upon a retrieval
        request a corresponding error message shall be
        returned to indicate that this instance does
        not exist (for example, a noSuchName error for
        SNMPv1 and a noSuchInstance for SNMPv2 GET
        operation)."
    SYNTAX  Gauge32

Hdsl2Shdsl1DayIntervalCount ::= TEXTUAL-CONVENTION
    STATUS    current
    DESCRIPTION
        "A counter associated with interface performance
        measurements during the most previous 1-day (24 hour)
        measurement interval.  The value of this counter is
        equal to the value of the current day counter at
```

```
        the end of its most recent interval.

        In the case where the agent has no valid data available
        for this interval the corresponding object instance is
        not available and upon a retrieval request a corresponding
        error message shall be returned to indicate that this
        instance does not exist (for example, a noSuchName error
        for SNMPv1 and a noSuchInstance for SNMPv2 GET operation)."
    SYNTAX  Gauge32

Hdsl2ShdslPerfTimeElapsed ::= TEXTUAL-CONVENTION
    STATUS    current
    DESCRIPTION
        "The number of seconds that have elapsed since
        the beginning of the current measurement period.
        If, for some reason, such as an adjustment in the
        system's time-of-day clock, the current interval
        exceeds the maximum value, the agent will return
        the maximum value."
    SYNTAX    Gauge32

Hdsl2ShdslPerfIntervalThreshold ::= TEXTUAL-CONVENTION
    STATUS    current
    DESCRIPTION
        "This convention defines a range of values
        that may be set in a fault threshold alarm
        control.  As the number of seconds in a
```



```
        15-minute interval numbers at most 900, objects
        of this type may have a range of 0...900, where
        the value of 0 disables the alarm."
    SYNTAX    INTEGER(0..900)

Hdsl2ShdslUnitId ::= TEXTUAL-CONVENTION
    STATUS    current
    DESCRIPTION
        "This is the unique identification for all units
        in an HDSL2/SHDSL Span.  It is based on the EOC
        unit addressing scheme with reference to the xtuC."
    SYNTAX    INTEGER
              {
              xtuC(1),
              xtuR(2),
              xru1(3),
              xru2(4),
              xru3(5),
```

```
                xru4(6),
                xru5(7),
                xru6(8),
                xru7(9),
                xru8(10)
                }

Hdsl2ShdslUnitSide ::= TEXTUAL-CONVENTION
    STATUS    current
    DESCRIPTION
        "This is the referenced side of an HDSL2/SHDSL
        unit - Network or Customer side.  The side
        facing the Network is the Network side, while the
        side facing the Customer is the Customer side."
    SYNTAX    INTEGER
                {
                networkSide(1),
                customerSide(2)
                }

Hdsl2ShdslWirePair ::= TEXTUAL-CONVENTION
    STATUS    current
    DESCRIPTION
        "This is the referenced pair of wires in an HDSL2/SHDSL
        Segment.  HDSL2 only supports a single pair (wirePair1),
        while SHDSL supports an optional second pair (wirePair2)."
    SYNTAX    INTEGER
                {
                wirePair1(1),
                wirePair2(2)
                }

Hdsl2ShdslTransmissionModeType ::= TEXTUAL-CONVENTION
    STATUS    current
```



```
    DESCRIPTION
        "Contains the regional setting of the HDSL2/SHDSL span,
        represented as a bit-map of possible settings. The various
        bit positions are:

        1 region 1          Indicates ITU-T G.991.2 Annex A.

        2 region 2          Indicates ITU-T G.991.2 Annex B.

        4 region 3          Indicates ITU-T G.991.2 Annex C."
    SYNTAX      Integer32
```

```
-- Span Configuration Group
--

hdsl2ShdslSpanConfTable OBJECT-TYPE
    SYNTAX     SEQUENCE OF Hdsl2ShdslSpanConfEntry
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
        "This table supports overall configuration of
        HDSL2/SHDSL Spans."
    ::= { hdsl2ShdslMibObjects 1 }

hdsl2ShdslSpanConfEntry OBJECT-TYPE
    SYNTAX      Hdsl2ShdslSpanConfEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry in the hdsl2ShdslSpanConfTable.  Each entry
        represents the complete Span in a single HDSL2/SHDSL
        line.  It is indexed by the ifIndex of the associated
        HDSL2/SHDSL line."
    INDEX { ifIndex }
    ::= { hdsl2ShdslSpanConfTable 1 }

Hdsl2ShdslSpanConfEntry ::=
    SEQUENCE
    {
    hdsl2ShdslConfNumRepeaters              INTEGER,
    hdsl2ShdslSpanConfProfile               SnmpAdminString,
    hdsl2ShdslSpanAlarmConfProfile          SnmpAdminString
    }

hdsl2ShdslConfNumRepeaters OBJECT-TYPE
    SYNTAX      INTEGER(0..8)
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "This object provisions the number of repeaters/regenerators
        in this HDSL2/SHDSL Span."
    ::= { hdsl2ShdslSpanConfEntry 1 }
```



```
hdsl2ShdslSpanConfProfile OBJECT-TYPE
    SYNTAX      SnmpAdminString (SIZE(1..32))
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
```

```
        "This object is a pointer to a span configuration profile in
        the hdsl2ShdslSpanConfProfileTable, which applies to this span.
        The value of this object is the index of the referenced profile
        in the hdsl2ShdslSpanConfProfileTable.  Note that span
        configuration profiles are only applicable to SHDSL lines.
        HDSL2 lines will not support this object.  By default, this
        object  will have the value 'DEFVAL' (the index of the default
        profile)."
    ::= { hdsl2ShdslSpanConfEntry 2 }

hdsl2ShdslSpanAlarmConfProfile OBJECT-TYPE
    SYNTAX      SnmpAdminString (SIZE(1..32))
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "This object is a pointer to an Alarm configuration profile in
        the hdsl2ShdslEndpointAlarmConfProfileTable.  The value of this
        object is the index of the referenced profile in the
        hdsl2ShdslEndpointAlarmConfProfileTable.  The alarm threshold
        configuration in the referenced profile will be used by default
        for all segment endpoints in this span.  Individual endpoints
        may override this profile by explicitly specifying some other
        profile in the hdsl2ShdslEndpointConfTable.  By default, this
        object will have the value 'DEFVAL' (the index of the default
        profile)."
    ::= { hdsl2ShdslSpanConfEntry 3 }

-- Span Status Group
--

hdsl2ShdslSpanStatusTable OBJECT-TYPE
    SYNTAX     SEQUENCE OF Hdsl2ShdslSpanStatusEntry
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
        "This table provides overall status information of
        HDSL2/SHDSL spans."
    ::= { hdsl2ShdslMibObjects 2 }

hdsl2ShdslSpanStatusEntry OBJECT-TYPE
    SYNTAX      Hdsl2ShdslSpanStatusEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry in the hdsl2ShdslSpanStatusTable.  Each entry
        represents the complete span in a single HDSL2/SHDSL
        line.  It is indexed by the ifIndex of the associated
```

```
        HDSL2/SHDSL line."
    INDEX { ifIndex }
    ::= { hdsl2ShdslSpanStatusTable 1 }

Hdsl2ShdslSpanStatusEntry ::=
    SEQUENCE
    {
    hdsl2ShdslStatusNumAvailRepeaters        INTEGER,
    hdsl2ShdslStatusMaxAttainableLineRate    Integer32,
    hdsl2ShdslStatusActualLineRate           Integer32,
    hdsl2ShdslStatusTransmissionModeCurrent
                Hdsl2ShdslTransmissionModeType
    }

hdsl2ShdslStatusNumAvailRepeaters OBJECT-TYPE
    SYNTAX      INTEGER(0..8)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Contains the actual number of repeaters/regenerators
        discovered in this HDSL2/SHDSL span."
    ::= { hdsl2ShdslSpanStatusEntry 1 }

hdsl2ShdslStatusMaxAttainableLineRate OBJECT-TYPE
    SYNTAX      Integer32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Contains the maximum attainable line rate in this HDSL2/SHDSL
        span."
    ::= { hdsl2ShdslSpanStatusEntry 2 }

hdsl2ShdslStatusActualLineRate OBJECT-TYPE
    SYNTAX      Integer32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Contains the actual line rate in this HDSL2/SHDSL span."
    ::= { hdsl2ShdslSpanStatusEntry 3 }

hdsl2ShdslStatusTransmissionModeCurrent OBJECT-TYPE
    SYNTAX      Hdsl2ShdslTransmissionModeType
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Contains the current PSD regional setting of the
        HDSL2/SHDSL span."
    ::= { hdsl2ShdslSpanStatusEntry 4 }
```

```
-- Unit Inventory Group
--
```



```
hdsl2ShdslInventoryTable OBJECT-TYPE
    SYNTAX     SEQUENCE OF Hdsl2ShdslInventoryEntry
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
        "This table supports retrieval of unit inventory information
        available via the EOC from units in a HDSL2/SHDSL line."
    ::= { hdsl2ShdslMibObjects 3 }

hdsl2ShdslInventoryEntry OBJECT-TYPE
    SYNTAX      Hdsl2ShdslInventoryEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry in the hdsl2ShdslInventoryTable.  Each entry
        represents inventory information for a single unit in a
        HDSL2/SHDSL line.  It is indexed by the ifIndex of the
        HDSL2/SHDSL line and the Hdsl2ShdslUnitId of the
        associated unit."
    INDEX { ifIndex, hdsl2ShdslInvIndex }
    ::= { hdsl2ShdslInventoryTable 1 }

Hdsl2ShdslInventoryEntry ::=
    SEQUENCE
    {
    hdsl2ShdslInvIndex                      Hdsl2ShdslUnitId,
    hdsl2ShdslInvVendorID                   OCTET STRING,
    hdsl2ShdslInvVendorModelNumber          DisplayString,
    hdsl2ShdslInvVendorSerialNumber         DisplayString,
    hdsl2ShdslInvVendorEOCSoftwareVersion   Integer32,
    hdsl2ShdslInvStandardVersion            Integer32,
    hdsl2ShdslInvVendorListNumber           DisplayString,
    hdsl2ShdslInvVendorIssueNumber          DisplayString,
    hdsl2ShdslInvVendorSoftwareVersion      DisplayString,
    hdsl2ShdslInvEquipmentCode              DisplayString,
    hdsl2ShdslInvVendorOther                DisplayString,
    hdsl2ShdslInvTransmissionModeCapability
                            Hdsl2ShdslTransmissionModeType
    }

hdsl2ShdslInvIndex OBJECT-TYPE
    SYNTAX      Hdsl2ShdslUnitId
```

```
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The index into the hdsl2ShdslInventoryTable."
    ::= { hdsl2ShdslInventoryEntry 1 }

hdsl2ShdslInvVendorID OBJECT-TYPE
    SYNTAX      OCTET STRING(SIZE(9))
    MAX-ACCESS  read-only
    STATUS      current
```



```
    DESCRIPTION
        "Vendor ID as reported in an Inventory Response message.
        Note that there is a variance between G.994.1 and G.991.2
        as to the contents of this field (8 octets vs. 8.5 octets
        respectively).  In all cases, this object should report
        the Vendor ID as reported by the inventoried unit.  The
        Vendor ID MUST be right-aligned with respect to the
        entirety of the octet string, resulting in the high order
        nibble of the first octet being zero.
        "
    ::= { hdsl2ShdslInventoryEntry 2 }

hdsl2ShdslInvVendorModelNumber OBJECT-TYPE
    SYNTAX      DisplayString
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Vendor model number as reported in an Inventory Response
        message."
    ::= { hdsl2ShdslInventoryEntry 3 }

hdsl2ShdslInvVendorSerialNumber OBJECT-TYPE
    SYNTAX      DisplayString
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Vendor serial number as reported in an Inventory Response
        message."
    ::= { hdsl2ShdslInventoryEntry 4 }

hdsl2ShdslInvVendorEOCSoftwareVersion OBJECT-TYPE
    SYNTAX      Integer32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
```

```
        "Vendor EOC version as reported in a Discovery Response
        message."
    ::= { hdsl2ShdslInventoryEntry 5 }

hdsl2ShdslInvStandardVersion OBJECT-TYPE
    SYNTAX      Integer32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Version of the HDSL2/SHDSL standard implemented, as reported
        in an Inventory Response message."
    ::= { hdsl2ShdslInventoryEntry 6 }

hdsl2ShdslInvVendorListNumber OBJECT-TYPE
    SYNTAX      DisplayString
    MAX-ACCESS  read-only
    STATUS      current
```



```
    DESCRIPTION
        "Vendor list number as reported in an Inventory Response
        message."
    ::= { hdsl2ShdslInventoryEntry 7 }

hdsl2ShdslInvVendorIssueNumber OBJECT-TYPE
    SYNTAX      DisplayString
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Vendor issue number as reported in an Inventory Response
        message."
    ::= { hdsl2ShdslInventoryEntry 8 }

hdsl2ShdslInvVendorSoftwareVersion OBJECT-TYPE
    SYNTAX      DisplayString
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Vendor software version as reported in an Inventory
        Response message."
    ::= { hdsl2ShdslInventoryEntry 9 }

hdsl2ShdslInvEquipmentCode OBJECT-TYPE
    SYNTAX      DisplayString
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
```

```
        "Equipment code conforming to ANSI T1.213, Coded Identification
        of Equipment Entities."
    ::= { hdsl2ShdslInventoryEntry 10 }

hdsl2ShdslInvVendorOther OBJECT-TYPE
    SYNTAX      DisplayString
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Other vendor information as reported in an Inventory
        Response message."
    ::= { hdsl2ShdslInventoryEntry 11 }

hdsl2ShdslInvTransmissionModeCapability OBJECT-TYPE
    SYNTAX      Hdsl2ShdslTransmissionModeType
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Contains the transmission mode capability of the SHDSL unit."
    ::= { hdsl2ShdslInventoryEntry 12 }

-- Segment Endpoint Configuration Group
--
```



```
hdsl2ShdslEndpointConfTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF Hdsl2ShdslEndpointConfEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This table supports configuration parameters for segment
        endpoints in a HDSL2/SHDSL line."
    ::= { hdsl2ShdslMibObjects 4 }

hdsl2ShdslEndpointConfEntry OBJECT-TYPE
    SYNTAX      Hdsl2ShdslEndpointConfEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry in the hdsl2ShdslEndpointConfTable.  Each entry
        represents a single segment endpoint in a HDSL2/SHDSL line.
        It is indexed by the ifIndex of the HDSL2/SHDSL line, the
        UnitId of the associated unit, the side of the unit, and the
        wire-pair of the associated modem."
    INDEX { ifIndex, hdsl2ShdslInvIndex, hdsl2ShdslEndpointSide,
            hdsl2ShdslEndpointWirePair}
```

```
    ::= { hdsl2ShdslEndpointConfTable 1 }

Hdsl2ShdslEndpointConfEntry ::=
    SEQUENCE
    {
    hdsl2ShdslEndpointSide                          Hdsl2ShdslUnitSide,
    hdsl2ShdslEndpointWirePair                      Hdsl2ShdslWirePair,
    hdsl2ShdslEndpointAlarmConfProfile              SnmpAdminString
    }

hdsl2ShdslEndpointSide OBJECT-TYPE
    SYNTAX      Hdsl2ShdslUnitSide
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The side of the unit associated with this segment endpoint -
        Network/Customer side - as per the Hdsl2ShdslUnitSide
        textual convention."
    ::= { hdsl2ShdslEndpointConfEntry 1 }

hdsl2ShdslEndpointWirePair OBJECT-TYPE
    SYNTAX      Hdsl2ShdslWirePair
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The wire-pair of the modem associated with this segment
        endpoint as per the Hdsl2ShdslWirePair textual convention."
::= { hdsl2ShdslEndpointConfEntry 2 }

hdsl2ShdslEndpointAlarmConfProfile OBJECT-TYPE
    SYNTAX      SnmpAdminString (SIZE(0..32))
```



```
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "This object configures the alarm threshold values to be
        used for this segment endpoint.  The values are obtained
        from the alarm configuration profile referenced by this
        object.  The value of this object is the index of the
        referenced profile in the hdsl2ShdslLineAlarmConfProfileTable,
        or NULL (a string of length 0).  If the value is NULL, the
        endpoint uses the default Alarm Configuration Profile for the
        associated span as per the hdsl2ShdslSpanAlarmConfProfile
        object in the hdsl2ShdslSpanConfTable.  The default value of
        this object is NULL.
    ::= { hdsl2ShdslEndpointConfEntry 3 }
```

```
-- Segment Endpoint Current Status/Performance Group
--

hdsl2ShdslEndpointCurrTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF Hdsl2ShdslEndpointCurrEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This table contains current status and performance information
        for segment endpoints in HDSL2/SHDSL Lines."
    ::= { hdsl2ShdslMibObjects 5 }

hdsl2ShdslEndpointCurrEntry OBJECT-TYPE
    SYNTAX      Hdsl2ShdslEndpointCurrEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry in the hdsl2ShdslEndpointCurrTable.  Each entry
        contains status and performance information relating to a
        single segment endpoint.  It is indexed by the ifIndex of
        the HDSL2/SHDSL line, the UnitId of the associated unit,
        the side of the unit, and the wire-pair of the associated
        modem."
    INDEX { ifIndex, hdsl2ShdslInvIndex, hdsl2ShdslEndpointSide,
            hdsl2ShdslEndpointWirePair}
    ::= { hdsl2ShdslEndpointCurrTable 1 }

Hdsl2ShdslEndpointCurrEntry ::=
    SEQUENCE
    {
    hdsl2ShdslEndpointCurrAtn               Integer32,
    hdsl2ShdslEndpointCurrSnrMgn            Integer32,
    hdsl2ShdslEndpointCurrStatus            Integer32,
    hdsl2ShdslEndpointES                    Counter32,
    hdsl2ShdslEndpointSES                   Counter32,
    hdsl2ShdslEndpointCRCanomalies          Counter32,
```



```
    hdsl2ShdslEndpointLOSWS                 Counter32,
    hdsl2ShdslEndpointUAS                   Counter32,
    hdsl2ShdslEndpointCurr15MinTimeElapsed  Hdsl2ShdslPerfTimeElapsed,
    hdsl2ShdslEndpointCurr15MinES           PerfCurrentCount,
    hdsl2ShdslEndpointCurr15MinSES          PerfCurrentCount,
    hdsl2ShdslEndpointCurr15MinCRCanomalies PerfCurrentCount,
    hdsl2ShdslEndpointCurr15MinLOSWS        PerfCurrentCount,
```

```
    hdsl2ShdslEndpointCurr15MinUAS           PerfCurrentCount,
    hdsl2ShdslEndpointCurr1DayTimeElapsed    Hdsl2ShdslPerfTimeElapsed,
    hdsl2ShdslEndpointCurr1DayES             Hdsl2ShdslPerfCurrDayCount,
    hdsl2ShdslEndpointCurr1DaySES            Hdsl2ShdslPerfCurrDayCount,
    hdsl2ShdslEndpointCurr1DayCRCanomalies   Hdsl2ShdslPerfCurrDayCount,
    hdsl2ShdslEndpointCurr1DayLOSWS          Hdsl2ShdslPerfCurrDayCount,
    hdsl2ShdslEndpointCurr1DayUAS            Hdsl2ShdslPerfCurrDayCount
    }

hdsl2ShdslEndpointCurrAtn OBJECT-TYPE
    SYNTAX      Integer32
    UNITS       "dB"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The current loop attenuation for this endpoint as
        reported in a Network or Customer Side Performance
        Status message."
    ::= { hdsl2ShdslEndpointCurrEntry 1 }

hdsl2ShdslEndpointCurrSnrMgn OBJECT-TYPE
    SYNTAX      Integer32
    UNITS       "dB"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The current SNR margin for this endpoint as reported
        in a Status Response/SNR message."
    ::= { hdsl2ShdslEndpointCurrEntry 2 }

hdsl2ShdslEndpointCurrStatus OBJECT-TYPE
    SYNTAX      Integer32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Contains the current state of the endpoint.  This is a
        bit-map of possible conditions. The various bit positions
        are:

        1 noDefect              There no defects on the line

        2 powerBackoff          Indicates enhanced Power Backoff

        4 deviceFault           Indicates a vendor-dependent
                                detection of diagnostics or
```



```
                                self-test results
```

```
        8 dcContinuityFault      Indicates vendor-dependent
                                 conditions that interfere with
                                 span powering such as short and
                                 open circuits

        16 snrMarginAlarm        Indicates that the SNR margin
                                 has exceeded the alarm threshold

        32 loopAttenuationAlarm  Indicates that the loop attentuation
                                 has exceeded the alarm threshold

        64 loswFailureAlarm      Indicates a forward LOSW alarm

        128 configInitFailure    Endpoint failure during initialization
                                 due to paired endpoint not able to
                                 support requested configuration

        256 protocolInitFailure  Endpoint failure during initialization
                                 due to incompatible protocol used by
                                 the paired endpoint.

        512 noNeighborPresent    Endpoint failure during initialization
                                 due to no activation sequence detected
                                 from paired endpoint.

        1024 loopbackActive      A loopback is currently active at this
                                 Segment Endpoint.

        This is intended to supplement ifOperStatus."
    ::= { hdsl2ShdslEndpointCurrEntry 3 }

hdsl2ShdslEndpointES OBJECT-TYPE
    SYNTAX      Counter32
    UNITS       "seconds"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Count of Errored Seconds (ES) on this endpoint since the xU
        was last restarted."
    ::= { hdsl2ShdslEndpointCurrEntry 4 }

hdsl2ShdslEndpointSES OBJECT-TYPE
    SYNTAX       Counter32
    UNITS        "seconds"
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "Count of Severely Errored Seconds (SES) on this endpoint
        since the xU was last restarted."
    ::= { hdsl2ShdslEndpointCurrEntry 5 }
```

```
hdsl2ShdslEndpointCRCanomalies OBJECT-TYPE
    SYNTAX       Counter32
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "Count of CRC anomalies on this endpoint since the xU was
        last restarted."
    ::= { hdsl2ShdslEndpointCurrEntry 6 }

hdsl2ShdslEndpointLOSWS OBJECT-TYPE
    SYNTAX       Counter32
    UNITS        "seconds"
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "Count of Loss of Sync Word (LOSW) Seconds on this endpoint
        since the xU was last restarted."
    ::= { hdsl2ShdslEndpointCurrEntry 7 }

hdsl2ShdslEndpointUAS OBJECT-TYPE
    SYNTAX       Counter32
    UNITS        "seconds"
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "Count of Unavailable Seconds (UAS) on this endpoint since
        the xU was last restarted."
    ::= { hdsl2ShdslEndpointCurrEntry 8 }

hdsl2ShdslEndpointCurr15MinTimeElapsed OBJECT-TYPE
    SYNTAX       Hdsl2ShdslPerfTimeElapsed
    UNITS        "seconds"
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "Total elapsed seconds in the current 15-minute interval."
    ::= { hdsl2ShdslEndpointCurrEntry 9 }

hdsl2ShdslEndpointCurr15MinES OBJECT-TYPE
    SYNTAX       PerfCurrentCount
    UNITS        "seconds"
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "Count of Errored Seconds (ES) in the current 15-minute
        interval."
```

```
    ::= { hdsl2ShdslEndpointCurrEntry 10 }

hdsl2ShdslEndpointCurr15MinSES OBJECT-TYPE
    SYNTAX       PerfCurrentCount
    UNITS        "seconds"
    MAX-ACCESS   read-only
```



```
    STATUS       current
    DESCRIPTION
        "Count of Severely Errored Seconds (SES) in the current
        15-minute interval."
    ::= { hdsl2ShdslEndpointCurrEntry 11 }

hdsl2ShdslEndpointCurr15MinCRCanomalies OBJECT-TYPE
    SYNTAX       PerfCurrentCount
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "Count of CRC anomalies in the current 15-minute interval."
    ::= { hdsl2ShdslEndpointCurrEntry 12 }

hdsl2ShdslEndpointCurr15MinLOSWS OBJECT-TYPE
    SYNTAX       PerfCurrentCount
    UNITS        "seconds"
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "Count of Loss of Sync Word (LOSW) Seconds in the current
        15-minute interval."
    ::= { hdsl2ShdslEndpointCurrEntry 13 }

hdsl2ShdslEndpointCurr15MinUAS OBJECT-TYPE
    SYNTAX       PerfCurrentCount
    UNITS        "seconds"
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "Count of Unavailable Seconds (UAS) in the current 15-minute
        interval."
    ::= { hdsl2ShdslEndpointCurrEntry 14 }

hdsl2ShdslEndpointCurr1DayTimeElapsed OBJECT-TYPE
    SYNTAX       Hdsl2ShdslPerfTimeElapsed
    UNITS        "seconds"
    MAX-ACCESS   read-only
    STATUS       current
```

```
    DESCRIPTION
        "Number of seconds that have elapsed since the beginning of
        the current 1-day interval."
    ::= { hdsl2ShdslEndpointCurrEntry 15 }

hdsl2ShdslEndpointCurr1DayES OBJECT-TYPE
    SYNTAX       Hdsl2ShdslPerfCurrDayCount
    UNITS        "seconds"
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "Count of Errored Seconds (ES) during the current day as
        measured by hdsl2ShdslEndpointCurr1DayTimeElapsed."
```



```
    ::= { hdsl2ShdslEndpointCurrEntry 16 }

hdsl2ShdslEndpointCurr1DaySES OBJECT-TYPE
    SYNTAX       Hdsl2ShdslPerfCurrDayCount
    UNITS        "seconds"
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "Count of Severely Errored Seconds (SES) during the current
        day as measured by hdsl2ShdslEndpointCurr1DayTimeElapsed."
    ::= { hdsl2ShdslEndpointCurrEntry 17 }

hdsl2ShdslEndpointCurr1DayCRCanomalies OBJECT-TYPE
    SYNTAX       Hdsl2ShdslPerfCurrDayCount
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "Count of CRC anomalies during the current day as measured
        by hdsl2ShdslEndpointCurr1DayTimeElapsed."
    ::= { hdsl2ShdslEndpointCurrEntry 18 }

hdsl2ShdslEndpointCurr1DayLOSWS OBJECT-TYPE
    SYNTAX       Hdsl2ShdslPerfCurrDayCount
    UNITS        "seconds"
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "Count of Loss of Sync Word Seconds (LOSWS) during the current
        day as measured by hdsl2ShdslEndpointCurr1DayTimeElapsed."
    ::= { hdsl2ShdslEndpointCurrEntry 19 }

hdsl2ShdslEndpointCurr1DayUAS OBJECT-TYPE
```

```
    SYNTAX       Hdsl2ShdslPerfCurrDayCount
    UNITS        "seconds"
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "Count of Unavailable Seconds (UAS) during the current
        day as measured by hdsl2ShdslEndpointCurr1DayTimeElapsed."
    ::= { hdsl2ShdslEndpointCurrEntry 20 }

-- Segment Endpoint 15-Minute Interval Status/Performance Group
--

hdsl2Shdsl15MinIntervalTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF Hdsl2Shdsl15MinIntervalEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This table provides one row for each HDSL2/SHDSL endpoint
        performance data collection interval."
    ::= { hdsl2ShdslMibObjects 6 }
```



```
hdsl2Shdsl15MinIntervalEntry OBJECT-TYPE
    SYNTAX      Hdsl2Shdsl15MinIntervalEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry in the hdsl2Shdsl15MinIntervalTable."
    INDEX { ifIndex, hdsl2ShdslInvIndex, hdsl2ShdslEndpointSide,
            hdsl2ShdslEndpointWirePair, hdsl2Shdsl15MinIntervalNumber}
    ::= { hdsl2Shdsl15MinIntervalTable 1 }

Hdsl2Shdsl15MinIntervalEntry ::=
    SEQUENCE
    {
    hdsl2Shdsl15MinIntervalNumber         INTEGER,
    hdsl2Shdsl15MinIntervalES             PerfIntervalCount,
    hdsl2Shdsl15MinIntervalSES            PerfIntervalCount,
    hdsl2Shdsl15MinIntervalCRCanomalies   PerfIntervalCount,
    hdsl2Shdsl15MinIntervalLOSWS          PerfIntervalCount,
    hdsl2Shdsl15MinIntervalUAS            PerfIntervalCount
    }

hdsl2Shdsl15MinIntervalNumber OBJECT-TYPE
    SYNTAX      INTEGER(1..96)
    MAX-ACCESS  not-accessible
    STATUS      current
```

```
    DESCRIPTION
        "Performance Data Interval number. 1 is the the most recent
        previous interval; interval 96 is 24 hours ago. Intervals
        2..96 are optional."
    ::= { hdsl2Shdsl15MinIntervalEntry 1 }

hdsl2Shdsl15MinIntervalES OBJECT-TYPE
    SYNTAX      PerfIntervalCount
    UNITS       "seconds"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Count of Errored Seconds (ES) during the interval."
    ::= { hdsl2Shdsl15MinIntervalEntry 2 }

hdsl2Shdsl15MinIntervalSES OBJECT-TYPE
    SYNTAX      PerfIntervalCount
    UNITS       "seconds"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Count of Severely Errored Seconds (SES) during the
        interval."
    ::= { hdsl2Shdsl15MinIntervalEntry 3 }

hdsl2Shdsl15MinIntervalCRCanomalies OBJECT-TYPE
    SYNTAX      PerfIntervalCount
```



```
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Count of CRC anomalies during the interval."
    ::= { hdsl2Shdsl15MinIntervalEntry 4 }

hdsl2Shdsl15MinIntervalLOSWS OBJECT-TYPE
    SYNTAX      PerfIntervalCount
    UNITS       "seconds"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Count of Loss of Sync Word (LOSW) Seconds during the interval."
    ::= { hdsl2Shdsl15MinIntervalEntry 5 }

hdsl2Shdsl15MinIntervalUAS OBJECT-TYPE
    SYNTAX      PerfIntervalCount
    UNITS       "seconds"
```

```
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Count of Unavailable Seconds (UAS) during the interval."
    ::= { hdsl2Shdsl15MinIntervalEntry 6 }

-- Segment Endpoint 1-Day Interval Status/Performance Group
--

hdsl2Shdsl1DayIntervalTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF Hdsl2Shdsl1DayIntervalEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This table provides one row for each HDSL2/SHDSL endpoint
        performance data collection interval."
    ::= { hdsl2ShdslMibObjects 7 }

hdsl2Shdsl1DayIntervalEntry OBJECT-TYPE
    SYNTAX      Hdsl2Shdsl1DayIntervalEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry in the hdsl2Shdsl1DayIntervalTable."
    INDEX { ifIndex, hdsl2ShdslInvIndex, hdsl2ShdslEndpointSide,
            hdsl2ShdslEndpointWirePair, hdsl2Shdsl1DayIntervalInterval }
    ::= { hdsl2Shdsl1DayIntervalTable 1 }

Hdsl2Shdsl1DayIntervalEntry ::=
    SEQUENCE
    {
    hdsl2Shdsl1DayIntervalInterval         INTEGER,
    hdsl2Shdsl1DayIntervalMoniSecs         Hdsl2ShdslPerfTimeElapsed,
    hdsl2Shdsl1DayIntervalES               Hdsl2Shdsl1DayIntervalCount,
```



```
    hdsl2Shdsl1DayIntervalSES              Hdsl2Shdsl1DayIntervalCount,
    hdsl2Shdsl1DayIntervalCRCanomalies     Hdsl2Shdsl1DayIntervalCount,
    hdsl2Shdsl1DayIntervalLOSWS            Hdsl2Shdsl1DayIntervalCount,
    hdsl2Shdsl1DayIntervalUAS              Hdsl2Shdsl1DayIntervalCount
    }

hdsl2Shdsl1DayIntervalInterval OBJECT-TYPE
    SYNTAX      INTEGER(1..30)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
```

```
        "History Data Interval number. Interval 1 is the the most
        recent previous day; interval 30 is 30 days ago. Intervals
        2..30 are optional."
    ::= { hdsl2Shdsl1DayIntervalEntry 1 }

hdsl2Shdsl1DayIntervalMoniSecs OBJECT-TYPE
    SYNTAX       Hdsl2ShdslPerfTimeElapsed
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The amount of time in the 1-day interval over which the
        performance monitoring information is actually counted.
        This value will be the same as the interval duration except
        in a situation where performance monitoring data could not
        be collected for any reason."
    ::= { hdsl2Shdsl1DayIntervalEntry 2 }

hdsl2Shdsl1DayIntervalES OBJECT-TYPE
    SYNTAX       Hdsl2Shdsl1DayIntervalCount
    UNITS        "seconds"
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "Count of Errored Seconds (ES) during the 1-day interval as
        measured by hdsl2Shdsl1DayIntervalMoniSecs."
    ::= { hdsl2Shdsl1DayIntervalEntry 3 }

hdsl2Shdsl1DayIntervalSES OBJECT-TYPE
    SYNTAX       Hdsl2Shdsl1DayIntervalCount
    UNITS        "seconds"
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "Count of Severely Errored Seconds (SES) during the 1-day
        interval as measured by hdsl2Shdsl1DayIntervalMoniSecs."
    ::= { hdsl2Shdsl1DayIntervalEntry 4 }

hdsl2Shdsl1DayIntervalCRCanomalies OBJECT-TYPE
    SYNTAX       Hdsl2Shdsl1DayIntervalCount
    MAX-ACCESS   read-only
    STATUS       current
```



```
    DESCRIPTION
        "Count of CRC anomalies during the 1-day interval as
        measured by hdsl2Shdsl1DayIntervalMoniSecs."
    ::= { hdsl2Shdsl1DayIntervalEntry 5 }
```

```
hdsl2Shdsl1DayIntervalLOSWS OBJECT-TYPE
    SYNTAX       Hdsl2Shdsl1DayIntervalCount
    UNITS        "seconds"
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "Count of Loss of Sync Word (LOSW) Seconds during the 1-day
        interval as measured by hdsl2Shdsl1DayIntervalMoniSecs."
    ::= { hdsl2Shdsl1DayIntervalEntry 6 }

hdsl2Shdsl1DayIntervalUAS OBJECT-TYPE
    SYNTAX       Hdsl2Shdsl1DayIntervalCount
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "Count of Unavailable Seconds (UAS) during the 1-day interval
        as measured by hdsl2Shdsl1DayIntervalMoniSecs."
    ::= { hdsl2Shdsl1DayIntervalEntry 7 }

-- Maintenance Group
--

hdsl2ShdslEndpointMaintTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF Hdsl2ShdslEndpointMaintEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This table supports maintenance operations (eg. loopbacks)
        to be performed on HDSL2/SHDSL segment endpoints."
    ::= { hdsl2ShdslMibObjects 8 }

hdsl2ShdslEndpointMaintEntry OBJECT-TYPE
    SYNTAX      Hdsl2ShdslEndpointMaintEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry in the hdsl2ShdslEndpointMaintTable.  Each entry
        corresponds to a single segment endpoint, and is indexed by the
        ifIndex of the HDSL2/SHDSL line, the UnitId of the associated
        unit and the side of the unit."
    INDEX { ifIndex, hdsl2ShdslInvIndex, hdsl2ShdslEndpointSide }
    ::= { hdsl2ShdslEndpointMaintTable 1 }

Hdsl2ShdslEndpointMaintEntry ::=
    SEQUENCE
    {
    hdsl2ShdslMaintLoopbackConfig      INTEGER,
```

```
    hdsl2ShdslMaintTipRingReversal     INTEGER,
    hdsl2ShdslMaintPowerBackOff        INTEGER,
    hdsl2ShdslMaintSoftRestart         INTEGER
    }

hdsl2ShdslMaintLoopbackConfig OBJECT-TYPE
    SYNTAX      INTEGER
                {
                noLoopback(1),
                normalLoopback(2),
                specialLoopback(3)
                }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "This object controls configuration of loopbacks for the
        associated segment endpoint.  The status of the loopback
        is obtained via the hdsl2ShdslEndpointCurrStatus object."
    ::= { hdsl2ShdslEndpointMaintEntry 1 }

hdsl2ShdslMaintTipRingReversal OBJECT-TYPE
    SYNTAX      INTEGER
                {
                normal(1),
                reversed(2)
                }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This object indicates the state of the tip/ring pair at
        the associated segment endpoint."
    ::= { hdsl2ShdslEndpointMaintEntry 2 }

hdsl2ShdslMaintPowerBackOff OBJECT-TYPE
    SYNTAX      INTEGER
                {
                default(1),
                enhanced(2)
                }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "This object configures the receiver at the associated
        segment endpoint to operate in default or enhanced power
        backoff mode."
    ::= { hdsl2ShdslEndpointMaintEntry 3 }

hdsl2ShdslMaintSoftRestart OBJECT-TYPE
```

```
    SYNTAX      INTEGER
                {
                ready(1),
                restart(2)
```



```
                }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "This object enables the manager to trigger a soft restart
        of the modem at the associated segment endpoint.  The manager
        may only set this object to the 'restart(2)' value to initiate
        a restart.  The agent will perform a restart after approximately
        5 seconds, and restore the object to the 'ready(1)' state."
    ::= { hdsl2ShdslEndpointMaintEntry 4 }

hdsl2ShdslUnitMaintTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF Hdsl2ShdslUnitMaintEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This table supports maintenance operations for units in a
        HDSL2/SHDSL line."
    ::= { hdsl2ShdslMibObjects 9 }

hdsl2ShdslUnitMaintEntry OBJECT-TYPE
    SYNTAX      Hdsl2ShdslUnitMaintEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry in the hdsl2ShdslUnitMaintTable.  Each entry
        corresponds to a single unit, and is indexed by the
        ifIndex of the HDSL2/SHDSL line and the UnitId of the
        associated unit."
    INDEX { ifIndex, hdsl2ShdslInvIndex  }
    ::= { hdsl2ShdslUnitMaintTable 1 }

Hdsl2ShdslUnitMaintEntry ::=
    SEQUENCE
    {
    hdsl2ShdslMaintLoopbackTimeout     Integer32,
    hdsl2ShdslMaintUnitPowerSource     INTEGER
    }

hdsl2ShdslMaintLoopbackTimeout OBJECT-TYPE
    SYNTAX      Integer32
```

```
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "This object configures the timeout value for loopbacks
        initiated at segments endpoints contained in the associated
        unit.  A value of 0 disables the timeout."
    ::= { hdsl2ShdslUnitMaintEntry 1 }

hdsl2ShdslMaintUnitPowerSource OBJECT-TYPE
    SYNTAX      INTEGER
                {
```



```
                local(1),
                span(2)
                }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This object indicates the DC power source being used by the
        associated unit."
    ::= { hdsl2ShdslUnitMaintEntry 2 }

-- Span Configuration Profile Group
--

hdsl2ShdslSpanConfProfileTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF Hdsl2ShdslSpanConfProfileEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This table supports definitions of span configuration
        profiles for SHDSL lines.  HDSL2 does not support these
        configuration options."
    ::= { hdsl2ShdslMibObjects 10 }

hdsl2ShdslSpanConfProfileEntry OBJECT-TYPE
    SYNTAX      Hdsl2ShdslSpanConfProfileEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Each entry corresponds to a single span configuration
        profile.  Each profile contains a set of span configuration
        parameters.  The configuration parameters in a profile are
        applied to those lines referencing that profile (see the
        hdsl2ShdslSpanConfProfile object).  Profiles may be
        created/deleted using the row creation/deletion mechanism
```

```
        via hdsl2ShdslSpanConfProfileRowStatus.  Profiles that are
        being referenced may not be deleted."
    INDEX { IMPLIED hdsl2ShdslSpanConfProfileName }
    ::= { hdsl2ShdslSpanConfProfileTable 1 }

Hdsl2ShdslSpanConfProfileEntry ::=
    SEQUENCE
    {
    hdsl2ShdslSpanConfProfileName        SnmpAdminString,
    hdsl2ShdslSpanWireInterface          INTEGER,
    hdsl2ShdslSpanMinLineRate            Integer32,
    hdsl2ShdslSpanMaxLineRate            Integer32,
    hdsl2ShdslSpanConfPSD                INTEGER,
    hdsl2ShdslSpanConfTransmissionMode   Hdsl2ShdslTransmissionModeType,
    hdsl2ShdslSpanRemoteEnabled          INTEGER,
    hdsl2ShdslSpanPowerFeeding           INTEGER,
    hdsl2ShdslSpanConfProfileRowStatus   RowStatus
    }
```



```
hdsl2ShdslSpanConfProfileName OBJECT-TYPE
    SYNTAX      SnmpAdminString (SIZE(1..32))
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This object is the unique index associated with this profile."
    ::= { hdsl2ShdslSpanConfProfileEntry 1 }

hdsl2ShdslSpanWireInterface OBJECT-TYPE
    SYNTAX      INTEGER
                {
                twoWire(1),
                fourWire(2)
                }
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "This object configures the two-wire or optional four-wire
        operation for SHDSL Lines."
    ::= { hdsl2ShdslSpanConfProfileEntry 2 }

hdsl2ShdslSpanMinLineRate OBJECT-TYPE
    SYNTAX      Integer32
    UNITS       "bps"
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
```

```
        "This object configures the minimum transmission rate for
        the associated SHDSL Line in bits-per-second (bps).  If
        the minimum line rate equals the maximum line rate
        (hdsl2ShdslSpanMaxLineRate), the line rate is considered
        'fixed'.  If the minimum line rate is less than the maximum
        line rate, the line rate is considered 'rate-adaptive'."
    ::= { hdsl2ShdslSpanConfProfileEntry 3 }

hdsl2ShdslSpanMaxLineRate OBJECT-TYPE
    SYNTAX      Integer32
    UNITS       "bps"
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "This object configures the maximum transmission rate for
        the associated SHDSL Line in bits-per-second (bps).  If
        the minimum line rate equals the maximum line rate
        (hdsl2ShdslSpanMaxLineRate), the line rate is considered
        'fixed'.  If the minimum line rate is less than the maximum
        line rate, the line rate is considered 'rate-adaptive'."
    ::= { hdsl2ShdslSpanConfProfileEntry 4 }

hdsl2ShdslSpanConfPSD OBJECT-TYPE
    SYNTAX      INTEGER
                {
```



```
                symmetric(1),
                asymmetric(2)
                }
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "This object configures use of symmetric/asymmetric PSD (Power
        Spectral Density) Mask for the associated SHDSL Line.  Support
        for symmetric PSD is mandatory for all supported data rates.
        Support for asymmetric PSD is optional."
    ::= { hdsl2ShdslSpanConfProfileEntry 5 }

hdsl2ShdslSpanConfTransmissionMode OBJECT-TYPE
    SYNTAX      Hdsl2ShdslTransmissionModeType
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "This object specifies the regional setting for the SHDSL
        line."
    ::= { hdsl2ShdslSpanConfProfileEntry 6 }
```

```
hdsl2ShdslSpanRemoteEnabled OBJECT-TYPE
    SYNTAX      INTEGER
                {
                enabled(1),
                disabled(2)
                }
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "This object enables/disables support for remote management
        of the units in a SHDSL line from the STU-R via the EOC."
    ::= { hdsl2ShdslSpanConfProfileEntry 7 }

hdsl2ShdslSpanPowerFeeding OBJECT-TYPE
    SYNTAX      INTEGER
                {
                noPower(1),
                powerFeed(2),
                wettingCurrent(3)
                }
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "This object enables/disables support for optional power
        feeding in a SHDSL line."
    ::= { hdsl2ShdslSpanConfProfileEntry 8 }

hdsl2ShdslSpanConfProfileRowStatus OBJECT-TYPE
    SYNTAX      RowStatus
    MAX-ACCESS  read-create
```



```
    STATUS      current
    DESCRIPTION
        "This object controlls creation/deletion of the associated
        entry in this table per the semantics of RowStatus."
    ::= { hdsl2ShdslSpanConfProfileEntry 9 }

-- Segment Endpoint Alarm Configuration Profile group
--

hdsl2ShdslEndpointAlarmConfProfileTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF Hdsl2ShdslEndpointAlarmConfProfileEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
```

```
        "This table supports definitions of alarm configuration
        profiles for HDSL2/SHDSL segment endoints."
    ::= { hdsl2ShdslMibObjects 11 }

hdsl2ShdslEndpointAlarmConfProfileEntry OBJECT-TYPE
    SYNTAX      Hdsl2ShdslEndpointAlarmConfProfileEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Each entry corresponds to a single alarm configuration
        profile.  Each profile contains a set of parameters for setting
        alarm thresholds for various performance attributes monitored
        at HDSL2/SHDSL segment endpoints.  Profiles may be
        created/deleted using the row creation/deletion mechanism via
        hdsl2ShdslEndpointAlarmConfProfileRowStatus.  Profiles that
        are being referenced may not be deleted."
    INDEX { IMPLIED hdsl2ShdslEndpointAlarmConfProfileName }
    ::= { hdsl2ShdslEndpointAlarmConfProfileTable 1 }

Hdsl2ShdslEndpointAlarmConfProfileEntry ::=
    SEQUENCE
    {
    hdsl2ShdslEndpointAlarmConfProfileName       SnmpAdminString,
    hdsl2ShdslEndpointThreshLoopAttenuation      Integer32,
    hdsl2ShdslEndpointThreshSNRMargin            Integer32,
    hdsl2ShdslEndpointThreshES
                Hdsl2ShdslPerfIntervalThreshold,
    hdsl2ShdslEndpointThreshSES
                Hdsl2ShdslPerfIntervalThreshold,
    hdsl2ShdslEndpointThreshCRCanomalies         Integer32,
    hdsl2ShdslEndpointThreshLOSWS
                Hdsl2ShdslPerfIntervalThreshold,
    hdsl2ShdslEndpointThreshUAS
                Hdsl2ShdslPerfIntervalThreshold,
    hdsl2ShdslEndpointAlarmConfProfileRowStatus  RowStatus
    }

hdsl2ShdslEndpointAlarmConfProfileName OBJECT-TYPE
```



```
    SYNTAX      SnmpAdminString (SIZE(1..32))
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This object is the unique index associated with this profile."
    ::= { hdsl2ShdslEndpointAlarmConfProfileEntry 1 }
```

```
hdsl2ShdslEndpointThreshLoopAttenuation OBJECT-TYPE
    SYNTAX      Integer32
    UNITS       "dB"
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "This object configures the loop attentuation alarm threshold.
        When the current value reaches/exceeds this threshold, a
        hdsl2ShdslLoopAttenCrossingTrap will be generated."
    ::= { hdsl2ShdslEndpointAlarmConfProfileEntry 2 }

hdsl2ShdslEndpointThreshSNRMargin OBJECT-TYPE
    SYNTAX      Integer32
    UNITS       "dB"
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "This object configures the SNR margin alarm threshold.
        When the current value reaches/exceeds this threshold, a
        hdsl2ShdslSNRMarginCrossingTrap will be generated."
    ::= { hdsl2ShdslEndpointAlarmConfProfileEntry 3 }

hdsl2ShdslEndpointThreshES OBJECT-TYPE
    SYNTAX      Hdsl2ShdslPerfIntervalThreshold
    UNITS       "seconds"
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
            "This object configures the threshold for the number of
            errored seconds (ES) within any given 15-minute performance
            data collection interval.  If the value of errored seconds
            in a particular 15-minute collection interval reaches/
            exceeds this value, a hdsl2ShdslPerfESThreshTrap will be
            generated.  One trap will be sent per interval per
            endpoint."
    ::= { hdsl2ShdslEndpointAlarmConfProfileEntry 4 }

hdsl2ShdslEndpointThreshSES OBJECT-TYPE
    SYNTAX      Hdsl2ShdslPerfIntervalThreshold
    UNITS       "seconds"
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "This object configures the threshold for the number of
        severely errored seconds (SES) within any given 15-minute
```

```
        performance data collection interval.  If the value of severely
        errored seconds in a particular 15-minute collection interval
        reaches/exceeds this value, a hdsl2ShdslPerfSESThreshTrap will
        be generated.  One trap will be sent per interval per endpoint."
    ::= { hdsl2ShdslEndpointAlarmConfProfileEntry 5 }

hdsl2ShdslEndpointThreshCRCanomalies OBJECT-TYPE
    SYNTAX      Integer32
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "This object configures the threshold for the number of
        CRC anomalies within any given 15-minute performance data
        collection interval.  If the value of CRC anomalies in a
        particular 15-minute collection interval reaches/exceeds
        this value, a hdsl2ShdslPerfCRCanomaliesThreshTrap will be
        generated.  One trap will be sent per interval per endpoint."
    ::= { hdsl2ShdslEndpointAlarmConfProfileEntry 6 }

hdsl2ShdslEndpointThreshLOSWS OBJECT-TYPE
    SYNTAX      Hdsl2ShdslPerfIntervalThreshold
    UNITS       "seconds"
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "This object configures the threshold for the number of
        loss of sync word seconds (LOSWS) within any given 15-minute
        performance data collection interval.  If the value of LOSWS
        in a particular 15-minute collection interval reaches/exceeds
        this value, a hdsl2ShdslPerfLOSWSThreshTrap will be generated.
        One trap will be sent per interval per endpoint."
    ::= { hdsl2ShdslEndpointAlarmConfProfileEntry 7 }

hdsl2ShdslEndpointThreshUAS OBJECT-TYPE
    SYNTAX      Hdsl2ShdslPerfIntervalThreshold
    UNITS       "seconds"
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "This object configures the threshold for the number of
        unavailable seconds (UAS) within any given 15-minute
        performance data collection interval.  If the value of UAS
        in a particular 15-minute collection interval reaches/exceeds
        this value, a hdsl2ShdslPerfUASThreshTrap will be generated.
        One trap will be sent per interval per endpoint."
    ::= { hdsl2ShdslEndpointAlarmConfProfileEntry 8 }

hdsl2ShdslEndpointAlarmConfProfileRowStatus OBJECT-TYPE
    SYNTAX      RowStatus
    MAX-ACCESS  read-create
    STATUS      current
```

```
    DESCRIPTION
```



```
        "This object controls creation/deletion of the associated
        entry in this table as per the semantics of RowStatus."
    ::= { hdsl2ShdslEndpointAlarmConfProfileEntry 9 }

-- Notifications Group
--

hdsl2ShdslTraps OBJECT IDENTIFIER       ::= { hdsl2ShdslLineMib 2 }
hdsl2ShdslTrapsPrefix OBJECT IDENTIFIER ::= { hdsl2ShdslTraps 0 }

hdsl2ShdslLoopAttenCrossingTrap NOTIFICATION-TYPE
    OBJECTS
    {
    ifIndex,
    hdsl2ShdslInvIndex,
    hdsl2ShdslEndpointSide,
    hdsl2ShdslEndpointWirePair,
    hdsl2ShdslEndpointCurrAtn,
    hdsl2ShdslEndpointThreshLoopAttenuation
    }
    STATUS     current
    DESCRIPTION
        "This trap indicates that the loop attenuation threshold (as
        per the hdsl2ShdslEndpointThreshLoopAttenuation value) has been
        reached/exceeded for the HDSL2/SHDSL segment endpoint identified
        by the ifIndex, hdsl2ShdslInvIndex, hdsl2ShdslEndpointSide, and
        hdsl2ShdslEndpointWirePair values."
::= { hdsl2ShdslTrapsPrefix 1 }

hdsl2ShdslSNRMarginCrossingTrap NOTIFICATION-TYPE
    OBJECTS
    {
    ifIndex,
    hdsl2ShdslInvIndex,
    hdsl2ShdslEndpointSide,
    hdsl2ShdslEndpointWirePair,
    hdsl2ShdslEndpointCurrSnrMgn,
    hdsl2ShdslEndpointThreshSNRMargin
    }
    STATUS     current
    DESCRIPTION
        "This trap indicates that the SNR margin threshold (as per the
        hdsl2ShdslEndpointThreshSNRMargin value) has been
        reached/exceeded for the HDSL2/SHDSL segment endpoint identified
```

```
        by the ifIndex, hdsl2ShdslInvIndex, hdsl2ShdslEndpointSide, and
        hdsl2ShdslEndpointWirePair values."
    ::= { hdsl2ShdslTrapsPrefix 2 }

hdsl2ShdslPerfESThreshTrap NOTIFICATION-TYPE
    OBJECTS
    {
    ifIndex,
```



```
    hdsl2ShdslInvIndex,
    hdsl2ShdslEndpointSide,
    hdsl2ShdslEndpointWirePair,
    hdsl2ShdslEndpointCurr15MinES,
    hdsl2ShdslEndpointThreshES
    }
    STATUS     current
    DESCRIPTION
        "This trap indicates that the errored seconds threshold (as
        per the hdsl2ShdslEndpointThreshES value) has been reached/
        exceeded for the HDSL2/SHDSL segment endpoint identified by the
        ifIndex, hdsl2ShdslInvIndex, hdsl2ShdslEndpointSide, and
        hdsl2ShdslEndpointWirePair values."
    ::= { hdsl2ShdslTrapsPrefix 3 }

hdsl2ShdslPerfSESThreshTrap NOTIFICATION-TYPE
    OBJECTS
    {
    ifIndex,
    hdsl2ShdslInvIndex,
    hdsl2ShdslEndpointSide,
    hdsl2ShdslEndpointWirePair,
    hdsl2ShdslEndpointCurr15MinSES,
    hdsl2ShdslEndpointThreshSES
    }
    STATUS     current
    DESCRIPTION
        "This trap indicates that the severely errored seconds threshold
        (as per the hdsl2ShdslEndpointThreshSES value) has been reached/
        exceeded for the HDSL2/SHDSL Segment Endpoint identified by the
        ifIndex, hdsl2ShdslInvIndex, hdsl2ShdslEndpointSide, and
        hdsl2ShdslEndpointWirePair values."
    ::= { hdsl2ShdslTrapsPrefix 4 }

hdsl2ShdslPerfCRCanomaliesThreshTrap NOTIFICATION-TYPE
    OBJECTS
    {
```

```
    ifIndex,
    hdsl2ShdslInvIndex,
    hdsl2ShdslEndpointSide,
    hdsl2ShdslEndpointWirePair,
    hdsl2ShdslEndpointCurr15MinCRCanomalies,
    hdsl2ShdslEndpointThreshCRCanomalies
    }
    STATUS    current
    DESCRIPTION
        "This trap indicates that the CRC anomalies threshold (as
        per the hdsl2ShdslEndpointThreshCRCanomalies value) has been
        reached/exceeded for the HDSL2/SHDSL Segment Endpoint identified
        by the ifIndex, hdsl2ShdslInvIndex, hdsl2ShdslEndpointSide, and
        hdsl2ShdslEndpointWirePair values."
    ::= { hdsl2ShdslTrapsPrefix 5 }
```



```
hdsl2ShdslPerfLOSWSThreshTrap NOTIFICATION-TYPE
    OBJECTS
    {
    ifIndex,
    hdsl2ShdslInvIndex,
    hdsl2ShdslEndpointSide,
    hdsl2ShdslEndpointWirePair,
    hdsl2ShdslEndpointCurr15MinLOSWS,
    hdsl2ShdslEndpointThreshLOSWS
    }
    STATUS     current
    DESCRIPTION
        "This trap indicates that the LOSW seconds threshold (as per the
        hdsl2ShdslEndpointThreshLOSWS value) has been reached/exceeded
        for the HDSL2/SHDSL segment endpoint identified by the ifIndex,
        hdsl2ShdslInvIndex, hdsl2ShdslEndpointSide, and
        hdsl2ShdslEndpointWirePair values."
    ::= { hdsl2ShdslTrapsPrefix 6 }

hdsl2ShdslPerfUASThreshTrap NOTIFICATION-TYPE
    OBJECTS
    {
    ifIndex,
    hdsl2ShdslInvIndex,
    hdsl2ShdslEndpointSide,
    hdsl2ShdslEndpointWirePair,
    hdsl2ShdslEndpointCurr15MinUAS,
    hdsl2ShdslEndpointThreshUAS
    }
    STATUS     current
```

```
    DESCRIPTION
        "This trap indicates that the unavailable seconds threshold (as
        per the hdsl2ShdslEndpointThreshUAS value) has been reached/
        exceeded for the HDSL2/SHDSL segment endpoint identified by the
        ifIndex, hdsl2ShdslInvIndex, hdsl2ShdslEndpointSide, and
        hdsl2ShdslEndpointWirePair values."
    ::= { hdsl2ShdslTrapsPrefix 7 }

hdsl2ShdslSpanInvalidNumRepeaters NOTIFICATION-TYPE
    OBJECTS
    {
    ifIndex,
    hdsl2ShdslConfNumRepeaters
    }
    STATUS     current
    DESCRIPTION
        "This trap indicates that a mismatch has been detected between
        the number of repeater/regenerator units configured for a
        HDSL2/SHDSL line via the hdsl2ShdslConfNumRepeaters object and
        the actual number of repeater/regenerator units discovered via
        the EOC."
    ::= { hdsl2ShdslTrapsPrefix 8 }
```



```
hdsl2ShdslLoopbackFailure NOTIFICATION-TYPE
    OBJECTS
    {
    ifIndex,
    hdsl2ShdslInvIndex,
    hdsl2ShdslEndpointSide,
    hdsl2ShdslMaintLoopbackConfig
    }
    STATUS     current
    DESCRIPTION
        "This trap indicates that an endpoint maintenance loopback
        command failed for an HDSL2/SHDSL segment."
    ::= { hdsl2ShdslTrapsPrefix 9 }

-- conformance information
--

hdsl2ShdslConformance OBJECT IDENTIFIER ::= { hdsl2ShdslLineMib 3 }
hdsl2ShdslGroups      OBJECT IDENTIFIER ::= { hdsl2ShdslConformance 1 }
hdsl2ShdslCompliances OBJECT IDENTIFIER ::= { hdsl2ShdslConformance 2 }

-- agent compliance statements
```

```
hdsl2ShdslLineMibCompliance MODULE-COMPLIANCE
    STATUS  current
    DESCRIPTION
        "The section outlines compliance requirements for this MIB."
    MODULE
    MANDATORY-GROUPS
    {
    hdsl2ShdslSpanConfGroup,
    hdsl2ShdslSpanStatusGroup,
    hdsl2ShdslInventoryGroup,
    hdsl2ShdslEndpointConfGroup,
    hdsl2ShdslEndpointCurrGroup,
    hdsl2Shdsl15MinIntervalGroup,
    hdsl2Shdsl1DayIntervalGroup,
    hdsl2ShdslMaintenanceGroup,
    hdsl2ShdslEndpointAlarmConfGroup,
    hdsl2ShdslNotificationGroup
    }

GROUP  hdsl2ShdslInventoryShdslGroup
    DESCRIPTION
        "Support for this group is only required for implementations
        supporting SHDSL lines."

GROUP  hdsl2ShdslSpanShdslStatusGroup
    DESCRIPTION
        "Support for this group is only required for implementations
        supporting SHDSL lines."
```



```
GROUP  hdsl2ShdslSpanConfProfileGroup
    DESCRIPTION
        "Support for this group is only required for implementations
        supporting SHDSL lines."

::= { hdsl2ShdslCompliances 1 }

-- units of conformance
--

hdsl2ShdslSpanConfGroup OBJECT-GROUP
    OBJECTS
    {
    hdsl2ShdslConfNumRepeaters,
    hdsl2ShdslSpanConfProfile,
    hdsl2ShdslSpanAlarmConfProfile
    }
```

```
    STATUS      current
    DESCRIPTION
        "This group supports objects for configuring span related
        parameters for HDSL2/SHDSL lines."
    ::= { hdsl2ShdslGroups 1 }

hdsl2ShdslSpanStatusGroup OBJECT-GROUP
    OBJECTS
    {
    hdsl2ShdslStatusNumAvailRepeaters
    }
    STATUS      current
    DESCRIPTION
        "This group supports objects for retrieving span related
        status for HDSL2/SHDSL lines."
    ::= { hdsl2ShdslGroups 2 }

hdsl2ShdslInventoryShdslGroup OBJECT-GROUP
    OBJECTS
    {
    hdsl2ShdslInvTransmissionModeCapability
    }
    STATUS      current
    DESCRIPTION
        "This group supports objects for retrieving SHDSL-specific
        inventory information."
    ::= { hdsl2ShdslGroups 3 }

hdsl2ShdslSpanShdslStatusGroup OBJECT-GROUP
    OBJECTS
    {
    hdsl2ShdslStatusMaxAttainableLineRate,
    hdsl2ShdslStatusActualLineRate,
    hdsl2ShdslStatusTransmissionModeCurrent
    }
```



```
    STATUS      current
    DESCRIPTION
        "This group supports objects for retrieving SHDSL-specific
        span related status."
    ::= { hdsl2ShdslGroups 4 }

hdsl2ShdslInventoryGroup OBJECT-GROUP
    OBJECTS
    {
    hdsl2ShdslInvIndex,
```

```
    hdsl2ShdslInvVendorID,
    hdsl2ShdslInvVendorModelNumber,
    hdsl2ShdslInvVendorSerialNumber,
    hdsl2ShdslInvVendorEOCSoftwareVersion,
    hdsl2ShdslInvStandardVersion,
    hdsl2ShdslInvVendorListNumber,
    hdsl2ShdslInvVendorIssueNumber,
    hdsl2ShdslInvVendorSoftwareVersion,
    hdsl2ShdslInvEquipmentCode,
    hdsl2ShdslInvVendorOther
    }
    STATUS      current
    DESCRIPTION
        "This group supports objects that provide unit inventory
        information about the units in HDSL2/SHDSL lines."
    ::= { hdsl2ShdslGroups 5 }

hdsl2ShdslEndpointConfGroup OBJECT-GROUP
    OBJECTS
    {
    hdsl2ShdslEndpointSide,
    hdsl2ShdslEndpointWirePair,
    hdsl2ShdslEndpointAlarmConfProfile
    }
    STATUS      current
    DESCRIPTION
        "This group supports objects for configuring parameters for
        segment endpoints in HDSL2/SHDSL lines."
    ::= { hdsl2ShdslGroups 6 }

hdsl2ShdslEndpointCurrGroup OBJECT-GROUP
    OBJECTS
    {
    hdsl2ShdslEndpointSide,
    hdsl2ShdslEndpointWirePair,
    hdsl2ShdslEndpointCurrAtn,
    hdsl2ShdslEndpointCurrSnrMgn,
    hdsl2ShdslEndpointCurrStatus,
    hdsl2ShdslEndpointES,
    hdsl2ShdslEndpointSES,
    hdsl2ShdslEndpointCRCanomalies,
    hdsl2ShdslEndpointLOSWS,
```



```
    hdsl2ShdslEndpointUAS,
    hdsl2ShdslEndpointCurr15MinTimeElapsed,
    hdsl2ShdslEndpointCurr15MinES,
```

```
    hdsl2ShdslEndpointCurr15MinSES,
    hdsl2ShdslEndpointCurr15MinCRCanomalies,
    hdsl2ShdslEndpointCurr15MinLOSWS,
    hdsl2ShdslEndpointCurr15MinUAS,
    hdsl2ShdslEndpointCurr1DayTimeElapsed,
    hdsl2ShdslEndpointCurr1DayES,
    hdsl2ShdslEndpointCurr1DaySES,
    hdsl2ShdslEndpointCurr1DayCRCanomalies,
    hdsl2ShdslEndpointCurr1DayLOSWS,
    hdsl2ShdslEndpointCurr1DayUAS
    }
    STATUS      current
    DESCRIPTION
        "This group supports objects which provide current status and
        performance measurements relating to segment endpoints in
        HDSL2/SHDSL lines."
    ::= { hdsl2ShdslGroups 7 }

hdsl2Shdsl15MinIntervalGroup OBJECT-GROUP
    OBJECTS
    {
    hdsl2Shdsl15MinIntervalES,
    hdsl2Shdsl15MinIntervalSES,
    hdsl2Shdsl15MinIntervalCRCanomalies,
    hdsl2Shdsl15MinIntervalLOSWS,
    hdsl2Shdsl15MinIntervalUAS
    }
    STATUS      current
    DESCRIPTION
        "This group supports objects which maintain historic performance
        measurements relating to segment endpoints in HDSL2/SHDSL lines
        in 15-minute intervals."
    ::= { hdsl2ShdslGroups 8 }

hdsl2Shdsl1DayIntervalGroup OBJECT-GROUP
    OBJECTS
    {
    hdsl2Shdsl1DayIntervalMoniSecs,
    hdsl2Shdsl1DayIntervalES,
    hdsl2Shdsl1DayIntervalSES,
    hdsl2Shdsl1DayIntervalCRCanomalies,
    hdsl2Shdsl1DayIntervalLOSWS,
    hdsl2Shdsl1DayIntervalUAS
    }
    STATUS      current
    DESCRIPTION
        "This group supports objects which maintain historic performance
        measurements relating to segment endpoints in HDSL2/SHDSL lines
        in 1-day intervals."
    ::= { hdsl2ShdslGroups 9 }
```

```
hdsl2ShdslMaintenanceGroup OBJECT-GROUP
    OBJECTS
    {
    hdsl2ShdslMaintLoopbackConfig,
    hdsl2ShdslMaintTipRingReversal,
    hdsl2ShdslMaintPowerBackOff,
    hdsl2ShdslMaintSoftRestart,
    hdsl2ShdslMaintLoopbackTimeout,
    hdsl2ShdslMaintUnitPowerSource
    }
    STATUS      current
    DESCRIPTION
        "This group supports objects that provide support for
        maintenance actions for HDSL2/SHDSL lines."
    ::= { hdsl2ShdslGroups 10 }

hdsl2ShdslEndpointAlarmConfGroup OBJECT-GROUP
    OBJECTS
    {
    hdsl2ShdslEndpointThreshLoopAttenuation,
    hdsl2ShdslSpanWireInterface,
    hdsl2ShdslEndpointThreshSNRMargin,
    hdsl2ShdslEndpointThreshES,
    hdsl2ShdslEndpointThreshSES,
    hdsl2ShdslEndpointThreshCRCanomalies,
    hdsl2ShdslEndpointThreshLOSWS,
    hdsl2ShdslEndpointThreshUAS,
    hdsl2ShdslEndpointAlarmConfProfileRowStatus
    }
    STATUS      current
    DESCRIPTION
        "This group supports objects that allow configuration of alarm
        thresholds for various performance parameters for HDSL2/SHDSL
        lines."
    ::= { hdsl2ShdslGroups 11 }

hdsl2ShdslNotificationGroup NOTIFICATION-GROUP
    NOTIFICATIONS
    {
    hdsl2ShdslLoopAttenCrossingTrap,
    hdsl2ShdslSNRMarginCrossingTrap,
    hdsl2ShdslPerfESThreshTrap,
    hdsl2ShdslPerfSESThreshTrap,
    hdsl2ShdslPerfCRCanomaliesThreshTrap,
    hdsl2ShdslPerfLOSWSThreshTrap,
    hdsl2ShdslPerfUASThreshTrap,
    hdsl2ShdslSpanInvalidNumRepeaters,
```

```
    hdsl2ShdslLoopbackFailure
    }
    STATUS      current
    DESCRIPTION
        "This group supports traps that enable notification of
```



```
        significant events/conditions associated with HDSL2/SHDSL
        lines."
    ::= { hdsl2ShdslGroups 12 }

hdsl2ShdslSpanConfProfileGroup OBJECT-GROUP
    OBJECTS
    {
    hdsl2ShdslSpanWireInterface,
    hdsl2ShdslSpanMinLineRate,
    hdsl2ShdslSpanMaxLineRate,
    hdsl2ShdslSpanConfPSD,
    hdsl2ShdslSpanConfTransmissionMode,
    hdsl2ShdslSpanRemoteEnabled,
    hdsl2ShdslSpanPowerFeeding,
    hdsl2ShdslSpanConfProfileRowStatus
    }
    STATUS      current
    DESCRIPTION
        "This group supports objects that constitute configuration
        profiles for configuring span related parameters in SHDSL
        lines."
    ::= { hdsl2ShdslGroups 13 }

END
```

7. Security Considerations

Security issues are not discussed in this memo.

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