

**Definitions of Managed Objects for High Bit-Rate DSL - 2nd generation  
(HDSL2) and Single-Pair High-Speed Digital Subscriber  
Line (SHDSL) Lines**

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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Abstract

This document defines a portion of the Management Information Base (MIB) module for use with network management protocols in the Internet community. In particular, it describes objects used for managing High Bit-Rate DSL - 2nd generation (HDSL2) and Single-Pair High-Speed Digital Subscriber Line (SHDSL) interfaces.

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## [1.](#) Introduction

This document defines a portion of the Management Information Base (MIB) module for use with network management protocols in the Internet community. In particular, it describes objects used for managing High Bit-Rate DSL - 2nd generation (HDSL2) [[18](#)] and Single-Pair High-Speed Digital Subscriber Line (SHDSL) interfaces [[19](#)].

## [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 is 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](#)], [RFC 2579](#) [[6](#)], and [RFC 2580](#) [[7](#)].
- o Message protocols for transferring management information. The first version of the SNMP message protocol is called SNMPv1 and is 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 is in [RFC 1901](#) [[9](#)] and [RFC 1906](#) [[10](#)]. The third version of the message protocol is called SNMPv3 and is 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].

### **3. Introduction**

This document describes an SNMP MIB for managing HDSL2/SHDSL Lines. 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 [19].

The MIB is 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.

#### **3.1. Relationship of the HDSL2/SHDSL Line MIB to other MIBs**

This section outlines the relationship of this MIB with other MIBs described in RFCs. Specifically, IF-MIB as presented in [RFC 2863](#) [21] is discussed.

##### **3.1.1 General IF-MIB Integration ([RFC 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
    ...
}
```

Note that the `ifFixedLengthGroup` from [RFC 2863](#) [21] MUST be supported and that the `ifRcvAddressGroup` does not apply to this MIB.

### **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`. For interfaces in systems implementing this MIB, those table entries indexed by `ifIndex` MUST be persistent.

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 MUST 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

### 3.2 IANA Considerations

The HDSL2-SHDSL-LINE-MIB module requires the allocation of a single object identifier for its MODULE-IDENTITY. The IANA has allocated this object identifier in the transmission subtree (48), defined in the SNMPv2-SMI MIB module.

## 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 [19].
- G. ES means errored second [19].
- H. LOSW means loss of sync word [19].
- I. LOSWS means LOSW seconds [19].
- J. SES means severely errored second [19].
- K. SNR means signal-to-noise ratio [19].
- L. UAS means unavailable second [19].

#### 4.2. Textual Conventions

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

##### o Hdsl2ShdslUnitId:

Attributes with this syntax uniquely identify 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:

Attributes with this syntax reference the two sides of a unit:

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

##### o Hdsl2ShdslWirePair:

Attributes with this syntax reference the wire-pairs connecting the units:

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

##### o Hdsl2ShdslTransmissionModeType:

Attributes with this syntax specify the regional setting for a SHDSL line. Specified as a BITS construct, the two mode types are:



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

o Hdsl2ShdslPerfCurrDayCount:

Attributes with this syntax define the behavior of the 1-day (24 hour) gauges found in the MIB.

o Hdsl2Shdsl1DayIntervalCount:

Attributes with this syntax define the behavior of the 1-day (24 hour) interval counters found in the MIB.

o Hdsl2ShdslPerfTimeElapsed:

Attributes with this syntax define the behavior of the elapsed time counters found in the MIB.

o Hdsl2ShdslPerfIntervalThreshold:

Attributes with this syntax define the behavior of the alarm thresholds found in the MIB.

o Hdsl2ShdslClockReferenceType

Attributes with this syntax define the clock references for the HDSL2/SHDSL span.

### **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:

- hdsl2ShdslSpanConfTable

o Span Status Group:

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

- 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:

- 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:

- 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:

- 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:

- 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:

- 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:

- hds12ShdslSpanConfProfileTable

- 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:

- hds12ShdslEndpointAlarmConfProfileTable

- o Notifications Group:

This group defines the notifications supported for HDSL2/SHDSL lines:

- hds12ShdslLoopAttenCrossing
- hds12ShdslSNRMarginCrossing
- hds12ShdslPerfESThresh
- hds12ShdslPerfSESThresh
- hds12ShdslPerfCRCAnomaliesThresh
- hds12ShdslPerfLOSWSThresh
- hds12ShdslPerfUASThresh
- hds12ShdslSpanInvalidNumRepeaters
- hds12ShdslLoopbackFailure
- hds12ShdslpowerBackoff
- hds12ShdsldeviceFault
- hds12ShdsldcContinuityFault
- hds12ShdslconfigInitFailure
- hds12ShdslprotocolInitFailure
- hds12ShdslnoNeighborPresent
- hds12ShdslLocalPowerLoss

#### **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.





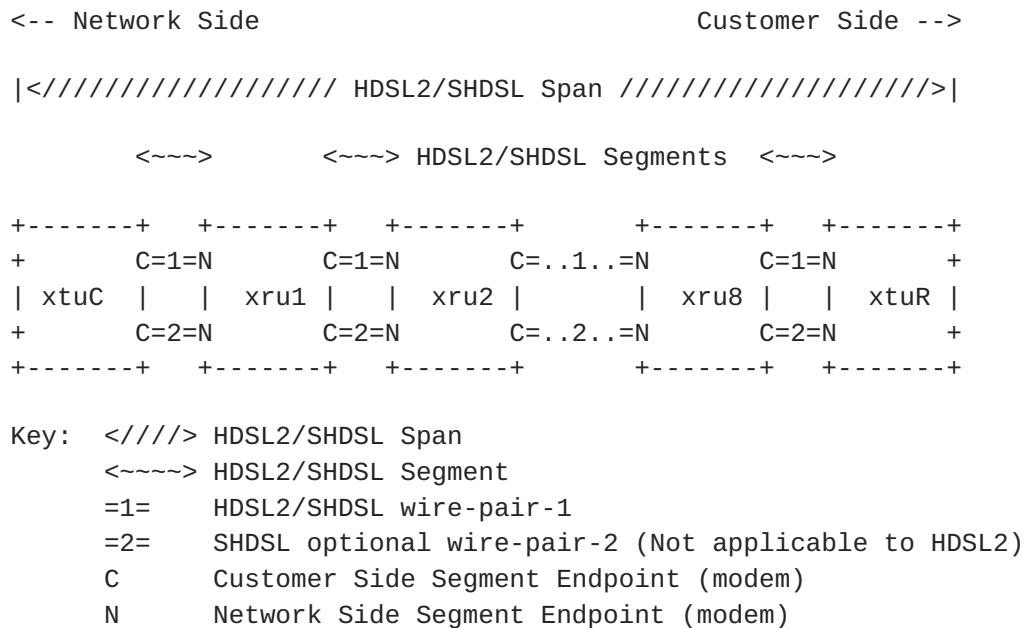


Figure 2: General topology for an HDSL2/SHDSL Line

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

For SNR Margin, Loop Attenuation, ES, SES, CRC anomalies, LOSW, 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.

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 MUST NOT report the interval. If the current 15-minute event bucket is determined to be invalid, notifications based upon the value of the event bucket MUST NOT be generated.

Not reporting an interval will result in holes in the associated table. For example, the table, `hdl2Shdsl15MinIntervalTable`, is indexed by { `ifIndex`, `hdl2ShdslInvIndex`, `hdl2ShdslEndpointSide`, `hdl2ShdslEndpointWirePair`, `hdl2Shdsl15MinIntervalNumber`}. If interval 12 is determined to be invalid but intervals 11 and 13 are valid, a Get Next operation on the indices `.1.1.1.1.11` would return indices `.1.1.1.1.13`.



There is no requirement for an agent to ensure a fixed relationship between the start of a fifteen minute interval 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:

- o Span Configuration Profiles - Span configuration profiles contain parameters for configuring HDSL2/SHDSL spans. They are defined in the `hdl2ShdslSpanConfProfileTable`. Since span configuration parameters are only applicable for SHDSL, the support for span configuration profiles are 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, the new configuration for this segment end point will override the span configuration for this segment end point only.

- o Segment Endpoint Alarm Configuration Profiles - These profiles contain parameters for configuring alarm thresholds for HDSL2/SHDSL segment endpoints. These profiles are defined in the `hdl2ShdslEndpointAlarmConfProfileTable`.

The index value for this 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., `hdl2ShdslEndpointAlarmConfProfile = `silver'`) by setting its hdl2ShdslEndpointAlarmConfProfile 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 `hdl2ShdslEndpointAlarmConfProfile` and `hdl2ShdslSpanConfProfile` to 'DEFVAL' where appropriate. This default profile name, 'DEFVAL', is considered reserved in the context of profiles defined in this MIB.

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. Notifications**

The ability to generate the SNMP notifications `coldStart`/`WarmStart` (per [21]) which are per agent (e.g., per Digital Subscriber Line Access Multiplexer, or DSLAM, in such a device), and `linkUp/linkDown` (per [21]) which are per interface (i.e., HDSL2/SHDSL line) is required.

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

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

The `hdl2ShdslEndpointCurrStatus` 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. Notifications corresponding to the bit fields in this object are defined.



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 notification occurs whenever the corresponding current 15-minute interval error counter becomes equal to, or exceeds the threshold value. One notification may 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` [21]). 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.

A `hdsl2ShdslSpanInvalidNumRepeaters` notification 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 `hdsl2ShdslSpanConfNumRepeaters`. For those conditions where the number of provisioned repeaters is greater than those encountered during span discovery, all table entries associated with the nonexistent 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:

```
hds12ShdslSpanConfGroup
hds12ShdslSpanStatusGroup
hds12ShdslInventoryGroup
hds12ShdslEndpointConfGroup
hds12Shdsl15MinIntervalGroup
hds12Shdsl1DayIntervalGroup
hds12ShdslMaintenanceGroup
hds12ShdslEndpointAlarmConfGroup
hds12ShdslNotificationGroup
```

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

```
hds12ShdslSpanConfProfileGroup
hds12ShdslSpanShdslStatusGroup
```

## 6. Definitions

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

```
IMPORTS
MODULE-IDENTITY,
OBJECT-TYPE,
Counter32,
Unsigned32,
Gauge32,
NOTIFICATION-TYPE,
Integer32,
transmission                FROM SNMPv2-SMI
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;
```

hds12ShdslMIB MODULE-IDENTITY

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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)."

REVISION "200205090000Z" -- May 9, 2002

DESCRIPTION "Initial version, published as [RFC 3276](#)."

::= { transmission 48 }

hdsl2ShdslMibObjects OBJECT IDENTIFIER ::= { hdsl2ShdslMIB 1 }

-- Textual Conventions used in this MIB

--

Hdsl2ShdslPerfCurrDayCount ::= TEXTUAL-CONVENTION

STATUS current

#### DESCRIPTION

"A gauge associated with interface performance measurements in a current 1-day (24 hour) measurement interval.

The value of this gauge 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 gauge is stored in the previous 1-day history interval, as defined in a companion object of type



Hdsl2Shdsl1DayIntervalCount, and the current interval gauge 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. Please note that zero is a valid value."

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 gauge is equal to the value of the current day gauge, as defined in a companion object of type Hdsl2ShdslPerfCurrDayCount, 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."

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 or the addition of a leap second, the current interval exceeds the maximum value, the agent will return the maximum value.

For 15 minute intervals, the range is limited to (0..899).

For 24 hour intervals, the range is limited to (0..86399)."

SYNTAX Unsigned32(0..86399)

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 Unsigned32(0..900)

Hdsl2ShdslUnitId ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"This is the unique identification for all units in a 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 a 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 a 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:

Bit	Meaning	Description
1	region 1	Indicates ITU-T G.991.2 Annex A.
2	region 2	Indicates ITU-T G.991.2 Annex B."

SYNTAX        BITS

```
{
    region1(0),
    region2(1)
}
```

Hdsl2ShdslClockReferenceType ::= TEXTUAL-CONVENTION

STATUS        current

## DESCRIPTION

"The various STU-C symbol clock references for the HDSL2/SHDSL span, represented as an enumeration."

SYNTAX        INTEGER

```
{
    localClk(1),           -- Mode-1 per G991.2
    networkClk(2),         -- Mode-2 per G991.2
    dataOrNetworkClk(3),   -- Mode-3a per G991.2
    dataClk(4)             -- Mode-3b per G991.2
}
```

-- Span Configuration Group

--

hdl2ShdslSpanConfTable OBJECT-TYPE

SYNTAX        SEQUENCE OF Hdsl2ShdslSpanConfEntry

MAX-ACCESS   not-accessible

STATUS        current

## DESCRIPTION

"This table supports overall configuration of HDSL2/SHDSL Spans. Entries in this table MUST be maintained in a persistent manner."

::= { hds12ShdslMibObjects 1 }

hdl2ShdslSpanConfEntry OBJECT-TYPE

SYNTAX        Hdsl2ShdslSpanConfEntry

MAX-ACCESS   not-accessible

STATUS        current

## DESCRIPTION

"An entry in the hds12ShdslSpanConfTable. 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 }
 ::= { hds12Shds1SpanConfTable 1 }
```

```
Hds12Shds1SpanConfEntry ::=
SEQUENCE
{
    hds12Shds1SpanConfNumRepeaters      Unsigned32,
    hds12Shds1SpanConfProfile           SnmpAdminString,
    hds12Shds1SpanConfAlarmProfile      SnmpAdminString
}

hds12Shds1SpanConfNumRepeaters OBJECT-TYPE
SYNTAX      Unsigned32(0..8)
UNITS       "repeaters"
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
    "This object provisions the number of repeaters/regenerators
    in this HDSL2/SHDSL Span."
 ::= { hds12Shds1SpanConfEntry 1 }
```

```
hds12Shds1SpanConfProfile 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 hds12Shds1SpanConfProfileTable, which applies to this span.
    The value of this object is the index of the referenced profile
    in the hds12Shds1SpanConfProfileTable. Note that span
    configuration profiles are only applicable to SHDSL lines.

    HDSL2 lines MUST reference the default profile, 'DEFVAL'.
    By default, this object will have the value 'DEFVAL' (the index
    of the default profile).
```

```
    Any attempt to set this object to a value that is not the value
    of the index for an active entry in the profile table,
    hds12Shds1SpanConfProfileTable, MUST be rejected."
 ::= { hds12Shds1SpanConfEntry 2 }
```

```
hds12Shds1SpanConfAlarmProfile 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 hds12Shds1EndpointAlarmConfProfileTable. The value of this object is the index of the referenced profile in the hds12Shds1EndpointAlarmConfProfileTable. 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 hds12Shds1EndpointConfTable. By default, this object will have the value 'DEFVAL' (the index of the default profile).

Any attempt to set this object to a value that is not the value of the index for an active entry in the profile table, hds12Shds1EndpointAlarmConfProfileTable, MUST be rejected."

```
::= { hds12Shds1SpanConfEntry 3 }
```

```
-- Span Status Group
```

```
--
```

```
hds12Shds1SpanStatusTable OBJECT-TYPE
```

```
SYNTAX      SEQUENCE OF Hds12Shds1SpanStatusEntry
```

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

```
STATUS      current
```

```
DESCRIPTION
```

```
"This table provides overall status information of
HDSL2/SHDSL spans. This table contains live data from
equipment. As such, it is NOT persistent."
```

```
::= { hds12Shds1MibObjects 2 }
```

```
hds12Shds1SpanStatusEntry OBJECT-TYPE
```

```
SYNTAX      Hds12Shds1SpanStatusEntry
```

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

```
STATUS      current
```

```
DESCRIPTION
```

```
"An entry in the hds12Shds1SpanStatusTable. 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 }
```

```
::= { hds12Shds1SpanStatusTable 1 }
```

```
Hds12Shds1SpanStatusEntry ::=
```

```
SEQUENCE
```

```
{
```

```
hds12Shds1StatusNumAvailRepeaters      Unsigned32,
```

```
hds12Shds1StatusMaxAttainableLineRate  Unsigned32,
```

```
hds12Shds1StatusActualLineRate        Unsigned32,
```

```
hds12Shds1StatusTransmissionModeCurrent
    Hds12Shds1TransmissionModeType
```



```
}
```

```
hds12ShdslStatusNumAvailRepeaters OBJECT-TYPE
```

```
SYNTAX      Unsigned32(0..8)
```

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

```
STATUS      current
```

```
DESCRIPTION
```

```
"Contains the actual number of repeaters/regenerators  
discovered in this HDSL2/SHDSL span."
```

```
::= { hds12ShdslSpanStatusEntry 1 }
```

```
hds12ShdslStatusMaxAttainableLineRate OBJECT-TYPE
```

```
SYNTAX      Unsigned32(0..4112000)
```

```
UNITS       "bps"
```

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

```
STATUS      current
```

```
DESCRIPTION
```

```
"Contains the maximum attainable line rate in this HDSL2/SHDSL  
span. This object provides the maximum rate the line is  
capable of achieving. This is based upon measurements made  
during line probing."
```

```
::= { hds12ShdslSpanStatusEntry 2 }
```

```
hds12ShdslStatusActualLineRate OBJECT-TYPE
```

```
SYNTAX      Unsigned32(0..4112000)
```

```
UNITS       "bps"
```

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

```
STATUS      current
```

```
DESCRIPTION
```

```
"Contains the actual line rate in this HDSL2/SHDSL span. This  
should equal ifSpeed."
```

```
::= { hds12ShdslSpanStatusEntry 3 }
```

```
hds12ShdslStatusTransmissionModeCurrent OBJECT-TYPE
```

```
SYNTAX      Hds12ShdslTransmissionModeType
```

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

```
STATUS      current
```

```
DESCRIPTION
```

```
"Contains the current Power Spectral Density (PSD) regional  
setting of the HDSL2/SHDSL span."
```

```
::= { hds12ShdslSpanStatusEntry 4 }
```

```
-- Unit Inventory Group
```

```
--
```

```
hds12ShdslInventoryTable OBJECT-TYPE
```

```
SYNTAX      SEQUENCE OF Hds12ShdslInventoryEntry
```

```
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.

Entries in this table are dynamically created during the line discovery process. The life cycle for these entries is as follows:

- xtu discovers a device, either a far-end xtu or an xru
- an inventory table entry is created for the device
- the line goes down for whatever reason
- inventory table entries for unreachable devices are destroyed.

As these entries are created/destroyed dynamically, they are NOT persistent."

::= { hdsl2ShdslMibObjects 3 }

hdl2ShdslInventoryEntry 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

{

hdl2ShdslInvIndex	Hdsl2ShdslUnitId,
hdl2ShdslInvVendorID	OCTET STRING,
hdl2ShdslInvVendorModelNumber	OCTET STRING,
hdl2ShdslInvVendorSerialNumber	OCTET STRING,
hdl2ShdslInvVendorEOCSsoftwareVersion	Integer32,
hdl2ShdslInvStandardVersion	Integer32,
hdl2ShdslInvVendorListNumber	OCTET STRING,
hdl2ShdslInvVendorIssueNumber	OCTET STRING,
hdl2ShdslInvVendorSoftwareVersion	OCTET STRING,
hdl2ShdslInvEquipmentCode	OCTET STRING,
hdl2ShdslInvVendorOther	OCTET STRING,
hdl2ShdslInvTransmissionModeCapability	Hdsl2ShdslTransmissionModeType



```
}
```

hds12ShdslInvIndex OBJECT-TYPE

SYNTAX Hds12ShdslUnitId

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Each entry in this table corresponds to a physical element in a HDSL2/SHDSL Span. It is based on the EOC unit addressing scheme with reference to the xtuC."

::= { hds12ShdslInventoryEntry 1 }

hds12ShdslInvVendorID OBJECT-TYPE

SYNTAX OCTET STRING(SIZE(8))

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Vendor ID as reported in an Inventory Response message."

::= { hds12ShdslInventoryEntry 2 }

hds12ShdslInvVendorModelNumber OBJECT-TYPE

SYNTAX OCTET STRING(SIZE(12))

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Vendor model number as reported in an Inventory Response message."

::= { hds12ShdslInventoryEntry 3 }

hds12ShdslInvVendorSerialNumber OBJECT-TYPE

SYNTAX OCTET STRING(SIZE(12))

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Vendor serial number as reported in an Inventory Response message."

::= { hds12ShdslInventoryEntry 4 }

hds12ShdslInvVendorEOCSoftwareVersion OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Vendor EOC version as reported in a Discovery Response message."

::= { hds12ShdslInventoryEntry 5 }

hds12ShdslInvStandardVersion 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 }

hdlsl2ShdslInvVendorListNumber OBJECT-TYPE  
SYNTAX OCTET STRING(SIZE(3))  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
"Vendor list number as reported in an Inventory Response  
message."  
::= { hdsl2ShdslInventoryEntry 7 }

hdlsl2ShdslInvVendorIssueNumber OBJECT-TYPE  
SYNTAX OCTET STRING(SIZE(2))  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
"Vendor issue number as reported in an Inventory Response  
message."  
::= { hdsl2ShdslInventoryEntry 8 }

hdlsl2ShdslInvVendorSoftwareVersion OBJECT-TYPE  
SYNTAX OCTET STRING(SIZE(6))  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
"Vendor software version as reported in an Inventory Response  
message."  
::= { hdsl2ShdslInventoryEntry 9 }

hdlsl2ShdslInvEquipmentCode OBJECT-TYPE  
SYNTAX OCTET STRING(SIZE(10))  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
"Equipment code conforming to ANSI T1.213, Coded Identification  
of Equipment Entities."  
::= { hdsl2ShdslInventoryEntry 10 }

hdlsl2ShdslInvVendorOther OBJECT-TYPE  
SYNTAX OCTET STRING(SIZE(12))  
MAX-ACCESS read-only  
STATUS current



## DESCRIPTION

"Other vendor information as reported in an Inventory Response message."

::= { hds12ShdslInventoryEntry 11 }

## hds12ShdslInvTransmissionModeCapability OBJECT-TYPE

SYNTAX Hds12ShdslTransmissionModeType

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"Contains the transmission mode capability of the SHDSL unit."

::= { hds12ShdslInventoryEntry 12 }

-- Segment Endpoint Configuration Group

--

## hds12ShdslEndpointConfTable OBJECT-TYPE

SYNTAX SEQUENCE OF Hds12ShdslEndpointConfEntry

MAX-ACCESS not-accessible

STATUS current

## DESCRIPTION

"This table supports configuration parameters for segment endpoints in a HDSL2/SHDSL line. As this table is indexed by ifIndex, it MUST be maintained in a persistent manner."

::= { hds12ShdslMibObjects 4 }

## hds12ShdslEndpointConfEntry OBJECT-TYPE

SYNTAX Hds12ShdslEndpointConfEntry

MAX-ACCESS not-accessible

STATUS current

## DESCRIPTION

"An entry in the hds12ShdslEndpointConfTable. 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, hds12ShdslInvIndex, hds12ShdslEndpointSide, hds12ShdslEndpointWirePair }

::= { hds12ShdslEndpointConfTable 1 }

Hds12ShdslEndpointConfEntry ::=

SEQUENCE

{

hds12ShdslEndpointSide Hds12ShdslUnitSide,

hds12ShdslEndpointWirePair Hds12ShdslWirePair,

hds12ShdslEndpointAlarmConfProfile SnmpAdminString

}





**hds12ShdslEndpointSide OBJECT-TYPE**

SYNTAX Hds12ShdslUnitSide

MAX-ACCESS not-accessible

STATUS current

## DESCRIPTION

"The side of the unit associated with this segment endpoint -  
Network/Customer side - as per the Hds12ShdslUnitSide textual  
convention."

::= { hds12ShdslEndpointConfEntry 1 }

**hds12ShdslEndpointWirePair OBJECT-TYPE**

SYNTAX Hds12ShdslWirePair

MAX-ACCESS not-accessible

STATUS current

## DESCRIPTION

"The wire-pair of the modem associated with this segment  
endpoint as per the Hds12ShdslWirePair textual convention."

::= { hds12ShdslEndpointConfEntry 2 }

**hds12ShdslEndpointAlarmConfProfile 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 hds12ShdslEndpointAlarmConfProfileTable, or NULL (a zero-  
length SnmpAdminString). If the value is a zero-length  
SnmpAdminString, the endpoint uses the default Alarm  
Configuration Profile for the associated span as per the  
hds12ShdslSpanConfAlarmProfile object in the  
hds12ShdslSpanConfTable. The default value of this object is  
a zero-length SnmpAdminString.

Any attempt to set this object to a value that is not the value  
of the index for an active entry in the profile table,  
hds12ShdslEndpointAlarmConfProfileTable, MUST be rejected."

::= { hds12ShdslEndpointConfEntry 3 }

-- Segment Endpoint Current Status/Performance Group

--

**hds12ShdslEndpointCurrTable OBJECT-TYPE**

SYNTAX SEQUENCE OF Hds12ShdslEndpointCurrEntry

MAX-ACCESS not-accessible

STATUS current



## DESCRIPTION

"This table contains current status and performance information for segment endpoints in HDSL2/SHDSL Lines. As with other tables in this MIB indexed by ifIndex, entries in this table MUST be maintained in a persistent manner."

```
::= { hds12Shds1MibObjects 5 }
```

## hds12Shds1EndpointCurrEntry OBJECT-TYPE

SYNTAX Hds12Shds1EndpointCurrEntry

MAX-ACCESS not-accessible

STATUS current

## DESCRIPTION

"An entry in the hds12Shds1EndpointCurrTable. 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, hds12Shds1InvIndex, hds12Shds1EndpointSide, hds12Shds1EndpointWirePair }

```
::= { hds12Shds1EndpointCurrTable 1 }
```

## Hds12Shds1EndpointCurrEntry ::=

## SEQUENCE

```
{
  hds12Shds1EndpointCurrAtn                Integer32,
  hds12Shds1EndpointCurrSnrMgn             Integer32,
  hds12Shds1EndpointCurrStatus              BITS,
  hds12Shds1EndpointES                      Counter32,
  hds12Shds1EndpointSES                     Counter32,
  hds12Shds1EndpointCRCAnomalies            Counter32,
  hds12Shds1EndpointLOSWS                   Counter32,
  hds12Shds1EndpointUAS                     Counter32,
  hds12Shds1EndpointCurr15MinTimeElapsed    Hds12Shds1PerfTimeElapsed,
  hds12Shds1EndpointCurr15MinES             PerfCurrentCount,
  hds12Shds1EndpointCurr15MinSES            PerfCurrentCount,
  hds12Shds1EndpointCurr15MinCRCAnomalies   PerfCurrentCount,
  hds12Shds1EndpointCurr15MinLOSWS          PerfCurrentCount,
  hds12Shds1EndpointCurr15MinUAS            PerfCurrentCount,
  hds12Shds1EndpointCurr1DayTimeElapsed     Hds12Shds1PerfTimeElapsed,
  hds12Shds1EndpointCurr1DayES              Hds12Shds1PerfCurrDayCount,
  hds12Shds1EndpointCurr1DaySES             Hds12Shds1PerfCurrDayCount,
  hds12Shds1EndpointCurr1DayCRCAnomalies    Hds12Shds1PerfCurrDayCount,
  hds12Shds1EndpointCurr1DayLOSWS           Hds12Shds1PerfCurrDayCount,
}
```



```
                Hdsl2ShdslPerfCurrDayCount,
    hds12ShdslEndpointCurr1DayUAS
                Hdsl2ShdslPerfCurrDayCount
}
```

hds12ShdslEndpointCurrAtn OBJECT-TYPE

```
SYNTAX      Integer32(-127..128)
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."
REFERENCE   "HDSL2 Section 7.5.3.7; SHDSL Section 9.5.5.7"
::= { hds12ShdslEndpointCurrEntry 1 }
```

hds12ShdslEndpointCurrSnrMgn OBJECT-TYPE

```
SYNTAX      Integer32(-127..128)
UNITS       "dB"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The current SNR margin for this endpoint as reported in a
    Status Response/SNR message."
REFERENCE   "HDSL2 Section 7.5.3.7; SHDSL Section 9.5.5.7"
::= { hds12ShdslEndpointCurrEntry 2 }
```

hds12ShdslEndpointCurrStatus OBJECT-TYPE

```
SYNTAX      BITS
            {
                noDefect(0),
                powerBackoff(1),
                deviceFault(2),
                dcContinuityFault(3),
                snrMarginAlarm(4),
                loopAttenuationAlarm(5),
                loswFailureAlarm(6),
                configInitFailure(7),
                protocolInitFailure(8),
                noNeighborPresent(9),
                loopbackActive(10)
            }
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "Contains the current state of the endpoint. This is a
    bitmap of possible conditions. The various bit positions
    are:
```



noDefect	There no defects on the line.
powerBackoff	Indicates enhanced Power Backoff.
deviceFault	Indicates a vendor-dependent diagnostic or self-test fault has been detected.
dcContinuityFault	Indicates vendor-dependent conditions that interfere with span powering such as short and open circuits.
snrMarginAlarm	Indicates that the SNR margin has dropped below the alarm threshold.
loopAttenuationAlarm	Indicates that the loop attenuation exceeds the alarm threshold.
loswFailureAlarm	Indicates a forward LOSW alarm.
configInitFailure	Endpoint failure during initialization due to paired endpoint not able to support requested configuration.
protocolInitFailure	Endpoint failure during initialization due to incompatible protocol used by the paired endpoint.
noNeighborPresent	Endpoint failure during initialization due to no activation sequence detected from paired endpoint.
loopbackActive	A loopback is currently active at this Segment Endpoint.

This is intended to supplement ifOperStatus. Note that there is a 1-1 relationship between the status bits defined in this object and the notification thresholds defined elsewhere in this MIB."

REFERENCE "HDSL2 [Section 7.5.3.7](#); SHDSL [Section 9.5.5.7](#)"  
 ::= { hdsl2ShdslEndpointCurrEntry 3 }

hdlsl2ShdslEndpointES 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."

REFERENCE "HDSL2 [Section 7.5.3.7](#); SHDSL [Section 9.5.5.7](#)"

::= { hds12ShdslEndpointCurrEntry 4 }

## hds12ShdslEndpointSES 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."

REFERENCE "HDSL2 [Section 7.5.3.7](#); SHDSL [Section 9.5.5.7](#)"

::= { hds12ShdslEndpointCurrEntry 5 }

## hds12ShdslEndpointCRCAnomalies OBJECT-TYPE

SYNTAX Counter32

UNITS "detected CRC Anomalies"

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"Count of CRC anomalies on this endpoint since the xU was last restarted."

REFERENCE "HDSL2 [Section 7.5.3.7](#); SHDSL [Section 9.5.5.7](#)"

::= { hds12ShdslEndpointCurrEntry 6 }

## hds12ShdslEndpointLOSWS 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."

REFERENCE "HDSL2 [Section 7.5.3.7](#); SHDSL [Section 9.5.5.7](#)"

::= { hds12ShdslEndpointCurrEntry 7 }

## hds12ShdslEndpointUAS 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."

REFERENCE "HDSL2 [Section 7.5.3.7](#); SHDSL [Section 9.5.5.7](#)"



```
::= { hds12Shds1EndpointCurrEntry 8 }
```

hds12Shds1EndpointCurr15MinTimeElapsed OBJECT-TYPE

```
SYNTAX      Hds12Shds1PerfTimeElapsed
UNITS       "seconds"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "Total elapsed seconds in the current 15-minute interval."
::= { hds12Shds1EndpointCurrEntry 9 }
```

hds12Shds1EndpointCurr15MinES OBJECT-TYPE

```
SYNTAX      PerfCurrentCount
UNITS       "seconds"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "Count of Errored Seconds (ES) in the current 15-minute
    interval."
REFERENCE   "HDSL2 Section 7.5.3.7; SHDSL Section 9.5.5.7"
::= { hds12Shds1EndpointCurrEntry 10 }
```

hds12Shds1EndpointCurr15MinSES 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."
REFERENCE   "HDSL2 Section 7.5.3.7; SHDSL Section 9.5.5.7"
::= { hds12Shds1EndpointCurrEntry 11 }
```

hds12Shds1EndpointCurr15MinCRCAnomalies OBJECT-TYPE

```
SYNTAX      PerfCurrentCount
UNITS       "detected CRC Anomalies"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "Count of CRC anomalies in the current 15-minute interval."
REFERENCE   "HDSL2 Section 7.5.3.7; SHDSL Section 9.5.5.7"
::= { hds12Shds1EndpointCurrEntry 12 }
```

hds12Shds1EndpointCurr15MinLOSWS 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."

REFERENCE "HDSL2 [Section 7.5.3.7](#); SHDSL [Section 9.5.5.7](#)"

::= { hds12ShdslEndpointCurrEntry 13 }

## hds12ShdslEndpointCurr15MinUAS OBJECT-TYPE

SYNTAX PerfCurrentCount

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"Count of Unavailable Seconds (UAS) in the current 15-minute interval."

REFERENCE "HDSL2 [Section 7.5.3.7](#); SHDSL [Section 9.5.5.7](#)"

::= { hds12ShdslEndpointCurrEntry 14 }

## hds12ShdslEndpointCurr1DayTimeElapsed OBJECT-TYPE

SYNTAX Hds12ShdslPerfTimeElapsed

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"Number of seconds that have elapsed since the beginning of the current 1-day interval."

::= { hds12ShdslEndpointCurrEntry 15 }

## hds12ShdslEndpointCurr1DayES OBJECT-TYPE

SYNTAX Hds12ShdslPerfCurrDayCount

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"Count of Errored Seconds (ES) during the current day as measured by hds12ShdslEndpointCurr1DayTimeElapsed."

REFERENCE "HDSL2 [Section 7.5.3.7](#); SHDSL [Section 9.5.5.7](#)"

::= { hds12ShdslEndpointCurrEntry 16 }

## hds12ShdslEndpointCurr1DaySES OBJECT-TYPE

SYNTAX Hds12ShdslPerfCurrDayCount

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"Count of Severely Errored Seconds (SES) during the current day as measured by hds12ShdslEndpointCurr1DayTimeElapsed."

REFERENCE "HDSL2 [Section 7.5.3.7](#); SHDSL [Section 9.5.5.7](#)"

::= { hds12ShdslEndpointCurrEntry 17 }



## hdsl2ShdslEndpointCurr1DayCRCAnomalies OBJECT-TYPE

SYNTAX            Hdsl2ShdslPerfCurrDayCount  
UNITS            "detected CRC Anomalies"  
MAX-ACCESS      read-only  
STATUS           current  
DESCRIPTION  
    "Count of CRC anomalies during the current day as measured  
    by hdsl2ShdslEndpointCurr1DayTimeElapsed."  
REFERENCE      "HDSL2 [Section 7.5.3.7](#); SHDSL [Section 9.5.5.7](#)"  
::= { hdsl2ShdslEndpointCurrEntry 18 }

## hdsl2ShdslEndpointCurr1DayLOSWS OBJECT-TYPE

SYNTAX            Hdsl2ShdslPerfCurrDayCount  
UNITS            "seconds"  
MAX-ACCESS      read-only  
STATUS           current  
DESCRIPTION  
    "Count of Loss of Sync Word (LOSWS) Seconds during the current  
    day as measured by hdsl2ShdslEndpointCurr1DayTimeElapsed."  
REFERENCE      "HDSL2 [Section 7.5.3.7](#); SHDSL [Section 9.5.5.7](#)"  
::= { 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."  
REFERENCE      "HDSL2 [Section 7.5.3.7](#); SHDSL [Section 9.5.5.7](#)"  
::= { 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. This table contains  
    live data from equipment. As such, it is NOT persistent."  
::= { hdsl2ShdslMibObjects 6 }

## hdsl2Shdsl15MinIntervalEntry OBJECT-TYPE

SYNTAX            Hdsl2Shdsl15MinIntervalEntry





MAX-ACCESS not-accessible  
STATUS current  
DESCRIPTION  
"An entry in the hds12Shdsl15MinIntervalTable."  
INDEX { ifIndex, hds12ShdslInvIndex, hds12ShdslEndpointSide,  
hds12ShdslEndpointWirePair, hds12Shdsl15MinIntervalNumber}  
::= { hds12Shdsl15MinIntervalTable 1 }

Hds12Shdsl15MinIntervalEntry ::=

SEQUENCE

{

hds12Shdsl15MinIntervalNumber	Unsigned32,
hds12Shdsl15MinIntervalES	PerfIntervalCount,
hds12Shdsl15MinIntervalSES	PerfIntervalCount,
hds12Shdsl15MinIntervalCRCAnomalies	PerfIntervalCount,
hds12Shdsl15MinIntervalLOSWS	PerfIntervalCount,
hds12Shdsl15MinIntervalUAS	PerfIntervalCount

}

hds12Shdsl15MinIntervalNumber OBJECT-TYPE

SYNTAX Unsigned32(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."

::= { hds12Shdsl15MinIntervalEntry 1 }

hds12Shdsl15MinIntervalES OBJECT-TYPE

SYNTAX PerfIntervalCount

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Count of Errored Seconds (ES) during the interval."

REFERENCE "HDSL2 [Section 7.5.3.7](#); SHDSL [Section 9.5.5.7](#)"

::= { hds12Shdsl15MinIntervalEntry 2 }

hds12Shdsl15MinIntervalSES OBJECT-TYPE

SYNTAX PerfIntervalCount

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Count of Severely Errored Seconds (SES) during the interval."

REFERENCE "HDSL2 [Section 7.5.3.7](#); SHDSL [Section 9.5.5.7](#)"

::= { hds12Shdsl15MinIntervalEntry 3 }



## hdsl2Shdsl15MinIntervalCRCAnomalies OBJECT-TYPE

SYNTAX        PerfIntervalCount  
UNITS        "detected CRC Anomalies"  
MAX-ACCESS   read-only  
STATUS       current  
DESCRIPTION  
    "Count of CRC anomalies during the interval."  
REFERENCE    "HDSL2 [Section 7.5.3.7](#); SHDSL [Section 9.5.5.7](#)"  
::= { 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."  
REFERENCE    "HDSL2 [Section 7.5.3.7](#); SHDSL [Section 9.5.5.7](#)"  
::= { hdsl2Shdsl15MinIntervalEntry 5 }

## hdsl2Shdsl15MinIntervalUAS OBJECT-TYPE

SYNTAX        PerfIntervalCount  
UNITS        "seconds"  
MAX-ACCESS   read-only  
STATUS       current  
DESCRIPTION  
    "Count of Unavailable Seconds (UAS) during the interval."  
REFERENCE    "HDSL2 [Section 7.5.3.7](#); SHDSL [Section 9.5.5.7](#)"  
::= { 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. This table contains  
    live data from equipment. As such, it is NOT persistent."  
::= { hdsl2ShdslMibObjects 7 }

## hdsl2Shdsl1DayIntervalEntry OBJECT-TYPE

SYNTAX        Hdsl2Shdsl1DayIntervalEntry  
MAX-ACCESS   not-accessible  
STATUS       current



## DESCRIPTION

"An entry in the hds12Shds11DayIntervalTable."

```
INDEX { ifIndex, hds12Shds1InvIndex, hds12Shds1EndpointSide,
        hds12Shds1EndpointWirePair, hds12Shds11DayIntervalNumber }
 ::= { hds12Shds11DayIntervalTable 1 }
```

Hds12Shds11DayIntervalEntry ::=

```
SEQUENCE
{
  hds12Shds11DayIntervalNumber      Unsigned32,
  hds12Shds11DayIntervalMoniSecs    Hds12Shds1PerfTimeElapsed,
  hds12Shds11DayIntervalES          Hds12Shds11DayIntervalCount,
  hds12Shds11DayIntervalSES         Hds12Shds11DayIntervalCount,
  hds12Shds11DayIntervalCRCAnomalies Hds12Shds11DayIntervalCount,
  hds12Shds11DayIntervalLOSWS       Hds12Shds11DayIntervalCount,
  hds12Shds11DayIntervalUAS         Hds12Shds11DayIntervalCount
}
```

hds12Shds11DayIntervalNumber OBJECT-TYPE

SYNTAX Unsigned32(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."

```
::= { hds12Shds11DayIntervalEntry 1 }
```

hds12Shds11DayIntervalMoniSecs OBJECT-TYPE

SYNTAX Hds12Shds1PerfTimeElapsed

UNITS "seconds"

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."

```
::= { hds12Shds11DayIntervalEntry 2 }
```

hds12Shds11DayIntervalES OBJECT-TYPE

SYNTAX Hds12Shds11DayIntervalCount

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"Count of Errored Seconds (ES) during the 1-day interval as



measured by hds12Shdsl1DayIntervalMoniSecs."  
REFERENCE "HDSL2 [Section 7.5.3.7](#); SHDSL [Section 9.5.5.7](#)"  
::= { hds12Shdsl1DayIntervalEntry 3 }

hds12Shdsl1DayIntervalSES OBJECT-TYPE

SYNTAX Hds12Shdsl1DayIntervalCount  
UNITS "seconds"  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
"Count of Severely Errored Seconds (SES) during the 1-day  
interval as measured by hds12Shdsl1DayIntervalMoniSecs."  
REFERENCE "HDSL2 [Section 7.5.3.7](#); SHDSL [Section 9.5.5.7](#)"  
::= { hds12Shdsl1DayIntervalEntry 4 }

hds12Shdsl1DayIntervalCRCAnomalies OBJECT-TYPE

SYNTAX Hds12Shdsl1DayIntervalCount  
UNITS "detected CRC Anomalies"  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
"Count of CRC anomalies during the 1-day interval as  
measured by hds12Shdsl1DayIntervalMoniSecs."  
REFERENCE "HDSL2 [Section 7.5.3.7](#); SHDSL [Section 9.5.5.7](#)"  
::= { hds12Shdsl1DayIntervalEntry 5 }

hds12Shdsl1DayIntervalLOSWS OBJECT-TYPE

SYNTAX Hds12Shdsl1DayIntervalCount  
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 hds12Shdsl1DayIntervalMoniSecs."  
REFERENCE "HDSL2 [Section 7.5.3.7](#); SHDSL [Section 9.5.5.7](#)"  
::= { hds12Shdsl1DayIntervalEntry 6 }

hds12Shdsl1DayIntervalUAS OBJECT-TYPE

SYNTAX Hds12Shdsl1DayIntervalCount  
UNITS "seconds"  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
"Count of Unavailable Seconds (UAS) during the 1-day interval  
as measured by hds12Shdsl1DayIntervalMoniSecs."  
REFERENCE "HDSL2 [Section 7.5.3.7](#); SHDSL [Section 9.5.5.7](#)"  
::= { hds12Shdsl1DayIntervalEntry 7 }





```
-- Maintenance Group
--
```

```
hds12Shds1EndpointMaintTable OBJECT-TYPE
```

```
SYNTAX      SEQUENCE OF Hds12Shds1EndpointMaintEntry
```

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

```
STATUS      current
```

```
DESCRIPTION
```

```
"This table supports maintenance operations (eg. loopbacks)
to be performed on HDSL2/SHDSL segment endpoints. This table
contains live data from equipment. As such, it is NOT
persistent."
```

```
::= { hds12Shds1MibObjects 8 }
```

```
hds12Shds1EndpointMaintEntry OBJECT-TYPE
```

```
SYNTAX      Hds12Shds1EndpointMaintEntry
```

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

```
STATUS      current
```

```
DESCRIPTION
```

```
"An entry in the hds12Shds1EndpointMaintTable. 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, hds12Shds1InvIndex, hds12Shds1EndpointSide }
```

```
::= { hds12Shds1EndpointMaintTable 1 }
```

```
Hds12Shds1EndpointMaintEntry ::=
```

```
SEQUENCE
```

```
{
  hds12Shds1MaintLoopbackConfig      INTEGER,
  hds12Shds1MaintTipRingReversal     INTEGER,
  hds12Shds1MaintPowerBackOff        INTEGER,
  hds12Shds1MaintSoftRestart         INTEGER
}
```

```
hds12Shds1MaintLoopbackConfig 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 hds12Shds1EndpointCurrStatus object."
```



```
::= { hds12ShdslEndpointMaintEntry 1 }
```

#### hds12ShdslMaintTipRingReversal 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."

```
::= { hds12ShdslEndpointMaintEntry 2 }
```

#### hds12ShdslMaintPowerBackOff 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."

```
::= { hds12ShdslEndpointMaintEntry 3 }
```

#### hds12ShdslMaintSoftRestart 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, which initiates a restart. The agent will perform a restart after approximately 5 seconds. Following the 5 second period, the agent will restore the object to the 'ready(1)' state."

```
::= { hds12ShdslEndpointMaintEntry 4 }
```

#### hds12ShdslUnitMaintTable OBJECT-TYPE

```
SYNTAX      SEQUENCE OF Hds12ShdslUnitMaintEntry
```



MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This table supports maintenance operations for units in a HDSL2/SHDSL line. Entries in this table MUST be maintained in a persistent manner."

::= { hdsl2ShdslMibObjects 9 }

hdlsl2ShdslUnitMaintEntry 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

{

hdlsl2ShdslMaintLoopbackTimeout Integer32,

hdlsl2ShdslMaintUnitPowerSource INTEGER

}

hdlsl2ShdslMaintLoopbackTimeout OBJECT-TYPE

SYNTAX Integer32(0..4095)

UNITS "minutes"

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 }

hdlsl2ShdslMaintUnitPowerSource 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."
    ::= { hds12ShdslUnitMaintEntry 2 }

-- Span Configuration Profile Group
--

hds12ShdslSpanConfProfileTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF Hds12ShdslSpanConfProfileEntry
    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.  This table MUST be maintained
        in a persistent manner."
    ::= { hds12ShdslMibObjects 10 }

hds12ShdslSpanConfProfileEntry OBJECT-TYPE
    SYNTAX      Hds12ShdslSpanConfProfileEntry
    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
        hds12ShdslSpanConfProfile object).  Profiles may be
        created/deleted using the row creation/deletion mechanism
        via hds12ShdslSpanConfProfileRowStatus.  If an active
        entry is referenced in hds12ShdslSpanConfProfile, the
        entry MUST remain active until all references are removed."
    INDEX { IMPLIED hds12ShdslSpanConfProfileName }
    ::= { hds12ShdslSpanConfProfileTable 1 }

Hds12ShdslSpanConfProfileEntry ::=
    SEQUENCE
    {
        hds12ShdslSpanConfProfileName          SnmpAdminString,
        hds12ShdslSpanConfWireInterface        INTEGER,
        hds12ShdslSpanConfMinLineRate          Unsigned32,
        hds12ShdslSpanConfMaxLineRate          Unsigned32,
        hds12ShdslSpanConfPSD                  INTEGER,
        hds12ShdslSpanConfTransmissionMode     Hds12ShdslTransmissionModeType,
        hds12ShdslSpanConfRemoteEnabled        INTEGER,
        hds12ShdslSpanConfPowerFeeding         INTEGER,
        hds12ShdslSpanConfCurrCondTargetMarginDown Integer32,
        hds12ShdslSpanConfWorstCaseTargetMarginDown Integer32,

```





```

hds12Shds1SpanConfCurrCondTargetMarginUp      Integer32,
hds12Shds1SpanConfWorstCaseTargetMarginUp      Integer32,
hds12Shds1SpanConfUsedTargetMargins            BITS,
hds12Shds1SpanConfReferenceClock
                                                Hds12Shds1ClockReferenceType,
hds12Shds1SpanConfLineProbeEnable              INTEGER,
hds12Shds1SpanConfProfileRowStatus             RowStatus
}

```

#### hds12Shds1SpanConfProfileName OBJECT-TYPE

```

SYNTAX      SnmpAdminString (SIZE(1..32))
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "This object is the unique index associated with this profile.
    Entries in this table are referenced via the object
    hds12Shds1SpanConfProfile in Hds12Shds1SpanConfEntry."
 ::= { hds12Shds1SpanConfProfileEntry 1 }

```

#### hds12Shds1SpanConfWireInterface 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."
DEFVAL      { twoWire }
 ::= { hds12Shds1SpanConfProfileEntry 2 }

```

#### hds12Shds1SpanConfMinLineRate OBJECT-TYPE

```

SYNTAX      Unsigned32(0..4112000)
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
    (hds12Shds1SpanMaxLineRate), 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'."
DEFVAL      { 1552000 }
 ::= { hds12Shds1SpanConfProfileEntry 3 }

```



## hds12ShdslSpanConfMaxLineRate OBJECT-TYPE

SYNTAX Unsigned32(0..4112000)

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 (hds12ShdslSpanMaxLineRate), 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'."

DEFVAL { 1552000 }

::= { hds12ShdslSpanConfProfileEntry 4 }

## hds12ShdslSpanConfPSD 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."

DEFVAL { symmetric }

::= { hds12ShdslSpanConfProfileEntry 5 }

## hds12ShdslSpanConfTransmissionMode OBJECT-TYPE

SYNTAX Hds12ShdslTransmissionModeType

MAX-ACCESS read-create

STATUS current

## DESCRIPTION

"This object specifies the regional setting for the SHDSL line."

DEFVAL { { region1 } }

::= { hds12ShdslSpanConfProfileEntry 6 }

## hds12ShdslSpanConfRemoteEnabled 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."  
DEFVAL { enabled }  
::= { hdsl2ShdslSpanConfProfileEntry 7 }

hdl2ShdslSpanConfPowerFeeding 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."  
DEFVAL { noPower }  
::= { hdsl2ShdslSpanConfProfileEntry 8 }

hdl2ShdslSpanConfCurrCondTargetMarginDown OBJECT-TYPE

SYNTAX Integer32(-10..21)  
UNITS "dB"  
MAX-ACCESS read-create  
STATUS current  
DESCRIPTION  
"This object specifies the downstream current condition target  
SNR margin for a SHDSL line. The SNR margin is the difference  
between the desired SNR and the actual SNR. Target SNR margin  
is the desired SNR margin for a unit."  
DEFVAL { 0 }  
::= { hdsl2ShdslSpanConfProfileEntry 9 }

hdl2ShdslSpanConfWorstCaseTargetMarginDown OBJECT-TYPE

SYNTAX Integer32(-10..21)  
UNITS "dB"  
MAX-ACCESS read-create  
STATUS current  
DESCRIPTION  
"This object specifies the downstream worst case target SNR  
margin for a SHDSL line. The SNR margin is the difference  
between the desired SNR and the actual SNR. Target SNR  
margin is the desired SNR margin for a unit."  
DEFVAL { 0 }  
::= { hdsl2ShdslSpanConfProfileEntry 10 }



**hdl2ShdslSpanConfCurrCondTargetMarginUp OBJECT-TYPE**

SYNTAX Integer32(-10..21)

UNITS "dB"

MAX-ACCESS read-create

STATUS current

**DESCRIPTION**

"This object specifies the upstream current condition target SNR margin for a SHDSL line. The SNR margin is the difference between the desired SNR and the actual SNR. Target SNR margin is the desired SNR margin for a unit."

DEFVAL { 0 }

::= { hdl2ShdslSpanConfProfileEntry 11 }

**hdl2ShdslSpanConfWorstCaseTargetMarginUp OBJECT-TYPE**

SYNTAX Integer32(-10..21)

UNITS "dB"

MAX-ACCESS read-create

STATUS current

**DESCRIPTION**

"This object specifies the upstream worst case target SNR margin for a SHDSL line. The SNR margin is the difference between the desired SNR and the actual SNR. Target SNR margin is the desired SNR margin for a unit."

DEFVAL { 0 }

::= { hdl2ShdslSpanConfProfileEntry 12 }

**hdl2ShdslSpanConfUsedTargetMargins OBJECT-TYPE**

SYNTAX BITS

```
{
    currCondDown(0),
    worstCaseDown(1),
    currCondUp(2),
    worstCaseUp(3)
}
```

MAX-ACCESS read-create

STATUS current

**DESCRIPTION**

"Contains indicates whether a target SNR margin is enabled or disabled. This is a bit-map of possible settings. The various bit positions are:

currCondDown      current condition downstream target SNR  
                    margin enabled

worstCaseDown     worst case downstream target SNR margin  
                    enabled

currCondUp        current condition upstream target SNR





```

        margin enabled

        worstCaseUp      worst case upstream target SNR margin
                           enabled."
    DEFVAL      { { currCondDown } }
    ::= { hds12ShdslSpanConfProfileEntry 13 }

hds12ShdslSpanConfReferenceClock OBJECT-TYPE
    SYNTAX      Hds12ShdslClockReferenceType
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "This object configures the clock reference for the STU-C
        in a SHDSL Line."
    DEFVAL      { localClk }
    ::= { hds12ShdslSpanConfProfileEntry 14 }

hds12ShdslSpanConfLineProbeEnable OBJECT-TYPE
    SYNTAX      INTEGER
                {
                    disable(1),
                    enable(2)
                }
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "This object enables/disables support for Line Probe of
        the units in a SHDSL line.  When Line Probe is enabled, the
        system performs Line Probing to find the best possible
        rate.  If Line probe is disabled, the rate adaptation phase
        is skipped to shorten set up time."
    DEFVAL      { disable }
    ::= { hds12ShdslSpanConfProfileEntry 15 }

hds12ShdslSpanConfProfileRowStatus OBJECT-TYPE
    SYNTAX      RowStatus
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "This object controls creation/deletion of the associated
        entry in this table per the semantics of RowStatus.  If an
        active entry is referenced in hds12ShdslSpanConfProfile, the
        entry MUST remain active until all references are removed."
    ::= { hds12ShdslSpanConfProfileEntry 16 }

-- Segment Endpoint Alarm Configuration Profile group
--
```



## hds12ShdslEndpointAlarmConfProfileTable OBJECT-TYPE

SYNTAX SEQUENCE OF Hds12ShdslEndpointAlarmConfProfileEntry

MAX-ACCESS not-accessible

STATUS current

## DESCRIPTION

"This table supports definitions of alarm configuration profiles for HDSL2/SHDSL segment endpoints. This table MUST be maintained in a persistent manner."

::= { hds12ShdslMibObjects 11 }

## hds12ShdslEndpointAlarmConfProfileEntry OBJECT-TYPE

SYNTAX Hds12ShdslEndpointAlarmConfProfileEntry

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 hds12ShdslEndpointAlarmConfProfileRowStatus. If an active entry is referenced in either hds12ShdslSpanConfAlarmProfile or hds12ShdslEndpointAlarmConfProfile, the entry MUST remain active until all references are removed."

INDEX { IMPLIED hds12ShdslEndpointAlarmConfProfileName }

::= { hds12ShdslEndpointAlarmConfProfileTable 1 }

## Hds12ShdslEndpointAlarmConfProfileEntry ::=

## SEQUENCE

```
{
  hds12ShdslEndpointAlarmConfProfileName      SnmpAdminString,
  hds12ShdslEndpointThreshLoopAttenuation      Integer32,
  hds12ShdslEndpointThreshSNRMargin            Integer32,
  hds12ShdslEndpointThreshES
      Hds12ShdslPerfIntervalThreshold,
  hds12ShdslEndpointThreshSES
      Hds12ShdslPerfIntervalThreshold,
  hds12ShdslEndpointThreshCRCAnomalies         Integer32,
  hds12ShdslEndpointThreshLOSWS
      Hds12ShdslPerfIntervalThreshold,
  hds12ShdslEndpointThreshUAS
      Hds12ShdslPerfIntervalThreshold,
  hds12ShdslEndpointAlarmConfProfileRowStatus RowStatus
}
```

## hds12ShdslEndpointAlarmConfProfileName OBJECT-TYPE

SYNTAX SnmpAdminString (SIZE(1..32))

MAX-ACCESS not-accessible



STATUS current  
DESCRIPTION  
"This object is the unique index associated with this profile."  
::= { hds12ShdslEndpointAlarmConfProfileEntry 1 }

hds12ShdslEndpointThreshLoopAttenuation OBJECT-TYPE

SYNTAX Integer32(-127..128)  
UNITS "dB"  
MAX-ACCESS read-create  
STATUS current  
DESCRIPTION  
"This object configures the loop attenuation alarm threshold.  
When the current value of hds12ShdslEndpointCurrAtn reaches  
or exceeds this threshold, a hds12ShdslLoopAttenCrossing  
MAY be generated."  
DEFVAL { 0 }  
::= { hds12ShdslEndpointAlarmConfProfileEntry 2 }

hds12ShdslEndpointThreshSNRMargin OBJECT-TYPE

SYNTAX Integer32(-127..128)  
UNITS "dB"  
MAX-ACCESS read-create  
STATUS current  
DESCRIPTION  
"This object configures the SNR margin alarm threshold.  
When the current value of hds12ShdslEndpointCurrSnrMgn  
reaches or drops below this threshold, a  
hds12ShdslSNRMarginCrossing MAY be generated."  
DEFVAL { 0 }  
::= { hds12ShdslEndpointAlarmConfProfileEntry 3 }

hds12ShdslEndpointThreshES OBJECT-TYPE

SYNTAX Hds12ShdslPerfIntervalThreshold  
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 hds12ShdslPerfESThresh MAY be  
generated. At most one notification will be sent per  
interval per endpoint."  
DEFVAL { 0 }  
::= { hds12ShdslEndpointAlarmConfProfileEntry 4 }

hds12ShdslEndpointThreshSES 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 hds12ShdslPerfSESThresh MAY be generated. At most one notification will be sent per interval per endpoint."

DEFVAL { 0 }

::= { hds12ShdslEndpointAlarmConfProfileEntry 5 }

hds12ShdslEndpointThreshCRCAnomalies OBJECT-TYPE

SYNTAX Integer32

UNITS "detected CRC Anomalies"

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 hds12ShdslPerfCRCAnomaliesThresh MAY be generated. At most one notification will be sent per interval per endpoint."

DEFVAL { 0 }

::= { hds12ShdslEndpointAlarmConfProfileEntry 6 }

hds12ShdslEndpointThreshLOSWS 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 (LOSWS) Seconds 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 hds12ShdslPerfLOSWSThresh MAY be generated. At most one notification will be sent per interval per endpoint."

DEFVAL { 0 }

::= { hds12ShdslEndpointAlarmConfProfileEntry 7 }

hds12ShdslEndpointThreshUAS 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 hds12ShdslPerfUASThresh MAY be generated. At most one notification will be sent per interval per endpoint."

DEFVAL { 0 }

::= { hds12ShdslEndpointAlarmConfProfileEntry 8 }

#### hds12ShdslEndpointAlarmConfProfileRowStatus 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. If an active entry is referenced in either hds12ShdslSpanConfAlarmProfile or hds12ShdslEndpointAlarmConfProfile, the entry MUST remain active until all references are removed."

::= { hds12ShdslEndpointAlarmConfProfileEntry 9 }

-- Notifications Group

--

hds12ShdslNotifications OBJECT IDENTIFIER ::= { hds12ShdslMIB 0 }

#### hds12ShdslLoopAttenCrossing NOTIFICATION-TYPE

##### OBJECTS

```
{
  hds12ShdslEndpointCurrAtn,
  hds12ShdslEndpointThreshLoopAttenuation
}
```

STATUS current

#### DESCRIPTION

"This notification indicates that the loop attenuation threshold (as per the hds12ShdslEndpointThreshLoopAttenuation value) has been reached/exceeded for the HDSL2/SHDSL segment endpoint."

::= { hds12ShdslNotifications 1 }

#### hds12ShdslSNRMarginCrossing NOTIFICATION-TYPE



## OBJECTS

{

hdl2ShdslEndpointCurrSnrMgn,  
hdl2ShdslEndpointThreshSNRMargin  
}

STATUS current

## DESCRIPTION

"This notification indicates that the SNR margin threshold (as per the hdl2ShdslEndpointThreshSNRMargin value) has been reached/exceeded for the HDSL2/SHDSL segment endpoint."

::= { hdl2ShdslNotifications 2 }

## hdl2ShdslPerfESThresh NOTIFICATION-TYPE

## OBJECTS

{

hdl2ShdslEndpointCurr15MinES,  
hdl2ShdslEndpointThreshES  
}

STATUS current

## DESCRIPTION

"This notification indicates that the errored seconds threshold (as per the hdl2ShdslEndpointThreshES value) has been reached/exceeded for the HDSL2/SHDSL segment endpoint."

::= { hdl2ShdslNotifications 3 }

## hdl2ShdslPerfSESThresh NOTIFICATION-TYPE

## OBJECTS

{

hdl2ShdslEndpointCurr15MinSES,  
hdl2ShdslEndpointThreshSES  
}

STATUS current

## DESCRIPTION

"This notification indicates that the severely errored seconds threshold (as per the hdl2ShdslEndpointThreshSES value) has been reached/exceeded for the HDSL2/SHDSL Segment Endpoint."

::= { hdl2ShdslNotifications 4 }

## hdl2ShdslPerfCRCAnomaliesThresh NOTIFICATION-TYPE

## OBJECTS

{

hdl2ShdslEndpointCurr15MinCRCAnomalies,  
hdl2ShdslEndpointThreshCRCAnomalies  
}

STATUS current

## DESCRIPTION

"This notification indicates that the CRC anomalies threshold



(as per the hds12Shds1EndpointThreshCRCAnomalies value) has been reached/exceeded for the HDSL2/SHDSL Segment Endpoint."  
::= { hds12Shds1Notifications 5 }

#### hds12Shds1PerfLOSWSThresh NOTIFICATION-TYPE

##### OBJECTS

{

hds12Shds1EndpointCurr15MinLOSWS,  
hds12Shds1EndpointThreshLOSWS  
}

STATUS current

##### DESCRIPTION

"This notification indicates that the LOSW seconds threshold (as per the hds12Shds1EndpointThreshLOSWS value) has been reached/exceeded for the HDSL2/SHDSL segment endpoint."

::= { hds12Shds1Notifications 6 }

#### hds12Shds1PerfUASThresh NOTIFICATION-TYPE

##### OBJECTS

{

hds12Shds1EndpointCurr15MinUAS,  
hds12Shds1EndpointThreshUAS  
}

STATUS current

##### DESCRIPTION

"This notification indicates that the unavailable seconds threshold (as per the hds12Shds1EndpointThreshUAS value) has been reached/exceeded for the HDSL2/SHDSL segment endpoint."

::= { hds12Shds1Notifications 7 }

#### hds12Shds1SpanInvalidNumRepeaters NOTIFICATION-TYPE

##### OBJECTS

{

hds12Shds1SpanConfNumRepeaters  
}

STATUS current

##### DESCRIPTION

"This notification indicates that a mismatch has been detected between the number of repeater/regenerator units configured for a HDSL2/SHDSL line via the hds12Shds1SpanConfNumRepeaters object and the actual number of repeater/regenerator units discovered via the EOC."

::= { hds12Shds1Notifications 8 }

#### hds12Shds1LoopbackFailure NOTIFICATION-TYPE

##### OBJECTS

{



```
hds12Shds1MaintLoopbackConfig
}
STATUS      current
DESCRIPTION
    "This notification indicates that an endpoint maintenance
    loopback command failed for an HDSL2/SHDSL segment."
 ::= { hds12Shds1Notifications 9 }
```

```
hds12Shds1powerBackoff NOTIFICATION-TYPE
OBJECTS
{
hds12Shds1EndpointCurrStatus
}
STATUS      current
DESCRIPTION
    "This notification indicates that the bit setting for
    powerBackoff in the hds12Shds1EndpointCurrStatus object for
    this endpoint has changed."
 ::= { hds12Shds1Notifications 10 }
```

```
hds12Shds1deviceFault NOTIFICATION-TYPE
OBJECTS
{
hds12Shds1EndpointCurrStatus
}
STATUS      current
DESCRIPTION
    "This notification indicates that the bit setting for
    deviceFault in the hds12Shds1EndpointCurrStatus object for
    this endpoint has changed."
 ::= { hds12Shds1Notifications 11 }
```

```
hds12Shds1dcContinuityFault NOTIFICATION-TYPE
OBJECTS
{
hds12Shds1EndpointCurrStatus
}
STATUS      current
DESCRIPTION
    "This notification indicates that the bit setting for
    dcContinuityFault in the hds12Shds1EndpointCurrStatus object
    for this endpoint has changed."
 ::= { hds12Shds1Notifications 12 }
```

```
hds12Shds1configInitFailure NOTIFICATION-TYPE
OBJECTS
{
hds12Shds1EndpointCurrStatus
```





```
}
STATUS      current
DESCRIPTION
    "This notification indicates that the bit setting for
    configInitFailure in the hds12ShdslEndpointCurrStatus object
    for this endpoint has changed."
 ::= { hds12ShdslNotifications 13 }

hds12ShdslprotocolInitFailure NOTIFICATION-TYPE
OBJECTS
{
hds12ShdslEndpointCurrStatus
}
STATUS      current
DESCRIPTION
    "This notification indicates that the bit setting for
    protocolInitFailure in the hds12ShdslEndpointCurrStatus
    object for this endpoint has changed."
 ::= { hds12ShdslNotifications 14 }

hds12ShdslnoNeighborPresent NOTIFICATION-TYPE
OBJECTS
{
hds12ShdslEndpointCurrStatus
}
STATUS      current
DESCRIPTION
    "This notification indicates that the bit setting for
    noNeighborPresent in the hds12ShdslEndpointCurrStatus object
    for this endpoint has changed."
 ::= { hds12ShdslNotifications 15 }

hds12ShdslLocalPowerLoss NOTIFICATION-TYPE
OBJECTS
{
hds12ShdslInvVendorID
}
STATUS      current
DESCRIPTION
    "This notification indicates impending unit failure due to
    loss of local power (last gasp)."
 ::= { hds12ShdslNotifications 16 }

-- conformance information
--

hds12ShdslConformance OBJECT IDENTIFIER ::= { hds12ShdslMIB 3 }
hds12ShdslGroups      OBJECT IDENTIFIER ::=
```



```
        { hds12ShdslConformance 1 }
hds12ShdslCompliances OBJECT IDENTIFIER ::=
        { hds12ShdslConformance 2 }

-- agent compliance statements

hds12ShdslLineMibCompliance MODULE-COMPLIANCE
    STATUS current
    DESCRIPTION
        "The section outlines compliance requirements for this MIB."
    MODULE
    MANDATORY-GROUPS
    {
        hds12ShdslSpanConfGroup,
        hds12ShdslSpanStatusGroup,
        hds12ShdslInventoryGroup,
        hds12ShdslEndpointConfGroup,
        hds12ShdslEndpointCurrGroup,
        hds12Shdsl15MinIntervalGroup,
        hds12Shdsl1DayIntervalGroup,
        hds12ShdslMaintenanceGroup,
        hds12ShdslEndpointAlarmConfGroup,
        hds12ShdslNotificationGroup
    }

GROUP hds12ShdslInventoryShdslGroup
    DESCRIPTION
        "Support for this group is only required for implementations
        supporting SHDSL lines."

GROUP hds12ShdslSpanShdslStatusGroup
    DESCRIPTION
        "Support for this group is only required for implementations
        supporting SHDSL lines."

GROUP hds12ShdslSpanConfProfileGroup
    DESCRIPTION
        "Support for this group is only required for implementations
        supporting SHDSL lines."

    ::= { hds12ShdslCompliances 1 }

-- units of conformance
--

hds12ShdslSpanConfGroup OBJECT-GROUP
    OBJECTS
    {
```



```
hds12ShdslSpanConfNumRepeaters,
hds12ShdslSpanConfProfile,
hds12ShdslSpanConfAlarmProfile
}
STATUS          current
DESCRIPTION
    "This group supports objects for configuring span related
    parameters for HDSL2/SHDSL lines."
::= { hds12ShdslGroups 1 }
```

```
hds12ShdslSpanStatusGroup OBJECT-GROUP
OBJECTS
{
hds12ShdslStatusNumAvailRepeaters
}
STATUS          current
DESCRIPTION
    "This group supports objects for retrieving span related
    status for HDSL2/SHDSL lines."
::= { hds12ShdslGroups 2 }
```

```
hds12ShdslInventoryShdslGroup OBJECT-GROUP
OBJECTS
{
hds12ShdslInvTransmissionModeCapability
}
STATUS          current
DESCRIPTION
    "This group supports objects for retrieving SHDSL-specific
    inventory information."
::= { hds12ShdslGroups 3 }
```

```
hds12ShdslSpanShdslStatusGroup OBJECT-GROUP
OBJECTS
{
hds12ShdslStatusMaxAttainableLineRate,
hds12ShdslStatusActualLineRate,
hds12ShdslStatusTransmissionModeCurrent
}
STATUS          current
DESCRIPTION
    "This group supports objects for retrieving SHDSL-specific
    span related status."
::= { hds12ShdslGroups 4 }
```

```
hds12ShdslInventoryGroup OBJECT-GROUP
OBJECTS
{
```



```
hds12Shds1InvVendorID,
hds12Shds1InvVendorModelNumber,
hds12Shds1InvVendorSerialNumber,
hds12Shds1InvVendorEOCSoftwareVersion,
hds12Shds1InvStandardVersion,
hds12Shds1InvVendorListNumber,
hds12Shds1InvVendorIssueNumber,
hds12Shds1InvVendorSoftwareVersion,
hds12Shds1InvEquipmentCode,
hds12Shds1InvVendorOther
}
STATUS          current
DESCRIPTION
    "This group supports objects that provide unit inventory
    information about the units in HDSL2/SHDSL lines."
 ::= { hds12Shds1Groups 5 }
```

#### hds12Shds1EndpointConfGroup OBJECT-GROUP

```
OBJECTS
{
hds12Shds1EndpointCurrAtn
}
STATUS          current
DESCRIPTION
    "This group supports objects for configuring parameters for
    segment endpoints in HDSL2/SHDSL lines."
 ::= { hds12Shds1Groups 6 }
```

#### hds12Shds1EndpointCurrGroup OBJECT-GROUP

```
OBJECTS
{
hds12Shds1EndpointCurrAtn,
hds12Shds1EndpointCurrSnrMgn,
hds12Shds1EndpointCurrStatus,
hds12Shds1EndpointES,
hds12Shds1EndpointSES,
hds12Shds1EndpointCRCAnomalies,
hds12Shds1EndpointLOSWS,
hds12Shds1EndpointUAS,
hds12Shds1EndpointCurr15MinTimeElapsed,
hds12Shds1EndpointCurr15MinES,
hds12Shds1EndpointCurr15MinSES,
hds12Shds1EndpointCurr15MinCRCAnomalies,
hds12Shds1EndpointCurr15MinLOSWS,
hds12Shds1EndpointCurr15MinUAS,
hds12Shds1EndpointCurr1DayTimeElapsed,
hds12Shds1EndpointCurr1DayES,
hds12Shds1EndpointCurr1DaySES,
```





```
hds12ShdslEndpointCurr1DayCRCAnomalies,
hds12ShdslEndpointCurr1DayLOSWS,
hds12ShdslEndpointCurr1DayUAS
}
STATUS          current
DESCRIPTION
    "This group supports objects which provide current status and
    performance measurements relating to segment endpoints in
    HDSL2/SHDSL lines."
::= { hds12ShdslGroups 7 }
```

```
hds12Shdsl15MinIntervalGroup OBJECT-GROUP
OBJECTS
{
hds12Shdsl15MinIntervalES,
hds12Shdsl15MinIntervalSES,
hds12Shdsl15MinIntervalCRCAnomalies,
hds12Shdsl15MinIntervalLOSWS,
hds12Shdsl15MinIntervalUAS
}
STATUS          current
DESCRIPTION
    "This group supports objects which maintain historic
    performance measurements relating to segment endpoints in
    HDSL2/SHDSL lines in 15-minute intervals."
::= { hds12ShdslGroups 8 }
```

```
hds12Shdsl1DayIntervalGroup OBJECT-GROUP
OBJECTS
{
hds12Shdsl1DayIntervalMoniSecs,
hds12Shdsl1DayIntervalES,
hds12Shdsl1DayIntervalSES,
hds12Shdsl1DayIntervalCRCAnomalies,
hds12Shdsl1DayIntervalLOSWS,
hds12Shdsl1DayIntervalUAS
}
STATUS          current
DESCRIPTION
    "This group supports objects which maintain historic
    performance measurements relating to segment endpoints in
    HDSL2/SHDSL lines in 1-day intervals."
::= { hds12ShdslGroups 9 }
```

```
hds12ShdslMaintenanceGroup OBJECT-GROUP
OBJECTS
{
hds12ShdslMaintLoopbackConfig,
```



```
hds12ShdslMaintTipRingReversal,
hds12ShdslMaintPowerBackOff,
hds12ShdslMaintSoftRestart,
hds12ShdslMaintLoopbackTimeout,
hds12ShdslMaintUnitPowerSource
}
STATUS      current
DESCRIPTION
    "This group supports objects that provide support for
      maintenance actions for HDSL2/SHDSL lines."
 ::= { hds12ShdslGroups 10 }
```

#### hds12ShdslEndpointAlarmConfGroup OBJECT-GROUP

```
OBJECTS
{
hds12ShdslEndpointAlarmConfProfile,
hds12ShdslEndpointThreshLoopAttenuation,
hds12ShdslEndpointThreshSNRMargin,
hds12ShdslEndpointThreshES,
hds12ShdslEndpointThreshSES,
hds12ShdslEndpointThreshCRCAnomalies,
hds12ShdslEndpointThreshLOSWS,
hds12ShdslEndpointThreshUAS,
hds12ShdslEndpointAlarmConfProfileRowStatus
}
STATUS      current
DESCRIPTION
    "This group supports objects that allow configuration of alarm
      thresholds for various performance parameters for HDSL2/SHDSL
      lines."
 ::= { hds12ShdslGroups 11 }
```

#### hds12ShdslNotificationGroup NOTIFICATION-GROUP

```
NOTIFICATIONS
{
hds12ShdslLoopAttenCrossing,
hds12ShdslSNRMarginCrossing,
hds12ShdslPerfESThresh,
hds12ShdslPerfSESThresh,
hds12ShdslPerfCRCAnomaliesThresh,
hds12ShdslPerfLOSWSThresh,
hds12ShdslPerfUASThresh,
hds12ShdslSpanInvalidNumRepeaters,
hds12ShdslLoopbackFailure,
hds12ShdslpowerBackoff,
hds12ShdsldeviceFault,
hds12ShdslcdcContinuityFault,
hds12ShdslconfigInitFailure,
```



```
hds12ShdslprotocolInitFailure,
hds12ShdslnoNeighborPresent,
hds12ShdslLocalPowerLoss
}
STATUS          current
DESCRIPTION
    "This group supports notifications of significant conditions
    associated with HDSL2/SHDSL lines."
::= { hds12ShdslGroups 12 }
```

#### hds12ShdslSpanConfProfileGroup OBJECT-GROUP

```
OBJECTS
{
hds12ShdslSpanConfWireInterface,
hds12ShdslSpanConfMinLineRate,
hds12ShdslSpanConfMaxLineRate,
hds12ShdslSpanConfPSD,
hds12ShdslSpanConfTransmissionMode,
hds12ShdslSpanConfRemoteEnabled,
hds12ShdslSpanConfPowerFeeding,
hds12ShdslSpanConfCurrCondTargetMarginDown,
hds12ShdslSpanConfWorstCaseTargetMarginDown,
hds12ShdslSpanConfCurrCondTargetMarginUp,
hds12ShdslSpanConfWorstCaseTargetMarginUp,
hds12ShdslSpanConfUsedTargetMargins,
hds12ShdslSpanConfReferenceClock,
hds12ShdslSpanConfLineProbeEnable,
hds12ShdslSpanConfProfileRowStatus
}
STATUS          current
DESCRIPTION
    "This group supports objects that constitute configuration
    profiles for configuring span related parameters in SHDSL
    lines."
::= { hds12ShdslGroups 13 }
```

END

## 7. Security Considerations

Blocking unauthorized access to the HDSL2-SHDSL MIB via the element management system is outside the scope of this document. It should be noted that access to the MIB permits the unauthorized entity to modify the profiles ([section 6.4](#)) such that both subscriber service and network operations can be interfered with. Subscriber service can be altered by modifying any of a number of service characteristics such as rate partitioning and maximum transmission rates. Network operations can be impacted by modification of notification thresholds such as SES thresholds.



There are a number of managed objects in this MIB that may be considered to contain sensitive information. 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.

These identifying objects in the inventory group are:

- hds12ShdslInvVendorID
- hds12ShdslInvVendorModelNumber
- hds12ShdslInvVendorSerialNumber
- hds12ShdslInvVendorEOCSoftwareVersion
- hds12ShdslInvStandardVersion
- hds12ShdslInvVendorListNumber
- hds12ShdslInvVendorIssueNumber
- hds12ShdslInvVendorSoftwareVersion
- hds12ShdslInvEquipmentCode
- hds12ShdslInvVendorOther
- hds12ShdslInvTransmissionModeCapability

Therefore, it may be important in some environments to control read access to these objects and possibly to even encrypt the values of these object when sending them over the network via SNMP. Not all versions of SNMP provide features for such a secure environment.

It is recommended that the implementors consider the security features as provided by the SNMPv3 framework. Specifically, the use of the User-based Security Model [RFC 2574](#) [12] and the View-based Access Control Model [RFC 2575](#) [15] are recommended.

It is then the customer/user's responsibility to ensure that the SNMP entity giving access to an instance of this MIB, is properly configured to give access to those objects only to those principals (users) that have legitimate rights to access them.

HDSL2-SHDSL layer connectivity from the xtuR will permit the subscriber to manipulate both the HDSL2-SHDSL link directly and the HDSL2-SHDSL embedded operations channel (EOC) for their own loop. For example, unchecked or unfiltered fluctuations initiated by the subscriber could generate sufficient notifications to potentially overwhelm either the management interface to the network or the element manager.

It should be noted that interface indices in this MIB are maintained persistently. VACM data relating to these should be stored persistently.





There are a number of management objects defined in this MIB that have 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.

## 8. Acknowledgments

The authors are deeply grateful to the authors of the ADSL LINE MIB ([RFC 2662](#) [23]), Gregory Bathrick and Faye Ly, as much of the text and structure of this document originates in their documents.

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